



国际服务外包之比较研究

Comparative Study on International Service Outsourcing

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Preface

This study is prepared in response to the request of MOFCOM with a view to identifying best practices in service outsourcing that could enhance the efficiency of the service sector including the regulatory framework and investment policy, the implementation of commitments already undertaken in GATS and the benefit of further liberalization of services. It attempts to achieve this objective through analysis of the performance of China in service outsourcing in comparison with the experience of relatively successful countries such as Ireland and India in the hope that this analysis can demonstrate how China's regulatory framework can take advantage of the information and communication technology to spur economic growth and contemplate new commitments in services that could contribute to the dynamic growth of world trade in services.

Executive Summary

There has been a dramatic global expansion of outsourcing of a wide and ever-growing range of business support services. The growth of outsourcing is driven by efficiency gains through application of information and communication technology. Outsourcing generates income and creates new jobs and therefore has negligible impact on employment in outsourcing countries.

While outsourcing occurs mainly within and/or among industrialized countries, offshore outsourcing offers unprecedented opportunities for developing countries to export their services and diversify their economy. WTO World Trade Report 2005 estimates that total outsourced services for 2003 was \$285 billion only \$40-45 billion of which was offshore outsourcing. These estimates are apparently too conservative. Statistical data on Ireland and India alone has far exceeded that number. India and Ireland are the single most important beneficiaries of outsourcing with annual export revenues of US\$17 billion and US\$56 billion respectively from services. China and some other Asian developing countries and some East European countries are catching up.

China has far better ICT infrastructure and far more advanced and promising general economic environment than India, but lags far behind India in export of services particularly in receiving outsourcing of services from industrialized countries. Each Chinese IT worker generates export revenue of US\$ 796 per year while Indian worker generates US\$ 20,722. There are great potentials to be tapped by China. Low efficiency rate of exploitation of ICT infrastructure is attributable to lack of contents of services to be supplied to foreign clients, the absence of a competitive market structures for value added services and comparatively low level of foreign direct investment in the service sector. Technically it is due to lack of understanding of western business culture and Chinese IT engineers do not have adequate language skill to communicate with clients. The key issue is that the service industry does not have a global development strategy and placed too much emphasis on protection of the domestic service industry in sharp contrast to the extent of openness in the manufacturing industry.

There is a looming shortage of talents China would need to enable it to exploit the enormous opportunities offered by the burgeoning outsourcing markets. The issue has to be addressed in the context of implementing the objective of transforming the mode of economic growth with greater emphasis on development of science and technology and expansion of service as prescribed in the 11th five-year Programme. China has all the potentials to become one of the strongest competitors in receiving outsourcing of services given an appropriate service development strategy which could include: (1) a more competitive ICT market structure to allow freer access to basic and value added telecom services for public, private and foreign enterprises;

(2) a more open FDI policy in service to encourage domestic/foreign partnership to emulate best practices in embracing outsourcing of services; (3) further strengthen enforcement of laws protecting intellectual property right and ensure network security; (4) reform the education system to encourage academic/business partnership to train highly qualified engineers with operational ability and high language skill; (5) Governments at central and local levels provide strategic guidance for the development of IT development parks and (6) Governments lead efforts to encourage public/private partnership, domestic/foreign partnership.

Chapter 1 General Overview

Spurred on by the pace of change and innovation in ICT technologies, there has in recent years been a dramatic global expansion in the ‘outsourcing’ of a wide and ever-growing range of business support services. When it takes the form of ‘offshoring’, i.e. outsourcing to a foreign-based service provider, it has resulted in the creation of major new business and trading opportunities for developing countries. India, more than any other developing countries, has benefited from and exploited this phenomenon, which has been the single most significant factor in the country’s remarkable recent economic performance.

1.1 Definitions and Approaches

As WTO World Trade Report 2005 pointed out, “there is no commonly accepted definition of “offshoring” in the public debate neither in the economic literature. However, the term “offshore” is widely used as a particular subcategory of outsourcing which has been defined as the act of transferring some of a company’s recurring interval activities and decision rights to outside providers, as set in a contract.” The report further classified outsourcing into four categories, i.e. captive onshore outsourcing, non-captive onshore outsourcing, captive offshoring and non-captive offshoring. (see Table 1).

Table 1 types of outsourcing

Shifting intra-firm inputs/ supplies to		Located in home economy	Located abroad
	Non-affiliated firm		Local/domestic/onshore outsourcing
Affiliated firm		Captive onshore outsourcing	Captive offshore outsourcing = captive offshoring (FDI)

Source: WTO World Trade Report 2005

Based on its review which was conducted between May 2004 to November 2005, U.S. Government Accountability Office (GAO) stated “Offshoring generally refers to a company’s purchase from abroad (imports) of goods or services that were previously produced domestically. A company may offshore services either by purchasing services from another company based overseas or by obtaining services in-house through an affiliate located overseas...broader definitions of offshoring sometimes include the movement of production offshore.”

As a matter of fact, in last few decades, the wave of outsourcing was driven by manufacturing companies in developed countries who can divide their production processes into discrete pieces and were motivated to cut costs in order to increase profits by transferring their manufacturing factories in developing countries. These companies generally retained higher-end, higher-skilled services functions within the house, such as management, finance, marketing, and research and development (R&D). Offshoring has recently expanded into services. Normally, services that are

capable of being performed at a distance and whose product can be delivered through relatively new forms of advanced telecommunications may be outsourced. For example, software programming and design, call center operations, accounting and payroll operations, Human Resource (HR) administration, medical records transcription, and software research and testing.

Generally speaking, there are four different structures that a company can use to do offshore outsourcing.

The first is a straightforward contractual outsourcing to an offshore service provider. Here the outsourcing company identifies its preferred offshore location and supplier, and then negotiates and signs an outsourcing contract. The simpler and less business critical the process to be outsourced, the more suitable is this option.

The second alternative is to do the outsourcing as an 'indirect outsourcing' where the company contracts with a specialist service resident in his or her country, which manages the offshore operation on your behalf. The more complex or business critical the process, the more attractive is the option of indirect sourcing.

A third option is to establish a wholly owned 'captive' operation in the offshore location. The complexities and cost inherent in this option means that it is realistic only for large multinationals familiar with cross-border establishment and integration issues.

Finally, you could establish and own part of a joint venture vehicle with a suitable service provider in the offshore location chosen. This is also only an option for larger entities which either have a very long term strategy, or are themselves looking to enter the service provider market in the offshore location.

There can be legal impediments, local or offshore, to outsourcing. Specific regulatory issues need to be addressed for heavily regulated industries such as banking and insurance. The Financial Services Authority (FSA) in the UK is increasingly scrutinising outsourcing arrangements and has published rules and guidelines which must be complied by regulated entities when outsourcing. Local laws in the outsourcing jurisdiction are also relevant, e.g. attitudes to copyright and the ability to recover damages under contract. Compliance with relevant data protection legislation is an issue. For data rich processes such as call centre handling, EU data protection legislation (which e.g. protects personal details and data of credit card holders) creates significant issues which must be dealt with. Under such circumstances, the presence of professional, locally based support services (e.g. legal), to ensure locally enforceable service contract, to assist with issues such as reporting and audit rights, contingency and exit planning, etc. becomes increasingly significant.

1.2 Estimate of Market Size

The WTO World Trade Report 2005, having reviewed a range of survey sources, (OECD, McKinsey, the EITO, Gartner), settles for the Gartner (2004) estimate of total outsourced IT services (excluding software) for 2003 of \$285 billion as the most accurate, with the offshore component of estimates to have been in the order of \$40-45 billion.

Using BOP data, world exports of IT services, defined as Computer and Information services, is estimated at \$75 billion¹ in 2003, with the two largest exporters, Ireland and India reporting, net exports of over \$10 billion each. As the report notes, the estimated size of the global offshore activities depends crucially on the accuracy of the data provided by the major offshorers and the countries providing the offshored services. The scope for misclassification and measurement inconsistencies abound; thus Ireland's exports are inflated by the practice of including software licenses in the total, and India's by the inclusion of various IT-enabled services, such as call centres, in the CIS total.

The report does note that the bulk of trade in IT-enabled services is in the category of captive offshoring. Thus US BOP data on US IT services imports confirm that affiliated trade – used as a proxy for captive offshoring - accounts for 63% of computer and information services imports and 77% of US imports of other business and professional services. India appears to be an exception to this rule, with NASSCOM estimating that India's software exports are largely provided by Indian-owned companies.

A more recent report by the National Association of Software and Service Companies (NASSCOM) of India, estimates the global IT outsourcing market at \$39.6 billion in 2004, with India holding a 43% share (nearly \$17.2 billion), Canada a 32% share, and China and Eastern Europe a 5% share each. According to Frost & Sullivan, India had around 813,000 knowledge professionals employed in the IT software and ITES BPO sectors in 2004. More than 65 Indian IT companies achieved SEI CMM Level 5 assessment at the end of 2003.

1.3 Driving Force for Outsourcing

The United States is the most important outsourcing country. It is essential to review how US organisations view the cost and benefit of outsourcing. The US Government Accountability Office (GAO) in its latest review stated that three key factors contribute to the recent move on service outsourcing. First, technological advances, such as advances in telecommunications and the emergence of the

¹ While this can be taken as a measure of 'trade' in IT services, it does not, as it should, equate to the equivalent BOP measure for CIS imports, which comes in at \$30 billion less.

Internet, have enabled workers in different locations worldwide to communicate and be connected electronically on global basis and has also facilitated the digitization and standardization of activities needed to complete business processes. These changes in turn have allowed business processes to be divided into smaller components, some of which could be carried out in different locations. Therefore, the offshoring of services constitutes an outgrowth of outsourcing business function. Second, main outsourcing destination countries have increasingly opened their borders to the global economy. Third, these countries have highly educated populations with the technical skills for performing services and technology-related work.

WTO also concluded in its report, “the driving forces for outsourcing and offshoring services are first and foremost technology development, notably information and communication technologies (ICT), and economic growth.

Incentives for service outsourcing are commonly summarized as follows:

1. Cost saving

More and more multinational companies are turning to offshore outsourcing to help them reduce costs and free talent to come up with new products and services. In recent years, Procter & Gamble, Du Pont, Cisco, Unilever, ABN Amro, and Marriott have all signed mega-deals with global outsourcing companies to overhaul internal operations such as accounting or HR or to upgrade their technology. (See Annex 1) In Feb. 2006, General Electric (GE) announced \$7.5 billion in five-year IT outsourcing contract with multiple IT companies, i.e. EDS, HP and Wipro. Cost savings achieved through service offshoring are typically in the range of 20-40 per cent with an average of almost 30 per cent, UNCTAD reported. For example, the banking and financial services sectors in the U.S. are observed to have made savings of \$8 billion in the last four years by outsourcing to India. The cost saving can be used to lower prices and to offer consumers new and better types of services. By raising profits and reducing prices, companies will become more competitive and, therefore, can invest to improve existing products or introduce new ones and invest in next-generation technology in addition.

Currently, American companies take a lead role in global outsourcing market and are positioned to benefit from the outsourcing, while European companies lag behind their U.S. rivals. Nevertheless, like their American competitors, the European companies also see offshoring as a way to reduce costs and improve their competitiveness. Almost 40 per cent of companies polled by UNCTAD have relocated services in the past. Regarding future activities, almost half of all companies are planning to offshore further services within the next few years. Companies that have engaged in offshoring are generally the ones that are also planning to offshore in the near future. The full range of services from office to back office functions is considered suitable for offshoring. Finance, accounting, IT support and HR services

together with other back office services are involved in some 60 per cent of all current or planned offshoring projects by the European companies interviewed. A third of the companies mentioned offshoring front office services, e.g. customer interaction.

2. Access to a workforce in different time zones may enable companies to conduct business around the clock, therefore serve global customers. For example, the geographical location of India is such that the time differential between India and some time zones in the U.S. is approximately twelve hours which make round the-clock work possible for firms in the U.S.
3. Outsourcing to external service providers enables outsourcing companies to use its resources more efficiently on core business.

A 2003 study carried out for the Asia Foundation², identified a total of 14 factors that drive the global outsourcing decisions of US SMEs. These were:

- Cost Savings
- Personal Connections
- A US presence
- Skilled Labour Pool
- Project Management Skills and Quality Certification
- Language and Culture
- Western Business Savvy and Practices
- Intellectual Property Rights Protection
- Regulatory Environment
- Telecommunications Infrastructure
- Physical Infrastructure
- Time Zone Differences
- Political Stability
- Country Image

These factors probably apply more widely than simply to SMEs. Interestingly (at least for this report), regulatory considerations are not always the dominant factor. The importance of intellectual property rights protection received a mixed response from the companies surveyed, although a majority of companies said they take this issue seriously and will conduct business only in countries with legitimate IPR enforcement regimes. Interestingly, China was singled out as a country they would not do business with for that reason. Some companies, while acknowledging the importance of IPR, preferred to employ safeguards to minimise the risk of their intellectual property falling into the hands of competitors, for example, by only outsourcing pieces of code or back office systems that have little resale value.

² 'Looking Beyond India: Factors that Shape the Global Outsourcing Decisions of Small and Medium Sized Companies in America', Christopher T. Coward, Director, Centre for Internet Studies, University of Washington.

Outside of IPR, other aspects of a country's regulatory environment did not receive attention in the interviews. Companies did not care what rules govern the internal business environment of their outsourcing providers as long as they can move code in and out of the country. However, under the FDI model of outsourcing, the local regulatory environment does play a significant role.

As regards telecommunications infrastructure, robust and high bandwidth data connectivity was not, somewhat surprisingly, critical to the software development projects that they outsourced. As the foreign provider had internet connectivity for some portion of each day, work could generally proceed without serious interruption. However, closer consideration of future outsourcing requirements told a different story. For example, database administration and maintenance services, particularly for legacy systems, offer tremendous opportunities for outsourcing, as employees of US companies who are familiar with the technologies of these legacy systems are reaching retirement age, leaving behind a need to find qualified software engineers to keep these systems operational and to make them accommodate future changes. Maintenance services however fall under the mission critical category since system failures demand immediate attention. This requires 24/7 (24 hours a day and seven days a week) data and voice uptime, a threshold very few companies can guarantee given the current quality of the telecommunications infrastructure in most countries.

Ensuring Data Security

Data security is a worry for many outsourcing buyers. Offshore employees touch a range of sensitive financial documents: income tax returns, mortgage loan documents, credit card payments etc. Many insurance companies process their medical claims offshore. How can buyers be sure their data remains safe? According to Outsource Partners International, a New York based service provider with an Indian component, a range of measures are taken, including extensive background checks on all employees. The safety of documents is guaranteed by ensuring that they never leave the Indian companies offices, instead they are scanned into OPI's system. All data servers stay in America and Indian workers access the data from the US based servers. They do not trust the internet to transmit data; they only use proprietary lines and relays and apply the latest encryption techniques. None of the computers in India have removable media drives. None are wired to a printer. Email capabilities have been disabled, and paper pencils or pens are not allowed at work stations. Offshore employees sit at two computer screens. The first screen shows the scanned data. They enter data into the second screen. These are manual processes like entering data into pre-formatted input and output screens.

1.4 Impact on Outsourcing Countries and Service Provider

Countries

Impact of outsourcing on destination countries is obvious and positive, such as, job creation, improved living standard and increased country overall wealth, however, impact of outsourcing on outsourcers is much more debatable.

GAO argued that while traditional economic theory predicts that offshoring will benefit the outsourcers' overall economy, concerns have been raised about four areas of potential impact. Offshoring

- J Will be beneficial for average U.S. living standards in the long run while could harm the standards in some circumstances.
- J Will cause some job losses, but expected to have little effect on long-run aggregate employment, although offshoring could affect the structure of the U.S. job market
- J Is contributed to increasing income inequality by changing the distribution of wage income among U.S. workers
- J May pose increased risks to national security and critical infrastructure, though it may not pose additional major risks.

Most studies conclude that the impact of service offshoring in outsourcing countries is mixed, but positive overall. Individual companies' greater demand will spark innovation and create jobs to replace those that have gone abroad. With flexible labor markets and strong economic growth, countries that offshore services can shift labor to higher-value activities, boosting productivity and living standards. The loss of offshored jobs should be compensated by increased employment and perhaps higher wages in the medium-term, provided labour markets are suitably flexible. Such view was mirrored by the major findings of Global Insight study, sponsored by the U. S. Information Technology Association of America (ITAA). It made promising projection,

- J While global software and IT service outsourcing displaces some IT workers, total employment increases. The incremental economic activity that follows offshore IT outsourcing creates over 257,000 net new jobs in 2005 and is expected to create over 337,000 net new jobs by 2010.
- J The benefits of global outsourcing contribute significantly to GDP in the U.S., adding \$68.7billion in 2005. By 2010, the figure is expected to be \$147.4 billion.
- J Due to relatively lower prices of U.S. products and higher incomes in the offshore outsourcing destinations, demand for U.S. export is expected to increase. Real exports are estimated to be \$5.1 billion higher in 2005 and expected to be \$9.7 billion higher by 2010.
- J Workers enjoy a bump in real wages. Global outsourcing actually adds to average pay of U.S. workers because, with inflation kept low and productivity high, real wages in the U.S. are estimated to be \$0.06 higher in 2005 and are expected to be \$0.12 higher in 2010.

- J The cost savings and use of offshore resources lower inflation, increase productivity, and lower interest rates. This boosts spending and increases economic activity.
- J Spending for global outsourcing of computer software and services will grow at a compound annual rate of almost 26 per cent, from approximately \$15 billion in 2005 to \$38 billion in 2010. Total cost savings from worldwide outsourcing of computer software and services will grow from \$8.7 billion to \$20.4 billion during the same time period.

