Dr. Rajendra K Bandi

Indian Institute of Management Bangalore
India

The Indian Software Industry and Relationships with the European Market

(rbandi@iimb.ernet.in)

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The Indian Software Industry and Relationships with the European Market

Abstract:

India has emerged as the leading destination for outsourcing of eWork, both in Software Services as well as IT Enabled Services (or business process outsourcing). With a world-class IT industry, a large low cost English speaking talent pool, and government initiatives and policies to encourage eWork and remote services, India has capitalized on its early mover advantage. Indian firms now develop software or offer IT Enabled services for more than half of the Fortune 500 companies.

A predominantly export oriented Indian IT industry has already established considerable presence in the US and has earned the reputation of being the first country of choice among US companies. However, most Indian firms are currently trying to focus beyond the American market, and are actively engaged in establishing relationships in the European and Asia Pacific markets.

This paper outlines the different factors that may be salient with respect to the competitive advantages of the Indian IT firms. We also discuss the nature of relationships, the challenges faced in managing the global relationships, as well as the domestic challenges faced by the Indian IT firms. While discussing the relationships, particular emphasis is placed on the relationship with the European Clients. While discussing the various challenges, particular attention is given to the social impacts of such relationships.

1. Introduction

India has emerged as the leading destination for outsourcing of business processes and eWork. With a large low cost English speaking talent pool, a world-class IT industry and government initiatives and policies to encourage eWork and remote services, India has capitalized on its early mover advantage. This paper outlines the different factors (such as, industrial structure, labor issues, education scenario, infrastructure and government policy) that may be salient with respect to understanding the eWork[1] location in India. The paper also discusses the Indian IT industry's relationships with in India and challenges in sustaining these relationships.

2. The Industrial Structure of India

This section gives a brief background of the Indian Industrial Structure to help the reader put in perspective the Indian IT industry. India is the world's second most populous country, after China, with a population of 1.02 billion that is growing at 1.75% per annum. With a GDP of $478 billion, India is now the world's 12th largest economy and the fourth largest in PPP terms. The GDP has been growing at a rate of 6% in the nineties although it slowed to 4% in 2000/ 01. India's per capita income in PPP terms was $ 2400 in 2000.

After independence in 1947, India adopted a planned economy with a system of price and quantity controls, an austere foreign exchange regime, a rigid licensing and regulatory mechanism and massive reliance on subsidies, high tariff and import substitution. From the '50s to '80s, India pursued this policy aimed at achieving economic self-reliance. In these decades, India's international trade shrank to as little as 8.5 % of GDP. The economy grew at just 3.5% annually, and FDI was just $300 million annually.

Economic growth accelerated in the 1980s following the onset of gradual economic reforms. Major reforms followed the balance of payments crisis of 1991. Since then international trade has more than doubled, FDI inflows increased ten-fold by 1998 (to $ 3 billion annually), and the economic growth rate has been a robust 6.1% annually, though FDI inflows to neighboring country China are ten times that of India's.

The structure of the Indian economy has changed over the decades. The share of agriculture, industry and manufacturing sectors in GDP in 1981 was 37.4%, 35.3% and 37.2%. This had changed to 24.9%, 26.9% and 48.2% respectively in 2000, showing a clear shift towards services. The services sector has been growing at an average annual rate of 7.8% in comparison with 2.1% for agriculture and 4.5% for manufacturing in 1997-02 (Table 1-1).

Today there is a widely diversified base of industry in the country. The index of industrial production has gone up from 7.9 in '50-'51 to 154.7 in 1999-2000. Major

[1] eWork is defined as *"information processing work carried out at a distance with the extensive use of computer systems and on the basis of telecommunication links"*

export industries of the country include traditional exports like cotton yarn and textiles, ready-made garments, leather goods, gems and jewellery and agricultural products and the most rapidly growing segments today like cashew nuts, transport equipment, software, electronic goods and manufactured metals.

Table 1-1: Sectoral Real Growth Rates in GDP

Item	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000	2000-2001	1997-2002
I. Agricultural	4.1	5.0	-0.9	9.6	-2.4	6.2	1.3	-0.2	**2.1**
II. Industry	5.2	10.2	11.6	7.1	4.3	3.7	4.9	6.3	**4.5**
III. Services	7.7	7.1	10.5	7.2	9.8	8.3	9.5	4.8	**7.8**
IV. Total GDP	5.9	7.3	7.3	7.8	4.8	6.5	6.1	4.0	**5.4**

Source: Indian Economic Survey, Ministry of Finance, Government of India, New Delhi.

