COMPUTER MARKETING

IT'S ROLE AND IMPORTANCE IN ECONOMIC DEVELOPMENT

2002

Thesis submitted for the degree of

Doctor of Philosophy

In

Commerce

OF

V.B.S.Purvanchal University

Jaunpur - 222001

Supervisor

Dr. Rudra Pratap Singh

Reader and Head
Department of Commerce
S.G.R.PG. College
Dobhi, Jaunpur - 222149

Researcher

Pramod Kumar Anand

V.B.S. PURVANCHAL UNIVERSITY

JAUNPUR - 222001 (U.P.) INDIA

Enrolment No. PU-94-43548

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v. R. P. Singh
M.Com, Ph.D.

Head :
Department of Commerce
S.G.R.P.G.College,
Dobhi, Jaunpur (U.P.)
Pin - 222149
☎ (05450) 46127

Date: 10-12-2002

Certificate

Certified that the research work on the topic **" COMPUTER MARKETING : It's role and importance in economic development "** has been undertaken by **Pramod Kumar Anand** for the award of **Ph.D. (Doctor of Philosophy) degree in Commerce** has been completed successfully under my guidance. This Thesis is his original work.

Dr. Praveen Kumar Singh
Principal
S. G. R. PG. College
Dobhi – Jaunpur

Principal
SRI G. R. P. G. COLLEGE
DOBHI, JAUNPUR

Dr. Rudra Pratap Singh
Reader and Head
Department of Commerce
S. G. R. PG. College
Dobhi – Jaunpur

SUPERVISOR

HEAD
DEPTT. OF COMMERCE
S.G.R.P.G COLLEGE
DOBHI, JAUNPUR

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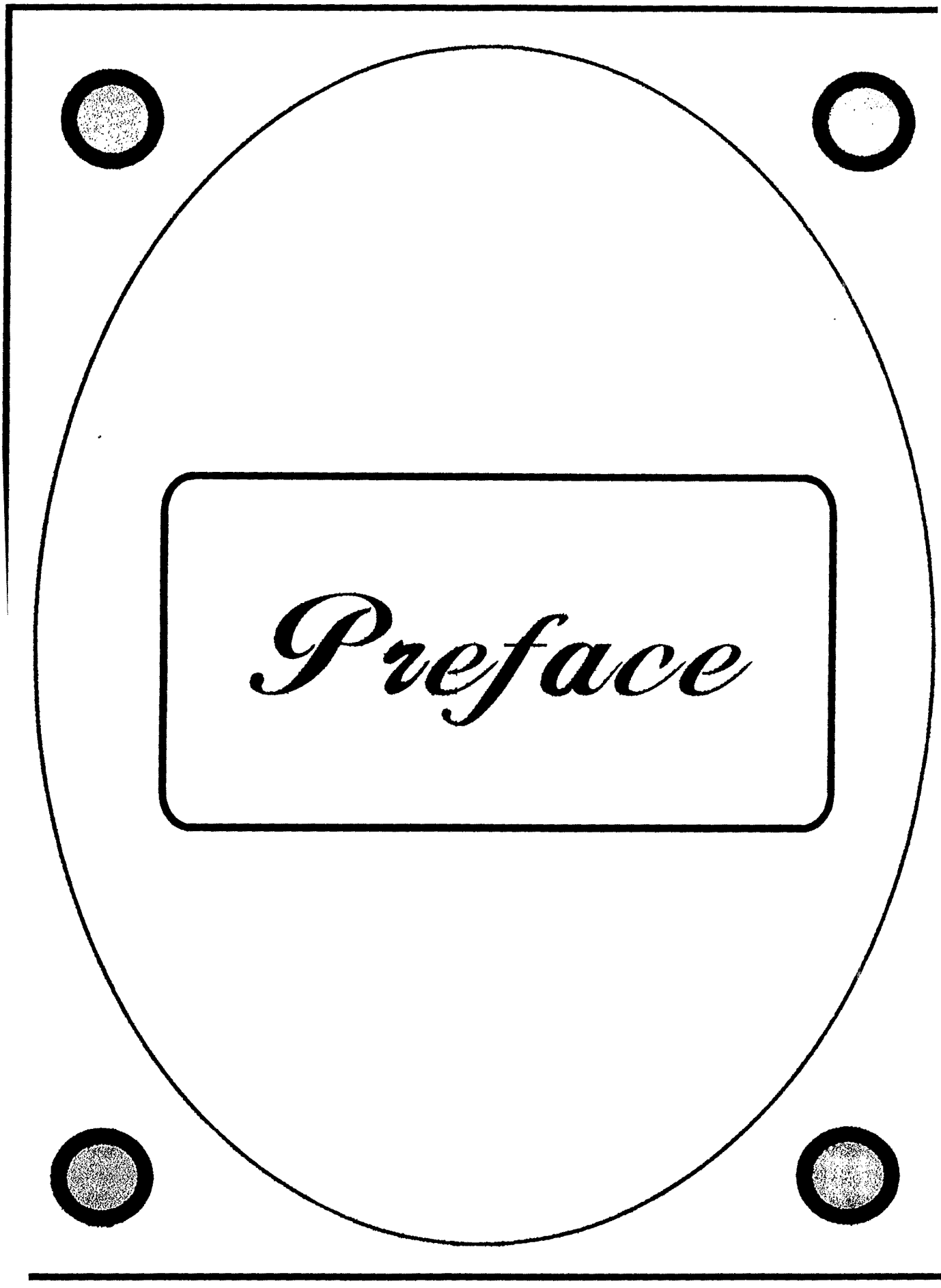

Preface

Preface

The Information and Communication Technology (ICT) revolution opens up new prospects for mankind. The third millennium witnesses realistic opportunities for developing countries and transition economies to play a qualitatively new role in the world economic landscape. Some developing countries have become aware of the new advantages ICT may bring, given its top priority.

IT software and services is a specific industry with considerable labor costs and intellectual investment that produces a unique "virtual product". Within the overall set of technologies that make up IT, software production is less capital-intensive and more labor-intensive, which offers favorable opportunities for developing countries and nations with transitional economies to become integrated into the global ICT market.

The recent decades have witnessed high growth rates in the software industries of such developing countries as India, China, Brazil, Mexico, Singapore, Hong Kong, Taiwan, South Korea and the Philippines. India stands apart in that list as its software history is one of the longest-established, and, secondly, because for the last 30 years the Indian government has pursued a well-defined IT software and services policy.

Indian software companies are already seized of the problem and are working out a solution. Of late, India has become a favourite destination of computer majors and multinationals for the location of their software centres. Today, more than 130 "Fortune 500" companies boast of their software centres in India.. The International

Technology Park (ITP) , a joint venture of the Tata Group of Industries, Karnataka Industrial Area Development Board (KIADB) and Singapore-based consortium, recently commissioned in Bangalore, is expected to give a big boost to software export from Bangalore which accounts for more than half the total software exports from India. Many multinational corporations and global software majors have already set up their shops in I.T.P..

Of late, the historical city of Hyderabad has also being making it big on India's software front. As observers say, "Hyderbad is all set to challenge the supremacy of Bangalore as India's Silicon Valley, thus triggering a healthy competition". The Hi-Tec city (Hyderbad Information Technology and Engineering Consultancy) being set up on the outskirts of the city, is all set to attract many big players in the information industry. The Rs. 15,000 million Hi-Tec city, spread over an area of 158 acres, will be completed in a phased manner. In addition to Bangalore and Hyderabad, Chennai, Pune, Cochin, Coimbatore and Vishakhapattanam are all set to make it big on the software production front and contribute substantially to India's ambitious software export drive."

India's Export Promotion Board (EPB) has identified software as thrust area and is planning to remove all the hurdles to achieve a phenomenal growth in the export of software from India. On another front, the Department of Electronics (DOE), with the object of creating a highly skilled pool of software professionals, on a sustained basis is planning to set up the National Institute for Education and Research (NIER) in Bangalore. This institute is proposed to be set up in association with the National Centre for Science and Technology (NCST) and Centre for Development of Telematics (C-Dot).

Unlike the on-line service providers in the USA or Western Europe, the growth of the on-line service providers in India has started tapering off. Major factors affecting the growth of Internet access in India have been partial deregulation of the telecom sector as opposed to complete liberalization, poor telecom infrastructure, a narrower home PC base, a high level of price sensitivity among the target audience, and a lack of effective exploitation of the on-line services for delivering content. For these reasons private sector service providers are slowly becoming marginalized in India. Any emerging country which wants to exploit this medium successfully needs to keep these constraints in mind while planning for the future.

The Prime Minister of India has given a call to make India an Information Technology superpower and one of the largest generators and exporters of software in the world within ten years. As an initiating step, a high powered National Task Force on IT and Software Development was set up by the Prime Minister's Office on May 22, 1998, under the Chairmanship of the Deputy Chairman of Planning Commission. This taskforce has mandate to formulate the draft of a National Informatics Policy.

This Special Website is designed to make the evolution of the Policy transparent. It is a forum for receiving suggestions, analysing them and hosting them back on the Website as a structured and classified digest of suggestions from IT Professionals in India and abroad.

India's unique experience in **Computer Marketing** is definitely worth studying. With its population mostly illiterate, initial

investment opportunities limited and its investment climate volatile, this vast and predominantly poor developing country, within a short time, succeeded in building a powerful IT industry and its software export sector, in particular. This has been made possible due to the Indian Government's policies that strongly support IT development, activities of Indian businessmen, and certain advantages this country enjoys.

For many countries India's experience can provide a useful source of new ideas to develop their hi-tech industries. In Russia, this experience can generate new momentum for the country's well-being, open up opportunities for its further socioeconomic progress, for the build-up of digital society and for Russia's comeback to the world scene in its new capacity of an IT superpower.

This is a study of **Computer Marketing** from the early 80s of the 20th century to the present day. The paper deals with the Indian Government's major steps to establish and develop the software export industry, and with the industry growth rates. India's rather long history of IT policies and industry development can provide valuable lessons to developing and transition economies looking for guidelines to develop the IT industry and especially software production.

This work purports to investigate and explore the potential of Computer Marketing in economic development. The study can be of interest to IT specialists, economists and politicians, businessmen and managers, and to the reader at large.

The study has been divided into seven chapters. The **first chapter** deals with the background and genesis of computer, it's importance in economic development, the global information and communication technology (ICT) revolution and some ICT growth problems.

In the **second chapter** an attempt has been made to trace the IT enable services and roles of computer in modern business organisation in India.

The **third chapter** is concerned with the Indian government and it's software policies.

The **forth chapter** deals with the Exim Policies, Venture Capital Fund and growth of IT industry in India.

The **fifth chapter** is concerned with the future direction and suggestions to the IT industry in India for it's long-term strategy.

The **sixth chapter** is related with the concluding part of the study of Computer Marketing and prospects for year 2003 and 2008.

The **seventh chapter** is concerned with the future application of the study and advanced computer technology.

Conclusions made here have been drawn from secondary sources, qualitative inputs derived from Delphi interviews, and first hand experience.

With profound sense of gratitude and regards, author convey his sincere thanks to **Dr. Rudra Pratap Singh (Supervisor)** for his valuable suggestions and wholehearted guidance for envisaging the fait accompli of this research work. I am also grateful to the staff members of computer and commerce department of S. G. R. PG. College, Dobhi, Jaunpur viz. **Dr. M.P. Singh, Dr. Yogesh Singh, Dr. B.K.Singh, Dr. Alok Singh, Sri S.N. Singh, Sri Ravindra Nath Singh** and others for their encouragement during the course of completion of this work.

My special thanks are due to **Dr. Praveen Kumar Singh** the incumbent Principal and **Dr. Bijay Pratap Singh** the Ex-Principal and Ex-Vice Chancellor Purvanchal University, Jaunpur for their inspiration and help for the completion of this work.

I also extend my thanks to my family members for their encouragement, especially to my wife **Mrs. Puja Anand** who sacrificed their inconveniences during the completion of this work.

Pramod Kumar Anand

Chapter – 1.

Introduction

1. Introduction

1.1 What is Computer

Most people know that a computer is a fast calculator, but it is much more than that. It is a machine which performs fast calculations plus performs burdensome chores such as choosing, copying, moving, comparing and performing other operations on alphabetic numeric and other symbols which represent data (raw material of information). In other words computer is an electronic machine that processes DATA according to the given instruction and program and then provide us our desire result. It is an electrical device built to recognize and follow a given set of instructions. By retaining the instruction and DATA in the form of electrical images it carries out the instructions one by one and works on (processes) the DATA to produce useful results, often called output or information. Computer output can be Reports, Charts or even moving images.

A computer may be defined as a machine that can solve problems by accepting data, performing certain operations and presenting the results of those operations under the direction of detailed step-by-step instructions. Such a set of sequential instructions, which cause a computer to perform particular operations is called a **PROGRAM.** Computer science is a study of the operating principles of computers, computer programming languages and algorithms for solving theoretical as well as practical problems. It involves the development and use of devices for processing information. Information in one form is presented to the device (Input information) and information in other form is required from it (Output information). This process of conversion of raw material into the finished product is nothing but data processing. **Data Processing** may

be defined as the process of transforming data (raw material of information) into useful information by the computer.

We are crossing the threshold of a new information era in which we are developing tools that permit us to amplify human intelligence and acquire the information needed to explore new systems of science, health care, education, manufacturing and business. This new information era is nothing but the "Computer Era".

Computers are the greatest achievement of our time. Computers have infiltrated in most of the activities around us. They are increasingly becoming the backbone of our information systems and are improving our industrial efficiency and optimal operation.
India has shown the potential of Computer Marketing. The following facts:

- India's pool of technical man power is one of the largest in the world,
- The growth rate of India's software industry has been tremendous in the recent past,
- Indian software exports are poised to reach US $50 billion by 2008 and
- The demand in the West for skilled software professional from India's top science and technology educational institutions has been very strong.

1.1.1 Research Objectives

To evaluate the potential of computer marketing in economic development, future of Indian software industry and to find out the long term strategy of Indian software players are the basic

objectives of this research. This work purports to investigate and explore the potential of computer marketing in India.

Has India realized the potential of Computer Marketing research ? Why is India as a destination for venture capital attractive or not attractive? What are the prospects for economic growth through computer marketing in India? Many of the less positive aspects concern the role of the Indian government and its proper role in the development of technology companies in India. What's a nice government to do ? Below are thoughts on my personal perspective of that issue.

1.1.2 Research Methodology

I have analysed the Indian market here to draw conclusions that may be of relevance to other such countries operating under similar constraints. Conclusions made here have been drawn from secondary sources, qualitative inputs derived from Delphi interviews and first hand experience. The observations and findings are based on visits to research and educational institutions, study of magazine, use of internet and discussions with researchers.

1.2 Importance of Computer in Economic Development

Although business information system can be manual, but today they often depend heavily on computers. By business personal computer is seen as an electronic device with ability to :-

- Accept user-supplied DATA;
- Input, store and execute programmed instructions;
- Perform mathematical and logical operations; and
- Output results according to user specifications.

A computer is an intelligent amplifier that performs the operations in much faster, accurate and efficient way. Thus, it gives us ample time to use it in matters involving creativity & judgement. The characteristics possessed by computers can listed as follows :-

a) Speed

A computer's speed varies from a few microseconds to nanoseconds.

b) Accuracy

Computers are very accurate. They can perform their hundreds of thousands of operations with great accuracy as their circuits have no mechanical parts to wear and malfunction. They can run errorless for days at a time.

c) Reliability

Computer output is generally very reliable, subject to the condition that the input data entering the computer should be correct and the program of instructions should be reliable and correct. Incorrect input data and unreliable programs give us computer errors and wrong results.

d) Capability

Because computers can operate on data at such phenomenal speeds, they can produce results that would simply not be feasible otherwise. For example, computers can be used to provide management with up-to-the-minute figures on all aspects of its business. With this information, managers can take more meaningful decisions. Similarly, computers enable companies to provide customers with instantaneous services, such as airline flight availability and charge account status.

e) Storage Capacity

Because various computer media can store millions of characters of data in a condensed form. There is tremendous savings in the storage area required to maintain the vital records necessary in a business environment.

f) Intangible Benefits

There are many companies that utilize computers for intangible benefits such as flexibility, ability to accommodate growth and the psychological factor that may give them a competitive edge in attracting consumers to buy their products or services.

g) Reduced Cost

With the ever-increasing advances being made in the state of art, the cost of computer equipment has dropped drastically over the years. Hardware costs have been decreasing at an estimated annual rate of 25%. Thus, companies that at one time could not justify the cost of acquiring their own computer system may now find it not only feasible to acquire a system, but cost-effective as well.

1.2.1 The Global ICT (Information and Communication Technology) Revolution

On the threshold of the third millennium the world is going through its fourth information revolution – an ICT revolution.

The first information revolution occurred 6000 years ago, with the invention of writing; the second one was 1300 BC and brought about the first handwritten book; the third came AD 1455, with the invention of the first printing press. Each invention resulted in a significant production growth and made it possible for mankind to reach a fundamentally new development stage and to improve considerably the quality of life. The ICT revolution seems unparalleled, in terms of its overall impact on humanity.

The information technology (IT) affects all spheres of life: telecommunications, trade, manufacturing, services, culture, entertainment, national defense and global security. The IT revolution removes old barriers and establishes new ties in a united world. IT is redefining the socio-economic landscape of various nations, communities and individuals.

1.2.1.1 In Economy

IT rapidly takes root in all economic spheres. The ICT development is not only a key factor of the economic growth but also a necessary prerequisite for development and even survival in the 21st century.

The ICT revolution has electronically shaped the global economic landscape, opened a new stage in the development of international economic ties. Improvements in telecommunications and telecom access go beyond geographical borders and bring to life:

- Changes in organization of production: transformed image of companies, new "virtual" companies with offices in various countries, more transnational corporations.
- Modernization of labor relations and marked growth of manpower mobility: optional presence in offices, full-time work while staying in another city, country or continent.
- Evolution of production process: shorter production cycles and lower transaction costs (commodity suppliers get closer to manufacturers, while the latter get closer to consumers).

This has resulted in a much faster return on IT investments and made IT development a crucial factor in each country's economic growth.

1.2.1.2 In Politics

Telecommunications provide a material base required for efficient civil society.

In the early 16th century, the emergence of effective mass media, i.e. books and periodicals, proved crucial for development of new democracies, since, on the one hand, it prompted mass elementary education and, on the other, encouraged many people in many major countries to become involved in politics. It was then that drastic cuts in the costs of information dissemination led to a system of a democratically-run major nation and, thus, broke a few thousand people barrier set by ancient philosophers as a limit to a democratically-run city-state.

The sweeping spread of IT and the Internet is a qualitatively similar thing. It provides a basis for:

- Democratization and development of new civil society – IT makes it possible for individuals to get free access to information, to bring about openness of their nations, and allows the broad strata of society to get actively involved in politics.
- Improvement in government structure efficiency – IT provides for a transition to a qualitatively new level of government control and data collection. IT also helps to get feedback from citizens - unprecedented in terms of its potentialities.

1.2.1.3. In Education and Culture

IT development provides phenomenal opportunities for:

- National cultures to integrate into the world landscape;

- Scientific and cultural achievements to become broadly popularized;
- Educational standards to improve by:
  - Getting broad access to information from any part of the world,
  - Developing remote education,
  - Developing and applying new effective teaching methods.

IT is:

- A powerful and efficient basis for converting material into information, knowledge and info services;

- A basis for developing environmentally-friendly resource- and energy-efficient technologies.

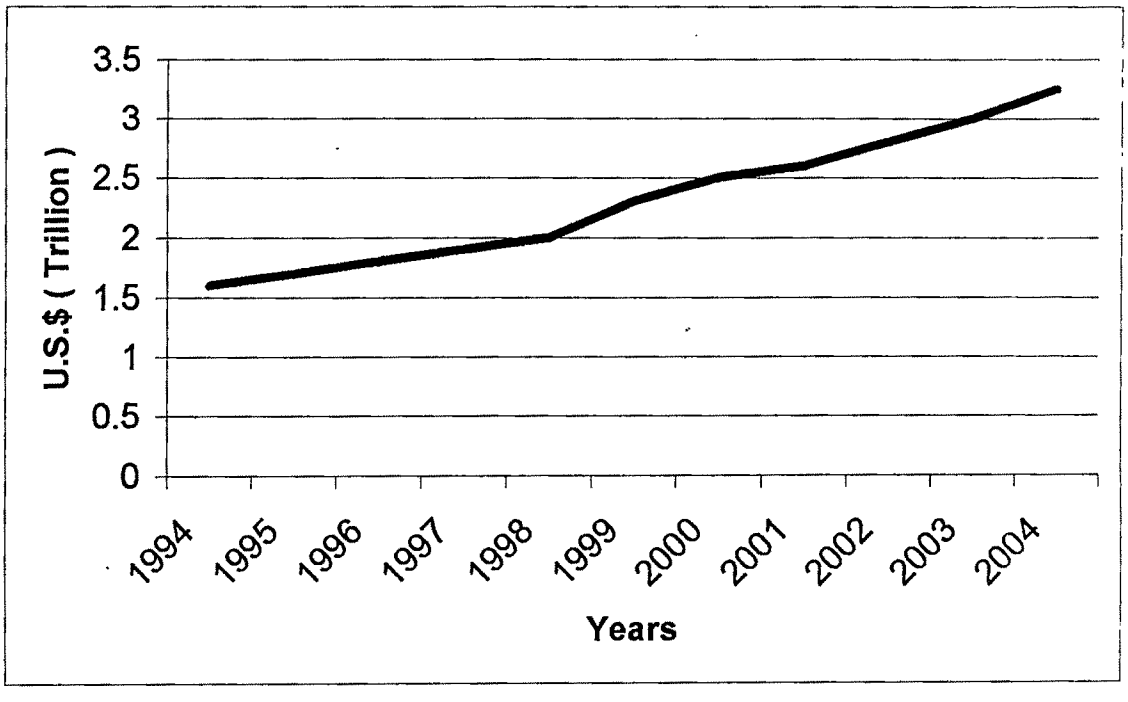
Thus, the ICT revolution opens up opportunities for **sustained development of the world community** in contrast to the blind alley of increased consumption of limited non-renewable natural resources.

All this suggests that, in terms of its impact on human progress, ICT has an immense potential unparalleled in history.

1.2.2 The Global ICT Market

According to *International Data Corporation (IDC)* and *Digital Planet 2000*, the global ICT market in 1999 has surpassed the U.S.$ 2 trillion mark and keeps growing at an average of 9% p.a. It is projected to reach U.S.$ 3 trillion by 2003-2004.

Growth of the Global ICT Market



Source: IDC

Many countries are making huge ICT investments, in particular, in building and supporting infrastructure, developing partnerships and training personnel to promote further ICT growth. North America remains the world's largest regional ICT market.

1.2.3 The Software and Services Market

"In the early years of the computer industry, manufacturers supplied all the required *software* 'free' with their machines. IBM realized in the late 1960s that software could become a golden stream of new revenues, and it started to charge separately for hardware and software. By doing so, it gave birth to the independent software industry, giving other companies a chance to supply programs for IBM computers more efficiently than IBM itself ."

After a modest start of the 60s, growth in the world software market became almost exponential from the late 70s onwards (about 18% p.a.): indeed, in 1978 the global software market was estimated at $2.5 billion, while in 1985 it already reached $25 billion. According to *McKinsey Global Institute*, currently this market is estimated at $400-500 billion and is growing steadily by 10-12 % p.a., with the software market growing by 14% on average, and the IT services market – by 10%.

Software is the 'lifeblood' that makes the metal stuff called hardware work. The IT development shows a sustained tendency to increase the percentage of software and services as compared to that of hardware in the total cost of computer products. Thus, while in 1960 about 80% of the cost was hardware and only 20% - software and services, currently this ratio is changing in favor of software: various sources estimate the contribution of the IT software and services sectors to the surging IT industry is invariably

increasing compared to that of hardware: software products and IT services amount to 60 – 80% of the total IT product costs.

The information technology boom and an ever growing demand for IT services have caused a number of problems in developed industrial countries. The rising software development costs and the severe shortfall of domestic IT professionals are at the top of the list. Western companies seeking new labor markets and targeting cost avoidance contribute to investing into less-developed economies.

1.3 Computers and Society

Computer is an important invention of the 20th century. It has made tremendous impact on the society in several ways in the last few two decades. Initially the computers were used mostly in advanced scientific institutions for the research purposes, in government organizations like defense, communication etc. But in the last two decades it has covered almost all the segments of the society and has opened new avenues e.g. in households, business, banking, education, medical science, industry, games and sports etc. to name few. In teaching it has evolved a new methodology where a student can communicate with a teacher sitting at a distant place. In banking a new system has evolved of electronic banking with which a customer can operate his account without entering the bank premises and sitting in any part of the world. Computers armed with bar code scanners have increased functionality in libraries and shops. It has resulted in fast searching, accessing, storing and supplying the large amount of materials and goods. During the 20th century, the key technology has been information gathering, processing, and distribution. Among other developments, we have seen the installation of worldwide telephone

networks, the invention of radio and television, the birth and unprecedented growth of the computer industry, and the launching of communication satellites.

Due to rapid technological progress these areas are rapidly converging, and the differences between collecting, transporting, storing and processing information are quickly disappearing. Organizations with hundreds of offices spread over a wide geographical area routinely expect to be able to examine the current status of even their most remote outpost at the push of a button. As our ability to gather, process and distribute information grows, the demand for even more sophisticated information processing grows even faster. Although the computer industry is young compared to other industries (e.g. automobiles and air transportation), computers have made spectacular progress in a short time.

1.4 Why Information Technology?

Humans thrive on information and communication. We crave human contact in the form of visual and audio communication. We were thrilled at the invention of the radio and telephone, marveled at the TV sets in the every home and was completely awed by the personal computer. We wake up every morning, read our newspapers, listen to radios, crank up the Internet, read our mail, write letters, and at the end of the day, we watch the news just in case we missed anything. Information is moving more quickly and becoming more plentiful and everywhere people are benefiting from this change. Across the world, advances in the way we distribute information are having a profound effect in shaping our world. IT is defined as the application of computers and techniques of using computers, to the handling of mass data. Many feel, that it is IT only, which is fueling

the economy through sales and employment. Ten years ago, there were 22 computer companies in the Forbes 500. Today, there are 189. a recent white paper in Japan proclaimed the IT industry as the major pillar of the Japanese economy. The IT Training Industry in the US is worth more than $9 billion dollars. There were am estimated 380 million Internet users in the years 2001. in February 1998, the Web Consortium was formed to shape our informational future by debating the direction of the Worldwide Web. Consortium members consisted of giants like AT&T. Microsoft, Sony, Netscape and Sun Microsystems. By mid- 2001, the consortium had 258 members. There is a huge shortage of IT professionals in North America and officially there is a shortage of 1 Lakh IT professionals in Germany and a similar number in UK. Along with the other countries they have invited the Indian IT industry to set up the business in their countries. Software and IT industry to sector surely has a brilliant future in these countries. However they demand that the professional must have good educational background with latest technical skills. According to a recent article in the Times Magazine· At every 1.67 second a mew user is added on the web and by the end of 2003 every tenth human being would be connected to the web. If this rate continues then by the end of 2004 every person would be connected to the web. Confirming that the scope of people going in for IT is immense. IBM vows for a paperless society by the end of 2005. Broadband technologies are coming to India as is evident by optical fibers being laid everywhere. ATM? have become a part of everybody life and all this is a result computerization. There are million of Web users, from school children to CEOs. With each click of the mouse, a door to the world is quite literally opened.

1.5 Some ICT Growth Problems in Developed Countries

The IT boom and ever increasing demand for IT services have caused some problems in industrialized economies. The most important of them are:

- Rising development costs,
- Shortage of skilled personnel.

Thus, according to *ITAA (Information Technology Association of America),* in 2000 the U.S. fell short of 844,000 IT specialists. The crisis of «the new economy», that hit the U.S. early in 2001 reduced the shortage of its IT personnel: by ITAA projections, in 2001 the overall need for IT specialists will constitute 900,000 people (in 2000, it was 1.6 million), with 425 vacancies.

According to *BITKOM (Bundesverband Informationswirtschaft, Telekommunikation und neue Medien),* in Germany over 1 million. specialists are currently employed in the national ICT sector. In the year 2000, there was a shortage of 55,000 IT specialists. According to the Federal Ministry of Education, at present it comes up to 100,000 people, while a large-scale survey made by *Initiative D21* shows that currently there is a shortage of about 150,000 IT specialists, with 60,000 of them with university degrees.

1.6 Globalization and Prospects for Developing Countries

Telecommunications and the Internet, alongside the standardization of software production, programming languages and hardware brought about sufficient stability in software and services production technologies and experience. This stability made it possible

to outsource projects, i.e. to involve other companies in the development of projects or of their separate stages. On the one hand, the outsourcing of projects promotes greater division of labor among separate companies and, thus, provides a source for productivity growth. On the other hand, the shortage of IT specialists resulting from a strong demand for information technology and IT services, opens up opportunities to make the entire production process internationalized and globalized through outsourcing.

Remote access to information, and prospects for globalization of the qualified labor market make it possible to project a drastic change in the economic growth rates of the world's least developed countries. Surging development of computer and information technologies and their cheaper costs are creating prerequisites for integrating developing countries into the global post-industrialized economic landscape.

1.7 IT Software and Services Industry

Software and services production is an absolutely special industry that requires large labor costs and intellectual investments in an absolutely special "virtual product". It is not as capital intensive as other IT branches. Thus, unlike hardware production, software development calls for much smaller investments in equipping job places and in direct organization of the technological process. This is the reason why the development of this branch of the IT industry creates more favorable opportunities for integrating developing countries and transition economies in the global ICT production complex.