By examining U.S and India, two main global outsourcing players, the McKinsey Global Institute (MGI) showed that offshoring creates wealth for the United States as well as for India, the country receiving the jobs. Of the \$1.45 - \$1.47 of value MGI estimates is created globally from every dollar spend a domestic company chosen to divert abroad, the U. S. captured \$1.12 - \$1.14 while the receiving country captures on average 33 cents. In other words, the U.S. captures 78 per cent of the total value. Therefore, for every dollar of corporate spending outsourced to India, the US economy captures more than three-quarters of the benefit and gains as much as \$1.14 in return. It concluded that offshoring creates mutual economic benefit.

1.5 Major obstacles

Although with great motivation to conduct business offshoring, some companies are hesitating to jump at outsourcing in immediate future due to some obstacles listed below.

- J Difficulty in managing outsourcing contract resulting additional cost that erodes saved cost, for example, increased complexity of managing relationship.
- J Unsatisfied quality of services provided, for example, low quality of output, reduced operational effectiveness and productivity, and decreased customer support.
- J Risks associated with outsourcing, such as, possible political instability, less reliable infrastructure, different legal and regulatory systems, and risks to intellectual property.
- J Anti-outsourcing legislation and political pressure.

In spite of all difficulties, outsourcing of services will likely continue to develop. Chapter 2-4 analyses country performances of Ireland, India and China and compare their successful experiences and lessons drawn upon the development of services outsourcing.

Chapter 2 The Experience of Ireland

2.1 Introduction

Ireland's Services Exports in 2005 were €43.9 Billion, compared to €42.2 Billion in 2004, and €37.1 Billion in 2003. Service Exports now comprise 34% of total exports, and Ireland's share of world services trade has expanded five fold in recent years (from 0.5 % to 2.5% of the total).

Table 2 Ireland Service Exports 2003-2005

Category	2003 €mn.	2004 €mn.	2005 €mn.	Share of 2005 Total
Total Services Exports	37,133	42,203	43,942	100%
Computer Services	12,575	14,972	15,346	35%
Financial and Insurance Services	11,056	12,214	11,596	26%
Business Services	6,957	8,141	9,493	22%

The two largest service export sectors are Computer Services – which includes software sales – and Financial and Insurance Services. While computer hardware sales have fallen over the last five years, companies in this sector have moved more toward service related ICT products. The third category of Business Services, which includes call centres, has been expanding rapidly and now accounts for 22% of the total.

Ireland's exports of IT services and IT Enabled Services are dominated by subsidiaries of multinationals established in Ireland. Hence, the Irish experience replicates almost in its entirety the FDI or 'captive' model of offshoring, and no discussion of outsourcing as it affects Ireland can be complete without an understanding of its FDI regime.

All inward direct investment to Ireland, and the operations of subsidiaries of multinationals based in Ireland, are overseen by the Industrial Development Agency (IDA). The current IDA was established in 1994 under the provisions of the Industrial Development Act of 1993 (earlier incarnations, with a greater emphasis on job creation, have been in existence since the early 1970's). It is an autonomous state sponsored agency funded under Government grant under the National Development Plan 2000-2006. The agency reports to the Minister of Enterprise, Trade and Employment. In addition to its Dublin head office, it operates a network of regional offices in Ireland and 12 overseas offices. Its main areas of support to inward investors are advisory services, provision of capital grants, and management of a network of Business and Technology Parks.

The IDA is an extremely successful organisation and has been instrumental in Ireland's economic success. An indication of the importance of multinationals to the Irish economy is the fact that approximately 95% of Irish exports are by multinationals. As competition from new lower cost locations has increased, the IDA has focused more on attracting higher value, R&D based operations. This has met with success, and recent examples (2004) of high value outsourcing operations established in Ireland include:

- A Lucent Technologies/Bell Labs research centre focused on next generation telecommunications technologies, with its own program of R&D and a corporate mandate as a centre of excellence for value chain driven research;
- A new IBM software R& D facility;
- Hewlett and Packard Technology Development Centre;
- Yahoo's European data centre, providing multilingual web services, customer support, and finance and administrative services;
- Business Objects, the leading provider of business intelligence software solutions, new operations centre to serve customers worldwide. Functions include multilingual technical support, shared services, global software localisation, marketing support and product distribution.

Effective as it is however, the IDA could not be as successful as it has been were it not for the presence of a highly supportive and innovative broad economic policy making framework. Key elements include:

- Low rates of corporation tax, i.e. a 12.5% rate applicable to manufacturing and internationally traded services;
- A well educated and youthful labour force;
- Tripartite 5 year partnership agreements between government, trade unions, and management guaranteeing labour stability;
- English speaking and a cultural affinity with the major investment source, the USA;
- EU market access;
- A professional and accessible political establishment and government bureaucracy.

A key player in the policy making framework is the state agency Forfas, whose role is to research and drive forward a progressive economic policy making agenda, and to closely coordinate this agenda with government departments and enterprise-focused state agencies (such as the IDA and Enterprise Ireland, the state agency mandated to support Irish-owned enterprises).

The role played by Forfas can be seen in the area of skills and labour supply, an area of critical importance to development of the ITC sector. To address the skills issue, the Irish Government has made significant investments in third level colleges. In 1997 the Government established the Expert Group on Future Skills Needs within Forfas with a mandate to tackle the issue of skill needs, education, and training for the IT sector. This group, which is comprised of government, business, trade union,

and academic interests, issues regular recommendations with respect to addition of new college places and facilities investments that are regularly acted on. Among the initiatives emanating from this group and acted upon, was the creation of a Scientific and Technological Education Investment Fund, which to date has provided almost €1 billion for the funding of technology education at all levels.

Two of the most successful sectors for inward investment in Ireland are those in which outsourcing is a global feature, i.e. IT Services/Software and the IT enabled Financial Services sector, and these are reviewed next.

2.2 IT Services/Software

Ireland has become a major hub for multinational IT/software companies, and most of the major multinational corporations have established Ireland-based subsidiaries. They include Microsoft, Oracle, Lotus, Apple, AOL, Google, Yahoo, McAfee, and numerous others. A very large number of these (mostly US) operations (also typical of other multinational sectors) are established specifically to service the EMEA (Europe and the Middle East) market, as part of a regionally dispersed global operating model (i.e. with regional hubs covering the Americas, Asia, and Europe/Middle East/Africa). Over 800 Irish and foreign owned software companies are based in Ireland, employing approximately 32,000 people, generating 10% of exports with revenues of €12 billion.

A typical example is the Oracle's Ireland operation. Oracle Ireland was the first location outside the USA to use the Oracle model, which is a telesales operation servicing customers throughout the EMEA region. It's European Product and Development Centre has global development responsibility for migration and certification framework products and responsibility for the test and release of Oracle server products across all of the key platforms. It's Worldwide Product and

Manufacturing, localisation, and distribution of software packages account for about half the jobs in the foreign owned software sector in Ireland. This is not a particularly high skill segment, although a high proportion of staff engaged in localisation has third level qualifications in information technology or linguistics. The remaining half of foreign sector software employment is in software development, which is more highly skilled.

At least as important as a favourable tax regime (which is emulated or surpassed in many jurisdictions) has been the supply of skilled and well educated labour that has been available in Ireland. For many operations, the availability of skilled labour was the key attraction. During the dotcom boom in the USA, programmers were often in short supply. Such was not the case in Ireland, and a number of software development centres were established for that reason (e.g. Liberty Mutual in Belfast, which develops software to produce policies, handle claims, and cover all aspects of its insurance business). Interestingly many of these Irish-based operations today offshore part of their applications development to Indian suppliers, utilising different skill sets at the Irish and Indian operations. For example, tasks like re-engineering projects (i.e. when software designed for one computer must be modified so that it runs on a different computer or database) are shipped to India. Software engineers typically work as part of larger teams based mainly in the USA.

Other attractive labour-based considerations included close working relationships with third level educational and training institutes (with curricula explicitly developed with the IT sector in mind). The Irish education sector is particularly strong in its development of the non-university element of the third level educational system. Thus, while Ireland matched the OECD average in terms of the proportion of the population aged 25-34 with tertiary degree level qualifications (16%), it far surpasses the OECD average in terms of the proportion of the population possessing third level sub-degree qualifications (e.g. diplomas from technical colleges etc.), with 13% compared to an OECD average of 9%.

Additional favourable factors have included the similarity of Human Resource practices in Ireland to the USA (with significant return migration of Irish IT personnel from work experience in the USA), and access to an EU wide labour market providing the range of linguistic coverage required for many IT work areas (e.g. software localisation).

Of course a reliable telecommunications infrastructure with good broadband access was an obvious locational requirement for this sector. The characteristics of this in Ireland are reviewed in more detail below.

2.3 Call Centres

Ireland is also home to a large number of companies offering Business Process services such as call centres, shared services, and supply chain management. The IDA introduced its Call Centre targeting programme in 1992. In addition to grants and tax incentive schemes, it offered the cheapest rates in Europe for international

freephone calls.

American firms account for over 80% of employment in the sector. Among the major firms which have established call centres in Ireland are American Airlines, Best Western, Korean Air, Radisson Hotels, UPS, etc. The IDA has promoted the low level call centre sector in order to encourage firms which have established such operations in Ireland to add on additional functions such as financial management and software development, i.e. 'shared services' such as payroll, accounting, insurance and legal, etc.

The same factors which induced the establishment of the software/IT sector in Ireland – good supply of good quality, educated labour, favourable tax regime, good telecommunications infrastructure, etc. – also induced the expansion of the call centre sector. The boundaries between the two overlap to a considerable degree.

2.4 Financial Services

The move towards a global operating model is a rapidly growing trend in financial services, and the larger global players are actively pursuing strategies of relocating to lower cost locations. There is no single defining strategy, and approaches vary considerably and are situational (i.e. dependent on the businesses organisation structure and operating model). In some situations offshoring is simply a short term response to cost pressures, while in others the important factor is security and operational resilience. By using a geographically distributed model with common processes and infrastructure, companies can ensure that if one location is 'down' operations can be quickly transferred to another. The key factors in the location decision are cost, operational risk, cultural compatibility, and specialised industry knowledge.

Outsourcing and third party administration has become a growing option in the asset management business, not only for financial but also for strategic reasons. By outsourcing non-differentiated functions, firms can concentrate resources and management attention on core business activities. Middle and back office functions

companies. Offshoring to nearby locations has certain risk reduction advantages over more distant locations.

The Financial Services industry is spending major sums on IT systems, driven by cost reduction, security and operational resilience, risk management etc. considerations. This is facilitating the adoption of the 'extended delivery model'. Obviously, only locations that are compatible and can work (e.g. supply of qualified programmers) with these new sophisticated IT processes will be considered.

International Financial Services Centre (IFSC), Dublin:

Unlike the IT/Software sector, the outsourced Financial Services sector in Ireland is clustered largely in one distinct location. This is the IFSC Centre in central Dublin, and it constitutes the single largest cluster of IT enabled outsourcing activity in Ireland. The IFSC is a prestigious €500 million plus development located along the river in central Dublin, incorporating world class office accommodation, educational institutions, executive housing, restaurants, etc. The IFSC was established in 1987, and is now recognized throughout the world as a significant world financial services centre and a major economic success story. It ranks as one of the world's leading locations for international banking, investment funds, and corporate treasury and insurance activities. Total employment has grown to over 16,000 people. Almost 450 international financial institutions operate from the IFSC, including more than half of the world's top 20 insurance companies and more than half of the world's largest banks. Over 80% of the financial institutions are non-Irish. They include Merrill Lynch, Deutsche Bank/Morgan Grenfell, ABN Amro, Chase Manhattan, Natwest, etc.

A wide range of activities and their ancillary services qualify for the IFSC, and were defined by the Finance Act of 1987 and subsequent legislation. They can be summarised as:

- Banking, Asset Financing, and Leasing;
- Corporate Treasury Management;
- Fund Management, Investment Management, Custody and Administration;
- Futures and Options Trading;
- Securities Trading;
- Insurance, Assurance, Reinsurance, Captives, Broking.

All activities must be carried out on behalf of non-Irish residents.

A fiscal regime was agreed with the EU that endorsed a special 10% rate of corporation tax for IFSC activities; this was rolled into the general corporate rate of 12.5% at the end of 2005. This low rate of tax allowed Ireland to compete against the established centres of Luxembourg, the Channel Islands, and the Isle of Man.

A critical factor underlying the development of the IFSC has been the commitment to the project of all political parties, helping it to withstand various changes in government since its formation. This commitment is epitomised by the expedient manner in which regulatory and taxation legislation is introduced and/or amended in

order to improve the IFSC's attractiveness to global players. Thus, Section 29 of the 1995 Finance Act introduced an exemption from all Irish taxes of the income of certain foreign branches of Irish companies. The exemption, which covers both income and capital gains, is available to companies which create substantial new employment, coupled with an appropriate level of capitalisation. This exemption has proven to be particularly attractive for financial institutions, which have taken the route of establishing a headquarters in Dublin and converting existing international activities into branches of the Dublin headquarters. Companies such as Merrill Lynch and Bear Sterns have created such structures in the IFSC.

Regulatory Developments: There has been explosive growth in both global and national regulation throughout the Financial Services sector as authorities have reacted to corporate scandals and the need for better consumer protection. Regulatory developments include the areas of Capital Adequacy (Basel 11, EU Capital Adequacy Directive), Corporate Governance (Sarbanes Oxley in the US), Money Laundering, and Financial Reporting. While the cost is high, regulatory compliance will remain a competitive necessity for Financial Services firms, and as they expand abroad, the conditions in the local markets within which they operate have to be closely monitored.

Within Europe, the FS Action Plan (FSAP) was launched by the EU Commission in 1999 to progress the creation of a single market for FS in the EU, by having harmonised legislative and regulatory approaches. The identified measures are going through a process of national legislative implementation. Through the IFSC, Ireland is capitalising on this move to a pan European business model. As a consequence of the FSAP, the EU market is also becoming more attractive to non-European players. Ireland has a reputation as a European gateway, and has introduced holding company legislation which makes it more attractive for US financial institutions to choose it as their European HQ.

The pro-business attitude of the regulatory authorities in Ireland is an important feature of the IFSC regime. The principal regulatory authorities are the Department of Finance (which oversees overall policy and fiscal issues relating to the IFSC), the Department of Enterprise and Employment (which regulates the insurance industry), and the Central Bank of Ireland (which regulates all non-insurance related activities). These agencies have adopted a positive approach to regulation while maintaining their prudential EU and international regulatory responsibilities. They are seen as user friendly and having an open door policy in terms of their willingness to meet project promoters and to discuss issues directly with them. There has also been strong support from the existing Irish financial services industry, with industry associations involved participants in various policy review groups and co-operative industry-government structures. This partnership between government bodies and industry practitioners has been a cornerstone of IFSC development policy and instrumental in the many innovations introduced within the IFSC programme.

The importance of a competent and well regulated regulator to an international

financial centre cannot be underestimated. For example, the termination of the employment of the CE (chief executive) of the Dubai Financial Services Authority in 2004 did serious damage to Dubai's efforts to create a world class financial centre.

Ireland's regulatory environment tends to be well regarded by those establishing here. While the aim of the EU's Financial Services Action Plan is to establish a level playing field in wholesale financial activities, in reality different regulators take different timeframes to implement EU directives. The establishment of the Irish Financial Services Regulatory Authority (IFSRA) in May 2003 was in part designed to support the application of these directives in a way that ensures Ireland will not be at a competitive disadvantage.

The IFSRA is now the single regulator for all financial services in Ireland, and combines a mandate for consumer protection with that of the prudential supervision of financial service providers. The main focus of work in the prudential area is the ongoing supervision of financial services providers and the authorisation of new providers. The on-site review process focuses on examining the books and records of financial services providers and testing compliance with regulatory requirements. The IFSRA also is responsible for the implementation in Ireland of various EU Directives, e.g. on Market Abuse, Money Laundering, and Transparency Directives. The structure which set up the Irish Financial Services Regulatory Authority (IFSRA) is virtually unique in Europe.

Another attractive factor is the fact that the Irish legal system is a common law system and is broadly similar to the legal systems of the UK and the USA. The professional support network (e.g. legal) is also an important factor and has been rated very highly by investors. EU Market Access, with Ireland seen as a gateway to the EU is also a very important factor, particularly for US based FS institutions. Cultural compatibility and the use of English are also very important.

Another critical factor has been the investment in the telecommunications infrastructure in Ireland in recent years. Telecommunications within the IFSC are state of the art and are supported by on-site 24 hour technical service. Full fibre-optic services support the IFSC.

Ireland's attractive tax rate was and is clearly a strong locational factor, particularly combined as it is with an attractive suite of double taxation agreements. . But there are many others, in particular a good supply of skilled labour and a quality educational system. The existence of a skilled labour pool is very important in the development of a financial services centre, and Ireland's seven major universities provide a steady supply of high quality graduates, with courses and curricula continually being updated to meet market demand (e.g. in quantitative finance). The policy group referred to earlier, – the Expert Group on Future Skills Needs - regularly reviews the state of the labour market and its needs, and its recommendations tend to be listened to and acted upon.

Ireland is particularly strong as a location for third party administration in asset

management. Most of the industry's biggest players have operations here, including State Street, Bank of NY, Northern Trust, JP Morgan Chase and others. Outsourcing has also become popular in the insurance sector, in the main of non core processes, e.g. the rating of policies, claims processing, and customer support.