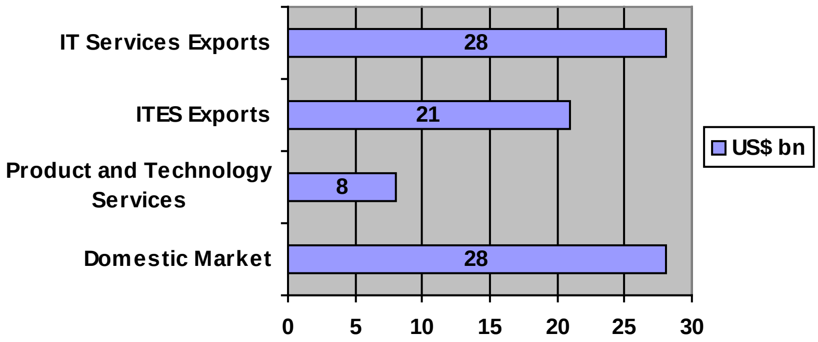
Indian Software Industry

For the better part of the last decade, India's software industry has been growing at 50% annually, starting from a small base in 1990. By 2000, the software sector's output had grown to $8 billion of which $6.2 billion is from exports. More than 800 firms, located in cities like Bangalore, Hyderabad, Pune, Chennai, and New Delhi provided a range of software services. The United States accounted for nearly 62% of Indian software exports, followed by Europe with 23.5% and Japan with 3.5%.

Although low-end work, such as maintenance of legacy systems or projects associated with the millennium bug (Y2K) and euro conversion accounted for about 20% of export revenues in 2000, the Indian industry has moved up the technology ladder over time. Tier one vendors like Wipro, Infosys and Tata Consultancy Services are now looking at business transformation work and providing high value services like consulting, integration and architecture. One another indicator of this upward shift is the fact that more than half of the software development centers in the world with Carnegie Mellon University's CMM Level-5 rating are currently located in India.

Global trends indicate that more and more IT spending will go to offshore solution providers. A survey by Merrill Lynch indicates that the proportion of the global IT spend outsourced to India could potentially increase from the current figure of below 5% to that of over 15% in the next two years. Among these the proportion of higher value added services is likely to increase. NASSCOM, India's association of software and service companies estimates that by 2008 the Indian IT industry can reach a figure of $57 billion in export revenues and $ 70-80 billion in overall revenues. (Chart 1-1)

Chart 1-1: Projected IT & IT Enabled Services Exports by 2008



Source: NASSCOM- McKinsey Report 2002

IT Enabled Services and other Emerging Services

IT Enabled Services such as call center operations, back office processing and medical transcription are currently emerging as a key business opportunity in the country. The country's strengths in the form of low staff costs, a large pool of skilled English speaking workforce and government support has made India a popular choice for outsourcing such services. The sector had grown to nearly $1.5 billion in 2001-02 and India is already considered the "back office to the world". More than a quarter of the Fortune 500 companies such as GE, American Express, British Airways, HSBC, Standard Chartered Bank, British Telecommunications, Citibank and AT&T are shifting their back office operations to India.

GE for example already employs 11000 people spread across its eight facilities in five Indian cities and plans to double the size of its operations in a year. The facilities provide services for 270 processes across 30 major GE businesses the world over. Almost 60% of GE accounts are handled in India involving processing of six million invoices annually. By shifting such operations to India GE now saves $275 million every year.

Its not just cheap labor that has made India attractive. Productivity and quality of services have also paid off. A recent McKinsey study found that an operation, which takes 20 seconds to process in a US facility, is handled in just 8 seconds in India. Indians also had much higher rates of error free transactions. McKinsey places India ahead of other countries in the world in terms of its value proposition in this sector (Table 1-2).

Table 1-2: Country Comparison

Country	Work-force	Market Access	Local Market	Infra-structure	Cosmo-politan	Cost base
New Zealand	2	2	-	2	3	2
Malaysia	1	2	-	2	2	2
Japan	1	2	1	3	1	3
Hong Kong	1	2	2	2	2	2
India	3	2	2	2	3	1

1 denotes low; 2 denotes average; 3 denotes high (Source: McKinsey & Co.)

Opportunities in advanced knowledge-based services also exist. Indians are carrying out design and engineering work for industrial and construction projects. For instance, the Indian firm, Satyam Computers, has formed a strategic alliance with TRW to provide a range of IT-related and engineering services for automotive applications. Even more advanced work is planned in GE’s R&D lab in such areas as basic chemistry, polymer science, mechanical engineering, ceramics, and metallurgy. Other foreign investors with similar aims include Ford, AOL Time Warner, and Advanced Micro Devices.

Another area holding enormous potential is biotechnology and pharmaceuticals. Indian firms, such as Dr. Reddy’s Lab, Ranbaxy, Shanta Biotech, have developed new molecules and drugs, sometimes funded by MNCs like Bayer, Unilever, and Pfizer. To encourage knowledge-based investments of this sort, the Indian government is rapidly becoming much more receptive to the idea of protecting intellectual property.

