E-commerce and Economic Development

(A Study Sponsored by the South Asia Network of Economic Research Institutes)

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Preface

The Foundation for Public Economics and Policy Research is an autonomous, non-profit organization whose major functions are to carry out research, undertake consultancy work , and conduct training in the area of public economics and policy.

The Foundation undertook this study, at the instance of the South Asia Network of Economic Research Institutes (SANEI). The main objective of this study is to highlight the fact that e-commerce is one of the most important factors that will revolutionise economic growth in a country like India. The study examines the issue of how the rise of e-commerce affects the suitability of various concepts and practices in the tax systems and in the long run, the overall economic development of the country. In doing so, the study takes Andhra Pradesh as a case study to have a thorough detailed analysis for making useful policy recommendations.

The study is the result of the collective effort of the team of the staff members of the Institute. It was planned and guided by Mahesh C. Purohit and Vishnu Kanta Purohit, who prepared the final draft of the study.

The authors are, however, indebted to Ajay Sawhney, Secretary, Information Technology and Communication Department; R. P. Sisodia, Director E-seva Kendra; Samir Sharma, Commissioner of Industries, and V. Bhaskar, Commissioner of Sales Tax for their very useful discussions on the subject during the course of their field visit to Hyderabad.

Thanks are also due to A. L. Meena, who provided excellent research assistance through out the tenure of this study and to R. Srinivasulu, who also provided research assistance during the initial period of the study.

The Governing Body of the *Foundation* does not bear any responsibility for the contents or views expressed in the report. The responsibility rests with the authors, in particular, the leader of the team.

New Delhi
February 25, 2005

Mahesh C Purohit
Director

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Executive Summary

Although there are many narrow and broad definitions of e-commerce, in general it is defined to mean “goods and services transacted over Internet”. It covers transactions in terms of business to business (B2B) or business to consumer (B2C).

E-commerce has a tremendous growth potential and also generates economic growth in the country. In order to realize its full potential to bring about the structural changes needed for economic development, it is important to recognize that e-commerce provides an environment in which new activities can fruitfully be developed. Its interaction with various aspects of growth has to be self-reinforcing to yield the required rate of growth.

A majority of low-income countries have adopted economic policies in which structural change is the driving force behind economic development. While the experiences of several countries and regions have been extremely mixed, the Asian Miracle witnessed dramatic increase in living standards associated with structural changes.

In view of the fact that the emergence of e-commerce is the most important development since the industrial revolution, this study examines the role of e-commerce as the most important factors that will revolutionize economic growth.

In India, the evolution of e-commerce during the past few years is a result of the transition from private or closed network system to an open, public network platform, such as the Internet. Its developments in recent years have affected the overall perspective of tax

policy and governance. These developments have also influenced business prospective by altering the ways of conducting business.

In view of the changing scenario of e-commerce and its emerging importance in economic development in India, this study attempts to present a proper understanding of the *modus operandi* of tax policy and tax governance in relation to e-commerce, both in the short and medium-term. In doing so, it analyzes the economic implications of taxation/non-taxation of e-commerce. It also examines the issue of how the rise of e-commerce will affect the suitability of various concepts and practices in the prevailing tax systems and the overall economic development in the long run.

It covers a broad overview of the issues under the umbrella of e-commerce and the knowledge-based economy. In doing so, it goes deep into the issues concerned and tries encompassing all technologies involved in it. The study further examines the current and potential level of e-commerce activities and identifies the challenges and opportunities for business and government in the new economy.

As a next step, the theoretical as well as practical issues emerging from e-commerce are analyzed thoroughly. In doing so, the study examines the strategy of the central and state governments as well as policy initiatives of the international organizations. It suggests strategies for encouraging e-commerce and integrating the tax system in such a way that it takes care of the twin problems of determining the *citus* of sale and identifying the jurisdiction with regard to its authority over tax transactions.

In view of the fact that e-commerce helps in fostering a favourable business and regulatory environment, the study analyses the mechanics and *modus operandi* of e-commerce. Also, it indicates as to how various factors related to e-commerce contribute to the growth of a vibrant and active electronic community, resulting in economic growth.

Realizing the impact of e-commerce on economic growth, this study suggests a bottom up approach, wherein micro economic variables are used to prove the hypothesis. Accordingly, this study takes a case study of Andhra Pradesh - the state which has launched several projects connected to the state's portal for better service delivery to the citizen. These include e-seva kendra, offering a wide spectrum of citizen-friendly services which help people save time that would otherwise have been spent running around various departments; Computer-aided Administration of Registration Department (CARD) relating to the system of land registration through electronic delivery of all the registration services,

saving time and money for all the citizens; Computerization programme covering all levels of the administrative spectrum of the *Mandal Revenue Offices* (MRO) to ensure quick, accurate and efficient aggregation of large amounts of data generated at the *mandal* levels for performance monitoring and analysis, at both the micro and macro levels; and creation and maintenance of a citizen database that can be used in a variety of ways such as public distribution system, issue of individual identity cards, in ensuring better targeting in all the poverty alleviation programmes etc.

With a view to attempting effect of e-commerce on economic development this study proposes a methodology of estimating productivity gains through it. In this context, unsuccessful efforts were made to collect data through a questionnaire. Notwithstanding non-availability of data at this juncture, it is hoped that in due course the methodology proposed would be put to use when the requisite data are available. Efforts are already afoot at international level to do so.

The study put forth policy recommendations to have good access and reasonable affordability of these services. It also recommends the need for extended exchanges (RAXs) at the lowest level with exchanges equipped to fall-in with the National Synchronization Plan. It further recommends that security of documents and data is of prime importance.

On the policy front, the study recommends that it is essential to remove deficiencies in the existing laws and to seek convergence of media and technologies as early as possible. The last mile connectivity is of cardinal importance in the promulgation of the Internet in a country like India where two-thirds of the population lives in rural areas keeping in view the access devices and their costs.

Finally, policy and facilitation have now become critical because technologies are not the barriers. They already exist. For example, Wi-Fi could be fruitfully used for the last mile access. In fact, the entire process has to be economic service oriented where the beneficiary pays for the information and the enterprise creates a win-win situation for all concerned.

1

The Issues

Introduction

E-commerce is an activity that has a tremendous growth potential and also generates economic growth in the country. However, in order to realize its full potential to bring about the structural changes needed for economic development in India, it is important to recognize that e-commerce provides an environment in which new activities can be most profitably developed. Its interaction with the various aspects of growth has to be self-reinforcing to yield the required rate of growth.

Economic development involves the creation of novel economic activities. New productive sectors emerge and change the structure and organization of the old activities drastically. The history of economic growth suggests that such a process of structural change is crucial for accelerating growth.

A majority of low-income countries have adopted economic policies in which structural change is the driving force behind economic development. While the experiences of several countries and regions have been extremely mixed[1], the Asian Miracle witnessed dramatic increase in living standards associated with state-led structural changes[2].

It is important to recognize that the key aspects of returns to scale are often found at the micro level—within very narrow sectors of production, or small districts of a city.

[1] See Rodrick, Dani (2003), "Growth Strategies", Mimeo, Harvard University, as quoted in Robin Burgess and Anthony J. Venables (2003), "Towards a Microeconomics of Growth", paper presented at the World Band ABCDE, Bangalore.

[2] Asian Development Bank (1997), *Emerging Asia: Changes and Challenges,* Philippines.

Microeconomics of growth is needed to capture these sectorally and spatially concentrated processes.

Empirical work has to capture this micro-level heterogeneity and diversity. Cross-country comparisons, though useful in identifying some of the factors affecting growth, cannot give a meaningful insight into the growth process. Instead a more bottom up approach is required, where microeconomic studies are used to build up an evidence base on what works in different countries, regions and sectors.

E-commerce is one such activity that has tremendous growth potential and also generates economic growth in the country. However, it has not been realized that it can bring about the structural changes needed for economic development. It is important to recognize that e-commerce is going to be the driving force of economic development in countries, especially India. The interaction of such factors will bring about rapid economic growth. Experiences of many countries indicate that increasing returns and cumulative causation have resulted in high rates of growth[3].

Statement of the Problem

Development is affected by the given investment climate of a country created by it's macroeconomic policies and economic governance. But another important factor that influences growth is the quality of infrastructure. In the Indian context, this attains considerable importance and poses countless challenges for the investment climate.

A range of aspects come under the rubric of infrastructure. These include power supply, transport, water supply, and telecommunication services. All these aspects are important movers of growth, but given the present state of development in information and communication technologies (ICT), telecommunication acquires special importance. The application of ICT has become widespread in global business and improves economic performance and welfare among user population. E-commerce is one such activity that has generated new dimensions in economic growth and has helped many countries to attain a higher level of development in recent years, thereby creating an investment climate conducive for further economic development.

There is a strong correlation between the indicators of investment climate and productivity. A "World Bank---Confederation of Indian Industries (WB-CII)" survey has

[3] Murphy, K. A., Shleifer and R. W. Vishny (1989), "Industrialization and the big push", *Journal of Political Economy,* 97,1003-26.

revealed that West Bengal, Kerala and Uttar Pradesh have a rather poor investment climate as compared to Tamil Nadu, Maharashtra, Karnataka and Andhra Pradesh[4]. This could *interalia* be seen in measures of e-mail connectivity. For example, in states such as Andhra Pradesh and Tamil Nadu, the typically small firm is using the internet to communicate with suppliers and customers[5]. The "WB-CII" survey reveals that the firms in states having good investment climate have been investing more and aggregate performance of these states has been better than in the poor investment climate states.

A similar World Bank survey on China indicates that China has been able to attract much larger foreign direct investment (FDI) --approximately 5% of its Gross Domestic Product (GDP), as compared to India where this ratio is less than one percent. The low level of FDI into India is a signal of the importance of tackling issues related to development of ICT, particularly of e-commerce.

Even when the crucial macroeconomic factors are present, there is no guarantee that growth will take place. There are numerous examples of growth taking place in very narrow sectors and of fast growing locations being adjacent to backward locations, in spite of both locations being subject to the same institutions and policies. Such factors, especially e-commerce, are thus central to understanding economic growth in the low-income context.

In this context, this study hypothesizes that e-commerce is one of the most important factors that will revolutionize economic growth in a country like India. It is important to note that the emergence of e-commerce is the most important development since the industrial revolution. Its evolution during the past few years is a result of the transition from private or closed network system to an open, public network platform, such as the Internet.

In the Indian context, according to a study by Goldman Sach, the number of Internet users is expected to grow from 0.5 million in 1998 to 9 million by the end of 2003, indicating a compound growth rate of 76 percent --the fastest in Asia. According to a NASSCOM survey, there will be about 10 million Internet subscribers (32 million Internet users) by 2003. The use of cable television to facilitate access to the Internet may result in a faster growth of the number of Internet users.

Amongst the Asian nations, the growth of e-commerce in India between 1997 and 2003 is expected to be the highest. India has a growth rate of 246 % as against 845 % in Australia,

[4] Stern, Nicholas (2002), *Public Finance &Policy for Development: Challenges for India,* Silver Jubilee Lecture, NIPFP, New Delhi.
[5] *Ibid,* p. 18.

145% in South Korea, 243 % percent in China, and 110% in Hong Kong. An Arthur Andersen study expects 3000 digital marketplaces to be operational in India by 2005.

However, the present volume of e-commerce is far below the levels achieved in the USA. Further the expected volume of e-commerce in India is also below the levels expected to be achieved in Australia, China, South Korea and Hong Kong.

The development in e-commerce in recent years has affected the overall perspective of tax policy and governance. These developments have also influenced business prospective by altering the ways of conducting business.

In view of the emerging importance of e-commerce in economic development in India, it is important to have a proper understanding of the *modus operandi* of tax policy and tax governance in relation to e-commerce, both in the short and medium-term. In doing so, it is useful to analyse the economic implications of taxation/non-taxation of e-commerce. It is also important to examine the issue of how the rise of e-commerce will affect the suitability of various concepts and practices in the prevailing tax systems and the overall economic development in the long run.

Review of Literature

A review of studies that have so far been attempted, indicates that in all other countries, e-commerce is a result of the transition from closed networks to a public network platform, such as the Internet. It further indicates that resorting to e-commerce is procreating a wide array of innovative businesses, markets and trading communities. This is clearly indicated by the work attempted in the USA[6] and by the studies from the international and regional organizations[7] as well as the literature coming from the OECD countries[8]. All these studies illustrate that e-commerce creates diverse functions and revenue streams. Also, it reduces costs of transactions significantly. It is believed that procurement costs can be reduced by 90 percent

[6] See for example, United States (1996), *Selected Policy Implications of Global Electronic Commerce,* Office of Tax Policy, Department of Treasury, Washington, D.C. and United States (1997), *A Framework for Global Electronic Commerce,* The White House, Washington, D.C.

[7] Emerging Economy Market Forum (2001), *International and Regional Bodies: Activities and Initiatives in Electronic Commerce, OECD, Paris.*

[8] See for example, OECD, (2001), *Taxation and Electronic Commerce: Implementing the Ottawa Taxation Framework Conditions,* Organization of Economic Co-operation and Development, Paris; and Centre for Tax Policy and Administration (2003), *Facilitating Collection of Consumption Taxes on Business-to-Consumer Cross-Border E-commerce Transactions, OECD, Paris.* .

by buying online[9], thereby increasing overall efficiency and giving a boost to economic development.

Methodology of the Study

Based on the review of available literature, this study attempts to present a broad overview of the issues under the umbrella of e-commerce and the knowledge-based economy. In doing so, efforts have been made to go deep into the issues involved and to encompass all technologies involved in e-commerce. It then examines the current and potential extent of e-commerce activities and goes on to identify the challenges and opportunities for business and government in the new economy.

As a next step, the study attempts a thorough analysis of the theoretical as well as practical issues emerging from e-commerce. Efforts have also been made to study the range of current activities in e-commerce. In doing so, the study examines the role of central and state governments in developing extremely sophisticated telecommunications infrastructure. This includes a comparative study of strategies, initiatives, and policies of taxation and e-commerce of various national governments, and international organisations It suggests strategies for encouraging e-commerce and integrating the tax system in such a way that it takes care of the twin problems of determining the *citus* of sale and identifying the jurisdiction with regard to its authority over tax transactions.

As e-commerce helps in fostering a favourable business and regulatory environment, the study analyses the mechanics and *modus operandi* of e-commerce. The methodology adopted studies various factors related to e-commerce and how they contribute to the growth of a vibrant and active electronic community, resulting in economic growth.

The study also attempts to capture micro-level heterogeneity and diversity. Cross-country comparisons, though useful in identifying some of the issues, cannot provide enough details to give a clear insight into the growth process. Hence, to take a more bottom up approach, this study adopts Andhra Pradesh for case study.

Objectives of the Study

Keeping in view this cumulative causation of infrastructure, governance and economic growth[10], the objectives of the study are as follows:

[9] In the Indian context, it is estimated that online banking costs 1 INR (Indian Rupee) as against 27 INR by cash machine and 114 INR by bank teller.

a. To highlight that e-commerce is one of the most important factors that will revolutionize economic growth in a country like India. In this context, the study attempts to bring out the fact that even when the macroeconomic factors are present, there is no guarantee that growth will take place. There are some factors that are central to understanding economic growth in the low-income context.

b. To analyze the role of information and communication technologies (ICT) as an important infrastructure tool in the growth of e-commerce that accelerates the Indian economy. It is well known that the application of ICT has become widespread in global business and improves economic performance and welfare among user population.

c. To emphasize the growth and potential of e-commerce.

d. To analyze developments that have influenced business prospective by altering the ways of conducting business. In view of the emerging importance of e-commerce in economic development in India, it is of paramount importance to have a proper understanding of the *modus operandi* of tax policy and tax governance in relation to e-commerce, both in the short and medium-term. In doing so, it is useful to analyse the economic implications of taxation as well as non-taxation of e-commerce; and

e. To examine the issues and make policy recommendations on how to make best use of the rise of e-commerce to bring about crucial changes in various concepts and practices in tax systems which in the long run will have a positive impact on the overall economic development of the country.

Scheme of Presentation

With the above objectives in view, the scheme of presentation of the study is as follows: in chapter 2 an attempt is made to explain the meaning of e-commerce and present its significance in the overall economic scenario. Chapter 3 is devoted to an analysis of the e-commerce strategy of different countries as well as that of India. It attempts to show that in spite of the existence of the digital divide, investment in ICT not only provides digital access but also has important implications for economic development . The next chapter (chapter 4) reviews the initiatives of international organizations (such as OECD), as well as countries such as USA, Canada, Japan, Australia etc. Also, it presents policy changes and other initiations in India to attain a high growth of e-commerce. Chapter 5 deals with issues related to taxation or

[10] Murphy, K. A., Shleifer and R. W. Vishny (1989), "Industrialization and the big push", *Journal of Political Economy,* 97,1003-26.

non-taxation of transactions related to e-commerce. In this context, effort is made to analyze issues related to tax policy and administration with reference to e-commerce.

In view of the fact that e-commerce has a tremendous but unrealized potential to restructure the over all economic environment, effort is made in chapter 6 to understand how this potential will be realized. To do this, the study moves beyond e-commerce and considers the underlying patterns of information and communication technologies (ICT) . Attempt is made in this chapter to examine as to what makes ICT a unique factor bringing about transformation in the over all economic environment. For a detailed mapping of ICT, that in turn structures the nature of e-commerce, this chapter presents as a case study the central structure of ICT in Andhra Pradesh (one of the ICT savvy states).

Finally, chapter seven presents the policy imperatives for furthering e-commerce in the country in terms of strategy, security issues and growth of the economy.

2

Concept, Process and Infrastructure for E-commerce

Today's digital revolution involving the Internet and worldwide use of websites has set the stage for e-commerce. This digital revolution is leading countries towards an "information society". It is also transforming social infrastructures resulting in socio-economic development of countries.

Concept of E-commerce

Legal Definition: The legal definition of e-commerce refers to sale of products directly to the consuming public or directly to other business involved in e-commerce. In short this is called B2B - 'business to business trade'. E-Commerce is conducted with low overhead costs and in most cases without even storefronts[1]. According to Dr. N L Mitra, e-commerce comprises transactions where offer and acceptance is done through the Internet, almost like mail order or telephone order'[2].

General Definition: In general, e-commerce refers to "goods and services transacted over Internet". It has a much broader scope than just carrying on merchandise transactions electronically and covers all forms of trade in goods and services and encompasses banking, insurance, and trading in shares. It involves both organizations and individuals using electronic data transmission technologies, such as those used on the Internet and the World Wide Web (www)[3].

According to the International Fiscal Association (IFA), e-commerce includes commercial transactions in which the order is placed electronically and the goods or services are delivered in tangible or electronic (digitized) form and there is an ongoing commercial

1 Legal definition from website: http://www.legal-term.com/e-commerce-definition.htm
2 Dr N L Mitra , National Law School of India, Bangalore University, Bangalore.
3 Schneider, Gary P. (2003), *Electronic Commerce,* Thomson Course Technology, Singapore, p. 4.

relationship[4]. Organization for Economic Cooperation and Development (OECD) also defines e-commerce to refer to all transactions based on the processing and transmission of digitized data, including text, sound and visual images that are carried out over open networks or closed networks that have a gateway onto an open network[5]. These include electronically marketed products from business-to-consumer, which are tangibles as well as intangibles such as travel and ticketing services, software, entertainment, banking, insurance and brokerage services, information services, legal services, real estate services, and increasingly health care, education and government services. The National Association of Software and Service Companies (NASSCOM) defines e-commerce to include all 'transactions where both the offer for sale and the acceptance of offer are made electronically'[6].

A more general definition given by Wigand suggests that "E-commerce is seamless application of information and communication technology from its point of origin to its endpoint along the entire value chain of business processes conducted electronically and designed to enable the accomplishment of a business goal. These processes may be partial or complete and may encompass business to business as well as business to consumer and consumer to business transactions"[7]. This definition introduces the value chain, an important point as e-commerce technologies can be applied in transactions between manufacturer and supplier, manufacturer and retailer and/or retailer/service supplier and consumer. The definition is, however, possibly a bit all embracing; one is tempted to think of an order processing system of the EDP era as an e-commerce system with 'partial' e-commerce processing.

A Survey of business views on the definition of e-commerce conducted on behalf of Statistics Canada, distinguishes between e-commerce and e-business. According to the findings of the survey "the notion of transactions, computer-mediation, channels and trigger events were found to be key concepts in defining e-commerce[8].

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4 The International Fiscal Association, Sprague, Gary D and Michael P. Boyle, "General Report of the International Seminar on Taxation of Income Derived from Electronic Commerce", held at San Francisco, USA, IFA(2001), Proceedings of the Seminar, Kluwer, The Netherlands, p. 23.

5 Organization for Economic Cooperation and Development (1999), *Defining and Measuring E-commerce: A Status Report,* Directorate for Science, Technology and Industry, OECD, Paris.

6 National Association of Software and Service Companies, www.nasscom.org

7 Wigand, R.T. (1997), "Electronic Commerce: Definition, Theory and Context", *The Information Society,* Vol. 13, No. , pp. 1-16.

8 Statistics Canada (1999), *A Reality Check to Defining E-Commerce,* A Report prepared by CGI for Statistics Canada.

The Group of Information Technology and Telecommunications of the Ministry of Information and Technology opines that the more acceptable definition of e-commerce could be the one adopted in the WTO Ministerial Declaration on E-commerce.[9] In the definition used by the WTO, e-commerce includes all transactions covering production, distribution, marketing, sales or delivery of goods and services by electronic means.

The various definitions of e-commerce given above suggest that e-commerce can be defined both in the narrow and broader sense. In narrow terms, e-commerce covers all transactions conducted on closed or open network using non-proprietary protocols, like the Internet, or over proprietary networks like intranet or extranet. While this definition excludes discrete sales (sporadic sales that do not involve substantial amounts) and transactions involving the use of electronic data interchange (EDI) and electronic funds transfer (EFT) and other electronic networks that were extensively used prior to the 1990's, it does not exclude electronically based transactions of the pre-internet era and includes the new possibilities of the future mode of transactions. In broader terms, it includes all those communication applications that support commercial activities. This definition focuses on e-commerce as a strategy or business model, rather than on e-commerce as an application or technology. In brief, the broader term encompasses e-commerce business activity and the narrower definition covers e-commerce transactions only.

Various definitions given by the same organization have also changed over time. This points to the fact that an e-commerce definition is dynamic and varies with the objective one wants to measure. It is also important to note that e-commerce is more than a technology; it is a business model built around the application of information and communication technologies to any aspect of the value chain for products and services.

Process of E-commerce

The process of e-commerce, in general involves a multiplicity of transactions as is aptly shown in Exhibit 2.1. It involves a large number of chains to complete the cycle of transactions. Assume that a dealer (Z Limited) of country X is a retailer. He is selling a wide range of goods and services. Another dealer (M Limited) from country Y is contemplating entering the market. M Limited does not plan to have any office, warehouses,

[9] WTO Work Programme on Electronic Commerce: Preparations for the 1999 Ministerial Conference. See A discussion paper on "Promotion of E-commerce: National Initiative" (2000), IT&T Group, Ministry of Information and Technology, New Delhi.

Exhibit 2.1: E-Commerce Process Charte

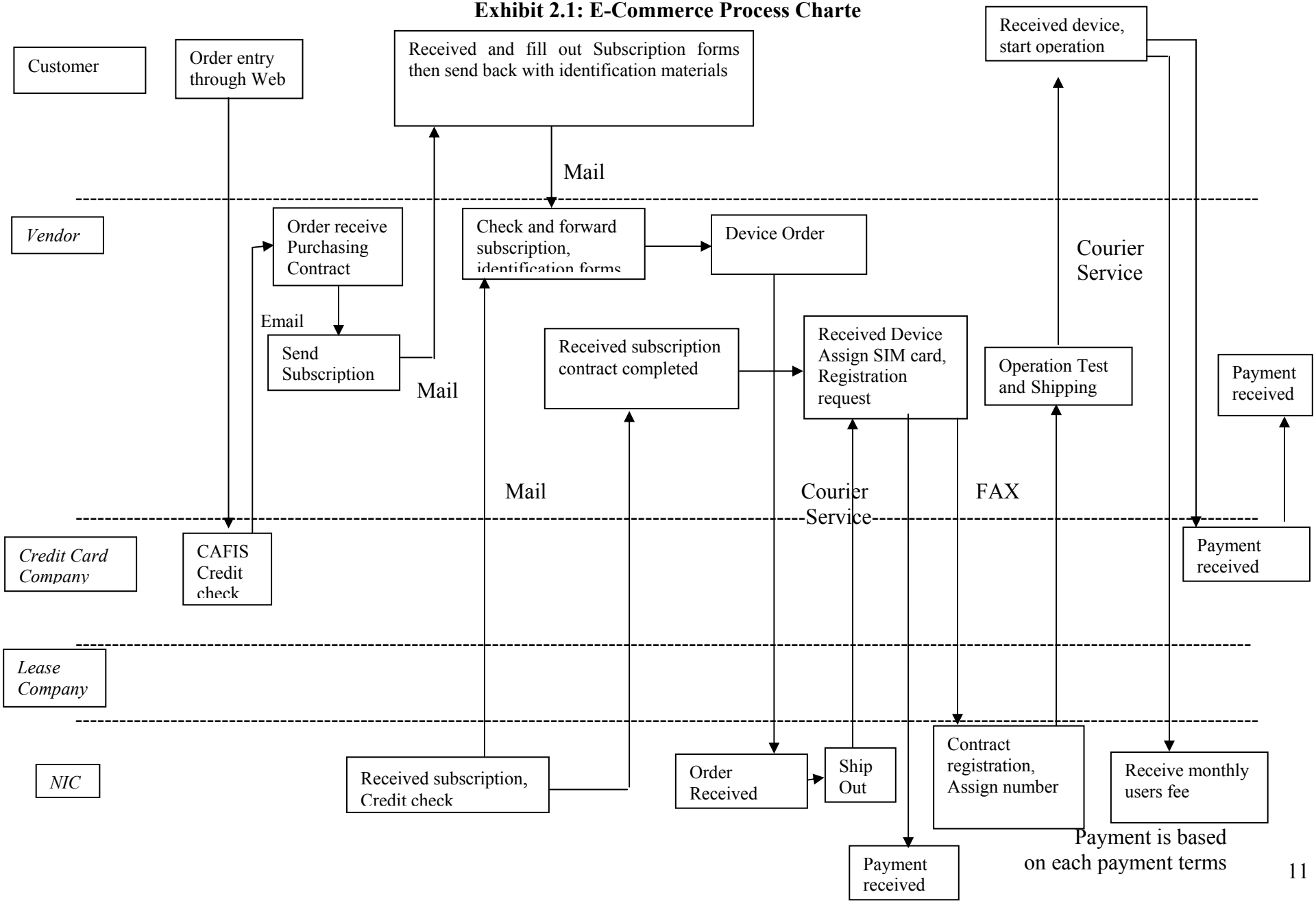
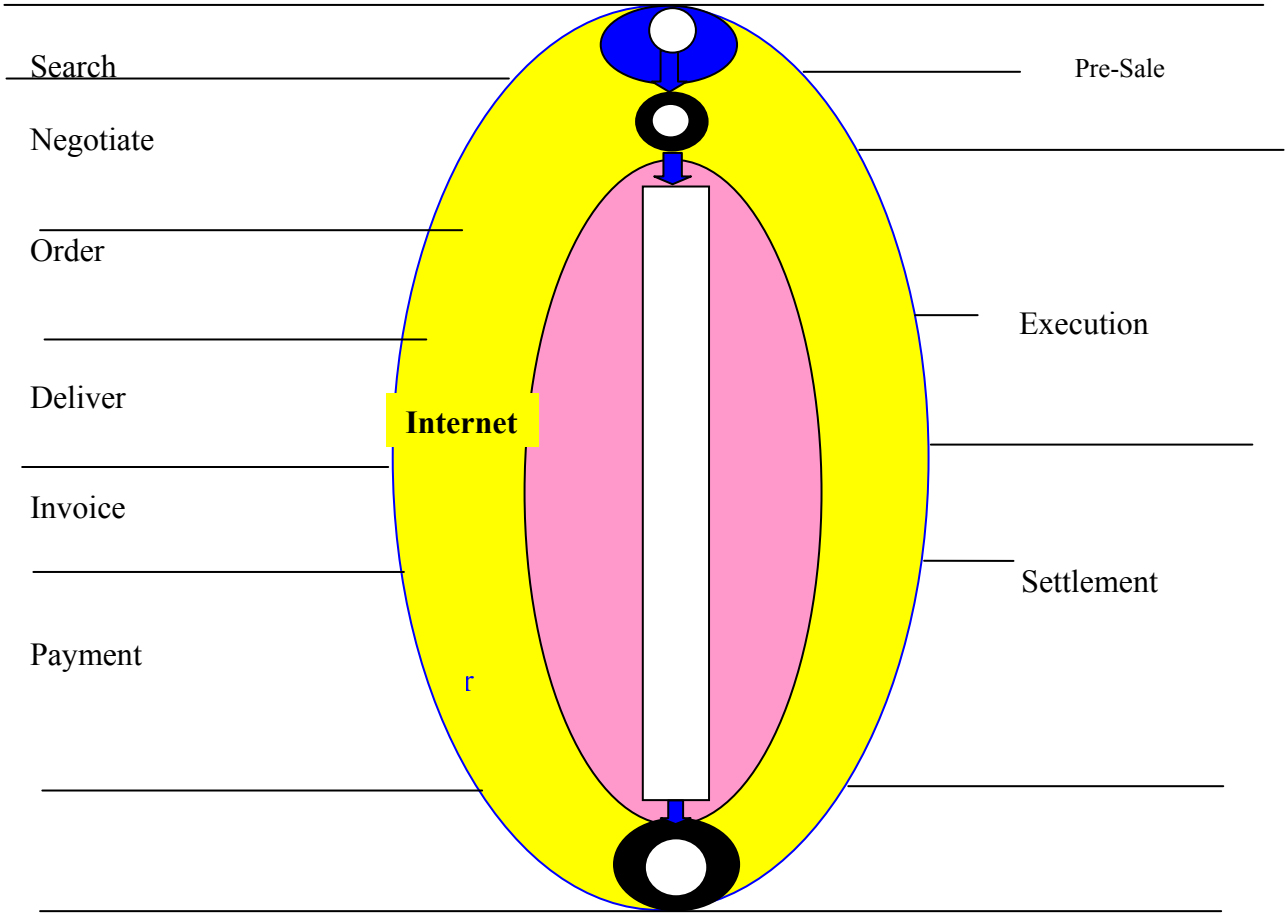


Exhibit 2.2

Internet and the Trade Cycle



factories or other facilities in country Y. He is also not planning to make his employees work in country Y. However, residents of country Y will be able to purchase goods from Z Limited by logging on to its website on the Internet[10].