The last decades of the second millennium saw high growth rates (the average of 30- 40% p.a.) of the software and services

industry in such countries as India, China, Brazil, Mexico, Singapore, Hong Kong, Taiwan, South Korea, and the Philippines. India occupies a special place among these countries. On the one hand, this was caused by the fact that among the Third World countries India has the largest software industry with the longest history. On the other hand, **India has been pursuing a government policy in software and services production since 1970**, which is much earlier than in any other developing country.

India provides a vivid example of a developing country integrating in the global information community. Within a comparatively short time, this country has been able to build a powerful IT industry, has literally become the Third World's computer colossus and is targeting for a leading position in the global IT market. India's relatively long history of IT development can provide useful lessons for other countries looking for guidelines in developing their IT industries and especially software industries.

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Chapter – 2.

Roles of Computer in Modern Business Organisation

2. Roles of Computer in modern Business Organization

In business, computers are being used for many data processing tasks such as word processing, filing, assembling numbers and facts associated with general office functions like accounting, payroll processing and personnel record keeping. The modern business organization spends a substantial amount on DATA management activities due to very tough competition. In most companies a separate department are set up to control Computer based data processing activities. Irrespective of a department's size, the data processing manager will need to be a businessman as well as computer expert. He will be concerned with budgets, personnel and equipment. He must be alert to the current needs of the department's users, his clients and keep himself up-to-date on development in software and hardware. So that he can maintain and hopefully improve the high level of efficiency which is required of a data processing department for economic development.

With advances in computer technology, the industrial sector has progressed remarkably in terms of :

(i) New efficient methods of production

(ii) Optimal usage of available resources

(iii) Greater efficiency

(iv) Better quality of products

(v) Reduction in cost of production

(vi) Improved safety and reliability

2.1 Growth of Computer

In fact the original objective for inventing the computer was to create a fast calculating machine. But more than 80% of the work done by the computers today is of non-mathematical or non-numerical nature. Hence, to define a computer merely as calculating device is to ignore over 80% of its work. It is popular today with all kind of people from businessman to employees, from engineers and scientists to school-going children.

An IBM PC compatible system is at present costing Rs. 20,000/- to Rs. 1,00,000/-. Over 100 different brands have been introduced in India which are said to be IBM PC compatibles. By compatible, we mean those computers which will have the similar memory, cycle time and chips as used by IBM and they will be able to support all software developed by IBM. The total number of software developed by IBM was more than 5000 in the year 1984 itself.

2.2 India & the IT boom

The shortage of IT professionals worldwide is in millions and growing, India is in a unique position to take advantage of the IT boom, which started in the decades of the 20th century. We have the biggest pool of English-speaking manpower. Indians head a third of Silicon Valley companies or are in senior management positions. The number of Indian-owned IT companies is growing quickly as is learning since ancient times. Today too, we have the highest number per capita of graduates and postgraduates. It is pointless to just churn out million of graduates without professional training. The global demand for IT professional is set to grow by 148% in coming years.

In 2002 alone the global demand will touch 3,60,000 jobs. Worldwide shortage of networking professionals will be 1.9 million by 2004. Worldwide IT demand market growth expected to recover to 11% by 2003. The Asia Pacific gap will result in a shortage of 3,00,000 networking professionals.

2.3 Future may hold the following possibilities :

Supercomputers, capable of billions of calculations per second and advanced in artificial intelligence, computers that can "think" and "reason" and further miniaturization of computer hardware. Artificial Intelligence may be describe as a branch of computer science that is involved with using computers to solve problems that appear to require human imagination or intelligence. The public first became aware of this discipline in 1956 when the term was coined as the theme for a conference held at Dartmouth college. Since then, researchers have used concepts from disciplines such as Linguistics. Psychology and Computer Science in an attempt to learn. How to prepare programs or construct systems that do tasks which no machine has ever automatically done before.

2.4 Internet and Society

Internet is a global collection of people computers, which are linked among them making communication possible among themselves in some common language. However, according to technological definition it is a network connecting many computer networks and is based on a common addressing system and communications protocol called TCP/IP (Transmission Control Protocol/Internet Protocol). From its creation in 1983 it grew rapidly beyond its largely academic origin into an increasingly commercial and

popular medium. By the mid-1990s the Internet connected millions of computers throughout the world. The original uses of the Internet were electronic mail (commonly called "E-mail"), file transfer (using ftp, or file transfer protocol), bulletin boards and newsgroups, and remote computer access (telnet). The World Wide Web, which enables simple and intuitive navigation of Internet sites through a graphical interface, expanded dramatically during the 1990s to become the most important component of the Internet. The Internet had its origin in a U.S. Department of Defense program called ARPANET (Advanced Research Projects Agency Network), established in 1969 to provide a secure and survivable communications network for organizations engaged in defense-related research. Researchers and academics in other fields began to make use of the network, and at length the National Science Foundation (NSF), which had created a similar and parallel network called NSFNet, took over much of the TCP/IP technology from ARPANET and established a distributed network of networks capable of handling far greater traffic. NSF continues to maintain the backbone of the network (which carries data at a rate of 45 million bits per second). The Internet protocol development is governed by the Internet Architecture Board, and the InterNIC (Internet Network Information Center) administers the naming of computers and networks. Amateur radio, cable television wires, spread spectrum radio, satellite, and fibre optics all have been used to deliver Internet services. Networked games, networked monetary transactions, and virtual museums are among applications being developed that both extend the network's utility and test the limits of its technology.

2.5 On-line Service in India

Unlike the on-line service providers in the USA or Western Europe, the growth of the on-line service providers in India has started tapering off. Major factors affecting the growth of Internet access in India have been partial deregulation of the telecom sector as opposed to complete liberalization, poor telecom infrastructure, a narrower home PC base, a high level of price sensitivity among the target audience, and a lack of effective exploitation of the on-line services for delivering content. For these reasons private sector service providers are slowly becoming marginalized in India. Any emerging country which wants to exploit this medium successfully needs to keep these constraints in mind while planning for the future. While in a country like the USA, private on-line services or Internet access providers have a substantial subscriber base which is growing, in India the subscriber growth rate for most service providers has slowly been tapering off. I hypothesize that most of the factors that seem to have contributed to the decline of private service providers in India are common to most emerging economies. As such, while a broader study taking more than one such country is required to draw conclusions which may have statistical validity. The private sector is not allowed to offer direct Internet access. Among other e-mail service providers, the difference between an on-line service provider and an Internet access provider is not as broad as it is in the USA. Most successful commercial e-mail service providers also provide other on-line services. Therefore, whenever the term on-line services has been used in the context of India it includes both e-mail service providers and on-line service providers, and vice versa.

2.6 A Brief History of E-mail Services in India

As elsewhere in the world, in India too e-mail services were initially introduced for academic institutions through ERNET -a UN funded project. ERNET was a project initially funded by United Nations Development Projects and later on subsidized by the Government of India. It offered subsidized access to educational and research institutions in India. ERNET worked and still works reasonably well, allowing Indian researchers and students access to Internet.

However, non-academic users are not allowed to access ERNET, and before the commercial on-line services came into the picture, the home PC users in the metropolitan areas like Delhi and Bangalore had to depend on either Compuserve (which in the Indian context was prohibitively expensive) or on the BBSs. Before the introduction of commercial on-line services Fidonet fulfilled the dual role of a discussion forum and electronic mail service provider. Following telecom liberalization, the Government of India (GOI) allowed private sector organizations to provide e-mail services to end users. However, it restricted their scope of operation through

- Refusal to give permission to provide direct Internet access
- High capital entry barrier in the form of a high licensing fee (Rs. 25 lakh per annum)

In spite of that, quite a few entrepreneurs and companies chose to enter this market. The following service providers have at some point played a major role in the on-line services market in India :

Computer Maintenance Corporation (CMC) :

It is a large government owned public sector organization that offered dialup connections through an X.400 based network. In

the initial days, its e-mail service, Indonet, picked up subscribers largely due its brand equity as a good Annual Maintenance Contractor.

ICNET :

One of the earliest service providers, it offered Closed User Group (CUG) solutions targeted at large corporate houses. Through powerful advertising campaigns and sustained direct sales effort, it captured a big chunk of the institutional market in Southern India. Later on, when Sprint entered the market with a superior product and better marketing skills, and targeted the same audience, most of its clients migrated to Sprint.

UUNET :

Another early entrant, UUNET offered UUPC/UUCP based e-mail service that required a certain degree of UNIX literacy on the part of the user. However, this feature helped it to get corporate users who use UNIX as the backbone of their network.

BIIT :

Business India Information Technology Ltd. (BIIT), a wholly owned venture by Business India, a Bombay based media conglomerate, was one of the earliest e-mail service providers. aXcess on-line services, the service provided by BIIT, managed to acquire a large chunk of the North and Western Indian market through a combination of aggressive marketing and good service. The aXcess subscriber base grew rapidly until recent months, when most potential subscribers defected to VSNL.

BIIT priced its service the lowest and were the first to target the home PC users and SOHOs. They also launched a service called Business Dataserve, a stockmarket quote delivery service. They also set up a nationwide distribution network consisting of franchisees who administered the aXcess local node in collaboration with BIIT on a

profit sharing basis and dealers who remarketed aXcess e-mail. It allowed them to penetrate the previously untapped non-metro market.

DART :

DART, a *Dalal Street Journal* (a financial publication) undertaking, started its on-line service, India On-line, largely to provide stock market information. Its offer for unlimited e-mail access bundled with that service for a flat fee generated a lot of interest. The service also offered other features like bulletin boards, real time chats, shareware downloads, etc.

VSNL :

Videsh Sanchar Nigam Limited, the Government-owned long distance carrier, had a skeletal, low profile e-mail service available. In 1995, it started offering direct access to the World Wide Web at a reasonable price and the entire Internet-literate market slowly started migrating to VSNL. In June 1996, they halved the tariff for dialup access, spruced up their service network and added more telephone lines. Because they are the only WWW access provider in the country, they are experiencing a high growth rate (the current user base is estimated at around 3,00,000).

In the recent past, VSNL faced criticism due to their unilateral pricing decisions and inability to cope with increasing demands for Web access. It has recently brought down the tariff for lease line access.

SRIL :

Sprint-RPG, a collaboration between Sprint in the USA and the RPG Group, one of the largest Indian corporations, offers Sprintmail, which is basically the e-mail service offered by Sprint in the USA. They have a state-of-the-art infrastructure and a good service

level. They priced their services higher than other providers and targeted the corporate sector. Later on, they set up a dealer channel to cater to individual users/SOHOs. Sprint has also started providing news summaries every morning and plans to introduce other related news services to cater to its clients. In its niche, Sprint has been doing moderately well.

Wipro BT :

The last major organization to enter the e-mail service arena was the Wipro-British Telecom collaboration, which launched their service in Bangalore and has only recently started expanding into Northern India. While it has not made any major impact so far, one can not entirely write them off since Wipro as the second largest hardware vendor in India has a lot of staying power.

Global Telesystems :

Another latecomer in the e-mail services business, it is slowly building up its infrastructure in anticipation of deregulation on the ISP front.

The few others who have entered later, like Datapro's Xeemail, have not been able to make a dent in the market.

2.7 Current Scenario

Currently, almost all the e-mail service providers are taking heavy losses. The major private sector service providers like BIIT and Sprint have stopped expanding the scope of their e-mail services business and VSNL is expanding largely because it's the only one providing WWW access.

In 1993, the e-mail market in India was an emerging sector in a rapidly deregulating telecom environment with a lot of excitement built up about it, but very little knowledge on the part of

the potential users about its utility. The choice of stance that various service providers took were to a large extent dictated by the current telecom environment. [Bleeke, 1990], in his article on opening markets, described how businesses in rapidly deregulating industries in the USA operated. There is an amazing degree of similarity between the market entry strategies employed by companies in USA in the past and the pioneer ISPs in India. However, the similarity ends there. Bleeke identifies 4 major categories :

- Broadband distribution company.
- Low-cost new entrant
- Focused segment marketer
- Shared utility

Of the 3 companies which are identifiably doing better than the other service providers in India, BIIT was unquestionably a low-cost new entrant as it kept its overhead very low to bring down the prices, targeted the price sensitive market and put into place a strong sales and customer support team and a distribution network which helped build a sense of personal relationship with its clients. Faced with a situation where all potential subscribers are opting for Web access through VSNL, it is trying to compete through putting up an intranet on which India-related content available on the Web will be mirrored with the permission of the content provider.

Sprint, which entered the market late and tried to leverage its superior product, state-of-the-art infrastructure and brand equity to target the most profitable segments of the market, had successfully exploited the rapid deregulation in the USA and its superior service quality to move up the service price ladder. Its India market entry strategy was similar. It also started expanding into related categories

like Sprintfax, etc. Faced with a slump in the e-mail services market, it is now in the process of leveraging its expertise to provide Intranet consultancy to the Indian corporate sector.

VSNL, CMC :

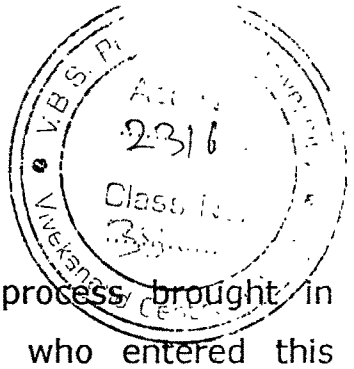
Both of them had the potential to become a broadband distribution company. However, CMC because of a lack of marketing orientation and poor service level got marginalized in the e-mail services market very early. In the initial months VSNL's product did not have an edge over the others, but the sheer breadth of resources at its disposal allowed it to commit resources to create a differentiated service in the long term.

However, during the first two years of commercial Internet access in India, the government-owned companies were not in high demand. The leading computing or telecommunication magazines were advising potential users to use one of the private service providers.

Although there is a great deal of similarity between the entry strategies adopted by ISPs in India and the strategies observed in the USA, unfortunately none of the ISPs in India is displaying the high growth rate that organizations at such a stage are enjoying in the West. The ISPs from the private sector are either getting out of the e-mail business, or have stopped growing.

2.8 Market Analysis

The major factors that have led to the marginalization of private sector e-mail service providers in India :



2.8.1 Lack of further telecom liberalization

The initiation of the deregulation process brought in private sector participation. The entrepreneurs who entered this market expected Governmental encouragement and further liberalization. However, due to changes in the sociopolitical environment, further liberalization has not materialized, which has made it difficult for ISPs to compete on an even footing.

Example : While VSNL (the Government-owned carrier), the Software Technology Park of India, and ERNET are allowed to provide World Wide Web access, private commercial providers still can't.

2.8.2 Lack of strong telecom infrastructure

The telecom infrastructure development in India has not kept pace with the rest of the world. While users in various forums on the World Wide Web debate topics like ISDN, cable modems, etc., in India basic telecommunication facilities are sometimes lacking. Due to lack of adequate customer education about the problems associated with the telecom media, in the users' mind, recurring connectivity problems due to poor infrastructure usually became a contributing cause to user dissatisfaction either with the medium or with the service provider

If it rains badly on one particular day in Delhi, the users will usually have difficulty getting connected to their dialup accounts and the helpdesks at the service providers' end will be flooded with irate phone calls from users.

2.8.3 Narrow base of home PC owners

In the USA, as the on-line service providers never tire of reminding others, 37% of the population have computers in their

homes. In India, while no empirical evidence exists on the total home PC population (part of the reason is that a large number of these PCs come from the unbranded/gray market), delphi interviews suggest that there are no more than 100,000 throughout India, out of a population of over 900 million spread out over a large geographical mass. This makes it extremely difficult to send targeted communication focused at this audience. Its only recently that a PC manufacturer has launched a Home PC targeted at the FTUs.

These home PC owners, the potential e-mail users centered in the metropolitan areas of Delhi, Bombay, Madras, Bangalore, and Calcutta belong primarily to the following segments :

- Computer professionals
- Expatriate foreigners
- Indians with overseas communication needs
- SOHO users

These segments use e-mail primarily as a communication tool and are not interested in on-line content in the format (ASCII) in which service providers are making it available. BIIT's aXcess, due to its cheaper price tag, was attractive to this target audience. However, this market got saturated very quickly and the incremental cost of converting individual subscribers started going up.

The secondary market that the service providers then targeted consisted of :

- Independent businessmen
- Exporters

These segments viewed e-mail as a cheaper alternative to faxes. However, in India, e-mail service could not compete with fax because of the time lag involved in sending e-mails from India to elsewhere. All private sector service providers have to go through the

VSNL link through which they can connect to their respective service partners in USA. Due to various technological problems at the service providers' end, international e-mail was sometimes taking much longer than it ordinarily would. In any case, the service providers were not offering real time solutions (Sprint started out with the promise of fast e-mail delivery, but they also ran into a service level problem). Thus e-mail could not be used as a cheaper alternative to fax for sending out time-sensitive information. While e-mail as a new technology attracted a lot of attention, these segments slowly started getting disenchanted with e-mail service as a solution.

The segment which has always been very aware of developments on the e-mail front is the corporate sector. The corporate sector as an e-mail market is maturing slowly in India. Most organizations have taken one or two e-mail accounts which a number of their personnel are sharing. The concept of a personal e-mail box is yet to take off in a major way in India. Also, most organizations are currently opting for VSNL connectivity now that it is giving direct Internet access.

2.8.4 Lack of a proper revenue stream

E-mail service in the initial stages has a high entry barrier. Also, the cost of converting and retaining customers is quite high. It's only after a service provider attains the critical mass of subscribers that the payoff in terms of monetary returns begin. In AOL it seems to have been achieved. The Web as a commercial entity has yet to achieve that. In India, that critical mass is yet to be achieved. Till one reaches that stage, the on-line services can be sustained by:

- Venture capital
- Revenue provided by content providers

❖ Revenue generated through subscription and usage

In an emerging economy like India, the concept of venture capital has only now started taking off. There is no venture capitalist around who is willing to take a risk on an emerging industry. Because of the lack of a large customer base, the content providers in India were not as attracted to the market provided by on-line services as they were in the USA.

Revenue generated through subscription : access as part of its marketing strategy kept its overhead very low and brought the prices down. Since the market size had been limited and the competition fierce, the other ISPs were forced to follow the lead provided by aXcess. However, all of them had higher overhead, which made it impossible for them to maintain profitability. So eventually there were two serious players left in the Indian ISP market, aXcess and Sprint, with two different target audiences. However, both ran into similar problems.

2.8.5 Subscriber discontent

E-mail service by its very nature requires a high degree of customer-orientation. Indian work culture, while highly professional, has never required the kind of 24-hour attention to clients that an e-mail service requires. What the industry needed was a highly skilled workforce. But because of low margin, overall salaries in the e-mail sector fell, bringing about a fall in the quality of manpower. This coupled with poor telecom infrastructure brought about a gradual lowering of service levels, which obviously led to a strong sense of post-purchase dissonance among the subscribers. The absence of an exit policy made matters doubly difficult for service providers.

2.8.6 The collapse of the distribution networks

Because of the subscribers' discontent, a lot more legwork was required on the part of the support centers (which were manned by VARs/franchisees in most non-metro locations for most ISPs). The eventual return on investment made after putting in so much effort was negligible when compared to returns on hardware/software sales in which most of these providers were also involved. So motivation too started dwindling, and the amount of time that a dealer or a franchisee devoted to this business vis a vis his/her other businesses declined, and the contribution of dealers from non-metro locations started to decrease.

2.8.7 Lack of organizational support

Most Indian business houses that went into the provision of online services are family-owned companies, with a low level of e-mail literacy. They seemed unaware that the industry would be slow to bring profits and that they would need to pour resources into it for a long time before the market attained critical mass. In the recent past, all of them have shown a strong inclination to cut their losses and get back to their core businesses.

The situation has been exacerbated by VSNL's launch of their WWW service. While the quality of VSNL's customer service is poor, they happen to be the only source offering Web access. They are also the only organization which by virtue of their being Government-owned can sustain a loss for years. Therefore, for the past few months, private on-line service growth rates have slowly been tapering off. Unless some major changes come about in the telecom environment in India, this trend is going to continue.

2.9 IT Enabled Services

Computer software solutions and services segment dominated the Indian knowledge Industry during the second half of 1990s. The beginning of new millennium is witnessing a new info-tech revolution called IT enabled services. IT Enabled Services cover the entire range of services exploiting information technology for empowering an organization with improved efficiency.

The IT Enabled Services is emerging as a USD 75 billion industry and is growing at more than 20% annually, the overall global market for IT enabled services will amount to approximately US$ 142 billion by the year 2008 from $10 billion in 1998.

The top five opportunities and their value creation potential will be as follows:

- Human Resource Services
- Customer Interaction Services
- Finance and Accounting
- Remote Education
- Data search, Integration and Analysis

IT enabled Services are delivered over telecommunication or data networks **(wireline and wireless)**;

They are either externally contracted (out-sourced) or provided by a remote subsidiary of the same company (out located). These services do not include remote production or manufacturing units, the local branches of global businesses or businesses on the Internet.

IT Enabled Services which are already existing include:

- **Customer Interaction Services such as Call Centres;**

- **Animation for movies and TV serials, cartoon strips, etc;**
- **Translation, Transcription and Localisation such as Medical Transcription Services;**
- **Finance and Accounting Services such as back office data processing for Airlines;**
- **Human Resources Services such as outsourced payroll preparations, etc.**
- **Content Development/Web Site Services for creating site contents, advertising, etc.**
- **Processing Insurance Claims of clients on pre-defined guidelines.**
- **Geographical Information Systems which provide information on geographical locations, ranging from digitized maps of countries to roads and townships.**
- **Data Conversion, Data Search, Integration and Analysis covering areas such as preparation of legal data bases (Deposition summaries), research & preparation of reports based an data bases on past records, etc.**

Marketing Services such as market research, bureaus for marketing products or services based on Call Centres or local market data bases;

- Remote Education for utilising IT infrastructure to strengthen formal Education system for remote and expertise starved areas;
- Medical Consultancy by providing expert advice;
- Out sourced Engineering and Design Services;

- Network Consulting;

are services which have the potential to evolve as IT enable services.

Currently, call centres and animation are the largest opportunities, accounting for 85% of all IT-enabled services in India. As per a survey conducted by Nasscom, IT Enabled Services in India employed 45,000 people as of 31 March 2000. With the result, it generated revenue of Rs. 2400 crore (US$ 560 million) for fiscal 1999-2000.

2.9.1 E-Governance

The information revolution has pushed corporations to change and adopt to the new technologies and business models. Today this revolution has reached governments. The governments have been challenged to keep pace with these rapid technological innovations and demands. Today various ministries, departments at state and central levels are coming online with information making way to online services tomorrow.

The advent of Information Technology as a highly leveraged enabling tool for delivery of services in the public and the private sector has by now been universally recognized. This has redefined the fundamentals and it is in this context that the issue of Smart Governance or popularly called Electronic Governance comes into focus.

E-governance efforts are underway in several other countries, prominently led by the United States. Central government portals and e-government initiatives are popping up everywhere across the globe. The UK is developing a single government web portal called UK Online. In East Asia, Japan, Singapore and Taiwan are also

making progress towards moving information and services on to the web. In Taiwan the government aims to achieve an 'intelligent' government, which provides online services to citizens and saves taxpayer money through online procurement. Such moves are also on in the United States where B2G expenditure is expected to be upto $2.2 billion by 2005. The security and privacy, however, have still been the areas of concern in e-governance interactions.

In our country Electronic Governance, which started off with computerisation of back office operations, has now gone beyond this basic feature. It intends to bring about the fundamental change in how the Government operates. This implies a new set of responsibilities for the executive, legislature and the citizens. The State and central governments have been involved in bringing about awareness of the e-services offered to its own workforce as well as service users.

Ministry of Information Technology has set up a Centre for E-Governance at the Ministry. The objective of the Centre is to showcase existing tools and applications in e-Governance and also serve as a forum for government officials, legislators, industry, and various other key players to come together, discuss, learn and explore issues of shared importance.

The following is a list of E-governance projects, both ongoing and in the offing, across the country.

Andhra Pradesh:

APSWAN:

Network of voice, data and video communication throughout AP operational with 2Mbps fiber optic links connecting state secretariat with 25 centres.

CARD Project:

System of registering immovable property transactions using computerized database.

Multipurpose Household Survey Project:

The project aims to capture socio-economic data of all residents of the state and a database of land records.

Automated Services of Transport:

The scheme is intended to provide services like issuance of driving licenses, vehicle registration through a comprehensive, networked solution. Pilot projects are in operation.

Secretariat Knowledge Information Management System:

This system caters to managing the work flow at the state government secretariat.

AP Development Monitoring System:

Combines GIS with data from remote sensing satellites. The system has created base maps of all mandals, constituent revenue villages and hibitations.

Gujarat:

Smartcard project :

Road transport offices of Gujarat equipped with state-of-the-art driving license enrolment and issuance centers.

State-wide WAN :

The network connects various office complexes of the government.[Proposed]

Disaster Management System:

To maintain communications during natural disasters.[Proposed]

Karnataka:

Computerization of Education Department:

The project intends to speed up routine work of administering examinations and spread computer awareness within the Department.

Computerization of Treasuries:

The project will comprise installation of around 250 VSATs all over the state to capture all transactions in 31 district and 184 'taluk' treasuries.

Vidyutnet for KPTCL India's first VSAT based communication network to support real time data application for power generation and distribution to be commissioned in KPTCL.

Kerala

Kerala RD Net:

All the 152 office blocks are networked offering enhanced connectivity. The network provides regular update of various activities undertaken in the state.

Automation of Controller of Entrance Examination:

Computerization of entrance exams and other related procedures.

Kudumbasree:

Programme for state poverty eradication.

Govt. Automation Project:

Digitising huge volumes of back data lying with the departments.

CARD:

Automatic registration system.

FRIENDS:

Aims at providing a single window for the citizens to remit their due at the same counter.

Maharashtra

Stamps and Registration Project.

Proposed to facilitate efficient property transfer and registration.

Connectivity Project:

Intends to connect around 3000 offices through a VSAT network.

Rajasthan

Raj-Swift:

Statewide intranet to facilitate data, text and email between office of CM and all the district collectors.

Rajnidhi Informaiton Kiosk Project:

Proposed to function as a modern service delivery system.

Chief Minister's information system:

For monitoring various key activities of the State.

Networking of Secretariat:

Project to interconnect more than a thousand rooms in the state government secretariat.

Vikas Darpan:

GIS based planning and decision support system.

Tamilnadu

STAR :

IT package for all needs of the registrants.

Telemedicine project:

Allows doctors in remote areas to consult experts on special cases through a direct ISDN link.

Computerization of land records:

To facilitate easy transactions.

Computerization of transport department:

the project extends to various departmental activities.

West Bengal

Web and Kiosk-based education information system:

A pilot project to standardize operations and processes

Vernacular interface project:

Provides information about tax payments, public utility bills, etc.

2.9.2 Telecommunications

Internet and Communication Technologies (ICT) technologies are at the base of knowledge economy and consequently knowledge management. The revolutionary trend of convergence of information, communication and entertainment has also created new opportunities accelerating the process of reforms which are now complete with all sectors in telecommunications opened for private participation. In the context of India, a number of initiatives have been taken up in telecom sector to provide infrastructure support for the Information Technology revolution and to introduce newer and the

state-of-the art services conforming to the latest technology during the last one year. The government initiatives are expected to give people the benefit of cost, quality and choice.

The latest among the structural changes brought in is the corporation of telecom services with Bharat Sanchar Nigam Limited coming in to existence on October 1, 2000. Other adjustments in the sector include reduction in telecom tariff, involvement of private operators in the long distance sector, etc.

Since the mid-80s, the Indian Government has been focusing on funding and developing the country's telecommunications infrastructure. While domestic communications development still remains the government's priority area, it has also allocated funds to develop international communications required for export development.

Government investments in international telecommunications amounted to:

- U.S.$ 150 million p.a. between 1985 and 1990,
- U.S.$ 200 million p.a. between 1990 and 1995.

Since 1990, government investments in domestic and international communications have annually increased by 15%. Intensive development of telecommunications infrastructure is the most important prerequisite for the industry's further development.

India's largest telecommunications company - *VSNL (Videsh Sanchar Nigam Limited)* - a monopolist (before April 1, 2002) in providing India's Internet international communications - is investing about U.S.$ 1.36 billion (59 billion Rupees) in telecommunications infrastructure development from 1997 to 2002, under a 5-year VSNL plan.

Several projects have been initiated to give a thrust in the ICT sector. The important among them are:

2.9.2.1 Sankhya Vahini Project:

The Project has been evolved as a technology mission of the National Task Force on Information Technology and Software Development after broad based consultations and discussions with academicians, scientists, technologists and a wide cross section of government officials. The objective of the project is to establish a high speed data network in India for the benefit of educational institutions, public and private corporations, service providers, individuals etc. for learning, training, research and other multi-media activities.

2.9.2.2 National Internet Back bone:

Two Internet Nodes, one at Delhi and other at Bangalore, have been commissioned as part of the National Internet Backbone (NIB) project which will provide an Internet infrastructure throughout the country. The project costing Rs. 33.5 crore consists of a total of 45 nodes located in important cities all over the country interconnected through wide bandwidth for smooth flow of Internet traffic.

2.9.2.3 Sanchar Sagar Project:

Phase-I of the Sanchar Sagar project has been completed in the first week of August 2000. The Project intends to provide National Information Infrastructure, connectivity for the National Internet Backbone and bandwidth on demand. The Phase-I of the project covers a route length of approximately 17,000 kms and provides 10 very high speed 2.5 Gbps capacity rings, connecting 33 large cities all over the country including major State capitals. The

Phase-II project covering a route length of 36,000 kms on 2.5 Gbps capacity rings will connect 150 more cities. All the envisaged 32 rings of this project are likely to be commissioned progressively from now on till March 2001.