India also has vast potential in media and entertainment as well. NASSCOM expects the animation/content development industry in India to almost double each year over a five-year period, growing from $ 202 million in 1999/ 2000 $4.2 billion by 2008, driven largely by exports. According to the industry, filmmakers could save as much as US$ 60,000, by using Indian animation houses rather than Southeast Asian animators, to produce a 22 episode series (30 minutes each). Apart from the technical synergy between software and media in producing animation, India enjoys a home market advantage in this sector, as the world’s largest producer of movies (ahead of Hollywood, with 800 titles annually).

3. Employment and Working conditions in India

Employment Trends

India is known for its regional imbalances, which have become further skewed over time. Even in terms of sheer size one state has a population of 139 million while another state has a population of just 0.4 million. According to the 1991 census 50% of India’s workers were in the 7 of the 25 states.

The total work force in the country, as in December ’99, was of the order of 397 million. About 7% of the total work force was employed in the formal or organized sector while remaining 93% work in the informal or unorganized sector. The rate of growth of employment declined from 2.04% in the period ’87-’88 to ’93-’94 to only 0.98% in the period ’93-’94 to 1999-2000.

The proportion of workers employed in agriculture declined from 68.5% in 1983 to 59.9% in 1999-2000 (the absolute number of people employed in agriculture has also declined for the first time in the economy). The share of manufacturing has marginally increased. Employment in service sectors like construction, trade, financial services, and transport, storage and communication has grown faster than the average and the overall growth in employment is mainly due to these sectors.

The new economic policies of globalization and internal liberalization have created an environment that is not conducive to expanding employment in the private sector. Most of the industrial units are shedding excessive labor and in order to be competitive are inducting sophisticated machinery and automation. The rate of unemployment has increased after 1991, from 6.03 % in ’93- ’94 to 7.32 % in ’99-’00.

IT and IT Enabled Services Sector

The employment scenario in the IT and IT Enabled services sector has been brighter. India has witnessed a healthy growth in the number of its IT professionals. From a base of 6,800 knowledge workers in 1985-86, the number is projected to increase to 5,22,000 IT software and services professionals by March 2002. Out of these 170,000 are working in IT software and services export industry, nearly 106,000 are working in IT Enabled services and nearly 2,20,000 in user organizations. It is projected that, by 2005, the Indian Software sector is likely to employ 14,00,000 professionals and the IT Enabled Services sector is expected to generate four million jobs. The most significant aspect of the success of the IT Enabled Services segment is the amazing rate at which players have ramped up operations. For e.g., GE’s original target for the ITES operations in India was 10000 people by 2005. It has now revised its target to 20000 people by 2003.

The IT and IT Enabled services sector has also changed the working conditions prevalent in the Indian Industry. Firms in these industries offer a young and vibrant work atmosphere. They promote fun in the work place, encourage informal dress codes and regularly organize picnics and excursions. Many software firms have campuses comparable to the best facilities in the world with gyms, tennis courts and swimming pools available for employee use.

Wages

India’s per capita income was $460 in 2001. However there is a wide disparity in salaries and wages depending on the work that is being done. For the educated workforce, at the lower and entry levels, salaries in the industry range from $150 for a secretary to $350 per month for a field services engineer. In comparison entry-level software developers and system engineers get an average salary of $650 and above.

Even with the rapid growth of the last few years, an Indian software engineer still costs one-half to one-fourth that of an American software engineer, although at higher ends wage differentials have reduced now (Table 2-2). In the IT Enabled Services industry the wage differential between agents from India and other countries such as Australia, the US, Ireland, and UK is almost 80-90 %. According to the International Customer Service Association USA, typically the average salary of customer service delivery agents in India is about US $2000 to $3000 per annum, while the comparable salary in the US or Australia is between US $23000 and $35000 per annum. The Indian salaries compare favorably with the average salary figures across Indian industries***. This is the reason why jobs in the IT Enabled Services sector are considered to be relatively prestigious in India as compared to the western countries***. The cost comparison clearly shows that wage differential between India and US will continue to be over 65 % in the coming years.