In order to establish an Internet presence, Z Limited arranges with an Internet service provider to establish a connection between his website, hosted on a server, to the Internet. Z Limited could maintain its own web server which is connected to the internet service provider or could lease space on the internet service provider's server or lease space on a server owned by a third party (say a server firm like Exodus, Digital Nation, etc) that is connected to the Internet.

The customer accesses the Internet by dialing a local phone number (using a wired or wireless connection) or using a direct connection (e. g. a cable modem). Once logged on to the Internet, the customer surfs the Internet using a web browser (software like Netscape Navigator, Internet Explorer, etc) to locate Z Limited's cybermall and then browses through the cybermall itself. Upon selection of the products to be purchased, he can click on a payment icon that provides the necessary credit (or debit) card information to consummate the sale. When the payment is complete, Z Limited permits the downloading of downloadable products or services in digital form (e. g. computer software, films, books, music, etc). Similarly, if the payment is for services, a video conference may be established between the customer and Z Limited's service personnel. If the items ordered are not downloadable, Z Limited makes shipping arrangements and the customer may download the payment receipt and the shipping information.

This process is explained with the help of Exhibit 2.2[11]. This form of e-commerce may give the customers credit facilities but is typified by the 'cash' trade cycle where a 'cash' payment is taken to include settlement at the time of purchase by a credit card or some form of e-cash. The Internet can be used for all or part of the trade cycle. The first stage of the trade cycle involves 'search' and the facilities of the Internet can be used to locate sites offering, or advertising, appropriate goods or services; a function, as already mentioned, that is similar to an electronic market. In many instances, Internet sites offer only information and any further steps down the trade cycle are conducted on the telephone or at a conventional shop outlet.

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[10] See Government of India (2001), "Report of the High Powered Committee on Electronic Commerce and Taxation", Central Board of Direct Taxes, New Delhi.

[11] See Whiteley, David (2000), *E-commerce: Strategy, Technologies, and Applications,*Tata Mcgraw-Hill, New Delhi (International Student Edition).

An increasing number of sites offer facilities to execute and settle the transaction,or in normal parlance- to make a purchase. The delivery may be in electronic form or by a home delivery service depending upon the nature of the goods or service being offered.

The final chain of the e-commerce transaction involves after-sales service. Many IT providers now offer on-line support and on-line services. Again the use of the Internet for after-sales may or may not be a follow-on of an earlier on-line transaction.

E-commerce as an Instrument of Transformation of Purchasing Process

The above definitions of e-commerce suggest that the Internet is profoundly changing consumer behaviour. Instead of buying things from usual market of "brick and mortar", many consumers now behave differently. A survey of e-commerce in the USA indicated that twenty percent of the customers going to Sears departmental store in America to buy an electrical appliance, for example, will have researched their purchase online[12]. Three-fourths of Americans start shopping for new cars online, even though most of them end up buying from traditional dealers (Exhibit 2.3). A study by Forrester, a research consultancy, shows that half the consumers in Europe, who have an Internet connection, buy products offline after having investigated prices and other details online. In Italy and Spain, for instance, people are twice as likely to buy offline as online, after researching on the Internet. But in Britain and Germany, the numbers are evenly split. Forrester says that people begin to shop online for simple, predictable products- such as DVDs, and then graduate to more complex items.

Travel makes up the biggest chunk of business-to-consumer e-commerce, accounting for about one-third of online consumer spending. Last year, 35 million Americans bought travel tickets online, a 17 percent increase as compared to 2002, according to the PhoCus Wright Consumer Travel Trends Survey. The survey found that nearly two-thirds of the travelers who had booked their tickets online were happy to buy personal travel tickets either from online agencies or directly from the websites of travel firms, and often used both for different parts of the same trip[13]. The vast majority of customers consulted at least one online travel agency and the website of one supplier before purchasing anything online. Many more people did investigate their travel options online but then booked offline. Online travel bookings in America could quickly move from 20% of the market to more than half.

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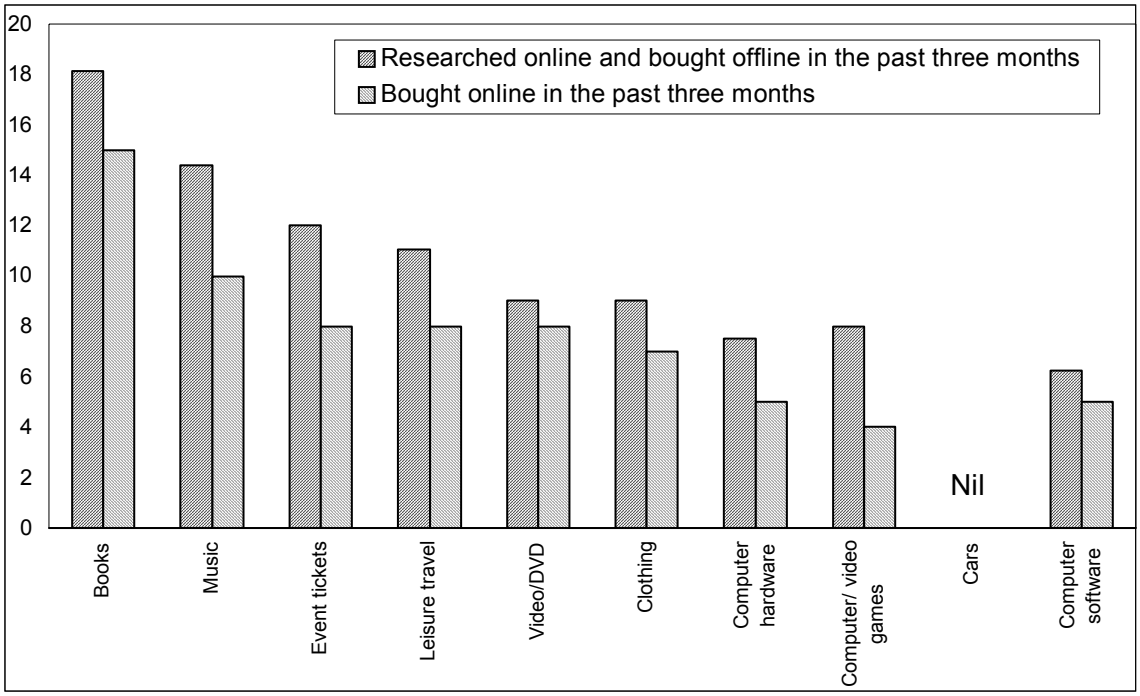
12 See, "A Perfect Market : A Survey of E-commerce", *The Economist,* May 15th 2004, pp. 3-16.

13 *Ibid*. p.7.

Exhibit 2.3
Ratio of Offline Purchases After Online Research to Online Purchases



Among the e-commerce of merchandise, books are a very important item. Amazon, the biggest e-seller of books, is trying to provide customers with a new experience. One innovative feature that the e-seller has provided is a "search in-side the book" introduced very recently, which allows customers to search the pages of the entire stock of more than 1,20,000 books. It is the on-line equivalence of being able to browse through pages of books as people do physically in a real bookshop.

Infrastructure for E-commerce

Though e-commerce is spreading its wings very fast, it is a new way of conducting, managing and executing business transactions using modern information technology. It is a phenomenon, which is drastically reshaping the parameters of trade.

Historically, e-commerce has existed for the last two decades in some form or the other but the spread of Internet has become a new force popularizing it. Six main instruments of e-commerce have been recognized by WTO. These are telephone, fax, TV, electronic payment and money transfer system, electronic data interchange and Internet.

The Internet provides access 24 hours a day, seven days a week --any time, anywhere. Thus, time and place are no longer the constraint. E-commerce builds on the structures of

traditional commerce by adding the flexibility offered by electronic networks. This facilitates improvement in operations leading to substantial cost savings as well as increasing competitiveness and efficiency through the redesigning of traditional business.

E-commerce transactions can be categorized in terms of target user groups such as business to business (B2B) which may include procurement over computer networks or business to consumer (B2C) such as on-line retail. Although business to business commerce on the net is growing, the use of Internet to bring e-commerce to the individual consumer has been a relatively new development.

As seen from the definitions and the scope of e-commerce, it is one such activity that has generated new dimensions in economic growth and has helped many countries to attain a higher level of development in recent years, thereby affecting the investment climate for furthering development. These include power supply, transport, water supply, and telecommunication services.

Growth of Information and Communication Technologies as a Basic Infrastructure for E-Commerce

All the above mentioned variables are important movers of growth but telecommunication plays a vital role in the development of information and communication technologies (ICT).

In the pre-independence era, the process of expansion of the network was rather slow in India. The Posts and Telegraphs (P & T) occupied a small corner in the Public Works Department (PWD) in 1831[14]. In the same year the first telegraph line opened for traffic to Kolkata. A regular and separate department was inaugurated in 1854 and telegraph facilities were thrown open to the public. In 1882, the first telephone exchange was opened at Mumbai. In 1914, on the eve of the First World War, the telegraph department was amalgamated under a single Director-General. In 1943, a Telecommunication Development Board was set up and in 1944 the Mumbai-NewYork Wireless Telegraph Service was commissioned. The major milestones achieved in telecommunication since Independence are shown in Annexure *A2.1*.

The reforms in telecommunications and ICT can be analyzed in three phases. The first phase of reforms in the telecom sector began in the 1980s, with the launch of a programme known as "Mission-Better Communication". In 1984, the private entrepreneurs were

[14] See for details of evolution, Kulkarni, V S, "Reforms in Telecommunications Sector: Some Issues", in Singh, Ravishankar Kumar (2004), *Economics Reforms in India,* Abhijit Publications, Delhi-100094.

permitted to manufacture customer premise equipment. During this period, the Center for Development of Telematics (C-DOT) was established for the development of indigenous technologies. Private franchises were freely given for public call offices (PCOs) that offered local, domestic and international calling services. Mahanagar Telephone Nigam Limited (MTNL) for Delhi and Mumbai, and Videsh Sanchar Nigam Limited (VSNL) for all international services, were mooted by the Department of Telecommunications (DoT). With these steps, the services that had hitherto been under a government department were now corporatised. In 1989, a High Powered Telecom Commission was set up to review the existing policies and to recommend future telecommunication policies.

The second phase of reforms commenced with the general liberalization of the economy in the early 1990s and the announcement of a New Economic Policy (NEP) 1991. This phase witnessed major reforms including commissioning of I-Net exchange, introduction of voice mail service, bringing cellular and WLL (wireless in local loop) telephone systems into vogue and commissioning of the Indo-Nepal optical fibre link. In 1991, telecom equipment manufacturing was de-licensed. Radio paging, cellular mobile as well as value-added services were gradually opened to private sector. The announcement of National Telecom Policy (NTP) in May 1994 was a major breakthrough in the telecom sector. The most vital feature of the new policy was to make provision for participation of companies registered in India in basic telecom services with a view to supplement the efforts of DoT. The NTP, 1994, announced the provision of one public call office (PCO) for every 500 people in urban areas. Telecom Regulatory Authority of India (TRAI) was set up as a statutory body to regulate telecommunication services in February 1997[15] and Bharati Telenet was launched commercially in June 1998. The second phase of reforms witnessed extension of services in the public sector but now much more reliance was on private participation in providing these services.

The third phase of reform was witnessed in the late nineties with the announcement of the New Telecom Policy of 1999 (NTP-1999), which provided a path breaking opportunity for the growth of this sector. The landmark event of the phase was the acceptance by the government that telecommunication was an important service for the common man and was a

[15] The major areas of functioning of TRAI were to recommend the need and timing of introduction of a new service provider (SP) and decide terms and conditions of its license, to ensure technical compatibility and effective intercommunication between different SPs, to regulate the arrangements of sharing of revenue, to protect consumer interests, to settle disputes between SPs, to fix rates for providing telecommunication services, and to monitore the quality of SPs.

driver of economic growth. This was enunciated in the guiding principles of the NTP-1999[16]. The NTP-99 had targeted to make telephones available on demand by the year 2002 and sustain it thereafter, so as to achieve a tele-density of 7 by the year 2005 and 15 by the year 2010. It encouraged development of telecom in rural areas, making it more affordable by adopting a suitable tariff structure and making rural communications mandatory for all fixed service providers. It aimed at increasing rural tele-density from the current level of 1.5% to 4% by the year 2010 and to provide reliable transmission media in all rural areas. The NTP-99 also planned to achieve telecom coverage of all villages in the country and provide reliable media to all exchanges by the year 2002.

With regard to e-commerce, it made provision for Internet access to all district headquarters and high-speed data and multimedia capability, using technologies including ISDN, to all towns with a population greater than two lakh, by the year 2002.

The policy gave a green signal for National Long Distance Service (NLDS) with effect from August 13, 2000. With the intention of encouraging International Long Distance Traffic (ILDT), the Government has announced the termination of monopoly of Videsh Sanchar Nigam Limited (VSNL) from March 2002.

Bharat Sanchar Nigam Limited (BSNL) was created by DoT on 1st October 2000 as a new entity to operate services in different parts of the country as a public sector unit. Since then, BSNL has grown considerably. As of now, it is the largest public sector undertaking of India with a network of over 45 million lines covering 5000 towns with more than 35 million telephone connections[17]. With the latest digital switching technology like OCB, ESWD, AXE-10, FETEX, NEC etc. and widespread transmission net-work, web telephone DIAS, VPN, broadband and more than 400,000 data customers, BSNL is undoubtedly a giant in the telecom sector. It has also achieved progress in providing cellular phone connections. There were 3.7 million of these connections (at all India level) on August 31, 2003. The

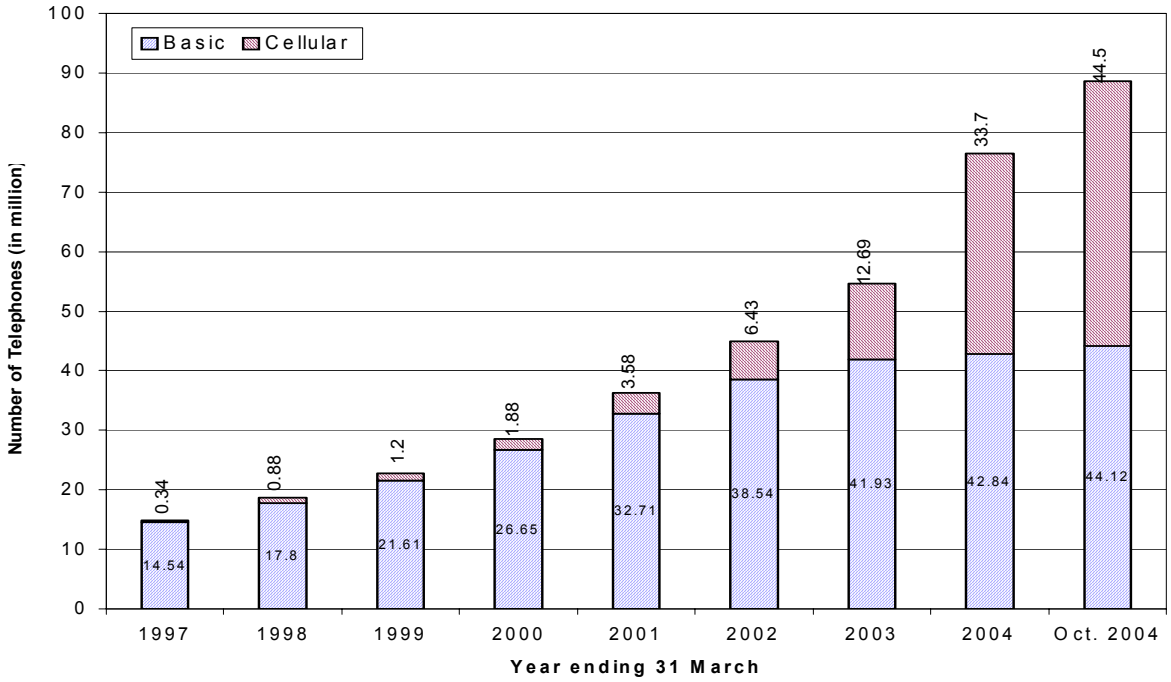
[16] The NTP had the following main features: (i) Affordable and effective communications to citizens is the core of the vision and goal of telecom policy; (ii) Balance between the provisions of universal service to all uncovered areas, including rural areas, and provision of high level services capable of meeting the needs of the country's economy; (iii) Building a modern and efficient telecommunications infrastructure to meet the convergence of telecom, IT and the media; (iv) Conversion of PCOs into Public Tele Info Centers having multimedia capability like ISDN services, remote database access, government and community information systems; (v) Transformation of the telecommunications sector to a greater competitive environment providing equal opportunities and level playing field for all players; (vi) Strengthening research and development efforts in the country; (vii) Achieving efficiency and transparency in spectrum management; (viii) Protecting the defense and security interests of the country; and (ix) Enabling Indian telecom companies to become truly global players.

[17] It has an authorized share capital of $3600 million and a net worth of $13 13.85 billion.

telecommunications network of the public sector--BSNL and Mahanagar Telephone Nigam Limited (MTNL)- is one of the largest telecom networks in Asia.

The first mobile telephone, MITS, was inaugurated on an experimental basis in Delhi on December 31, 1985. Later on, in 1996 Motorola- a USA based company, commercially introduced mobile phones all over the country. Since then, there has been a revolutionary change in the field of cellular mobile phone services in the country. The growth in the fixed lines and cellular mobile phones has been spectacular, as shown in Exhibit 2.4.

Exhibit 2.4
Fixed Line Telephones and Cellular Mobile phones (in million)



Internet Services have also expanded at a colossal speed after they were opened to the private sector in November 1998. By 30th September 2001, 528 licenses of Internet Service Provider (ISP) have been issued.

Convergence Bill 2000/2001

Communication Convergence Bill 2000 is pending before the Parliament. It aims at promoting and facilitating the carriage and content of communication and development infrastructure[18].

[18] The bill also proposes to make TRAI and Telecom Dispute Settlement Appellate Tribunal (TDSAT) more effective, to encourage FDI, to create globally competitive Indian entities through mergers and acquisitions and to increase bandwidth availability.

The proposed Bill is a futuristic piece of legislation, that aims to

i. Facilitate development of national infrastructure for an information based society and to enable access thereto;

ii. Provide a choice of services to the people with a view to promoting plurality of news, views and information;

iii. Establish a regulatory framework for carriage and content of communication in the scenario of convergence of telecommunication, broadcasting, data-communication, multimedia and other related technologies and services; and

iv. Establish the powers, procedures and functions of a single regulatory and licensing authority and of the Appellate Tribunal.

In order to facilitate the convergence of different technologies and the services they provide, the main thrust of the Bill is to consolidate the regulatory mechanisms governing the three principal communication areas *viz.,* broadcast, telecommunications, and data/Internet. Specifically, the bill proposes a licensing structure which would break the provision of services into five different categories, *viz*.:

a) *Network infrastructure facilities provider /owner* would include earth stations, cable infrastructure, wireless equipments, towers, posts, ducts and pits used in conjunction with other communication infrastructure, and distribution facilities including facilities for broadcasting distribution[19].

b) Networking services provider defined to include bandwidth services, fixed links and mobile links;

c) Network application services provider covers public switched telephony, public cellular telephony, global mobile personal communication by satellite, internet protocol telephony, radio paging services, public mobile radio trucking services, public switched data services.

d) Content application services provider refers to satellite broadcasting, subscription broadcasting, terrestrial free-to-air television broadcasting and terrestrial radio broadcasting; and

[19] This implies that there would be one licensing structure for network facility providers, regardless of whether the network is designed for voice, data, broadcast, or all of these, and regardless of whether the networks are based on fixed line or wireless technologies.

e) Value added network application services providers such as Internet services and unified messaging services. This category has been defined to specifically exclude information technology enabled services. Thus, IT enabled services such as call centers, e-commerce, tele-banking, tele-education, tele-trading, tele-medicine, videotext and video conferencing shall not be licensed under the new legislation.

Further, the Bill proposes, among other provisions, replacing the multiple regulatory bodies presently in place with a single body, the Communications Commission of India (CCI). The Bill grants sweeping powers to the CCI to control the content and operation of communication facilities in the national interest[20]. It also provides for the establishment of the required dispute resolution mechanisms and appellate authorities. The Bill, if passed, will repeal five laws- The Indian Telegraph Act, 1885; Cable TV Networks Act, 1995; Indian Wireless Telegraphy Act, 1933; the Telegraph Wires (Unlawful Possession) Act, 1950; and the Telecom Regulatory Authority of India Act, 1997. Despite typical infrastructure weaknesses, India has a strong growth potential in the WTO work programme on e-commerce. The Government needs to lay more stress on this crucial area to reap the benefits of WTO agreements.

The Tenth Five Year Plan also aimed at having higher growth of communication system in the country. In this context the objectives of the Plan were as follows:

- Affordable and effective communication facilities to all citizens;
- Provision of universal service to all uncovered areas, including rural areas;
- Building a modern and efficient telecommunications infrastructure to meet the convergence of telecom, IT and the media;
- Transformation of the telecommunications sector to a greater competitive environment providing equal opportunities and level playing field for all the players;
- Strengthening R&D efforts in the country;
- Achieving efficiency and transparency in spectrum management;

[20] The CCI would have the powers to carry out spectrum management, grant licenses and enforce license conditions, determine appropriate tariffs and rates for licensed services, ensure that granting licenses does not eliminate competition, promote competition and the efficient operation of communications services, formulate and determine conditions for fair and equitable access to network infrastructure, protect consumer interests and enforce universal service obligations, formulate programme and advertising codes, formulate commercial codes in respect of communication services and network infrastructure facilities, and take steps to regulate or curtail the inter-operability of services and infrastructures etc.

- Protecting the defense and security interests of the country; and
- Enabling Indian telecom companies to become truly global players.

With the above objectives in view, the Tenth Five-Year Plan had set the target to endeavour to make available telephones by and large on demand by the end of 2002-03 and sustain it thereafter. It also aimed at achieving telecom coverage of all villages and reliable transmission media in all rural areas by December 2002, an overall tele-density of 9.91 by 31st March 2007, providing reliable media to all the exchanges by the end of March 2003, providing high-speed data and multimedia capability using technologies including ISDN to all towns with a population greater than two lakh by the end of March 2003.

Current Status

With all these reforms, the ICT has been a major contributor to economic growth during recent years. According to the available estimates, the total value of software and service exports were estimated to have increased by 30% to $ 12.5 billion in 2003-04 as compared to the previous year[21]. In 2003-04, the Indian IT software sector earned more than $12.8 billion in revenue, with a growth of 29.6% over the previous year. Last year, industry majors scaled new heights, with Infosys, TCS and Wipro entering the billion dollar club and several other players crossing the $100 million mark in revenues earned. Exports account for a major share of the revenue in the software market, with US and Western Europe as the key markets. The total value of IT and ITES-BPO services sourced from India in 2004 is estimated at $17.2 billion, which is over one third higher than the value of services sourced from Canada, the next most preferred destination. These achievements were possible due to the over all growth of this sector. As of today, India has a telephone network of over 88.62 million telephones, including mobile phones. Indian telecom system is the 6th largest network in the world and second largest among the emerging economies (after China) with a wide range of services-basic, cellular, internet, paging, V-SAT etc. The telephone lines added to the basic services network over the last five years are one-and-a-half times that added over the preceding five decades.

Given the low telephone penetration rate of about 8.20 per hundred of population, which is much below the global average, India offers a vast scope for growth. It is, therefore, not surprising that India has one of the fastest growing telecommunication systems in the

[21] The Financial Express February 3, 2005

world with an average annual growth of about 19% for basic telephone services and 83% for cellular and internet services.

ICT in India increased significantly in the last five years. All India tele-density increased from 1.28 (number of telephones per 100 of population) to 8.20 from March 1995 to October 2004. This indicates that there is a tremendous growth in ICT. With the efforts of the government, the rural tele-density has also increased from 0.29 to 1.67 over the period.

As on 31st March 1997, numberof telephones were 14.54 million and 0.34 million mobile phones in the country. Since then the network increased by a compound growth rate of 19 percent per annum for basic services and around 83 percent for cellular and Internet services. As on 30th October 2004, there were 44.12 million basic telephones and 44.50 million mobile telephones (Table 2.1 and Exhibit 2.5). As per the latest available information from the Department of Telecommunications, the tele-density has increased to 8.59 percent by 31st December 2004 (Table 2.2 and Exhibit 2.6) with over 16.4 million telephone lines added during the current year. The total number of phone lines in India stood at 92.9 million at the end of December 2004. This means that every 12th Indian now has a telephone connection[22], as per the details given below:

Type of Connections	Connections (numbers)	Total
New CDMA connections		
Reliance Info	374,000	
Tata Tele	120,000	
HFCL	1,300	
Total Connections		**10.4 million**
New GSM connection		
Bharti	350,000	
Hutch	252,000	
BSNL	136,000	
Total Connections		**38.65 million**

The GSM base in the country totalled 38.65 million[23] and the CDMA category had a total subscriber base of 10.4 million, as on January 31, 2005[24]. Bharti, the largest player, has a market share of 26.50 percent with a subscriber base of 10.2 million and added 350,000 new users in January 2005 as against 410,000 in December 2004. For the state-owned BSNL, with a market share of 22.44 percent and a subscriber base of 8.7 million, the total numbers

22 The Economic Times dated 9th February 2005.

23 This is based on the latest data available from the Cellular Operators Association of India (COAI), which represents nine GSM carriers. Source: The Economic Times dated 9th February 2005.

24 This is based on the data released by the Association of Unified Service Providers of India (AUSPI). Source: The Economic Times dated 9th February 2005.

increased by 136,000 in January, as against 286,000 in December 2004. For CDMA operators, Reliance added 374,000 subscribers in January taking its subscriber base to 9.5 million, while Tata Tele added 120,000 customers, making the company's mobile base cross 900,000.

In wireline services, Mahanagar Telephone Nigam Ltd's base was down by 20,354 connections in January 2005 with a total of 4.6 million subscribers. The state-owned unit, which provides services in Mumbai and Delhi, also added 6,689 WLL subscribers to touch the mark of 188,000. BSNL also provided direct exchange lines and village panchayat telephones in rural areas.

Recognizing that the telecom sector is one of the prime movers of the economy, the Government's regulatory and policy initiatives have been directed towards establishing a world-class telecommunications infrastructure in the country. The main features of the developments in the telecom sector can be summarized as follows:

- The Foreign Direct Investment (FDI) has increased from Rs. 20.6 million in August 1993 to Rs. 98.725 million in January 2004 (Table 2.3 and Exhibit 2.7). This clearly indicates the positive policy of investment in the sector.
- The sector has an investment requirement of approximately US$37 billion by 2005 and approximately US$69 billion by 2010.
- Independent regulatory body (Telecom Regulatory Authority of India) and dispute settlement body (Telecom Dispute Settlement and Appellate Tribunal) are fully functional. Current players include state-owned operators as well as private operators, operating on the basis of 'level-paying field'. As on 31 March 2003, there were 158 private companies participating in providing telecommunication services (Table 2.4). A large number of these companies (70) were infrastructure providers.
- A total of 4,11,067 employees were working in Telecommunication sector as on 31 March 2003 (Table 2.5).
- As on 31 March 2003, the demand for fixed line connection was 42.23 million while the total connections provided were 40.42 million leaving a gap of 1.81 million connections between demand and supply. (Table 2.6 and Exhibit 2.8).
- Scientists claim to have invented an instant translator that will allow people talking on phones in various languages to understand each other. A research team from Rouses in Bulgaria has patented the technology which converts words spoken in one language into another language immediately. The project leader Koycho Mitev says "A person can talk freely on the phone in their mother tongue and at the other end of the world, people will hear the translation of what they

say". This universal translator will help solve a number of problems facing the information and technology sector.