2.5 Ireland's Regulatory and Policy Background

Regulatory reform is an ongoing process and there is no unequivocal starting date for the point at which it catalysed as a significant inducement for foreign investors. Any selection of such a point is therefore somewhat arbitrary. In recent years, however, a marker that is often acknowledged as providing a strategic focus for attracting internationally traded services to Ireland was the publication of the 'Shaping Our Future' document by Forfas in 1996. In this document specific Telecommunications Based International Services Opportunities were identified. The strategy put forward encompassed four main elements:

An Irish Information Society Initiative: This initiative recognised the fact that advanced telecommunications were having impacts not just on industry and business but on the economy and society in general. The initiative brought together high level representatives of industry, trade unions, telecommunications operators, and relevant Government Departments. Priority areas to be acted upon included:

- Building up the national telecommunications and broadcasting infrastructures and reducing costs;
- Investment in Education and Training, with different approaches required at primary, secondary, and tertiary levels;
- Efficient and IT based delivery of public services.

Telecommunications Market Liberalisation and Competition: At that time, the structure, ownership, and cost base of the national telephone monopoly Telecom Eireann limited the potential for future improvement in services and prices. Part-privatisation or a joint venture with an international partner was identified as urgently needed to improve TE's competitiveness. Once this was achieved, all aspects of telecommunication were to be opened to competition as rapidly as possible. It was recognised that there need not be a single uniform network for advanced communications but rather a range of different infrastructures, each optimised for particular market segments. A regulator, independent of Government, with responsibility for licensing all credible applicants wishing to provide telecommunications was required. The regulator was to have a duty to promote the provision of as wide a range of competing services, over as wide a range of competing infrastructures, as possible. As a first step, basic telecommunications price targets and, if necessary, an appropriate price cap would be negotiated by the regulator with TE, with the objective of bringing tariffs into the lowest quartile in Europe.

Accelerating Broadband Infrastructure and Applications: The strategy also recognised that broadband infrastructure capable of carrying voice, data, images and sound would facilitate a host of future products and services. Government policy should be to promote the provision of broadband infrastructure in advance of demand, and to act as a catalyst for applications development. Significant future investment would be required to develop the Cablelink network for interactive TV and multimedia services. The case was advanced for the sale of Cablelink to an independent network provider subject to conditions on significant investment and upgrading in order to promote competition and new services.

Also, Government should move forward the participation of health, education, customs, social security and other branches of government in advanced communications initiatives. A rising proportion of each department's budget was earmarked for advanced communications related projects and systems. This action was seen as creating a market for applications developers.

EU Information Services Hub: The plan was advanced the position that Ireland adopts an early mover position in the foreseen telecommunications revolution, and become an 'information and services hub' for Europe. Highly competitive telecommunications services and costs were seen as an essential first requirement for this.

The framework outlined in this 1996 document formed the basis for a whole range of policy and regulatory initiatives that were undertaken in the succeeding years.

2.5.1 The Framework for Regulatory Reform

Regulatory reform is a restructuring of the laws and institutions that govern economic activity with the basic objective of improving the competitive process. It is not the same as deregulation. In Ireland as in many other countries, regulatory reform is seen as a particularly important piece of policy action, because many of the traditional policy instruments are no longer available to Government because of EU rules, EMU membership, WTO membership, and other international agreements.

The legal framework for regulation of economic activities in Ireland includes Common Law, the Constitution, EU law, and international commitments such as WTO Agreements. There is also primary legislation that affects all enterprises such as the Companies Acts, Competition Acts, consumer legislation, etc. Statutory bodies such as the Competition Authority, COMREG, and others, including Government Departments, also play a major role.

The OECD has drawn up a series of recommendations on regulatory reform. They include:

- Adoption of broad programmes of reform with clear objectives and a clear implementation framework;
- Systematic review of regulations to ensure continued effectiveness;
- Regulatory processes should be transparent, non-discriminatory, and efficient;

These general OECD principles were broadly adhered to in the Irish situation. The OECD was also requested by the Irish government to undertake a country review and analyse the regulatory regime in Ireland in the light of international experience of this field.

The process was kick started with the launching of an Action Programme for Regulatory Reform in July 1999. The initial focus was largely on the elimination of red tape, and included a stocktaking of existing legislation, a checklist for new legislation, and a central unit to drive the reform agenda. A series of new legislation was passed on the basis of policy recommendations, such as the Electronic Commerce Act (2000), the Copyright and Related Acts (2000), and the Communications Regulations Act, 2002. Explicit policy decisions were made that Ireland become a leader in the creation of a secure legal environment, which was seen as one of the most important supportive factors to the development of e-business and for the attraction of ICT based activities. A key recommendation was that an overarching framework be put in place to ensure that the legitimate rights of all parties are protected in a coherent manner.

Important prior steps that had been undertaken included the establishment of the Competition Authority in 1991 with the role of ensuring the application of general competition law across the economy. The role of various EU market liberalisation and competition Directives in driving the process was also very important.

In May 1998 the government decided to renounce its EU derogation and to liberalise voice telephony a year earlier than had been previously agreed with the EU. There has been full liberalisation since December 1998. An independent regulator the ODTR (Office of the Director of Telecommunications Regulation) was set up entrusted with the technical issues such as access pricing, output pricing, licensing and the determination of universal service obligations.

2.5.2 The Information Society Action Plan

Recognising the challenges posed by the 'Information Age', the Irish Government established an Information Society Commission that was charged with developing recommendations for public-private initiatives in this area. This resulted in the drafting in early 1999 of a key policy document 'Implementing the Information Society: Action Plan', which outlined a comprehensive action framework. This was also informed by other reports carried out at the time, such as the National Competitiveness Council's 'Statement on Telecommunications'.

The Action Plan outlined a range of measures to be pursued across a number of critical areas such as: telecommunications infrastructure, development of electronic commerce and business opportunities, enabling measures, legislative measures, ICTs and delivery of public services. The Action Plan also identified the Departments or bodies with responsibility for each action point, and where relevant, target dates for completion. Some of the key headings were as follows:

Telecommunications Infrastructure

- International Connectivity
- Submarine Cable Licencing
- Regulatory Issues – i.e. co-ordinating the activities of the ODTR, the Competition Authority, and others with regard to regulating the new, converged environment. Commissioning of a review to consider what legislative provisions, if any, were required to strengthen the promotion of competition in the sector.
- Planning and funding provisions for a nation wide broadband network;
- Local Access – measures to unbundle the local loop, as recommended by the Advisory Committee on Telecommunications
- Planning for the Telecom Eireann IPO, and the divestiture of Cablelink.

Development of Electronic Commerce and Business Opportunities

- Acceleration of plans to complete new Digital Parks in the Dublin area
- Action programme for the development of electronic commerce and associated business opportunities in the enterprise sector

Legislative and Regulatory Measures

- Drafting of legislation to facilitate electronic transaction and give legal recognition to electronic signatures;
- Data protection; the Department of Enterprise Trade and Employment (DETE) was charged with providing for appropriate self regulation measures within the relevant legislation
- Draft legislation on copyright was prepared by DETE and was to be enacted at the earliest possible opportunity
- Proposals for legislation covering telecommunications infrastructure installation and access were also prepared;
- A paper on Telecommunications Regulatory Policy was prepared as a prelude to addressing the powers of the ODTR and that Office's role in relation to competition;

ICTs and Delivery of Public Services

- A long list of steps to be taken by government departments and other public agencies to advance the transition to an e-enabled delivery of public services was also developed (e.g. electronic delivery of tax returns etc.).

2.5.3 Public/Private Programme for Broadband Connectivity

Broadband was seen as critical to achieving the aims set out. Ireland's broadband telecommunications infrastructure comprises it's international connectivity, the national network, world class data centres, and other telecom services. Ireland now

has numerous international telecom connections entering at 3 locations (Belfast, Dublin, and Wexford). Cable & Wireless, BT, eircom, ntl, Hibernia Atlantic, and Global Crossing all offer international connectivity with considerable capacity to clients. There is wide ranging telecommunications coverage throughout the State, with over half a dozen network providers. The Irish government is currently building Metropolitan Area networks (MNAs) around 19 towns and cities to complement the existing network and increase competition based on price and service. They will consist of carrier neutral, open access fibre optic cables. There is also a network of high calibre data centres clustered near Dublin which provide both managed services and co-location in world class facilities. Users include Microsoft, Google, airlines, numerous banks etc.

The provision of high capacity bandwidth connectivity was identified as an essential strategic requirement for Irish industry going forward. To that end, a task force reporting to the Minister of Public Enterprise and representing the IDA and other public and private sector interests was established in 1998 to move the idea forward. Agreement was reached with the global connectivity provider Global Crossing in 1999, which resulted in underseas fibre optic cables being laid connecting directly to Global Crossings transatlantic cable to the USA and also linking in with a European city network. This generated a 15 fold increase in Ireland's internet capacity and led to a dramatic lowering of costs (to 10% of previous prices). As part of the deal, the Irish government retained options on selling so called dark fibre bandwidth (for management by other operators) to interested users at prices significantly less than prevailing prices. The expansion in bandwidth capacity and reduction in costs was seen as significantly increasing the attractiveness of Ireland as a location for multinational e-business companies. As an example, this initiative opened up the US as an accessible e-business market, for serious dot.com projects, e.g. for web design or other types of new media companies.

There were doubts in the first few years, which coincided with the international IT downturn, with over 50% of the capacity remaining unsold, and much of what was sold (e.g. to Eircom, the state telephone company and the anchor tenant) remaining unused. Nevertheless, the capacity deal was seen as essential from a strategic and economic point of view, as being a necessary signal that Ireland was serious about attracting large scale data centres and cutting edge activities. The deal was strongly backed by Microsoft Ireland, who has a major e-enabled operation near Dublin, with a requirement for thick broadband pipe. The subsequent new investments in Ireland by Google, Yahoo, McAfee and others and expansions by existing players such as IBM appear to have vindicated the decision taken.

2.6 Intellectual Property Protection

Intellectual Property is an essential element in modern information societies, and there are a wide variety of laws that apply to this area, in particular patent and copyright laws. As regards patents, Ireland is a signatory to the European Patent Convention (1973), and as such has little room to independently legislate in this area.

European patent legislation is more costly and more restrictive than in the USA. There are also differences in interpretation of the law of patents across European member states.

The implementation of appropriate intellectual property legislation is overseen by a separate Intellectual Property Unit, located within the Department of Enterprise, Trade, and Employment. It is responsible for the development of IP policy, the preparation of legislation, and the provision of an IP regime that reflects the international law environment and best practice. The Unit also acts as a liaison between the Government and the Patents Office on policy and legislative matters.

The Patents Office is responsible for the granting of patents, the registration of industrial designs and trade marks, the provision of information on patents, design, and trade marks, and has certain limited functions under the Copyrights and Related Rights Act 2000 in relation to copyright disputes. The IP Unit covers three areas – Copyright and Related Rights, Trade Marks and Industrial Design, and Patents.

The copyright provisions are especially germane to the IT sector, and computer programs are expressly as a category of work that is given equivalent legal protection to that accorded to literary works etc. Copyright has been recognised by the Irish courts as a property right, supported by statute. The 2000 Act incorporates the Database Right protecting databases, the introduction of which was required by the EU Database Directive.

The 2000 Act came into force on January 1 2001, and its general objectives were as follows:

- To put in place a modern and effective regime of statutory protection for copyright and related rights, including provision for civil remedies and criminal penalties sufficient to deter copyright theft;
- To transpose into Irish law a number of EU directives in this field;
- To bring Irish law into conformity with all obligations incurred under international law on copyright, in particular under the Berne Convention (Paris Act), the Rome Convention, the TRIPS Agreement, and the WIPO Copyright Treaty;
- To provide, for the first time in Irish law, for tailor made regimes of civil protection for performers rights, rights in performances and non-original databases in line with the best EU and international standards.

The Act contained new measures to protect encryption and other technological protection devices and makes it an offence to make or sell etc. protection defeating devices such as illegal 'smart cards'.

In relation to the Internet, there are 'notify and take down' provisions whereby, if infringing material is being carried on a service (e.g. by an ISP), service providers will be obliged to remove that material as soon as is practicable.

The Act clarifies the role of the Controller of Patents, Designs and Trade Marks in the area of dispute resolution and administration of the copyright law. Much clearer criteria in relation to licensing disputes have been laid down. The Controller also acquired a new role in the maintenance of registers of licensing bodies which will contain information prescribed under the Act, including such as details of the scales of charges to be levied and the class of rights-holders represented.

The Act strengthened the range of civil remedies available to rights owners. It allows for civil search and seizure procedures and alters the evidential burden in favour of the plaintiff, thus facilitating the protection of copyright through legal proceedings. It also contains provisions that protect the identity of witnesses in copyright infringement proceedings (e.g. by employees). For criminal copyright offences penalties have been substantially strengthened.

Another interesting piece of legislation has been the Arbitration Act 1998, which adapted the UNICTRAL (United Nations Commission on International Trade Law) model law on international commercial arbitration considerably increased Ireland's attractiveness as an international centre for commercial arbitration. Thus, in June 2001, the American Arbitration Association established the European HQ of the International Centre for Dispute Resolution in Dublin, a move which significantly enhanced the status of Ireland as a centre for the resolution of international disputes, including those involving e-business.

Chapter 3 The Experience of India

3.1 India ICT Sector Overview

The Information and Communications Technology (ICT) sector, consisting of information technology services, hardware and products, and telecommunications services and infrastructure, has become a major engine of growth and development for India over the last ten years. It is currently estimated to have a revenue output of close to \$40 billion (2005), roughly \$12 billion from Telecommunication services, and over \$28 billion from Information Technology services. India's domestic ICT market is also the world's fastest-growing, expanding by more than 25% annually in each of the past five years.

Some interesting and somewhat contradictory features of India's ITC sector include the following:

- While India has become a major and successful contender in the export markets, the domestic market is characterized by low penetration of ICT products and services.
- India's software sector is recognized as having a high level of maturity at the global level, but its electronics hardware sector remains nascent and a screw-driver technology industry. India is totally import-dependent in telecom and IT hardware.
- While India produces the largest number of IT graduates in the world, nearly 45% of its population is illiterate, and India's PC density of 1% of population is among the lowest in the world.

Table 3 India's IT Sector Profile 2005

India's IT Sector Profile, 2005	
PCs	10 million
Notebooks	0.3 million
PC servers	0.2 million
Telephone connections	123 million
Internet Connections	6 million
Broadband Connections	300,000
Leased line circuits	17000
Bandwidth	1 GBps
IT Services manpower	830,000
Exports	US\$ 17 billion
Imports	US\$ 4 billion

The Indian IT sector (including IT enabled Services) has grown at an amazing rate since the early 1990s. India's IT sector had an estimated market output of Rs 1240 billion (\$28.5 billion) in the year ended March 31, 2005, recording a growth of 33 per cent over the previous year. The sector is driven by exports, which represent nearly

two-thirds of the sector output or \$17.2 billion (including IT enabled service exports of \$ 5.2 billion). However, India accounts for less than 4% of the global market for IT software and services, although it has captured about 20% of outsourced software services.

The domestic market, considerably smaller than exports, is valued at Rs. 430 billion (\$9.8 billion), of which hardware, comprising servers, workstations, peripherals, and networking equipment, posted revenues of Rs250 billion. This market is almost entirely served by imports.

The IT sector currently employs close to 850,000 engineering and other highly skilled professionals, including employment in on site projects in destination markets. However, the expanding ITES sector is foreseen as having greater employment potential in the next few years, especially for graduates with non technical qualifications.

There are close to 8,000 registered business enterprises in the sector. The top 20 companies account for more than 75% of revenues and the top five players, Tata Consultancy Services, Wipro, Infosys, HP and HCL Technologies, account for almost one-third of the total sector revenue.

Growth prospects:

A 2002 study by McKinsey and NASSCOM (the National Association of Software Services Companies) estimated that India's IT sector revenues would grow to \$80 billion by 2008, of which, exports would account for \$65 billion. The industry would create over 2 million jobs by 2008, approximately evenly divided between software development and ITES. The parallel support services industry was estimated to create employment for another 2 million people.

Table 4 IT Services Sector Potential in 2008

Category	\$Billion
IT Services Exports	28-30
ITES Exports	21-24
Product and Technology Services	8-11
Domestic Market	13-15
Total	70-80

Source: NASSCOM-McKinsey Report 2002

A more recent Nasscom-Mckinsey Report (2005) estimated that Indian software services and business process outsourcing export revenues were likely to grow at 25 per cent year-on-year till 2010 to reach \$60 billion. If this is achieved, India's offshore IT and BPO industries would contribute seven per cent of the country's GDP by 2010 and account for over 44 per cent of export growth over the next five years. The growth could also result in creating 2.3 million direct jobs and over 6.5 million indirect jobs in the same period.

The global market for IT enabled services, is estimated to be more than \$40 billion, and is growing at over 10% per annum. However, unlike software development,

competitiveness in IT enabled services emanates not only from labour costs, but also from a reliable and cost competitive IT infrastructure, especially telecommunications infrastructure to support large bandwidth applications. According to the 2002 NASSCOM-McKinsey study, India has opportunities to attain \$24 billion in ITES exports by 2008.

Table 5 Opportunities by 2008

Service segments	US\$ billion
Human Resources	3.5-4
Customer care	8-8.5
Payment Services	3-3.5
Content development, etc.	2.5-3
Administration	1.5-2
Finance	2.5-3
Total	21-24

To realise this opportunity, India has initiated several actions to develop an export-oriented IT Enabled Services portfolio. This includes several steps toward the development of a suitable infrastructure to support high speed data communication and large bandwidth between India and key destination markets.

India's ITES exports have climbed rapidly in the past five years, shooting up 45% in 2005 to \$ 5.2 billion, which is almost 30% of the total IT sector exports for the year. Exports for 2006 are projected to be \$7.2 billion. Insurance and banking are the biggest BPO segments, including voice based services (call centres) as well as non-voice services (transaction processing, loyalty programmes, billing, etc.) According to NASSCOM, over 0.35 million persons are currently employed in the segment and around 2 million jobs will be generated by 2008. An estimated 400 companies operate in this segment, including some large foreign companies (for example GE Capital, AXA, Citicorp). Interestingly, most of these are FDI based captive units. This operating mode is related to data security concerns. There have been several high profile acquisitions of successful Indian start-up companies in the ITES space in recent times, by the likes of GECIS, IBM and Citigroup. Unlike Bangalore's grip over the software development segment, the ITES segment is more spread out across India, with smaller cities emerging as competitive destinations offering local talent base and real estate at lower costs than the larger metros.