Table 2-2.
Salaries paid to software professionals internationally in 1995, (US$)

	Switzerland	USA	Canada	UK	Ireland	Greece	India
Project leader	74,000	54,000	39,000	39,000	43,000	24,000	23,000
Business analyst	74,000	38,000	36,000	37,000	36,000	28,000	21,000
Systems analyst	74,000	48,000	32,000	34,000	36,000	15,000	14,000
Systems designer	67,000	55,000	36,000	34,000	31,000	15,000	11,000
Development Programmer	56,000	41,000	29,000	29,000	21,000	13,000	8,000
Support Programmer	56,000	37,000	26,000	25,000	21,000	15,000	8,000
Network analyst	67,000	49,000	32,000	31,000	26,000	15,000	14,000
Quality specialist	71,000	50,000	28,000	33,000	29,000	15,000	14,000
Database analyst	67,000	50,000	32,000	22,000	29,000	24,000	17,000
Process specialist	74,000	48,000	29,000	31,000	–	15,000	17,000
Documentation staff	59,000	36,000	26,000	21,000	–	15,000	8,000
Test engineer	59,000	47,000	5,000	24,000	–	13000	8,000

Source: www.man.ac.uk/idpm/isicost.htm.

Labor Laws

Labor is in the concurrent list of the Indian constitution. This means that both the parliament as well as the state legislatures can enact laws on aspects relating to employment, trade unions, industrial disputes, social security etc.

Recently calls for labor legislation reforms have become more frequent in the country. Retrenchment of labor and employment of contract labor are some of the issues on which industry leaders are demanding urgent reforms. As of today, retrenchment of labor by all units with more than 100 workers can be implemented only with the explicit permission of the government, which in practice is hardly ever given. A second area relates to contract labor. The contract labor (regulation and abolition) Act, 1970 was originally enacted to regulate contract labor to avoid exploitation. But in practice it has been interpreted as if its intention is to abolish contract labor and forces enterprises to have all services performed by regular employees on their payroll.

IT and especially IT Enabled services need to work uninterrupted – on all 365 days of the year. Allowing flexible working hours and staggered timings, permitting use of contract and part time employees on a continuous basis are some of the items on the wish list of service providers in the country. The Prime Minister's Task force on Knowledge based industries has made various recommendations regarding labor legislation that are appropriate for the new industries and many of these are expected to be adopted. Exemption has been sought from rules regarding restriction on working hours, restricting on period of work, overtime payment and specifying hours of rest and minimum leave The Task force has even sought exemption for knowledge based industries from the contract labor act since at present, outsourcing of services like catering, transport, gardening, house keeping, maintenance and other related services makes the firms liable as a principal employer and certain obligations are imposed by the Act.

Some state governments have already undertaken initiatives to address these issues. The state of Andhra Pradesh has amended the shops and establishments act to enable 24 * 7 * 52 service, employment of women at night and flexible working hours. The state of Karnataka has drafted a bill that enables women to work at night and allows for three shift operations even on national holidays.

4. Education and Skills in India

Overall literacy levels have been improving steadily in India from 43.6% in 1981 to 64 % in 2001. For the female population it has improved from 39.3% in 1991 to 54.16% by 2001. The state of Kerala in South India for example, has managed to achieve a literacy rate of 92%.

In spite of the low percentage of literate population, the sheer size of the India's population ensures the availability of cheap, good quality labor. The previous section on labor pointed out that educated job seekers constitute a high percentage of the unemployed population. This combined with the rise in literacy is responsible for the situation where the educated do not have sufficient avenues of employment. ***Hence IT Enabled Services which may be considered to be undesirable, low income jobs in the west have become attractive and relatively prestigious avenues for employment in India***.

Higher Education

India has about 3 million students graduating every year in different streams (excluding medicine and engineering). Currently over 1,60,000 engineers from all disciplines graduate every year. There are 400,000 teachers in and around 13000 colleges and 294 universities all over the country. The Indian higher education system has witnessed a 13-fold increase in the number of universities, 25-fold increase in the no of colleges and 30-fold increase in the no of enrollment of students in the last five decades. It is believed that about 60% of Indian graduates can speak English, with this percentage also steadily increasing, as knowledge of English is now recognized as necessary in the job market. A special emphasis has come to be laid on women's education. The number of women's colleges has recorded a substantial increase, and India has 1195 women's colleges today.

The government has set a target of 10% for access to higher education, which is of course way below the 59% access in US, 54% in Canada, 22% in UK and 30% in Israel. With a view to increasing accessibility to higher education the Indian government has increasingly been granting "deemed university" status to private educational institutions. The number of deemed universities in the country today is 70 with 100 more applications pending. By virtue of being self-financed institutions these deemed universities enjoy considerable autonomy compared to state funded universities and colleges.

India has a large pool of technically qualified English speaking manpower, the eighth highest in the world, available at a comparatively lower cost. Over 1,60,000 engineers from all disciplines graduate every year from more than 650 engineering colleges. The four hot specializations in any engineering college are IT, Computer Science, Electronics and Communication and Electrical Engineering. More than 900 colleges provide computer education at the degree/diploma level. MCA (Master of Computer Applications) courses were set up across India in 1984 and have contributed to the talent pool in the country. Thanks to economic liberalization, private schools are augmenting the government's efforts to expand the supply of students to meet the anticipated needs of the software industry. Private institutes, such as NIIT and Aptech, together produce nearly 100,000 IT professionals annually, a figure that is projected to increase to half-million by 2006.