Table 2.1

Growth of Telecommunications (Fixed Line, Cellular Mobile and Private Basic Telephones) in India

As on 31st March	Number of Telephones (in million)				
	Public	**Private**	**Fixed Lns[1]**	**Mobile[2]**	**Total Phones**
1981	2.15	--	2.15	--	2.15
1991	5.07	--	5.07	--	5.07
1992	5.81	--	5.81	--	5.81
1993	6.80	--	6.80	--	6.80
1994	8.03	--	8.03	--	8.03
1995	9.80	--	9.80	--	9.80
1996	11.98	--	11.98	--	11.98
1997	14.54	--	14.54	0.34	14.88
1998	17.80	--	17.80	0.88	18.68
1999	21.59	1.22	21.61	1.20	22.81
2000	26.51	2.02	26.65	1.88	28.53
2001	32.44	3.84	32.71	3.58	36.28
2002	38.16	6.81	38.53	6.43	44.96
2003	43.17	11.45	41.93	12.69	54.62
2004	46.48	30.06	42.84	33.70	76.54
Oct. 2004	49.32	39.30	44.12	44.50	88.62
CAGR (%) 1991-Oct. 2004	19.32	82.93[3]	18.75	83.37[4]	23.41

Sources:

1. GoI (2004), "*Indian Telecommunication Statistics- Policy Framework, Status and Trends"*, Ministry of Communications & IT, Department of Telecommunications Economic Research Unit, Statistics Section, New Delhi, p.162
2. GoI (2004), ***"Performance of Telecom Sector",*** DoT ERU (STT) December 2004, Ministry of Communications & IT, Department of Telecommunications Economic Research Unit, Statistics Section, New Delhi., p.22

Notes:

1 = Fixed + WLL (Fixed)
2 = WLL (Mobile) + CMPs
3 = 1999 to October 2004
4 = 1997 to October 2004

Exhibit 2.5
Growth of Telecommunications (Fixed Line, Cellular Mobile and Private Basic Telephones) in India

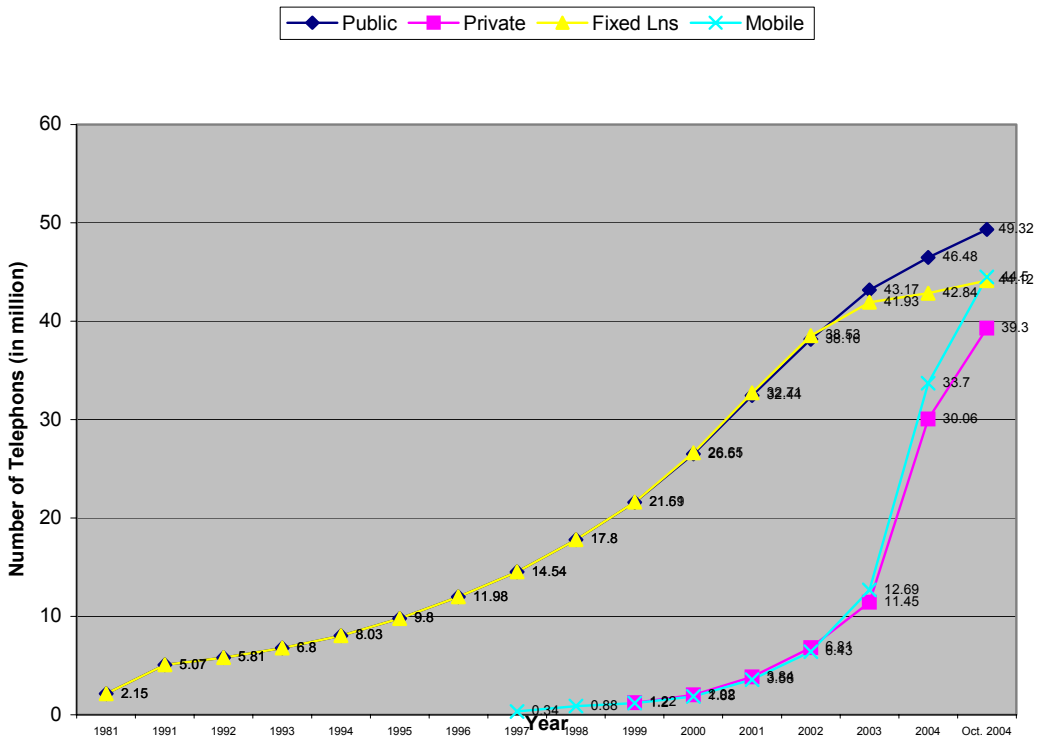


Table 2. 2

Tele-Density per 100 populations

Year	Rural	Urban	Total
1996	0.29	3.95	1.3
1997	0.34	4.76	1.6
1998	0.43	5.78	1.9
1999	0.52	6.94	2.3
2000	0.68	8.36	2.86
2001	0.93	10.37	3.58
2002	1.21	12.20	4.39
2003	1.49	14.32	5.11
2004	1.57	20.74	7.02
Oct. 2004	1.67	24.62	8.20

Sources:

1. GoI (2004), ***"Indian Telecommunication Statistics- Policy Framework, Status and Trends"***, Ministry of Communications & IT, Department of Telecommunications Economic Research Unit, Statistics Section, New Delhi, p.162.
2. GoI (2004), ***"Performance of Telecom Sector"***, DoT ERU (STT) December 2004, Ministry of Communications & IT, Department of Telecommunications Economic Research Unit, Statistics Section, New Delhi., p.22

Exhibit 2.6
Tele-Density (Number of Telephones per 100 population)

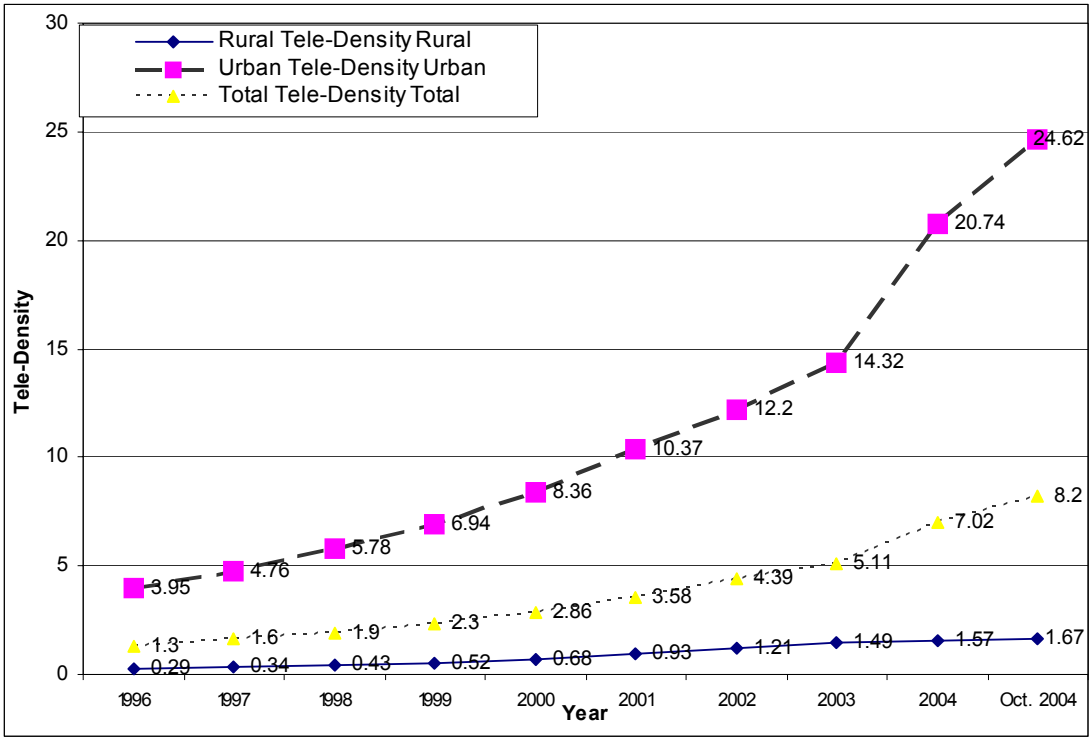


Table 2.3

FDI Inflow Year-wise (August, 1991 to January, 2004)

Year	FDI (Rs. in Million)	January-December
Aug.1993	20.6	140.2
1994	160.8	2067.4
1995	2228.2	7648.3
1996	9876.5	12451.9
1997	22328.4	17756.4
1998	40084.8	2126.7
1999	42211.5	2885.8
2000	45097.3	39709
2001	84806.3	10815
2002	95621.3	3014
2003	98635.3	4096
Aug. 2004	102821.3	--

Sources:

1. Annual Report 2003-04, Department of Telecommunications, ministry of Communications & Information Technology, pp.101
3. GoI (2004), ***"Performance of Telecom Sector"***, DoT ERU (STT) December 2004, Ministry of Communications & IT, Department of Telecommunications Economic Research Unit, Statistics Section, New Delhi., p.29

Exhibit 2.7

FDI Inflow Year-wise (August 1991 to August 2004)

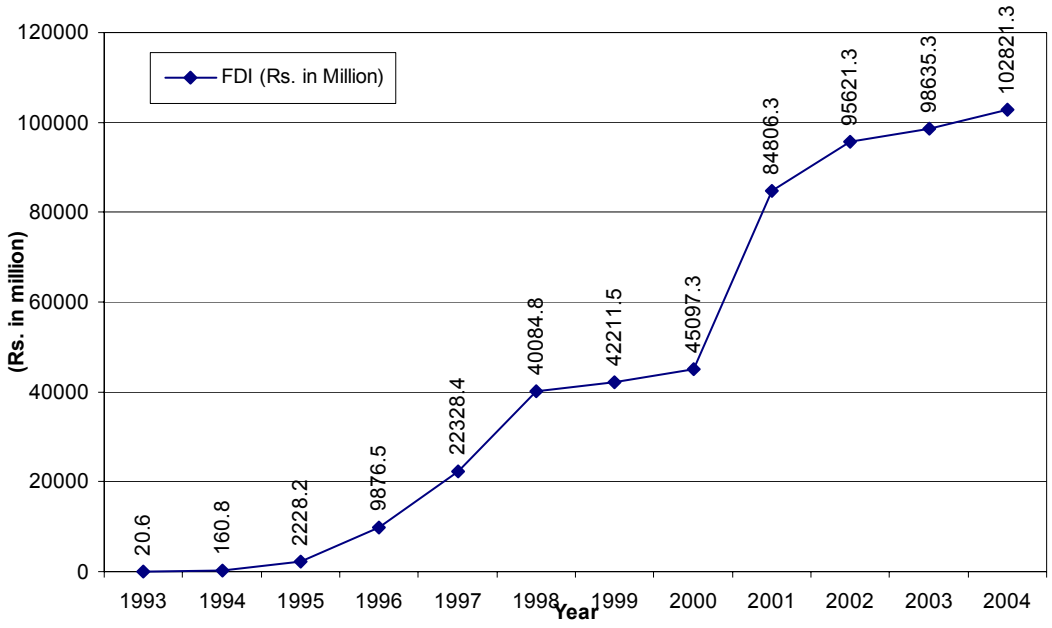


Table 2. 4

Private Sector Participation (As on 31.03.2003)

Purpose/Area	No. of Companies Registered/ Licensed	No. of Licenses/ Registrations issued
CMPs/ 4 Metros	23	16
CMPs/18 Circles		62
Basic Services	7	31
Infrastructure Provider-I	65	65
Infrastructure Provider-II	5	5
Voice Mail & AudioNet Service/14 cities	7	28
Public Mobile Radio Trucked Service/25 cities	16	47
ISPs	-	388
Internet Gateways Permission	24	55
VSAT Service	11	11

Source: GoI (2004), "*Indian Telecommunication Statistics- Policy Framework, Status and Trends"*, Ministry of Communications & IT, Department of Telecommunications Economic Research Unit, Statistics Section, New Delhi

- MTNL Delhi introduced the wireless in Local Loop (WLL) telephone system in 1997. In the same year, an ISD booth was set up at the highest altitude in Siachen base camp (at 18,000 ft) by the Army Corps of Signals.
- The cable system South East Asia-Middle East-Western Europe-2 (SEA-ME-WE-2), the first international submarine cable was laid in ME Indian Ocean covering 13 countries from Marseilles to Singapore, stretching over 18,600 kms. The 64

kbps cable is capable of handling 75,000 simultaneous conversations. This system is constructed and operated by a consortium of 60 telecommunication organizations from 47 countries, at a cost of 4.2 billon French francs. The project was launched in 1998 and was completed in June 1994. VSNL, the third largest investor in the project, contributed Rs. 2500 million. The cable enters India at Mumbai.

The largest international submarine cable system, the 20 Gbits ME-3 (South East Asia-Middle East Western Europe-3) with a 41 landing plan in 35 countries spanning 4 continents, from Western Europe to Australia, is 39000 km long. It started functioning from 30th August 1999.

Growth of e-commerce

With the above developments in ICT sector, e-commerce is going to be one of the important means of transactions in times to come. In fact, it is said that e-commerce is potentially the most important development since the industrial revolution, supported by the recent developments in ICT. Its evolution during the past few years is a result of the transition from private or closed networks to open, public network platform, such as the Internet. In that sense, e-commerce can be seen as an evolution rather than a revolution.

Internet penetration

Goldman Sach's study found that, the number of Indian internet user is expected to grow from 0.5 million in 1998 to 9 million in 2003, which translates to a compound annual growth rate (CAGR) of 76 percent, the fastest in Asia. At present, India is not amongst the top 15 Internet using nations. This is primarily because of the low PC penetration in the country. According to a NASSCOM survey, there were about 5 million PCs in India as on August 31,2000, for a population of 1 billion. This number will increase to 13 million by March 2005, increasing the PC penetration to 11.92 per thousand of population (Table 2.7). Similarly, Internet users will increase from 6.6 million in 2000-01 to 52.87 million by the end of March 2005[25]

Trends in the growth of e-commerce

A comparative analysis of the data from the OECD countries for 2000-01 indicates that the share of Internet users buying online was highest in the Nordic countries, the United Kingdom and the United States, where 38 percent of users had made purchases online; it was lowest in Mexico, where fewer than 0.6 percent had done so. As regards business-to-business

[25] Source: NASSCOM.

Table 2.5
Employees in Telecommunications

As on	Management Staff			Other Staff		Total	Increase Over	%age
31st March	Senior	Middle	Junior	Operating	Supporting	Staff	previous year	Increase
1981	218	1172	5291	231545	42213	280439	16796	6.3
1991	702	2847	14493	272059	78818	368919	4678	1.3
1992	858	2684	13338	269222	80718	366820	-2099	-0.6
1993	873	3088	15879	268539	90810	379189	12369	3.4
1994	1002	2789	21050	256148	108098	389087	9898	2.6
1995	1025	3619	21289	262336	124789	413058	23971	6.2
1996	1021	5043	22231	256334	131434	416063	3005	0.7
1997	802	5808	22670	266269	127964	423513	7450	1.8
1998	1262	4690	23443	278334	112403	420132	-3381	-0.8
1999	1728	4713	23437	284867	104324	419069	-1063	-0.3
2000	1674	5673	50514	265779	92962	416602	-2467	-0.6
2001	1844	6820	49988	276601	83383	418636	2034	0.5
2002	3146	5831	51209	272361	80859	413406	-5230	-1.2
2003	3327	5953	55503	266181	80103	411067	-2339	-0.6

Source: GoI (2004), "*Indian Telecommunication Statistics- Policy Framework, Status and Trends"*, Ministry of Communications & IT, Department of Telecommunications Economic Research Unit, Statistics Section, New Delhi, p.34

Notes: 1) The figures from 1985 includes the officers and staff of the Telecom Board, who were previously included separately under " Common Services". 2) From 1979-80, in the Training Centres, the staff was bufurcated between the postal and telecom departments.

3) Classification of Employees: (a) Senior Management: Junior Adm. Grad & above. (b) Middle Management: Senior & Junior Time Scale. (c) Junior Management: Group 'B' Officers. Operational Staff: Group 'B' (Non-Gazetted) and 'C' Officers. Supporting Staff: Group 'D' Officers (Excluding Industrial workers of workers of telecom stores and factories). Total Staff includes employees of BSNL, MTNL and DOT and excludes Industrial Workers.

Table 2.6
Supply and Demand of Telephones (Fixed Lines) (in million)

As on 31st March	Demand	Supply
1981	2.60	2.15
1991	7.03	5.07
1992	8.10	5.81
1993	9.64	6.80
1994	10.52	8.03
1995	11.95	9.80
1996	14.26	11.98
1997	17.44	14.54
1998	20.51	17.80
1999	23.57	21.59
2000	30.19	26.51
2001	35.36	32.44
2002	39.63	37.94
2003	42.43	40.62
As on Dec. 2003	42.23	40.42

Source: GoI (2004), "*Indian Telecommunication Statistics- Policy Framework, Status and Trends"*, Ministry of Communications & IT, Department of Telecommunications Economic Research Unit, Statistics Section, New Delhi, p.162.

Exhibit 2.8
Supply and Demand of Telephones (Fixed Lines) (Number in million)

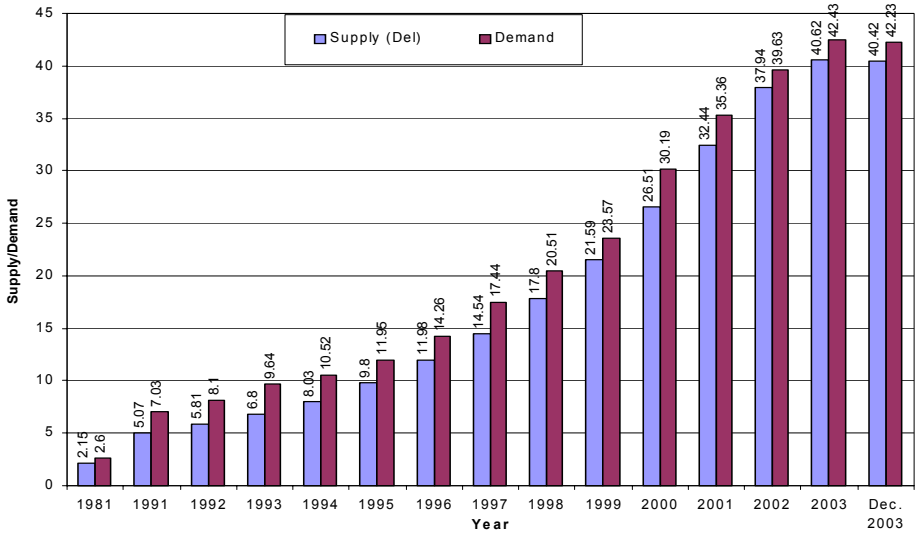


Table 2.7
P C Penetration and Internet Users in India (1998-2005)

	March-97	March-98	March-99	March-00	March-01	March-02	March-03	March-04	March-05
PC sales	580	800	1,030	1,405	1,882	2,003	2,228	2,784	3,653
Household		120	200	287	416	449	528	659	890
Business		680	830	1,118	1,466	1,554	1,700	2,125	2,763
P C population	1,570	2,120	2,810	3,760	5,070	6,709	8,482	10,650	13,486
Households					780	1,205	1,693	2,295	3,102
Business					4,290	5,504	6,789	8,355	10,385
Population (million)	961	977	993	1,010	1,027	1,047	1,086	1,106	1,131
P C Penetration (Per 1000 population)	1.63	2.17	2.83	3.72	4.94	6.41	7.81	9.63	11.92
Internet penetration									
Business (percent)					38	40	50	60	70
Household (Percent)					80	85	90	92	95
Internet Subscribers	25	105	350	650	1,130	1,763	3,661	4,403	6,674
Business	23	125	224	335	511	739	2,137	2,292	3,727
Business (percent)	92	83	64	51	45	42	58	52	56
Households	2	26	126	319	622	1,024	1,523	2,111	2,947
Households (percent)	8	17	36	49	55	58	42	48	44
User to subscriber ratio									
Business					10	11	12	12	13
Household					2.5	2.5	2.2	2.0	1.5
Number of users					6,668	10,684	29,000	31,723	52,875
Business					5,114	8,124	25,649	27,501	48,455
Household					1,554	2,561	3,351	4,222	4,420

Source: *NASSCOM*

(B2B) e-commerce transactions, official US statistics show that in 2001, annual B2B online sales in the United States amounted to $995 billion, or 93.3 percent of all US e-commerce[26].

The growth of e-commerce in India between 1997 and 2003 is expected to be the highest with CAGR of 246 percent as against the CAGR of other Asian nations. According to the Centre for Monitoring Economy *(CMIE)*, the contribution of e-commerce for the year 2000-01, is estimated to be about 0.05 percent of the national GDP estimate for that year of US$ 466 billion (Rs 21, 900). *According to NASSCOM-McKinsey* estimates, e-commerce in India is likely to be between US$5.7 and US$13.4 billion by 2008. *According to ICRA-estimates,* the B2B segment is expected to account for 90 percent of the e-commerce in India. It is estimated that B2B transactions will account for almost 80 percent of the worldwide business volumes of e-commerce by the year 2001 and that the growth rate in B2B segment business will be thrice the growth in the B2C segment.

The number of Internet hosts worldwide grew by 35.8 percent between January 2003 and January 2004, reaching a total of over 233 million, which represents a doubling of the growth rate in 2002. In terms of number of websites, as of June 2004 there were over 51,635,284 websites worldwide, 26.13 percent more than a year before. The number of websites using the secure sockets layer protocol (SSL), which supports secure transactions, grew by 56.7 percent between April 2003 and April 2004, reaching 300,000[27].

The impact of e-commerce for developing countries is at present mainly in the international trade sector. Studies indicate that over the past few years, the import and export industries have grown significantly, and, therefore, the impact of e-commerce will be quite significant. E-commerce will also have a significant impact on the services sector as this is not only the fastest growing sector of today, but is also going to be the sector with the greatest potential for offering digitized services and transactions in the years to come[28].

All the above data do not indicate the relative extent of domestic and cross border e-commerce in India. Data regarding likely trade outflows and trade inflows through cross border e-commerce are not available. Data are available for e-commerce, which involves online delivery and affects both direct and indirect taxation in a crucial manner. India's software export projections were based on a target of US$300 million, which corresponds to

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26 United Nations Conference on Trade and Development (2003), *E-commerce and Development Report 2003,* United Nations, New York.

27 United Nations (2004), *E-commerce and Development Report, 2004*. United Nations Conference on Trade and Development, UNCTD Secretariat, New York and Geneva.

28 Singh, (2002).

about 0.6 per cent of the world's software trade. Based on this, it was felt that there was need for more concrete policies for the promotion of software development and export[29].

Conclusion

Liberalization of Indian telecom sector has lead to the convergence of computer, telecommunication and information, making it universally available and affordable. With the IT revolution, there is a constant and continuous convergence of technology and India is witnessing a change never seen before. The change and pace of growth is dynamic-from basic telephony to voice video and data services, and bandwidth on demand to virtual private networks. The fast track revolution in IT, particularly the spread of Internet , makes it imperative that the telecommunication sector keep pace for its survival and growth. The growth of e-commerce in India (1997 to 2003) is expected to be the highest among the Asian nations. It is estimated that e-commerce in India is likely to be around US$13.4 billion by 2008 with B2B segment having a 90 percent share.

[29] Joseph, (2002)

Annexure A2.1

Telecommunication Milestones Since 1947

Year	Milestones
1947	Nationalization of External Telecommunications Service (OCS)
1948	Multi-address press broadcast from Delhi
1952	First telex exchange between units installed at Mumbai and Ahmedabad. Operational in 1953.
1953	12-channel carrier system introduced at Kolkata and Amristsar.
1956	Telecom Research Centre set up in Delhi.
1957	First Leased Telegraph Circuit for BOAC from Kolkata to London.
1960	Subscriber Trunk Dialing (STD) started between Lucknow and Kanpur on November 26.
1967	First Crossbar Trunk Automatic Exchange commissioned in Chennai.
1967	Telecommunications Consultants India Limited (TCIL) set up to provide telecom consultancy.
1971	The earth station ARVI introduced the first operator-dialed service to international subscribers.
1973	First intercontinental telephone exchange commissioned.
1975	International Television Transmission/Reception Service.
1976	First International Subscriber Dialing (ISD) introduced between Mumbai and London.
1978	Press Bulletin Service (PBS) started. First satellite station for domestic communications established at Secunderabad.
1979	First fibre optic system for local junctions started in Pune.
1979	Centre for Development of Telematics (C-DOT) set up.
1980	First Mobile Telephone Service introduced in Delhi.
1982	SPC telephone exchange at Mumbai, Delhi and Chennai.
1983	First SPC analog electronic exchange commissioned at Mumbai.
1986	VSNL incorporated as successor to OCS
1986	MTNL established
1987	First digital co-axial 140 mbps between Mumbai and Fujairah.
1988	Gateway Packet Switched Service introduced.
1991	First Packet Switching Network I-net set up
1991 December	DOT invites bids from India companies for cellular licenses in the four metropolitan circles
1992	INMARSATLES at ARVI
1993	First ISD across sea on August 16, when R. Vasudevan Director General, shipping dialed the tanker Jawaharlal Nehru anchored off the coast of Kutch.
1994	Commissioning of satellite earth stations at Chennai and Calcutta.
1994 May	Government announces the National Telecom Policy, opening up the basic service sector to private players
1994 November	Licenses issued to cellular operators in the four metros
1995 January	DOT floats tenders for basic services and cellular services in non-metro circles
1995	Commissioning of satellite earth stations at Chennai and Calcutta.
1996	Integrated Services Digital Network (ISDN) service went commercial

Year	Milestones
1996 October	Licenses for 20 cellular circles issued
1997 March	Telecom Regulatory Authority of India Act, 1997 is passed, creating the TRAI. The Act gives the TRAI broad powers to make technical, operational, and licensing recommendations, and generally "facilitate competition,"
1997 August	Government decision to set up Internet Management Authority, similar to TRAI, which will monitor the functioning of private sector ISPs and monitor technical aspects of the service.
1997 September	Basic operators sign license agreements with DOT
1997 October	The Union Government sets up an inter-departmental committee to examine the need for 'cyber laws', which might address issues of taxation, and clauses in various Indian laws that might make electronic commerce illegal. Cyber law The DOT announces the clearing of the Internet policy. An Implementation Committee starts formulating plans to put the policy into practice. The Committee consists of representatives of the DOT, the DoE, the Planning Commission, the India Railways and the Power Grid Corporation of India Ltd.
1997	Wireless in Local Loop (WLL) telephone system introduced by MTNL, Delhi.
1998 January	The DOT announces the ISP policy. The licenses will be issued immediately on receipt of the applications will not have to provide earnest money. Private ISPs will have to meet the technical requirements of Internet access providers, e.g. VSNL and the DOT. There will be license fees for the first 5 years of operation.
1998 July	The National Taskforce on Information Technology and Software Development (IT Taskforce) submits its first Action Plan. [IT Taskforce Action Plan]
1998 November	The New Internet Policy goes into effect: ISP business opened up to operators other than DOT and VSNL
1998 November	IT Action Plan Part II: *New Policy Paradigm for the hardware industry* submitted to Government of India.
1998	Introduced new Frame Relay Service.
1999 March	The Union Cabinet approves the *New Telecom Policy 1999* (NTP 1999). Among other provisions, the NTP 1999 opens national long distance service beyond service area to competition by private operators effective January 1, 2000; strengthens the TRAI; restructures the DOT to separate service provision from policy and licensing functions [NTP 99]
1999 April	IT Action Plan Part III: *Long Term National IT Policy* is issued. Some of the key elements affecting the Internet in India include the encouragement of the Government's use of electronic means to improve the speed and accuracy of information-based service delivery; the development of a domain name registration system permitting the management Interest names and addresses in India; the creation of a high bandwidth national backbone (Project Sankhya Vahini) linking research centers and institutions of higher learning.[IT TF Action Plan]
1999 July	The Indian Government formulates the implementation mechanism for security provisions and clearance for ISP to set up their own international gateways for Internet traffic.
1999 July	DOT announces Migration Package for private Telecom operator to move to a revenue-sharing regime.
1999 August	The DOT formally invites ISPs to set up international gateways for Internet provisions.
1999 October	DOT split into two departments: DTS-responsible for Telecom Services Provision; and DOT for Licensing and Policy-making functions.
2000 January	TRAI (Amendment) Ordinance 2000 redefines the role of TRAI by splitting it into two,

Year	Milestones
	with one acting as a regulator and the other as an arbitration unit in the form of a tribunal
2000 August	Government announces guidelines for opening up domestic long distance telephony for carrying both inter-circle and intra-circle traffic, with no restriction on the number of players Aug. 2000
2000 August	TRAI issues the first tariff order and cuts domestic and international long distance telephony charges.
2000 October	Department of Telecom Services is corporatized with the creation of BSNL
2001 January	The Department of Telecom opens up basic services to unlimited competition and allows basic operators to provide WLL services on a restricted basis.
2001 August	Opening of National Long Distance Service to competition.
2001 September	Fourth Cellular licenses issued.
2002 January	Bharti starts cellular to cellular long distance services with sharp cuts in tariffs.
2002 February	Government transfers control of VSNL to Tatas through sale of strategic holding.
2002 April	International Long Distance (ILD) sector opened to competition. End of VSNL monopoly.
2002 April	Government allows restricted IP Telephony
2002 May	Bharti offers ILD services with sharp cuts in tariffs.