3.2 Telecom Infrastructure

The quality of telecom infrastructure is critical for the development of the India's Information technology sector, particularly in the IT enabled services, which hinge

upon data communication infrastructure and connectivity. In this respect, India has taken rapid strides to upgrade its telecom infrastructure to support the emerging demand for data connectivity.

In 2005, India's telecommunication services market had a revenue output of Rs 600 billion, or about US\$ 12 billion, from fixed line services and mobile services. Data communications presently accounts for less than 5% of revenues, but is growing rapidly.

Voice Telephony:

As of September 2005, there were 75 million mobile subscriptions and 48 million fixed lines. Mobile subscriptions drive growth in telephony, and have shot past fixed line subscriptions, despite the much longer presence of the latter in India.

Today India has become the world's fastest growing telecom market, adding more new subscribers each year than any other market (48 million new subscribers in 2005).

Table 6 Tele-density of India

	October'05	November'05	December' 05
Total subscribers	116.12mn	119.9mn	123.85mn
Tele-density_(phones per 100 people)	10.66	11.00	11.43
Fixed line	48.17mn	48.47mn	48.93mn
Mobile	67.95mn	71.46mn	75.92mn

Tariffs have also come down sharply as a result of competition. The governmental monopoly on basic telephone services has been removed and any number of operators can now offer services. The lowest tariffs are currently Rs 1.20 per minute for mobile services and Rs 0.85 per minute for fixed line services.

However, India's low levels of teledensity sharply contrast with its stature as an IT services exporter. In 2005, national teledensity was just 11.2%, including fixed lines as well as mobile connections. Rural teledensity remains stagnant at around 2%, while urban densities have risen sharply to 33%.

Internet and Broadband Services:

Internet Services do not attract any prior licensing and are completely unregulated. In 2005, there were 163 Internet Service Providers (ISPs), serving 6.1 million subscribers. The base is growing over 4% per quarter, or 18% annually. Internet telephony services are provided by 51 of those ISPs. In June 2005 there were more than 17000 leased circuit lines, and 0.39 million broadband (256 kbps and more)

connections.

While the total internet subscriber base has exceeded the 6 million target set for December 2005 by the Ministry of Telecommunications, broadband connections, despite growing over 50% per quarter, are way below the 3 million target set for the same period.

Submarine Cable:

Over the last four years, Indian companies have made strategic international moves to increase their influence on markets as well as strategic assets. Indian companies have become dominant players in submarine cable routes in the last two years, after Reliance Infocomm Flag and Tata acquired Tyco, two US-based companies which controlled a big chunk of global under-sea cable network. India has submarine connectivity to South East Asia, West Asia and Europe, and a fibre optic backbone 670,000 circuit kms all over India.

Constraints:

Some challenges remain to be addressed and overcome for India to become globally competitive in telecom tariffs, which are still very high, compared to other Asian markets. It is estimated that current tariff levels, Indians pay 60 times more than subscribers for the same throughput.

Crucial issues like spectrum allocation, calculation of ADC (access deficit charges), and rural penetration need to be resolved by the new National Telecom Policy which is to be announced in 2006.

Future Prospects:

According to NASSCOM, India has achieved 'maturity with offshoring' which is dramatically increasing the breadth of services (all types of business processes, e.g. healthcare, payroll, customer management, claims management).

Future growth in the sector will come from four key trends:

- **New service lines:** As the conventional software development and ITES segments attain more maturity and attract greater competition, Indian IT companies are expected to diversify into greater added value services, e.g. Packaged Software Support and Installation; Network infrastructure management; Systems integration; IT Training and Education; Hardware support and Installation; and Network consulting and integration.
- **Under-penetrated geographies:** While established markets such as the US and UK have been tapped to some extent, large non-English speaking markets in Japan and Western Europe remain under penetrated by Indian IT companies. These two markets alone offer the Indian Industry over \$5-6 billion in export potential. Indian companies have also great opportunities in English-speaking geographies like Canada, Netherlands, Sweden and Australia. Together these

markets account for 6.7 percent of the world's IT spend and represent an opportunity of \$1.2 billion by 2008. But there are challenges in terms of awareness, cultural openness to offshoring, conduciveness of regulatory environment and penetrable language barriers that Indian companies need to overcome.

- **High potential verticals:** Indian companies have focused primarily on three key verticals (Financial Services, Telecom and Manufacturing) that account for nearly 45% of the industry's revenues today. Verticals like Retail, Telecom Services and Healthcare are likely to offer the next wave of opportunities for the industry. Indian companies should build domain knowledge in these sectors.
- **Tapping Product Centric Opportunities:** While India has been able to establish its strong credentials in the IT services arena, it has not been able to make a dent in the software products market (i.e. applications software and packaged software products). India has only been able to capture a meagre 0.2% of the \$180 billion market. A broader spectrum of opportunities is however becoming available to Indian players in areas such as embedded software; development and delivery of specialized components; product development opportunities; product acquisition and enhancement and developing shrink wrapped products. India however still needs to address security concerns relating to these.

3.3 Key Success Factors

In retrospect, the success of India's IT sector may represent a unique case, an aberration as it were, of the perfect balance of right timing, entrepreneurship, a highly supportive policy and enabling business environment, and effective partnership between industry and government, which succeeded in making India the leader in information technology services.

The various factors that have contributed to this phenomenon are analysed below.

Technical Manpower and Institutions

As part of its self reliance development agenda, India has steadily invested in a good higher education system since the 1960s. These include world-renowned institutions of excellence in technical and management education, notably the Indian Institute of Science, the Indian Institutes of Technology, and the Indian Institutes of Management.

India's participation in the information technology space was possible fundamentally due to a large pool of highly skilled, English speaking technical manpower. In the IT sector, more than 850 certified technical institutions offer recognised IT curricula at the diploma, graduate and post-graduate levels, accredited by the Department of Electronics. Also, each year 253 universities and 13,150 colleges in India turn out 2.46 million graduates (although the quality may be uneven) and about 290,000 engineering degree and diploma holders. English is the principal medium of

instruction in India at the secondary school and all higher levels. Every year more than 40,000 Indian software professionals get US H1B visas. .

Besides technical education, the Indian government has also regularly supported and sponsored R&D activities for development of computer software at different institutions, through the Technology Development Council created in 1973. Special institutions have been set up for development of high-end expertise in the sector include. These include the National Centre for Software Technology (NCST), the Supercomputer Education and Research Centre (SERC), Department of Computer Science and Automation, and the Centre for Development of Advanced Computing (C-DAC). These have been instrumental in the development of country wide networks and the Internet, India's first supercomputer, and software in Indian languages. All these government institutions, under the Ministry of Science and Technology and the Ministry of Telecommunications, receive budgetary support, as do all government bodies.

Export Centric Development Mode

India's IT sector development originated in an export-centric approach. The high turnout of technically instructed, English speaking manpower from Indian institutions was readily absorbed in high-tech industries in the West, which offered much better employment and income prospects than could be found in India.

The emergence of big time venture capital in the Silicon Valley, as well as the low start up costs, catalyzed the proliferation of software entrepreneurs in the US as well as in India. The early business models consisted of onsite services in destination markets, and Indian companies evolved as 'body shopping' operations, mainly carrying out recruitments and shipping project personnel to project sites in the US and subsequently to EU.

India's 'brain drain' became the US' high tech industry's key link to India's fledgling software exports in the mid 1980s. Indians, whether students, professionals or entrepreneurs, working in the Silicon Valley could rely on Indians for developing their high-tech backyards, on the strengths of educational skills and ethnic linkages/comfort factors. The 12 hour time zone difference between the US and India so 1

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employment generation and export earnings, without being capital intensive. Export of manpower services brought in large foreign exchange earnings to India - in form of business earnings as well as workmen remittances- without placing any demands on telecom or data infrastructure, while exploding domestic demand for technical higher education, assured by ready off take in form of attractive 'foreign placements'.

The major financial and investment incentives provided to the sector are summarised below.

- Tax exemptions: India's export oriented policies provide income tax exemptions on all export profits (India's basic income tax rates were 55% in 1990 and are presently 30%). These export subsidies are allowed under India's WTO membership until 2010. These tax benefits were extended to the export of services in 1995 by officially classifying software development and IT services as an industry. Software exports, including ITES exports presently enjoy a 90% tax exemption on export profits until 2010. Software development units in export zones and software technology parks are fully exempt from income taxes for five years of their operations.
- Import tariffs: Software and hardware imports attract low rates of duty, and are being phased out totally, under the provisions of the Information Technology Agreement (ITA). IT hardware and capital goods attract 5% customs duties, while software imports are duty free.
- Foreign Investment: Foreign direct investments in IT companies are permitted up to 100% of the shareholding, and foreign institutional investments up to 49%, without prior approval. Venture Capital Funds were allowed to invest in India on a pass-through basis, which exempted them from taxes on their gains from disinvestment. A special facility available only for the IT sector is that a foreign investor is allowed to invest in or partner with several companies operating in the same sector; in all other sectors you have an exclusive Indian partner, and cannot partner with more than one in the same sector.
- Employee Stock Options: Indian regulations for the issue of sweat equity and other ESOPs were introduced first in the IT sector, recognising the importance of human capital in the sector. All employees can be given stock options by the company, which can be redeemed in accordance with a policy approved by the Board of Directors. Employees of Indian companies were also permitted to hold shares of subsidiaries in other countries, as well as in shares of the foreign parent company in the case of Indian subsidiaries.
- Outbound investments: Indian companies are now allowed to enter into share swaps with overseas companies, acquire companies abroad, issue securities in the US and EU markets, and seek listing on the NASDAQ and NYSE. This was not the case previously.

Software Technology Parks

The government has intervened in the provision of infrastructure customised to the needs of the IT sector, by setting up Software Technology Parks in various parts of

the country. STPs can also be set up by the private sector, including by foreign companies. At present there are 39 Software Technology Parks in various parts of India, replete with international high speed connectivity through satellite links and fibre optic cable, and single window clearances for investments and for import/export documentation. In recent months, infrastructure developers from Malaysia and Singapore have invested in large software townships in southern India.

STP units account from nearly 80% of India's IT exports.

Telecom Policies

Realizing the importance of telecommunication in the overall development of the economy in general and that of the IT and software service sector in particular, the Government initiated a number of policy reforms that helped create a highly competitive environment, leading to a drastic reduction in telecom costs but also to increased access and better quality services. These are covered in greater detail in another section in this report.

Industry- government partnership

Another important factor in the sector is the unique partnership between the government and the industry body NASSCOM, which covers the realm of long term vision and strategy, legislation and regulatory policies, human resource development and other issues, such as an effective IPR regime. This level of partnership between government department and industry is not to be found in any other sector, and highlights the high level of trust and reliance among the various stakeholders in the sector. The absence of factions and lobbies within the IT sector are perhaps important factors behind such a relationship.

Government: the hidden hand in India's software saga

Some observers have tended to argue that India's success in the software industry has been an outcome of free play in the market and of benign State neglect (Arora et al., 2000). However, there are reasons to believe that the rise of the export-oriented software and related service industries in India has been a more deliberate development with a number of valuable development consequences.

While the series of policy initiatives and institutional interventions made by the national Government during the 1960s and 1970s laid the foundation for the development of a vibrant software industry in India (Kumar and Joseph, 2004), it was the Computer Policy of 1984 that gave a special thrust to software development by highlighting the need for institutional and policy support on a number of fronts. The policy, for example, called for the setting up of a separate Software Development Promotion Agency (SDPA) under the erstwhile Department of Electronics (DoE). The import of inputs needed for software development was made more liberal.

Against this background, the need was felt for more concrete policies towards the promotion of software development and export. Accordingly, an explicit software

policy was announced in 1986 and software was identified as one of the key sectors in India's agenda for export promotion. The policy underlined importance of integrated development of software for the domestic and export markets (India DoE, 1986). To facilitate the stated objectives, the policy emphasized the need to simplify existing procedures pertaining to all aspects of software development and production for the domestic as well as the export market. It also provided software firms with various commercial incentives, such as tax holidays, a tax exemption on income from software exports, export subsidies and the duty-free import of any hardware or software to be used 100 per cent for export purposes.

With the initiation of economic reforms in the early 1990s, the Finance Ministry made an assessment indicating that, apart from the general orientation of all industries towards export markets, India's comparative advantage was in software and not in hardware. Therefore, a major thrust was consciously given to software exports. Accordingly, new policy measures have been initiated, among which are the following:

(a) the removal of entry barriers against foreign companies; (b) the removal of restrictions on foreign technology transfers; (c) the participation of the private sector in policymaking; (d) provisions to finance software development through equity and venture capital; (e) measures to make available faster and cheaper data communication facilities; and (f) the reduction and rationalization of taxes, duties and tariffs

(Narayanamurthy, 2000).

Recognizing the potential of IT-related industries and software for India's development, the Prime Minister created the National Task force on Information Technology and Software Development (NTITSD) in May 1998 under the chairmanship of the Deputy Chairman, Planning Commission. NTITSD submitted a report outlining a national IT plan comprising 108 recommendations for software and 87 recommendations for hardware (India, NTITSD, 1998). These recommendations have since been notified by the Government in the Gazette of India dated 25 July 1998 (India, MIT, 2000). NTITSD has set before the country an ambitious target of US\$ 50 billion worth of software exports by 2008. DoE was upgraded to a full-fledged Ministry of Information Technology (MIT) in October 1999 to coordinate the promotional role of the Government in the industry.

Source: RIS, New Delhi

Value Innovation and Diversification

The early business for India's IT sector came from 'onsite services', which offered companies in India and in the US high arbitrage margins (up to 300% of the contracted rate of the on site professional) for skilled Indian manpower. The large scale demand for software professionals and a ready supply of suitably qualified Indians, incentivised by the work and eventually immigration opportunities into the US, led to a prolific body shopping industry. However, high attritions,

disintermediation, H1B visa restrictions to minimize displacement of higher-cost US manpower, besides externalities such as 9/11 and competition from other English speaking countries, posed increasing challenges and declining margins for the body shopping model.

Indian companies have responded to these challenges rather well.

Market Diversification

With increasing competition and declining returns in the onsite business in the US, Indian companies turned attention to other - especially English speaking- markets to diversify their market presence. The US accounts for less than 65% of software exports, with the EU and Japan accounting for 22% and 8% respectively.

Offshore Models

The larger Indian companies positioned themselves as the right candidates for large, turnkey projects, based on technological and project management skills. This enabled migration from the 'onsite' to the 'offshore' model offered the same or even better arbitrage opportunities, and required only a small on site presence to facilitate the client relationship and coordinate project monitoring with the client and the offshore operations. As a result, despite steady overall growth for the sector, the share of on-site services in India's IT exports has fallen from 90% in 1988 to only 40% in 2003-2004. There has also been a change in composition of exporters. While onsite services were controlled by Indian companies- given the ethnic linkages, there is a greater balance in the offshore model, as several large US companies have set up their own captive offshore businesses in India.

Moving up the value chain

The low capital investment needs facilitated the entry of a large number of IT start ups in the sector, increasing competition at the lower end of the value chain (writing software code). Even the biggest Indian companies were essentially, subcontractors to companies based in destination markets. In recent years, Indian companies have begun moving into higher-end programming, and building domain expertise in the major end use segments.

Over the past few years, Indian companies have also managed to develop and launch a number of proprietary products, especially in banking, financial and accounting software. For instance, Infosys' banking solutions products are being used by several Indian and foreign banks. I-Flex, a company supported by Citigroup, has developed a block buster product Flex Cube which is used by financial institutions in more than 80 countries. Similarly, WIPRO Technologies has recently launched two branded products, viz. Teleprodigy, a billing system for ISPs, and WebSecure, an Internet security package.

Yet, the larger reality is that Indian products have only a negligible share in the packaged software market.

Global Standards

Certification is a key measure of differentiation for software technology companies. The ultimate benchmark of technological capability is the Level 5 SEICMM Certification (Software Engineering Institute, Capability Maturity Model of the United States), developed by the Carnegie Mellon University. India has the distinction of having the highest number of companies in the world (51 of the 74 worldwide) having Level 5 Certification. This seal of excellence has generated confidence among the biggest customers in the world to outsource their software development requirements to India. According to NASSCOM, 85 of the Fortune 100 companies have outsourced their software requirements to Indian companies.

Foreign Direct Investment

India allows up to 100% foreign holding in the IT services sector. This has enabled an increasing presence of foreign companies in form of subsidiaries and joint ventures, for captive software development centres in India. There are more than 150 subsidiaries of foreign companies, including software giants like Microsoft, IBM, SAP, Sun Microsystems and Oracle, besides global financial institutions like HSBC, Citicorp, ABN AMRO and Deutsche Bank, and airline companies. MNC affiliates accounted for nearly one-fourth of India's IT service exports in 2004 (Dataquest, 2004).

3.4 Regulatory Framework

Until the 1990s, India remained a closed market for external trade and foreign investments in practically all sectors of the economy. Telecommunications services as well as infrastructure were under government monopoly, and technology transfer in electronics and computing were subject to strict reviews by government, on security concerns. However, as a part of the economic reforms undertaken since 1992, there has been a gradual but steady pace of deregulation in the ICT sector. Reforms in the sector have progressed successfully to the present level of a practically free market status, under an effective independent regulatory body (the Telecom Regulatory Authority of India TRAI).