The Indian Institutes of Technology (IITs), Indian Institutes of Management (IIMs) and the Indian Institute of Science are world-class centers of technology and management education. Between 25000 and 30000 IIT engineers are now settled in the US alone and in the late 1990s some of the world's finest companies discovered the IIMs. In the 1980s there were few Indians in the senior management corps of global corporations. Today there are a few hundred, some of them in the highest positions. Multinational such as GE, Unilever and Pepsico vouch that their Indian operations boast some of their finest managers in their global network.

One important initiative undertaken to increase the information technology workforce in India was the setting up of four Indian Institutes of Information Technology (IIIT) in 1998. The IIITs aim to provide software engineering degrees as well as conduct short-term courses for skill building. To capitalize on bioinformatics and the biotechnology sector opportunities, a "Biotech City" and an Institute of Bioinformatics and Applied Biotechnology is being set up in South India. Another biotechnology research center in collaboration with Cornell University has been announced.

Brain Drain

The outflow of India's technical talent to other countries may impact the outsourcing of remote services and eWork to the country. "Made in India" today has become a signal of quality in software, just as "Made in Japan" is a signal of quality in consumer electronics. As a result, more countries have begun to court Indian IT talent. More than 20% of the H1B visas issued by the US are to Indian IT professionals, though not all of it is brain drain since Indian software exporters use H1B visa extensively for body shopping and client support. ***Indian IT experts accounted for 20% of the green cards issued by Germany for non-EU computer specialists in 2000***. Singapore has set a goal of attracting 250,000 Indian IT professionals over a five-year period. The list also includes other countries like UK, Finland, France, Germany, Ireland, Japan, New Zealand, and South Korea.

It must be acknowledged however that brain drain however has ceased to be a one-way flow outside the country. Many Indian technology professionals working outside India have also started returning to India, while others circulate between the two countries, thereby diffusing technology and skills. The IndUS Entrepreneur (TIE), for instance is a network of Indian entrepreneurs and professionals with 25 chapters, including five in India, several in the U.S., and one each in countries like Singapore, Switzerland, and the United Kingdom. While most of their wealth goes to U.S. companies, they are also funneling funds into a new generation of start-ups in India as well as hybrid companies and that operate in both India and the U.S.

Quality of Education

A government report on education observes that it is a matter of serious concern that expansion in quantity growth in education has been accompanied by a decline in quality. For instance, the country produces 1,60,000 engineers every year but only about 3,000 engineers produced by premier institutions are of international quality. An autonomous body, National Accreditation and Assessment Council, has been established to assess the quality of higher educational Institutions on a regular basis. There is also an absence of formal institutions in India for ranking higher educational institutions on a regular basis. Of late, India Today, a publication, along with Gallup, a market research Firm, has been conducting an annual ranking of higher educational institutions.

Some state governments have taken noteworthy steps to ensure quality of IT education. The state of Karnataka has established a Board for IT Education Standards. This is a forum that brings together key stakeholders, i.e. industry academia and government to devise standards for IT education in the state. The board is actively involved in curriculum development, teacher training and imparting training through e-learning and distance education programs.

5. Telecommunications Infrastructure

Technology infrastructure is a strong theme of the 21st century in India. There is a telecom revolution in the air and on the ground. Fiber crisscrosses India’s cities and countryside. Cities are being connected by terrestrial networks. A group of private players is pushing national and international phone call costs down sharply. Cheap bandwidth and always-on Internet access for homes in cities and most towns will start off in 2003. Yet infrastructure has been the Achilles heel of India in the last century.

Telecom Network

At the end of January 2001, of the 0.61 million villages, 0.45 million villages had telecom facilities. Domestic demand for telephone lines is expected to increase by 13.8% to 112 million lines by March 2010. Hence teledensity (total fixed and mobile lines) is expected to increase from 3.6% in 2000 to 7.5% by March 2005, and over 15% by March 2010. In comparison the teledensity in China was 7% and in Russia was 19.7% in 1998. The quality of many lines in India is poor, largely owing to low quality last-mile connections.

Wireless in local loop has been introduced for providing connections in urban, semi urban and rural areas. However at present interconnectivity between the basic, mobile and limited services is still a problem with the regulatory authority’s position that service providers need to work out such agreements between themselves.