Sources:

1. *"Connecting India", BSNL house journal Vol. 1 issue 2. August-October 2003*quoted in Kulkarni V. S. "Reforms in Telecommunications Sector: Some Issues" in Singh, Ravishankar Kkumar (2004), *Economic Reforms in India,* Vol. I, Abhijeet Publications, Delhi, pp. 301-03.
2. Administrative Staff College of India (2003), *Study on The Digital Divide in India (mimeo)* submitted to Department of Telecommunications, Ministry of Communications & IT, Government of India, New Delhi

3

Digital Divide and E-Commerce Strategy

The fast track revolution in information and communication technology (ICT), especially in e-commerce , as mentioned in the earlier chapter, makes it imperative that the telecommunication sector also grows rapidly. This is crucial for the survival and growth of ICT. The efforts of the government in making the telecommunication sector keep pace with ICT have thrust India into the Information Age. However, India's rank in the use of e-commerce, in comparison to the developed countries, is still at a very low level. The need of the hour is to adopt a very sound strategy to encourage the growth of e-commerce in the country.

The Global Scenario

As per the international scenario, the number of people connected to the Internet, as well as to the activity of e-commerce, has risen substantially. The study of the International Telecommunication Union (ITU), for example, suggests that at the end of 2001, the number of Internet users was 500 million. The estimates indicate that these numbers jumped to 655 million during 2002. Similarly, the estimates of United Nations Conference on Trade and Development (UNCTAD) show that the global e-commerce market was worth around US$ 615.30 billion. It is expected to grow to US$ 4,600 billion by 2005[1]. Also, according to the estimates of Forrester Research, e-commerce accounted for approximately US$ 2,293.50 billion of world trade during 2002.

[1] United Nations (2003), *E-commerce and Development Report, 2003,* United Nations Conference on Trade and Development, UNCTD Secretariate, New York and Geneva.

At the end of 2003, nearly 676 million people (or 11.8 percent of the total population of the world) had access to the Internet. This represents an increase of 49.5 million people or 7.8 per cent compared with the figures at the end of 2002. Developing countries account for more than 36 percent of all the Internet users in the world and their share in the Internet population of the world grew by nearly 50 percent between 2000 and 2003. However, Internet users in the developing world are concentrated in a handful of countries: China, the Republic of Korea, India, Brazil and Mexico account for 61.52 percent of them. Almost 75 percent of the growth in the number of Internet users in the world occurred in the developing world. In spite of rapid rates of improvement in the penetration ratios of developing countries, these remain ten times lower than the average of the developed world[2].

E-commerce penetration, however, varies from region to region. The Asia Pacific region has been ahead of others. It has added approximately 50 million Internet users every year. Africa witnessed a 30 percent growth in Internet subscribers during 2001. The entire African continent has 1.3 million Internet users. Most key African cities are "Internet-enabled," with high data traffic. The markets of these regions, however, have low e-commerce activity, which may be due to the poor infrastructure. In Latin American countries such as Argentina, Brazil, Chile and Mexico, e-commerce is confined to a few items such as automobiles. While these countries have significant growth in Internet connectivity, this is mainly used for e-mail and information gathering. Online transactions in other commodities or services are low. USA and Europe have the highest Internet penetration and e-commerce activity. The share of online transactions in total sales is growing rapidly in all these regions.

Most firms expect B2B (business to business) transactions to grow very fast. A study by Forrester Research shows that B2B e-commerce activity accounted for business worth US$ 2160 billion and this will rise to US$ 8,823 billion by 2005. The Forrester estimates show that:

- The share of developing countries in the areas of B2B and B2C (business to consumer) will be small in the medium term as compared to developed nations;
- In developing countries, e-commerce will be driven by B2C activity, followed by B2B transactions; and

[2] United Nations (2004), *E-commerce and Development Report, 2004*. United Nations Conference on Trade and Development, UNCTD Secretariat, New York and Geneva.

- For B2B growth to happen in regions such as Asia Pacific, the countries need to be ready in terms of infrastructure (roads, ports, railways, power, bandwidth) to facilitate the working of supply chains.

E-commerce in India

India has been lagging behind in comparison to other countries, although it has made considerable efforts in achieving advances in the area of e-commerce. The Ministry of Information and Technology[3] formulated an Action Plan in May 1997 for the setting up of a National Information Infrastructure. Broad components of Action Plan, *inter alia*, included setting up of the national high-speed backbone network, and interconnection of networks[4]. India has also been facing problems regarding the regulatory and legal framework for e-commerce, as also of PC penetration. This is due to a variety of reasons, including the lack of software in Indian languages.

Anticipating the need to facilitate the growth of e-commerce, the government initiated the formulation of cyber laws in the country. In this connection, four international state-of-the-art studies were prepared to draw a parallel for India. These dealt with the key cyber laws cryptography, IPR, digital signature and computer crimes. A project of Electronic Data Interchange (EDI) to facilitate trade amongst trading partners has also been implemented[5]. The second half of 1999 saw some of the big companies move their multi-billion dollar purchasing operations on to the Internet. E-commerce got a big boost when many Fortune 500 Companies began moving their supply-chain transactions, involving purchase and sales of goods and services, on to the Internet. Intel, IBM, Cisco, 3 Com, Dell and some others had done this much earlier. B2C transactions, which means direct purchase of products on the Internet, especially in books, automobiles, music, entertainment, software, PCs etc. has picked-up significantly.

There are far more people connected to the Internet in India today (around 13 million users as on March, 2003) due to the improving PC penetration, availability of bandwidth and power. However, despite the growing Internet population, India witnessed modest e-commerce activity. E-commerce activity during 2002 was estimated to be in the region of

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3 This refers to the Department of Electronics.

4 Government of India (1998), *Information Technology Action Plan,* Ministry of Information and Technology, New Delhi.

5 EDI is in the process of exchanging data in electronic formats between heterogeneous applications and/or platforms in a manner that can be processed without manual intervention.

around US$ 300 million, almost half that of China. B2B e-commerce implementation was low, except in certain items such as the automobile, banking and finance.

A recent survey by IDC on the Indian e-commerce transactions showed the following:

- Indian B2C spending was estimated to have grown by 88 percent during 2002 to reach Rs. 380 million
- B2C e-commerce is expected to grow to Rs. 23000 million by the end of 2006, at a CAGR of 79 percent
- Travel is the fastest growing category for B2C e-commerce transactions, accounting for around 23 percent of transactions in this area during 2002

The Digital Divide

In spite of the increase in e-commerce activity in India, the access to information has so far been limited to a small fraction of the population, when this is measured in terms of access to the World Wide Web.

It is now becoming clear that there exist massive differences in access to ICT. This is known as the "digital divide" and it exists between the economically developed sections of the population and others in the low income groups. Various surveys conducted in this context reveal that ICT has initially given an advantage to the rich; depriving the poor of its benefits[6]. This phenomenon of the "digital divide" is, however, true for all the countries around the world. It exists in the so-called "North" (industrialized and wealthy nations like the US, West Europe, and Japan) and the "South" (virtually all developing nations including India).

Analytically viewed, the "digital divide" can be categorized in three different ways, as given below:

The first divide refers to the inequality in the use of ICT in a country amongst its people (between the 'haves' and the 'have-nots'). In India, as in any other country, ICT has benefited those who have telephone connectivity and also possess the installed base of computers and Internet. As explained in the preceding chapter, telephone connectivity in India, measured in terms of tele-density, is extremely low. Although it has increased over the years, even today tele-density stands at 8.59 percent (as on December 2004). Despite the success of PCO/STD/ISD booths (manned pay phones) in cities and villages, many Indian

[6] Jauhari, Vinnie (2004), "Information Technology, Corporate Business Firms and Sustainable Development: Lessons from Cases of Success from India", paper presented at a National Seminar on E-commerce and Economic Development, organized by the Foundation for Public Economics and Policy Research, on December 11, 2004.

villages remain without a telephone. As regards installed base of computers, the situation is all the more critical. According to the estimates of the Manufacturers Association of Information Technology (MAIT), by 2004 there were approximately 9 million computers in India. Of this, 2/3rd were in businesses, schools, and government offices. This leaves about 2 million computers in households. The Internet connectivity in India, on an average, is very low. As on March 31, 2003 there were only 35 lakh subscribers. More importantly, when viewed from the dispersion among the States, this number varies from 0.03 lakh in Nagaland (also in Tripura and Andman and Nicobar islands) to 27.09 lakh in Maharashtra. These data indicate that all these ICT related facilities are available with the most affluent people in India. Also, these are mostly concentrated in the major towns[7]. Such a "digital divide" based on income or education (also urban and rural residence) exists on a massive scale in the Indian context.

A second type of digital divide concerns linguistic and cultural variations, which exists in India. The available data indicate that 60 to 80 percent of all web sites in the world are in English. The rest of the sites are in Japanese, German, French, Spanish, Portuguese, or in Chinese. But in India, like the rest of South Asia, only an estimated 2 to 10 percent of the population speaks fluent English, while the rest speak other languages. For those who do not speak English, the barrier to the information age is insurmountable, irrespective of their being rich.

The third digital divide is the growing digital gap between the rich and the poor nations. The U. N. Report on Human Development highlights the widening gap between the information-rich nations of the North and the information-poor nations of the South[8]. India has witnessed a very high rate of IT sector growth in the last decade. Despite this high rate of growth, there exists inter-state and rural-urban divide in the spread of ICT. Three major indicators of ICT namely tele-density, tele-usage and Internet-density have been considered. All the three indicators show varying rates of diffusion of ICT in different states. The disparity in the spread of ICT is found to be the most in the case of Internet. Internet development in a country like India is constrained by factors such as dependence on fixed line network access (which creates an in-built advantage for those states with better network coverage), high entry costs for purchase of equipment, inability to have sufficient bandwidth to support fast and efficient uploading as well as downloading of information; a low

[7] This is in comparison to more than 70 percent household computer saturation and 60 percent household Internet connection in the US in 2002.

[8] UN (1999), *Report on Human Development*, New York.

educational level, non-availability of software in local languages, and lack of computer skills amongst the population.

In this context, a study conducted by the Administrative Staff College of India (ASCI) on the "digital divide" observed that the spread of rural tele-network is very limited in Bihar, Madhya Pradesh, Uttar Pradesh, Orissa and Northeast. Although tele-usage is high in Bihar, Orissa, Jammu and Kashmir and Northeastern states, tele-density is very low. Moreover, unfulfilled demand for telephone connections[9] is also high in Orissa and in J&K, but the rate of expansion of tele-network is very low. The study concludes that there exists a high degree of correlation between socio-economic factors and ICT indicators such as tele-density and Internet-density. In the case of tele-usage, however, the correlation is not very significant. Delhi ranks first in terms of socio-economic factors and ICT indicators. The results also indicate that the spread of ICT is more in those states where the level of socio-economic development is already high. Hence, these states will be able to derive greater benefits (e.g. e-commerce, tele-medicine, tele-health etc.) from the spread of ICT. This is likely to reinforce and exacerbate the existing inter-state socio-economic divide. The situation is not much better at the micro level. Rural-urban divide is much too skewed for all the indicators of ICT. This is also true among different socio-economic classes in the urban areas. It follows from the ASCI study that there is an urgent need for bridging this inter-state and rural-urban digital divide for equitable distribution of the benefits of the new economy[10].

An analysis of the "digital divide" around the globe indicates that less than 5 percent of the world's population has so far gained access to ICT. This is true of India as well. It is, therefore, important to examine as to how ICT, especially e-commerce, can improve the conditions of life for the 95 percent of the population not having access to ICT. The basic question that one has to ask is whether the scarce resources be invested in ICT or in providing basic needs, when most of the population lack basic education, essential health care, or adequate nutrition.

The ICT and the Economic Development: The Strategy for India

In this context, it is important to understand that there is no contradiction between ICT and the other critical human and social goals. ICT is not an end in itself. It is an instrument in the pursuit of other goals.

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[9] This is measured from the waiting list as a percentage of direct-exchange-lines (DEL).

[10] Administrative Staff College of India (2003), *Study on the Digital Divide in India,* Administrative Staff College of India, Hyderabad (mimeo), pp. 4-11 and 4-12.

Investment in ICT helps not only in achieving economic growth but also in helping the society in a variety of ways. The most creative use of ICT seems to be in the application of other computer-based technologies, including embedded chips, satellite based information, etc. in order to meet local needs better.

To illustrate this point, one of the applications that has been successfully adopted in India relates to the dairy sector. In fact, the use of the ICT has helped this industry, which is the world's largest producer of milk and dairy products[11]. It started with the setting up of a well-organized co-operative movement of dairy producers in Gujarat. Traditionally, individual milk producers brought their milk to the central collection point, where payment was based on volume and the butterfat content. Volume was easily ascertained, but assessing the butterfat content was a complex process. This meant lengthy delays before payment. Complaints and charges of fraudulent assessment were frequent. The solution to the problem involved the use of partially automated equipment. Initially, the expensive imported variety was used at the milk collection centres. This totally automated butterfat assessment machinery was of European manufacture and functioned poorly in Indian conditions. This was, therefore, replaced by a local design of the computer-based assessing equipment. It was less sophisticated, less expensive, partially automated and needed some human intervention but it gave accurate butterfat readings in a few minutes. This computer-based equipment shows a final output that automatically combines the volume of milk with butterfat content to yield a payment chit immediately cashable by the farmer. The new process was transparent. It diminished delays and complaints and satisfaction of suppliers increased considerably.

In addition to private-public participation, the private sector has also singly participated in such projects, which has lead to the development of the community. One such example is that of the Indian Tobacco Company in Uttar Pradesh. In this case, the ITC has developed a grower, marketing nexus and enabled each player to benefit. The ITC project suggests that the interventions, linked with the stage of development and resource strength, in a particular geographical location can benefit rural masses considerably[12].

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[11] See, Kenneth Kenistor and Deepak Kumar (Eds.) (2004), *IT Experience in India: Bridging the Digital Divide,* Sage Publications, New Delhi.

[12] Jauhari, Vinnie (2004), "Information Technology, Corporate Business Firms and Sustainable Development: Lessons from Cases of Success from India", paper presented at a National Seminar on E-commerce and Economic Development, organized by the Foundation for Public Economics and Policy Research, on December 11, 2004.

Another example of creative use of sophisticated ICT relates to fishermen living on the Andhra Pradesh coast of the Bay of Bengal and on the Kerala coast of the Arabian Sea. In both these areas, scientists from the Indian Space Research Organization (ISRO) download information on ocean temperatures from the satellites. Ocean temperatures help predict where fish are most likely to be found offshore. The ISRO scientists translate the digital satellite information into maps of the offshore fishing areas, which are transmitted by telephone or fax to the coastal regions; in turn increasing the probability that fishing expeditions will produce profitable results. Here, sophisticated satellite technologies are placed in the service of local fishermen to improve their livelihood.

Also, ICT plays an important role in improving the efficiency of industries. It enables firms and industries to be competitive in an open economy through increased information flow. This results in knowledge transfer as well as improved industrial organization. ICT also makes possible the emergence of new activities such as online outsourcing of services and production of different types of goods. In particular, ICT has become an important tool for improving productive capacity and increasing international competitiveness by reducing the transaction costs.

Many other such case studies of projects successfully implemented in Andhra Pradesh for public convenience are detailed in Chapter 6. These projects relate to:

- E-seva kendra, offering a wide spectrum of citizen-friendly services which help people save time that would otherwise have been spent running around various departments. It provides a one-stop venue for services of various state and central government departments, and private businesses in an efficient, reliable, transparent and integrated manner through a chain of computerized Integrated Citizen Service Centers (ICSC), known as e-seva kendra.
- Computer-aided Administration of Registration Department relating to the system of land registration through electronic delivery of all the registration services, saving time and money for all the citizens.
- Computerization programme covering all levels of the administrative spectrum of the *Mandal Revenue Offices* (MRO) to ensure quick, accurate and efficient aggregation of large amounts of data generated at the *mandal* levels for performance monitoring and analysis, at both the micro and macro levels. And
- Creation and maintenance of a citizen database that can be used in a variety of ways such as public distribution system, issue of individual identity cards, in ensuring better targeting in all the poverty alleviation programmes etc.

The above illustrations point out the fact that the ICT can be beneficially used keeping in mind local needs, as defined by the local people.

Despite the wide range of benefits that can be brought about by ICT, its adoption by India has so far been limited. Reasons for this include lack of awareness of what ICT can offer, insufficient telecommunications infrastructure and resultant low Internet connectivity, expensive Internet access, absence of adequate legal and regulatory frameworks, shortage of requisite human capacity, failure to use local language and content[13], and lack of entrepreneurship and a business culture open to change, transparency and democracy.

It is encouraging to note that the Indian enterprises have begun to derive advantages from adopting e-commerce. Although security concerns may be holding it back, the policy framework for the promotion of e-commerce for development, the increasing social and economic importance of open source software, and the development of business process outsourcing are indicative of the trends in Internet access.

A high number of Internet users does not necessarily mean a high rate of e-commerce activity. If citizens find it difficult to use the Internet (i.e. if scarcity or language represents an important barrier), then the technological conditions for the adoption of ICT for businesses are probably not being met. In addition, access is by no means the only bottleneck in the development of a digital economy; it also requires, among other things, changes in the legal framework, in the managerial culture of enterprises, and in consumer attitudes and habits.

The trends in the development of ICT, as given in Chapter 2, indicate that the world economy is becoming an ICT-based economy. By lowering transaction costs, the Internet removes distance-related barriers that have traditionally determined the location of service providers and goods producers.

Broadband Internet access may accelerate the growth of Internet traffic and change the way people and businesses use the Internet. However, businesses buy much more online content than consumers do, and broadband makes such content more accessible, easier to use and, therefore, more sellable, especially to small and medium size enterprises (SMEs).

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[13] The year 2000 survey of the market for local language software, jointly sponsored by the Manufacturer's Association of Information Technology (MAIT), and the Indian Institute of Information Technology, Bangalore, highlights the benefits of using local language software and the many obstacles that stand in the way of its widespread development and use.

In this regard, the development of Web services, a technology that allows automated interaction over the Internet between computers managing different businesses, has had a dramatic impact on the efficiency of processes such as inventory control and routine purchasing.

Many studies indicate that ICT has a positive and considerable impact on capital-deepening, labour productivity and total factor productivity. This promotes productivity growth[14] in the economy. These studies cover different time periods, various countries and regions and examine the impact of ICT at the firm and industry levels, taking samples of large and small firms. In spite of all these studies, there is little systematic empirical evidence regarding the economic consequences of ICT.

Keeping the results of the available studies in mind, it will be appropriate to suggest that the Indian Government fosters an improved understanding of best practices in the use of ICT, so that optimal choices can be made regarding the most efficient use of ICT. Also, Government should support the development of infrastructure that will provide greater access to low-cost, high-bandwidth Internet connections and the use of affordable software will play a leading role in addressing skill deficiencies in the workforce through training and education.

Despite the important opportunities that the knowledge economy offers for growth of countries such as India, most firms and industries are still excluded from its ambit for want of infrastructure required for its use. As a result, the gap in the use of ICT between developed and developing countries remains wide.

In this context, it is important to highlight that ICT is an 'enabler' of economic development and growth, and deserves particular attention in the planning framework. The National ICT strategy of Thailand is considered as an example of a developing country's strategy for expanding its information society. It indicates that through the application of the ICT, firms become more competitive, new markets can be accessed and new employment opportunities created. All of this results in wealth generation, thus ensuring future sustainable economic growth.

Enhancing awareness and public understanding about the benefits of ICT is an important starting point in the planning of ICT policy. Other priority areas include basic

[14] OECD (2004), *The Economic Impact of ICT: Measurement, Evidence and Implications,* Organization for Economic Cooperation and Development, Paris.

access to ICT, low cost hardware and software, and the use of local-language Web sites. Furthermore, in many of the developing countries, lack of local Internet leads most people to purchase online from foreign sites (mainly from developed countries) rather than local or even regional sites.

Since the late 1990s, India has made efforts at launching its own national ICT programmes and strategies. These cover a broad range of policy areas, such as raising awareness, building infrastructure, deregulation of telecommunications, education and training of labour force, changes in legislation, and e-governance. India has also legislated its Information Technology Act[15] and prepared an Action Plan[16] to have long term planning in this area.

Formulating and implementing national ICT strategies is perhaps the biggest challenge the policy makers face. Initiating the right policy framework for the development of ICT involves many difficulties. People must be trained on how to use ICT and exploit commercially the information and knowledge they make available; regulatory frameworks need to be established to provide enterprises and consumers with confidence in the security of the Internet; financing needs to be available, both for infrastructure (including foreign direct investment) and for the development of small and medium enterprises (SME). Increasing awareness is important in the use of e-commerce. People start using it only when they have experienced the immediate benefits.

In the Indian context, the following strategies should be adopted to promote the growth of ICT and eventually e-commerce as well as of its use to benefit the society.

Public-private partnership: With a view to developing ICT in the country, it is important that the government plays an active role as 'enabler' of ICT development. It should focus on facilitating the entry of smaller, underprivileged players into the marketplace and work on public-private partnership for increasing investment in this sector.

Development of software: Availability of software is an important factor in the growth of e-commerce. It is argued that free and open-source software (FOSS) helps a great deal in this regard[17]. In this context, the OECD Report on E-Commerce and Economic Development

[15] Government of India (2000), "*The Information Technology Act, 2000*", Ministry of Communications & IT, Department of Telecommunications, New Delhi.
[16] Government of India (1998), *Information Technology Action Plan,* Ministry of Information and Technology, New Delhi.
[17] FOSS is a software whose source code has been made public. The source code is the instructions that constitute a particular software application, such as a word processor or a database.

states that "opening the source code to public scrutiny is much more than a technical issue: it allows collaborative development in software production, easier integration with other programmes that can be produced by independent programmers, and customization of software to meet the commercial, regulatory, cultural and linguistic requirements of users. By contrast, closed-source or proprietary software requires a significant upfront investment in license fees and is not always adaptable to local concerns"[18]. FOSS, therefore, is a different kind of process for building, maintaining and changing the rules that govern information flows. It transforms the perception of how software is written, and who can change it and under what conditions, and the freedoms and responsibilities associated with this process. FOSS not only enables but more importantly, empowers people to manage their ICT development.

Experience so far has shown that an open-source environment often produces reliable, secure and upgradeable software at a comparably low cost to users. FOSS provides an unproved approach to security issues and to the need for public and open standards. It eliminates the national-level economic loss resulting from duplication of software development.

The increasing adoption of FOSS by major corporations and institutions in the developed world is creating export opportunities. Thus, it is important for India to analyze the issues related to FOSS which may provide an improved approach to security issues. It is claimed that FOSS code applications are transparent and if for any reason a security flaw is detected, it can easily be linked to the code causing it and fixed.

Business process outsourcing (BPO): This is yet another important area concerning e-commerce and economic development. It involves contracting a service provider to completely manage, deliver and operate one or more of a client's functions[19]. In the past, BPO existed for decades, especially in manufacturing, as a way of reducing costs. The earliest BPO ventures, principally by large enterprises, were in the area of IT services. These services have considerably expanded in recent years, primarily due to the development of ICT combined with the increasing demand from enterprises in developed countries, wishing to outsource non-core business functions at low cost. It is, therefore, of paramount

[18] United Nations Conference on Trade and Development (2003), *E-commerce and Development Report 2003,* United Nations, New York.

[19] These include data centres, networks, desktop computing and software applications.

importance for a country like India to analyze the trends and issues related to BPO, and highlight the key prerequisites that can enable India to attract and sustain outsourced services.

It is expected that with advances in network technology, high-speed data networks, and increased bandwidth capacity, outsourcing will expand further to include a wide range of management services, so that enterprises are now able to offload entire business functions. BPO services could now be made available in areas such as finance, insurance, health care, human resources, mortgage, credit card, asset management, customer care and sales and marketing.

The Indian experience in this context indicates that the market for BPO is expanding, with some sources projecting that the value of BPO will reach the range of $300 to $585 billion in the next two years. Almost half of the Fortune 500 companies are known to be outsourcing services; most of these companies are located in the United States or Europe. While India is a leading provider of outsourced services, other countries providing such services are Bangladesh, Brazil, China, the Philippines, Romania, Singapore, Thailand, Venezuela and Viet Nam.

A number of factors are critical for the success of BPO in the service-supplying country. These include the availability of adequate Internet infrastructure and access, political stability, strong government support, adequate investment resources, the availability of an educated and skilled labour force and proficiency in the client's primary language. Other factors include compatibility in culture and mindset between the client and the service supplier. These factors have to be taken note of in developing strategy for the development of ICT an India.

Regulatory framework: This assumes increasing importance in the growth of e-commerce. This is primarily due to the fact that one of the main challenges facing e-commerce relates to opportunities and risks created by ICT. The issue of security of data on internet and related issues are extremely important for the success of BPO or e-commerce. Similarly, the issue of how to resolve cross-border disputes in the e-commerce environment is equally important. Distances between parties, linguistic and cultural differences, difficulties in determining the applicable law and competent jurisdiction, and enforcement of judgments are among the main obstacles that can significantly increase the cost of doing business online.

Given that traditional dispute settlement mechanisms may not provide effective redressal in e-commerce transactions, there is a need to consider alternative dispute resolution

(ADR) mechanisms that can provide speedy, low-cost redressal for claims arising from online interactions. It is, therefore, pertinent to think in terms of the main forms of ADR- arbitration, mediation and negotiation- as processes effective in settling disputes out of court and in a manner that is less formal than litigation in court. Although ADR is still in its infancy, it has the potential to grow and to provide fair and inexpensive adjudication of disputes arising out of online transactions.

All these aspects have to be taken note of by the policy makers to promote activities that aim to reinforce the growth of the digital economy in India.

4

International Initiatives in E-commerce

The Indian software industry as a whole, as shown in the preceding chapter, has grown by about 50 percent annually over the past decade. This has been possible due to the considerable growth in information and communication technology (ICT) through the efforts of the government, at the central as well as at the state levels. Also, the Indian software industry has the economic advantage of comparatively low costs and a large pool of technically skilled and English-speaking manpower[1]. It has, therefore, succeeded in making inroads into Silicon Valley technology and venture capital companies. These developments have made India highly competitive *vis-à-vis* China, Russia, Eastern Europe and the Philippines for big corporations outsourcing software development and other services. Also, it has allowed the successful entry of Indian brands into the ICT market[2].

Initiatives by International Organizations

Many international initiatives made this growth in the Indian software industry and in e-commerce possible. These have ensured that e-commerce develops in a fashion that best promotes the conduct of secure business transactions. Thus , a large number of international organizations such as the United Nations Conference on Trade and Development (UNCTAD), United Nations Commission on International Trade Law (UNCITRAL), World Intellectual Property Organization (WIPO), Organization for Economic Co-operation and Development (OECD) etc. have helped India develop a global framework for e-commerce. The main initiatives taken by some of these organizations are as follows:

[1] India has the second largest group of software professionals in the world after the United States.
[2] It is important to note that four Indian companies are listed on the US Nasdaq and NYSE.

The United Nations Conference on Trade and Development (UNCTAD)

A number of agencies of the UN are involved in the area of trade facilitation, including the UNCTAD- which is the principal organ of the UN General Assembly in the field of trade and development. The Plan of Action adopted by UNCTAD provides a specific mandate on e-commerce. It requires UNCTAD to have international debates on the development impact of global information networks addressing, in particular, developing countries' specific problems - such as access to information technology, infrastructure constraints and build-up of human resource capacity. Particular importance is given to their impact on the enterprise sector, including corporate structures and the role of small and medium enterprises (SMEs) in global competition, as well as international trade and investment flows. UNCTAD's Division of Services Infrastructure for Development and Trade Efficiency has conducted a series of regional workshops and roundtables on e-commerce and development. These have allowed enterprises to share their experiences regarding e-commerce activities. This has led to the formulation of a wide range of conclusions and recommendations that developing countries can adopt, so as to be able to use e-commerce as an engine for trade and development. It has also launched a series of publications, the first of which is *Building Confidence: E-commerce and Development.* This will be followed by an annual publication that will provide information on and analyze e-commerce matters that are of interest to developing countries[3].

United Nations Commission on International Trade Law (UNCITRAL)

The UNCITRAL was established by the UN General Assembly in 1966. The Commission is the core legal body of the UN system in the field of international trade law, and the main vehicle by which the UN can play a more active role in reducing and removing obstacles to the flow of trade. The general mandate of the Commission is to further the progressive harmonization and unification of international trade laws and to remove unnecessary obstacles to international trade caused by inadequacies and divergence in national legislations affecting trade. The Commission has carried out work in different areas of trade law[4], developed the preparatory work on topics within the Commission's programme

[3] The most recent publications in this context is titled, UNCTAD (2004), *E-commerce and Development Report 2004,* United Nations, New York and Geneva.

[4] These include: international sale of goods and related transactions (Convention on Contracts for the International Sale of Goods); international transport of goods (Hamburg Rules); international payments (Legal Guide on Electronic Fund Transfers, Model Law on International Credit Transfers); banking law (Convention on Independent Guarantees and Stand-by Letters of Credit); international commercial arbitration (Model Law on International Commercial Arbitration); procurement (Model Law on Procurement of Goods, Construction and Services); insolvency (Model Law on Cross-border Insolvency); and e-commerce (Model Law).

areas, and has set up three Working Groups for International Contract Practices, Insolvency Law and E-commerce, respectively. It has also prepared a draft "Model Law on E-commerce", to enable electronic signatures and remove impediments to electronic transactions.