- The IT sector was seen as an easy source for high employment generation and export earnings, without being capital intensive. Export models brought in large foreign exchange earnings to India - in form of business earnings as well as workmen remittances- without placing any demands on telecom or data infrastructure, while exploding domestic demand for technical higher education, assured by ready off take in form of attractive 'foreign placements'.
- India's export oriented policies provide income tax exemptions on export profits (until 2010). These tax benefits were extended to export of services, primarily to attract software companies to repatriate profits from onsite jobs to India. This resulted in a proliferation of small sized Indian companies entering the software development market, building their businesses on the onshore model.

Easy pickings from export orientation- foreign exchange as well as high employment potential- and the complexities of regulating the fast-paced technology sectors created few incentives for government to intervene in the sector. Large supply capacities- each year, 60,000 graduates pass out from India's technical institutions; and good timing- a boom in the US tech sector, funded by venture capitalists- were major factors that worked in India's favour in the 1990s, in which India established itself as the principal supplier of technical manpower to the world.

In sharp contrast, the opportunities in the domestic economy were rather limited at the time.

- Computerisation in government- at the time the largest potential user for IT services- was politically sensitive. Modernisation and privatisation in banking, insurance and other public sector areas was on the slow burner.
- The low penetration of PCs (less than 1% in the 1990s) restricted even the private sector market opportunities.
- There was no indigenous hardware manufacturing base in India, and the industry relied on SKD and CKD (Semi knocked down and Completely knocked down) imports. Imports were costly as well, with import tariffs in the region of 100%, and a regime of quantitative restrictions until 2001.
- The telecom manufacturing and service sectors were under government monopoly until 1997, and the government was the regulator as well as the operator even after the onset of privatisation in telecom services.

Present state of regulations:

Until 1996, there was no separate ministry for information and communications technology, which were clubbed under the Ministry of Science and Technology. Policy setting and approvals were delegated to a lower level- the Department of Electronics. Subsequently, in 2001, information technology and telecommunications have been merged into one ministry.

The creation of an apex policy body led to the formation of a more integrated approach to developing the ICT sector, covering a broad range of issues: long term policies, licensing and competitive regulations, telecom penetration, infrastructure

quality and costs, service costs and standards, investment regulations, and export facilitation measures, including certification, tax incentives and intellectual property rights. This enabled the government to address and balance the development needs articulated by the users i.e. IT service providers, as well as the providers of connectivity and telecom services.

The New Telecom Policy (1999) and the general guidelines on Foreign Direct Investment embody the broad policy aspects of India's ICT sector. The major highlights of current regulations are:

Investment:

- The full range of telecom services, including voice, Internet and other data communications, are open to private participation, including varying levels of foreign direct investment.
- FDI ceilings in various telecom activities are:
 - 74% in basic, cellular, value added services, and global mobile communication by satellite , with prior approval
 - 49% on automatic basis and 74% with prior approval in Internet gateways, radio paging services, and end-to-end bandwidth (Category II providers)
 - and
 - 100% in Internet services not providing gateways (both for submarine and satellite cables), infrastructure providers providing dark fibre (Category I), e-mail and voice mail services
 - 100% in software development, IT services, BPO and other IT-enabled services
 - 100% in telecom equipment manufacture
- Licensing and security requirements apply.

Yet, some aspects still remain restrictive. For instance:

- 100% foreign ownership is allowed only on the condition that 26% shall be divested to the Indian public within five years;
- Transfer of license ownership is restricted for a specified period to avoid trading of telecom licences. A company cannot sell off its holdings after getting service licenses.
- Upfront bank guarantees of Rs 1 billion are required to be furnished by end-to-end bandwidth infrastructure providers (this is proposed to be replaced with a 6% of estimated revenue).

The effects of competition are evident from the steady decline in tariffs.

- Lowest tariffs for cellular calls are poised to breach the Rs 1 per minute floor, from their introductory levels of Rs 12 in 1996. In 2006, companies have begun offering lifetime subscriptions for less than Rs 1000 (incoming free for life), and shall soon offer a single, all-India tariff.
- International long distance tariffs have fallen from Rs 120 per minute in 1996 to Rs 7 per minute on the busiest India-US circuit.
- Steep reductions (75% and more) have taken place in leased line tariffs for the data com segment, which, until 2001, were a monopoly with the government international long distance carrier.
- Import tariffs on various ICT hardware have been eliminated completely or slashed to 5%, as per the WTO IT Agreement(which India has signed), which is catalyzing penetration of IT and telephone devices in the domestic market.

3.5 Intellectual Property Protection

Prior to the WTO agreements, India's intellectual property rights regime covered only four categories: patents, copyrights, trademarks and industrial designs, and Indian regulations on these subjects varied to different extents from international trends. In general, India's intellectual property regulations have been perceived to offer inadequate protection to IPRs registered in other markets, and even supportive of some degree of reproduction, re-engineering and piracy, including in pharmaceuticals.

Primarily, IPRs in the Information technology sector cover integrated circuit designs, and software programmes. While India's earlier regulations did not cover ICs, computer software programmes were under the purview of the Indian Copyright Act, along with other literary works. Although major amendments have been made to comply with the TRIPS agreement of the WTO, which came into force in 1995, several provisions of the Indian laws are at variance with regulations in Europe and the US.

Software Piracy

A study carried out by the Business Software Alliance (a global body representing the software industry) reported that in 2004, 73% of software used in India was pirated, up from 64% in the previous year. Piracy in the higher end is even higher, in the range of 85% for Macromedia, AutoDesk and Oracle. High software prices of licensed software and weak enforcement of intellectual property rights are the key reasons for piracy in India. One of the most important factors that encourage piracy in India is the high cost of commercial software. The street price of software forms one-sixth of the price of acquiring the computer, which encourages consumers to use pirated software.

Software Protection Rights

The term 'software' includes published and unpublished computer programs, databases, computer files, preparatory design material and associated printed documentation, such as users' manuals. Under Indian law, computer programs are not entitled to patent protection, on the justification that algorithms are not permissible under the Patent laws. However, they are entitled to copyright protection under the Indian copyright Act 1957, which was amended in 1994 to extend to satellite broadcasting, computer software and digital technology. The present Copyright Amendment) Act, 1999, which came into force on January 15, 2000, is TRIPS compliant. Copyright protection is available to registered as well as unregistered works.

Though the amendments to the Copyright Act now cover all forms of computer software, there are several weaknesses as well:

- Ambiguities exist in determining ownership rights of clients and employers on products developed by employees and third party contractors under fixed term contracts. The Act implies that an employer shall, in the absence of any agreement to the contrary, be the first owner of the Copyright. This does not make the employer the sole and exclusive owner of such rights. Given that Indian software companies develop products for the international market, there are inadequacies in protection of products developed under contracts that are not governed under Indian laws.
- In case of software programmes, it is not clear whether materials deposited in object code mode qualify for copyright protection, considering that the source code is an important trade secret and can not be deposited on the public domain. Procedures do not exist for registration of object code pending assurance that the code does represent copyrightable material.
- Copyright laws generally do not protect the owner from reverse engineering, resulting in a proliferation of legitimate 'inspirations' of protected products.

3.5.1 Data Security Issues

The issue of data security has become extremely crucial to the Indian IT services/ITES-BPO industries, particularly with a large number of global companies outsourcing their processes to India.

In recent months there have been a slew of reports indicating that while the outsourcing phenomenon has yielded huge cost savings for companies, many were not careful enough in securing the sensitive information they transmitted. These have raised new concerns on data security, as evident in a few recent cases of database misuse and fraud by employees of leading Indian BPOs.

- In April 2005, Citibank account holders in the US became victims of a US\$ 350,000 fraud by former employees of a reputed Indian BPO (Mphasis BFL). These customers, whose account queries were being handled by a call

centre at Mphasis, found their accounts debited by varying amounts for credit card and other online transactions. Sixteen former employees of Mphasis involved with the fraud were arrested, but the money could not be recovered.

- In September 2005, an investigator at British newspaper 'The Sun' revealed the ease with which sensitive information can be attained, by buying secure private information including bank accounts, passport numbers, mobile numbers and medical records for 1,000 Britons for only \$7, a New Delhi-based call centre employee.
- Two employees of Cybersys Infotech Limited a BPO based in Gurgaon (near New Delhi, India), were arrested by police on charges of stealing confidential documents of its client City Credit (UK). The contract was supposed to be limited to the two parties, but the work was outsourced to other Indian companies to cut costs. The documents were reportedly stolen to make the data available to these companies.

Data Protection Laws

Companies in the EU have legal restrictions in outsourcing to India, in the absence of comprehensive data security legislation. The adequacy norms of the European Union's Data Protection Directive require the EU to declare that third-party countries have levels of data protection that conform to European standards and thus allow data on EU citizens to be transmitted outside of the union. India is not among this list of third party countries; as a result, outsourcing of sensitive data from the EU is negligible.

The Ministry of Information Technology in India has taken steps to upgrade security standards including the following:

- set up the Standardization, Testing and Quality Certification (STQC) Directorate
- rolled out independent third-party certification schemes for Information Security Management Systems
- set up the Indian Computer Emergency Response Team (CERT) to protect Indian assets against viruses, etc.
- set up of the Information Security Technology Development Council (ISTDC) to respond to information security incidents and threats and attacks at the national level.

Rather than enact a separate law to deal with data security and privacy, the government is considering an amendment to its Information Technology Act of 2000, based on draft texts being suggested by NASSCOM. The new clauses are intended to meet the requirements of the European Union's Data Protection Directive and the Safe Harbour privacy principles of the US.

India's legislation on data protection is covered under the Indian IT Act, 2000. However, its provisions for dealing with breach of data are grossly inadequate. The

Phone conversations are recorded and monitored. Other measures being used are employee background checks, magnetic access cards, video security, and biometric security, including retina scans and palm reading.

Nasscom is initiating measures for independent audits of its 860 member companies' security systems, to send a strong signal to clients in the US and EU of the seriousness the industry attaches to the subject. It has also, in association with KPMG, created a special study on Business Continuity Management and is encouraging Indian software and services vendors to adopt best practices in security and data privacy.

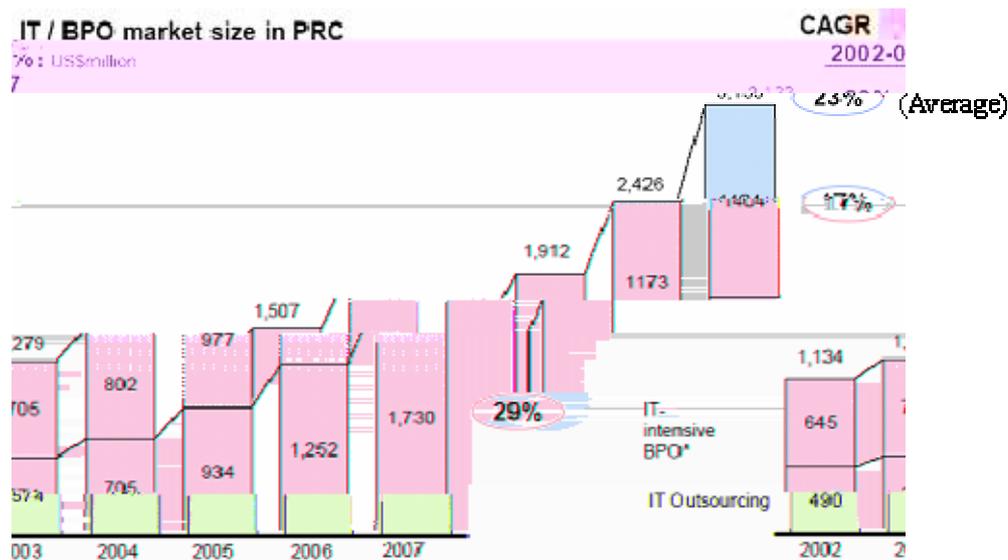
Meanwhile, there is a new dimension emerging in India as to the liability of the enterprise in events of security breaches. Current indications are that the government is unlikely to make BPO enterprises liable to breach of confidential information by its employees. The Indian government is considering amendments in the IT Act under which BPOs will be excluded from the definition of network service providers. The exclusion from the ambit of network service providers would mean that BPOs would not be held responsible for the theft of any confidential information of foreign clients, like credit card or bank account details. If implemented, such provisions would have serious implications for the outsourcing business.

Chapter 4 China in Services Outsourcing

4.1 Overall development of China's outsourcing industry

There is no official statistics on China's outsourcing. This study is based on unofficial statistics gathered from different sources. International Data Corp (IDC), estimated in 2004 that China's IT outsourcing market value stood at US\$433.7 million, which accounted for 9.9 per cent of the total IT service market. It would grow at a CAGR (compound annual growth rate) of 36.5 per cent from 2003 to 2008, and the size of China's IT outsourcing market will hit US\$1.69 billion in 2008. It will account for 17.7 per cent of the total IT service market. Gartner and McKinsey also reported that the IT outsourcing and IT-intensive BPO market in China is expected to explode in the next few years and it will increase at a CAGR of 23 per cent annually from 2002 to 2007, as following chart illustrated.

Chart 1 Market Size



Source: McKinsey (2004)

According to A. T. Kearney published 2004 Offshore Location Attractiveness Index, China is the most attractive destination for offshore outsourcing services, only next to India. It claimed "China's vast labor pool and low costs secured it second place in the index, although it lags behind India in terms of experience and other key factors such as IT and management education, language skills, concerns about intellectual property and overall country risk".

However, China enjoys her own comparative advantages.

4.1.1 Availability of large low-cost workforce

An obvious advantage is that most multinational companies (MNCs) want to utilize China's large low-cost talent pool to save cost. Comparing to \$4,000 in the U.S. and \$700 in India, an average month salary for engineers in China is only about \$500. A.T. Kearney stated that in 2003 almost 500,000 IT professionals entered the industry, representing a 60 per cent increase over 2002. As for software industry, according to CSIA, China's 4500 largest software enterprises employed 520,000 people of which around 260,000 carried out software development. The largest numbers of working software developers can be found in Guangdong, Beijing, Shanghai, Shandong, Zhejiang and Shaanxi. Therefore, many leading global companies are tapping such large pool of talent. IMB, for example, opened three new IT/BPO data centers in the summer of 2003, two in Hong Kong and one in Shenzhen. The Shenzhen center represents the expansion of IMB's manufacturing partnership with Great Wall Computer. In summer 2003, Beijing Ericsson Communication Systems Co Ltd (BEC) was approved by the State Administration for Industry and Commerce to become the first foreign company to engage in enterprise telecommunication outsourcing in China.

4.1.2 Large market size

There is huge demand inside China for outsourcing services to meet the needs of both the country's own booming economy and of the thousands of MNCs that have set up manufacturing bases in China. Firstly, China has more than 100,000 large corporations and over 10 million small and medium-sized companies, Gartner said. Many huge size domestic companies are on their way of ambitious informatization, to set up most advanced hardware systems and to install robust software. With such great opportunity in domestic market, for example, massive need for data entry from local banks, insurance companies and hospitals, booming smaller outsourcing companies are more likely to focus on providing services to local companies. Another edge is that numerous MNCs, like IBM, Motorola, SAP, Microsoft, NEC, BEA, established offshore manufacturing, development or service centers in China, which request IT/BPO service for the market and their customers in China and other Asian countries. Cisco revealed plans for building the company's first research center in China, since half of its top 12 business partners and half of its main competitors could come from China.

4.1.3 Rapid and sustained economic growth

China has witnessed a long period of rapid and sustained economic growth, partly due to favorable investment environment attracting huge Foreign Direct Investment (FDI) and partly due to huge domestic demand. Actually, China, India, and the United States are the main destinations of global FDI in Information and Communication Technologies (ICT), accounting for more than 50 percent of the overall global

investment, although the profile of these investments varies across these countries. India is preferred for R&D and IT-enabled services, IT services projects are concentrated in the United States, and China is considered the hub for ICT manufacturing.

Nevertheless, if only considering FDI amount in absolute number, China obviously enjoys larger amount of FDI than India does. Last year China attracted a massive US\$ 60.63 billion foreign investment, roughly 20 per cent of that was in IT and telecommunication, more than the total FDI into India for the last ten years. In fact, the total FDI into India last year was US\$ 5.33 billion.

China's entry into the WTO is spurring further investment. So far, nearly 450 out of the world's top 500 transnational corporations have invested in China, part of them moved their regional headquarters into China. In recent years, over 600 foreign-funded R&D institutions have been put in place, and the hi-tech industries as well as trade in services are becoming the focus of foreign investors.

The government has established 15 national software industrial parks (See Annex 2) to facilitate more investment in the country, with support from the government, such as subsidies, tax benefit policies, free rent and financial assistance for worker certifications. Shanghai, home of Pudong Software Park, is becoming a service hub. More than half of the roughly 1,000 foreign start-ups in Shanghai in 2002 were in service industries, challenging Hong Kong's long track record in attracting service-sector investment.