Other initiatives in the ICT sector include, large-scale encouragement to private ISP, and strengthening the role of Telecom Regulatory Authority of India.

2.9.3 Advertisement Industry :

Marketing in the new economy has been influenced by the emergence of seamless global society, virtual enterprises, Internet and Communication Technologies (ICT) revolution. It faces many challenges in terms of shorter product life cycles, Brand equity, customer integrity and loyalty etc.

The continuous economic liberalisation has opened the gates of markets with similar characteristics. This has lead to the formation of the borderless society with the introduction of new communication technologies. There are rapid strides in the field of information technology towards faster and multi-media data transmission systems. Technologies related to telephones, televisions, computers and data transmission channels evolved with the help of satellite technology in providing the consumer easy and quick access to information and knowledge. The latest addition of internet, as a new medium is a boom to markets in boosting the sales of their products. Advertising being an important part in marketing has been greatly influenced by this revolution. The net has finally revealed its presence as far as the spendings on advertisement goes. Other significant impact on the advertisement is the trend of mergers and aquisitions across the globe.

The advertisement industry has witnessed unprecedented growth of 24.8 percent over the last year. The gross income of the advertising agencies stands at Rs10,253.4 million an increase of Rs. 2,039.8 million over last year - a growth rate of 24.8% over the previous year.

2.9.4 E-Commerce

E-Commerce has also started to show its true potential in India. India is one of the twelve countries, which have given a legal sanctity for e-commerce. India being strong in software and in IT is not that efficient in the case of E-commerce. but still there is a lot of growth and future for this segment in this country. National Association of Software and Service Companies (NASSCOM), the apex body and Chamber of Commerce of India's software-driven IT industry, had recently released findings of its survey to evaluate E-Commerce scenario in India. As per preliminary findings of the survey, the total volume of E-Commerce transactions in India was about Rs. 450 crore in the year 1999-2000. Out of this volume, about Rs. 50 crore were contributed by retail internet or Business-to-Consumer transactions, and about Rs. 400 crore was contributed by Business-to-Business transactions. This amount is very less compared to global standards but, with the background of almost non-existing regulatory framework, low internet usage this amount is good for E-Commerce in India. The Nasscom survey also revealed that E-Business transactions in India are expected to reach Rs. 3500 crore during 2000-01. Out of this, about Rs. 300 crore could comprise of retail transactions and Rs 3200 crore of business-to-business transaction. But, with regulatory framework firmly in place; improvement in telecom infrastructure; increase in PC penetration could lead to Rs. 15,000 crore of E-

Commerce transactions in India by 2001-2002. The Indian e-commerce business is going to grow at a rate of almost 300 -600%. The success of e-commerce has led to its implementation in many important business sectors. The ability to conduct critical back office transactions in a fast, secure and reliable way has become a major part of the manufacturing, retail and transportation industries. It is rapidly being adopted in other vertical market sectors.

2.10 Electronics City

Electronics City is an industrial park spread over 330 acres exclusively meant for electronics industries. It houses more than a hundred industries, including IT industry leaders such as Motorola, Infosys, Siemens, ITI, and Wipro etc. The area is maintained by Keonics, which provides all the necessary infrastructure.

2.11 International Tech Park Limited (ITPL)

The International Tech Park, Bangalore offers a superb business advantage to corporations seeking a foothold in India, one of the world's biggest emerging markets. The futuristic Park is built to exacting international standards, supported by state-of-the-art infrastructure. Amidst a refreshing and aesthetically appealing environment, the Park offers a one-stop solution integrating office, production, commercial, residential and recreational needs in a single location. The International Tech Park, Bangalore is meticulously designed and built to suit the requirements of international hi-tech companies in the field of information technology, software development, electronics, telecommunication, research and development, financial services and other non-polluting hi-tech industries.

2.12 Technology Parks

2.12.1 Software Technology Parks of India (STPI)

Software Technology Parks of India (STPI), is a society under the Ministry of Information Technology, Govt of India. Recognizing the immense potential of the Indian Software Industry, the Ministry of Information Technology (MIT), Govt. of India brought out in 1986, a policy document on "Computer Software Export, Software Development and Training". Subsequently, in 1990, the Ministry of Information Technology (MIT), Govt. of India, formulated the Software Technology Park (STP) scheme to promote & facilitate software exports from India. Offering new fiscal incentives, state-of-the-art infrastructure and an investor friendly environment, the scheme has contributed to a steep growth in the Software Exports.

Software Technology Parks of India (STPI), is a society set up by the Ministry of Information Technology, Government of India in 1991, with the objective of encouraging, promoting and boosting the Software Exports from India. STPI maintains internal engineering resources to provide consulting, training and implementation services. Services cover Network Design, System Integration, Installation, Operations and maintenance of application networks and facilities in varied areas ranging from VSATs to ATM based networks.

Currently there are 19 structural units of Software Technology Parks (STPs) united in a single autonomous formation by the IT Ministry – a network of *Software Technology Parks of India – STPI.*

Basic Characteristics of India's Software Technology Parks (STP), Export Processing Zones (EPZ) and Export Oriented Units (EOU) :

- Simpler export-import procedures, zero customs duties;
- A quick "single window" for all bureaucratic dealings;
- Lower sales taxes and excise rates;
- 10-year corporate tax exemption for STPs and 5-year corporate tax exemption for EPZs and EOUs;
- Simpler access to hard currency;
- Wholly owned foreign firms;
- Well-developed telecommunications infrastructure, access to international communications channels, in particular, to satellite communications;
- More vacant production premises and preferential terms to build new production facilities;
- Cash compensatory support and reduced rents of facilities, apartments, and lower prices for water and power supplies;
- A well-developed social and communal infrastructure, etc.

Currently the STPI share of software and services exports is 60%. STPs have 15 international outlets due to land-based satellite communication stations F3 IBS (which provide for high speed channels whose channel capacity equals that of several T1 lines). *(For example, at present in the STPs of the city of Noida the aggregate capacity of international channels of the satellite communications station is 13.824 Gbit/sec.)*

STPI has the license to provide international high speed data communication services to IT community in the country. It is also category 'A' Internet Service Provider (ISP) in the country.

2.12.1.1 STPI - International Gateways

STPI - has a complete and excellent infrastructure for operating International Gateways (IBS F3 Earth Station). Following International Gateways operating at Noida (New Delhi), Bangalore and Mysore (Karnataka), Mumbai(Maharastra), Jaipur (Rajasthan), Mohali (Punjab), Bhuvaneshwar (Orissa), Gandhinagar(Gujarat), Hyderabad (Andhra Pradesh) and Trivandrum (Kerala). From these locations high - speed data communication services and high - speed Internet access are provided.

Software Technology Parks of India - Bangalore

STPI - Bangalore was started with 2.5 crores investment by the Ministry of Information Technology (formerly known as Department of Electronics). Today the investment in the Network Operation Centre is in excess of 40 crores as this is due to greater level acceptance by the customers of STPI. It has a microwave network with 140 radios providing services to about 400 customer projects.

Nortel, one of the major telecon equipment supplier in the world, has located their hub in STPI - Bangalore since 1997, and presently the relationship enjoyed is unique and the network services rendered are of premium quality.

The Network operations center has an area of 8000 sq.ft. There is implementation of every technology one can think of - France Relay, ATM, ISDN, VSAT, Fibre, Microwave and others.

Chapter – 3.

Indian government

&

Software Policies

3. Indian Government & Software Policies

On the threshold of the third millennium a new mantra emerged in India – that of information technology. IT is now on the lips of every educated Indian, mainly due to the global success of India's export-led software industry. The industry's huge potential in generating wealth, hard currency inflow and new job opportunities has already caught the imagination of India's businessmen, individuals, economists, bureaucracy and politicians. With software production as its prime-mover, India's IT industry is a priority of the national economy and justly draws everybody's attention as an instrument and a pattern to transform the entire Indian economy.

3.1 Government Interventions in IT Industry

Recent historical evidence provides little support for the view that market forces alone can be left to determine the size, composition and characteristics of a country's industrial sector. It can be argued that governments in at least the majority of developing countries ought to retain some responsibilities for the process of industrialization.

Yet, this does not apply to developing countries only: the U.S. IT industry is known to have been government-funded in the 40s, 50s and 60s, when a strong inflow of capital was critical for the industry development. Now, with its feet firm on the ground and U.S. software products highly competitive in the global market, the U.S. IT industry development is determined by market forces. And the U.S. Government has always been actively assisting the industry development: suffice it to say that it was the Government that funded the Internet development and is currently involved in funding the

Internet 2 project; another example is *ARPA (Advanced Research Projects Agency)* investments in IT R&D, which in the 90s amounted to hundreds of millions of US dollars.

In all countries governments are the largest consumer of IT products and services. Thus, the U.S. government sector consumes 23% of IT national consumption, and in India this figure is about 28%. Thus, government demand for IT products and services in many respects affects the areas of IT industry development.

By formulating and pursuing certain economic, legal and taxation policies, by setting priorities, the governments cannot but intervene in or influence the development of economic industries in their countries. **The government has three roles to play in economic development – that of**

- ***a regulator***
- ***a promoter and***
- ***a producer.***

"The East Asia Miracle" - a study published by the World Bank, stressed the need to formulate clear-cut government policies to intensify the IT industry development.

3.2 Indian Government Policies to Develop Software and Services

India exemplifies a country where the government has been strongly supporting software and services development.

3.2.1 Software Development Constraints

The Indian software industry faces a number of development constraints, which include:

- Overall low level of the country's economic and social development;
- Limited access to financial sources;
- Limited access to emerging technologies;
- Insufficient number of highly professional and well trained staff;
- Low standards of technological research and production development;
- Limited access to telecommunications and other infrastructure;
- Limited access to the international software and services market and to information about them;
- Insufficiently developed domestic market;
- Computer piracy, etc.

In response to these constraints, The Indian Government's actively intervened in software industry development aimed to minimize these constraints and their negative implications for the industry development.

The current surge of India's software industry, given the country's narrow domestic market and a low level of economic development, has become possible due to the government policies of incentives for **science-intensive technology exports**, and in particular, for **software and services exports**. As a result the IT industry has become markedly export-oriented.

India's software industry is the result of the government policies aimed at encouraging high technology export in general, and IT software and services export in particular. In 1998, the Indian government set up a National Task Force on Information Technology and Software Development (IT Task Force) to define the draft of a

National Informatics Policy. The IT Task Force has submitted the Information Technology Action Plan for the next 10 years (till the year 2008) which is aimed at accomplishing the following three basic objectives:

- **Info-Infrastructure Drive**: Accelerate the drive for setting up a world class Info Infrastructure.
- **Target ITEX – 50**: Target for a $50 billion annual export of India's IT Software and IT Services.
- **IT for all by 2008**: Accelerate the process of IT penetration into every walk of economic and social life.

3.3 History of Government Policies in Software and Services Production

3.3.1 The 1970s: Building the Basis for Software Exports

In the mid-60s, the Indian government's industrial policies showed some signs of liberalization, departure from rigid planning and an emphasis on exports, while the government policy's principal elements remained unchanged. At that time hardware was predominantly imported.

In the 1970s, the government tried to intensify domestic hardware production by tough regulatory measures (e.g.: by introducing 100 percent customs duty on hardware imports and by reducing hardware imports. By encouraging software production the Government primarily aimed to create conditions for exporting producers to be supplied with imported hardware.

In the mid of 1970, the Department of Electronics was established *(DoE, in the late 90s it was reorganized to become the IT Ministry)*, whose responsibilities were to promote the software industry and to formulate policies for its development. In the early 70s, the

DoE approved some export developing programs. Thus, in 1972 it adopted the "Software Export Scheme" that allowed hardware imports in order to produce software under certain export obligations.

The year 1974 can be regarded as the year of birth for Indian software exports: it was the first time in history when the Indian company - *Tata Consultancy Services (TCS)* - took a decision to export software in order to import hardware.

That period was described as a "law-making" time and, indeed, some specific measures were taken to give momentum to the development of the industry:

- The DOE invested significant funds in scientific research projects carried out by public enterprises involved in software development.
- Government support was provided to Indian companies – software developers (who actually adjusted imported software products).
- The government supported the system of higher computer education to enable it to meet the modern standards of the industry development.

In 1976, the industrial policy was in part liberalized:

- Customs duties on imported hardware were reduced from 100% to 40%.
- Banks were recommended to extend loan terms for software producers.
- Software exporters were promised faster customs clearance, besides they were allowed to be located in *EPZs (Export Processing Zone*) whose taxation was preferential and export-import procedures organized.
- Software exporters began to get cash compensatory support - 8% of their total exports.

On the other hand, the Indian Government pursued the policy of encouraging domestic producers of hardware by limiting activities and rights of foreign importers. The Government exerted pressure on foreign companies by making them continuously improve their technological process, pay for the entire import with equivalent exports, and reduce their share in Indian companies, etc. These measures resulted in IBM departure from India in 1978 and consequently in the inflow of 2,000 ex-IBM skilled specialists to the Indian labor market. This had a positive impact on the industry development, since many of them had good managerial skills and set up their own companies.

3.3.2 1980 – 1984: Regulatory Measures

Between 1980 and 1984, some measures were taken to toughen control over hardware imports. To boost domestic production, customs duties for imported hardware were raised to 135%, and export enterprises were recommended to import hardware under a new pattern – by leasing.

In 1981, the Ministry of Trade established the status of an export-oriented unit – *EOU (Export-Oriented Units)*. By their rights and benefits EOUs were placed on the same footing as EPZs, but unlike them EOUs lacked in developed infrastructure.

Despite toughened policies to lower the abuse of the then export- import legislation, the DoE further promoted conditions for software and services export growth. For example, it was at that time that *the Engineering Export Promotion Council (now the Electronics and Computer Software Export Promotion Council*) began to assist software and services exporters in marketing. Later the Trade Development Authority was entrusted with these functions.

3.3.3 1984-1986: New Computer Policy

By 1984, it became clear that the government policies failed to meet the requirements of the developing industry and there was an urgent need to work out a new concept. It took quite a long time to develop *New Computer Policy*. Its draft was approved in November 1984 – a few days after *Rajiv Gandhi* was elected Prime Minister.

An ardent supporter of computerization and high technologies, the new Prime Minister came to power at a time when IBM-compatible PCs emerged in the Indian market. While the main points of the *New Program* addressed computer production in India, it also included measures to liberalize the software and services industry. In particular, it aimed:

- To simplify procedures related to hardware imports;
- To reduce the price of imported hardware by lowering the basic customs duty on imported hardware from 135% to 60%, and on some peripherals from 80% to 5%;
- To lower duties on imported software from 100% to 60% and to permit duty-free imports of source code software on paper;
- To recognize software production as an industry and to delicense software development;
- To simplify procedures related to hard currency accounts and transactions;
- To allow the use of international telecom links to export software and services;
- To place software under the Copyright Act (which brought the threat of fines or imprisonment for software pirates).

3.3.3.1 Government software policy in the making: Rajiv Gandhi and his coterie

The role of certain government officials interested in formulating the present-day policy targeting for the country's leading position in information technology deserves special attention.

It was then – in the mid-80s – that the basis for India's industrial policy in software production was laid, which prompted its further boom.

A key role in formulating the main areas of this policy was played by Dr. H. Seshagiri, the DOE Additional Secretary, who between 1984-1986 was the moving spirit and architect behind the government liberalization policy in the software industry. Sincere, determined and actively committed to liberalization, Dr. Seshagiri saw India's future as that of a strong competitive software power and tried to implement his beliefs. In his words, by developing software exports India gets access to a vast economic and technological potential, which will obviously benefit the country.

Rajiv Gandhi, as Prime Minister, took a personal interest in the liberalization of industrial software policy. Seshagiri's initiatives were broadly supported by Rajiv, partly because they had worked together on information systems for the 1982 Asian Games.

In the mid-1980s, some ministers and advisers supported the development of the software industry. Among them was *Vishvanat Pratap Singh,* who was Finance Minister during the early part (till January 1987) of Rajiv Gandhi's tenure. That support had an important impact, since Dr. Seshagiri's activities to liberalize India's industrial policies were opposed by some government officials.

Some of Dr. Seshagiri's initiatives failed to be implemented at that time, however they laid the basis for further reforms made in

India in the late 80s and the early 90s. It was this man's efforts that provided a foundation for the further development of the DoE and for its transformation into a promoter of the software industry, into a technocratic rather than bureaucratic authority.

3.3.3.2 1986: Software Development as a Priority

In 1986, India made the development of the software industry one of the economic priority areas. The Indian Government developed the program: *Policy on Computer Software Export, Software Development and Training*. Under this program, hardware imports were made easier through some procedural changes, and regulations on domestic-oriented use of imported hardware were dropped. The import of software was also delicensed (changed from quota to tariff protection) so that anyone could import it if they paid the 60 per cent import duty. However, hardware imports became more risky because the attached *export obligations* were strengthened.

Software exporters' cash compensatory support was raised to 10% of their total exports.

In 1986, the *Software Development Agency (SDA) was set up within the DOE.* The new structure was designed to formulate, implement and coordinate government software policies and also to assist the country's software industry development.

In 1986, the DOE came up with its favorite brainchild – its first *Software Technology Parks (STPs)* Their aim was to promote offshore programming and get faster and easier access to international telecommunications. Under certain terms and export-import obligations the STP status can be given both to an individual company and to an entire industrial zone locating multitudes of companies. STP rights and benefits in international economic activities and in tax

concessions were equal to those of EPZs and acquired the status of EPZs under the DoE control (while the Finance Ministry was in charge of «regular» EPZs).

3.3.3.3 Import Liberalization Implications

Import liberalization was needed to make use of the world's advanced high-tech achievements. This, in turn, helped India:

- ❖ overcome technological barriers in offshore software development;
- ❖ fill the gap between world technologies and pricing and India's ones;
- ❖ increase productivity and improve software production quality;
- ❖ increase software exports considerably.

3.3.4 1987-1990: Policy-Making during Reversed Liberalization

According to some Indian industrial officials and international observers, that period is described as departure from a clear-cut liberalization in India's entire government industrial policy, which also affected government policies toward the software industry. Then government measures can be described as "one step forward two steps back". However, by the end of that period software and services exports in India were regulated by the following provisions:

- ❖ **"10 crore rule"** (1988). Any large company exporting more than Rs. 100 million of software ($7.1 million at the then exchange rate) could pay off its export obligations in whatever manner it chose *(for example, it could be done at the expense of their staff working on their clients' sites overseas),* while smaller companies were restricted to exports that made use of the imported computer which had attracted the export obligations in the first place.

- **New hardware import conditions**, differentiated export obligations and customs tariffs. Thus, for EPZs, EOUs and STPs hardware imports had zero customs duties, while for the remaining enterprises:
  - Loaned computer systems could be imported:
    - for 6 months, with an export obligation of 25% depending on the cost of the imported hardware, and customs duties were 18%;
    - for 1 year, with 50% and 20% respectively.
  - The bigger obligations the companies assumed, the lower customs duties for imported hardware they paid:
    - If export obligations were high (350% of the imported hardware value) customs duties were 35%;
    - If export obligations were low (250% of the imported hardware value) customs duties were 65 %.
- **Software import duties were established at 107%** (on any medium)

From 1987, software companies had to register with the DOE to receive certain export promotion assistance.

The export turnover threshold for those eligible to register was reduced from Rs. 5 million in 1987 to Rs.0.2million in 1989.

An insurance scheme was introduced in 1987 to cover the clients of Indian software companies against malpractice, besides, export shipment credit and credit guarantees were made available. During the same period **venture capital funding** for software companies was first introduced.

In 1986, India launched a telecommunications satellite to ensure fast communications between their software R&D companies

and their overseas clients. In 1987, a Bangalore branch of the U.S. company *Texas Instruments* installed the first land-based satellite communication station in India to organize export-import transactions related to software development (for voice and fax communication and for data transmission).

In 1988, the government set up the *Electronics and Computer Export Promotion Council* to support electronics and software exporters mainly in the area of marketing.

Late in 1990, the software industry was wholly exempted from tax on export profits received from software and services exports.

In 1990, the concept of software technology parks took more specific shape of *Software Technology Parks of India (STPI) Scheme*, under which the STP status of an export processing zone under DOE was reaffirmed.

3.3.5 1991-1997: Renewed Liberalization

Early in 1991, software imports became more problematic. This was caused by the rupee devaluation and more stringent import policies (demands for considerable cash deposits in hard currency, software import duty was raised to 112%, new procedural difficulties in customs clearance were introduced, etc.).
In the middle of 1991, with new Prime Minister *Narasimha Rao* and new Finance Minister *Manmohan Singh* in power, India started a new phase of its development – a liberalization boost in the entire industrial policy. Manmohan Singh had received Western education, for some time he had worked for the World Bank, had liberal views which he actively implemented when he was Finance Minister.
In that period,

- Private capital was allowed access to most industries (except six strategically important ones);
- Many foreign trade barriers were lowered;
- Lists of imported goods subject to licensing were shortened;
- Foreign investment policies were liberalized especially with respect to institutionalized investors and non-resident Indians;
- Acceptable ratio of exports to domestic sales was established for exporters;
- Foreign capital share was increased to 51%, and for exporters - to 100% *(earlier it had been allowed only in EPZs and STPs).*

In 1991, N.Vittal was appointed the DoE Secretary. In many respects due to his activities in software policy-making some software-related measures were adopted. They encouraged the industry's further development. Among the most important measures were the following:

- Reduction in telecommunications charges for satellite links;
- Duty-free, obligation-free import of telecommunications equipment into EPZs, STPs, etc.;
- Confirmation of exemption from profit tax on software and services exports;
- Zero excise rates from software sold;
- Export obligations can be met from earnings of the staff sent to work overseas at the client's site.

From the mid-80s, the World Bank actively promoted India's software development by funding and supporting government reforms and changes in finances, education and marketing. Namely, in 1990-1991, technical training support projects were approved. Under the projects, the Indian Department of Education was to receive U.S.$ 567 million during 8 years. In 1992, the World Bank developed the IT

strategy it recommended to India, where it defined the guidelines for government-encouraged growth and improvement of IT production.

Late in 1992, the Department of Electronics was reorganized to increase its role of a promotional body for the software industry. The process included:

- Change and update of DOE training policies;
- Change and update of DOE R&D policies;
- Changes and amendments in the Copyright Act to toughen punishment for illegal software production and software piracy.

Import policies were changed: customs duties for software imports were reduced from 112% in 1991:

- to 110% in 1992,
- to 85% in 1993,
- to 20% for applications and to 65% for systems software in 1994,
- to 10% for all software in 1995.

In 1992, India's IT industry marked a remarkable event: for the first time an Indian software producing company received ISO 9001 certification. The pioneer company that opened the way for many other Indian companies was *International Informatics Solutions*. From 1993, the government in every way encouraged Indian software companies to obtain international certifications like ISO 9000, CMM and others.

In April 1993, India permitted reproduction (duplication) of imported software by agreement with foreign partners. If the author's share of a foreign company was less than 30%, there was no need for a preliminary DOE permission to organize production.

In September 1995, India adopted a regulation which made individuals, firms and companies working abroad under software and services contracts return to India at least 30% of the contract amount.

In the same period, new high export obligations were introduced – 400% for a 5-year period, which made it possible to import hardware and pay 15% customs duty.

3.3.6 1998-2000: Targeting for Leading IT Positions

In 1998, Prime Minister *Atal Bihari Vajpayee* said in his first televised address to the Indian people that the development of the IT industry was one of the five national priorities and declared that India was targeting for the status of a global IT superpower. In April 1998 at an annual *CII* (the *Confederation of Indian Industry)* session, the Prime Minister stressed that IT production was the only sphere where India would be able to rate among the superpowers due to the country's high competitiveness. In the same year, the *IT Task Force"* was set up by the Government.

It is remarkable that Dr.N.Seshagiri – now General Director of India's National Informatics Center became the General Director of the organizing committee for this new government body. N.Vittal was also included in the committee.

The IT Task Force launched India's software development program for the next decade (up to the year 2008) - ***Information Technology Action Plan.***

This plan is being implemented now. The Indian IT Ministry's official site shows the implementation of all its points and can be openly accessed.

The IT Action Plan defines three major development areas of the IT industry:

1. **Info-Infrastructure Drive** as a key factor for the industry development.

The main objective is to develop a world class information infrastructure, which provides for a 30% annual growth of the entire telecommunications infrastructure from the 1998 level that had the following performance indicators:

- Fiber Optic communication – 75,000 km of fiber optic;
- *VSAT (Very Small Aperture Terminal)* – aggregate channel capacity of over 300 Mbit per second;
- Satellite antennas – aggregate channel capacity of 3,000 MHz.

The program involves measures to build state-of-the-art information infrastructure, to develop and integrate local, national and global telecommunications infrastructure into a single network by developing fiber optic links, satellite telecommunication and wireless (radio communications).

Proposed measures to implement this include:

- Delicensing of certain services;
- Lower tariffs;
- Private sector development;
- Privatization of India's major state-owned telecommunication company – *VSNL*;
- Demonopolization of international VSNL Internet outlets, development of private Internet providers for international outlets;
- Building of «Hi-Tech Habitats» with developed infrastructure and research/educational institutes, etc.

2. **Target ITEX-50** *(ITEX – IT EXport)* – **to reach U.S.$ 50 billion exports by 2008**. It also includes some measures to develop the domestic software and services market.

To this end, **taxation policies** have been revised , namely:

- Zero customs duty and zero excise rates on software imports were introduced from January 1, 1999;
- Phased reduction to zero of customs duty on hardware and hardware-related imports;
- Zero income tax on software and services exports for individual software developers;
- Tax allowances were introduced for PC purchasers;
- 100% depreciation of hardware and software within 2 years after purchase.

In terms of **finances**, the software and services industry was announced as a priority industry for investments, and

- Schemes of preferential financing for the industry's enterprises were proposed;
- Measures were taken to create favorable conditions for **venture capital foundations**, in particular, the withholding of corporate taxes on investments in software development companies, etc.

As part of the **ITEX-50** program, measures are being taken

- To promote Indian companies in the global market;
- To optimize investments by Indian companies in foreign firms and purchases of foreign companies' shares;
- In the global market, to create India's image of a provider of high quality services and products;
- To provide government support and incentives for the companies to obtain ISO 9000, IS/ISO 9000, ISO 14000, SEI CMM certifications of the 2nd and higher levels;

- To promote Indian brands, etc.

3. **Information Technology for all by 2008**: informatization in all walks of life.

As part of this program, the following measures are being implemented:

- National program of **overall computer literacy**, a broader computer park and Internet access (by 2008, 50 people are planned to get access to one Internet connected PC, while in 1998 the respective figure was 500 people), adjustment of imported software, software translation into the languages of nationalities residing in India.
- Program of **computerization and broad use of the Internet in all walks of life**, including banking transactions, medicine, education, e-commerce, development of information centers and libraries, etc.
- Program of **IT-supported national governance** and of highly effective information links to citizens.
- Program **to improve quality of IT education** of all levels (from elementary to high school, graduate and postgraduate) and **to train skilled IT staff**. As part of this program, an ad-hoc government commission was set up within the Department of higher and secondary education in July-August 2000. It was made up of Minister of Education, Minister of Finance, IT Minister and others. The Commission adopted a program - *"Human Resource Development in IT"*. Its measures aim to raise IT education to the world's highest level, using, among others, the following ways and means:
  - To improve the quality of secondary and higher IT education;

- To train highly skilled specialists using global IT technologies;
- To make specializations of trained staff more consistent with software industry requirements;
- To increase the number of IT graduates;
- To coordinate activities of the private and public education sectors;
- To organize various types of Internet education, systems of remote education and the use of PCs to improve educational levels.

In the context of these objectives, it should be reminded, that in India ***about 46% of adults – over 15years of age –are illiterate****. To increase the literacy level still remains the most urgent issue and the most vital prerequisite for successful implementation of IT programs.*

3.3.7 2001-2002: year of significant progress and achievement

The year 2000-2001 (July-June) has been a year of significant progress and achievement for the Computer Society of India (CSI) – the premier Society of IT Professionals in India.

The Society which has a strength of about 20,000 members conducts its activities through its 61 chapters and 80 student branches located across the country. As is widely known, in the global scenario India, with its vast pool of talent and brain power, is a leading player in the development and application of Information Technology.

The IT scenario is so very rapidly changing that it has become imperative to have a more pragmatic vision with objectives and goals which can meet the emerging trends, needs and challenges. Hence CSI's vision document primarily lays more emphasis on improving the quality, level and areas of activities to keep pace with

the changing needs and demands of the future. In furtherance of these objectives CSI had conducted a large number of activities during the year through its various chapters and student branches.

Following were some of the activities conducted.

I. Seminars, Conferences and Workshops:

Three 2 day National Conferences on e-Security, one each at Bangalore (July, 2000), Rourkela (Feb. 2001) and Pune (Feb. 2001) were held. These conferences emphasized the importance of e-Security for the success of e-Commerce.

CSI 2000 - the 4 day National Convention with the theme 'Society and the Digital Millennium' was held at Chennai in Sept. 2000. Over 1000 delegates from India and abroad participated in the convention which also had an IT Exhibition with about 150 stalls spread over an indoor area of nearly 50,000 sq.ft. The exhibition was visited by over 75000 people.

CSI recognises outstanding contributions and confers every year "Fellowships " which are of universal distinction. In addition the meritorious 'Honorary Fellowship" is conferred by CSI upon a distinguished person of international repute. CSI takes pride in announcing that in CSI-2000 , it had great pleasure to confer the Honorary Fellowship on Sir Arthur C Clarke .

COMAD 2000, the International Conference on Data Management, was held at Pune in Dec. 2000. The Conference focused on the new developments in the principles and practices related to Data Management and brought together Researchers, Practitioners, Developers and Users who presented and discussed emerging trends, concepts, techniques, technologies and experiences in Data Management.