The Ministry of Communications regulated telecommunications in India until recently. In 1994 the Government of India put in place a liberalization and license-bidding process for private sector participation in basic telephone and cellular services. The government also established the Telecom Regulatory Authority of India, TRAI, an autonomous body with quasi-judicial powers to regulate telecommunications services in India. State owned companies, BSNL, MTNL and VSNL (privatized recently), continue to dominate India's telecom services market, though private players like Reliance and Bharti Telecom are beginning to make their presence felt.

Investments

Telecom investments have increased by 19.3%, from $2 billion in 1995- 96 to $4.5 billion in 2000-01. Basic services accounted for an estimated 82% of the fresh investments in 2000- 01, and cellular services for 18%. The investment to revenue ratio was maintained at approximately 70% during the 95- 96 to 2000-01 period. The ratio was high compared to the world average of 21%. FDI accounted for less than 3% of the investments in the telecom services sector. However the share of FDI in the mobile services sector was higher at over 11%.

Internet

India has lagged far behind many other Asian countries in the adoption of the Internet. In a population of one billion people, there are fewer than two million Internet subscribers while China, has more than eight million. Some of the factors responsible for this are listed in the table below. (Chart 5-1)

Chart 5-1. Reasons for Slow Adoption of Internet In India

- Low Teledensity
- Low per capita income
- High Illiteracy rates
- Low reliability of the telephone system
- Lack of high speed communications backbone till recently
- High tariffs till recently
- Poor overall infrastructure has limited the expansion of Internet within the country for commercial purposes.

The overall telecom situation in the country is improving steadily however because of various initiatives. The international bandwidth situation in India has improved dramatically with the launch of India’s first private undersea cable on 9th April 2002. In addition VSNL, the biggest ISP, has negotiated contracts to use parts of several international cables. The international bandwidth available for Internet by October 2001 was about 1.2 gbps.

The National Internet Backbone is another ambitious project by the state owned BSNL for building an information superhighway right across the nation. Phase one of the project has been completed, which covers a route length of over 17,000 km. Phase two will provide connectivity to additional 150 cities. Permission has also been given to private companies for laying optical fiber cables.

Tariffs

The fall in telecom tariffs is also expected to have a significant impact. In just two years India has effected a 110% drop in the international private lease line rates with an equally dramatic fall in long distance telephonic charges. Currently the peak rate from India to US is $1.0 per minute while off peak rate is $ 0.9 per minute. The US to India rate is $ 0.53 per minute. In comparison, the cost of a call to the US from China in 2000 was $ 1.4 per minute. Cellular phone tariff rates were reduced by almost half in January 2002, by the state owned MTNL. These changes are expected to result in higher volume of traffic and revenue increase, apart from improving the communication facilities on a much wider scale.

STPI and Software Technology Parks

The 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 has 12 centers spread across India. These centers act as a "single-window" in providing services to the software exporters. These centers are equipped with basic facilities and provide incubating infrastructure to SMEs enabling them to commence operations without any delay.

The Government of India has also launched the Software Technology Park (STP) scheme. Till date, around 7000 software units have been given approval by the government to operate under this scheme. The STP scheme is a 100% Export Oriented Scheme. The Indian Government had announced a tax holiday of 10 years for the EOU/EPZ units, especially the software units under this scheme.

Many state governments have created such software technology parks in which the infrastructure is vastly superior compared to that found elsewhere in the country. Notable examples include Bangalore’s Electronic City and Hyderabad’s HITEC City, which offer not only office space and communications links but housing and other social amenities as well. These cities like Bangalore, New Delhi, Chennai, Hyderabad, and Pune have emerged as hubs around which most of the software industry is located.

6. Government Policy

In the last decade India has opened up greatly to private participation and global competition. Tariffs have come down from an average of 100% or more to 30%. Most forms of import or industrial licensing have gone. FDI is automatic, and 100% foreign ownership is permitted in many sectors, including software. The rupee has been made freely convertible on the current account. Corporate income taxes have been reduced to 45%. Foreign portfolio investment and venture capital financing have been encouraged. Many Indian state governments are also taking steps to encourage industry. These include single window services to simplify procedures and clearances, incentives to attract investments, strengthening infrastructure and simplifying rules. India has stepped into an era of competitive industrial environment in which entrepreneurs would be responding more to the signals of the market than trying to skirt around bureaucratic controls.

The Ministry of Information Technology was formed in 1999. The IT minister has played a key role in pushing legislations and making sure that the reforms process continues.

The Information Technology Act

With the enactment of the Information technology act, India joined a select group of 12 nations to have legislation in this arena. The act provides legal framework to facilitate electronics commerce and electronics transaction and aims to recognize electronic contracts, prevention of computer crimes, electronic filing/ documentation, digital signature, etc. The act raises electronic records to the level of conventional paper-based physical ones as primary evidence for all legal requirements. Moreover the Negotiable Instruments Act, which legalizes various Financial Instruments, is being modified to enable secured financial transactions over the Internet, which is a basic requirement for the development of e- commerce and e- services in the country.