World Intellectual Property Organization (WIPO)

The WIPO is an intergovernmental organization responsible for promoting the protection of intellectual property throughout the world. It has contributed to the development of e-commerce by examining the issues surrounding the growth and governance of the Internet Corporation for Assigned Names and Numbers (ICANN). It has developed recommendations for issues related to trademarks/domain name disputes and the addition of new generic top-level domain names (gTLDs). In late 1999, ICANN adopted a Uniform Dispute Resolution Policy and Rules along the lines of its recommendations.

Other UN Bodies

The World Customs Organization (WCO) has contributed to the growth of e-commerce through its revised customs convention and a new plan to facilitate the international movement of goods purchased over the Internet. Similarly, the International Telecommunication Union (ITU), through its technical assistance to developing countries, facilitates the setting up of e-commerce operations to enhance market access worldwide. The United Nations Economic Commission for Europe (UNIECE), through the UNICEFACT Centre for Trade Facilitation and Electronic Business, has also played a major role in developing trade facilities and e-commerce solutions that create predictability, stability and trust. The UNICEFACT also provides an international standard for electronic data interchange. The International Telecommunication Union (ITU), for example, has developed standards on security and encryption techniques for telecommunications, and privacy techniques; the Universal Postal Union (UPU) has established a global policy framework for consumer privacy and data protection relevant to "Global Trust" service provisions. Issues related to the applicability of existing international trade rules, and obligation to digital goods and services, are the subject of intense discussion. In late 2000 and early 2001, the WTO General Council discussed how to proceed with further work on e-commerce from the existing work on procedural and substantive standpoints.

Organization for Economic Co-operation and Development (OECD)

The OECD has become the focal point for discussions and resolution of issues relating to e-commerce. It has made a number of recommendations on e-commerce issues relating to telecommunications policy and regulations, the economics of the information society, high-performance computing and networking, the Internet, IT standards, and security, privacy, cryptography, and IP rights. The OECD has also studied the issues relating to its model tax treaty reflecting the issues relating to e-commerce.

As part of its work on e-commerce, it has organized a series of conferences on e-commerce which have culminated into an international policy framework to foster and promote global e-commerce[5]. Discussions at these conferences resulted in general consensus on the following points:

- any taxation proposals should ensure neutrality and a fair sharing of tax revenues, avoid causing double taxation (or no tax), and avoid excessive compliance costs;
- there is a preference for existing taxes to be applied to the e-commerce environment;
- tax-compliance issues are more pressing than tax policy issues;
- governments and businesses should work cooperatively to develop solutions to tax problems;
- international cooperation will be needed to develop solutions to tax problems;
- governments must move to a globally seamless approach to tax administration;
- there are new opportunities for tax administrators to improve service to taxpayers;
- tax should not be a barrier to the development of e-commerce; and
- e-commerce should not be allowed to undermine taxation systems; and

[5] Some of the important conferences include the following: The first conference held at Paris (France) in March 1997 on *Global Marketplace for Consumers*, focused on consumer issues and impediments; the second conference held in November 1997 at Turku (Finland) concentrated on *Dismantling the Barriers to Global E-commerce* related to private sector impediments; and the third held in 1998 at Ottawa (Canada) discussed the issues of Global E-commerce. In recent years UNCTAD has planned various sessions like UNCTAD XI held in Sao Paulo, Brazil, (13-18 June 2004) and its Electronic Commerce Branch has organized some important meetings (such as UNCTAD Expert Meeting on Measuring E-commerce on 8th-10th September 2003).

- a 'bit' tax is not desirable[6].

It is widely acknowledged that the OECD is the international organization best suited for coordinating the work of governments on the taxation issues surrounding e-commerce. Some of the areas in taxation that are expected to be focused on are:

- how the information needs of tax administrations can be met, including the need to identify taxpayers operating on the Internet;
- how e-commerce activities should be taxed under consumption tax systems, taking into account the need to ensure an internationally consistent treatment in EU countries, in some non-EU countries that operate VAT systems, and in countries that operate sales taxes;
- how concepts in tax treaties can be adapted to this new environment; and
- how the OECD's transfer-pricing guidelines can be applied to e-commerce.

Group of Seven Nations

The Group of Seven Nations (G7)[7] has an ongoing policy working group on e1ectronic commerce that is developing underlying policy-recommendations for the facilitation of global e-commerce, especially for SMEs. The group held a conference in April 1997 at Bonn, to explore issues of legal harmonization for global commerce and monetary policy for electronic payment systems. At the summit of the Heads of States of G7 held in June 1997, the OECD and other appropriate international organizations like the WTO, were directed to help facilitate the growth of global e-commerce.

Other International Initiatives

In addition to the initiatives of the above international organizations, there are many other international organizations and industry associations that are involved in global e-commerce activities. The other international organizations which have addressed specific issues related to e-commerce are: the World Trade Organization (WTO), responsible for trade and tariff issues; and the International Organization for Standardization (ISO), responsible for IT standards. These represent the large organizations, but there are several others that also contribute to the global e-commerce activities.

[6] See Canada (1998), Electronic Commerce and Canada's Tax Administration, A Report to the Minister of National Revenue from the Minister's Advisory Committee on Electronic Commerce, Ottawa, pp. 44-47.
[7] These include the United States, the United Kingdom, France, Germany, Italy, Canada, and Japan.

Initiatives by National Governments and Regional Organizations

Some of the countries that are leading in this field have also taken initiatives in defining the way e-commerce should progress. These are mainly the USA, European Union, Japan and the countries of the Asia Pacific Economic Cooperation (APEC). Some of the initiatives taken are given below:

The United States of America (USA)

On July 1, 1997, the President of the United States of America approved and released the final version of *A Framework for Global E-commerce* following a series of consultations of a US government interagency working group with academics, business representatives, consumer groups, and members of the Internet community. The *Framework* outlined the US government's approach on issues pertaining to global e-commerce. The *Framework* was preceded by a discussion paper of the US Treasury Department (in 1996) entitled *Selected Tax Policy Implications of Global E-commerce* which was designed to elicit views on various related issues of e-commerce.

The USA ensured that no new taxes will be imposed that discriminate against e-commerce, that existing taxes will be applied in a way that avoid inconsistent national tax jurisdictions and double taxation, and that tax systems treat economically similar transactions equally.

The Framework sets out the principles governing the development of domestic and international tax policy related to e-commerce, as is given below:

- not to hinder commerce, discriminate among types of trade, or create incentives that will change the nature of transactions or their locations;
- be simple, transparent, capable of capturing the overwhelming majority of appropriate revenues, and easy to implement;
- minimize burdensome record keeping and costs for all parties; and
- be able to accommodate tax systems used by the United States and its international partners.

The *Framework* suggests that the best means to implement these principles is to follow existing taxation concepts and principles wherever possible. It also notes that the challenges facing the tax system are the result of three basic characteristics of the Internet - the

potential anonymity of buyers and sellers, the capacity for multiple small transactions, and the difficulty of associating online activities with physically defined locations.

European Union (EU)

The EU has used its role as the source of policy initiatives to transform the framework provided by the Union's founding treaties, into today's integrated structures. A number of initiatives have been undertaken to balance the interests of protecting personal privacy and allowing business access to market information.

In April 1997, the Commission of the European Communities (CEC) released its e-commerce plan entitled A *European Initiative in E-commerce.* The plan recommended an implementation timetable in three broad policy areas: access to the global electronic marketplace infrastructure, technology and services, creating a favourable regulatory framework, and promoting a favourable business environment.

In July 1997, the EU and Germany hosted a European Ministerial Conference. It arrived at a consensus on various aspects including developing content and commerce, the role of the private sector, the role of government in providing the framework and stimulating new services, the need to build confidence, empowering user, building on Europe's strengths, and strengthening its international dimensions.

The Industrial Declaration issued at the conference states that the technological advances that are driving e-commerce are not compatible with the existing tax rules and that technology, rather than tax policy, will likely determine the tax rules of the next century. The declaration makes the following proposals:

- The harmonization of payment of VAT and excise tax for goods and services ordered electronically is advisable.
- There is a future role for the OECD and the WTO in coordinating an international, uniform system for taxation on ICT.
- Tax on information distributed electronically should be technology-neutral.

The official Bonn Declaration supported the principle of non-discriminatory taxes on use of Global Information Networks.

The EU launched the eEurope initiative on 8 December 1999 with the adoption of the Communication "eEurope- An Information Society for All". The initiative aims at

accelerating the uptake of digital technologies across Europe and ensuring that all Europeans have the necessary skills to use them.

Asia-Pacific Economic Cooperation (APEC)

APEC, formed in 1989 in response to the growing interdependence among Asia-Pacific economies, promotes practical economic cooperation among its 18 member states[8]. At the fifth APEC Economic Leaders' Meeting, held in 1997 at Vancouver (Canada), leaders agreed to "intensify work on e-commerce."

A number of APEC working groups are engaged in a variety of e-commerce projects, including telecommunications, human resources development, customs procedures, and industry, science, and technology. The APEC Telecommunications Working Group (TELS) has also organized seminars to continue the process of creating a sustainable e-commerce framework.

In November 1998, the APEC approved an APEC Blueprint for E-commerce that includes a framework for the region, which emphasizes the leading role of the private sector in the development of e-commerce. APEC Ministers established an APEC E-commerce Steering Group (ECSG) in 1998, to ensure implementation of the work programme and to co-ordinate the activities of the various APEC forums involved in e-commerce activities.

Japan

In May 1997, Japan released its e-commerce strategy titled *'Towards the Age of the Digital Economy: For Rapid Progress in the Japanese Economy and World Economic Growth in the 21st Century.* The strategy is built on five principles: constructive efforts and swift response to change, resolution of problems through technology and the marketplace, security and trust, universal access, and international coordination.

Convergences

The initiatives of various international organizations and other countries on promotion, regulations, and taxation of e-commerce suggest that a convergence is approaching in all these aspects including the challenges faced by all tax administrations. It is acknowledged that the global range and implications of e-commerce require broad international cooperation, and consensus on taxation policies and principles. It is generally

[8] These include Australia, Brunei Darussalam, Canada, Chile, Chinese Taipei, Hong Kong (China), Indonesia, Japan, Malaysia, Mexico, New Zealand, Papua New Guinea, the People's Republic of China, the Republic of Korea, the Republic of the Philippines, Singapore, Thailand, and the United States.

agreed that existing taxation concepts and principles should be applied and, if necessary, adapted before they are replaced by new concepts and principles. It is also agreed that tax systems should ensure or achieve tax neutrality and equity between traditional and e-commerce activities, should be simple to administer and comply with, and should avoid the imposition *of* multiple taxation. Finally, it is agreed that new or additional taxes should not impede the development of e-commerce.

5

Issues in Taxation of E-commerce

To enable India to prosper in e-commerce, it is important to keep in mind the pre-requisites for encouraging e-commerce as well as the need for changing the organizational and operational aspects of tax administration including income tax, CenVAT and State-VAT.

E-commerce is one of the most important developments since the industrial revolution and it will affect the overall perspective regarding the system of tax governance and business management in the country. In recent years, e-commerce has influenced business prospects by fundamentally altering the ways of conducting businesses.

In general, e-commerce, which refers to conducting trade via the Internet, has a much larger scope than just conducting merchandise transactions electronically. It not only includes all forms of trade in goods but also encompasses services such as banking, insurance and trading in shares.

E-commerce is procreating a wide array of innovative businesses, markets and trading communities. It creates diverse functions and revenue streams. Also, it reduces costs of transactions significantly. It is believed that procurement costs will be reduced by 90 percent through buying online. It is estimated, for example, that online banking costs one rupee as against Rs. 27 by cash machine and Rs. 114 by bank teller.

In view of the reduced costs and increased efficiency of e-commerce as compared to the traditional system of trade and commerce, growth of e-commerce is likely to be highest

in India amongst the Asian nations. Estimates show that it will grow at the rate of 246 percent in India as against 84 percent in Australia, 110 percent in Hong Kong, 145 percent in South Korea and 243 percent in China.

If this rate of growth of e-commerce is achieved in India, e-commerce will soon become the way of life. With the industry and trade rapidly picking up computer culture, its full potential will be realized in the near future. The opening up of the economy and globalization will stimulate its use and have a profound effect on the system of tax governance in the country.

Principles of Taxation for E-commerce

With a view to encouraging e-commerce, most countries initially adopted the policy of exempting e-commerce from taxation. The 'infant industry' argument was the justification for such a policy. It is, however, important to note that the European Union has now started taxing e-commerce. The argument for taxation of e-commerce is based on the premise that such an exemption might induce other dealers/ tax payers to enter into transactions that saves them some tax. It is, therefore, important to evolve the principles that should govern taxation of e-commerce.

In general, the following principles of taxation have been enunciated: Equity, neutrality, productivity, certainly and simplicity. Equity requires similar treatment between e-commerce and the traditional commerce. From the point of view of equity, therefore, there is no case for exempting e-commerce from tax. A differential tax treatment must not be adopted as it offers an easy tax avoidance mechanism and creates administrative complexity. What is crucial is that e-commerce represents a fast growing base, which no country can afford to exclude from the tax net. It is, therefore, important that all persons engaged in e-commerce should be subject to the same tax treatment as is meted out to traditional commerce.

In the context of taxes on income and property, the Government of India constituted a High Powered Committee (HPC) in December 1999 to examine the position of e-commerce transactions under the existing tax laws. The committee was to suggest as how to implement taxation of e-commerce transactions and to determine if any changes have to be made in the tax laws. The HPC submitted its report to the Government in July 2001[1]. It suggested that taxation of e-commerce should take note of:

[1] Government of India (2001), *Report of the High Powered Committee on Electronic Commerce and Taxation*, Central Board of Direct Taxes, New Delhi.

- Neutrality of taxation of e-commerce with reference to traditional commerce;
- Integrity of tax base through constant monitoring of trade flows, changes in technology and business practices; and
- International consensus while protecting national interest.

The HPC pointed out that although e-commerce does not raise any new issues for direct taxation, it may provide innovative avenues for evasion due to anonymity of parties and transactions. The HPC also opined that there is no real alternative to the concept of 'place of effective management' and that this should continue to be used. While in the case of a globally integrated enterprise, there might be no unique solution available through the concept of 'place of effective management', a solution can be found in the 'source based' taxation[2].

In terms of Article 5 of the OECD Model Tax Convention, a server at the disposal of an enterprise who is hosting its website could constitute a permanent establishment (PE), if it is kept at a fixed place for a sufficient period of time and performs core business functions of the enterprise. The HPC, however, suggests that applying the existing principles and rules to e-commerce does not ensure certainty of tax burden and maintenance of the existing equilibrium in the sharing of tax revenues between countries of residence and source. The HPC, therefore, supports the view that the concept of PE be abandoned and a serious attempt be made, within the purview of the recommendations of the OECD or the UN, to find an alternative to the concept of PE.

The concept of PE has evolved over time because in traditional commerce, physical presence is required in the source country, if there exists any significant level of business activity. Absence of a PE implies insignificant business activity, which can be overlooked for tax purposes. This concept lost relevance with the technological advances in communication and development of teleconferencing. As a result of this and the growth of the Internet in the 1990s, the correlation between the size of business and the extent of physical presence in the source country ceased to co-exist. In all transactions undertaken through the Internet, even where delivery is in the traditional manner, the tax base in the source country will be nominal.

[2] The "source based taxation" of business income depends on physical presence in the form of fixed place of business or a dependent agent in the source country. It also depends on the characterization of income. With e-commerce, the need for physical presence virtually ceases. This affects sharing of revenue between countries. The change in mode of delivery from physical to online raises characterization issues. Lack of physical presence also creates problems in enforcement of tax laws.

According to Doernberg, it is useful to adopt the 'base erosion' approach in taxation of income streams in source countries[3]. The proposal requires taxation of any payment to a foreign enterprise, if it is tax deductible in the hands of a taxpayer in the source country. The implementation of the tax would be in the form of a low withholding tax, with the option for being taxed on net income. This proposal implies that the concept of PE continues to exist. In this context, the HPC further suggests that the 'base erosion' approach offers a possible solution for equitable tax sharing between residence and source countries when:

- the concept is applied to all commerce and not just e-commerce;
- the tax is implemented through a low withholding tax on all tax-deductible payments to the foreign enterprise; and
- the withholding tax is final, without the option of tax on net income being given to the taxpayer or the tax administration.

Before considering a solution on these lines, trade data needs to be studied carefully to ascertain if, and to what extent, there will be erosion of tax base. The HPC recommends that a thorough study must be undertaken:

- to examine the practicality of taxing all imports and
- to assess the erosion of tax base as a result of credit for taxes levied by other countries on exports.

It also recommends that there be regular interaction at the international level and in a structured way.

It is, however, felt that the base of "erosion approach" is contrary to the international consensus that withholding taxes are appropriate only in certain limited cases[4]. This approach is a radical departure from this consensus, and is in conflict with the internationally accepted standards on when a jurisdiction has the right to impose an income tax on a non-resident enterprise. Any unilateral move on India's part to adopt such an approach may throttle the growth of e-commerce in India. It might also lead to disputes between India and its various treaty partners. It is believed that India must carefully consider the issues relating to the World Trade Organization (WTO), since it might expose India to intricate issues in relation to the WTO.

[3] See Doernberg, Richard L (2000), "E-Commerce and International Taxation" paper presented at the IFA Asia Regional Conference held at Mumbai in November, 2000.
[4] Such cases include source based interest, royalty, dividend payments etc.

The Technical Advisory Group (TAG) set up by the OECD scrutinized 28 categories of transactions. Given the provisions of the Act, the HPC examined each of these categories of transactions as well as the double taxation treaties entered into by India with UK and US.

At the policy level, the HPC agrees with the view that the characterization of income should not change with the mode of delivery from physical to digitized form. It recommends that the Central Board of Direct Taxes (CBDT) should announce its stand on each category of transactions. This will ensure uniformity of approach amongst all the assessing authorities and certainty of the tax burden for the taxpayers.

It is also recommended that the CBDT should closely monitor the developments and continuously issue guidelines to the assessing authorities on the new emerging categories of transactions. The monitoring should be through an expert advisory body having representatives of administration, professionals, academicians, and concerned industry groups.

It is also recommended that the CBDT should closely monitor the developments and continuously issue guidelines to the assessing authorities on the new emerging categories of transactions. The monitoring should be through an expert advisory body having representatives of administration, professionals, academicians, and concerned industry groups.

Having considered all the aspects related to taxation of e-commerce, the HPC recommends that there is no rational basis for having differential tax treatment for different categories of incomes.

Issues in Administration of Taxes:

There could be many challenges anticipated for enforcement of transaction related to e-commerce. These are anonymity of identity and location of parties, anonymity of transactions and accounts, disintermediation, transfer pricing issues, online delivery and net cash, easy access to tax havens and low tax jurisdictions, identification of taxing jurisdiction, new evasion opportunities, recovery of tax, and exchange of information.

The HPC considered each of the above issues and noted that large volumes of business are not done between strangers. Also, in a majority of e-commerce transactions, the mode of delivery and payment remains traditional. These leave audit trails and are not anonymous. The real challenge for enforcement arises only where delivery and payment are through Internet or any other network. At present, this is limited in scope, with little chance

of acquiring significant levels in the immediate future. However, once the problems with delivery mechanism and net cash are sorted out, e-commerce with delivery and payments through networks will grow exponentially. It is, therefore, necessary for the tax administration to have an appropriate tax policy in place well before that happens. This essentially requires setting up of systems of disclosure by the enterprises. The disclosure has to be related to the third party information requirements for intermediaries like Internet service providers (ISPs), and banks and services related to monitoring and surveillance. The systems must be setup in consultation with responsible businesses, other enforcement agencies, the banks and the professional bodies. The focus should be on meeting the requirements of healthy business practices and enforcement with minimum compliance burden on enterprises and intermediaries.

The recommendations of the HPC on these counts are in conflict with the existing OECD Commentary on Article 12. It is generally not in agreement with most existing and emerging rules regarding the characterization of software transactions. Given this, it may be noted that no reasoning has been given by the HPC for its divergence from these views. It is important to take into consideration the observations made by the Indian court on OECD commentaries in 1983, which said that "In view of the standard OECD models which are being used in various countries, a new area of genuine 'international tax law' is now in the process of developing. Any person interpreting a tax treaty must now consider decisions and rulings worldwide relating to similar treaties. The maintenance of uniformity in the interpretation of a rule after its international adaptation is just as important as the initial removal of divergences. Therefore, the judgments rendered by courts in other countries or rulings given by other tax authorities would be relevant." [5]

E-commerce Challenges for VAT

With regard to the challenge posed by e-commerce for domestic trade taxes, it is important to keep in mind that these taxes are almost set to enter the era of value added tax (VAT). At the central level the union excise duties have already been replaced by a central-VAT. At the state level it is certain that all the states will be adopting state-VAT on April 1, 2005 to replace their existing sales tax.

[5] Commissioner of Income Tax vs. Visakhapah1am Port Trust [1983] 144 ITR 146; Andhra Pradesh High Court.

The efforts in the context of income tax, as explained above, have initiated some amendments in the Indian income tax rules based on the recommendations of the HPC. Cyber laws have also been enacted which aim at amending the existing laws to tackle the issues related to e-commerce. The issues related to e-commerce and administration of VAT (both at the central and states' level) has so far not been studied carefully.

The time is ripe to take note of the organization for VAT administration and related procedures for large and small dealers for CenVAT as well as state-VAT. An important aspect for the administration of VAT would be to keep track of the extent of domestic and cross border trade in India. It is useful to point out that as of today sales tax/VAT department has no data on trade inflows and outflows through intra-state or cross-border trade. Even when some of the states have border as well as internal check posts, no relevant information is available in any of the states to help tackle the issue of evasion of tax. The degree of tax evasion in different commodities lies between 5 and 85 percent[6]. The advent of e-commerce worsens the scenario as it involves online delivery which will affect taxes on commodities and services in a crucial manner.

Given the rapid growth of e-commerce in India, the tax administration will have to review the existing tax procedures. Three points should be kept in mind.

1. The tax procedures has to be simplified.
2. Ensure that the tax laws are implemented appropriately and
3. The integrity of the tax base must be maintained.

The tax department has to create an environment conducive to this. For example, the system of registration of dealers and submission of tax returns can be through e-mail. The dealers should submit their set of accounts along with their software programmes to the department on floppy disks. The issues related to tax at destination have, however, to be given careful consideration. Within the existing tax laws, it would be extremely useful to consider the ways and means to equip e-commerce in such a way that it does not increase evasion of tax. It is high time that we learn from the initiatives and experiences of the international and regional organizations, as explained in the preceding chapter. The experiences of the European Union in taxing e-commerce suggests strategies for encouraging e-commerce and integrating the tax system in such a way that it takes care of the twin problems of determining the *citus* of sale as also of identifying the jurisdiction with

[6] See Purohit, Mahesh C. (2001), *Sales Tax and Value Added Tax in India,* Gayatri Publications, New Delhi-110052.

regard to its authority on tax transactions. In doing so we have to keep in mind the associated risk for tax compliance.

In spite of all these difficulties in tax administration due to the advent of e-commerce, it is important that India is encouraged to keep pace with the changing world environment. At present, the volume of e-commerce in India is far below the levels achieved in USA, as shown in chapter 2. However, the expected volume of e-commerce in India is likely to get a big spurt in the near future.

Accordingly, the government should prepare a policy to cope with the challenges posed by e-commerce to the tax administration regarding both the central and the state VATs. These issues must be addressed in an innovative way so as to encourage growth of e-commerce within the framework of globalization of the economy. It should keep in view the issues related to security, global information infrastructure and the measures needed to check evasion of tax.

6

Role of E-commerce in Economic Development:

A case study of Andhra Pradesh

Economic development is a complex process. It typically involves the creation of new economic activities. New productive sectors develop, and old activities function in radically different ways. Evidence from economic history suggests that the process of structural change is central to economic development. Economic theorists have viewed this as a process of transformation, say from agriculture to manufacturing or as a process involving changes in productivity in the newly developing sectors, which in turn pushes up productivity in the traditional sectors[1].

Structural change being the driving force of economic development compelled many low-income countries to pursue policies of state-led industrialization. The Asian miracle, however, saw dramatic increase in the share of labour force in manufacturing. Over the past decade, the technological innovations have introduced changes in information and communication technology (ICT), which have stimulated growth further.

Due to these changes in many countries, including India, business processes have improved considerably and these make use of e-commerce technology. One of the Indian states, , Andhra Pradesh, has shown that developments on similar lines can be attained. The state has been able to achieve an innovation led development. This has been made a reality

[1] Burgess, Robin and Anthony J. Venables (2003), "Towards a Microeconomics of Growth", ABCDE, held at Bangalore, World Bank.

through a farsighted state government's strategy, and the integration of local and global networks.

E-commerce has classified the market into different segments like B2B and B2C. The most significant impact of the Internet has been on the B2B segment of the markets. The link between ICT and development is basically represented by access to networks, information and knowledge. ICT reduces market imperfections, as buyers and sellers are aware of the present market situations and can improve their business prospects tremendously. Thus, e-commerce reshapes competitive dynamics in the traditional producer-driven and buyer-driven value chains such as automobiles, coffee[2] and a host of other commodities and services.

Measuring Economic Impact of E-commerce

E-commerce has generated new dimensions in economic growth and has helped many countries attain a higher level of development in recent years, thereby affecting the investment climate for furthering development.

In analyzing the importance of e-commerce and its impact on economic development, e-commerce is defined in broader terms, as explained in chapter 2[3]. Accordingly, e-commerce refers to more than a technology- it is a business model built around the application of information and communication technologies to any aspect of the value chain for products and services. Determining the size and impact of e-commerce requires developing indicators that capture the key elements and processes common to a representative range of operational e-commerce models. These should also respond to policy needs.

Further, in analyzing the effect of e-commerce on economic growth, ICT seems to have different effects on productivity and growth. First, capital goods investment in ICT contributes to overall capital deepening and therefore, helps in increasing labour productivity. Second, rapid technological progress in the production of ICT goods and services may contribute to higher multi-factor productivity (MFP) growth in the ICT-producing sector. And third, greater use of ICT may help firms to increase their overall efficiency, and thus raise MFP. Greater use of ICT may also contribute to network effects, such as lower transaction costs and more rapid innovation, which will help improve the overall efficiency of

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[2] Goldstein, A. and D. O'Connor (2000), "E-Commerce for Development: Prospects and Policy Issues", Development Centre Technical Paper No. 164, OECD, Paris.

[3] While analyzing the concept of e-commerce, we have seen that e-commerce can be defined in a narrow as well as in a broader sense, as discussed in an earlier chapter. Here we are referring to the broader sense of the definition.

the economy, i.e. MFP. These effects can be measured and examined at different levels of aggregation, i.e. at the macro-economic level, the sectoral or industry level, or at the firm level.

Realizing the immense potential for growth of e-commerce and its impact on economic growth of the country, this chapter attempts to suggest a bottom up approach, wherein micro economic variables are used to prove this hypothesis. Since development is affected by the given investment climate of a country, the chapter suggests a methodology that takes into account the quality of infrastructure that attains considerable importance and poses countless challenges for the investment climate.

With this perspective in view, this chapter presents a case study of Andhra Pradesh, a computer savvy state, to measure the economic impact of e-commerce. The main reason for selecting Andhra Pradesh as a case study is that this state has launched several projects connected to the state's portal for better service delivery to the citizen. These projects, as explained in the latter part of this chapter, include TWINS, CARD, FAST, etc. With the help of these projects, connectivity has already been established and is operational between Hyderabad and all district headquarters, plus two other major towns. Connectivity has also been taken to the *mandal* (block) and village levels and is proposed to be optimally used by the government departments and agencies to translate e-governance into reality. A video conferencing facility between Hyderabad and twenty-five other towns has been operational since January 1999, and will eventually be extended to all major departments. All these activities tend to increase the efficiency in governmental activities; this will give a boost to their status and increase the wealth of the state.

Before estimating the effect of e-commerce on economic development in Andhra Pradesh, it is important to note that in India, no major work has been attempted in this regard. In other countries, many studies have been attempted. The study of the Department of Treasury, USA (1997), the White House, USA (1996)), and the OECD (2001) indicate that e-commerce reduces costs of transactions significantly. Some other studies are also important. These are United Nations (2003), and OECD (2004).

An analysis of the methodology, level of aggregation and the results of some of the studies in estimating effect of e-commerce on economic development, are summarized below:

S No	Author (s)	Methodology	Country	Level of aggregation	Results
1	Robin Burgess & Venables (2003)	Labour Productivity growth	India	Aggregate level	Growth contribution of ICT increases over the period; especially the boom in the IT sector during that period.
2	Hollenstein (2003)	Rank Model, ICT model or organizational model	Switzerland	Firm level analysis	The organization model and the extended version of the ICT model point in the same direction. ICT intensity and workplace organization are interrelated. They found statistically significant results for both direction of causality.
3	Toney Clayton at al.,(2003)	Regression analysis-Cobb-Douglas production function	United Kingdom (UK)	Firm level analysis	Productivity modeling shows significant gains (and some losses) associated with electronic network use. The evidence suggests that some of these are related to the impact which e-procurement has had on market prices.
4	K.Lal (2002)	Censored regression model- TOBIT analysis to identify the factors that influenced the export performance of firms.	India	Firm level	The technological collaboration of Indian firms with foreign companies does not play any role in influencing the export performance of the firm. This is contrary to our expectations. It is quite possible that even firms that are doing business in domestic market might have had technological collaboration with multinational corporations (MNCs) to strengthen competitiveness.
5	K.J. Joseph (2002)	Semi-log form-Labour productivity measure	India	Firm level	Most of the variables are significant in this model. There is an increasing realization of the potential that IT offers for human welfare. IT induced product and growth are limited to the developed world

A review of all these studies indicates that the empirical work in this regard is still progressing, both conceptually as well as in methodology.