A 2 day National Conference on 'IT in Education' was held in Calcutta in Feb.2001.

Computing 2001, a 2 day National Conference on 'Web Enable Application' was held in Indore in March 2001.

CONSEG-2001, a 3 day International Conference on Software Engineering on the theme 'Software Engineering : Emerging Trends' was held at Trivandrum in March 2001.

CONMICRO-2001, a 2 day National Conference on Micro Computers on the theme 'Era of e-Revelation' was held at Lucknow in April 2001.

II. CSI & SEARCC:

Apart from the Conferences and Exhibitions the most path breaking event of the year was the formal launch of the results of India's First National IT Skills & Manpower Survey covering individuals and organizations conducted by CSI . India geographically being a vast country the survey which in the first phase alone covered over 300 Corporates and 3000 IT Professionals, was indeed a very expensive and tough task but nevertheless it was completed with determination. It was the first serious effort in India to assess the status of skills and manpower of Information Technology Communication Professionals in the country and highlighted the gaps in skills and the numbers that exist which will be useful to policy makers. The survey results were formerly launched by the Joint Secretary, Ministry of Information Technology, Government of India, in the honorable presence of the Federal Minister for IT, Communications & the Arts, Govt. of Australia during the latter's visit to Mumbai in Dec. 2000.

III. CSI's Contribution in Research:

In the field of IT research, one of the several important projects completed during the year was CSI's Research Project on prevention of the dreaded foot and mouth disease in Cattle. With the aid of CDs developed, various CSI Chapters are currently educating farmers in urban and rural areas on this dreadful disease and the steps needed to be taken for its timely prevention.

CSI's continuing work in specified research areas specificially in General Education curricula design, multimedia and software usability, achieved considerable progress during the year.

IV. CSI & IFIP:

The Society took steps during the year to increase its IFIP related activities. Accordingly KBCS-2000 a 2 day International Conference on Knowledge Based Computer Systems was held at Mumbai in Dec.2000. The Conference provided a platform for all those in India and abroad interested in Artificial Intelligence, to interact and share ideas . KBCS-2000 was sponsored by IFIP & CSI.

Yet another IFIP related event which CSI is endeavoring to organize is NETWORKS- 2001. The Society has proposed to organize this event at Hyderabad in Dec. 2001.

V. CSI & Student Activities:

There are about 80 Student Chapters spread over India. Many of the CSI Student Branches organised during the year the State level student conventions. These Conventions were held at States like Andhra Pradesh, Karnataka, Tamilnadu, Kerala, Maharashtra etc and largely attended. The Karnataka Student Convention at Belgaum which

was held for the fourteenth year in succession was attended by over 500 students of the State.

During the year CSI conducted the National Software Programming contests at various centres across the country at the regional and national level and selected two School teams of students below the age of 17 years. These teams were imparted thorough training in software programming language Q Basic. CSI sponsored participation of one of the teams in the International Software Programming Contest held at SEARCC-2000 Convention in Manila.

VI. CSI & Social Service Activities:

During the year CSI Education Directorate at Chennai which periodically conducts examinations, took steps to implement several projects of social and educational significance. One such project is of conducting examinations for those from the economically weaker sections of the Society undergoing computer training courses conducted by Sterilite Foundation - a charitable institution having 181 training centres all over the country. There has also been a request from the Victoria School for the Blind, Mumbai to conduct examinations for the students (some of them completely blind and others with impaired vision) undergoing training in basic computer language. CSI is working out an MOU with them to see how best we could render service to the disabled.

Software moghul Bill Gates is on a quick India sojourn and all spotlights are focused on the big man. While the agenda of the chairman of Microsoft, the world's Number One software company, might appear a bit different this time, it is clear that software continues to hold his attention and his commitment.

Finding it difficult to grow further in the near-saturated markets of the US and Europe, global software and services companies are now making a beeline for a piece of the Indian telecom services software market that still looks lucrative.

US-based companies like Comverse Technologies, CSG Systems and Portal Software are among those that are trying to increase their footprint in India over the past year. All of them cater to telecom operators in areas like billing, customer care and customer management. Interestingly, many of them are either incurring losses or reporting substantial drop in their bottom lines in their existing operations.

The Indian market, however, still offers good revenue opportunities.

According to the Yankee Group, the Indian market for mobile services grew nearly 80 percent within a year, from 3.5 million subscribers in March 2001 to more than 6.43 million subscribers in March 2002. Moreover, since India's tele density is very low, the potential for growth is huge.

The size of Indian telecom software is considered to be around Rs. 4,500 crore, but that also includes exports, according to Voice and Data. Nasscom estimates the total IT/Telecom vertical market (including hardware) was around $1.2 billion last year. Deal sizes are respectable, if one goes by the recent $10 million deal won by Comverse to deploy pre-paid mobile customer system for Reliance.

India appears to be a dream destination for such companies as most of these companies - apart from tapping the local market - are setting up software development operations also. The idea is to leverage their sales presence as well as to enjoy the cost and technology skills advantage. "It's a win-win situation for them. While

they generate more revenues from sales, they save a few dollars on each person hour invested in software development," says a Delhi based corporate consultant.

According to Comverse Technologies worldwide vice president for corporate marketing and corporate communication Paul D Baker, the telecom industry worldwide is going through a tough time. "India is one of the few markets where substantial growth is expected in the next few years".

Comverse started its subsidiary in India early this year and has also secured large orders from Indian operators recently. "The Indian telecom scenario is witnessing rapid growth in mobile telephony.

Portal Software, another $120 million customer management and billing software company, has also entered India recently to tap the local market and set up a development centre.

Indian IT Manpower: Driven by Continuous Learning

Indian IT professionals have been on the radar screen of the world for over a decade now, known for their state-of-the-art skill sets, high productivity and cost effectiveness. Telecom software players see rich pickings in India.

NASSCOM survey shows Enterprise Software skills most sought after today

According to a research based on primary and secondary data collected by NASSCOM to ascertain manpower skill requirements in the Indian software sector, ERP skills top recruitment demand today. The survey which was conducted from June to September 2002 after surveying over 1,100 job openings revealed interesting trends that reflect the growing maturity of user requirements, the service lines offered by Indian software companies and changing skill requirements of the IT sector. The survey was conducted across leading job websites, recruitment advertisements in the print media and a dipstick survey among 20 HR professionals in the Indian software sector. Key highlights of the survey are: **Indian Market ERP skills lead the pack** as user organizations in export markets attempt to fine tune ERP **Skill Set% of jobs** Enterprise Software .NET, Java, J2EE, Unix, SQL, C++, COBOL, CICS, DB2, CRM, Business Intelligence, Data Warehousing, Linux, EDA, ASIC, VLSI, ASP, Graphics, Animation,EAI, Content management, applications to derive maximum RoI from their existing deployments. **Web Services** are next in line and reflect the growing importance of this fast growing technology, with skill sets such as J2EE and .NET in high demand The relative importance of traditional skill sets such as **Unix, C++, COBOL, CICS, DB2** continues to be high New application skills in **Business Intelligence & Content Management** are growing rapidly with companies demanding specialists in WebSphere, Cognos, and BEA Web logic Interestingly, **EDA/ASIC/VLSI skills are growing rapidly** reflecting the growing presence of Indian companies in semiconductor design. This is reflected by the fact that a growing number of MNCs such as Cadence, Mentorix, ST Micro Electronics have set up Development

Centres in India In order to ascertain the relative differences between the skill sets in the Indian market vis-a-vis the US market, NASSCOM conducted a similar survey in a leading US job site. The key trends in the US market are: In terms of relative ranking of skill sets, there is not much difference in the US and Indian job markets ERP skills and Web service technologies are the leading skills in demand in the US market too Emerging segments such as EAI (Enterprise Application Integration), Business Intelligence, Content Management and Data Warehousing account for a larger share in the US skill demand reflecting the higher levels of maturity of these segments in the US market NASSCOM findings show that Indian software companies have demonstrated significant capabilities to adapt to changing technologies and upgrade their skills. However, NASSCOM believes that the focus on IT in education institutions needs to be upgraded in order for Indian companies to further enhance their global competitiveness. For instance, India trains only 350 micro-electronics engineers every year, as compared to the requirement of over 3,500 per year. Only a handful of engineering colleges have introduced engineering design in their curricula. NASSCOM is actively working with Ministry of HRD and 9 engineering colleges to serve as a key link between market requirements and skills imparted through the formal education system. Total may not add up to 100 due to multiple skill set requirements in a single job. For instance, a vacancy might be advertised as Oracle professional with C++ skills.

In 2002 IT Enabled Services :

- Recently emerged as a major driver of software industry
- Covers services like medical transcription, customer interaction service, data digitization, back office operations
- In FY02, showed 70% growth (Rs. 70 bn)
- Employs over 1,00,000 people
- Will account for 40% of all venture capital investment by end of 2002
- India exports software to 102 countries.

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Chapter – 4.

Computer Marketing : Growth of IT Industry In India

4. Computer Marketing : Growth of IT Industry in India

India prides itself in having one of the largest technical manpower in the world. It's software industry has seen tremendous growth -- over 50% each year during the last 10 years -- which is the envy of many software exporting countries throughout the world. The students from India's top science and technology educational institutions are highly sought after by research universities in the US and Europe. India is one of just half a dozen countries to have successfully built and deployed their own satellites and launch vehicles.

India's most prized resource in today's knowledge economy is its readily available technical work force. India has the second largest English-speaking scientific professionals in the world, second only to the U.S. It is estimated that India has over 4 million technical workers, over 1,832 educational institutions and polytechnics, which train more than 67,785 computer software professionals every year. Government of India is stepping up the number and quality of training facilities in the country to capitalize on this extraordinary human resource. It is the knowledge industry that will help take the Indian economy to a sustained higher rate of growth and the policy makers are fully aware of this.

4.1 Promotion of IT - governmental incentives

With the formation of a new ministry for IT, Government of India (GOI) has taken a major step towards promoting the domestic industry and achieving the full potential of the Indian IT

entrepreneurs. Constraints have been comprehensively identified and steps taken to overcome them and also to provide incentives. Thus for example, venture capital has been the main source of finance for software industry around the world. However, majority of the software units in India is in the small and medium enterprise sector and there is a critical shortage of venture capital kind of support. In order to alleviate this situation and to promote Indian IT industry, the Government of India has set up a National Task Force on IT and Software Development to examine the feasibility of strengthening the industry. The Task Force has already submitted its recommendations, which are under active consideration. Norms for the operations of venture capital funds have also been liberalized to boost the industry. The Government of India is also actively providing fiscal incentives and liberalizing norms for FDI and raising capital abroad.

Recently, an IT committee was set up by the Ministry of Information Technology, Government of India, comprising Non Resident Indian (NRI) professionals from the United States to seek expertise and advice and also to step up U.S. investments in India's IT sector. The committee is chaired by Minister of Information Technology, Government of India, and the members include Secretary, Ministry of Information Technology and a large number of important Indian American IT entrepreneurs.

The group will:

- Monitor global IT developments and refine Indian IT policy to meet global requirements. Specifically, this will help angel investors, venture creators and incubation;
- Promote the growth of human resource development in the IT sector with the aim of creating quality-based education;

- ❖ Promote R&D in the sector by identifying thrust areas and drawing up a blueprint for action.

4.1.1 Indian Exim Policy

Exim Policy 1999 allows import of all kinds of computers in India without obtaining any licenses. Prior to 1999, this was not allowed.

Encouragement to export of quality goods or services for getting status certification.

The government and business policies targeted for better quality products and services resulted in international recognition of the Indian IT industry: by April 1, 2000, 210 companies obtained certifications ISO 9000 and SEI CMM Level 3 and higher, and about 70 were in the process of obtaining them. As of January 2001, out of 58 companies with the highest SEI CMM Level 5 certification, 32 companies are Indian, including Wipro Technologies, Tata Consultancy Services, Motorola, Zensar, IBM, Infosys, CBSI, DCM ASIC, NIIT, CG Smith, Satyam, TCS, COSL, HCL Perot, I-Flex and NeST and others.
Exim Policy 1997-2002 announced on 31 March 2000. The Government will recognize software companies who have acquired ISO 9000 series or IS / ISO 9000 Series or ISO 14000 Series or SEI CMM Level 2 and above accreditation / certification. Double weightage will be given on exports made by such units for granting status certification (e.g. Export House, Trading House, Star Trading House, Super Star Trading House).

The Indian software industry continued to get international recognition for its quality in software development.

India's Top Twenty Software and Services Exporters

Company	Certifications	
	ISO 9000	**SEI CMM**
1 Tata Consultancy Services	ISO 9001	Level 5
2 Wipro Technologies	ISO 9001	Level 5
3 Infosys Technologies Ltd.	ISO 9001	Level 5
4 Satyam Computer Services Ltd.	ISO 9001	Level 5
5 HCL Technologies Ltd. 149.37	ISO 9001	Level 5
6 NIIT Ltd.	ISO 9001	Level 5
7 Silverline Technologies Ltd.		Level 4
8 Cognizant Technology Solutions	ISO 9001	Level 4
9 Pentamedia Graphics Ltd.	ISO 9001	Level 4
10 Pentasoft Technologies Ltd.	ISO 9001, ISO 9002	Level 3
11 Patni Computer Systems Ltd.	ISO 9001	Level 5
12 IBM Global Services India Ltd.	ISO 9001, ISO 9002	Level 5
13 DSQ Software Ltd.	ISO 9001	Level 4
14 Mastek Ltd.	ISO 9001	Level 5
15 Mahindra British Telecom Ltd.	ISO 9001	Level 3
16 HCL Perot Systems	ISO 9001	Level 5
17 I-Flex Solutions Ltd.		Level 5
18 Tata Infotech Ltd.	ISO 9001, ISO 9002	
19 Zensar Technologies Ltd.	ISO 9001	Level 5
20 Birlasoft Ltd.	ISO 9001	

Source: NASSCOM, SEI

4.1.2 Special Schemes For Electronics & S/W Exports Duty Drawback Scheme

Exporters are eligible for reimbursement of all custom duty paid on imported inputs of an export product. In a few cases, adhoc quantum of duty drawback has been fixed to facilitate quick reimbursement. In other cases the exporter has to submit his claims for reimbursement with supporting evidence to the Commissioner (Duty Drawback) in the Department of Revenue, Ministry of Finance.

Duty Exemption Scheme

The scheme consists of duty free License and Duty Entitlement Pass Book (DEPB).

Duty Free License

Duty Free License include Advance License, Advance Intermediate License and Special Imprest License and are granted for duty free imports of raw materials, intermediates, components, consumables, parts, accessories, mandatory spares (not exceeding 10% of CIF value of license), Computer software and packing materials required for the purpose of export production of goods. Application for duty exemption has to be filed in the prescribed proforma with the office of the Director General of Foreign Trade (DGFT). Exporters are eligible for the Customs Duty Free Licenses against specific order on production programme on the basis of up to 100% of the average FBO value of their exports in the preceeding three licensing years. Such license is issued in accordance with the polity and procedure in force o n the date of issue of the license and is subject to the fulfillment of time bound export obligation and value addition as may be specified. Exporters of electronics goods & services are eligible for SIL benefits at 25% NFE in DTA DEPB holders and 15% of NFE for advance licence holders.

A Duty Free license needs to specify the following :

- The name and description of the items to be imported and exported/supplied
- Quantity of each item to be imported or if the quantity can not be indicated the value of the item; subject to limiting factors in standards input output norms announced from time to time.
- The CIF value of imports in aggregate.
- The FOB/FOR value and quantity of export product/supplies

Advance Intermediate License

An Advance Intermediate License is granted for the duty free import of inputs by the Intermediate manufacturer for supply to the ultimate exporter or eligible deemed exporter holding a license of duty exemption scheme.

Special Imprest License

A Special Imprest License is granted to a manufacture-exporter for the import of inputs required for the manufacture of goods to be supplied in the specified categories of "Deemed exports" as covered in the EXIM Policy.

DEPB Scheme

Under DEPB Scheme exporters are eligible to claim customs duty credit as a specified percentage of FOB value of exports made in freely convertible currency. The credit shall be available against such exports products at the rates specified by DGFT. The Pass Book would be issued with one year validity period either on pre export basis or on post export basis already made at single port of registration. The scheme covers both manufacturer and merchant exporters. Any item except those in the negative list shall be allowed for import. Third party exports are also admissible for credit under DEPB Scheme . The

DEPB on post export basis and/or the items imported against it is fully transferable. The credit rates for electronic items are announced by DGFT from time to time.

Deemed Exports

The Following category of sale of goods and services services will be regarded as "Deemed Exports" under the Export-Import Policy, provided the goods are manufactured in India and the payment is received in Indian rupees.

- Supply of goods against licences licences issued under Duty Exemption Scheme
- Supply of goods to units located in EPZs or EOUs, EHTPs and STPs;
- Supply of goods to projects financed by the multilateral or bilateral agencies/Funds or any other agency/Fund as are to be notified by the Ministry of Finance under international competitive bidding or under limited tender system in accordance with the procedure of those Agencies/Funds where the legal agreement provided for tender evaluations without including the custom duty.
- Supply of Capital Goods to fertilizer plants to the extent of 10% of FOR value, if the supply is made under the procedure of international competitive bidding
- Supply of goods to any project or for for purpose in respect of which the Ministry of Finance by a notification permits the Import of such goods at Zero custom duty coupled with the extension of benefits under this capital for domestic supplies.
- Supply of goods to the holders of licenses under EPCG scheme subject to the condition that such supplies will be eligible for benefits as stated Exim Policy.

- Supply of goods to such projects in power, oil, gas sectors in respect of which Ministry Finance by a notification extent the benefit under this chapter to domestic supplies. Deemed exports are eligible for the following benefits in respect of manufacturer and supply of goods qualifying as deemed exports:
- Special Imprest License/Advance Intermediate Licence.
- Deemed exports Drawback Scheme.
- Refund of terminal excise duty;

4.1.3 Nil Excise Rates

Government of India has taken another major step for Excise Rates:

1. Computer software attracts "nil" excise rates (duty).
2. Excise duty is exempted on goods purchased from the Domestic Tariff Area (DTA) by units in 100 percent Export Oriented Units (EOUs), Export Promotion Zone (EPZs), Software Technology Parks (STP), Electronic Hardware Technology Parks (EHTP). Ministry of Finance Notification No. 1/95 dated 4 January 1995.
3. No Service Tax on Computer Software Services - Ministry of Finance Notification No. 4/99 - Service Tax dated 28 February 1999. As per the above notification, taxable service provided to any person by a consulting engineer in relation to computer software development is exempt from the purview of Service Tax.

4.1.4 The Panel On Development, Manufacture And Export Of Information Technology Hardware

New Policy Paradigm For The It Hardware Industry

The Hardware Industry and the Software Industry are two sides of the same gold coin representing India emerging as a Global IT superpower. The Government of India approved the 108 recommendations covering IT Software and associated services. The second integral part of this exercise is the matching policy framework for the IT Hardware and associated services. The success of one, whether it is the export of software of $ 50 billion by the year 2008 or IT penetration drive for realising IT for all by 2008, depends on the concomitant success of the other which calls for the creation of policy ambiance for the IT hardware industry. The past and the existing policy framework brought about a high degree of uncertainty discouraging investments in a frequently changing duty regime, with duty on inputs often more than that on finished goods, with cumbersome and counter-productive import/export procedures which impeded the velocity of business. This predictably led to the decline in value addition of the hardware industry and eventually to the closing down of many of the units. In contrast, the software industry flourished with a continuously increasing buoyancy attributable, in part, to the factor advantage of high quality software human resources and partly due to a series of incentives given and procedural simplifications made special to this industry. Being human resource intensive, the software industry was able to convert this comparative advantage into increasing exports. Techno-economists pose the obvious question: Given the same degree of incentives and simplification of procedures bestowed on the software industry , is there a feasible policy regime which can give similar buoyancy to the

Indian IT Hardware Industry inspite of the relatively higher capital intensiveness of the industry as a whole, without conflicting with the growth of the Software and IT Services industry? The answer to this question requires careful reconciliation between numerous conflicting factors, which are outlined here. In a controlled economy, different import duties were levied on various components and subsystems going into the manufacture of the end-equipment like Personal Computers depending upon whether the component is made in the country or not. For those made in the country, a suitable higher barrier on import is placed. Added to this, is the financial resource mobilisation for which Government is utilising the import duty as an instrument. Most countries which have succeeded in setting up the hardware industry on a large scale with high value addition, have done so without taking recourse to this route. In India, taking this route in the past was one reason for the progressive decimation of the hardware industry. Higher duty on Personal computers, for example, would mean that the cost of Personal Computers in India will be higher. This in turn, will severely impede the large scale penetration of PC-based applications in the social and economic spheres of the country. The opportunity cost associated with not having these IT applications in place to the desired levels, is several times the revenue mobilised by the levying of such duties. The adverse price elasticity has resulted in far more adverse demand elasticity. Without having enough population of IT products in the country, the economy of scale got reduced. Producing IT hardware at unviable economy of scale, has resulted in increased cost of production. Thus, the entire industry languished as a small time industry. The flourishing software and IT services industry, which saw this trend as a counter-productive economics, increased the pressure for taking the import route. Thus,

they perceived the hardware industry as a stumbling block to their growth and consequently became a direct or indirect agent for de-emphasising the value addition in the hardware industry. The hardware industry, under such pressure, took recourse to a continuously decreasing added value in their manufacture. The IT hardware industry increasingly got transformed into direct or indirect dealers of foreign brands. When this happened, the software industry and those wanting to promote more and more IT services and applications, began asking a logical question: "why should imports be so channellised only through those who were labelled as hardware manufacturers and why not open out imports through non-manufacturing dealers and get the systems maintained either by themselves or through third party maintenance service units?" Based on the recommendations of the National Task Force on Information Technology and Software Development, the Government of India approved the policy for advancing the zero import duty target on all IT finished goods from 1-1-2003 to 1-1-2005 and several key parts to January 1, 1999 in the WTO-ITA-I schedule. With less than 30 months to this target, applicable specially to only the IT sector, the Government's revenue earning through import duties need not be a major concern. The protection of the surviving units of the hardware industry can be given as a reason for not advancing the target date even further. With the drive for PC and other IT product penetration ever-increasing and with the past and existing policy paradigm, it is unlikely that many of these surviving hardware units which have achieved higher value addition can survive to see the year 2003. Marginal retuning of the policies would have no salient impact. If the present surviving units are required to survive and grow in future and if the entire hardware industry has to be put on a high growth path,

without adversely affecting the growth of the software industry as well as IT services and applications, then a major paradigm shift of the policy regime is essential for the following reasons:

1. Uncertainty discourages investment - uncertainty has to be minimised by avoiding change of duty regime every year with zero duty as the ultimate goal.
2. 2. Duty on inputs should not be more than that on finished goods, as the negative potential gradient will impede further investments.
3. All factors leading to the gray market, which creates unfair competition, have to be de-emphasised.
4. In an import intensive industry like the hardware industry, with fast changing prices and obsolescence, all procedures for imports, exports, licensing and inspection should be simplified to help increase the velocity of business.
5. The economical scales internationally achieved should also be nationally achieved in the shortest possible time. Until large enough volumes of production can be put in place, the market should combine a large enough export drive with the internal market.
6. Competitive climate for investment and production in comparison with that present in the competing countries should be put in place including those related to customs, foreign exchange regulations, labour laws, banking facilities and support infrastructure.

Making IT hardware manufacture viable in the Indian context, is a major challenge of reconciling highly conflicting parameters cutting across software, IT services and applications, hardware import, hardware manufacture, subsystem and parts import, subsystems and parts manufacture, component import and component manufacture. One exercise is to work out the reconciliation which calls

for a minimum sacrifice - be it the loss of Government revenue, attenuated growth of one industry or the other, survival of the more disadvantaged units, slowing down of the IT application drive, etc. For evolving such a well knit integrated package of policies, the Soft Bonded IT Unit (S-BIT) scheme is proposed with the following broad features:

(i) Any set of policies oriented towards making India an IT Super Power should consider IT Hardware and Software as two sides of the same coin.

(ii) A steady decline of the IT hardware industry over the past 7-8 years due to faulty and deficient policies , should be immediately reversed into a growth path through the introduction by a set of policies conducive to growth and international competitiveness.

(iii) An investment climate comparable to Taiwan, Philippines, Singapore, Korea and Malaysia has to be created in India in order to derive the maximum competitive advantage from the twin factors - a Low-cost high quality knowledge workforce and a fast growing internal market.

(iv) Local and export production should be seamlessly integrated for maximising the economy of scale.

(v) The unit should be subjected to only fiscal and procedural control and not physical control.

(vi) For maximising the velocity of business, a-posteriori controls should substitute the existing a-priori controls.

(vii) 'Export obligation' should be substituted by 'self-regulated export incentives'

(viii) Aggregation of S-BIT units to any extent, even to the complexity of a self-contained High-Tech Habitat, should be

possible subject to the same set of policy instruments at all levels of complexity.

(ix) The Indian IT Industry should be made strong enough to meet the demands of a zero duty regime under the WTO-ITA by the year 2003 by creating a maximally similar condition within the S-BIT Unit.

(x) The S-BIT Scheme should be, by and large, revenue-neutral in the long run for the Government. To work out details of such a scheme as well as to identify and work out the policy instruments for simplification of procedures and giving appropriate incentives to the industry, the National Task Force on Information Technology and Software Development decided the setting up of a Panel on the Development, Manufacture and Export of IT Hardware.

4.1.5 Income Tax Deduction in respect of profits derived from export of computer software

As per the provisions of section 80HHE of the Income tax Act, 1961 ("Act"), profits derived from export/ transmission outside India of computer software or provision of technical services outside India in connection with development/ production of computer software are exempt from tax up to a specified limit. Profits from export of computer software also include profits derived from on site development of computer software. Further, deduction under this section is also available to supporting software developers.

Percentage of profits that can be claimed as a deduction under section 80HHE of the Act is as follows:

Financial Year	**Amount of Deduction**
Financial Year 2001-2002	70 percent
Financial Year 2002-2003	50 percent
Financial Year 2003-2004	30 percent
Financial Year 2005 onwards	**No Deduction**

Computer software for the purpose of claiming deduction under section 80HHE means a computer programme recorded on any disc, tape, perforated media or any other information storage device and includes any customized electronic data or any product/ service of similar nature notified by the Board which is transmitted from India to a place outside India by any means. The Central Board of Direct Taxes ("CBDT") has notified a number of information technology enabled services such as back office operations, call centers, data processing, revenue accounting, payroll, medical transcription, insurance claim processing, content development and animation, web site services, etc in respect of which deduction under section 80HHE of the Act can be claimed.

4.1.6 Depreciation on computers at 60 percent

As per the provisions of the Act, annual depreciation on computers can be claimed at the rate of 60 percent of written down value at the beginning of the relevant financial year for income tax purposes. Therefore, under the written down value method, 84 percent of cost of computers can be depreciated in first 2 years.

4.1.7 Incentives for Venture Capital Fund ("VCF") and Venture Capital Company ("VCC")

A complete 'pass through' status has been provided to income distributed by a VCF/ VCC from investments in a Venture Capital Undertaking ("VCU").

Accordingly, income received by a person out of investments made in a VCF/ VCC shall be taxable in the hands of such person as if it were received from investments made directly in the VCU while income of a VCF/ VCC will be exempt from tax under Section 10 (23FB) of the Act.

4.1.8 Current Account transactions

With the liberalization of the exchange control laws (substitution of Foreign Exchange Regulation Act, 1973 by Foreign Exchange Management Act, 1999), current account transactions can be freely undertaken subject to the prohibitions/ restrictions imposed by RBI from time to time.

4.1.9 Import of software up through Internet is permitted

RBI permits remittance towards import of software through Datacom Channels/ Internet subject to production of documentary evidence in support of the remittance e.g. invoice of the foreign supplier, user's license etc.

4.1.10 Reproduction of software in India

RBI Circular AD (MA Series) No 4, dated 10 March, 1993. An Indian company can sign an agreement with overseas copyright holder, which allows the Indian company to reproduce software in

India. The payment of royalty would be on the basis of Indian Published Price.

Remittance of royalty up to 30 percent of the Indian Published Price in respect of legally duplicated/ reproduced software in India to overseas copyright holder is permitted without reference to RBI. Where the royalty exceeds 30 percent of Indian Published Price, the applicant is required to obtain specific approval from Department of Electronics, Government of India.

4.1.11 Use of International Credit Cards, ATM Cards, Debit cards, etc for import of software, books, etc

RBI has issued Circular No 53 [AP (DIR Series)], dated June 27, 2002 clarifying that International Credit Cards can be used on the internet for any purpose for which foreign exchange can be purchased from an authorized dealer in India such as import of books, purchase of software by downloading from the internet and any other item permitted to be imported under the EXIM policy. Further, there is no separate aggregate monetary ceiling prescribed for use of International Credit Cards through the internet.

It has been further clarified that Debit cards and ATM cards can also be used for any purpose for which foreign exchange can be purchased from an authorized dealer in India.

4.1.12 Budget 2002-03 strong on basics; but disappoints software industry : NASSCOM

NASSCOM disappointed by inconsistencies in tax regime under Section 10(A) and 10(B) due to short-term revenue compulsions, voices concern over eroding competitiveness of SMEs and IT Enabled services and reiterates

its demands for procedural simplicity and consistency in Section 10(A) and 10(B).