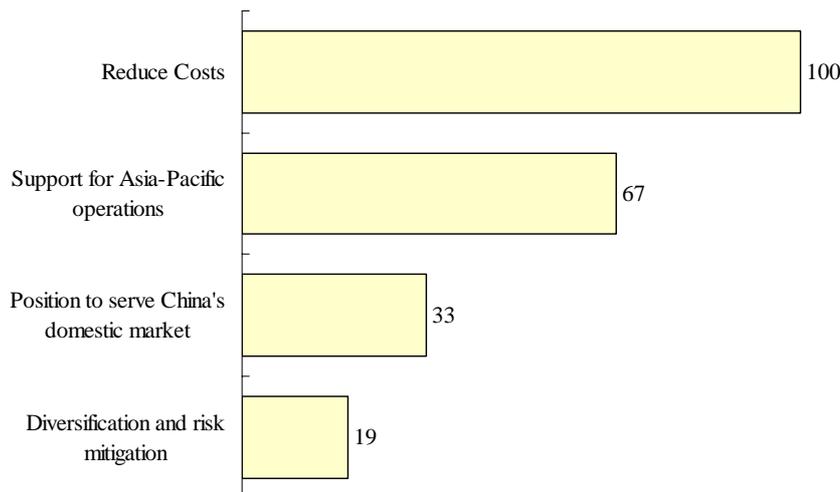
Due to the comparative advantages mentioned above, many MNCs touch China's outsourcing market actively. So far, GE has set up 4 global capital service centers as finance back office in India, Mexico, Hungary and China respectively, to provide data processing, finance and IT services for its four global regions, i.e. U.S., Canada, Europe, and Japan. Its service center, GE Capital International Service located in China, in particular, provides remote processing operations that handle back office functions for 20 different GE businesses. At its new software-development center in Shanghai, BearingPoint Inc. aims to quadruple its staff by 2005. In May 2005, IBM China set up a new service center which accommodates 1,000 persons and provided brand-new BPO services ranging from customer relationship management, finance and accounting to HR. IBM announced that, at current stage, it will double its employees within next 16 months and invest most heavily in China among its established 35 outsourcing centers worldwide.

In addition, some MNCs wish to reduce risks by carrying out outsourcing services in different countries. IndayMac, an American Bank, turned its eye to China. Last year, IndayMac outsourced its loan process system to Indian software developers, while, this year, the bank is planning to outsource other crucial IT projects to countries other than India, in order to keep eggs in different baskets.

Third, China is also becoming a destination for companies targeting the Japanese and Korean markets. Using China as a staging ground for building outsourcing

relationships with Japan and other Asian countries, MNCs choose to place operations in the northern coastal city of Dalian, as a result of the high concentration of Japanese and Korean speaking locals in the city. Dell Computer and CSK Corp. are opening Japanese-language call centers. Accenture Ltd. has opened a software-development unit and will soon boast 1,000 staff in Dalian. So far, Dalian is home for 18 of the world's top companies, including Citibank, GE and IBM.

**Chart 2 Top objectives that drive offshore initiatives in China
(Index scores where reduced costs = 100)**



Source: A T Kearney (2005) *the Changing Face of China*

Like their international rivals, Indian IT companies also see that the Chinese market could provide a gateway to largely untapped market of Japan and the Asia Pacific region, gain access to the huge domestic and export market, provide business continuity and reduce risk for multinational companies. Indian companies could also use the Chinese market to get access to multinational companies moving into China and they could use China as part of global delivery chain.

- J Easier to find developers with Japanese and Korean language skills
- J Serve as a bridge to the growing Japanese outsourcing market
- J Decrease dependence on the US revenues (currently 68% of India's outsourcing revenues stems from the US)
- J Large potential customer base: MNCs in China and domestic market
- J The 2008 Olympics in Beijing, the World Expo in 2010 in Shanghai, E-government initiatives and the banking reforms create business opportunities
- J Booming IT-training market

Therefore, Indian IT firms are increasingly setting up operations in China in order to capture on the future prospects that the country might offer in IT outsourcing and view China as a base for winning business in Asia. As of June 2005, nearly 18 Indian companies had operations in China and had a workforce of nearly 2,000, with investments estimated to be around \$50 million. By the end of 2005, Indian

companies were expected to expand their Chinese operations as well as double their employee base in China, according to NASSCOM.

Infosys Technologies, India's second largest outsourcing service provider, recently announced plans to invest \$65 million to expand its business in China, where it will hire 2,000 computer experts over the next two years and build large new corporate campuses in Shanghai and Hangzhou, which will accommodate more than thousands workers. Infosys claimed that it will have around 10,000 employees by 2009 and, apart from Chinese market, will target Northeast Asia market, i.e. Japan and Republic of Korea. Infosys also accepted 100 Chinese interns at a corporate campus it maintains in the Indian city of Mysore. Infosys's moves in China have been mirrored by those of several other large Indian companies, like Satyam Computer Services, Tata Consultancy Services, and Wipro etc. that specialize in computer services and outsourcing.

Satyam Computer Services Ltd., India's fourth-biggest supplier, set up a development center in Shanghai with plans to expand. Earlier this year, Satyam announced its plans to build a major campus in Beijing. Satyam reported that China presents more opportunity than any other country, which mainly contributes to MNCs who need reliable software support for their expanding mainland businesses. Satyam signed a memorandum with Microsoft to develop market in China together.

India's Tata Consultancy Services has a 100-person software center in Hangzhou. iGATE Global Solutions, a \$90 million Bangalore software provider, was set up in the eastern city of Wuxi. MphasiS Group bought a 50-employee Chinese software developer in Shanghai. NIIT has recently expanded its presence in China, creating over 50 training centers around the country, where it teaches programming and other computing skills. Indian computer-training companies are teaching 20,000 students in more than 150 centers across China.

Besides companies currently conducting offshore outsourcing services in China, many other companies show great interest in doing so and indicate willingness to outsource in near future. In DiamondCluster's recently conducted third annual survey, International's 2005 Global IT Outsourcing Study, 40% of companies expect to outsource some IT functions to China over the next three to five years, compared to 8% last year. While in 2004, only 6% of survey respondents said they planned to establish offshore operations in China. Today, that number has soared to 40%. It concluded, "as outsourcing capability in China takes off, it will put pressure on the traditional providers of commoditized outsourcing services and set an entirely new price point. The most aggressive providers are establishing operations in China now to grab market share. Taking a wait-and-see approach is not an option."

The greatest attraction is the promising prospects of China's dynamic economic growth and fast expanding domestic market. No companies can afford to lose their shares in the Chinese market.

4.2 IT and Telecommunication sector

4.2.1 The improved legal and regulatory framework

China joined the WTO with a commitment to significantly expand the scope of market access to telecommunications services. China has agreed to the WTO Basic Agreement on Telecommunications Services (BATS), which aims to reduce foreign ownership agreement restrictions and ensure fair regulatory practices for competition and market access. This has provided legal guidance for China's domestic telecommunications laws.

Legislative process in telecommunication seems to progress slowly compared with banking and ensuring. The drafting of a communication law has not been foreseen for the immediate future.

As a common practice of regulatory reform, China normally began with formulating administrative regulations to accumulate experiences and then codify successful experiences into law at a later stage. In the field of telecommunication, the State Council adopted in September 2001, the telecommunications Regulation of the People's Republic of China on both basic and value-added telecommunications, establishing general guidelines for licensing and interconnection rules, establish pricing standards, outline rights and obligations for carriers, set construction standards and establish rules for security.

Section 1 gives general guidelines for the regulations, which are "formulated with the purpose of regulating the telecommunications market, securing telecommunications networks and information and promoting the stable development of the telecommunications industry."

Article 1-6 detail security protections, establish MII as the industry's regulators, and confirm that the central government controls the telecom administration of the provinces, autonomous regions and municipalities.

Article 4 is particularly important regarding international competition. The article states, "The surveillance and control of the telecommunications sector shall be based upon the following principles: the separation of administrative departments and enterprises; the breakdown of monopolies and the encouragement of competition, transparency, fairness and just practice". In fact, basic telecom is a state monopoly. In order to enhance the efficiency of telecom operation, it is necessary to create law to encourage competition.

Article 7 categorizes telecommunications services and establishes license regulations. To engage in telecommunications services, a telecom license must be acquired from the telecom administrations of a province, autonomous region or municipality directly under the central government.

Article 8 defines value-added telecommunication services as telecommunications and information through public networks.

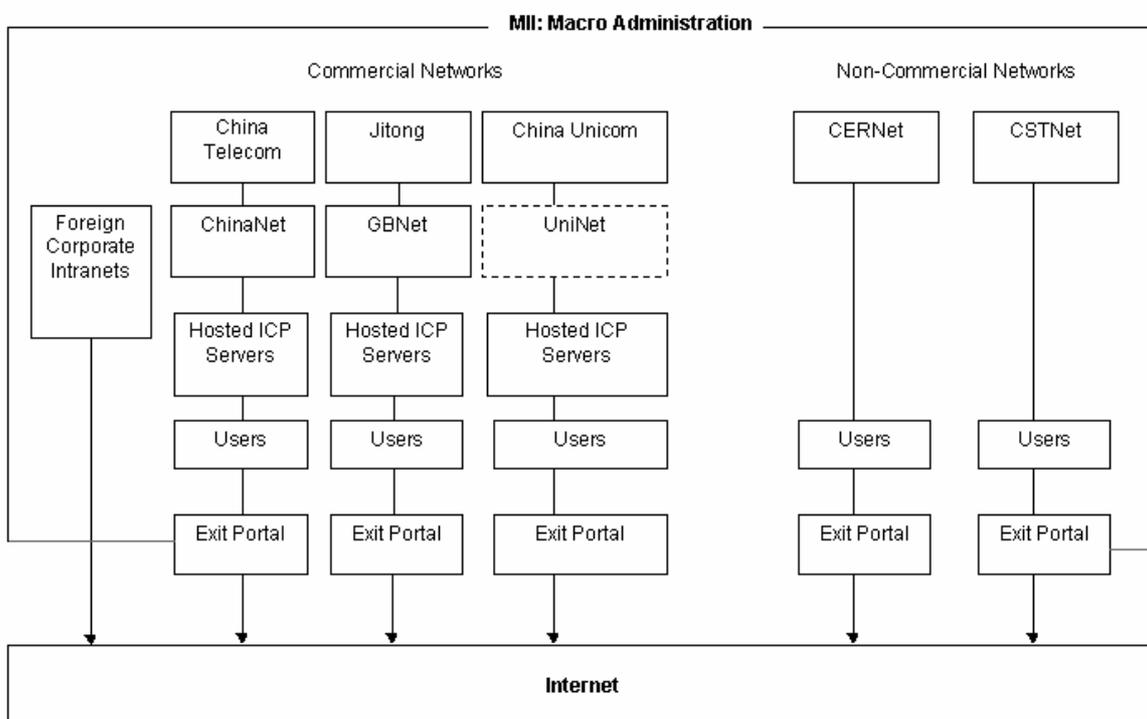
Article 13 provides that a telecommunication carrier must meet the following conditions to engage in value-added telecommunications service:

- J The telecommunications carrier is a lawfully established company
- J The telecommunications carrier has sufficient capital and qualified professional skill to provide the services
- J The telecommunications carrier has the credit and or ability to provide long-term service to customers
- J The telecommunications carrier meets any other conditions required by law.

So far, foreign investment in telecom service was limited to 50 per cent of a company's total investment, and any foreign company that provided value-added telecom services had to first register with MII.

4.2.2 Legal framework for network connectivity and network security

In 1996, the Ministry of Public Security issued the Circular Concerning the Records of Computer Information Systems Linked to Foreign Networks. The circular states that all Internet users are required to register with a local public security bureau within 30 days of establishing a link. It empowers public security authorities to warn and/or shut down computer networks that jeopardize the safety of computer information networks. Public registration forms are now included in applications for internet service subscriptions.



Source: Chinaonline.com

In addition, two laws were initiated to regulate the actual internet access process. These laws legally set forth the Internet services systems by regulating international

gateways and creating a four-tier system for domestic networks' international access.

First, developed by the State Council in 1996 and revised in 1997, the Provisional Regulations of the People's Republic of China Concerning Administration of International Connections of Computer Information Networks lays out the basic organizational and administrative structure of China's information services network. This addressed the issues relating to the establishment of interfacing networks and their connection to the international computer networks. Under such a system, subscribers, whether individuals or legal person must connect their computer systems to connected networks operated by properly approved and registered domestic ISPs, which, in turn, are linked up with the interconnected networks.

Second, the Implementation Measures for the above provision issued in 1998, states that all connections to overseas computer networks must go through the international gateway operated by the MII that can be connected to China's domestic network for the purpose of commercial services. This means that actually China's backbone Internet operators are allowed to connect to the Internet only through MII controlled gateways. The establishment of new interconnected networks is subject to the approval of the State Council.

Therefore, the Internet administration in China is structured in the four-tier: Internet subscribers, local/private ISPs, national state-owned ISPs, and the international gateways. Internet users may gain Internet access either indirectly via a local/private ISP or directly through a national state-owned ISP. There arises the problem of low efficiency in the use of expanded ICT infrastructure caused by restricted Internet access through limited gateway.

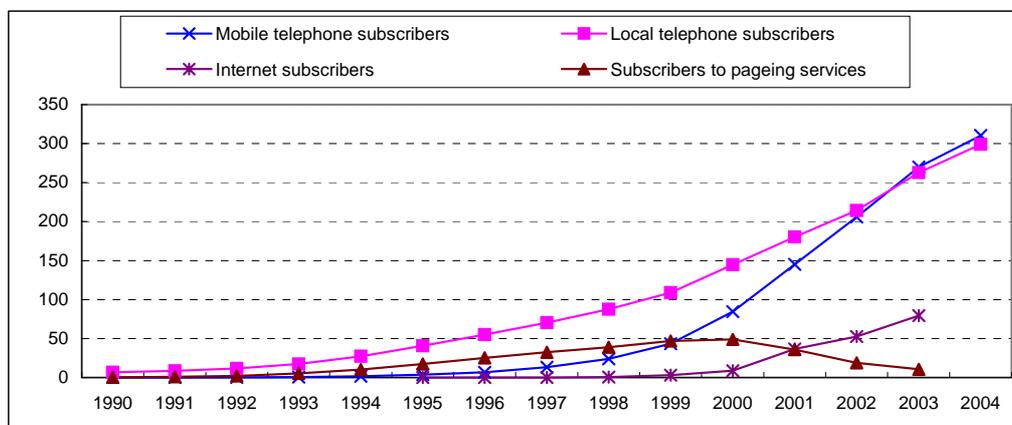
4.2.3 China's ICT infrastructure and the market

Thanks to government initiatives for a modern telecommunications system and great efforts on infrastructure development, China's telecommunications system is improving remarkably. China's teledensity (combined fixed and mobile subscribers per hundred inhabitants) touched 57 per cent at the beginning of 2005, whereas India's teledensity stood at 11.43 per cent by the end of 2005, and the US and Japan have reached saturation points with teledensity levels at 115 per cent and 120 per cent respectively. In the 10th Five-year Plan (2001-2005), MII set a target of a combined teledensity of 40 per cent by the end of 2005, a figure which was achieved in 2003. Length of long distance optical cable lines reached 594,303 kilometers in 2003, three folds of the 194,100 kilometer five years ago.

The bandwidth of international Internet broadband connection is dramatically expanding. It is now 43 gigabits per second, 120 times the bandwidth China had just four years ago, with international connection points in Beijing, Shanghai and Shenzhen. China has also experienced phenomenal growth of Internet users since 1995 when public service was first offered. Internet users increased from 2 million to 103 million over the past 8 years. The number of the host computers increased from 8.92 million in 2000 to 45.6 million in 2005. After Japan and the US, China is the

world's biggest market for personal computers and continues to be the fastest growing.

Chart 3 Usage of communication facilities (million)



Source: China Statistical Yearbook 1996-2004.

All these demonstrated that China is the most rapidly developing telecommunications market in the world. Many MNCs are interested in investing in such a huge market with great potential to continue to grow remarkably.

However, at current stage, China's telecommunication market is dominated by seven large state-owned companies, i.e. China Telecom, China Unicom, China Netcom, China mobile, China Satellite, Jitong and China Railway Com. So far, due to investment cap, only France Telecom opened its first wholly owned R&D facility, Innovative Garden in Nov. 2004 to pave the way to further expansion in the world's biggest telecommunication market.

Due to the high fixed costs charged by state-owned companies to lease the line of the national backbone and international gateway, local ISPs pass such costs to the consumer. Therefore, the cost for internet connection is too high for individual users. Chinese users complain about quality of services, high prices, and poor content. With more foreign investors entering the market, the problems are expected to be partly resolved due to competition. Also, increasing FDI will raise capital for localized ISPs, offering a more competitive price to consumers. Increasing subscribers will lower per unit costs for the leased lines to each consumer, and decrease consumer prices without reducing profits of operators.

4.2.4 Implementation of China's WTO commitment

FDI is a large and growing source of equity investment that brings considerable benefits: technology transfers, management know-how, and export marketing access. All stimulate local productivity through backward linkage to service suppliers and labor force. FDI in services will decrease prices, increase trade and productivity, increase wages and incomes and increase consumer welfare ultimately.

China has committed to progressively liberalize its telecommunications services upon accession to WTO. In value-added and paging services, foreign service suppliers may hold a 30% equity share upon accession, 49% after one year and 50% after two years. Foreign service suppliers can provide e-mail, voice mail, online information and data base retrieval, EDI, enhanced/value-added facsimile services, code and protocol conversion, online information and data processing, and paging services. The geographic restriction on the above services to the three cities of Beijing, Shanghai and Guangzhou will be lifted two years after accession. In mobile voice and data services, the foreign service suppliers will be able to provide all analogue/digital mobile services and personal communication services and hold a 25% share one year after accession, 35% after three years, and 49% after five years. Further, foreign service suppliers can provide services nationwide five years after accession. (see Annex 3)

However, taking Internet services for example, foreign companies often complain that complex licensing procedures for Internet content providers, resulting in discretionary interpretations by various ministries. Thirteen ministries are allowed to draft their own regulations without consulting other government entities or affected business. This leads to an intractable situation of what accurately are the access conditions and causes investment risk when Internet service providers depend on economic growth to increase telecommunications infrastructure and its subscriber base. If regulatory risk remains high, foreign investors are wavering in investing large amount of capital since they want a more transparent and consistent regulatory framework, which would allow them to achieve predictable results. Investors may be scared away by bureaucratic red tape particularly when India, China's main competitor offers up to 100% foreign holding in telecom services.