Methodology

In attempting to estimate the effect of e-commerce on economic development, this study has taken the broader definition of e-commerce. Accordingly, the data collected refers to technology adoption and changes in firms behaviour associated with electronic transactions and the economic effects of e-commerce.

Since the information needed for this purpose was not available from the secondary sources such as the *Stock Exchange Directory*- which gives balance sheets of all the companies, the data was collected through fieldwork.

In doing so, a questionnaire was prepared (given as Annexure A6.1) and sent to one hundred selected industries, drawn on the basis of a sample survey of the conglomeration of industries in the state of Andhra Pradesh. The sample was drawn from all types of industries, *i.e.* both from ICT and non-ICT companies.

In estimating the effect of ICT on economic development, Cobb-Douglas form of production function has been used, as given below:

$Q = AK^{\alpha} L^{\beta} M^{\gamma}$

where

K, L and M are capital, labour and other inputs (including raw material and all other inputs), respectively. 'A' is a technology change term which shifts the production function, and is a function of the use of computer/electronic networks for the buying or selling operations of the firm, as shown below:

$A=exp(\delta_0 + \delta_1 eActivity)$

where

eActivity has value= 1, if a reporting unit uses an electronic network for buying or selling, whichever is appropriate, and the value is zero, if it does not. The equation on which regression is based is therefore.

$$\text{In}\left(\frac{Q}{L}\right) = \delta_0 + \delta_1 eActivity + \alpha \ln\left(\frac{K}{L}\right) + \gamma \ln\left(\frac{M}{L}\right) - (\alpha+\beta+\gamma-1) \ln L + u$$

The *eActivity* term in the analysis is split into a number of dimensions for different specifications of the model, to show separately the effects for:

- Firms using computer networks for selling.
- Firms using computer networks for buying.
- Firms using networks for either buying or selling.
- Firms using networks for both buying and selling.

The reason for estimating the effect of selling and buying separately is to distinguish between "market effects" and internal effects. Market effects from e-selling will be positive for a firm due to increased market size and ability to grow or negative due to tougher competition. Market effects from e-procurement are due to better access to more supply sources, to better collaborative working, or to better pricing conditions. Expected effects of e-commerce on internal efficiency may be due to reduced transaction costs or better information or better process flows within the firm.

The analysis takes in to account variations in the industry as is shown below:

- Reporting unit size, as represented by number of employees.
- Industry sector and region.
- Ownership (both multinational, which has a major influence and foreign ownership).
- Age of reporting unit.
- Macroeconomic shocks as measured by year dummies.

Since the response from the sample units drawn was extremely disappointing, and the required information was not available, it was not possible to quantify the impact of e-commerce on economic development.

However, it is possible to get the effect estimated if some corporate entities are taken into confidence. In doing so, use is made of the two links between ICT use and labour productivity growth *viz.,* increased capital deepening (raising the ratio of capital to labour) as businesses step up investment in ICT; and MFP gains associated with ICT use.

There are two lines of argument about the possible effects of ICT use on MFP growth. The first looks upon ICTs as a general purpose technology that enables other productivity-enhancing changes. For example, ICTs provide an indispensable platform upon which further product or process innovations are based. The second line of argument looks to spillover effects, such as network economies, as the sources of MFP gains. For example, an expansion in connections to the Internet or "closed" networks reduces search and transactions costs for businesses.

E-commerce and Economic Development

In spite of our inability to get empirical estimates of the effect of ICT on economic development, we hope that in times to come, the methodology proposed would be put into use when the requisite data are available.

In the meanwhile, the study hypothesizes that e-commerce (and the basic infrastructure of ICT needed for it) is the new activity that will put India on a rapid development path in the near future.

It is, however, important to recognize that the process of change in these activities is 'lumpy', requiring huge investments. But once this is done, these activities will accelerate

growth in many other sectors. Hence, it is important to reorient the analytical framework to determine the growth path of an IT location.

As is the case with ICT and e-commerce in India, many countries have done well in a few extremely narrow product segments[4]. Such specialization has also increased the export of these items.

As ICT provides basic infrastructure for e-commerce, efforts must be made to move beyond e-commerce and to consider the inherent patterns embodied in information and communication technologies (ICT).

An attempt must be made to examine as to how and to what extent ICT have become the unique transformative factor for the entire economy. The independent existence of ICT from the actual development of e-commerce shows that it is a viable and extensive economic and social reality. This study attempts to make e a detailed mapping of ICT that in turn structures the nature of e-commerce. For this purpose, the rest of the chapter presents a case study of the central structure of ICT in Andhra Pradesh.

ICT in Andhra Pradesh

While information and communication technology (ICT) has got an impetus in most Indian States, Andhra Pradesh has announced a special ICT policy and granted various incentives to this industry- initially through the industry-friendly incentives announced in May 1999[5] and later through various other infrastructure developments to promote the growth of the IT industry within the State[6]. The Government has also announced a Hardware Policy[7] and a special policy for the IT Enabled Services (ITES) sector[8].

The incentives offered by the government were availed of by most of the industries in the state. For example, 153 IT companies made use of subsidy on power tariff and 26 companies availed of investment subsidy. Similarly, 14 companies benefited from rebate in stamp duties and 26 IT companies took advantage of allotment of land and exemption from zoning regulations.

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4 Such examples are of Bangladesh being successful in exporting shirts, trousers and hats; and Pakistan in bed linen and footballs.

5 Information and Communication Technology Policy of the Government of Andhra Pradesh, 2002 announced through the Gazette Notification is given in Annexure A6.2 to this chapter.

6 Various exemptions granted to IT industry in Andhra Pradesh vide Government Order # 27 Department of IT&C dated 27.6.2002 is given in Annexure A6.4 to this chapter.

7 Through G.O. No. 3, IT&C Department dated 25th May 2000.

8 Through G.O. No. 4, IT&C Department dated 21st August 2001.

This resulted in the significant growth of IT industry in Andhra Pradesh during the last few years. The growth rate of the industry is more than 80%, with the exports of software reaching Rs.2855 crore for the year 2001-02, from a level of Rs. 574 crore for the year 1998-99. This has also provided employment, which has grown from 12000 to 64000 during this period, to give an overall boost to the state economy.

There has been a significant progress in the implementation of innovative projects in the area of e-governance, with the objective of deploying the tools of ICT for increasing the efficiency of government operations, providing better citizen services and above all, enhancing the quality of life of the average citizen. These e-governance initiatives have acted as a catalyst for the growth of the IT sector in the State.

Following the e-governance initiatives, Andhra Pradesh is changing the way of providing services to the society. The Internet facility is the biggest contributor of this change. The change is being felt in all economic and social activities, in every conceivable manner.

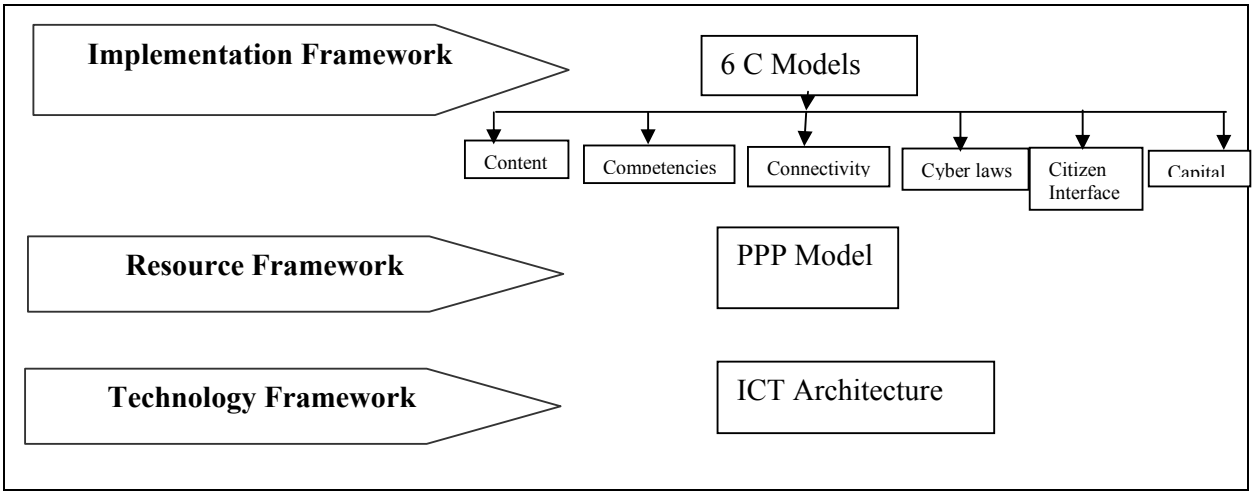
The basic philosophy behind this attempt is the daily experience faced by citizens for securing services from a government agency, which entails indirect costs in terms of delay and uncertainty, corruption, ill treatment at the offices, loss of wages/business of the citizen, cost of travel and staying out of the work place. If the government provides its services in such a way that these indirect costs are reduced or eliminated, the citizen will be prepared to avail of the same even at an additional charge. E-governance has the possibility of providing such services to citizens and business with equal access and equal treatment to the rich and the poor, with enhanced transparency and reduced costs.

With a view to implementing the IT policies in the state, the government of Andhra Pradesh created a suitable framework for effectively meeting the challenges posed by management of technology.

The framework developed for this purpose, as given in Exhibit 6.1, comprises the following three parts:

Exhibit 6.1

Framework of e-Governance in Andhra Pradesh



1 *Implementation Framework:* Andhra Pradesh has developed a model from the experience of implementing/coordinating a number of projects in the government departments. The model tries to incorporate the essential features of a structured approach for successful implementation of IT projects. The model consists of the following:

Content: The process of content development encompasses a whole range of activities starting with a comprehensive study of the system, identification of the objectives and ending up with delivery of the intended benefits to the citizens or other users of the IT system.

Competencies: Departments, desirous of implementing major IT projects, are required to simultaneously build up the required competencies at various levels.

Connectivity: Widespread connectivity is a pre-requisite for provision of services on an any-time, any-where basis.

Cyber laws: All major IT projects derive their legitimacy and strength from a suitably formulated cyber law.

Citizen Interface: The state has conceptualized the project and planned how the services of an e-governance project will reach the intended beneficiaries, in a cost-effective manner.

Capital: The implementation of IT projects involves the mobilization of capital investments as well as the funds required for maintenance of the systems, on a sustained basis.

II. *Resource Framework-Public-Private Partnership*: Experience across the globe shows that IT is one of the areas which is eminently suited for public private partnership (PPP) especially in areas such as driving licenses, utility bill collections, management of land records etc. Investments in information technology by governments has an opportunity cost given the limited availability of resources of money, time and attention. Investing these in IT would imply less of such investments in other development areas like provision of water, sanitation, health, shelter, production technology and skill development. Investments in information technology have, therefore, to be made very strategically by the governments. The Government of Andhra Pradesh has focused its energies on creation of content and digitization of databases so that transaction based services become attractive for private sector players.

III. *Technology Framework:* Given the large number and variety of applications to be developed across government departments, a comprehensive exercise has been attempted in Andhra Pradesh to prepare an overall IT architecture for e-governance, with the assistance of Price Waterhouse Coopers (PWC). With a sound IT architecture, there is no apprehension that a rapid-fire development of applications would result in duplication, incompatibilities or any other problem.

E-governance Initiatives

Andhra Pradesh envisages that it can attain a position of leadership and excellence in the information age and transform itself into a knowledge society.

As a step towards this, the Government of Andhra Pradesh has initiated an innovative, broad based, enterprise-wide approach to service delivery. It has implemented many e-governance projects, as shown in Table 6.1, which yielded encouraging results. The following are some examples of these initiatives:

1. **Computer-aided Administration of Registration Department**

The Computer-aided Administration of Registration Department[9] (CARD) is directed at altering the manual procedures that have governed the registration system for all these years , affecting the sales of urban and agricultural properties. The manual registration system is governed by antiquated procedures, which include laborious copying and indexing of documents as well as their unscientific space-consuming preservation in ill-maintained backrooms. The manual procedures lack transparency in property valuation and result in a flourishing business for brokers and middlemen, who exploit citizens selling property.

Table 6. 1
Core Applications/ Projects

Initiatives	Description
OLTP-Online Transaction Process System-focus on Citizen Data Management System Integrated Land Management System Geographical Information System	▪ Provides a single window to citizens to access the services across multiple departments ▪ Archives horizontal and vertical integration of departments at Mandal (lowest administrative unit), District and State levels.
e-Seva (electronic services to citizens acting as a single window)	▪ Already implemented across the State capital of Hyderabad ▪ Rolling out e-Seva across the State
Single window for businesses	Provide single window to business to access the services across multiple departments
Social Benefits Management System	▪ Monitoring and tracking various welfare schemes ▪ Better targeting of beneficiaries.
Complaints redressal-Help Desk and Call Centre	▪ Centralized complaints- receipts, distribution and tracking
Integrated Financial Information System	▪ Integration of applications in Finance Department and its associated departments ▪ Use of middleware products
e-Procurement	▪ Applying e-Government concepts and technologies to the area of purchasing ▪ 100% potential for PPP Model ▪ CoTs solution preferred
Human Resource Management System	▪ Centralized payroll and G2E portal Self-service zone for I million Government employees.
Generic Office Management System (smartgov)	▪ Workflow automation + KM in AP Secretariat. ▪ A bundle of 483 applications across 30 departments of Secretariat.

[9] For details see Satyanarayana, J. (2000), "Computer-aided Registration of Deeds and Stamp Duties" in Bhatnagar, Subhash and Robert Schware, (eds.), "*Information and Communication Technology in Development: Cases from India*", Sage Publications, New Delhi

The CARD project is designed to eliminate the maladies affecting the system of registration. It completes registration formalities, within an hour, through electronic delivery of all the registration services. The CARD project illustrates some of the key implementation issues to improve citizen-government interfaces.

Table 6.2
Core Technology Infrastructure Initiatives

Initiatives	Description
Government Portal	▪ Common gateway for all State services, applications, and information.
Secure Intranet	▪ Communication infrastructure to connect all the locations of Government offices ▪ Connectivity available from Hyderabad to District offices
Data Centre	▪ One central facility where the application and database server are located ▪ To be implemented under a PPP model ▪ The focal point for hosting all major applications and data of Government departments
Kiosks in rural areas	▪ Access points for rural location ▪ Implementation under PPP model
Public Key Infrastructure	▪ Secure transactions over internet ▪ Digital Signature ▪ Implementation under PPP Model
Identity cards for citizens	▪ Unique identification number (SSID) for citizens based on MPHS data using Smart Card Technology
Data Warehousing	▪ To analyze the huge historic data generated in the computerized department & agencies ▪ Project implemented jointly by GOI and Govt. of AP

The architecture of the CARD System has three layers of master data as given below:

i. *The CARD master data:* This layer contains the master data created at the state level and is common throughout the state. It can be modified only by the specific authority of the commissioner and inspector general of registration at the state level. CARD master includes registration of office codes, village and habitation codes, rates of stamp duty, transfer duty and registration fee, standard unit rates for valuation of structures, depreciation rates, codes for different classes of

instruments and codes for different classes of lands. The users at the district and sub-district levels can only read/print this master data but cannot alter it.[10]

ii. *The Sub-Registrar Office (SRO) masters:* This layer contains the master data relevant and applicable to the jurisdiction of an SRO. It can be altered only under the authority of the district registrar. It contains the basic values (rates per acre/sq. yard) of all the land within the SRO, according to survey-number and house-number for agricultural and residential/commercial properties. The information is available for all the villages falling within the jurisdiction of the SRO.

iii. *The SRO user:* This layer contains data relating to the transactions handled over the counter in the SRO. It is the user-level data entered by the operators on a transaction basis. The operator cannot alter most of this data. The CARD system handles a wide variety of transactions. These include registration of deeds, cash transactions, market value assistance, issuing Encumbrance Certificates (ECs) and delivery of certified copies.

The CARD project aims at improving the quality of services offered by the registration department, by providing a computer interface between citizens and the government. The CARD project launched on 4th November 1998, has had a very positive impact on the efficiency of registration operations. Today , 80 percent of all transactions are done through CARD. Its achievements during the period from 4th November 1998 to 31st May 1999 are given below:

Market value check slips	164,231
Registrations	234,499
Value of stamps sold	Rs. 740 million

The CARD system replaces the existing manual services with computerized services besides introducing a few new services. This is the first step in making use of information technology to improve citizen services.

2. E-seva Kendras:

E-seva Kendra is another very important e-governance initiative of the Government of Andhra Pradesh. It offers a wide spectrum of citizen-friendly services to save citizens the

[10] The CARD software has been designed and developed using client-server architecture. The server stores and processes all the master and transaction data. The clients provide the business logic and form the front-end at the counters handling the various transactions.

bother of running around various departments. It provides a one-stop venue for services of various state and central government departments, and private businesses. This is provided in an efficient, reliable, transparent and integrated manner through a chain of computerized Integrated Citizen Service Centers (ICSC), known as e-seva kendras[11].

These e-seva kendras provide the facility of online transaction processing of various payments to government agencies and issue of certificates needed by citizens and businesses[12]. It connects the citizens to departments and agencies like the electricity, water, and telephone utilities, passport, municipal corporation, transport, tourism and health.

This project has been implemented on public-private partnership on the basis of Build Own Operate and Transfer (BOOT) model where the technology partners will provide the necessary hardware, software, connectivity and maintenance for the centers. The same equipment will be transferred to the government after the completion of the contract period i.e. five years.

The technology is based on three-tier architecture. The transactions are done on a real-time basis. The services of different departments are connected to the eSeva data Centre, which in turn is connected to different e-seva kendras. Connectivity is provided through leased lines with ISDN as back up. Transactions conducted at the e-seva kendras are recorded directly on the server of the department concerned, after duly accrediting the same on the Central server of eSeva.

Each e-seva kendras has 8-10 computerized manned counters with one PC, Printer, Bar-Code reader per counter to handle the services. The scalable architecture of eSeva provides a strong opportunity to turn this platform into a one-stop shop for all government to consumer (G2C) and B2C services, making it even more convenient for the citizens. A detailed note on the activities and organizational structure of these kendras is given in Annexure A6.3 to this chapter.

3. Computerization of *Mandal* Revenue Offices

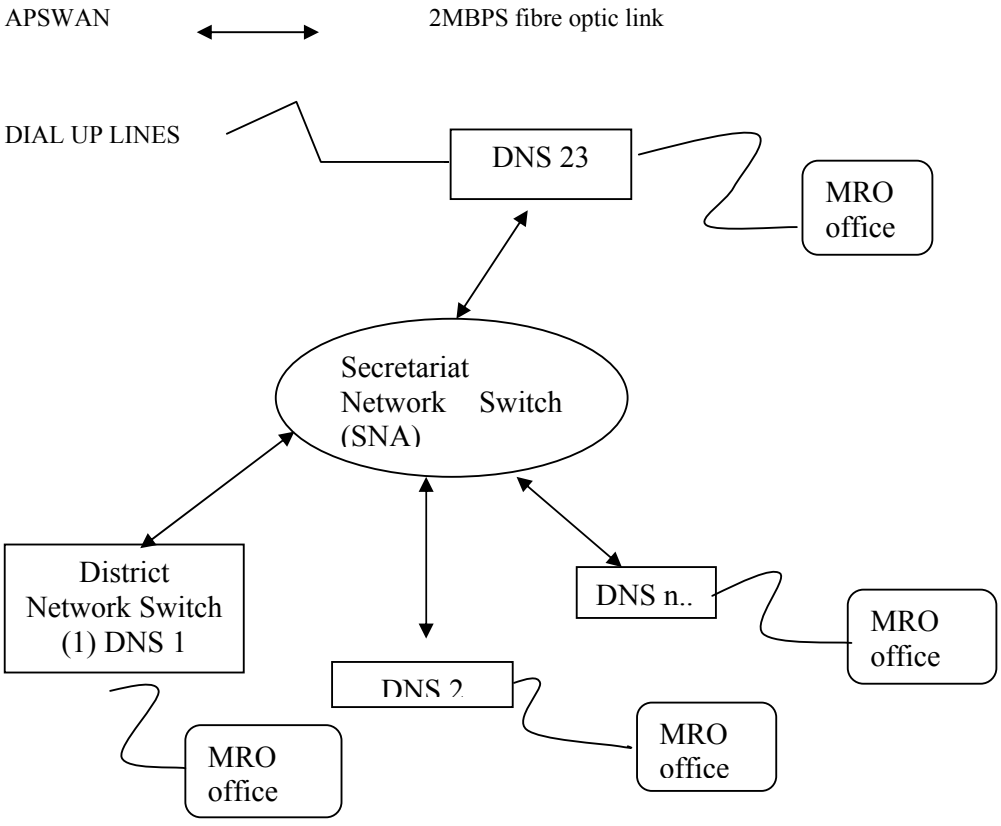
Information and communication technologies are important tools of the government of Andhra Pradesh to become SMART (simple, moral, accountable, responsive and transparent). With the large Andhra Pradesh Secretariat Campus Network at one end of the spectrum and the *mandals* (lowermost institutionalized tier of the state administration) at the

[11] Henceforth referred to as e-seva kendras.
[12] The details of the services provided by e-Seva Kendras is given in *Annexure A6.2*

other end, the MRO project envisages introducing computers right down to the *mandal* level which comprises many villages[13]. There are 1,124 *mandals* in the state, each with a population ranging from 35,000 to 500,000. A group of seven to 15 *mandals* forms a revenue division. There are in all 78 revenue divisional offices in the state. One or more revenue divisions are grouped together to form 23 districts. Andhra Pradesh Statewide Area Network (APSWAN) connects the state secretariat with 23 district headquarters with a 2 MBP optic fibre link and serve as the backbone for 'multi-services' (voice, video and data). This is in accordance with the IT policy of the state. As shown in Exhibit 6.2, a client-server architecture has been adopted in the project[14]. These multi-services will improve

Exhibit 6.2

Functional Diagram of the APSWAN (AP State Wide Area Network)



[13] Kumar, Ashok (2000), "Computerization of *Mandal* Revenue Offices in Andhra Pradesh: Integrated Certificate Application" in Bhatnagar, Subhash and Robert Schware, (eds.), "*Information and Communication Technology in Development: Cases from India*", Sage Publications, New Delhi.

[14] Exhibit 6.2 provides an overview of the technical configuration, including wide area network (APSWAN) at the state and district levels and campus local area network (LAN) to be established in public offices

coordination between state headquarters and district offices in managing various regulatory, developmental and hazard mitigation programmes of the state government, as shown in Exhibit 6.2. This will also ensure quick, accurate and efficient aggregation of large amounts of data generated at the *mandal* level for performance monitoring and analysis, at both micro and macro levels.

The scope of the project is to computerize all the MROs (1.124), revenue divisional offices (78), collectorates at state headquarters (23), office of the commissioner of land revenue, directorate of economics and statistics, and the central headquarters in Hyderabad. The two-year computerization project will include data collection, coordinating the implementation of different databases and developing human resources through intensive training.

Approximately 4,500 computers- along with related accessories such as printers, UPS and monitors, are installed in 1,124 MROs in 23 districts spread over an area of 275,045 sq. km. The large scope and the vastness of the geographical area has created a need for extra resources to procure, deploy, operate and maintain the large number of computers.

4. Multi-purpose Household Survey Project (MPHS):

This is one of the biggest IT projects undertaken by the Government of Andhra Pradesh. It aims at creating the database of the socio-economic aspects of all the citizens of the state. The project is proposed to be implemented at all the *mandals*, which are the pivotal administrative units of the Government. The package of applications implemented under this project include creation and maintenance of a citizen database that can be used in a variety of ways such as for the public distribution system, issue of individual identity cards, in ensuring better targeting in all the poverty alleviation programmes, land records, land acquisition and grievance redressal systems. The government proposes to use the infrastructure created under this project as the nucleus of all efforts aimed at taking the benefits of IT to the common man. The MPHS project has been implemented in all the *mandals*. Also, database of 75 million citizens and 25 million land records have been created.

5. Computer-aided Administration of Commercial Taxes (COMPACT):

All the offices of Commercial Taxes Department, including check-posts have been computerized from 1st April 1996. Database contains details regarding more than 350,000 registered dealers. Over 1 million returns are fed annually into the computers at 182

commercial tax officers (CTO) offices, for processing and analysis. About 5,000,000 transactions are captured online in the computers at 16 check-posts annually and the data analyzed and used for taking up investigations to detect evasion of sales tax.

6. TWIN cities Network Services (TWINS):

A pilot project to provide one-stop services to the citizens was launched in December 1999. It provides an initial set of 18 services to the citizens of ward 8 of Hyderabad. These include payments of utility bills, issue of certificates, licenses and provision of information useful to the citizens.

7. Secretariat Knowledge and Information Management System (SKIMS):

This project is designed to develop a generic product that efficiently manages the information and knowledge of a large organization. Secretariat, the seat of the Government, is a repository of information and knowledge. It is felt that IT holds the key to efficiently managing the affairs of the Government.

8. Fully Automated Services of Transport department (FAST):

The fully automated services of transport department is another e-governance project that aims at providing all transport department services like issue of learner's license, driving license and registration of vehicles through a comprehensive network solution. A pilot project has been launched with effect from 12th May 2000 at 3 sites (Secunderabad, Vijayawada and Tirupati) in the State. It is being implemented on a build-own-operate (BOO) basis. The Government intends to implement it at 34 more sites across the State, on a BOO basis, with private sector participation.

9. Computerized Treasury Accounting System (C-TAS):

This is one of the oldest e-governance projects taken up in the State. All the accounting needs of the treasuries department are taken care of under this project. 233 District Treasuries and 300 sub treasuries have been computerized under this project. It is possible to know the receipts and expenditure of the Government, on a dynamic basis.

Essentials of E-governance- Framework in Andhra Pradesh

The above mentioned projects implemented by the Government of Andhra Pradesh indicate that the Government recognized the State's potential for employing Internet communications and web technologies to improve Government services and promote economic development.

From its experience in implementing a few e-governance projects at the department/agency level, the Government of Andhra Pradesh realized that such individual projects implemented by the departments on a stand-alone basis would result in duplication of work, besides creating islands of excellence, which are not inter-operable. Integration of these disparate systems at a later time would involve tedious *plumbing.* A standards-based approach was felt to be the need of the hour. In January 2001, the Government of Andhra Pradesh developed a statewide IT architecture & technology standard, security policy and PKI strategy[15]. Common business models/processes and shared technology infrastructure services were identified as key success areas during the exercise. Standards for various technology components were identified to enable re-usability and ensure inter-operability and integration.

The efforts of the Government of Andhra Pradesh for building the ICT architecture for e-governance has thrown up a few key issues which need to be kept in mind when making implementation plans. These are described below:

Enterprise Approach: In order to implement and gain the advantages of e-governance, a State must consider itself as one entity in which all parts work together for the common good- avoiding duplication of efforts, enabling sharing of technical assets, and exchanging information from its multitude of databases (while protecting privacy of the citizens). The single enterprise concept includes development of core policies, core applications and core ICT infrastructure that span across departments. Also, it emphasizes the relevance of a statewide perspective and suggests that it can no longer afford to be an agglomeration of separate and disjointed organizations, programs and assets.

This enterprise approach strategically plans and implements the symbolization of multiple applications that run on a number of infrastructure components, necessary to deliver digital government services to the citizen.

Departments need to work cooperatively, yet independently, to realize the vision of digital Government. Mutual, interdependent application development and service delivery among state departments is necessary for citizens to experience online services through a single window.

[15] Consultancy services for the architecture were provided by Price Water House Coopers, over the preceding 5 months.

Having developed the ICT architecture and having realized the importance of the key 'learning' emanating from it, the Government of Andhra Pradesh seems to be technologically equipped to build large applications that will enable it to realize its grand vision of e-governance.

The Government of Andhra Pradesh has attempted to identify core initiatives (Table 6.3), which provide maximum benefits to its stakeholders (citizens, businesses, employees) and also form the backbone for future e-governance initiatives. Such an initiative could be a policy, an infrastructure or an application.

Some of the key characteristics that have been considered by the Government of Andhra Pradesh in the identification of core initiatives are as follows:

- Usability by large number of departments;
- Statewide geographical coverage;
- Impacts key stakeholders.
    - Citizens (Urban and rural locations).
    - Business (Organizations/ institutions/ vendors who deal with Government).
    - Employees (serving and retired).
- Any other key variable that is critical for the realization of the State's vision.