National Association of Software and Service Companies (Nasscom), the apex association for the software and service companies in India today welcomed the Union Budget Proposals as one that consolidates the ongoing reform process, focuses hard on key infrastructure issues, and recognizes the need to strengthen agriculture and rural development. However, NASSCOM is worried that inconsistencies in tax regime could hamper India's competitiveness in global markets. In its pre-budget memorandum, NASSCOM had urged the government to maintain a status quo on the tax incentives to the software and service sector, which is likely to emerge as the largest exporter during 2002-03. In the Finance Bill 2002, the Finance Minister has proposed a reduction in the deduction from 100 per cent to 90 per cent of export profits under section 10(A) and 10(B) of the Income Tax Act. As recently as April 2000, the Finance Minister had announced a long-term tax policy in order to provide a stable policy regime for the software and services sector, wherein the tax holiday was announced for the decade ending March 2010. This policy had resulted in a large number of overseas investors making India a preferred destination to set up their software and back office operations.

While the revenue gains from the announced provision will only result in marginal revenues to the exchequer; it is clearly a retrograde step. NASSCOM understands from the Notes to the Finance Bill that this provision applies only for the A.Y. 2003-04. Phiroz Vandrevala, Chairman NASSCOM said, we recognize that this provision is valid only for the coming financial year. However, such inconsistencies in the tax regime will affect the confidence of overseas investors in the Indian software industry; especially since other

countries such as China, Ireland, Philippines are pulling all stops in providing incentives to attract FDI in this sector. Domestic companies will find it difficult to plan their future strategies and investments in light of the uncertainties created by inconsistent policies. Hence, we are confident that the government will withdraw this provision and abide by its commitments made to the fast growing, globally competitive software industry. In the current challenging global environment, Indian companies, especially SMEs and ITES companies are making significant investments in setting up sales and marketing infrastructure in the overseas markets. This withdrawal of tax exemption would reduce their investible surplus and affect marketing efforts during the year 2002-03. NASSCOM is also disappointed with continuation of sub-section (9) under Section 10(A) and Section 10(B). As per this clause, if during the year, more than 51% of shareholding (beneficial interest) changes in a 100% EOU, STP, EPZ then the company will cease to get Income Tax exemption from that year. This provision adversely affects the ability of companies to raise funds either from capital markets or venture capitalists. It hits all companies especially SMEs and start-ups in software and ITES space, where the shareholding pattern may change with the exit of venture capitalists. This may constrain venture capital funding. Moreover, this provision is acting as a deterrent to mergers and acquisitions, which is today seen as an important step for future growth. NASSCOM welcomed certain provisions that are likely to enable larger software companies to strengthen their global competitiveness through acquisitions or alliances. These include Indian companies being permitted to invest upto US$ 100 million overseas Indian companies being permitted to make overseas investments in joint ventures abroad by market purchases without prior approval up to 50 per cent of their net worth.

NASSCOM also welcomed the lowering of customs duties on components and capital equipment for computer hardware, stating that this will improve competitiveness of domestic hardware producers, bring about a reduction in prices of computers and result in increased IT penetration in the country.

4.1.13 NASSCOM submitted its recommendations

To retain current status for Software & Service industry

NASSCOM (National Association of Software and Service Companies), the apex industry association of IT Software and Service companies in India, submitted its recommendations for the Union Budget 2002 to the Government, for consideration. NASSCOM is not demanding any major fresh concessions but only urging the government to remove certain procedural bottlenecks in order to further growth in the Indian Software and Services Industry.

Some of these include self declaration of Softex forms, clarification on on-site software development, tax benefits under Section 10A/10 B, exemption of export profits on amalgamation/demerger, 80 HHE: Clarification on on-site software development and TDS on data communication.

NASSCOM also request the simplification of certain procedures that is currently hindering smooth transaction of business as this could be crucial. The government needs to take initiatives to make India an attractive IT destination such as removing procedural obstacles and delays in the area of infrastructure, opening more STPs, enhancing telecom infrastructure, reducing the cost of computerization, setting up more educational institutions in the lines of IITs or IIITs and boost e-commerce activities.

The self declaration of Softex forms

Nasscom has recommended that the Softex form as well as Forms A and B should be dispensed with or be made into Self Declaration Forms to avoid unnecessary paper work and delays in processing.

Clarification on onsite software development in 80HHE

Two of the most important demands of NASSCOM are related to Section 10A/10B of Income Tax Act. This Section provides for Income Tax holiday to units registered with 100% EOU, EPZ, STP. NASSCOM has recommended that a clarification be issued that onsite services will continue to get income tax exemption with retrospective effect under the new Sections 10A/10B of the Income Tax Act.

There is a narrow definition of Computer Software in 10A/10B sections of the Income Tax Act, with the result many Income Tax officials believe that on-site services exports are not exempted from Income Tax under the new Sections.

Section 10A/10B of Income Tax Act is acting as a deterrent to Mergers and Acquisitions

Another issue in Section 10A/10B is regarding change in ownership and the tax treatment - As per the provision of new Section 10A/10B, if during the year, more than 51% of shareholding ownership changes in 100% EOU, STP, EPZ then the Company will cease to get Income Tax exemption from that year. In listed companies, there is hardly any legal bar to change in shareholding pattern and we believe that the company should not loose its tax holiday status just because the ownership changes.

This provision not only adversely effects listed companies but also unlisted companies. It also hits SMEs and start-ups, especially where the shareholding pattern may change with the exit of venture

capitalists. This may constraint venture capital funding. Moreover, provision in the section is acting as a deterrent to mergers and acquisitions, which is today seen as an important step for future growth.

4.2 Economic Development in IT Industry

The Indian software industry has grown from a mere US $ 150 million in 1991-92 to a staggering US $ 10.1 billion (including over $7.68 billion worth of software exports) in 2001-2002. No other Indian industry has performed so well against the global competition.

The annual growth rate of India's software exports has been consistently over 50 percent since 1991. As per the projections made by the National Association of Software and Services Companies (NASSCOM) for 2002-2003 (April 1, 2002 - March 31, 2003), India's software exports would be around $ 9.3 billion, in addition to $ 3.0 billion in domestic sale.

The industry in India grossed an annual revenue of Rs 48,000 crore (US$ 10.1 billion) during 2001-02, from Rs. 39,500 crores (US$ 8.75 billion) in 2000-01, registering an overall growth of 26% in rupee terms. The growth in dollar terms was 20%.

Despite 2001-02 being a very challenging year for the Indian software and services industry, the industry has proven to be resilient and continued to record impressive growth. The industry has crossed the US$10 billion landmark figure on an increasing base and generated 92,000 new jobs and provided indirect employment to over 2,50,000 people in 2001-02.

The total revenue of Rs. 48,000 crore for the IT software and services sector, exports grossed Rs. 36,500 crore (US$7.68

billion) of revenue while the domestic software market contributed Rs. 11,500 crore (US$ 2.42 billion).

The software exports sector registered a growth of 29% in rupee terms and 23% in dollar terms over revenues of Rs. 28,500 crores (US$ 6.3 billion) in 2000-01. The domestic software market has grown by 16% in rupee terms and 12% in dollar terms over revenues of Rs. 11,000 crore (US$2.45 billion) in 2000-01.

During the year 1999-2000, software exports earned foreign exchange worth Rs. 17,150 crore or US $ 4 billion. This is a growth of over 57 percent in rupee terms and 51 percent in dollar terms over last year's software exports of Rs 10,940 crore or US $ 2.65 billion.

One of the most interesting highlights of 1999-2000 was that Indian software exports accounted for 10.5% of India's total exports during 1999-2000. Five years back, software exports from India accounted for only 2.5% of total exports.

NASSCOM's survey indicated that in the year 1999-2000, about 37 software companies in India have exported more than Rs 100 crore (US$ 25 million) worth of software and services; 180 companies have exported more than Rs 10 crore (US$ 2.5 million) worth of software. In comparison in 1992-93, only eight companies had exported software more than Rs 10 crore. This indicates an upswing, high proliferation and all-round growth of software exports. The top twenty software exporters included TCS, Wipro, Infosys, Satyam, HCL, NIIT, Silverline, Cognizant, Pentamedia Graphics, Pentasoft Technoligies, Patni Computers, IBM, DSQ, Mastek, MBT, HCL Perot, I-Flex, Tata Infotech, Zensar Technologies and Birlasoft.

One of the highlights of 1999-2000 was the first ever listing of an Indian internet / ISP company at NASDAQ. It was a

moment of great pride for the Indian software industry and its professionals that during 1999-2000, the second Indian infotech company - Satyam Infoway was listed on NASDAQ - which is the dream exchange of hi-tech companies. Later Rediff.com has also been listed on NASDAQ and recently Silverline Technologies got listed on NYSE. The first Indian software company to be listed on NASDAQ was Infosys Technologies on 11 March, 1999.

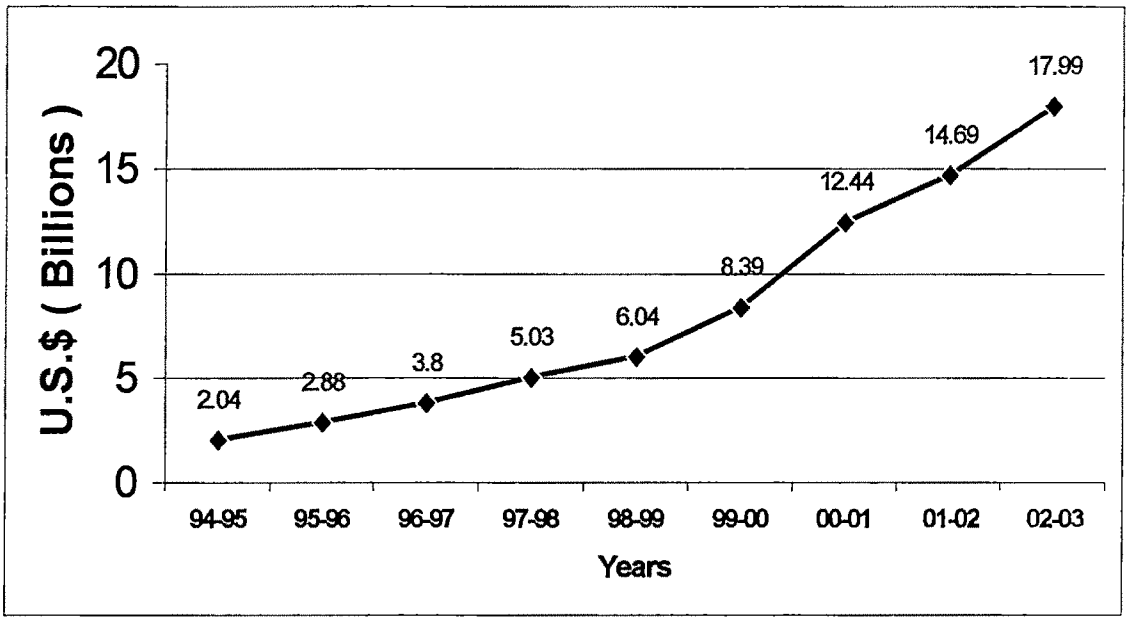
According to Nasscom's survey, till now it was the US customers who were gaining competitive advantage by aligning with Indian software companies. But now even US investors will have an opportunity to invest in software companies from India. The Nasscom Survey has projected that in the next eighteen months, at least 20 more Indian companies are expected to be listed on overseas stock exchanges including NASDAQ, NYSE and LSE.

"The industry is gaining significance in the Indian economy with sustainable growth rates, increased contribution to FDI, employment and exports. This industry has led to wealth creation of Rs. 90,000 crore in the last six years and is expected to attract cumulative FDI worth $1.2 billion by 2005".

"This sector also contributed Rs. 960 crore in direct taxes alone in the last year, which is significant when you compare this to any other sector".

To understand the significant trends that are emerging in the Indian software and services sector at a micro-level, NASSCOM's annual survey covered 2,800 companies. This included Indian software companies, Indian product and service companies, mid-sized and small software companies, third-party Indian ITES providers, Multinational Software companies and leading Captive Remote Services companies.

Information Technology Industry Growth in India



Source : NASSCOM

Indian Software Industry (in U.S.$ billion)

	1998-99	1999-00	2000-01	2001-02	2002-03
Domestic Market	1.25	1.7	2.45	2.42	3.0
Export	2.65	4.0	6.3	7.68	9.3
Total	3.9	5.7	8.75	10.1	12.3

Indian Software Industry (in Rs. Crore)

	1998-99	1999-00	2000-01	2001-02	2002-03
Domestic Market	4,950	7,200	11,000	11,500	13,200
Export	10,940	17,150	28,500	36,500	47,500
Total	15,890	24,350	39,500	48,000	60,700

Source : NASSCOM

4.2.1 Software Exports Grew By 29 Percent

The growth in software services exports has been at a healthy 29% during a difficult year for many industries. The growth engine of exports this year has been the ITES sector, which grew at a stupendous 67% while IT Services grew at 22%.

NASSCOM's annual industry survey revealed that the Top 20 Indian software companies accounted for 48% of the total software and service exports. The MNC segment emerged as an important contributor to the total software and services export revenue with a share of 27%. This included a share of 22% in IT services and 45% in IT Enabled Services.

"The interesting trend seen during the year was the tremendous growth in offshore delivery. Billing through offshore increased by 64% to Rs. 18,000 crore in the year 2001-2002 from Rs.10,950 crore in the year 2000-2001. In comparison to this, onsite billings increased by 7% from Rs. 15,900 crore in 2000-2001 to Rs. 17,000 crore in 2001-2002".

4.2.2 Trends In Service Lines And Verticals In IT Service Companies

NASSCOM's annual industry survey reveals consolidation and growth in existing service lines and encouraging growth in new service lines during 2001-02. Custom Application Development and Maintenance increased from Rs. 11,375 crore (US$2.5 billion) to Rs. 12,588 crore (US$2.65 billion) in 2001-02 and Application outsourcing grew from Rs. 7737 crore (US$1.7 billion) to Rs. 8,788 crore (US$1.85 billion). Similarly packaged software installation and support increased from Rs. 910 crore (US$ 0.2 billion) to Rs. 1,425 crore (US$ 0.3 billion) during 2001-02.

Amongst the verticals, BFIS (Banking, Finance and Insurance Services) continued to dominate the verticals with its share increasing to 22% in 2001-2002 from 20% during 2000-2001. Similarly contribution from telecom also increased to 14% in 2001-02 from 12% in 2000-01. Manufacturing was one of the highest growth verticals with its share increasing from 12% in 2000-01 to 16% in 2001-02.

4.2.3 Software Export Destinations

During 1999-2000, India exported software and services to 95 countries around the world. Out of the total software exports of Rs 17,150 crore during 1999-2000, almost 62% was to North America (USA and Canada); 23.5% to Europe; 3.5% to South East Asia; 3.5% to Japan; 1.5% to West Asia; 1.5% to Australia and New Zealand; and 4.5% to Rest of the World.

Onsite software exports to USA are quite dependent on availability of H-1B visas. Although the H-1B visa limit was increased from erstwhile 65,000 global cap in 1998 to 115,000 during 1999-2000, but this increased limit was also exhausted in March 2000. The exhaustion of limit of H-1B visas during March 2000 may adversely affect some of the onsite projects. However, NASSCOM is working in close association with various lobby groups in USA and US Congress to increase the H-1B visa cap. There are currently two bills pending in the US Congress and Senate respectively, that propose to increase the H-1B visa cap to 200,000 for the three year period of 2000 to 2002.

The study also indicated that due to NASSCOM's and Government of India's initiatives, especially the NIESA (Nasscom's India Europe Software Alliance) Programme, software trade with Europe has been growing rapidly. The year 1999-2000 witnessed

software exports of almost 23.5% to Europe. During 1999-2000, total Indian software exports to Europe was worth Rs 4030 crore or US $ 920 million. UK was the most favoured destination of Indian software exports to Europe. As per Nasscom's study, Europe is fast recognising the competitive advantage that would accrue to its economy by aligning with Indian software companies. The shortage of skilled manpower in Germany, Austria, UK, France and Italy has resulted in process of liberalisation of work permit requirements and sourcing of skilled manpower from India.

On the other hand, to increase software business with Japan, Nasscom has also launched Project NINJAS (Nasscom's India Japan Software Alliance). In financial year 1999-2000, software and services exports from India to Japan was about Rs. 600 crore or US$ 140 million. However, in years to come, this is expected to grow substantially. NASSCOM survey indicates the annual Indian software exports to Japan can be in excess of US $ 500 million in the year 2002-03.

Out of the total software exports of Rs 36,500 crore during 2001-02, almost 63% was to the Americas (USA, Canada and Latin America); 26% to Europe; 4% to Japan; and 7% to Rest of the World. USA continues to be India's largest export destination for more than a decade. Currently, more than 270 Indian companies have set up offices, subsidiaries and marketing alliances in USA.

An interesting trend in 2001-02 was the increase in software and services exports to USA despite the slowdown in the US economy. While the IT services segment witnessed a slowdown in exports to USA, increase in ITES exports to USA, resulted in an increased share of USA in India's software and services exports.

As per the NASSCOM survey, 2001-02 also saw Indian companies actively expanding into emerging markets such as Europe and Asia. Exports to Europe saw an increase of 2% from 24% in 2000-01 to 26% in 2001-02.

4.2.4 Indian Software Companies Eye China's Market

More Indian software companies will come to explore China's huge market and establish co-operation with local hardware makers that will result in a win-win situation for both sides, an official at the Indian Embassy to China said. More Indian software companies will come to explore China's huge market and establish co-operation with local hardware makers that will result in a win-win situation for both sides, an official at the Indian Embassy to China said. Dinesh Kumar Patnaik, head of the Commercial Division of the Indian Embassy, said all of India's large software companies are planning to start businesses in China. "Following the big companies' steps, more and more Indian software firms will come in herds," he said in an interview. Satyam, a leading Indian software company, recently opened an office in Shanghai. TCS, Infosys and Wipro - other big Indian software names - are all busily preparing their Chinese offices. China excels at hardware production, and India could help manufacture complementing software, he said. "With the combination of the best hardware and software, both countries will win," the Indian official said. "Chinese software makers could gain technology and management experience from their Indian counterparts to advance faster," Patnaik said. Many Indian software training centres are also planning to open engineer training schools in China. "China needs at least 120,000 entry-level software engineers per year, yet less than 60,000 are available at present," he said.

With more entry-level software engineers, or the so-called "software blue-collars," China's software industry will catch up with world standards faster, according to the official.

The development of China's information technology industry is quite unbalanced with the software sector only one-fifth the size of the hardware side, according to the Ministry of Information Industry_(MII). China has many software companies, yet most of them are small in size with less than 50 employees, the MII said. Domestic software companies are feeling the heavy pressure from their Indian peers. Compared with other big software makers, Indian companies are more flexible in making specialized goods, especially in designing management solutions for industries. Furthermore, since labour is also relatively cheap in India, China loses its comparative advantage in that respect. An executive at Kingsoft, one of the country's leading software firms, said the strengths of Indian companies lie in their research and development capabilities, high efficiency and rich experience in providing specialized software solutions, which domestic companies are less experienced in. China's software development level lags behind that of India. Of the world's 58 software institutes that satisfy the demand of CMM5, or the fifth grade of Capability of Maturity Model for software which measures the development ability of software makers, 32 are in India while China has none. After 10 years of booming development, India has grown into the world's No 2 software industry with an annual output capacity of US$55 billion and earned US$8.1 billion from software exports last year to 102 countries and regions, according to figures provided by the Indian Government. The Indian would like to help the development of China's software industry, Patnaik said.

Indian software companies quietly started to penetrate the Chinese market years ago with many engineers taking part in the software development of China's telecoms, aviation, textile, transportation and financial industries.

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Indian software companies quietly started to penetrate the Chinese market years ago with many engineers taking part in the software development of China's telecoms, aviation, textile, transportation and financial industries.

The Indian software industry has been afflicted with "China-phobia" for over a year, the fear being that its neighbor could supplant India as the digital software giant of Asia.

But the National Association of Software and Services Companies (NASSCOM), which had earlier issued warnings, has now said that China is not a threat until at least 2005.

According to Sunil Mehta vice president of NASSCOM "Indian industry is substantially ahead of the Chinese software industry, not only in terms of revenues but also quality, skilled manpower, project management capabilities and execution skills,"

Mehta, who recently visited China, said the Chinese government has officially projected it would achieve $1.5 billion in software exports in 2005; the Indian projection for 2005 is $23 billion. Chinese exports between April 2001 and March 2002 stood between $400 million to $600 million, while Indian exports for the same period were $7.8 billion, Mehta said.

Yet while those projections comforted Mehta, a top executive of a software firm in Hong Kong scoffed: "No Indian company in its right mind should fall for this false sense of security," said the executive, who spoke only on condition of anonymity. "Figures lie. One fine day India may wake up to the fact that China has beaten it to the finish line."

The executive declined to elaborate on what exactly China is doing to achieve this end. And while the executive's decision to remain anonymous might seem unnecessary considering the innocuous nature of his boast, one Indian investor says it's all part of the way the Chinese do business.

"Many corporates there have taken a policy decision not to react to the Indian software industry. They don't want Indian companies to get a clear idea of what they are thinking".

While until about a year ago top Indian service firms were charging American companies $75 to $90 an hour, today the figures are merely $6 to $9. China will very soon do the same job at about $3 an hour -- and that will bleed Indian firms to death.

The projected growth rate for the Indian software firms between 2002 and 2003 is about 20 percent, a tremendous decline from the recent days of more than 100 percent annual growth. "Even steel companies grow at 20 percent," an observer said.

One of the factors that Indians count on in securing software contracts is their mastery of English. The Chinese, meanwhile, have only recently begun to emphasize English in their schools.

When China was bidding for the 2008 Olympics, the mayor of Beijing announced that every man in his city will learn to speak English if the sporting event comes to his town. China has bagged the right to hold the Olympics in 2008, and there are some Indians who think it's a bad omen.

Ironically, China's rapid growth in Internet technology could wind up being a plus for India; many are beginning to view China as a great market rather than as a potential competitor.

The size of the Indian domestic market fades in comparison with China's. **India has just 7 million Internet users while China has 34 million. This means that while 68 Indians in 10,000 have access to the Net, the corresponding figure for China is 260.**

"Indian IT companies seeking to globalize their operations should evaluate China as a huge potential market in telecom, financial services and manufacturing sectors," said Nandan Nilekani, CEO of India's Infosys, which is very serious about doing business in China. "China could also serve as a base for software development for Indian companies."

4.2.5 MS launches Project 2002

A decade after Project 1.0 was launched, Microsoft is preparing an assault on the enterprise project management space with MS Project 2002. This new suite from Microsoft allows collaboration across locations and it is more scalable than the earlier versions that were confined to desktops—Project 2002 has a server version in addition to the traditional desktop tool. Microsoft still has a standard edition aimed at SMEs, but it also has the professional version and server editions aimed at large corporates.

To make Project 2002 an enterprise tool, Microsoft took feedback from its top users. "People wanted a multiple portfolio analyser across projects, they wanted to get resource or capacity information for each project and conduct 'what-if' analysis on resource utilisation," says Tarun Malik, product manager—business tools, Microsoft.

Most IT services companies in India use MS Project. Microsoft wants to extend that to the construction, engineering and manufacturing verticals going after companies like L&T, Indian Oil and ONGC. The company has 2,000 customers for Project 2002 across MNCs (banks and FIs), software houses and government organisations with some presence in manufacturing. In addition to these enterprise customers, it also has 2,000 SME customers.

Microsoft's business model for this product range is built around annuity sales to enterprises that purchase software assurance—free upgrades for two years. Customers, who bought the annuity before July 31, get to use the new server offering as well. As part of its marketing push, Microsoft has conducted a seven-city roadshow with PMI (Project Management Institute). These events were attended by the top 150 organisations in each city.

4.2.6 India's Internet: Ready for Explosive Growth

India's NASSCOM predicts 23 million Internet users in India by 2003, a twenty-three fold increase in three years.

4.3 Information Technology Enable Services as a Growth Driver

The NASSCOM annual industry survey shows that ITES has been the growth engine for the exports sector in 2001-02. The ITES sector grew at a rate of 67% this year contributing to about 20% of the total software and service exports.

The survey reveals that in terms of ITES Service lines, Customer care, emerged as the most important with 103 companies working in this area. The other important service lines included Web sales and Web marketing, Billing services and Accounting transaction. The ITES sector has shown tremendous growth during the last year and is turning out to be the second pillar of the Indian IT export revolution. However, there are some unique issues facing the industry in terms of infrastructure, labour regulations, quality and manpower which need to be addressed to maintain the growth trajectory.

Nasscom also conducted India's first ever city wise survey on the ITES sector covering 310 companies. The survey revealed that:

- The average number of employees in the ITES sector is 190 but the range is huge and varies from as low as 4 people to as many as 16,000 people
- The encouraging trend in this area is the presence of MNC Captive units that account for 45% of the industry and are a vital determinant of the long term competitiveness of India in this sector.
- Amongst the cities representing the ITES sector, the National Capital Region (NCR) has emerged as the largest with 53 companies based in this region. Mumbai comes second with 45 companies and Bangalore and Chennai are at fourth place with 35 companies each.

4.4 Domestic Software Market

The NASSCOM annual industry survey reveals that the domestic software industry clocked a revenue of Rs. 11,500 crore in 2001-2002 as compared to Rs. 11,000 crore in 2000-2001.

There are a number of opportunities emerging in the domestic sector, which will help catalyse growth in the next 2-3 years. These include the Energy sector, Insurance, Financial and Banking Services, E-governance and the Manufacturing sector.

In the energy sector, de-regulation will drive spend on ERP and SCM. Further, with the privatization of the power sector, spending on IT to improve productivity will get an impetus. In the Banking and Financial Service sector, the need for nation-wide connectivity and the

imperative to improve customer access will provide opportunities for IT. Also the emergence of new Insurance companies will lead to increased IT spending.

For e-governance, the major thrust this year will be in the area of local language applications and application integration. This is in keeping with the second stage of e-governance implementation in the states where the networks are in place.

Further, with the recovery of the manufacturing sector and other traditional sectors on the anvil, organizations will start using IT outsourcing in order to increase productivity.

4.5 Labor Productivity

Comparison of actual volume of work done by an Indian developer per time unit (e.g. lines of software code produced per person-day) shows that Indian specialists working at their Western clients' sites achieve productivity levels as high as those of their Western counterparts and sometimes higher by 20-50%.

Figures within India suggest that productivity varies quite widely from one company to another, but on the whole it achieves 90%-50% of that in the West. This can be accounted for by a number of constraints, with the most important of them being:

- Shortage of skilled managers;
- Lack of resources (in particular, hardware resources, power cuts, etc.).

Major companies well-established in the market are much less affected by these constraints due to larger funds and high technologies used to manage the engineering process. Lower labor productivity is partly compensated by a longer work week: a 45- hour week in India against a 35- or 40-hour week in the West.

4.6 Income per head

Total income divided by the number of employees will give one of the productivity indicators – «income per head». The Indian software industry has the following indicators:

- Income per head in onsite work abroad (e.g. in the USA), is roughly twice that for offshore work in India.
- Income per head in export-oriented companies is 2 or 3 times that in domestic oriented software production.
- Income per head in software services exports is about half that for software package exports.
- Income per head in larger software companies is about twice that in smaller firms.
- Income per head in the wholly-owned multinational subsidiaries is the highest in the industry.
- Income per head in software exports is about one-quarter that in the U.S. software industry, which is linked to a proportion of packages in software exports and to lower wages.

4.7 Investments

Between 1996 and 2000, venture capital investments in the Indian IT industry grew from U.S.$ 20 million to U.S.$ 370 million. At present the country has registered 28 venture foundations, 18 of which were registered during the year 2000.

According to Nasscom, in FY 2000-2001 venture capital growth reached 100%, which in absolute terms come up to U.S.$ 700 million. *It is remarkable that 38% of this amount is invested by non-resident Indians.* In 2001-2002, investments in the industry was double, and in 2008 they will reach U.S.$ 10 billion, and India will rate

among the first five countries with the highest venture capital investments in the IT industry.

Businessmen of different countries – Indians by birth – are actively investing in Indian IT companies and set up their companies' branches in India.

The World Bank is an active investor. Among its recent initiatives in India's IT development is the funding of the following projects:

- To improve quality of technical education (U.S.$ 64.9 million, up to 2006),
- Telecommunications reforms (U.S.$ 62 million, before 2005).

At present, nearly all major global IT companies, including Microsoft, IBM, Cisco Systems, Lucent Technologies, Motorola and others, have their branches and centers in India and are active in their further development. For example, *Motorola India Electronics Ltd. (MIEL)* (a branch of Motorola, Inc.) invested U.S.$ 40 million last year to establish the largest center near the city of Bangalore. Only in the past few months :

- **IBM** announced its intention to open a research laboratory in India with 500 staff members;
- **Nortel Networks**, whose 1,300-employee center is already located in India, announced its plans to invest another U.S.$ 350 million in its development within the next three years and to increase its staff in India up to 1,800;
- **Cisco Systems** intends to allocate U.S.$ 200 million to develop its center in India;
- **Deutsche Bank** has invested U.S.$ 4.335 million to build a development center in India, with about 500 programmers.

- **Microsoft President Bill Gates said, when visited India in November'2002 that Microsoft has decided to invest $400 million (Rs. 2000 crore) to expand its activities and promote technology development in India over next three years.**

Before this on visit of India in 2000, He announced to invest U.S.$ 50 million in the Microsoft center in India and also to open a new software development center in Bangalore.

The move indicates that the company is confident about the country's future prospects as a software power. *"This is the largest investment by the company, excluding hardware outside of the US".* Microsoft chairman and chief software architect, Bill Gates announced. Investment will be made in education, industry partnerships, technology innovation and in the expansion of Microsoft's India development Centre (MIDC) in Hyderabad. Gates announced a **$20 million fund for "Siksha" an online learning project,** that will train teachers, develop IT curricula and offer end-to-end software solutions. *"Over 80,000 school teachers and around 3.5 million students across the country will be able to benefit from this initiative over the next three to five years",* Gates said. Microsoft is also planning to set up 10 state-of-the-art Microsoft IT academies in collaboration with state education departments and over 2000 partner-driven school laboratories. Gates said that expected employee strength at Microsoft's India Development Centre (MIDC) to double to around 500, over the next three years, from the existing 200 people. Microsoft is also increasing investment to around $100 million for the centre.