4.2.5 The development strategy of the IT sector - hardware and software

Currently, production of hardware is estimated at \$15.4 billion, while software estimates are \$5 billion. China software exports can be divided into three different categories: software products, embedded systems and outsourcing services. The major part of software exports today fall into the third category, with a lot of the work carried out being simple low-end work, such as coding and system integration, PC based application, development, application maintenance, system integration, data processing and product development according to China Software Industry Association (CSIA). CSIA also stated that the software products being exported today are mainly middleware solutions and virus software. More than 60% of China's offshore software development revenue is from companies based in Japan. For the Dalian Hi-Think Computer Technologies, China's largest software exporter, more than 70% of revenues are from Japanese clients.

In the 10th five-year plan, the government for the first time outlined a policy for the development of software industry. This included a growth target of 30% annually, which would lead to sales revenue of \$20 billion in 2005. The government also aims to build 20 large software companies with revenues exceeding \$120 million, more

than 100 “famous software brands” and software exports of \$1.5 to 2 billion by 2005. CSIA reported that the export goal was reached by 2003.

The government also established 15 national software industrial parks, which guarantee an uninterrupted power supply, with most equipped with backup power generators, and provided inducements, such as tax free zones, tax benefit policies and provision of specific financing sources. For example, fast track of loan application specifically available for software outsourcing companies; subsidies provided for companies setting up overseas representative offices or branches; crediting loans to SMEs to explore overseas market; offering free service such as contract registration and customs clearance. Other than the overall tax policy and policies for specific sectors that are set on a national level, which stated in State council document 18 (see section 2.4 for specific measures), local governments also are increasingly competing to offer special conditions in order to attract investors.

Liaoning

- J Exemptions from urban and town land use tax

Beijing

- J Tax refund on one-time investment for purchase of car or accommodation when hiring senior software manager or senior technical personnel. The tax refund may correspond to a maximum of 80 per cent of the individual income tax paid to senior software personnel.

Guangdong

- J Accelerated depreciation of fixed assets after registration with local tax authorities

Shanghai

- J Refund enterprise income tax of the local revenue portion derived from earnings reinvested in a software enterprise or invested in the establishment of a new software enterprise in Shanghai. The investment schedule has to span over more than five years

High-tech parks in Beijing

environmental protection. Zhongguancun's rapid development is significant to Beijing's ongoing restructuring of its industries, as well as the technological innovation of the whole country.

To help the park become one of the most important development zones in the world, Beijing has implemented favorable policies to encourage high-tech development and attract overseas investment for the project. The preferential treatment includes simplified corporate registration procedures, extensions of credit, research funding, subsidies, or specialized rights that enable intellectual workers to share in the economic returns of their companies. Also, Beijing is considering implementing more preferential policies in order to attract talents, set up a new property rights system and help high-tech firms list on the stock markets.

In addition, the city will upgrade the area's infrastructure, services and environment in order to create a better climate for Zhongguancun high-tech park. To improve Zhongguancun's communications with downtown Beijing, the Capital International Airport and the Beijing-Tianjin-Tangshan Highway, a comprehensive road network will be built.

Another high-tech development park near the Capital International Airport in Beijing was set up particularly to attract Chinese scholars returning from overseas to start-up their own technology-related business in China. Created by the Beijing Service Center for Scholarly Exchange and Beijing Airport Industrial Zone, the 20,000 square meter development park was inaugurated in December 1999. Preferential policies to be enjoyed by companies with less than \$1.25 million (RMB10 million) investment in the development park include a three-year period of income tax waiver and another three-year period to enjoy income tax concessions. Property used for business operation and research and development purposes will also be provided free of rent for two years. Even better preferential treatment could be accorded to ventures with above \$1.25 million (RMB10 million) investments.

Dalian software industrial park

The following list illustrates the preferential policies of the Dalian software industrial Park which hosts more than 18 MNCs as mentioned in section 2.1:

- J Land price: most favorable price will be given to the projects in the Park
- J Income tax: 15% income tax rate is adopted, in addition, two years exemption (start from making profit) and subsequent three years reduction (rate of 7.5%) will be given.
- J Local income tax: 3% income tax rate is adopted, and seven years exemption will be given.
- J Land appreciation tax and factory building purchase deed tax: free
- J Profit remittance tax: free
- J Individual income tax: rate of 5-45%, after RMB 1200 deduction for Chinese employees and RMB 4000 for foreign expatriates

- J Workers recruit policy: the urgently needed technical and managerial staff and their families could be recruited from outside of Dalian without paying for residents multiply fee.
- J Production equipment depreciation: enterprises in the Park could have the shortest production equipment depreciation period in accordance with State regulations.
- J Other policy: enterprises in the Park could have related financial support guaranteed by SMEs Bank.

Suzhou Industrial Park

Suzhou Industrial Park provides one-stop shop services. Companies only rent the premises for their operations and can focus investment on equipment and machinery. The park has established a computer-based customs declaration and taxation system, a human resources center, real estate consultant market, and a number of finance and public accounting firm. An export-processing zone enables companies to bypass many customs restriction.

Since, so far, China is more successful in hardware and less successful in software, the following section will focus on software industry and try to explore the driving causes.

4.3 Barriers

1. Fragmented market

Firstly, of China's 8,000 software services providers, only 5 have more than 2,000 employees, and almost three-quarters of them have fewer than 50 employees, McKinsey said in its first 2005 quarterly report. India, by contrast, has fewer than 3,000 software services companies, at least 15 of which have more than 2,000 workers, and some of them, including Infosys Technologies, Tata Consultancy Services and Wipro Technologies, have gained international recognition and a global clientele. In addition, the top 10 suppliers in China control roughly 15 per cent of the market, compared with an estimated 45 per cent in the hands of India's top 10. Therefore, without adequate scale, Chinese players are unlikely to attract top international clients. In general, smaller companies are more vulnerable to the loss of key personnel, may not have the financial resource to survive for the duration of a project, and often don't have the capacity to

companies that could have taken their place.

Secondly, although the growth of revenues from software services in China is high, it is mainly driven by domestic demand. Most customers are small and medium size Chinese enterprises that want software customized to their own needs. The country's foreign software outsourcing business accounts for just 10 percent of the industry's total revenue, compared with around 70 percent for India. As for services offered, Indian companies provide a wide range of services from customer call centers and medical transcription to insurance-claims processing and litigation support. For example, Japan, the largest overseas customer for Chinese companies, seek mostly low-value application-development contracts rather than more lucrative ones for design, accounting for about 65 percent of this sector's income.

Thirdly, despite lower costs, profit margins in Chinese software-services company average only 7 per cent, compared with 11 per cent at similar companies around the world, because many projects are below optimal scale, suppliers often compete on price, and collecting payments can be problematic.

Fragmentation exacerbates other problems, including weak process controls and product management. By the end of 2003, only 11 of China's 30 largest software companies,(9 of which are domestic companies) are certified at levels four of Carnegie Mellon Capability Maturity Model (CMM) and above. By contrast, all of the top 30 Indian software companies have achieved these rankings.

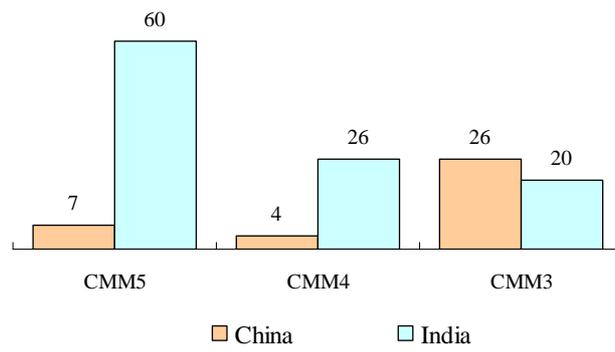
So far, no big Chinese rivals for the multinational outsourcing firms have yet emerged. If Chinese companies hope to take a step into and to increase their size in international market, the fragmented market must be consolidated. Nevertheless, such situation is gradually changing with the sign of a recent strategic combination of three major enterprises³. Compared with three individual companies, the combined group will clearly have superior status in the arenas of business coverage and customer service. This is a pragmatic choice of China's software outsourcing industry in the face of international competition.

2. A lack of high-level international quality certification

Chinese companies have relatively low capabilities and services levels, comparing to foreign rivals. As mentioned above, only 11 firms in China had reached CMM level four and above, and 4 of these certifications were achieved by different Motorola branches. This can be compared with 86 firms in India that have reached this level.

³ The three companies taking part in this strategic combination are: Dalian's HiSoft Technology International Ltd., Beijing's Ensemble International Limited and Shenzhen's Teksen Horizon Systems (Asia) Ltd.

Chart 4 Number of CMM certified companies in China versus India



Source: A T Kearney (2005)

all students to start learning English in third grade. Some shanghai elementary school children receive math and science instruction in English. The 2008 Olympics in Beijing are expected to provide strong push for raising the level of language skill.

China expected 2.8 million college graduates with certain language level to hit the job market in summer of 2004, 300,000 of whom are engineers, about ten times the number in Germany. India turns out some 3.1 million college graduates every year, whereas the U. S. turns out 1.3 million college graduates a year. The number in 2004 is an increase of 680 thousand over the same period in 2003. By 2005, the number of graduates is expected to reach a record 3.4 million.

4. Lack of certain skills and high turnover rates

The Chinese software industry has limited international reach. This, in turn, is attributable to the lack of a contingent with international experience and knowledge of international standards. So far, the outsourcing contracts that local companies have been able to obtain have either been gained through contacts or through foreign companies that already are located in China. Less chances to reach international market also means that Chinese project managers are short of experience in managing large-scale projects. Without reaching out to the international market to compete, it is also difficult to develop the industry.

Gartner reported that most Chinese IT professionals with a few years of work experience and English proficiency have left China for jobs overseas. Over the past ten years, 400,000 students have left the country for further education, of these, only 100,000 have returned. The government has devoted substantial resources to promoting technical and business exchanges that involve overseas Chinese students. This typically involves events such as conference, study tours, joint research projects, and exhibits. Such activities are designed to involve scientists and researchers, business people, and policy makers in cross-regional exchange of know-how and information. These initiatives also include measure to encourage students to return home by giving them preferential treatment when starting business. With increasing business opportunity in China, more and more overseas Chinese students are returning home.

In addition, few Chinese companies have used stock options, training programs, or other incentives to build talent. Annual employee turnover was about 20 percent, compared with an average of 14 percent in the United States, which itself has a very fluid IT labor market. The main reasons for high turnover is dissatisfaction with the management system, dissatisfaction with the benefits package, or the search for better career development opportunities. Larger companies tend to attract more interesting projects, provide better training opportunities, and offer more generous incentives, which in turn, make it easier to attract and retain workers with valuable technical and language skills.

The lack of talents and high turnover rates for people holding these kinds of skills contribute the difficulty of developing the industry. Often the ability of one company to attract talent means that another firm will be losing manpower. 45 per cent of the software developers that leave local companies to find new employment at foreign companies and around 20 per cent go abroad to continue higher education.

But with government involvement, professional training and experience, such obstacles mentioned in item 3 and 4 are surmountable.

The government is making great efforts in creating a first-class high-tech labor force. In order to satisfy the demands of China's expanding IT industry, the government has adopted a model similar to India's for creating and developing a software workforce. The goal is to create a pyramid-shaped skills structure with three skills levels, high-level skills, management, analysis and design skills; mid-level skills, backbone software development skills and low-level skills, technology workers, aiming to have 800,000 software developers by 2005. Both multinational and Indian firms are providing training in partnership with the government at undergraduate, post-graduate and adult education levels. Universities are training in software development and applications and other technical skills.

In addition to large-scale investments in technical education, the government helped to enhance labor force technical skills by forging partnerships with multinationals to train information technology engineers and promoting the study of English across the country. For example, IBM has signed deals to train 100,000 software specialists in various Chinese cities over three years. In 2003, IBM and China's Ministry of Education announced to use grid technology to enable universities across the country to collaborate on research, scientific and education projects, one of the world's largest implementations of grid computing, powered by Linux. By tapping unused computing resources, the grid will link more than 200,000 students and faculty across multiple universities. As the system grows, users will be able to work on intensive projects with relative low costs. Life science researchers have already used the grid to collaborate and share findings. And Cantonese-speaking students in Hong Kong use voice recognition and real-time chatting services to practice Mandarin.

On another front, the Chinese Ministry of Science & Technology (MOST) in 1995 founded "the Torch Plan" that seeks to fund academic institutions and small new companies to commercialize the products of academic research. They have generally been active for some specific areas of the high tech industry such as photo-electronic, software and biotech. Under such a plan, 53 science and industrial parks were established nation wide. This lead to a further organic development of software parks in all corners of China. The State Development and Reform Commission announced 10 national software bases that receive central government support.

The China-India Software Associate, founded in November 2003, is collaborating with Indian IT firms to establish technical parks across the country. Cooperation with Indian companies at current stage gives Chinese companies access to big mature players with domain experience, bring knowledge about proven world class process maturity/quality standards, and give access to existing multinational clients. Further, Chinese companies can gain project management skills, accrue benefits of world-class engineering design and embedded systems capability as well as unbundle the semiconductor value chain, as they could focus on low-cost manufacturing with flexible Indian design skills.

With government put much emphasis on higher education, the number of people going to Chinese universities is increasing. The percentage of the Chinese population that attends university rose from 2% 1980 to 12% today. Thanks to such huge government support, the number of engineering graduates and software applications professionals in China has grown considerably in recent years, and the number of English-speaking graduates in the work force has doubled since 2000 to more than 24 million in 2004. Still, China is lagging behind developing countries in terms of education spending. Today, China ranks in the 13th worst place in terms of education spending as percentage of GDP with 2.1%. This can be compared to India that spends 4.1% of GDP on education, Economist reported. Furthermore, community-based and private training and professional on-job training provide channels for IT professional to gain knowledge and experience.

Community-based and private training

Today around 100,000 IT-workers graduate each year from training centers and non-university training educational institutions. This can be compared to India where the corresponding figure is 300,000, according to CSIA. This forms an important cornerstone for the India software industry. In contrast, India's literacy rate was less than 55% while China's was more than 85%, i.e. India had almost twice illiteracy rate of China. It reflects the fact that the IT targeted education in India is paying off and got ahead of China, a country with much higher literacy rate. It contributes much to Indian IT development. This is a good experience for China to emulate in training IT-skilled people to join the current IT workforce and thus accelerate the development of the IT industry.

As a foundation for the future professional education in China, the government in September 2002 issued a document with the title Vigorously Moving Ahead with Reform and Development of Professional Education. This document addresses how to extend the scope of professional training. One part of this policy aims at promoting foreign organizations and private entrepreneurs to start training institutions

Traditionally, there have been a number of community-based training organizations. The problem with these has been that most of them focus on how to use software and little about how to develop it. This means that these kinds of organizations

provide less than 25% of the total software workforce. People with such kind of background mainly work in sales or other type of support activities. Nevertheless, the organizations are slowly becoming aware of what industry demands and are adjusting accordingly. This awareness has led to fierce competition, strong market growth, with more foreign players entering the market to establish their brand names. India's largest training company, NIIT, and third biggest, Aptech, have also established themselves in China. NIIT has a subsidiary that operates about 50 training centers and plans to establish 500 centers by the end of 2007. NIIT has entered a partnership model with 6 universities. Aptech has established its first JV center, co-invested with MOST in Beijing University in 2000. In 2003, Aptech had 30,000 students enrolled in their training courses.

Professional on-job training

In the area of professional work training there are a number of cooperative agreements between higher educational institutions and local and foreign companies. Some examples of companies engaged in these kinds of activities are Microsoft, IBM, Sybase and Oracle.

5. Intellectual-Property Right (IPR) protection

The protection of IPRs is a difficult job anywhere in the world. The rapid application of modern technology particularly ICT and Internet accelerates dissemination of information and knowledge, and at the same time make IPR theft extremely difficult to control. Effective IPR protection is an essential condition to attracting service outsourcing.

Outsourcing expensive software development and localization to China is increasingly attractive to firms setting their strategic sights on the China market. At present, IPR piracy has become a major obstacle discouraging outsourcers from assigning contracts to Chinese software developers. <Economist> reported that 92% of all business software sold in China is pirated.

China addresses the issue of IPR protection on three fronts. i.e. legislative, judiciary and administrative measures. In order to comply with China's WTO commitments, China has taken prompt actions to revise all IPR related laws and regulations such as the patent law, copy right law, software law. In respect of increasing effectiveness of judiciary measures, the Supreme Court and Supreme Procuratorate have jointly adopted judicial interpretation of criminal penalty provisions to enforce severe penalty against IPR violations. However, IPR holders are generally reluctant to take cases to court because laws suits are time-consuming with uncertainty in the final verdict. It will also spoil business environment. Administrative measures will be more effective in reinforcing IPR protection.

Driven in part by China's WTO entry process and commitments under Trade-Related aspects of Intellectual Property Rights (TRIPs), there are now increasingly

meaningful legal procedures and civil remedies available. In October 2001, amendments to the copyright law were approved to bring the legislation into line with WTO norms and international agreement on intellectual property.

To strengthen the law enforcement, the State Council set up the Working Group of IPR protection, consisting of 12 State Council agencies. It is headed by Vice Premier Wu Yi, taking up the role of central leader and coordinator of nation-wide IPR protection. The Working Group is responsible for leading and coordinating IPR protection work all over the country and overseeing the handling of major cases. Under the uniform deployment of the Working Group, an inter-ministerial IPR Enforcement Collaboration System has been set up to enhance working communication and coordination. The Working Group also made specific arrangement for nationwide publicity and training. At present, all provinces, autonomous regions and municipalities directly under the central government have correspondingly established their own IPR protection task force, and under the working pattern featuring uniform leadership by the central government, responsibility taken by the local government, guidance and coordination by relevant departments and joint action by all parties involved, they are engaged in routine and specialized IPR enforcement work.