The Convergence Bill

The Government of India has recently completed and released a draft Communication Convergence Bill, 2000 that aims to provide a clear regulatory framework for keeping pace with the convergence of telecom, Internet and broadcasting services occurring worldwide. This new legislation, drafted along the lines of an amendment to the U.S. Telecommunications Act of 1996 and Malaysia's 1998 Multimedia Act, would make India the second country in the world after Malaysia to adopt legislation covering the convergence of high-tech media. The government has also addressed the specific regulatory concerns of the IT Enabled services sector such as allowing sharing of bandwidth between multiple entities for disaster recovery or mission critical applications.

The next version of the Convergence Act is likely to come in 2004 and is expected to drop the artificial barrier between voice and data. It would be possible then to pay for bandwidth and run whatever is needed – voice, data and video.

Telecom Policy

The Public Telecom operators account for 85% of the total telecom revenues. The government is moving towards privatization and corporatisation of the telecom industry. In February 2002, the disinvestment of the state owned VSNL, one of the key players in the telecom industry, was completed by bringing down the government equity to 26% and the management of the company was transferred to the Tata Business Group. International long distance, national long distance services and basic services also have been opened up for private sector participation. The number of subscribers served by the private Basic Service operators increased from 272760 as on

April 1, 2001 to 44,7618 as on December 31, 2001, a growth of 64%. As the market matures the focus of the regulatory structure is shifting from licensing of basic telecom and cellular services to emerging services and to issues related to ensuring fair completion and consumer protection.

Internet telephony has been opened up for private participation from April 2002. Only Internet Service Providers (ISPs) have been allowed to offer Internet telephony for national as well as international long distance calls, without paying any additional license fee, since Internet telephony has been defined as a value-added application service.

With privatization it is expected that even the public sector would not be able to influence policy making even though it would continue to control a large share of the market. The sharp fall in telecom tariffs has been possible with the entry of private players in this sector.

Foreign Direct Investment

Deregulation of industries lowers entry barriers and leads to greater competitiveness. Foreign Direct investment policies have undergone a dramatic change since the closed economy days of the last decade. FDI up to 74% is now allowed in the telecom sector and in a few cases even 100% is permitted. The remaining restrictions on foreign ownership of telecom companies are expected to be gradually phased out as in the other countries. Up to a 100% FDI has been permitted for B-to-B e-commerce FDI up to 49% from all sources is permitted in the private banking sector and up to 26% is permitted in the insurance sector. FDI up to a 100% is permitted in airports, courier services, hotel and tourism sector. Automatic route is available to proposals in the IT sector, even when the applicant company has a previous joint venture or technology transfer agreement in the same field. The government has also taken various steps to improve enforcement of intellectual property rights, to attract FDI.

e- Governance

India has been one of the few countries that have been able to use Information technology to bring good governance to citizens. Many state governments are actively trying to promote e- governance solutions. Gyandoot, a project in an Indian state Madhya Pradesh has a network of around 35 Internet kiosks set up in 20 village centers. These provide the masses with information on a range of issues relevant to their lives and easy access to government officials. This project was the first major government initiative that helped in taking IT to the masses. The state of Karnataka's e- governance initiative through which it has started computerizing the 17 million odd land records throughout the state has even won a commonwealth award.

7. Relationships with the European Market

Compared to the other markets, India has the highest penetration in North America. As mentioned earlier in the paper, almost 62% of India's IT services export revenues were realized from the US market, followed by Europe with 23.5% and Japan with

3.5%. The following table (Table 7-1) shows the percentage of India's IT services to different markets.

Table 7-1: Indian Software Exports (country wise)

Country / Region	Percentage
Australia & New Zealand	1.10
Japan	3.60
South East Asia	4.30
West Asia	1.47
North America	62.65
Europe	23.82
-- UK	11.84
-- Germany	3.20
-- Belgium	1.41
-- Netherlands	1.27
-- Switzerland	1.20
Rest of the World	3.06

These statistics reveal an over dependence on the US market, as well as a possible under-penetration of markets such as Western Europe, Japan and Latin America. This balance will need to be redressed, by Indian software companies exploring export destinations other than the US. One of the reasons, for this over dependence on the US market than others is because many Indian businesses have links through family members or friends who are US residents; because many software developers are US-trained and so understand that market best; and because there is a vast predominance of US firms in the all-important collaborations which provide so much of India's software export market. The US has also had more liberal immigration rules for work or residence than most other developed countries.