Table 6.3
Core Policy Initiatives

Initiatives	Description
Architecture	▪ A compilation of open technology standards ▪ A set of best practices in deployment of ICT, with special reference to Government ▪ Already developed and published on the Internet. ▪ Standards have been mandated through Government order for compliance by all departments/ developers ▪ The Architecture developed is being updated with latest technology developments ▪ Model to be improved incorporating role for NGOs.
PPP for e-Government	Policy for funding e-Government initiatives announced.
Change management policy	▪ Framework to manage the organizational change due to e-Government
Privacy policy	▪ How to safeguard the information and provide confidence to stakeholders

Based on the application of the above framework (shown in Exhibit 6.1) and the criteria being followed, the Government of Andhra Pradesh has identified the core Initiatives (Table 6.3) and classified them according to interdependent components. These initiatives provide Government of Andhra Pradesh an opportunity to improve its efficiency in providing its services in a cost effective manner.

Conclusion

E-commerce has the spectacular capability to restructure the growth phenomenon. To analyze how this capability can be realized, one has to move beyond e-commerce to ICT which is the unique transformative factor for promoting economic growth in the country. To understand how this can be achieved, Andhra Pradesh (one of the leading ICT savvy states) has been used for the case study. The analysis demonstrates that the use of ICT in e-governance changes the way the government 'serves' the society. It shows that the system of e-governance, as adopted by Andhra Pradesh, increases the efficiency of services offered to the general public. This has been made possible in Andhra Pradesh, which is the first state in India to design a statewide computerization programme covering all levels of the administrative spectrum from the smallest-the *Mandal Revenue Offices* (MRO) to the highest, largest and most powerful.

Annexure A6.1

FOUNDATION FOR PUBLIC ECONOMICS AND POLICY RESEARCH
133, SFS, Phase Four, Ashok Vihar, New Delhi-110052
Phone: 011- 27463008, 27427758, Fax 011- 27142802,
e-mail: mcpur@nda.vsnl.net.in; mahesh@fpepr.org ,
website : www.fpepr.org

Name of the Respondent:
Designation of Respondent:
Address of the company:
Date:

Questionnaire for
A Study of the Effect of E-commerce on Economic Development

Recognizing the tremendous potential for the growth of e-commerce and its impact on economic development, this study attempts to adopt a bottom up approach, wherein micro economic variables are captured to prove the hypothesis that the growth of e-commerce will accelerate economic development. Since development is affected by the quality of available infrastructure, this study attempts to take note of growth in infrastructure.

A range of aspects falls under the rubric of infrastructure: these include power supply, transport, water supply, and telecommunication services. Despite the great importance of all these variants of infrastructure, growth of information and communication technologies (ICT) attains a very special importance for the growth of e-commerce.

With a view to evaluating effects of e-commerce on economic development, this study plans to undertake a survey of ICT companies. For this purpose, we have selected Andhra Pradesh as a sample state, which has taken keen interest and provided many initiatives for the establishment of ICT companies and thus, encouraged growth of ICT in the State. The data for the survey are being collected from a selected sample of Industries in Andhra Pradesh. The sample has been drawn on the basis of random sampling method, under which your company has been selected. The foundation would be grateful if you could kindly fill in the questionnaire and send the same to us.

The information supplied by you will be kept strictly confidential. It will be used in the study for estimating aggregates, proportions and averages. The information of individual companies will be used would only for academic purposes.

Thanking you for your cooperation.

Director

FPEPR

1. Name and address of the company.
2. Year of establishment
3. Sales turnover over last ten years

Year.	Sales Turnover (Rs.)	Total Cost (Rs.)	Capital Expenditure	
			Total	In ICT[16]

4. If you are an ICT company, please give below expenditure for last ten years in the development of the ICT related infrastructure in the state.

Year	Expenditure on R&D	Expenditure on ICT Networking, Telephony, Internet, etc.

5. Number of workers employed in the organization during last ten years

Year	No. of workers employed		Emoluments/Wages paid (Rs.) Total	
	Skilled	Unskilled	Skilled	Unskilled

6. Numbers of workers falling under following educational category skills during last ten years

Year	Secondary level	Graduate level (only science and arts stream)	Graduate level (engineer level)	Post graduate level (only science and arts stream)	Post graduate level (engineer level)	Doctorate level: (both engineer and arts & Science)

7. Other costs of production during last ten years.

Year	Raw material and other inputs excluding labour	Depreciation	Other inputs

[16] Investment incurred in information and communication technologies (ICT) including expenditure on equipment and software computer and office equipment, data processing machines, precision instruments, optical instruments and photographic equipment, telecommunication equipment and measuring equipment, electronic equipment, software and communication equipment.

8. Are you using any type of Internet connection, electronic data interchange (EDI) or any other network system in your company? Yes/No

   If yes please specify the year when you first used any of these systems.

9. What is the usage of Internet per day (Hours)?

10. What is the main purpose of the Internet usage in your company from among the purposes given below? (Tick out the options)

    i. Selling only
    ii. Buying only
    iii. Selling and buying or both
    iv. Mail checking
    v. Searching
    vi. All three activities (e-mail, searching & buying and selling)

11. Which is the first year when you used Internet facility for selling/Buying?

12. What kind of network technology have you adopted? (Small, medium and large)

13. Whether you have technological collaboration with foreign firms or not? (Yes/No)

14. What is the business e-commerce sale via Internet, Intranet and via other computer-mediated network system (intranet-within the firm) since use of network

15. What kind of payment system is followed in e-modeling? And what steps are taken about security and privacy of personal data?

16. Whether you use electronic networks to place orders for goods and services, or to receive orders? Yes/No

    If Yes, what is the percentage level per month?

17. Based on your experience in e-commerce, what are the problems faced in acquiring ICT?

18. What kind of strategy should be adopted for building the e-commerce in India? Give suggestions.

19. Do your suppliers have access to real-time information on your company's sales and stock levels? Yes/No

20. Is your firm's internal operations electronically integrated with those of your customers? Yes/No

21. Is your firm's internal operations electronically linked with those of your suppliers? Yes/No
22. Does your company have the e-business capacity to access your suppliers' (Tick a relevant one)
    i. Production capacity?
    ii. Available inventory?
    iii. Lead times?
    iv. Delivery flexibility?
    v. Others (specify)
23. Are your front office and back-office systems electronically integrated? Yes/No
24. Does your company require suppliers to make use of e-business technologies? Yes/No
25. Does your company have a supply-chain development programme? Yes/No
26. Does your company use e-business technology for B2B procurement? Yes/No
27. Does your company use e-business technology for B2B sales? Yes/No
28. Does your company use e-business technology for B2C sales? Yes/No
29. Is your company linked to an internet-based B2B trading exchange? Yes/No

Information and Technology Policy of the Government of Andhra Pradesh

The IT policy announced through the first G.O. was valid up to 24/05/2002. Considering the positive results of the IT Policy during the last 3 years, the Government feels that it is necessary to continue the thrust being given to the ICT sector and give it a new direction. Accordingly, in continuation and modification of all the orders issued earlier on the subject of ICT Policy, the Government approves the following policy for the ICT industry.

I. Definitions:

1) IT Industry includes IT hardware and software industries. IT software industry includes IT Software, IT services and IT Enabled Services.

2) IT Infrastructure means the physical Infrastructure built by a firm or a builder and sold/leased or transferred on lease-cum-sale to an IT Industry for its own use or the Infrastructure built by an IT Industry for its own use.

3) Telecommunication companies include Basic Telecom Service providers (fixed), VSAT, Cellular (Mobile) companies, Telecom Infrastructure companies, ISPs and any other value added services licensed by Ministry of Communications & IT, Government of India.

4) Date of commencement of commercial operations is the date on which commercial operations are started, subject to furnishing of the first sale bill/invoice.

   i. Incentives available to the IT companies automatically:

      - IT software units are exempt from the purview of the AP Pollution Control Act, except in respect of power generation sets.
      - IT units are exempt from the purview of statutory power cuts.
      - IT units are exempt from inspections under the following Acts and the Rules framed there under, barring inspections arising out of specific complaints. The IT units are permitted to file self-certificates, in the prescribed formats.

        i. The Factories Act 1948
        ii. The Maternity Benefit Act 1961
        iii. The AP Shops & establishments Act 1988
        iv. The Contract Labour (Regulation & Abolition) Act 1970

v. The Payment of Wages Act 1936

vi. The Minimum Wages Act 1948

vii. The Employment Exchanges (Compulsory Notification of Vacancies) Act 1959

viii. General permission is accorded to the IT software industry to run a three-shift operation.

II. Incentives to be sanctioned on application by the IT units:

The Consultative Committee on IT Industry (CCITI)- a joint committee with representatives from the Government and the IT Industry with the composition and terms of reference specified.

a. *Concessional Power Tariff*: New IT units, registered after the announcement of IT Policy 1999, shall be eligible for a 255 rebate in power tariff for a period of 3 years from the date of commencement of commercial operations.

b. IT software units shall be classified as industrial units for the purpose of availing the industrial power tariff.

c. *Reimbursement of Stamp Duty*: A 50% Reimbursement of the stamp duty, transfer duty and registration fee, shall be allowed to:

   i. IT Infrastructure Companies on sale, lease or lease-cum-sale of built up space to IT Companies.

   ii. Telecommunication Companies acquiring land on purchase, lease or lease-cum-sale, for setting up their facilities and

   iii. IT companies acquiring land on purchase, lease or lease-cum-sale, for setting up facilities or IT Parks for their own use.

d. *Zoning regulations*: IT software companies (intending to establish facilities for their own use) and IT Infrastructure companies (intending to set up IT parks) are eligible for an exemption from the zoning regulations and from the payment of conversion fee, subject to these criteria.

e. *Rebate in cost of land*: IT companies establishing their own facilities on land allotted by the Government or APIIC, are eligible for a rebate in cost of land calculated at the rate of Rs. 20,000 per job created. The eligibility criteria, procedure for allotment of land and for availing of the rebate.

f. *Investment subsidy*: An investment subsidy, to the tune of 20% of the fixed capital investment, shall be admissible for new IT units, subject to a ceiling of Rs.20 lakhs. The subsidy shall be 25% with a ceiling of Rs. 50 lakhs in respect of entrepreneurs belonging to Scheduled Cast and Scheduled Tribes.

g. *Special provisions for mega projects*: For mega IT Projects with investment of Rs. 50 crores and above, a special land-pricing scheme will be applicable in respect of land allotted within the Hitec City layout. Besides this, other incentives may also be sanctioned in respect of Mega IT Projects, based on the gestation period of projects, pioneer nature of projects, locational aspects, State-of-Art Technology, profitability and scope for further related investments.

h. The CCITI shall endeavour to decide upon the applications for incentives, within a maximum period of 4 weeks.

III. The Government also expresses its intention to bring in suitable legislation to establish an IT-enabled single window system for providing a smooth interface between industrial and business units and the regulatory agencies of the Government.

IV. With a view to help promote the participation of IT units in international events, the Government will provide a 30% subsidy to the SME units, with turnover not exceeding Rs. 10 crore in the preceding year in respect of the stall rent payable for participation in international events notified by the IT &C Department.

V. *Preference to AP units in the award of e-Government projects*: A weightage of upto 10% in score shall be given to IT units with registered offices in Andhra Pradesh, during the technical evaluation of all e-Government projects. The Government of Andhra Pradesh has drawn up an ambitious plan of action for implementation of e-Governance which is expected to create large opportunities in the ICT sector during the next 3 years.

VI. *Reimbursement of expenditure on quality certification*: With a view to promote quality consciousness among IT Companies, the Government shall reimburse, prospectively, 20% of the cost incurred by an IT software company on securing quality certification of SEI CMM level 2 and above, subject to a maximum ceiling of Rs.4 lakhs. This incentive shall be available only at one time in respect of an IT software company even though it may go in for higher certifications at different periods.

VII. The format of application is common for all the above incentives.

VIII. This policy will be in force for a period of 3 years.

IX. This order is issued with the concurrence of the Finance department.

Copy of this order is available online.

Annexure A6.3

A Note on E-seva Kendra

eSeva is one of the e-Government initiatives of Government of Andhra Pradesh, offering a wide spectrum of citizen-friendly services to save citizen the bother of running around various departments. It provides a one-stop venue for services of various state and central government departments and private businesses in an efficient, reliable, transparent and integrated manner, through a chain of computerized Integrated Citizen Service Centers.

Services at Present Available at e-Seva Kendra (46)

Payment of Utility Bills (13)

1. Electricity, telephone, water and sewerage bills
2. Property tax
3. Filing of CST returns, A2 returns of APGST, and AA9 returns of APGST
4. Collection of examination fee, affiliation fee & recognition fee of Board of intermediate
5. Filing of IT returns of Salaried class
6. Property tax of L.B. Nagar Municipality
7. Property tax of Kukatpally Municipality
8. Property tax of Qutbullapur Municipality
9. Sale of prepaid parking tickets of MCH

Certificates: (4)

1. Registration of birth and death
2. Issue of birth and death certificates

Permits / Licenses (10):

1. Renewal of Trade licenses
2. Registration of new trade licenses
3. Quarterly tax payments of autos
4. Life time tax payments of new vehicles
5. Change of Address of a vehicle owner
6. Transfer of ownership of a vehicle
7. Issue of Learner License
8. Issue of Driving Licenses (Non Transport Vehicle)
9. Renewal of Driving Licenses (Non Transport Vehicle)
10. Registration of new vehicle

Reservation (2):

1. Reservation of APSRTC bus tickets and water tanker

Other Services (7)

1. Sale of passport application forms
2. Filing of passport applications
3. Sale of non-judicial stamps
4. Sale of trade license applications
5. Sale of National Games Tickets
6. Sale of entry tickets for WTA
7. Sale of EAMCET applications

Internet Services (2)

1. Internet-enabled electronic payments
2. Downloading of forms and Government Orders

B2C Services (8):

1. Collection of telephone bill payments of TTL
2. Sale of new AirTel Magic cards
3. Top up/recharge of AirTel Magic cards
4. Sale of entry tickets for Tollywood Star cricket
5. Sale of entry tickets for cricket match (RWSO)
6. Filing of reliance CDMA Mobile Phone connections
7. Sale of Prepaid Indian Telephone Cards
8. Sales of applications for Model EAMCET

Technology Partners of e-seva

Government has appointed a PIC to select the operators according to zones for technology and site preparation. Following are the agencies selected.

(a) Site preparation:

Zones	Selected Agency	Contract Address and Persons
II, IV, V	M/s Mohan Wood works, Plot No. 17, 18, IDA Charlapalli, Hyderabad	Sri. R.J. Mohan Rao Tel: (O) 2726515, 56461001 (M)
I, VI	M/s Raavela Doors Decors Plot No. A-13, Road No. 9 IDA Nacharam, Hyderabad	Sri Srinivas Tel: 27154121, 22
III	M/s Rajarajeswari Furniture works 415, Wood Complex Vedaiah Palem, Nellore	Sri B. Veerasekharam 98484 94462 (M) 0861-2325032 (O)

(b) Technology:

Zone	Districts	Implementation Partner	Contract Person
I	Srikakulam, Vizianagaram, Visakhapatnam	M/s CMS Computers Ltd. Hyderabad	Sri K. Jagannath Regional Manager Tel: (O) 040-27898835, 9849036284 (M)
II	East Godavari, West Godavari, Krishna	M/s United Telecom Limited, Hyderabad	Sri V. Appaji Rao Vice President Tel.: 55669777
III	Guntur, Prakasam, Nellore	M/s CCS Infotech Ltd Nellore	Sri S.H.Rao Tel: (O) 0861-2323325 9440277679
IV	Chittoor, Cuddapah, Ananthapur, Kurnool	M/s CMS Computers Ltd, Hyderabad	Sri K. Jagnnath Regional Manager Tel: (O) 040-27898835, 9849036284 (M)
V	Khammam, Warangal, Karimnagar, Adilabad		
VI	Mahboobnagar, Medak Nizamabad, Nalgonda		

Implementation Strategy

The following is the process involved to establish eSeva centers:

- Construction of eSeva structures
- Preparation of site (Interiors, Cabling etc.)
- Installation of hardware and software

  The architecture of eSeva in the municipalities is shown as below:

  Architecture:

  - One data center at district head quarters
  - ICSCs will be connected to this data center through leased line with a back up of ISDN
  - Similarly, departments should make the data available at the district head quarter to provide access to eSeva i.e. department will also have a data center at the district head quarter which will give available data for that district
  - Departments need to update this level of database on a periodical basis
- Providing connectivity between the data center and eSeva centers
- Providing connectivity between the data center and of eSeva and data centers of departments
- Monitoring the departments preparedness to join eSeva Services.

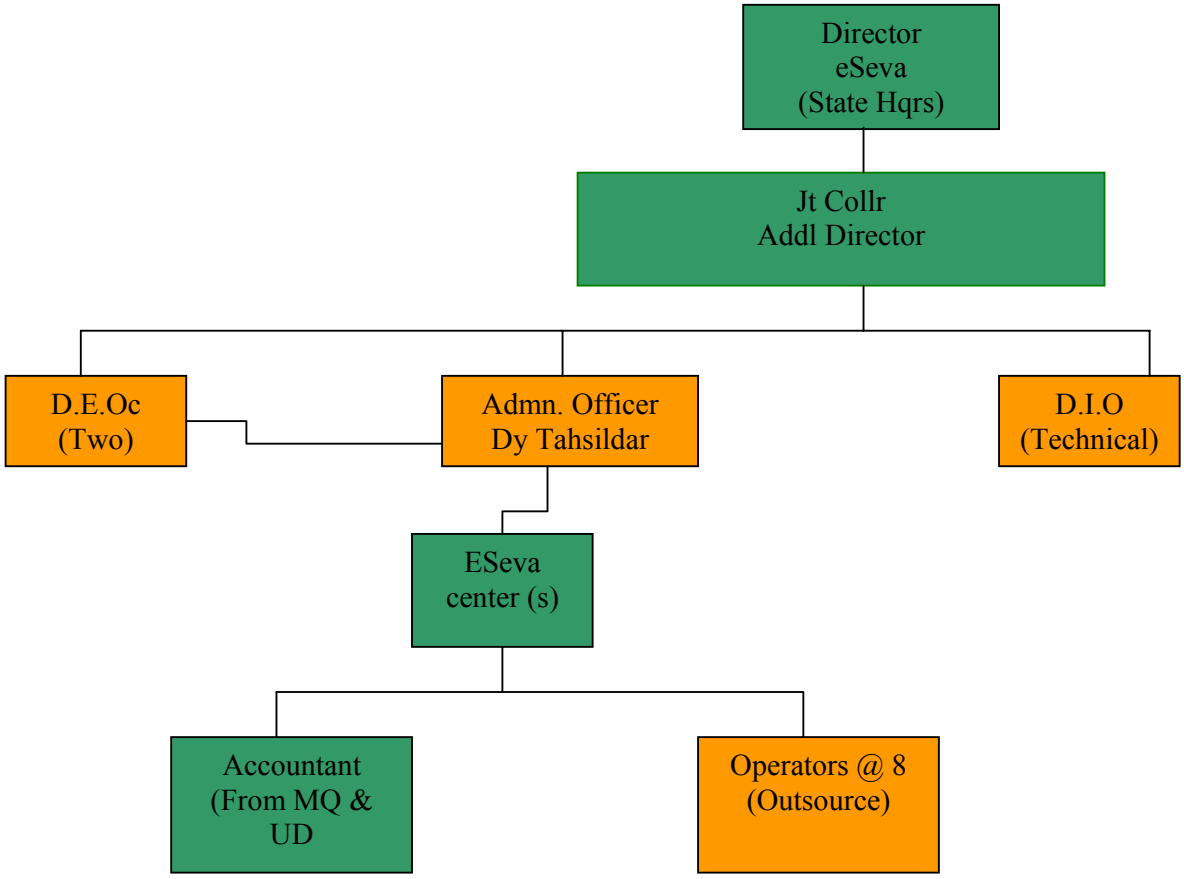
  Presently, eSeva is at Hyderabad providing 46 different services of central, state and private sector and 24 more services are in the pipe line. More services of Central or state or private sector will join eSeva depending on the network capabilities and its spread across the districts. The revenue model for each service varies according to the transactions and availability of database.

  All the departments should make available the required hardware and software to start the services in eSeva. Joint collectors should review preparedness of the departments in joining eSeva services.

The major services that are proposed to be included in eSeva services are payment of electricity, telephone (BSNL), telephone (Tata Teleservices), minicipal property tax, registration of birth, death, APSRTC reservations, Registration & stamps services, filing of A2/AA9/C6 returns of sales tax, filing of income Tax returns. The departments must be prepared with respect to their databases, services & internal networking modules. The departments must also provide an one router port for leased line module and another port for ISDN module for eSeva at each district level server.

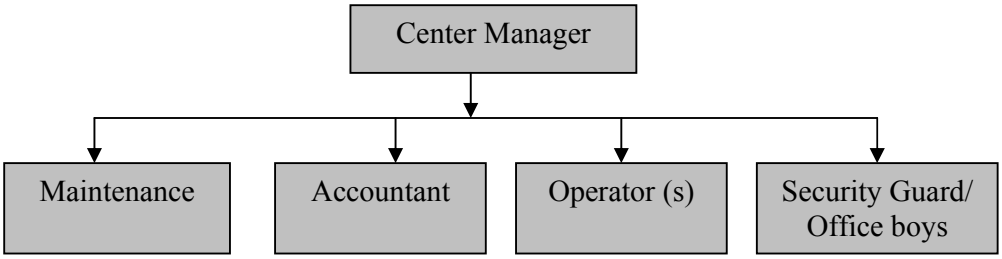
- Identifying the departmental officers to receive payments from eSeva district head offices

5. **Organization Structure of eSeva Kendras in the Districts**



6. Center Procedures

<u>Organization of eSeva Service Center</u>



Incentive Schemes for Development of IT Sector in Andhra Pradesh[17]

I. Rebate in Power Tariff

25% Rebate in Power Tariff is provided to the new IT Industry, Companies. Industrial Power Tariff is also admissible to the IT Industry including those in the Urban Areas. This concession is available to IT Industry as per the following terms and conditions:

1. Eligibility:

a. IT Companies registered on or after 25.05.1999 are eligible for 25% rebate in Power Tariff and for Industrial Category Power Tariff.
b. IT Companies registered before 25.05.1999 would be eligible only for Industrial Category Power Tariff prospectively, subject to the approval of CClTI.
c. The CCITI will consider the applications of all IT Companies after one year, from the date of commencement of commercial operations or earlier if a substantial turnover is achieved by the IT Company.
d. All **power connections should be in the name of the IT Company** applying for concessions.
e. 25% rebate in power tariff would be limited to a maximum of Rs. 30 lakhs for Small Scale IT Units (for investments made in Plant & Machinery upto Rs. 1 Crore) and Rs. 50 lakhs for large IT Units based on the consumption charges.
f. The concession would be available for a period of 3 years from the date of release of power or going into actual commercial production, whichever is **earlier**.
g. IT Companies located in multiple premises or having multiple meters would be eligible for the concessions provided the power connections are in the name of the IT Company, subject however to the ceilings specified in (e), being computed on the consumption at / through all such premises / meters put together.

2. Procedure:

a. The application form is available for download at http://www.ap.gov.in/ lncentiveTrack/ default.asp
b. The application can be submitted online by adopting the following steps:

- Register through URL http://www.ap.gov.in/lncentiveTrack/newdetaiis / regform.asp
- After registration, login through URL http://www.ap.gov.in/lncentiveTrack/Login.asp

Complete the application and submit online.

3. The CCITI would consider the application and upon its approval a certificate would be issued by the Department of IT&C, certifying the IT Company is eligible for the 25% rebate in power tariff or for applicability of industrial tariff or both.

II. Reimbursement of Registration Fee, Stamp Duty and Transfer of Property Duty

IT Infrastructure, Telecommunication and IT Companies would be eligible for a 50% Reimbursement in Registration Fee, Stamp Duty & Transfer of Property Duty as per the following terms and conditions:

1. Eligibility:

(a) **IT Infrastructure Companies** building **IT Parks** should provide State-of-the-Art

[17] Vide G. O. No: 27, Dept. of IT&C, dated 27.06.2002, ICT Policy

building with facilities like uninterrupted/backup power, reliable telecom links, etc **for the use of the IT Industry.**

(b) **Telecommunication Companies** would be given this concession for acquiring land by outright purchase / lease or lease-cum-sale for setting up their own **Telecommunications facilities.**

(c) The above concession would also be available on the purchase of land **by an IT Industry** for establishing an IT park for its own use provided it **does not avail** of the **concession i.e., rebate on cost of land** linked to employment.

(d) The reimbursement would be applicable on the combined levy of registration fee, stamp duty and transfer of property duty.

(e) This concession would be available only for the first transaction, when the first sale by the infrastructure company is made to an IT industry.

(f) This concession would be available only to those who have executed the sale / lease-deed after the announcement of the ICT Policy and subject to the approval of the CClTI.

2. Procedure:

(a) The application form is available for download at http://www.ap.gov.in /lncentiveTrack/ default.asp

(b) The application can be submitted online by the eligible units, after registration of the property at the respective Sub-Registrar Office:

- Register through URL http://www.ap.gov.in/lncentiveTrack/newdetails/regform.asp
- After registration, login through URL http://www.ap.gov.in/lncentiveTrack/Login.asp complete the application and submit online.

3. The CCITI would consider the application and upon its approval, separate orders would be issued by the Department of IT&C for reimbursing the amount approved.

4. Performance Guarantee:

The IT Industry, IT Infrastructure and Telecommunication Companies availing the above reimbursement should provide a Bank Guarantee for an equal amount along with interest before the issue of the notification. The format of the Bank Guarantee is available for download at URL http://ap-it.com/govtorders.html

III. Exemption from Zoning Regulations

1. IT Software Units are exempted from the Zoning Regulations and the payment of conversion charges for the location of IT Units as per the following terms and conditions:

i. The conversion / exemption from land use zoning regulations for setting up of InformationTechnology Software Units shall be made applicable only in the following notified land uses in the Master Plan / Zonal Development Plan:
   (a) Residential use zone.
   (b) Commercial use zone.
   (c) Institutional use zone.
   (d) Industrial use zone.
   (e) Conservation / Agricultural use zone.

ii. The conversion / exemption from land use Zoning Regulations, as given above, shall be applicable to the Information Technology Units which are notified by the Information Technology & Communications Department.

iii. Information Technology Software Units so notified by Information Technology and Communications Department are exempt from payment of conversion charges.

2. Information Technology Parks being developed by Construction Firms / Builders are exempted from the Zoning Regulations as per the following terms and conditions:

i. The conversion / exemption from Zoning Regulations in land uses for setting up of Information Technology Parks developed by Construction Firms / Builders shall be made applicable only in the following notified land uses in the Master Plan / Zonal Development Plan:
   (a) Residential use zone.
   (b) Commercial use zone.
   (c) Institutional use zone.
   (d) Industrial use zone.

ii. Information Technology parks notified by Information Technology and Communications Department are exempt from payment of Conversion Charges.

iii. The conversion / exemption from Zoning Regulations is subject to the following conditions:
   (a) The minimum area for the Information Technology Park for utilizing the above exemption shall be **4000 Square Meters**.
   (b) The Information Technology Parks developed by Construction Firms / Builders shall provide the amenities / infrastructure specified in List I- on a mandatory basis, and those specified in List-II- as desirable amenities, to suit the needs of the Information Technology Industry.
   (c) The construction firm / builders shall furnish an undertaking to the Local Authority that the built space shall be sold / leased / rented only to Information Technology Units recognized by Information Technology and Communications Department and if any Information Technology Firm vacates, the same will be informed to the Information Technology and Communications Department and subsequent lease etc., will be given only to the units recognized by the Information Technology and Communications Department.
   (d) The local authority shall obtain a Bank Guarantee for an amount equal to twice the conversion charges.
   (e) The premises will be inspected on completion by the Information Technology and Communications Department, for ensuring compliance with the above stipulations before advising the Local Authority for discharge of Bank Guarantee.

3. Procedure:

(a) The application form is available for download at http://www.ap.gov.in/ lncentiveTrack/ default.asp

(b) The application can be submitted online:
   - Register through URL http://www.ap.gov.in/lncentiveTrack/newdetaiis/ regform.asp
   - After registration login through URL http://www.ap.gov.in/lncentiveTrack/ Login.asp
     Complete the application and submit online.

(c) The following documents should be submitted along with the application:
   i. Latest Annual Report.
   ii. **Copy of Title Deeds of the land in respect of which conversion is sought**.

4. The Department of IT&C would issue a separate letter after the approval of the CCITI.

5. The **mandatory specifications** are enumerated in **List-I** and **desirable amenities for all IT Parks** are in **List II**, which are given in the G.O.

IV. Rebate in Cost of Land

IT Companies establishing their own facilities can avail rebate in the cost of land linked to employment. The terms for allotting land and the procedure for availing the rebate are specified below:

1. <u>Conditions for Allotment of land</u>:

(a) The rebate shall be applicable only in respect of lands allotted by Government / APIIC with prospective effect.

(b) The rebate shall be restricted to Rs. 20,000/- per job created or the cost of the bare land (excluding development charges) whichever is less, subject to a ceiling computed at the rate 0.30 acres for every 100 jobs created. {Eg. If 3250 jobs are created the limit for allotment of land at confessional price would be 9.75 acres}.

(c) The minimum number of employees to be hired by a company, in order to avail of the concession on land cost shall be 100 (corresponding to a ceiling of 0.30 acres of land).