Gates is clearly poised to expand Microsoft's ties with India's top IT companies – Infosys, TCS, Wipro and Satyam.

4.7.1 Venture Capital

India's recent success story in the area of information technology has amply demonstrated that there is tremendous scope for the growth of knowledge based industries. With technology and knowledge based ideas set to drive the global economy in the coming millennium, and given the inherent strength by way of its human capital, technical skills, cost competitive workforce, research and entrepreneurship, India can unleash a revolution of wealth creation and rapid economic growth in a sustainable manner. However, for this to happen, there is a need for risk finance and venture capital environment which can leverage innovation, promote technology and harness knowledge based ideas.

Venture Capital Environment in India

The Indian venture capital sector faced a challenging external environment in 2001. Most funds were adversely affected by the collapse of the dot com boom, the slowdown in the global economy and a competitive market scenario.

However, contrary to popular belief, the figures released by the Indian Venture Capital Association suggest that there was only a marginal decline in total amounts of venture funding during the year 2001-02. The total quantum disbursed is projected at $ 1.1 billion during the year, a marginal decline compared to the disbursements of $ 1.2 billion during 2000-01.

Year	Rupees (in Crores)	US Dollars (in Millions)
1996-97	70	20
1997-98	320	80
1998-99	1,052	250
1999-2000	2,160	500
2000-01	5,470	1,200
2001-02	5,200	1,100
2007-08 F	60,000	10,000

India was the second largest market for VC funding during the year, with total disbursements estimated at US$ 1.1 billion spread over 91 ventures; the largest market was Japan with a funding of $ 1.9 billion over 39 ventures. In contrast, China received only $39 million of funding spread over 11 ventures.

- Flight to quality: Nearly all VCs were hesitant to invest in startups with inexperienced business experience or a clear, scalable business model. Consequently, the seed funding share in total disbursements is only 15 per cent.
- More funding for expansions: The total amount disbursed over expansion and late funding grew to about 41 per cent of the total, indicating VCs preference to continue funding ventures that had demonstrated success in their enterprise. The deal sizes have undergone a change in accordance with the latest trend. While Series A & B (first and second rounds of funding) typify a deal size of $1 to $1.5 million (Series A), $3 to $5 million (Series B). Series C and D typify a deal size of $4 to $8 million (Series C) and $5 to $15 million (Series D).

- Increased interest in India: Nearly 70 VC funds were operating in India with total assets under management of nearly $ 5.6 billion. The amount has grown nearly twenty fold in the past five years. Most VCs believe that a further capital of $ 3 billion can be expected to be raised in 2002 only for India centric funds.
  - Size matters: Most VCs are not keen to fund small companies; the minimum deal size is in the region of at least $ 1 million. Most VCs are also evaluating the option of investing in listed companies.
  - IT services no longer in favour: With most small software service companies unable to offer a differentiated value proposition and facing a slowdown in key markets; and with Internet centric ventures facing it difficult to sustain or scale up revenues; VCs turned their attention to emerging areas - IT enabled services emerged as the flavor of the year; with wireless applications and biotechnology following closely.
- IP software development companies slowly coming into the limelight: with a growing talent pool of Indian engineers with experience of having worked in leading multinationals' R&D centers, the focus on developing intellectual property (IP) is slowly increasing. This is especially true in the areas of embedded software, digital signal processing, system on chip (SOC) among other applications. A number of VCs are expressing tentative interest, of course, the caveat of domain knowledge, and management capability continue to rule strong.
- Internet investments decline: The non-Internet related investments increased from 28 per cent of VC investments in 2000 to 68 per cent in 2001. This increase has been mainly

because of an increase in VC investments in the longer-gestation medical (health and biotechnology) sector.

Trends for 2002

- Most VCs believe that the this year will undoubtedly be better; driven by a relatively stable economy, with growth rates again picking up. The digital signature regime to be implemented by April 2002 offer a big boost to the e-commerce sectors especially e-banking and online trading.
- It is estimated that total disbursements will be in the region of $ 2 billion, and fund raising for India-centric funds could increase significantly, driven by increased European interest.
- Total VC disbursements in India were to the tune of about $1.1 billion in 2001 (as compared to $1.3 billion in the previous year), according to the IVCA. VCs feel that 2002 will see VC disbursements in the $2 billion range, with India centric capital to the tune of $1 billion to be raised in 2002.
- According to VCs, the Indian market is one of the preferred markets in this part of the world right now. Things are poised for change over the next 3-6 months since the valuation gap between entrepreneur expectations and VC pricing has fallen when compared to last year.
- As far as the areas of investment and deal sizes are concerned, most VCs feel that the market will favour large sized deals and probably even management buyouts.
    - Growth or mezzanine stage capital will continue to occupy centre stage according to most VCs. As for startup funding--the views are mixed. Some VCs believe that startup stage funding is likely to surface again though a

larger share of the capital will go into Series B rounds and possibly investments in listed companies, Others continue to remain bearish on startups since scaling up startups is a tough business.

4.8 The Digital Decade (2000-2009) : Bill Gates View

Bill Gates stressed that India was rapidly moving to becoming a global computer superpower. He also said that although elsewhere there are cheaper places for business than India, high professionalism of Indian IT specialists in software development makes it especially attractive for investments. He particularly noted the Indian Government's recent telecommunications initiatives, notably, the invention of new deep-sea fiber optic cables for the Internet overseas communications and privatization of national telecommunications services.

Appreciating India's liberalisation and infrastructure growth in the communication sector, Gates outlined his vision of **"The Digital Decade (2000-2009)"** and said the country needed to invest heavily in education to emerge as a major player in information technology. He said Microsoft wanted to put people at the centre of the elements of the digital world, with India playing a crucial role in it. *"As we enter the digital decade the opportunity for India to drive innovation is tremendous. This presents a unique role for the government to create a vibrant knowledge-based economy that encourages innovation".* And at the core of his decision to bet on India is a vision that over the next 10 years people will be at the centre of **"a digital universe",** with all kinds of PCs, wireless devices and PDAs connected to the Internet.

So far, particularly in his previous two visits, Gates largely prodded India to build a communications infrastructure, a nation-wide Internet backbone, to increase PC penetration, to invest in education and build skill sets that would offer high quality IT research for global software giants like Microsoft.

Like many international software firms, Microsoft is increasingly reliant on India as a source of cheap programming talent. Some 20% of the company's software engineers are of Indian extraction.

4.9 Staffing and Training

According to Nasscom data, as of March 31, 2000, 340,000 professional software developers are employed in the Indian software industry, 80% of whom are Masters of Science in Engineering.

According to the data of the Indian *Department of Higher and Secondary Education,* for the year 2000, about 68,000 specialists in computer technology annually graduate from Indian colleges and universities. Projections by the IT Ministry and the Department of Higher and Secondary Education say that by 2008 public higher educational institutions will have trained 1.79 million IT specialists, 263,000 of whom will get Master's and higher degrees, while 785,000 will get Bachelor's degrees. The growing needs of the IT industry call for an annual increase in IT graduates: in the 1999-2000 academic year, public, budget-based higher educational institutions trained 25% more specialists than in the previous year, before 1999 the annual growth was on average 15%. The number of IT specialists trained by private universities and MCA *(Master of Computer Applications)* courses is steadily growing: according to Nasscom, every year they have 40,000-50,000 graduates. An increasing number of IT

specialists get remote education from open universities or migrate to the IT industry from related hi-tech branches, which is an additional significant source of employees.

It took India a sufficiently short time to reform the IT higher educational system, to develop efficient models of staff training by world standards. India developed a network of *Institutes of Information Technologies,* including *IIIT (Indian Institute of Information Technology)* and *IIT (Institute of Information Technology),* located in different Indian states. All of these educational institutions have flexibly organized academic processes closely linked to production. Thus, the Indian Institute of Information Technologies (IIIT) located in the city of Hyderabad includes schools of IBM, Microsoft, Motorola, Oracle, Metamor and Satyam companies, equipped with new hi-tech equipment. Lecture courses are worked out in conformity with current IT development trends and specific needs of the companies. Great attention is given to managerial training. Training of specialists is done by academics from major U.S. universities.

It is also remarkable that one of India's major IT companies - *NIIT* specializes in personnel training.

4.10 Staff Turnover

High turnover rate is typical of most Indian companies: the number of employees leaving the companies ranges from 15 - 20% to 50% a year. Staff turnover is a major problem in their business development, and for some companies – *the* major problem. Some of the employees leave to work in other Indian companies, others – 10 - 15% - go to work or study overseas.

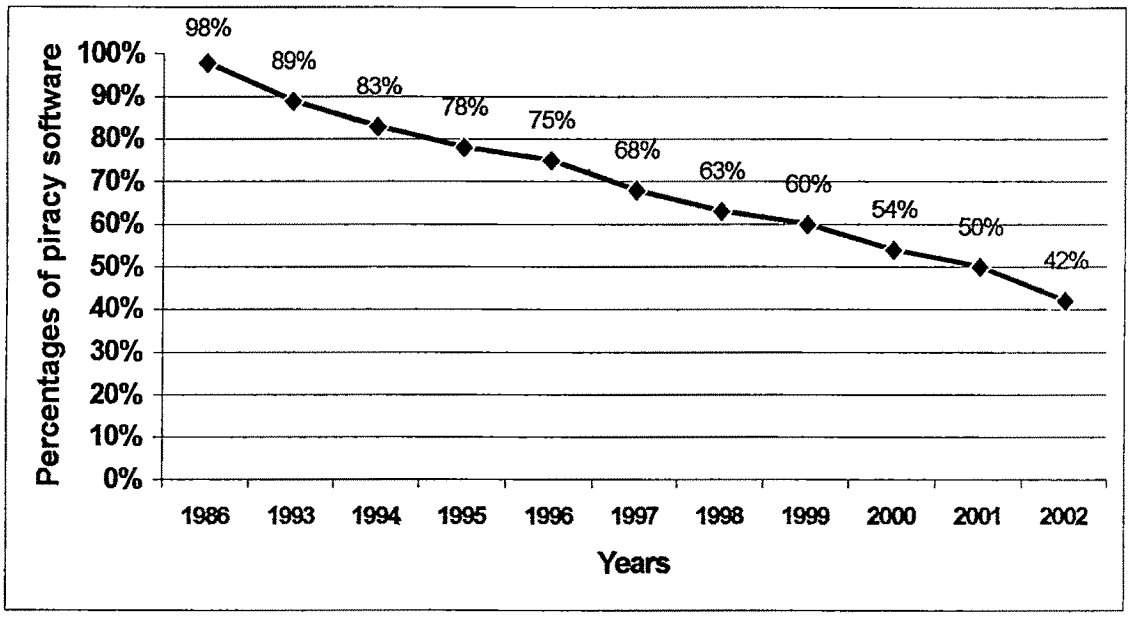
The reason for these high losses is a chance to get a qualitatively better job, given high demand for IT specialists both at home and abroad. Considering the specifics of the contracts carried out by most Indian companies, education, experience and skills of employees remain underused. This is the reason why higher remuneration plays an important but not domineering role in changing jobs. The most important factors are:

- Involvement in more advanced, state-of-the-art projects;
- Creative self-fulfillment, involvement in project analysis and design;
- Work in a professionally challenging environment;
- Access to greater range of resources – software, hardware, etc.

4.11 Copyright Protection and Piracy

The Government's targeted policies and Nasscom's efforts to protect copyrights of software producers make the share of licensed software steadily increase. Thus, according to Nasscom, 98% of the entire software in the Indian market was pirated in 1986, but by 1999 the share of licensed software grew to 40%. And in 2002 the percentage of pirated software is near about 42 %.

Reduction in Software Piracy in India



Source: Nasscom,

4.12 India's Software Industry – Software and Services Exports

The Indian IT industry can best be described as export-oriented. India refuted a widespread opinion that IT exports require a strong national industry and a well developed domestic market.

4.12.1 Prerequisites for Software and Services Exports

The following specific regional features made for the development of an export oriented software industry:

- **Sufficiently large English-speaking communities** (5% of the total population), and English is known to be the IT language.
- On average, very **low living standards** in a one-billion-people country, which creates conditions for a large market of relatively cheap labor.
- **Mathematical culture**, whose history in India is over 2000 years long. In the words of Indians themselves, they are a nation of mathematicians, which is another prerequisite for hi-tech development and training of top-notch specialists.

India has become successful as a software and IT services exporter due to the following important factors:

- **Government officials** concerned about the country's advance along this path.
- **Established technocratic government bodies**, promoting and patronizing the industry.
- **Nasscom as an active and influential organization that united software companies.** Nasscom has an important role to play in the industry's policy-making at different levels, including the governmental one. It was established in 1988 and consolidated 38 companies with the total revenues of 65% of the software industry.

As of December 31, 2000, Nasscom comprised 797 companies whose overall revenues equaled 95% of the total revenues of India's software and IT services industry.

4.12.2 Indian in USA

According to official information placed on the site of the Indian Embassy in the USA (Washington, D.C.), and also directly obtained from the Embassy's information services:

- 1.5 million people of Indian origin reside in the USA.
- According to official statistics (the U.S. Census Bureau), the average income of an Indo-American family amounts to U.S.$ *60,093*, while the average family income in the U.S. is U.S.$ *38,885*. This high income reflects the high educational level of the Indian diaspora.
- *87%* of Indian-born Americans graduated from high schools, *62%* – from colleges, *58%* of 25-year-old Indo-Americans received Bachelor's and higher degrees.

- In the Silicon Valley:
  - About *300,000* Indians work in computer companies.
  - 7% of IT firms are headed by Indians by birth. Here are just a few of the well known names: one of the founders of Sun Microsystems is an Indian – Vinod Hosla; HotMail founder is also an Indian – Sabir Bhatia (he sold his company to Microsoft for U.S.$ 400 million).
  - In the Silicon Valley alone, 774 computer companies were established by Indians by birth, among them about 15 IT

companies have an annual turnover between U.S.$ 100 million and U.S.$ 1 billion.

- Over 15% of all start-up companies in the region have been established by Indians.

- The USA has become home for thousands of Americans of Indian origin, who are involved in the IT business and whose wealth amounts to millions of dollars. According to some data, there are over 5,000 millionaires of Indian origin in the Silicon Valley alone. Many of them made fortunes of billions of dollars: e.g. the wealth of Guriradj Deshpande, co-founder of some companies dealing with network technologies, is estimated at U.S.$ 4-6 billion. The Indian Diaspora in the U.S. actively supports its homeland, encouraging the inflow of capital to India. Among its members are both venture capital owners investing in Indian IT companies and a great deal of immigrants from India who established their own companies or are CEOs in U.S. IT companies and contribute to a continuous flow of offshore contracts.

Americans of Indian origin assist in developing and improving IT education in India. Here are some facts:

- Graduates of Mumbai's IIT at their reunion party held in Chicago in 2000 raised U.S.$ 22 million to support this institute in India.
- Americans of Indian origin proposed to raise U.S.$ 1 billion to establish a network of 6 private research and training institutes in India – *Global Institutes of Science and Technology* – to train specialists of different qualifications. Each institute will train about two thousand students.

Software Specialist Salaries in Different Countries Comparison (U.S. $)

	Switzerland	USA	Canada	Great Britain	India
Project Leader	74,000	54,000	39,000	39,000	23,000
Business Analyst	74,000	38,000	36,000	37,000	21,000
System Analyst	74,000	48,000	32,000	34,000	14,000
System Designer	67,000	55,000	36,000	34,000	11,000
Development Programmer	56,000	41,000	29,000	29,000	8,000
Support Programmer	56,000	37,000	26,000	25,000	8,000
Network Analyst/ Designer	67,000	49,000	32,000	31,000	14,000
Quality Assurance Specialist	71,000	50,000	28,000	33,000	14,000
Database Analyst	67,000	50,000	32,000	22,000	17,000
Documentation/ Training Staff	59,000	36,000	26,000	21,000	8,000
Test Engineer	59,000	47,000	25,000	24,000	8,000

Source : R.Heeks << Indian Software Labor : Cost Breakdown and Comparison >>

4.12.3 Importers of Indian Software and IT Services

Before the late 80s, the U.S. was the principal importer of India's software and services. Currently the U.S. still occupies this position. However, since 1990 a significant part of Indian IT exports has gone to other countries.

According to a Nasscom report, in 1999-2000 India exported software and services to 95 countries, with a larger portion of exports - nearly 62% - going to North America (the U.S. and Canada), 23.5% - to Europe, 3.5% - to Japan, 5% - to other Asian countries, 1.5% - to Australia and New Zealand, 4.5% - to other countries of the world.

It should be noted that the initiatives of the government and Nasscom which gave birth to a program of Indian-European software cooperation - *NIESA (Nasscom's India Europe Software Alliance)*, made it possible to develop steady trade relations between India and West European countries in software and services supplies. In 1999-2000, software exports to European countries reached 23.5% (in 1997-1998 it was 20%) of the total software exports or U.S.$ 920 million, with nearly half of the European exports going to Great Britain. European countries are becoming increasingly aware of the benefits they get from offshore project development by Indian companies. IT workforce shortages in Germany, Austria, Great Britain, France and Italy result in lowering entry visa barriers, and more and more often companies in these countries invite Indian specialists to work directly at their sites.

Japan is another important geographic area of Indian software exports. Japan is the second largest world ICT market after the U.S.. For broader trade relations with Japan, Nasscom also developed a software cooperation project - *NINJAS (Nasscom's India*

Japan Software Alliance). In 1999-2000, software and services exports to Japan amounted to about U.S.$ 140 million, with its gradual planned increase to U.S.$ 500 million by 2002-2003.

In 2000 during his visit to India *(the first visit by a Japanese head of state to India since 1990)*, Japanese Prime Minister Yoshiro Mori visited Bangalore, in particular, the Wipro and Infosys corporate centers which have long been working for Japanese clients. The Prime Minister said that India and Japan had a great potential in IT cooperation and made a few proposals for its further development. Being increasingly recognized in the world, Indian software companies consistently expand their exports geographically. India enters into new developing markets. This can be evidenced by some trade contracts Nasscom signed with Israel, Singapore, Ireland, Mexico, and Morocco.

4.12.4 Capital Concentration

India's IT industry is characterized by a high degree of capital concentration. According to Nasscom data for 1999-2000, out of 1,250 IT export firms:

- 37 companies exported over U.S.$ 2.3 million of software and services;
- 60 companies exported over U.S.$ 1.15 million of software and services;
- firms (Tata Consultancy Services, Wipro Infotech, Infosys Technologies, Satyam, HCL Technologies and NIIT) cover over 40% of the total exports;
- Seventy percent of export revenues are earned by top 20 software companies, with 12 of them having the highest certification – SEI CMM Level 5.

4.12.5 Specialization Areas:

Currently the Indian software industry is going through a period of global transformation and is heading for new challenges in areas related to **e-commerce** and **IT-enabled services**. It is also active in developing areas of IT services.

In FY 1999-2000, India's revenues from software and services exports in **e-commerce** reached U.S.$ 500 million. In 2000-2001, this figure is expected to rise to U.S.$ 1.4 billion, and by 2008 to equal 20% of India's total software exports (U.S.$.10 billion).

The second important development area in IT services, along with e-commerce, is **IT enabled services** which includes organization of information telephone services, support services, database processing and support in various socio-economic sectors, World Web development, etc. The global market of IT services in this area equals U.S.$ 10 billion. In the opinion of Nasscom international consultants, this market keeps steadily growing and by 2008 will reach U.S.$ 200 billion. It is planned that about 1.3 million specialists will be employed in this Indian sector and its revenues will reach U.S.$ 17 billion.

Some major Indian companies (Wipro, NIIT and others), and also the Indian branches and centers of the world's computer giants (Microsoft, Motorola, Intel, IBM, Cisco, HP and others) are developing **systems software**, including those for network and embedded systems.

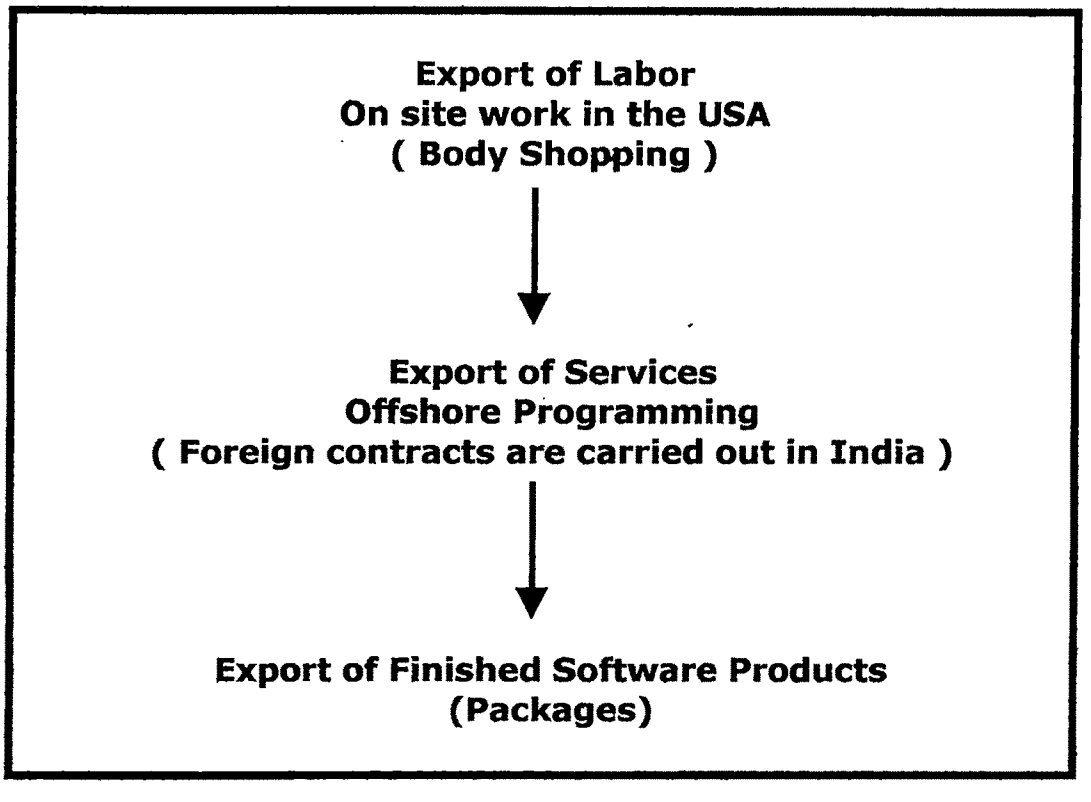
4.12.6 Export Products

Basic strategies

Three basic evolution strategies are used in software and IT services exports from developing countries and transition

economies, with each later strategy indicating higher development level of their national IT industries :

Software Export Strategies



Initially India's IT export was dubbed "body shopping". Thus, in 1988, labor export was a domineering trend: 75% of all export earnings came from the work done by Indian specialists at the client's site overseas ('onsite'), mainly in the USA. Export share of offshore programming was only 25% of the total exports. There were no finished products (packages) from India in the world market. The situation has changed by now: 50% of exports is onsite work overseas, about 45 % is offshore programming, export of packages is no more than 5% of the total volume .

Note. The above estimation can be described as optimistic, since according to Nasscom, in 1999-2000 offshore programming as a percentage to total software exports was over 42%, while onsite work

constituted 58%. In 1991-1992, offshore programming was only 5%, while onsite work was 95% of total software exports.

Export of Labor

India loses 15% of IT specialists annually due to immigration, mainly to the USA : about half of the U.S. work visas are issued to immigrants from India. According to the *INS – the U.S. Immigration and Naturalization Service,*:

- In FY 1999: 63,900 Indian specialists received U.S. work visas, which is 47.5% of the total number of H-1B visas;
- In FY 2000: in the first 5 months (from October to February 2000) out of 81,262 of all petitions approved, 34,381 (42.6%) were from Indian citizens, which was 37.5% (19,209) of new petitions falling under the quota, and 51.4% (15,172) of all extended work visas H-1B. Most of the INS-approved petitions for work visas – 42,563 (53.5%) - were from the IT sector applicants.

It should be noted that the professional level of Indians leaving to work abroad is much higher than the average of the Indian IT industry, which means that for some explicit and implicit reasons the best qualified specialists tend to immigrate.

Work abroad on a temporary contract in many cases entails immigration, which is often seen as negative, i.e. "brain drain", in terms of benefits to India. However, this process also has some positive implications for donor-countries supplying skilled labor:

- Compared to irreversible **«domestic brain drain»**, i.e. inevitable loss of skills when the work has to be done at a low technological level or is not related to the skills at all, **«external brain drain»** makes it possible for the specialists to get access to new state-of-the-art technologies, to improve their skills and **to return home at a qualitatively new professional level.**

- At micro-level, some software developing companies, who send their specialists to work abroad, see this as **a stepping stone to penetrating into the world market**. Well-reputed specialists create a positive image of their home companies and help build a zone of confidence and, by so doing, attract new clients to the national market. All these factors contribute to the development of the national IT industry.
- One result of the intellectual immigration is opening branches and missions of national companies in Western countries, which, in turn, helps further promote these companies in the world market. Practically all major Indian companies have now opened their offices in the U.S., Japan, Canada, and also in some West European countries.
- **The immigrants can create a powerful lobby** for their own country to expand its presence in the IT market, to promote the growth of commercial interest to invest in the country which supplies intellectual workforce. Thus, immigrants from India are currently employed at the managerial level of most major U.S. IT companies, which enables them to lobby the interests of Indian developers by facilitating the use of Indian companies as project developers. The Indian has become an influential political and economic force in the USA. Indian liberal policies and successful tactics of immigrant businessmen resulted in the emergence of many joint ventures both in the USA and in India and in a great deal of missions and full-fledged branches of U.S. companies in India.

U.S. President Bill Clinton visited India in March 2000. During this unprecedented visit the President was accompanied by 157 U.S. businessmen. In the course of the visit they signed some

cooperation agreements in different spheres, including information technology, in the total amount of U.S.$ 4.4 billion. Clinton noted, that the «brain drain» had paved the way for «brain gain» because most of the largest North American companies have opened their branches in India. If a person calls Microsoft for help with software, there's a pretty good chance he'll find himself talking to an expert in India, rather than in Seattle.

The U.S. President spoke constantly of India's success. In his opinion, "India is fast becoming one of the world's software superpowers." This proves that in the global community, developing countries can occupy leading positions as well as become successful.

4.12.7 Offshore Software Development

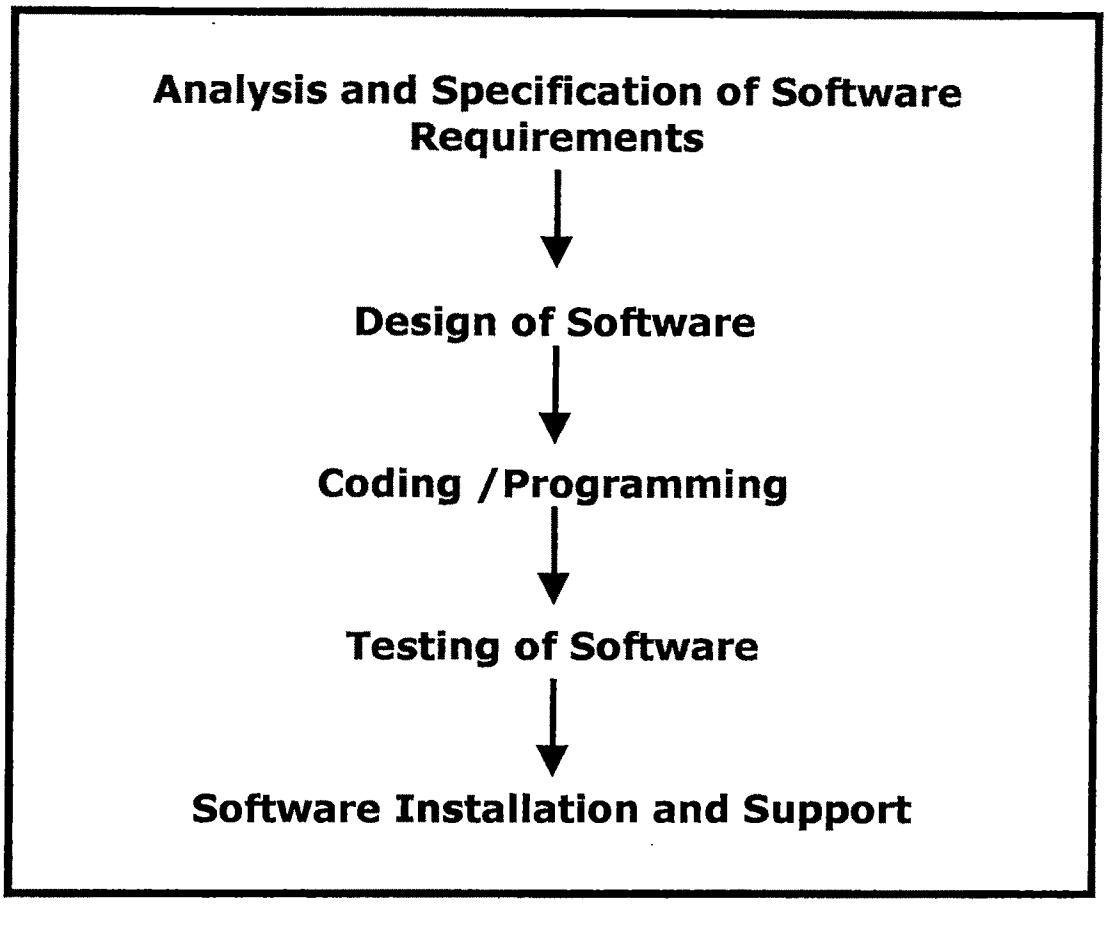
Growth in demand for IT services resulted in the spread of project outsourcing, i.e. transfer of projects to other firms or outside developers to be carried out by them. Projects can be delegated for development both at home and abroad (the latter case is called offshore software development). Terminologically, offshore software development means doing programming in countries with cheap labor for cost efficiency purposes, and outsourcing or contract programming means delegating orders to high-class professionals when companies are unable to do the job on their own.