The Indian IT industry is aware of this situation and is actively focusing on the European market (as well on the Latin American market) as a part of its explicit de-risking strategy. Couple of developments in the last 2-3 years has led to this focus. The first development is the economic slowdown in the US markets, starting in the mid-tolate-2000, which still continues even today. As a result the IT budgets of leadings US companies during 2002 and 2003 are stated to be lower than the IT spend in 2001. The 9/11 incident has further contributed to the uncertainties prevailing in the market. The success of in the Indian IT industry, resulted in a growing resentment in the US labor market owing to the loss of job opportunities in the local market. The current initiatives in the New Jersey legislature to introduce a bill banning such job movement is a direct of this resentment. This resentment is much more prominent in jobs affected in the Business Process Outsourcing (BPO) segment, compared to the jobs affected in the software service segment.

Looking at the limited penetration of the Indian IT industry into the European market, it is clear the UK is the biggest market so far in Europe. This however should not come as a surprise. One of the significant factors claimed to be an advantage enjoyed by the Indian industry is the available of a large English speaking population. This will not be a significant advantage in UK and a couple of other countries. In fact, the fact that Indian developers do not speak German, French, Italian etc., are definitely considered a disadvantage as far outsourcing of the BPO jobs is considered. However in the case of outsourcing IT services jobs it is not perceived to be a great disadvantage. Organizations from countries such as Germany, Netherlands etc, which have either outsourced software services jobs to India, or have set up wholly owned subsidiaries in India have reported that English is accepted as the primary language of communication, and this hasn't looked as putting constraints on communication.

Siemens, Phillips, British Telecommunications, Bosch Telecom, HSBS, Standard Chartered Bank, Swiss Air, Swiss Re, Morgan Stanley etc., are examples of some well known European companies which have moved their IT services and / or Business Processing jobs to either partially or totally.

In the case of IT services, several European countries are facing severe shortage of qualified IT professionals. As a result, the governments of several European countries have been actively wooing the Indian IT professionals to migrate to Europe. One such high profile initiative was from Germany, which offered "green cards" (permanent residency) to Indian IT professionals. Today from the Indian perspective it is looked at as an unsuccessful initiative.

However this is not true in the case of manpower required to handle call centers and other business processes. Manpower shortage is not the primary reason for movement of jobs to India. The main reason is the significant cost benefits offered by the Indian BPO organizations. This has naturally resulted in significant tensions between the unions and the management, and will continue to be a problem unless both the Indian and the European organizations seriously address this issue. British Telecommunications is at the center of one such controversy in moving jobs to India.

Case studies of several Indo-European relationships, bring out the following factors as being critical in managing the relationships:

Knowledge transfer is a critical issue and must be a continuous activity. To inform, train, and motivate the teams in India, several organizations bring the key Indian personnel to their site in Europe and conduct continuous training programs onsite in India.

Videoconferencing, frequent onsite visits and inspections, and teleconferencing are musts, to manage project schedules, and problem solving.

Companies should not underestimate the infrastructure issues.

Language and time issues are equally critically issues. The two countries usually have different off-days and religious or national holidays.

Managers of the client and development organizations should recognize the differences and constraint and evolve strategies to achieve a high degree of congruence.

8. Indian IT Industry Conclusions

India's success in the field of eWork is due to a combination of unique circumstances. Through investment in centers of excellence like the Indian Institutes Technology and Indian Institutes of Management and a network of universities apart from these centers, right from the '60s, India has been able to produce the knowledge workers of the 21st century just in time for the 21st century! India was able to capitalize on the severe shortage of IT workers during the dot com boom of the late 90s and the Y2K boom to emerge as a leading software services provider. The Indian Diaspora, which was earlier treated as a major cause for concern and resulting in brain drain from the country has also resulted in funneling business and money back to the country.

Realizing the opportunity that is knocking at the gates of the country the government at the state and central levels is moving to implement policies that can act as enablers for the industry. The reforms that were initiated at the beginning of the decade have begun to boost the annual growth rates of the country. There is a new dynamism and level of confidence in the country's capabilities, whether in the popular press of the country or in the growing respect for India's abilities in the international arena.

However there remain significant areas of concern. The biggest cause for concern is the infrastructure. Although the government is aware of the need to rapidly improve this sector, India is still likely to lag behind many of the competitor countries for some time to come. A second cause for concern is the political instability and the deteriorating relationship with its neighbor Pakistan. Finally the wide economic and social disparities that exist within the country cannot be wished away. It is possible that as this industry grows within the country and companies move towards the smaller towns and non-urban areas from the larger urban areas in which they are right now concentrated, labor talent which is a key factor responsible for India's success, may not be as easily available as it has been till date.