(d) On areas allotted in excess of the limit i.e.. the ceiling of 0.30 acres for every 100 jobs created, no concessions would be applicable.

(e) The minimum gross salary / wage for an employment to be considered to have been created would be **Rs. 5000/-** per month.

(f) The period for which such employment would have to be sustained, to be eligible to be reckoned for this incentive, shall be two years.

(g) The number of employees to be considered for the purpose of this provision shall not exceed the number arrived at by the formula: [no. of computer work stations at a location x (1.33) x number of shifts (of 8 hours each) operated by the company at the location].

(h) Government shall specify suitable guidelines to ensure that the benefit of this provision reaches a company only after it meets the stipulated conditions regarding job creation and that the employment figures reported are corroborated by other supporting data, such as investment, turnover, returns filed with RBI, returns filed with STPI, Hyderabad, etc.

2. <u>Eligibility Criteria</u>:

(a) The concessions linked to employment generation will be limited to the extent of the number of persons of Andhra Pradesh origin employed by the company. A company will be free to employ persons as per their own policies. However, the concessions available under this incentive will be restricted to the number of persons of AP origin employed by the company. For the purposes of this provision, a person of AP origin is defined as specified below:

- A resident of the State of AP. domiciled in the State of AP.
- Born in the State of AP.
- Studied in School/College / University in the State of AP.
- A person either of whose parents was born or attended School/College / University in the
- State of AP or was domiciled in AP.

(b) A resident of the State of AP is defined as a person satisfying any of the following criteria:

i. Whose name finds place in electoral roll anywhere in Andhra Pradesh.

ii. ii. Whose name finds place in the citizens data maintained by the Revenue Department and is assigned with a multipurpose identity card no. (also termed

SSID No:)

iii. Who holds a ration card / telephone connection / gas connection in his / her name or in the name of any member of his / her family.

iv. Who is able to furnish any other proof of residence like withdrawal of monthly salary through bank account.

A minimum time period of 2 years of residence in Andhra Pradesh is stipulated for this purpose.

3. Performance Guarantee:

For availing the above rebate on cost of land a Bank Guarantee has to be furnished for the rebate amount, for a period as per the terms of the MoU to be signed between the IT Company and the Government of Andhra Pradesh. The format of Bank Guarantee is available at http://ap-it.com/govtorders.html

4. Computation:

(a) For computing the number of eligible employees two schemes are prescribed as below:

Scheme-A: Taking a count of the number of eligible employees at any date chosen by the company within the maximum admissible period in terms of the MoU signed between the Government and the IT Company.

Scheme-B: Counting the number of eligible employees on any convenient date chosen/ suggested by the company and counting the additional number of eligible employees at the end of each year thereafter, within the maximum admissible period, in terms of the MoU signed between the Government and the IT Company. The bank guarantee would be discharged to the extent of eligible employees counted at the end of each period as mentioned above, the count being done on an incremental basis.

(b) The IT Companies availing rebate may furnish the statement of names and number of eligible employees after satisfying themselves of compliance with the eligibility criteria and furnishing a declaration to the effect.

5. Procedure:

(a) The application form is available for download at http://www.ap.gov.in/lncentiveTrack/default.asp

(b) The application can be submitted online:

- Register through URL http://www.ap.gov.in/lncentiveTrack/newdetails/regform.asp
- After registration login through URL http://www.ap.gov.in/lncentiveTrack/Login.asp complete the application and submit online.

(c) Project Report should be submitted along with the application.

6. The Department of IT&C would enter into a Memorandum of Understanding (MoU) with the IT Company on receiving approval from CCIT\. The format of MoU is available at http://ap-it.com/govtorders.html

V. Investment Subsidy

Investment Subsidy is available to **new IT Companies setup after 25.09.1999**, on fixed capital Investment as per the following terms and conditions:

1. Definition:

Fixed capital investment (land & building, plant, machinery and equipment including hardware & software) wherever referred to in this order shall always mean the original fixed capital invested in the project before depreciation.

2. Eligibility:

(a) All new IT Companies who have commenced their commercial operations after 25.05.1999 and who have filed for Investment Subsidy within **$1^{1/2}$ year** from the date of commencement of commercial operations would be eligible.

(b) Existing industrial units establishing separate / new IT unit with separate identifiable investment will be eligible. "Separate Identifiable Investment" shall mean that the new IT Unit should not have any production linkage with the existing business process, i.e., if the existing Industrial unit is already an IT Company, then it will not be eligible for Investment Subsidy under Separate Identifiable Investment. The new IT Unit should be in a separate building, should maintain separate books of accounts and project should be appraised independently by financial institution as a viable project. A new project will not, however, be regarded as a "Separate Identifiable Investment" if the utilities of the existing unit for water, electricity are extended to the new IT Unit.

(c) IT Industry availing rebate on land cost will not be eligible for availing this subsidy.

3. Procedure:

(a) IT Companies should file the applications with **GM, District Industries Centre** of the concerned District for availing Investment Subsidy. The address of the respective GM, DIC can be obtained from the AP Portal (www.aponline.gov.in) or from:
Commissioner of Industries Office,
Chirag Ali Lane, Abids, Hyderabad-500 00 I.
Telephone: 040-3201235, Fax: 040-3201335
Email: ci@industry.ap.nic.in

(b) The GM, DIC will certify the fixed capital Investment made by an IT Company including the date of commencement of commercial operations as per the detailed guidelines given in the Industrial Policy of Andhra Pradesh.

(c) The **Consultative Committee on Information Technology Industry (CCITI)** shall sanction the Investment Subsidy based on the merits.

4. The Department of IT&C would issue separate orders for the disbursement of the Investment Subsidy on receiving approval from the CCITI.

5. More details are available in the Industrial Policy G.O.Ms.No.9, Industries and Commerce (IP) Department, dtd.05.0 1.200 I alongwith guidelines for implementation of scheme for Investment Subsidy from URL link http://ap-it.com/incentivesgo/ gono9.pdf

VI. Special Provisions for Mega Projects

1. A special land pricing policy for the sale of land in and around Hitec City for Mega IT Projects is provided as per the following terms and conditions:

(a) An IT project with an Investment of Rs. 50 crores or more is treated as a Mega Project.

(b) The land shall be offered at a cost of Rs. 50 lakhs (Rs. 5 million) per acre at the Hitec City layout prospectively for Mega IT Projects.

(c) Rebate in the cost of land linked to employment @ Rs. 20,0001- per job created would be available (as per the details in Annexure-V) limited to the cost of land i.e. Rs. 50 lakhs per acre.

(d) APIIC 1 L& T Infocity will limit the development charges to Rs. 30 lakhs (Rs. 3 million) per acre only for Mega IT Projects.

(e) The incidence on account of premium on FAR (Floor Area Ratio) to be imposed by Cyberabad Urban Development Authority will be limited to Rs. 20 lakhs per

acre in respect of Mega IT Projects. If necessary the additional cost over and above Rs. 20 lakhs per acre, if any, but limited to FAR of I: 1.75 only, will be paid from the budget of IT&C Department.

(f) The above land pricing structure will be valid upto 31.12.2003.

(g) The land allotted under the Mega IT Project incentive scheme cannot be alienated or transferred in future for any purpose other than to a person 1 company undertaking IT or ITES activity specified by the IT Policy and the ITES Policy respectively.

2. The application for allotment of land for establishing a Mega IT Project should be submitted in the format available at the following URL:

(a) The application form is available for download at http://www.ap.gov.in/ lncentiveTrack/default.asp

(b) The application can be submitted online:

- Register through URL http://www.ap.gov.in/lncentiveTrack/newdetails/ regform.asp
- After registration login through URL http://www.ap.gov.in/lncentive Track/Login.asp complete the application and submit online.

(c) Detailed Project Report to be submitted along with the application.

7

Policy Imperatives

Information and communications technology (ICT), particularly e-commerce, has a profound effect on the economic development of a country. It results in greater efficiency in industries and enhanced productivity in the economy. This is accomplished through increased information flow resulting in knowledge transfer, improved organization and reduced transaction costs of production, and exchange of goods and services.

In spite of the rapid growth in e-commerce and related ICT activities in India, its access has been limited to a very small fraction of population causing a "digital divide", the character and contours of which are shaped by the policy and regulatory environment in the ICT sectors. Consequently, India has reached the Information Age but its masses have not been able to avail of its full benefits. This is due to insufficient telecommunications infrastructure and Internet connectivity, high cost of Internet access, absence of adequate legal and regulatory frameworks, and failure to use local languages and content. Keeping these constraints in mind , this chapter presents policy imperatives that will help growth of ICT and consequently, e-commerce in the near future.

Reducing Cost of Access and Bridging the "Digital Divide"

For enhancing the use of e-commerce and ICT, one of the most important requirements is the access and affordability of these services. While considerable efforts in the past have been made by the Indian telecom sector through liberalization and restructuring of the sector, much more needs to be done.

The National Telecom Policy 1994 emphasized the provision of affordable telecom services, and gave a thrust to the liberalization of the overall sector. The Telecom Regulatory Authority of India (TRAI) was created through the TRAI Act in 1997, which gave broad powers to make technical, licensing, and operational recommendations, and facilitate healthy competition. The IT Action Plan, 1998 was an important milestone for the ICT-related sectors in India. The country's informatics policy and strategy was given a forward thrust

with the setting up of the National Task Force on Information Technology and Software Development, in 1998. The Task Force brought out its first basic document, IT Action Plan I, in July 1998. The Action Plan contained recommendations to facilitate India's emergence as a Information Technology Superpower[1]. This was followed by IT Action Plan II (October 1998), which focused on IT hardware and the associated services sector. IT Action Plan III, released in April 1999, focused on a long-term national IT policy. The Action Plan forms the basis for the National Informatics Policy, which came into effect in 1998.

Reduction in Cellular Tariff

With the above policy measures, while cellular tariffs have reduced over time, it ought to fall a great deal more to be affordable for all. The prices of handsets have come down considerably given the drop in tariff by over 90%, between May 1999 and 2001. As a result, there has been a very significant increase in the cellular subscriber base. As on March 2002, out of a total of 6 million subscribers nearly 60 percent were prepaid and the balance of 40 percent are post-paid. However, the average revenue per user (ARPU), in March 2002, was Rs.1270 for post-paid as against only Rs.454 for a pre-paid cellular connection. This increase in subscriber base is a promising sign. According to some estimates, the cellular subscriber base is projected to grow to about 40 million by 2006. The cellular mobile services industry has achieved significant consolidation over the past few years, resulting in the emergence of 4 to 5 big players.

With the announcement of the Internet Services Provision (ISP) Policy, in January 1998, the monopoly of the then Government operator --VSNL-- ended. Subsequently, in August 1999, ISPs were permitted to set up their own International Gateways for Internet provision. Some issues relating to DOT interconnect charges were also resolved in favour of private ISPs. In April 2002, restricted IP telephony was allowed.

The number of Internet subscribers has grown from about 140,000 in March 1998, to about 3.8 million in September 2002, and the estimated number of users has grown, from about 700,000 to almost 9 million over this period. According to the estimates of the Planning Commission, the number of subscribers and users in the near future is going to increase as given below:

[1] The recommendations were notified in the gazette on July 25, 1998. The three broad objectives of the IT Action Plan were: to build world-class IT infrastructure; to achieve US$50 billion in software and IT service exports by 2008; and IT for all by 2008: that is, to make telecom, computing, Internet, and IT-enabled public services available to all by 2008.

Year	Internet Subscribers (Million)	Broadband Subscribers (Million)	Internet Users (Million)
2005	15	6	75
2007	35	14	175
2009	60	24	300

Source: Planning Commission

India's aggregate international Internet bandwidth has also grown from nearly 80 Mbps in January 1999, to about 3Gbps as on January 2003. The broadband subscribers, as shown above, are also going to increase from 6 million in 2005 to 24 million by 2009.

However, fulfilling these targets seems rather far fetched as three pre-conditions are required, *viz.,* infrastructure access, access devices and content costs. The Internet Service Providers Association of India (ISPAI) points out that the bottlenecks include the high cost of leased lines, and the high costs of renting premises when co-location is resisted. Almost 85 percent of the Internet traffic first goes to the US, and then returns[2]. International connectivity has high costs attached to it. If this situation is reversed through a *domestic Internet exchange*, it would save costs all around. Though a decision to set up such an exchange was taken two years ago, there has been little progress.

Affordable Internet subscriber tariff

Internet tariff has progressively come down, although this is neutralized to some extent by the increase in telephone dial-up access charges. The cost of Internet leased line has also dropped significantly over the last few years. However, Internet access is still unaffordable for the average consumer; it remains in the urban domain, although some inroads have been made in rural areas.

While the tariffs for cellular services and long distance services are market determined, fixed-line service tariffs are regulated by TRAI. The trend in urban local tariffs, in recent years, has been to reduce the cross-subsidization of local services by promoting long distance services. But the Government owned BSNL faces stiff price-competition in long distance services, which makes cross-subsidization of local services no longer as practicable as it was in the pre-competition regime. From the digital divide viewpoint, several marginal urban telephone owners will be priced out of the subscriber base. This trend is already noticeable in metros such as Mumbai. This points to the need for increasing public access in urban and rural areas, and making public access affordable.

[2] See Prabhu, Rajendra (2004), "Networks of Hope for the Deprived—The Next Goal of ICT in India" in *Convergence Plus,* vol. 5, No. 1, January 2004, pp. 4-11.

Subsidizing Rural Tariff

Rural tariffs contain a high subsidy component. Even at these levels, affordability is low in rural area and is limited to a small portion of the population. Over 85% of the rural population cannot afford to own telephones. It has also been observed, that a significant proportion of outgoing rural calls are usually long-distance calls. This underlines the need to provide a model with sustainable public access, with rural PCOs providing STD facilities. At present, a large proportion of rural PCOs are not equipped with STD facilities.

Implementation of National Internet Backbone

One of the significant contributions in increasing Internet access has been the implementation of the National Internet Backbone (NIB). With the completion of the NIB, Internet Points of Presence have been provided at district headquarters, and Internet calls to the nearest Point of Presence are charged at local call rates. As a result, Internet access is available from every exchange in the country. However, reliable telecommunication needs to be extended to exchanges (RAXs) at the lowest level, and it should be ensured that these exchanges are equipped to fall-in with the National Synchronization Plan.

Strengthening Regulations for E-commerce

The Information Technology (IT) Act, 2000 provides the legal and regulatory structure for e-commerce and electronic governance in India by addressing the issues of electronic documents, electronic signatures, encryption, electronic payments, and other features that are an integral part of an e-commerce economy.

Various provisions of the IT ACT serve the purpose of according legal legitimacy to electronic documents and electronic transactions, and establishing their authenticity and integrity. Also, these provisions make cyber crimes punishable by law. The Act also provides for dispute resolution mechanisms through adjudication, and a higher appellate body in the form of a cyber regulations appellate tribunal.

The Act provides for investigation of cyber crime by a person not below the rank of Deputy Superintendent of Police; and penalties for hacking. It also provides for paying damages to persons affected by contravention of the Act.

The Act also allows for limitation of Network Service providers' liabilities in case of violations committed by users, if they can demonstrate that the violations occurred without their knowledge.

Other legislation which have implications for the implementation of the IT ACT are the Indian Penal Code, The Indian Evidence Act, The Banker's Book Evidence Act, and the Reserve Bank of India Act. These have been suitably amended in order to make the Information Technology Act operational.

In addition to the IT Act, the existing Indian laws should be in synchronization with widely accepted international tax norms. An advance pricing agreement programme should be immediately introduced and an advance ruling authority should be fully empowered to deal with interpretation and application of transfer pricing regulations, just as most courts around the world do.

India's withholding of the proper tax regime and its practical applications has had a predictable fallout. It is the single biggest impediment to trade with and investment in India. India has traditionally insisted on source-based taxation as against a revenue-based one.

However, in a few years from now India will move from IT services to becoming the global IP hub, whereby it will begin to generate revenues from licensing and sale of products. If this happens, India will have to forego its revenue first to source states and give credit against foreign taxes, leaving very little to be taxed in India. Therefore, there is a need to reconsider India's stance on this front.

It is essential that there be pragmatic and frequent use of CBDT's powers to issue clarifications in conformity with internationally accepted principles. CBEC must introduce advance rulings in the indirect tax field for completed transactions (and not only to proposed transactions, as is currently the case) as provided for under the direct tax laws.

Tightening Information Security

Information is an intangible asset for a business organization. The security of information is essential for the very existence of a business. This enables the business to maximize its return on investments, and acquire more and more business opportunities. Hence for e-commerce to be successful, security of information is of paramount importance.

All information whether printed or written on paper, stored electronically, transmitted by post or using electronic means, shown on films, or spoken in conversation or in whatever form it is shared or stored, ought to be appropriately safeguarded. Failure to do so will ensure that no organization will venture into e-commerce transactions because much of the information stored on computers or shared or exchanged with business partners is of critical importance to them.

Information security enables protection of information and computing assets. It has three basic components:

Confidentiality: This requires protecting sensitive information from unauthorized disclosure or intelligible interception. In fact, there is a growing concern that the information may be disclosed or modified, e.g. due to misuse, error or theft. Increasingly, organizations and their information systems are faced with a range of security threats from computer-assisted fraud to sabotage to the more traditional threats of vandalism, fire, flood and other disasters. Apart from commercial reasons for protecting information, businesses have legal obligations to take care of the personal information entrusted to them. Good information security implies actions, which relate to the prevention of unauthorized or unlawful processing, and of accidental loss or damage to the information.

Integrity: Business integrity requires safeguarding the accuracy and completeness of information and software; and

Availability: It is important to ensure that information and vital services are available to users when required. This implies that the information will be protected form computer viruses and computer hackers.

Information Security Management System (ISMS) is the means by which senior management monitor and control their security, minimizing the residual business risk and ensuring that security continues to fulfil corporate, customer and legal requirements.

In order to build an appropriate ISMS, the first step of an organization should be to assess and define specific security requirements, design a solution that meets those unique requirements, deploy the necessary policies, technology and procedures and continuously maintain, adapt and improve that solution to the changing requirements. An organization's overall information security strategy will provide such a framework.

In this context, it is extremely important that the person involved in e-commerce has the requisite confidence in the network security. Various initiatives of the Department of IT, as is given below, will strengthen the confidence of the consumer in network security[3]:

1. Information Technology Act 2000 covers security of information under e-commerce, e-governance, computer related offences, and security related issues

[3] The Department of Information Technology, Ministry of Information and Communication Technology--http:www.stqc.nic.in/interservices/overview.htm

2. Indian Computer Emergency Response Team (CERT) has a mandate to serve as a central point for responding to computer security incidents and provide a reliable, trusted, 24-hour referral contact for emergencies; to disseminate best practices among system administrators and service providers; to increase awareness and understanding of information security and computer security issues among Indian cyber user community; to alert the community on latest security threats in the form of advisories, vulnerability notes and incident notes; to serve as a coordination centre among organisations to solve computer security issues; and to establish linkages with similar organisations in the international arena.

3. Information Security Management (STQC) Services have been developed to issue certificates on the quality of security management (e.g. giving BS 7799 part 2 certificate); imparting training and conducting workshops or seminars to create awareness among users on topics related to information security; conduct audit and assessment of "Network Architecture Security Assessment", to conduct IT security audit and developing norms of security standards, and conducting research and development in these areas.

4. R&D in E-commerce and Information Security: The Department of IT is helping to develop R&D capabilities in core technologies and national capacity building. It is funding several projects at leading academic institutions, R&D laboratories as well as industrial units thus helping to build up information technological capabilities.

5. Cyber Forensics: The department is engaged in issues related to fraud detection in the use of cyber sources. In this context, it has prepared a Manual on the handling/processing digital evidence. Also, a state-of-the-art Cyber Crime Lab has been set up at the National Policy Academy, Hyderabad, to conduct training for law enforcement officers and forensics personnel on procedural and technical aspects of cyber forensics. A Technical Resource Centre has also been set up at C-DAC, Thiruvananthapuram, to develop appropriate indigenous technology for handling/processing digital evidence and to undertake R&D in Cyber forensics.

6. Human Resource Development: The department is also engaged in developing requisite human resources for the application of the security issues developed by it. In this context, it has chalked out a plan of action in HRD on Information security & enhancement of e-commerce skill. The programmes involve both long term and short

term certification Courses (CISA, CISSP etc). The different programmes are under various stages of implementation.

While the efforts of the Department of Information and Technology are appreciable, it is important that the next generation cyber laws are prepared well in advance. It is essential that India's experience in implementing the IT Act be reviewed. The deficiencies in the existing laws need to be removed and suggestions put forth to improve them. Also, it is important to analyze the experience of other countries in implementing their respective Cyber Laws and the manner in which these have been addressed. Finally, to draw upon the experience of international agencies, it is useful to study new Cyber Laws/Acts enacted in the world, with special emphasis on the work of UN and other multilateral agencies like UNICTRAL, WIPO, UNCTAD, European Council etc. A study group should be appointed to analyze their relevance in the Indian context and thereby, formulate appropriate Indian Cyber Laws.

The IT Act allows businesses, Governments, and citizens to communicate electronically. With the legal validity and admissibility accorded to email, for instance, email could become a formal medium of communication both within the organization, and with external parties.

E-commerce will get an impetus, as on-line transactions and digital signatures are valid legally and are admissible as evidence. Further, mandatory corporate information can be preserved in electronic form, as long as authentication and format issues are dealt with in the course of electronic recording.

Electronic Government will also be more effective, as documents can be filed electronically, and Governments will be in a position to issue authenticated licenses, permits, and authorizations on-line, and citizens will be able to transact conveniently with various governmental departments.

One of the contentious issues is ensuring the privacy of citizens' data. The CCA has been given powers to access any data, if the need arises, in the national interest. There is a point of view that these powers go against the principles of data privacy.

On the other hand, there is a view that cyber crime needs to be tackled effectively, and there isn't enough evidence of the efficacy of IT in this respect.

In spite of these limitations, the positive aspects of the Information Technology Act will go a long way in building the environment for legal and secure electronic business and governance.

Convergence of all Communications

Today, separate regulatory mechanisms exist to govern telecommunications, data networking/ Internet services, and cable TV broadcasting. These, by and large, make distinctions on the basis of technologies and media.

On-going technology developments have resulted in increasing convergence of media and technologies. Convergence is possible at the provider's end as well as at the consumer's end. The traditional boundaries between telecommunications, computing, and broadcasting are slowly disappearing. Voice communications, data, and video/ broadcasting services can be transmitted over IP (Internet Protocol) Networks. Cable TV networks and receiving sets can be used for Internet services. A service provider thus has a range of technology options to provide his applications/content. A consumer similarly, has a choice of options to receive communications and information/entertainment services.

Against this backdrop of convergence, dealing with several regulatory mechanisms, which distinguish on the basis of technologies becomes increasingly impracticable, particularly from the point of view of providers who wish to exploit the concept of convergence and convergence technologies.

It is in this context that a Convergence Bill was drafted in the year 2000, and made open for debate and consultative processes. In August 2001, the Union Cabinet approved the Convergence Bill for introduction to Parliament, where so far it remains under debate.

The proposed Convergence Bill is intended to facilitate the use of convergence technologies in the provision of communications services. It is meant to draw more realistic categories of service providers, and thus facilitate the exploitation of convergence, ultimately benefiting the consumer.

However several concerns have been raised about the nature of the proposed legislation. These include the lack of a legal definition of convergence; the sweeping powers to be given to the proposed Communications Commission of India (CCI)[4], and the

[4] See for details of the Communications Commission of India, chapter 2 *supra*.

composition of the CCI. Doubts have been also been raised regarding the real autonomy of the CCI.

Urgency of Last Mile Connectivity

The last mile connectivity is of cardinal importance in the promulgation of the Internet in a country like India where two-thirds of the population lives in rural areas. While network expansion has been attempted in most of the urban areas, there still exists the problem of connecting it to the villages, known as the problem of the last mile connectivity.

Fiber is expensive and the cost to the subscriber is prohibitive. Use of DSL technology with its variations is one good answer, as it partly enables the existing copper wire network to be used for Internet and for broadband. BSNL is providing a pilot scale broadband service on copper wires using DSL technology. However, the problem with the copper wire network is that BSNL and MTNL own 95 percent of the copper wire network and they are reluctant to share this capacity with their competitors.

Access devices and their costs also keep the middle class out of the Internet loop. The cost of the PC, Windows OS and unreliable power connection create the need for expensive back–up systems. In addition, with the lack of a PC re- cycling system, all of these are listed as access hurdles. Alternative access devices have not fulfilled their promise. The Simputer, for instance, does not give significant cost savings for the level of features it provides, and there is no widespread business model for bundling the access device with Internet services at a monthly installment rate, which presently some mobile service companies are doing. Adding to these woes is the lack of availability of significant local language operating systems and applications. In addition, content providers are hesitant to invest in space as there is no widespread base of subscribers. Moreover, there is no incentive for the Internet user to invest in Internet subscriptions and devices. The entire set of factors acts to mutually reinforce their impact decelerating the growth of the Internet.

There is an inverse relationship between the present Internet costs and infrastructure. Both, the cost of a P C and the cost of a DSL or cable modem is more in India than in Korea where their use is the maximum (over 50 percent)[5]. In India, the competition is between copper with DSL, fibre optics and wireless, and the quality of service (QoS) should be a factor built into any arrangement. QoS, however, cannot be a sole responsibility of the ISP, as

[5] Korea, with a per capita income of US $10,000 pays US &500 for a P C, while India, with a per capita income of US $465 pays US $600. The cable or DSL modem costs US $60 in Korea versus US $100 in India. The subscriber charge for 100Kbps of broadband in Korea is just US $0.25, in India it is US $15.63.

the access provider also comes into the picture. ISPs want any media for setting up the last mile. This will create problems of interconnection with the access provider's infrastructure.

Under the present circumstances, it will be interesting to see how the Reliance Infocom experiment with its own broadband service works out. Now that the government is going to lift the 49 percent ceiling on FDI in telcos for all purposes, the investment in the last mile should rise and the basic complaint of innumerable Internet/broadband users about the quality of service should be a thing of the past.

While huge investments have been made in the broad band sector, it is important to jumpstart broadband in a meaningful way. It is important to note that a proactive national broadband plan, as pushed by the government of Korea, needs to be pursued in India vigorously. This will reduce the cost considerably. Significantly, the US is far behind with a penetration level of around 10 percent and a monthly price of US $25, as compared to Korea where the penetration level is 58 percent of households at a monthly price of US $20. India needs to follow a national broad band policy on the Korean pattern. We could use it in a very cost-effective manner for the masses in India by providing broadband connections, in a phased manner, to all the government owned educational institutions and make its curriculum development authorities install distance learning into the education system.

A significant contribution that broadband can bring to the education process is the sharing of teachers. If a teacher is absent at one school, his/her students could still attend class via a two-way video connection at another end. For instance, many schools do not teach certain subjects, as not enough students are available to take that particular course. Hence, it is not worthwhile to employ a special teacher. Videoconferencing can help aggregate such students across the country. This would make it easier to gainfully employ few experts in certain areas. Distance learning is also an excellent means to train teachers, who cannot travel to attend special training programs, to keep pace with the rapid changes in science and technology. Broadband distance learning will have a positive impact on teacher employment, and give our youth better opportunities to develop their potential.

Finally, policy and facilitation will now become more important because technologies are not the barriers. They already exist: e.g. corDECT for rural connectivity with a variant termed nLogue, free-space optics (FSO), 3G mobile and VSAT. Wi-Fi could also be fruitfully used for the last mile access. This is the cheapest means to bring telecom to India's educational institutions and villages, and as it is broadband, remote doctors can actually see

their patients and remote teachers their students. Networks, as large as dozens of kilometers away, are being set up worldwide, with information hopping from node to node as it does on the Internet.

The Future Horizon

The current Telecom policy and regulatory framework is guided mainly by the TRAI Act of 1997 and the New Telecom Policy 1999 (NTP 1999), which was amended in the year 2000. The New Telecom Policy 1999 (NTP 1999) significantly changed the dynamics of the Indian Telecom Industry. It envisaged the establishment of a liberalized telecom service regime characterized by a competitive telecommunications service provider industry.

Policy and regulatory issues have played an important part in shaping the contours of the Digital Divide in India. Although the contribution of the policy and regulatory environment is laudable in almost all areas, it is important to address several issues. It is apparent that the recommendations to promote the growth of IT industry, particularly software exports, have been more effectively implemented than those which aimed to broadly spread the benefits of IT amongst India's vast population. Outstanding issues relating to access and affordability to the rural population, and the weaker sections of the urban population, needs to be addressed to ensure digital inclusion for all. It is, therefore, important to put in place a workable alternate public access model for the rural population and the lower income groups of the urban population. Relevant content in local languages is required to increase the usage of Internet based ICT services. The implementation of Universal Service obligations needs to be addressed expeditiously.

To conclude, the entire process has to be economic service oriented as in the case of the postman carrying a mobile phone as a PCO to small entrepreneurs like Nancy Rani, setting up of a village Internet booth[6], or a large corporate like ICT establishing an "e-Chaupal" in over 14,000 villages[7], where the beneficiary pays for the information and the enterprise creates a win-win situation for all concerned.

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6 *Ibid.*

7 Jauhari, paper submitted at the National Seminar on E-commerce and Economic Development, held on December 2003, organized by the Foundation for Public Economics and Policy Research, New Delhi.

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