According to the Nasscom report for FY 1999-2000, 185 of the Fortune 500 companies outsourced their projects to Indian software developers. In 2001, their number will increase to 300, and by 2003, Indian companies plan to provide these services to 80% of the Fortune 500 companies.

Technological Level

Software development is usually seen as broken down into the following standardized basic production stages :

Software Production Stages



Actual software development is somewhat different from this simple picture (many processes are conducted in parallel and some iteration, etc.), this model is close enough approximation to reality, as it shows that software development has been fragmented and standardized and, thus, made into a production process.

Software analysis and design are technologically the most complex (and requiring higher skills and experience) and the most expensive. Programming and testing constitute only 10-15% (by

some estimation, up to 30% at the most) of the total project cost and do not require higher skills. *In the international division of labor the majority of contracts allocate only the less-skilled coding and testing stage to Indian workers: 80% of all contract jobs carried out by Indians are coding, testing and support, while Western software developers carry out more skill-intensive work.*

Recently there has been some tendency for change and increase in hi-tech projects. More and more companies can carry out the full life cycle development. For example, in its Indian-based research and development centers, Wipro does the entire cycle of software development for companies like Intel, Sun Microsystems, Tandem, Alcatel and Cisco. On the whole, it has become possible due to the following factors:

- Indian companies accumulated sufficient experience in organizing and realizing offshore projects, achieved coordination in client-contractor relationship that made it possible to start remote project development with software analysis and design;
- export of labor and offshore programming opened access to new technologies and advanced experience, and helped become aware of the need to train specialists (in particular, managers, analysts, and designers) and to raise education to a proper level.

Thus, offshore programming in India has paved the way for building India's IT industry.

Export of Packages

It has already been mentioned, that exports of packages in India's software and services exports currently constitute no more than 5%. Primarily they are adjusted software (i.e. not new but already existing software products adjusted to the needs of specific

consumer groups), and also, to a much smaller degree, new packages developed for foreign companies and sold under their brands.

This is a logical situation, since the export of packages requires good marketing and, hence, large investments: major companies spend 40-50% of their funds on marketing and sales. Besides, investments in R&D require 10-15% of the company's revenues. According to Nasscom data, in 1999-2000 this figure in the Indian software industry was on average only 3.4%, which was marked progress compared to FY 1997-1998 when software companies invested in R&D 2.5% on average. Some major Indian companies have already reached the world levels of spending on technological R&D: e.g. in FY 1999-2000 Wipro invested in this business area approximately 14% of the company's total annual revenues. However, in absolute terms, these amounts are insignificant against those of Western companies: R&D investments of only one major Western company come up to billions of dollars, which is more than the overall revenues of all Indian software producers taken together. For example, the Microsoft R&D budget is 7-10 times more than the total revenues of Tata Consulting Services (TCS) – a major Asian firm, and Microsoft spending on sales and marketing is comparable with software development revenues of continents. Considering that only 1-5% of developed products are successful and in demand, and also that Indian companies do not have their own famous brands, the difficulties they face in the market of package exports become obvious.

Yet, at present Indian companies begin to show some growth in production and export of packages. Namely, TCS exports to the world market about 14 application programs for banking and finance, insurance, medicine, etc; the Wipro corporation has developed

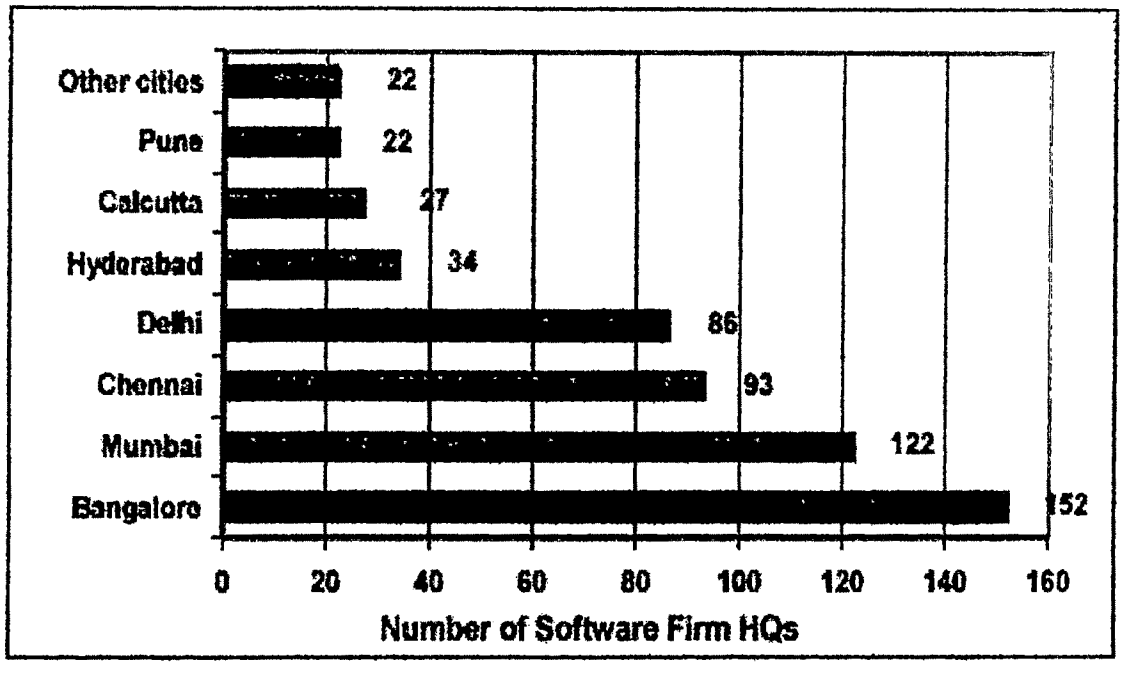
some first-class packages – Cybermanage (network management system), Softchips (a unique system based on the semi-conducting technology developed by the company for telecommunications and other industrial spheres), etc..

Thus, qualitative and quantitative growth of Indian software companies creates conditions for producing and promoting their own packages and new technologies in the world market.

4.12.8 Locational Concentration of Software and Services Companies in India

Software companies are mainly located around a few major Indian cities. Before the mid-80s, Mumbai was the center of this industry. However, since the late 80s software companies have been concentrating around Bangalore, which on the analogy with California's Silicon Valley is now called India's Silicon Plateau.

Location of Indian Software Company Headquarters (sampling of 558 major companies)



Source : DATA QUEST

These concentrations are determined by the following basic factors:

- Availability of **skilled labor** due to a broad network of research laboratories, educational institutes and public sector IT firms. By STPI estimations, 75,000 IT specialists currently work in Bangalore. They have been a key source of entrepreneurs, since a great deal of companies have been set up by former software specialists.
- **High quality of life**: Bangalore benefited from its reputation for a good climate, cosmopolitanism and good social conditions of life. Besides, it is famous for its 'pub culture', which in many ways facilitates informal communication and socializing of specialists and managers of different levels: Bangalore is the locus of *BAIT (Beer-Drinkers Association of Information Technology)*.
- **Modern and extensive infrastructure**. Unlike Mumbai, Bangalore has a better water and power supply and better developed transportation infrastructure.

Apart from these factors, Bangalore became Mecca of Indian software production due to one historical fact that occurred in 1986 when the U.S. company *Texas Instruments (TI)* set up its branch there. Later it became the first full-fledged offshore center of software development, which used satellite-based communication links to transmit data to the U.S. This was broadly reported in the home and international mass media. TI was known to have successfully cut through many red tape barriers and obstacles (particularly on imports) during its first months in India and this further encouraged firms to go to Bangalore.

In FY 1999-2000, almost 400 companies located in and around Bangalore exported software and services totaling over U.S.$ 1.1 billion to the world market.

4.13 Government Policies

The success of software exports and its potential as a foreign exchange earner has spurred the Indian government to come out with policies and initiatives to aid the IT industry.

The Indian central government wants software to be their number one export. It provides many incentives, facilities and privileges. The government has created many technology parks where there is no import duty or corporate taxes on companies. The parks have the best possible infrastructure such as computing and networking facilities. Many government procedures have been simplified for these companies.

The Government continues to be the largest player in India's economy and it's policies are conducive and are tuned to realize the growth potential of the industry.

4.14 Indian economy is set to grow 5.5% in fiscal year to March 31, 2003

The IMF (International Monetary Fund), Washington has forecast that the Indian economy is set to grow 5.5 per cent in the fiscal year to March 31, 2003. The IMF said after an annual review of India's performance : "The economy is projected to grow at 5.5 per cent in 2002-03, assuming a modest recovery in the industrial sector." The IMF said after an annual review of India's performance. The Indian economy is expected to grow 5.4 per cent this year, up from four per cent last year, the IMF said. Prices are expected to rise, with inflation growing 4.3 per cent in 2002, up from 3.8 per cent last year.

4.15 Major Software Associations :

There are three major software associations - National Association of Software and Services Companies (Nasscom), Computer Society of India (CSI) and MAIT.

Nasscom is an apex body and umbrella organisation of I.T. Software and Services industry in India. Nasscom is not only a Chamber of Commerce, but also a single point-reference on any information on I.T. and Services and Industry in India. It was specifically set up to facilitate business and trade in software and services and to encourage advancement of research in software technology. It is a not-for-profit organisation.

Computer Society of India is the largest association of IT professionals in India. In a span of about three decades, it strength grew from 50 to 1800 members. The purposes of the society are scientific and educational directed towards the advancement of the theory and practice of computer science, computer engineering and technology, systems science and engineering, information processing and related arts and sciences.

MAIT is apex body representing hardware, training and services sector of Indian IT industry.It was set up in 1982 for the purpose of scientific , educational and IT industry promotion. MAIT's activities have been consolidated with special focus on export promotion and attracting foreign investment in the Indian IT Industry.

The National Centre for Software Technology (NCST) is an autonomous R&D centre under the administrative purview of the Ministry of Information Technology (MIT), Government of India. It was

set up with the objective of carrying out R&D with practical impact and contribute to high quality education to professionals in IT industry.

Several multinational software companies are operating from India to reap the benefit of the available IT manpower in the country.

India is one the 12 countries in the world to have made laws enabling e-commerce activities.

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Chapter - 5.

Future Direction

5. Future Directions

5.1 India Must Develop Domestic Market

The computer software industry is India's feel good factor. Over a period of time, success stories, astute lobbying, government patronage, and well-meaning but largely ignorant media, have all played their bit in building a larger-than-life image of the sector. True, it is one sector that has won us international recognition. But although it has been said in the past, it needs to be re-emphasised. Despite the adulation and kudos it receives, the sector urgently needs to rework its priorities.

There are a number of areas that need attention, but the most pressing should be to address the continual neglect of the domestic software industry. The figures seem to bear that out as well. In 2000-2001, India's total software production (including IT enabled services) was $8.75 billion. Out of this, exports accounted for $6.3 billion and domestic market for a mere $2.45 billion. A year later, while the total reached an estimated $10.1 billion, exports touched $7.68 billion, and the domestic industry sputtered to $2.42 billion.

Contrast this with China, the country we don't often but should choose to compare our software skills with. China's total software production in 2001 was $9.6 billion, of which, exports accounted for a mere $0.7 billion. Several would term this as a no-contest, because they tend to weigh success in software with exports performance alone. If that were the case, then yes, India is clearly ahead. But such an attitude is fraught with danger. No country can really be a leader in any field unless it has a strong and resilient industry supporting it domestically.

And as the figures above show, India's performance on that front is abysmal. As for the export advantage we have, it is only a matter of time before the dragon catches up. Some information technology-related statistics from China are quite revealing. China has a PC penetration of 21.6 per 1,000, against India's 5.7. In the year 2001, it is estimated that the number of PCs sold in India hovered around 1.8 million. China during the period sold around nine million PCs. As for the total installed base of PCs by 2001, while the figure for China stands at 27.5 million, India has a base of under six million.

Then there are comparisons of per capita IT spending and IT spending as percentage of GDP. While China's per capita spending on IT is $8.9, India's is low at $2.4. And India's IT spending is 0.5 per cent of its GDP whereas China's stands at 1.1 per cent. What do the figures above tell us? Explicitly, they tells us that the Chinese are a far bigger user of IT and PCs. However, what they do not tell, but is implicit, is that if the IT spending and PC usage is so much greater in China than in India, all of it would also require software to run. This means that tremendous amount of code is being written domestically to run applications on these systems. Most of this code is not in English and this argument is often used to scoff at the threat, especially to the export market.

But for how long? Several recent visitors to China have noticed how even taxi drivers have an English dictionary in their vehicles. Apparently there is an unwritten directive that in the near future, anybody who comes in touch with a foreigner must possess a working knowledge of English. There is little doubt that the software programmers are being put through an even more rigorous regimen. As soon as this shortcoming is taken care of, the next step would be to start coding for the export markets. Their seriousness in the matter

was there for all to see when delegation after delegation visited India last year to learn the ropes. They made it a point to visit India's silicon valley — Bangalore — and were less than discrete in revealing the real intent of their visit.

What should our reaction be? We cannot stop a nation from picking up a language, but we must fiercely guard skills acquired through years of experience. However, that, at best, would be a short-term measure. What is really required are long-term measures. And among the most important features there has to be focus on domestic software. The Chinese are so confident about their growing software prowess not because their English is improving, which is important, but because they have the confidence of a vibrant and dynamic domestic software industry.

As soon as the English shortcoming is addressed, the huge benefit of developing software for domestic consumption would come in handy in making a mark internationally too. Nobody wants India not to export, but continuing neglect of the domestic market would, sooner or later, almost certainly tell on our export performance as well.

As for exports, it is a job best left to entrepreneurs, with the government playing the role of a catalyst. But there too the approach has to be different. Government-funded export bodies need to be manned by experts and not used as a parking slot for non-performers. At present, they are as good at their job as any government body can be, and that is not good enough.

Government-owned monopolies like VSNL are usually not equipped to cater to the consumer market. In India, the Government has for a long time been toying with the idea of allowing the private sector to provide direct Internet access. So far no explicit policy has

been made available to the public, probably as much due to bureacratic distaste for any kind of change with respect to deregulation as it is to the fluidity of the political situation for the last couple of years.

E-mail service providers expect the Department of Telecommunication (DOT) to allow the private sector to provide Web access later this year. VSNL is expected to remain the only gateway to India and act as a backbone to smaller Internet service providers. There is also a lot of lobbying going on to reduce the licensing fee requirement which supposedly DOT has pegged at Rs. 30 lakhs. If the Government of India actually lowers the licensing fee requirement and allows the private sector to provide direct Internet access, many more are expected to enter the market and the e-mail market scenario in India is probably going to undergo a sea change. Otherwise, most of the existing e-mail services will likely end up as money-losing propositions

5.2 Liberalize the telecom environment

Governments will need to liberalize the telecom environment at one go rather than do it gradually : What happened in India in terms of gradual liberalization did more harm than good.

5.3 Service providers need to be given higher priority

Certain facilities like quick provisioning of hunting lines etc., which may be taken for granted in a country like the USA or the UK, are a privilege in a developing country. Good telecom facilities are essential for a high level of service. Most developing countries have Government-owned telephony companies. The private sector telecom

service providers under such circumstances tend to be at a disadvantage. E-mail service providers in India are obviously much bigger consumers of telephone company services than end users are, and they need to be offered a lower, bulk rate. Also, speedy approval of requests for additional telephone lines should become de rigeur. Since telephony is a monopoly and the private sector service providers have no alternative to using MTNL's (Mahanagar Telephone Nigam Ltd - the Government controlled Telephony companies in the metros), the government needs to be especially sensitive to the needs to service providers

5.4 Availability of funds

Unlike the USA and Western Europe, entrepreneurs in most developing countries don't have access to venture capital. Most Governments in such countries usually have a kitty/incentives which they make available to industries in preferred categories. While that might sound like preferential treatment, in the absence of any better alternative, making that available to ISPs/on-line service providers is an alternative such countries can look at.

5.5 Managing expectations

One of the major reasons for the initial boost for e-mail services in India was the publicity generated by the press. In this instance, the press was acting as an ally of the service providers. However, the perspective that they provided was largely a Western perspective. In the Indian context, what was made available was much less. With expectations built up so high, when an individual/institution subscribed to an e-mail service, the post-purchase unhappiness was too high for the service providers to handle. The consumer

dissatisfaction got translated initially into a high churn rate and down the line for some customers into a discontinuance of e-mail service subscription altogether. (There is no empirical evidence available in this area though). As such, it is important that what is possible is made known to consumers from the outset.

5.6 Customer orientation

The concept of customer service is difficult to master under the best of circumstances. One only need look at the number of anti-AOL sites and pro-AOL sites (1) listed under Yahoo to understand. Most employees, with training, will gradually get into the mindset (in India, the junior management of the hotel industry too is also ill-paid, and not everyone gets tips, but the service level in most 5-star hotels is excellent). So it makes sense to invest in retraining all employees who interact with customers.

5.7 Building Virtual Communities

As recent events in the USA demonstrate, on-line services there too are going through a turbulent phase. However, successful service providers like AOL and even less successful ones like Genie had managed to retain a large customer base in part because of the virtual communities that they have built around chat rooms and on-line games. In a business marked by parity of service and a lower level of brand loyalty, it is important to encourage the development of user communities that will help retain clients despite any post-signup distress over the provider's level of service.

5.8 Long-term strategy of Indian software players

Growth prospects of software products are rising. However, customized software development will continue to be the mainstay of Indian software companies. For, software products involve high marketing expenditure. Indian software companies need to move up the value chain fast by providing end-to-end consulting services and creating unique software products and services. For this, they have to invest in research and development and acquire domain expertise in their areas of operation.

Indian software companies should aim high and benchmark themselves against global competitors. They need to tap emerging opportunities, differentiate themselves, increase revenue productivity and move up the value chain.

Indian software companies should exploit opportunities in under-penetrated markets and increase market share in existing markets. Indian software companies should open regional sales offices and tie up with local partners. And reconfigure their organizations to address geographical market segments.

Manpower turnover should be decrease consider people as the most important resource and offer the packages of innovative benefits to all employees. Companies should introduce a broad-based employee stock option plan. Also companies should provide a collegial atmosphere and should have an informal culture.

5.9 Branding is the Key

Branding is the key differentiater for moving ahead in the Indian software industry. A software company is no longer evaluated only on a cost platform, it is also being evaluated on a value platform.

If you want to be a global software player, it is important to build a strong brand equity.

5.10 India should think of China as a competitor

India should think of china as a competitor, the Chinese have great strength in manufacturing and many are surprised as to why India is not competing in that area. After all, the number of jobs in manufacturing is much larger than in the IT services sector and it funds infrastructure greatly. And China is a world leader in this area in the same way India is in software services.

At some point, India has to decide on policies to be competitive in manufacturing.

China will offer software services, but it has to shape its education system accordingly and create companies centered on that. So it is only over a five-year period that the Chinese will catch up. It is not a zero sum game. It is not that jobs are created in just one country; the number of jobs will increase in many countries. Today, for instance, India gets a lions share of jobs.

5.11 Dividends from Overseas Subsidiary Companies of IT Software and Service Companies should be tax-exempt

Recommendation by NASSCOM that affects Indian companies is setting up overseas subsidiaries. Indian companies export software using various methods of operation and many times, they do not open branch offices in USA, but open their subsidiaries. Technically, there may be a difference between a branch office and a subsidiary, but not for practical purposes. Both do same kind of software development work. "As per the Income Tax Act, if an

overseas branch office brings in profits from its overseas software activities into India, then it gets income tax exemption, whereas an overseas subsidiary for similar operations does not get similar exemption. This anomaly needs to be corrected ".

5.12 Software Services should continue to remain outside the purview of sales tax

NASSCOM has recommended that computer software development and IT software services should be continued to kept outside the purview of Service Tax in the domestic market. Various state governments have already reduced sales tax on software with the government of Karnataka rolling back the sales tax on software to zero percent.

5.13 No tax on E-commerce Transactions

NASSCOM has demanded a tax moratorium of not having any fresh tax on e-commerce at least for the next five years.

"Parties should be able to enter into legitimate agreements to buy and sell products and services across the Internet with min mal government intervention. In fact, the government should positively encourage such Net based transactions. The Government should not impose new and unnecessary regulations, bureaucratic procedures, or taxes and tariffs on commercial activities that take place on Internet".

5.14 Physical Bonding by Customs at IT Software Units at STP, 100% EOU, EPZ should be removed.

As per the current Exim Policy and Customs notifications, all units in EOU/EPZ/ STP are physically bonded i.e. equipment in these units cannot be taken out without prior permission of competent authority.

The problem with physical bonding is that it involves procedural delays. For example, new units coming in Bhubaneshwar have to wait for periods as long as 1 to 2 months because of want of customs inspection before they can start operation of the unit. Even transporting a laptop computer out from a STP unit for a demonstration or presentation to a client in a local hotel involves unwanted hardships.

As the whole gamut of delivery of software has oriented itself towards use of telecom links, the very reason of physical bonding has lost its meaning and therefore, we have requested quick implementation of Government's intention of removing physical bonding at STP, EOU, EPZ.

5.15 Enhancement of Telecom Infrastructure

Allocation of resources for enhancement of infrastructure like airports and power at the major software cities of India and has also requested for at least 2 Gbps of national Internet bandwidth.

Implementation of the recommendations of national IT task force for bringing down the street price of software and to retain zero import duty regime on computer software.

We are confident that the Finance Ministry would consider all these issues favorably. Information technology industry have the

full support of Ministry of Communications and Information Technology and many of recommendations have already been accepted by Government of India through Gazette Notification in response to the first report of the National IT Task Force."

5.16 Further Guidelines for Government Incentives in Software Industry Development

Since 1986, when the software sector was declared a priority area of the Indian economy, the Indian Government has been focusing on formulating a specific IT policy. The Government policy aimed to solve fundamental problems affecting the industry's development. These problems are:

- Limited capital market;
- Limited access to advanced technologies;
- Difficulties in harmonizing client-producer relations;
- Poor marketing;
- Deficiencies in the educational and training systems, etc.

A great deal of restrictions and barriers have led to:

- Somewhat lower growth rates of the software industry;
- A shift in emphasis from package production to services;
- Priority development of export production rather than the domestic market;
- More favorable conditions for major company development;
- India's position in the world in the capacity of a supplier of skilled IT labor, and also of rather cheap low-tech programming.

The Indian Government used a flexible iteration approach by analyzing the results of the measures taken and modifying its policies to meet the industry's changing needs.

The following are some areas of further government policy improvements:

- To introduce additional financial procedures to regulate the work of the industry's companies and to promote their favorable development ;
- To support private IT education, and also R&D in the private sector of the IT industry;
- To train industry-oriented staff in the system of public education;
- To develop infrastructure and to make it cheaper;
- To develop marketing at the government level in order to promote IT companies in the global market;
- To be more active in the policies against piracy;
- To further develop the system of government contracts on software development and IT services by Indian firms;
- To make bureaucratic procedures faster and simpler, etc.

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Chapter - 6.

Results & Conclusion

6. Results and Conclusion

6.1 IT an engine for global economic growth

Information technology is both an industry and a modernizing force. In most countries, IT spending grows at two to five times the rate of overall economic growth. To the extent that the spending is on locally produced products and services, the industry provides employment, tax revenues and a generally expanded industrial base. As a modernizing influence, the use of IT leverages investments in other capital, called "capital deepening" -- such as human capital, production equipment, etc. This in turn can increase a country's overall productivity and output per capita.

Building an IT ecosystem within a country relies on efforts both by IT suppliers and governments. Governments help to provide stable infrastructure within which an IT industry can grow, as well as education and skills development for the IT-using populace. The IT vendors bring new products to the local market, establish delivery channels, and service and support networks, usually employing nationals.

Evidence supporting the notion that IT is an engine for growth can be seen in this Study -- which tracks IT spending and growth, IT-generated revenues, and IT employment.

IT can really be a true engine for growth only through the help of technology partners. The synergy of these partners and their ability to help design, implement, and support solutions for customers are all critical parts of that engine and are certainly important parts of the IT ecosystem worldwide.

The study also found that worldwide IT spending grew by more than 10 percent annually during much of the past decade -- a

pace faster than the global economy overall. These results provide evidence that IT is not only a contributing factor in the success of Indian economy, but that it has a significant and growing role in the global economy. Besides the economic benefits, tax revenues, jobs, productivity improvement -- a robust IT industry can help raise the skill base of citizens involved in the IT ecosystem, improve learning through use in schools and at home and add diversity of experience to citizens vicariously through computer networks and online activity.

6.2 IT is Best Bet for India

India's best bet for the future is information technology (IT) with IT-enabled service industries, an industry that already has an export earning of Rs. 3,65,000 crore in FY 2002 (financial year ending March 2002). This earning represents 16 per cent of India's total exports up from 14 per cent the previous year, and is also 29 per cent more in rupee terms compared to the previous financial year. And this despite the worldwide slowdown in the IT industry in particular and all industries in general.

Yet software production growth to reach the target of 77 billion dollars, (excluding 10 billion dollars of e-commerce transactions) by 2008, as set in the IT Task Force report of 1999. The exports would be 50 billion dollars. What would this mean in concrete terms to the economy?

Considering that IT jobs are high paying—Infosys with some 3,000 workers pays a higher wage bill annually than Tata Steel with some 30,000 employees—the multiplier effect of this employment would be enormous as most of the direct employment would be of educated people.

What is more encouraging, the historical growth rate of the industry since 1999 when the target was set, has been higher than what was required to achieve the target. Hence, between now and 2008, an annual growth of 34 per cent is what is required to achieve the target. Despite the general slowdown in industry, the growth in FY 2002 was 27 per cent in rupee terms and 22 per cent in dollar terms according to the NASSCOM annual survey. The industry has the unique distinction of an annual output of Rs. 48,000 crore which works out to 10.1 billion USD. "The industry has proven to be resilient and continued to record impressive growth,".

In this industry, exports (Rs. 36,500 crore = USD 7.68 billion) far outshadow the domestic software market of Rs. 11,500 crore (USD 2.42 billion). Exports to the U. S. A. are still above 60 per cent and dominant. But Electronics and Computer Software Export Promotion Council Executive Director D. K. Sareen says that this body, a wing of the Commerce Ministry, is trying to create a better spread of the market in South-East Asia, Japan and lately an aggressive thrust in emerging African markets.

A feature of this industry is that while Indian firms continue to dominate the software and services export market, the MNC segment has emerged as an important contributor with a share of 27 per cent. More and more MNCs are looking to India and are setting up their research centres here.

IT-enabled services (ITES) like call centres, medical transcription, customer relationship, geographic positioning services, etc. are emerging as huge employment creators. As much as 45 per cent of ITES output is in offices set up by MNCs. Out of the total exports of Rs. 36,500 crore in software and services, the share of ITES is already Rs. 7,100 crore. By 2008, says the McKinsey study, ITES

exports would reach between 21 and 24 billion dollars. "We expect the ITES sector to grow faster than the earlier projections, given the increased interest in offshoring by global companies," says Karnik.

ITES would add one million jobs by 2008 but many people in the industry believe that it could be much higher if the large plans of some of the industrial giants fructify. Reliance Infocom is stated to have plans to create call centres that would employ some one lakh people. At an average of 20,000 dollars annually per employee, ITES could add a trillion dollars to India's GDP said Prof. Michael Dertouzos of the MIT Computer Lab two years ago at a meeting in Delhi. But even with an average salary of Rs. 10,000 the one million new jobs would create a disposable income of Rs. 100 billion (Rs. 10,000 crore). In FY 2002, the IT industry as a whole added 92,000 new jobs and over 250,000 indirect jobs in the country. It has created an FDI inflow of 800 million dollars rising to 1.2 billion USD by 2005. In the past six years, the IT industry has created a wealth of Rs. 90,000 crore. These are substantial sums.

Deepak Puri, chairman of Moser Baer, an IT hardware manufacturer, who took over recently as chairman of the Electronic and Computer Software Export Promotion Council, is planning a new strategy for boosting the IT industry. He says that the main weakness of this industry is in hardware where sales are not picking up as fast as they do in software. Actually, PC sales in FY 2002 went down from 1.88 million to 1.67 million. The sales of both Notebooks and Servers also was down in a year although we were promoting use of computers and software in different sectors of the economy. India is also very weak in hardware exports as domestic costs are higher than the landed costs of these items. Puri has plans to combine hardware and software into one package and launch such sales in markets abroad to

strengthen the hardware export market. He also says that some major MNCs will soon set up shop in India, taking advantage of the new economic zones.

One reason why PC sales are down in an environment where IT usage domestically is increasing is that users are not able to articulate what their IT requirements are. And PC vendors are either trying to oversell their hardware or undersell the required software. With almost 50 per cent of the PC sales done through the gray market, the users are short changed extensively—some thing they discover only once they begin to use the hardware they buy. The widespread practice of pirating software that is needed to be installed in the PCs and Notebooks, is taking its toll with the pirated software failing to perform efficiently. Users also say that IT companies are not offering simple solutions that they can understand.

In the domestic sector, we can expects a significant increase in software usage in banking, finance and insurance, telecom and manufacturing. This also reveals that the Indian economy is modernising at a rapid rate. Most banks and financial institutions are switching over to online and remote banking operations where the customer is served where he is. The success of this depends on software and reliable telecom networks. Infrastructure companies are installing supply chains and just-in-time manufacture using software-based solutions. There is also a projected high growth rate in use of software in the power sector as more and more power utilities get privatised and the new private power distribution companies employ computerisation to improve their customer relationships and distribution arrangements.

In a companion citywide survey, NASSCOM has found that the National Capital Region has the largest number of software

companies—53, Mumbai has 45, Bangalore and Chennai have 35 each. Among the top Indian exporters of software, Tata Consultancy Services (TCS) stands first with a turnover of Rs. 3,882 crore, Infosys is second with Rs. 2,553 crore, Wipro Rs. 2,298 crore, Satyam Rs. 1,703 crore and HCL Technologies Rs. 1,320 crore. The exports of the other 3,100 companies in the sector are less than Rs. 1,000 crore. The MNCs with their development centres in India are also doing well—IBM Rs. 3,100 crore, Cognizant Rs. 2,712 crore and Oracle Rs. 2,000 crore among others. Over Rs. 16,000 crore of software exports are achieved by merely the first 10 MNCs with their development centres here.

Indian software and services industry would grow in FY 2003 to Rs. 60,700 crore, the IT services exports growing by 22 per cent and IT-enabled services exports by 65 per cent. The domestic market would grow to Rs. 13,200 crore. We are going to see a further uptake in outsourcing in IT services abroad due to continued pressure faced by global companies. This will ensure continued volume growth (despite flat budgets for IT investment) for Indian software and services companies.

6.3 Growth look like for the IT sector in the future

I believe that the industry will grow an average of 11 percent a year between now and 2006, or -- well over twice the expected worldwide GDP. By the end of the decade, the technology industry should surpass $2.4 trillion in spending on hardware, software and services. In other words, in the first 40 years of information technology, IT users spent $6 trillion on hardware, software and services. During the next decade alone, they will spend $15 trillion.

6.4 The keys to a successful technology relationship between the public and private sectors

First, a government can promote IT industry growth by enacting and enforcing strong intellectual-property laws, which provide critical protection for technological innovation -- the lifeblood of the IT industry. Second, by investing in IT education and training. For the last 10 years, the demand for skilled IT workers has outpaced supply, and, **over the next 10 years eight of the 10 fastest-growing occupations will be computer-related**. Third, government should encourage commercialization of publicly funded research -- in other words, make sure that the results of publicly funded research are made available to the private sector in a useful way.

The key is to provide opportunities for researchers, business leaders and entrepreneurs to work together, attracting technology businesses and building new industries to create high-quality, high-tech jobs for the 21st century.

6.5 The key aspects to building a vibrant IT industry

Some of the common characteristics for a vibrant IT industry seem to be:

One, an educated and willing workforce.

Two, some key academic centers of excellence, such as universities and research labs.

Three, a stable business climate.

Four, strong and flexible communications infrastructure -- now usually entailing telecom deregulation.

Five, a good climate for investment for start-up activities -- either venture, corporate, foreign, or government.

Six, Government needs to promote the proper regulatory environment.

In addition, government can become an important role model and leader through example by ensuring its operations and services are as efficient as possible.

With more and more of the industry now revolving around software and content products, reasonable intellectual property protection is also growing in importance. But a country doesn't have to be perfect. The IT industry is a high-growth opportunity, so investors and industry participants are willing to work within existing strictures in order to have access to markets. On the other hand, it is also a global industry, and suppliers will funnel investment to the countries within which they see the most return.

6.6 An Economic Idea of India

Strengths

- **sustained growth at 6.4 for over a decade (but recent slowdown)**
- **strong export potential, current a/c deficit low**
- **healthy foreign exchange reserves**
- **low external debt**
- **low inflation regime**
- **political consensus on reforms**
- **deepening financial sector**
- **knowledge base advantage, demographic surge**

Weaknesses

- **fiscal deficit high, debt gdp ratio high**
- **fiscal situation of states worse**
- **inadequate infrastructure, huge funding need**
- **unsatisfactory investment climate**
- **rising gap between rich and poor states**
- **dependence on oil imports, monsoons**
- **slowing of reforms, coalition compulsions**
- **social indicators below world average**

Indian Software Industry

- **accounts for about 2% of India's GDP.**
- **In FY01, its share was 1.5% of the global market ($387 bn).**
- **In FY02, the size of the industry was Rs. 485 bn of which exports accounted for 76% and domestic software 24%.**
- **India exports software to 102 countries.**

6.7 Future of Indian Software Industry

" The future is very Promising ".

The Indian software industry will continue to grow and growth will be driven by buoyant exports. Indian software exports are poised to reach US $50 billion by 2008. The software industry will catalyse the transformation of the Indian economy. Indian software companies should move up the value chain fast. Breakdown of Software Company charges per Programmer/Developer are as follows:

Breakdown of Indian Software Company Charges per Programmer/Developer

Charge element	Onsite work (U.S.$)		Offshore work (U.S.$)	
	1999	**2002**	**1999**	**2002**
Overseas allowance	1900	3000	n.a.	n.a.
Overseas rent	1700	2500	n.a.	n.a.
Overseas local travel	300	450	n.a.	n.a.
Overseas travel, Insurance and visas	450	650	n.a.	n.a.
US taxes	Vary	Vary	n.a.	n.a.
Local hardware use	n.a.	n.a.	550	900
Basic Indian salary	900	1300	900	1350
Indian salary extras	400	600	400	600
Administrative and financial overheads	650	950	650	900
Training overheads	300	450	300	450
Building and utilities overheads	200	300	200	300
Additional offshore overheads	n.a.	n.a.	400	600
Profit	1200	1800	1200	1800
Total	8000 + taxes	12000 + taxes	4600	6900

Source: R. Heeks India's Software Industry, Indian Software Labor: Cost Breakdown and Comparison

6.8 Outlook For Indian Software Industry in FY03

It is estimates that the total size of the Indian software services industry for the Financial Year 2002-2003 is expected to be Rs. 60,700 crores (US$ 12.3 billion). Additionally, IT Services exports is expected to grow by 22% to Rs.35,800 crore and ITES exports is expected to grow by 65% to Rs. 11,700 crore. The domestic market is expected to grow to Rs. 13,200 crore in the Financial Year 2002-2003. While globally, IT budgets are expected to be flat or marginally up, the share of software services in IT budgets is expected to increase. Moreover, within IT services we are going to see a further up-take in outsourcing due to continued cost pressure faced by global companies. This will ensure continued volume growth for Indian software and service companies.

The Indian Software Services industry will witness an increase in addressable market in terms of new geographies, new service lines as well as higher penetration in new verticals. Amongst the new geographies that will provide growth opportunities for India include Germany, France and Italy in Europe; Singapore, Korea and Malaysia in South East Asia; and Chile, Mexico, Uruguay and Brazil in Latin America. On the Service lines front, IS Outsourcing, Application outsourcing and Systems Integration will be the growth areas. Among verticals, Healthcare, Retail, Government, Utilities and Telecom Service Providers are likely to increase their share in the total exports. In FY03, Indian IT Software and Service Companies will work towards beefing up their capabilities. In the area of marketing, Indian companies will look towards building expertise through Thought Leadership, gaining better Customer Access and Key Account Management. Indian companies will also examine the possibility of building Global Delivery Models to overcome geo-political risks.

Further, the industry will see a strengthening of domain expertise due to lateral recruitment. Companies will try to contain costs by recruiting in line with utilization rates, hiking the proportion of variable pay, and better management of fixed price contracts. The industry is also expected to witness a rise in M&A activity as players try to broaden product offerings and build scale.

6.9 India is a computer software super power.

"India continues to create waves in the multi-billion collar global software industry, with a steady and impressive increase in the volume of software exports. The handsome growth in India's software exports is mainly due to continuous increase in offshore services. Today, India is supplying high quality software to nearly 100 countries around the globe. Indeed, from being a low profile and slow-moving sector, the Indian software venture has blossomed into a high quality, high profile enterprise with a lucrative prospect of netting an ever-increasing volume of foreign exchange for the country. Demand for the Indian software professionals is likely to increase at an exponential rate as developed countries will require many more such professionals. By 2008 the IT industry would employ four million people, probably making it the largest single industry. It would account for seven per cent of India's earnings. Despite the availability of training manpower, a demand supply gap still exists in the IT manpower market. If India's IT software and services sector is to achieve an annual revenue of US$ 70-80 billion in 2008, it will have to educate at least 2 million additional knowledge workers over the next 6 years. Though the quantity of workers is important, it is the quality of this knowledge base that will ultimately play a crucial role in deciding the fate of the IT industry in India.

We sized the global employment market at 26 million worldwide. This includes employees at IT hardware manufacturers, software suppliers and services firms, as well as those involved in the delivery and installation of IT products and services. It also includes all the IT professionals working within enterprises to design, deploy, and manage IT applications.

Although 2001 was a flat year for employment -- a product of the global IT recession -- between now and 2005 we will add another 12 million people to the employment roster, almost half again the current roster.

Smart use of IT can raise productivity levels, which has direct impact on the bottom line. Also, The Internet presents new opportunities to drive new businesses, create new models of governance, and help jump start the economies of even the least developed nations of the world. What we found in the Oxford Analytica case studies was that the success of each nation's IT industry, and the discrete sectors related to it, seems to have been significantly influenced by the surrounding public policy environment. These factors were: public funding for IT development, training and use; the ability to engage in open, barrier-free trade; the promotion of competition in telecommunications markets; and a regulatory environment that promotes competition and the ability to respond quickly to changing conditions.

The labour is comparatively cheap in India, the government is also very supportive of such projects that have vast potential for foreign exchange earnings.

The world at large has, in the meanwhile, taken note of the fact that Indian software export is no longer dependent on "body shopping" - a euphemism for deputing manpower to work at the

overseas sites of the clients. For today, Indian software companies are at the cutting edge of the latest generation of programmes, including multimedia and client server applications.

"The Government has been very supportive to the Indian Software and Service industry and we hope that it will continue to retain the incentives provided to help strengthen India's position as a leading software superpower worldwide. In order to sustain growth and reach revenues of $87bn by 2008, the industry is looking forward to the assistance and assurance from the government that there will be no fresh imposition of tax and that the incentives continue to be long term."

On the issue of competition India is facing from other Asian countries in software exports that we should not ignore the threat from China. Though India at present is far ahead of China, the latter is seeking to come abreast. It has imported 4,000 English teachers to train Chinese software engineers in English and neutralise India's huge advantage in that language. China has also set up development centres in India to learn about Indian software-making. Infosys and Wipro are among the Indian software companies who are in China already. Indian training major NIIT was commissioned by the Chinese government to draw up training programmes for the Chinese in computer education. India should be alive to the threats posed by the countries like China and Russia. since China has 125 million telephone connections compared to India, which has only 30 million." In fact, China is also far ahead of India in mobile phones. "If India do not improve the infrastructure and ease bandwidth, we can not think of making big in the global market".

The government has to work in unison with the private sector to grow. It also has to be open to any innovative idea to make India a superpower in IT.

New market opportunities for Indian software in Germany, France and Italy in Europe, Singapore, Korea and Malaysia in South-East Asia and in Chile, Mexico, Uruguay and Brazil in Latin America will expand our exports. The growth areas are listed as: institutional outsourcing, application outsourcing, systems integration, healthcare, retail trade, government, utilities and telecom service providers which will give a vast spread for the software firms. Altogether the prospects are extremely rewarding.

"The last decade, the mantra of every company was IT-enabled services. But now, IT out sourcing and business process outsourcing would rule the business and whoever understands this would reap the harvest of wealth." "To make a call from India to US it costs Rs. 47 per minute, but if you call from the US it only costs 57 cents. We would lose the benefits of IT if the communication costs are not within the reach of the common man".

India is no doubt making deep inroads into the global IT, but what the Indian companies need to focus is on quality and logistics. Firms should go an inch further in meeting the needs of customers in what is called customer relationship management (CRM). Indian companies should adopt CRM, otherwise they would be out of the race.

- Quick, India may not remain a software 'market' for long. It is becoming one of the world's top exporters of software.
- Global software giants that are active in India include Oracle, Microsoft, Cypress, Spectra Innovations (of the US), LG Electronics (Korea), Siemens (Germany), while others like

Hewlett Packard, IBM, Texas Instruments, Motorola, Digital Equipment Corporation, etc.

- The government of India 's industrial and investment policies support all software ventures, particularly export projects. Import duties have been rationalized in the past years and are expected to be further reduced to enable the industry compete on a global basis.
- The Prime Minister of India has given a call to make India an Information Technology superpower and one of the largest generators and exporters of software in the world within ten years.
- As an initiating step, a high powered National Task Force on IT and Software Development was set up by the Prime Minister's Office on May 22, 1998, under the Chairmanship of the Deputy Chairman of Planning Commission. This taskforce has mandate to formulate the draft of a National Informatics Policy.

6.10 Building India's Software Export Sector

Within a rather short period, India – a vast and poor Third World country – was able to become an important player in the global IT market. India's export-oriented IT industry and, in particular, extensive development of offshore programming enable the country to get access to the front line of hi-tech development and to experience in organizing industrial development of software.

The current boom in information and telecommunications technologies and globalization of world economic structures enabled India to get the recognition it deserves as a power possessing a strong scientific and technological potential as well as a source of skilled labor.

6.11 Prospects for 2008

The current tendencies and the favorable economic and political climate sustained, by 2008 the software and IT services industry will play a key role in the Indian economy:

- Software and services production in India will reach U.S.$ 87 billion
- On the whole the IT industry in India will be estimated at U.S.$ 140 billion;
- Projected minimal capitalization of the software and services market will reach U.S.$ 225 billion;
- 10 Indian transnational corporations will have annual turnover of over U.S.$ 2 billion each;
- Software and services will constitute over 7.5% of the total growth of India's GDP;
- The package software market will reach U.S.$ 18 billion, U.S. $10 billion of which will be the domestic market;
- From 2001, software and services exports will annually double and by 2008 will amount to U.S.$ 50 billion p.a.;
- million specialists will be employed in the sector, about 200,000 of whom will be high professionals and will be involved in Class «À» development – hi-tech software production, about 570,000 – in IT services and e-business;
- Foreign investments in the sector will come up to about U.S.$ 4-5 billion, which exceeds the volume of all foreign investments in the Indian economy in 1998.

Prospects for India's IT Industry Development

Indicators	As of March 31, 2000 (U.S.$ billion)	As of March 31 , 2008 (U.S.$ billion)
Software and Service Production	**5.7**	**87**
Software and Service Exports	**3.9**	**50**
India's Information & Tech. Industry	**8.6**	**140**

Source : NASSCOM

Basic Information and Communication Technology Development Indicators in India

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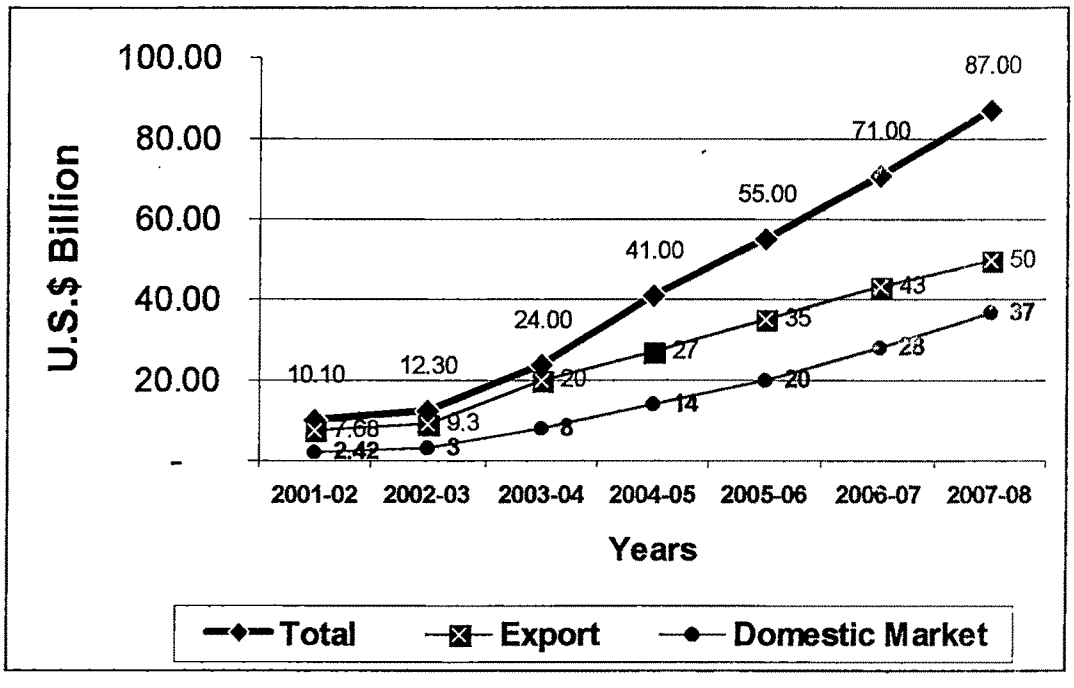
Indicators	As of March 31, 2000	Target by 2008
Total PCs	4.3 million	20 million
Internet Subscribers	0.77 million	35 million
Internet users	3.2 million	100 million
Cable TV Subscribers	37 million	70 million
TV – sets	75 million	225 million

Source : NASSCOM

Software Industry Growth in India from FY 2001-02 to 2007-08



6.12 Foundation for the IT industry's Growth in India

Specific regional prerequisites and the following factors provided a foundation for the dramatic growth of the Indian IT industry:

- Successful **enterprise tactics**, based on marketing and well-thought-out organization of production, internal and external networking, etc.
- Successful **national strategy** designed to promote India as an IT exporter in the global market. The Government is the industry' promoter and its policy is directed to liberalizing the industry.
- **National vision**: India's success as a Third World IT colossus resulted from a thirty-year dream of businessmen and government officials alike that came true thanks to the nation's creative potential. Information technology has literally become a new mantra of Indian society.

The national strategy of the country to encourage the development of the IT industry has been implemented due to some basic initiatives undertaken by the Indian government in the following spheres:

- **Administrative Regulatory Measures**:
  - Delicensing of the software industry.
  - Drastic simplification of registration procedures for software and services producers.
  - Creation and development of government structures promoting the industry's growth (in marketing, organizing the production process, etc.).
- **Export-Import Policies**
  - *Export incentives:*

- Making tax concessions (including profit taxes) and lowering customs duties, etc. Tax exemption for software and IT services export revenues (since 1991) is worth special emphasis.
- Establishing the status of EPZs, EOUs and, especially, STPs with favorable treatments for production development.
- Introducing a 10-year tax exemption for software producing companies located in free economic zones and STPs.
- *Import liberalization:*
- Gradually lowering customs duties on software imports from 14% to 0%, under the 1999 regulation.
- Introducing zero customs duties on imported textbooks, guides, operation manuals, journals and periodicals on CDs, under the 1998 regulations.
- Lowering by stages customs duties on computer imports and computer-enabled goods.
- Introducing zero customs duties on imported computers and other equipment which after two years' use are donated to social institutions, hospitals, schools and government structures.
- Liberalization of the «e-market» in the Internet.

Finances and Investments

- Incentives to attract private and foreign capital to the software industry, telecommunications infrastructure and IT education:
- Introducing tax concessions for companies, special treatment for joint ventures, private educational institutions.
- Introducing preferential lending schemes.
- Introducing schemes for risk insurances.
- 100% involvement of foreign capital in all IT areas.
- 100% involvement of foreign capital in e-commerce.

- Introducing tax concessions on purchasing shares of major foreign companies.
- Introducing tax concessions on venture capital investments in IT companies.

❖ **Education and Training**

- Higher and secondary IT education reforms, development of a retraining system.
- Certification system for specialists.
- Incentives for standardizing education and certifying educational institutions.
- Incentives for young people to get an IT education (systems of subsidies, preferential taxes, etc.).
- Incentives to attract private and foreign capital.
- Government support and funding of educational institutions.

❖ **Telecommunications Infrastructure**

- Private and foreign capital involvement in telecommunications development.
- Privatization of national telecommunications companies.
- Removal of government monopoly on various services.
- Government support and funding of telecommunications development.

❖ **Intellectual Property Protection**

- Better legal systems and tougher punishment for breaching the intellectual property right law.
- Economic leverage to encourage the use of licensed products (*e.g. zero customs duty on software imports).*

❖ **Improvements in the production process, development and introduction of advanced technologies**

- Funding and crediting research and industrial hi-tech projects.

- Incentives for standardization and international certification (ISO 9000, SEI CMM).
- Launching a system of government contracts to encourage development and implementation of high technologies in production and management.

, 2000, VO'

Breakdown ai
Manchester, Uk

Export", IDPM,

Chapter – 7.

Future Applications

business environment will depend upon finding practi utions to making computers easier to use; continuation of increa power while reducing the cost of computer systems; stu s role communication and computer application ; advances in era, storage and retrieval; and the availability of ar astest application software. he

At present, one large obstacle to wid computers is the technical knowledge required on the p who users; i.e., skills in programming and an understandi ting computer operates. Currently, research is being done to be initial technical knowledge required by developing new w individual can communicate with a computer. One is th promising is voice recognition and voice response. This approach will allow the user to vocally converse with the computer.

It is becoming more obvious that we are on th e of a tremendous change in how computer market will have a ound effect on our society and in particular our work environment.

On the basis of this research Information Te olo related companies and businessman can study the global Infor mat and Communication Technology market and their trends for the which will be certainly helpful in decision making for the their suc

Appendix

Glossary Of Terms

Appendix :

A) Glossary of Terms

- **AICTE** -- All India Council for Technical Education
- **AOL** – America On Line
- **ARPANET** – Advanced Research Projects Agency Network
- **ASCII** – American Standard Code for Information Interchange
- **ASP** – Active Server Pages
- **BARC** -- Bhabha Atomic Research Center
- **BAIT** -- Beer-drinkers Association of Information Technology
- **BFIS** – Banking, Finance and Insurance Services
- **BIIT** – Business India Information Technology Ltd.
- **BITKOM** -- Bundesverband Informationswirtschaft, Telekommunikation und neue Medien – Germany's Federal Union on Informatics, Telecom and New Media.
- **CAIR** -- Center for AI and Robotics
- **CBDT** – Central Board of Direct Taxes
- **CDAC** -- Center for the Develolpment of Advanced Computation
- **CDOT** -- Center for the Development of Telematics
- **CII** -- The Confederation of Indian Industry – Non-government, non-profit structure established 100 years back to promote India's industrial development. At present it i. 'ves 3800 private and public companies, representing 80% of India's entire industry.
- **CISMOD** -- Conference on Information Systems and Management of Data
- **CMC** -- Computer Maintenance Corporation
- **COBOL** – Common Business Oriented Language

- **COMAD** -- Conference on the Management of Data
- **CONSEG** -- Intl. Conference on Software Engineering Practices
- **CSI** -- Computer Society of India
- **DAE** -- Department of Atomic Energy
- **DEPB** – Duty Entitlement Pass Book
- **DGFT** – Director General of Foreign Trade
- **DoE** -- Department of Electronics - in the late 90s was transformed to the IT Ministry of India.
- **DoS** -- Department of Space
- **DOT** – Department of Telecommunication
- **DTA** – Domestic Tariff Area
- **DST** -- Department of Science and Technology
- **ECIL** -- Electronics Corporation of India, Limited
- **EHTP** – Electronic Hardware Technology Parks
- **EOU** -- Export-Oriented Units – its rights and benefits are equal to those of EPZs, but unlike them, EOUs do not have a well-developed infrastructure. Under the Indian Ministry of Finance.
- **EPZ** – Export Processing Zone – designated area within a country, separate from domestic tariff area, in which specific export-oriented regulations apply. Under the Indian Ministry of Finance.
- **ERNET** -- Educational and Research Network
- **ERP** – Enterprise Resource Planning
- **EXIM** – Export – Import Policy
- **Export Obligations** –export obligations on goods and services produced on imported hardware (here: software and IT services) imposed on a company importing hardware. The total volume of obligations – cost of goods and services to be exported – is

calculated in proportion to imported hardware cost and depends on the customs clearance pattern chosen.

- **FSTTCS** -- Foundations of Software Technology and Theoretical Computer Science
- **FTU -- First Time Users :** The home computer buyers who are buying computers for the first time are often referred to by the acronym FTU. For a long time, the FTU segment was ignored by Indian PC makers.
- **Gbps** – Giga Bits Per Second
- **GOI** – Government Of India
- **IBM** – International Business Machine
- **ICT** – Information and communication technologies.
- **IDC** – International Data Corporation
- **IISc** -- Indian Institute of Science
- **IIT** -- Indian Institute of Technology - India has a network of IIT branches located in its various states.
- **IIIT** – Indian Institute of Information Technology.
- **INS** – Immigration and Naturalization Service (U.S.).
- **ISI** -- Indian Statistical Institute
- **ISO** – International Standards Organization – international body that sets work standards, including those covering software production.
- **ISP** – Internet Service Provider
- **ISRO** -- Indian Space Research Organization
- **IT** – Information technology.
- **ITAA** -- Information Technology Association of America
- **ITES** – Information Technology Enable Services
- **ITPL** – International Technology Park Limited
- **IWPP** -- Intl. Workshop on Parallel Processing

- **LAN** – Local Area Network
- **LSE** – London Stock Exchange
- **MatScience** -- Inst. for Mathematical Sciences, Madras
- **MAIT** -- Manufacturers Association for Information Technology
- **Mbps** – Mega bits Per Second
- **MIDC** – Microsoft India Development Centre
- **MII** – Ministry of Information Industry
- **MIT** -- Ministry of Information Technology
- **MNC** – Multinational Company
- **MoD** -- Ministry of Defence
- **NAL** -- National Aerospace Laboratories
- **Nasscom** – National Association of Software and Services Companies –India's National Association established in 1988. It comprised 38 companies with total revenues of 65% of those of the entire software industry. As of December 2000, Nasscom had 797 companies whose total revenues constituted almost 95% of the total software production in India.
- **NCST** -- National Center for Software Technology
- **NIB** – National Internet Backbone
- **NIC** -- National Informatics Center
- **NICNET** -- National Informatics Center Network
- **NIESA** – NASSCOM's India Europe Software Alliance
- **NINJAS** -- NASSCOM's India Japan Software Alliance
- **NRSA** -- National Remote Sensing Agency
- **NSF** – National Science Foundation
- **NYSE** – New York Stock Exchange
- **PC** – Personal Computer
- **RBI** – Reserve Bank of India
- **REC** -- Regional Engineering College

- **SCM** – Software Configuration Management
- **SDA** – Software Development Agency: sub department within the Department of Electronics.
- **SEI CMM** – Softv ineering Institute Capability tority Model – internationa. tification developed by U.S. D.fense Ministry-sponsored Softw. Engineering Institute (SEI) ..ain Carnegie Mellon University. CMM Level 5 Certificati n is gi n to companies whose softv ocess meets the highest world standards a.. ar products are of world quality standards.
- **SOHO** -- Small Office Home Office Users : Small scale entrepreneurs who operate either out of the house o .. of a small office with skeletal infrastructure are called SOHO users. Many of them are very IT savvy and are often early adopters of technology in India.
- **SQL** – Structure Query Language
- **SSF** -- SPIC Science Foundation, Madras
- **STP** -- Software Technology Parks
- **STPI** -- Software Technology Parks of India
- **TCP/IP** – Transmission Control Protocol / Internet Protocol
- **TRDDC** -- Tata Research, Development, and Design Center
- **USD** – U.S. Dollar
- **VCC** -- Venture Capital Company
- **VCF** -- Venture Capital Fund
- **VCU** -- Venture Capital Undertaking
- **VLSI** – Very Large Scale of Integrated Circuit
- **VSAT** – Very Small Aperture Terminal – small-sized satellite land-based complexes of telecom networks.

- **VSNL** – Videsh Sanchar Nigam Limited – India's largest telecom company, before April 1, 2002 - a monopoly in installation of the Internet telecommunications with India. Until recently, VSNL was a state-owned company. After the decision to privitaze some telecom companies, 52.97% of VSNL shares are state-owned, 30% are owned by foreign investors.
- **WAN** – Wide Area Network
- **WTO** – World Trade Organization
- **WWW** – World Wide Web

Basic Characteristics of STPs, EPZs and EOUs in India

- ❖ Simpler export-import procedures, zero customs duties;
- ❖ «Single window» system, faster bureaucratic procedures;
- ❖ Lower sales taxes and excise rates;
- ❖ Corporate tax exemption for a 10-year period for STPs and 5-year period for EPZs and EOUs;
- ❖ Simpler access to hard currency;
- ❖ Opportunities to establish wholly-owned foreign companies;
- ❖ A well-developed telecom infrastructure, access to international communications links, in particular to satellite communication;
- ❖ A large number of vacant production premises and preferential terms to build new production facilities;
- ❖ Cash compensatory support and reduced prices for rent of premises and apartments, for electric power and water supply;
- ❖ Extensive social and communal infrastructure, etc.

Appendix

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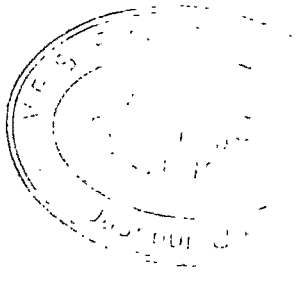
2. Amar Ujala
3. Computer Express
4. Dainik Jagran
5. Economics Times
6. Hindustan
7. Hindustan Times
8. Indian Express
9. The Hindu
10. Times of India, New Delhi



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