The State Council also decided to launch a specialized campaign for IPR Protection throughout the country from September 2004 to August 2005 under the auspices of the National IPR Protection Working Group. The specialized campaign will identify priority areas, linkages and regions to drive comprehensive progress by extending from focused places to wider coverage.

In addition, China's Supreme People's Court and Supreme People's Procurator is working on formulating the Legal Interpretation on Several Issues of Specific Law Application in Criminal Cases of IPR Violations in order to lower the threshold of criminal penalty against IPR violation. Civil law specifically states that IPR is a major civil rights issue, and infringement on trademarks, patents and copyrights is a criminal offense. The severest penalty is prison sentence up to seven years. The Chinese governments at different levels hold the IPR Protection Publicity Week regularly and organize diversified activities on many occasions to raise people's awareness of IPR protection.

Although these potential pitfalls mentioned above have held Chinese upstarts back, the government recognizes the potential and importance for development of outsourcing services industry and enacts various policies and regulations to offer a favorable investment environment.

4.4 Government support

National policy: 10th five-year Plan

The government has strongly encouraged R&D and technological innovation in the 10th five-year plan covering 2001-2005. It plans for software industry to grow up to 7% of the country's GDP by 2005. Specifically, IT goods will become a driving force in China's economy. Over the years, China's IT hardware industry has produced considerable exports as foreign investors have expanded their manufacturing capabilities to China while software industry still lags behind. The specific targets are set below

- J Optical cable: 2.5 million kilometer in length, over 500000 kilometers for long distance cabling. Basically cover the cities and villages in the whole country
- J Fixed telephone capacity: 300 million
- J Total wireless network capacity: 360 million subscribers
- J PC online: 40 million
- J Internet subscribers: 200 million
- J No. of ISPs/ICPs: 5000

In addition, the government will enact the Telecom Law and related regulations and create a fair operating environment.

Particular attention will be given to software industry

- J Develop Chinese operating systems, platforms, database management systems and Chinese network management system
- J Change the traditional ways in which software is developed and managed, support the development of software parks and the backbone software industry assess and manage the software process using the CMM for software.
- J Encourage corporations in developing application software, support will be provided to the development of software applied in information system management, industrial control, CAD/CAM as well as those applied in finance, taxation, insurance, information service, education and multi-media entertainment
- J Encourage the export of software and increase the market share of locally developed software.

State council document 18: Tax incentives for the IT sector

The State Council document 18th File Policy on the Encouragement of Software and Integrated Circuit Industry, issued in June 2000, is the basis for the preferential policies aimed at the software and integrated circuit industry development. As an incentive policy to develop the software and IC industry, the policy provides inducements such as venture capital programs, tax-free zones, tax benefit policies and a reserve on foreign currency. Most of the promotional measures outlined in the document related to taxes, including:

- J A Value Added Tax (VAT) refund to be used for R&D and expanded production. The refund reduced the effective VAT for software companies from 17% to 3%

- J Newly established companies, once approved, would pay no Enterprise Income Tax (EIT) for two years and then half EIT for the next three years, beginning with the first year of profitability.
- J Certain software companies, designed as “key software enterprise” in the national plan which do not qualify for 0% EIT, are to be taxed at an EIT rate of 10%.
- J Software company’s imports of technology and equipment are exempted from tariffs and VAT.

A “fast-track” approval for software firms that want to raise capital in overseas stock markets.

In addition, by actively organizing various summits/conferences, Chinese government also provides a platform for the developing outsourcing industry and builds up new partnerships with foreign investors. The Global IT Outsourcing Summit in Shanghai, for example, is being organized by the Ministry of Commerce, Shanghai Municipal Informatization Commission, and the Shanghai Foreign Economic Relations and Trade Commission for three consecutive years since 2002. In December 2005, International software outsourcing summit was held in the city of Shenzhen and co-organized by Gartner and Chinese government agencies. In June 2006, China will first time take part in outsourcing conference in the United States with slogan “China, Beijing, Zhongguancun”.

Local government officials also jump the bandwagon to promote outsourcing services across China. Jiangsu Province, for example, recently announced plans to recruit as many as 400 Indian software engineers to help it energize its provincial information technology sector. Other provinces and cities, like Yunnan province, the city of Dalian announced their local policies to attract more FDI respectively.

To facilitate software industry development, Chinese Premier, Wen Jiabao, visited several Indian IT outsourcing hubs such as Bangalore and also visited the Indian Institutes of Technology (IITs) in 2004

4.5 Assessment of China’s Advantage and Disadvantage

As measured by China’s schedule of commitments on services, the general level of openness of China’s service sector is close to that of industrialized countries such as the United States, European Union and Japan and much higher than that of other developing countries such as India and Brazil. According to WTO International Trade Statistics 2005 and WTO World Trade Report 2005, China’s Trade in commercial services is among the highest of developing countries in terms of both import and export. The following table shows that China’s total exports of commercial services (2004) was US\$ 62.1 billion compared to US\$ 39.6 billion for India and US\$ 45.9 billion for Ireland. However the breakdown for computer and information service was a disappointing low US\$ 1.6 billion (statistics available only for 2003) compared to

US\$ 7.06 billion for India and US\$ 7.49 billion for Ireland. Total import of commercial services was even higher US\$ 71.6 billion compared to US\$ 40.9 billion for India and US\$ 58.4 billion for Ireland. The breakdown for computer and information services was also low at US\$ 1.3 billion, though higher than India and Ireland.

The ratio of computer and information services is insignificant in both import and export in comparison with the general level of trade in commercial services. This low level of trade cannot be attributed to lack of ICT infrastructure capacity. Table 9 compares China's ICT capacity with that of India. China's capacity is several times larger than India in teledensity, total telephone subscribers, total internet subscribers, host computers and bandwidth. China's trade in computer and information services is not commensurate with its ICT capacity. This implies that the market of computer and information services is much closed than commercial services in general let alone manufacturing industry. There are great potentials for further development of imports and exports in information and communication services particularly in undertaking services outsourcing from multinational enterprises wishing to achieve efficiency gain and enhance international competitiveness.

Table 8 Trade in Commercial Services 2003/2004

(Billion dollars)

	China	India	Ireland
Total export of commercial services	62.1 (2004)	39.6 (2004)	45.9 (2004)
Of which: Computer & information service	1.6 (2003)	7.059 (2003)	7.49 (2003)
Total import of commercial services	71.6 (2004)	40.9 (2004)	58.4 (2004)
Of which: Computer & information services	1.3 (2003)	0.465 (2003)	0.36 (2003)

Source: WTO International Trade Statistics 2005, WTO World Trade Report 2005

An OECD Working Paper made analysis from the angle of in-sourcers i.e. countries receiving global outsourcing of services. The following table reproduced from the OECD working paper by Mary Amiti and Shang-Jin Wei based on IMF Balance of Payment Statistics shows that the major industrialized countries are the biggest insourcers. This paper should dispel the concern of industrialized countries about loss of jobs resulting from outsourcing of services.

This report also reflects similar trend of China's position vis-à-vis India and Ireland. China was the 14th biggest insourcer in business services and 12th in computer and information services. India ranked the 6th in business service, but without separate information of computer and information services. However, EUCTP Expert estimate of India's export of IT services (including IT-enabled services) for 2005 was US\$ 17.2 billion. Although this is not strictly comparable because of different time series, it does show that India is far ahead of China in the export of computer and information services. For China insourcing takes place mainly in business services, insourcing in

computer and information services is insignificant compared with business service. Industry.

Who Are the Biggest Absolute Insourcers (2002)?¹⁷

Million US Dollars

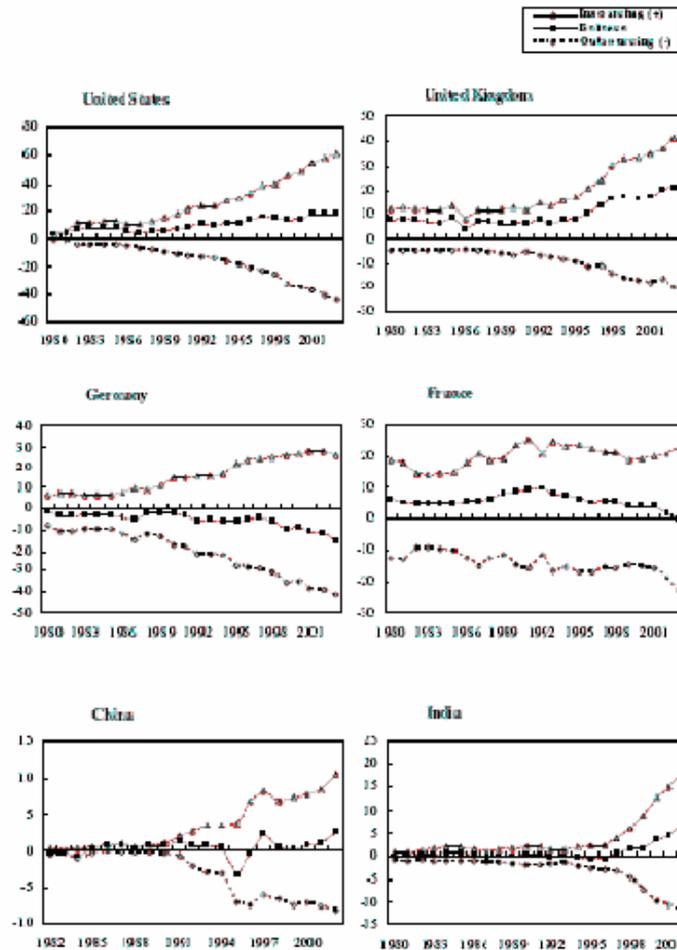
Rank	Country	Business Services	Rank	Country	Computer & Information Services
	United States	58,794	1	Ireland	10,426
	United Kingdom	36,740	2	United Kingdom	5,675
	Germany	27,907	3	United States	5,431
	France	20,864	4	Germany	5,185
	Netherlands	20,074	5	Spain	2,487
	India	18,630	10	France	1,191
	Japan	17,401	11	Japan	1,140
	China P.R.	10,419	12	China P.R.	638
	Russia	2,012		Russia	127

¹⁷ There is no separate figure for Russia in the total information services in the table because of government's data.

Source: 2004, *Balance of Payments Statistics Yearbook*.

A review from a longer period perspective, one can easily observe that China was far ahead of India ten years ago. The Figure below shows that India started to catch up around 1996. In less than 10 years time India left China far behind. The shift of positions of China and India conveys an important message that appropriate policy strategy could rapidly change a country's international competitive position. India's success can be attributed to India's deliberate efforts in developing computer software and IT-related services as well as the economic reform launched in the 1990. China on the other hand focused on development of the manufacturing industry and neglected the importance of enhancing the competitiveness of the service industry. While the capacity of ICT infrastructure has been remarkably improved, the efficiency of application of the infrastructures is low, the impact on international trade in service is not commensurate with its ICT capacity. Rethinking of policy strategy is necessary to put computer and information services in perspective of global competition to push domestic service providers to ensure optimal utilization of infrastructure capacity and enhance international competitiveness.

**Insourcing and Outsourcing of Business Services
(billion dollars)**



Source: IMF Balance of Payments Statistics Yearbook and International Financial Statistics.

The table 9 below compares China's ICT capacity with that of India. China's teledensity in 2005 was 57 per 100 persons while India's was only 11.43 per 100 persons. China's bandwidth was 43 GBps compares with India's 1 GBps. China has 103 million Internet subscribers, India has only 6 million. China had 45.6 million host computers, India had only 10 million host computers. Only in one area, fibre optic India is more advanced than China. However, India had made full use of its infrastructure in generating export revenues. India has a more liberal FDI regime in telecom services. As described in Chapter 3, FDI ceilings are: 74% in basic, cellular, value added services, and global mobile communication by satellite with prior approval; 49% on automatic basis and 74% with prior approval in Internet gateways, radio paging services and end-to-end bandwidth; 100% in Internet services not providing gateways (compared to 100% monopoly in China), 100% in software development, IT services, BPO and other IT-enabled services. In China FDI ceilings for different categories of telecom services range between 25% and 50%. India's IT workforce of 830,000 generated export revenues of US\$ 17.2 billion. China's IT

workforce of 2.386 million with much more advanced infrastructure generated only US\$ 1.98 billion. Chinese policy makers need to consider ways to encourage enterprises, public or private, domestic or foreign, to make full use of the infrastructures and provide broader ranges of services.

Table 9 ICT Capacity Comparative Table

	China	India
Teledensity	57 per 100 persons (2005)	11.43 per 100 persons (2005)
Total subscribers	750 million (2005)	123.85 million (2005)
Bandwidth	43 GBps (2005)	1 GBps
Broad band connection	64,300,000 (2005)	300,000 (2005)
Internet subscribers	103 million (2005)	6 million (2005)
Host Computers	45.6 million (2005)	10 million
IT workforce	2,386,000 (2005)	830,000 (2005)
Export of IT and related services	US\$1.98 bn (2004)	US\$17.2 bn (2004)

Source: Compiled by EUCTP experts from multiple sources.

Some analysts suggest that China will not be able to catch up with India in 10-15 years because the Indian IT sector has developed under a complete laissez-faire market conditions free from any government interference and acquired its international competitiveness in its own right. This study discovers that the rise of the export-oriented software and related services industries in India has been a more deliberate development. The success of the Indian IT sector has been attributed to well conceived IT development strategy with strong Government support and a liberal IT and ICT foreign investment policy. For example, the Computer policy of 1984 providing for institutional and policy support had played an important role in promoting software development.

The following table shows China's strength and weakness which may facilitate policy makers to design appropriate policy to take advantage of China's strength and overcome its weakness with a view to strengthening China's international competitiveness in undertaking service outsourcing.

Table 10 China's Strength and Weakness

strength	weakness
Attractive economic environment: 9% GDP growth and large domestic market	Lack of English language skill and knowledge of western business savvy
Large human resource pool –1.6 million young professionals, 160,000 qualified young engineers with annual increase of 50,000. Computer science graduates could reach 200,000 annually	Lack of business executives with global vision and managing skill to lead technical teams to undertake large scale outsourcing assignments.
Low labour cost – Monthly pay for software engineer \$500 in Shanghai, \$700 in India, \$4,000 in US. Combined with low overhead cost, outsourcing could save cost up to 60%.	Inadequate enforcement of IPR protection law.
More much advanced infrastructures: Teledensity, Internet subscribers, bandwidth, computers online, IT spending 5 times higher than India.	Uncertainty arising from transition toward a market economy system. Excess administrative interference in business activities affects strategic decision of outsourcing companies.
Leverage on manufacturing capacity and foreign investment enterprises: Around 450 of the top 500 MNEs set foot in China	Regulatory system unclear for level playing field in supply of services particularly in computer and information services
Government support for software development and rapid progress in hardware development.	Few enterprises acquire CMM certificate (high level international quality certification) prerequisite for outsourcing jobs.

Chapter 5 Conclusion and policy recommendations

5.1 Conclusions

Ireland's share of world service trade has expanded five fold in recent years thanks to a liberal FDI policy. Ireland's exports of IT services and IT enabled services are dominated by subsidiaries of multinationals which account for 95% of Ireland exports. Ireland is a developed countries and its trade policy is regulated by the European Union. Due to difference in stage of development, the case of Ireland might not be strictly comparable with China. India may be a more relevant case for comparison.

China and India adopted different economic development strategies. China has targeted the manufacturing sector as priority area for development and foreign direct investment for the past 20 years. China pursued a gradual approach of liberalising its trade regime and a very liberal foreign direct investment policy in the manufacturing industry. By end of 2005, China has attracted a total FDI of US\$640.9 billion. There were 565,581 foreign investment enterprises. The Chinese strategy has resulted in more than two-decade 9% average economic growth and made China the world most important manufacturing base. The drawback of this strategy is the negligence of the service sector which lags behind in its openness and the utilization of FDI. Fast economic growth while substantially improving living standard of the Chinese people as a whole has also been accompanied by widening rural-urban disparity. India chooses to leapfrog from an agricultural economy to a knowledge based service economy and has already made India the world most important exporter of software and IT-enabled services. It adopted a liberal FDI policy in software and IT-related services allowing up to 100% foreign holdings, granting various fiscal incentives including exemption of taxes and import duties without prior approval. In sharp contrast is the closed policy in manufacturing. Until 1990s, India remained a closed market for external trade and foreign investment in practically all sectors of the economy. The drawback of this strategy is that, India

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advanced infrastructures including particularly ICT infrastructure, low labour cost and a skilled and devoted labour force and a large Diaspora including mainland Chinese, Hong Kong, Macao and Taiwanese residents living in Europe, North America and Japan. China does not need to worry about market access but there is an urgent need to build strong capacity and high skill to compete internationally through a more liberal trade regime in services as the manufacturing industry has done so in the past 20 years. The dynamic economic growth requires faster development of the service sector. China has already a huge manufacturing industry to service. It should explore better business models to develop producer services (services as inputs of the value of a final products) to assist manufacturers to further raise their added value and enhance international competitiveness. In the process of specialization the service industry will in itself sharpen its international competitiveness and be able to provide high quality services to outsourcing enterprises

5.2.1 Accelerate further reform to establish a competitive market structure which provides a level playing field for all basic telecom operators and value added service providers

Monopoly (with one supplier) or oligopoly (with few suppliers) leads to inefficiency and low quality of service, artificially high prices and lack of incentive for development of new service products. Only a competitive market structure with many telecom operators and service providers competing with each other can enhance efficiency and provide high quality services to consumers. Infrastructure enabling both equal access to and rapid provisioning of high-speed digital communications is an important enabler of both IT and BPO offshoring. A good regulatory framework is absolutely necessary, but should be independent, neutral, transparent and automatic, leaving no discretionary power to favour particular enterprises or group of enterprises. The policy requiring users to give priority to national products (normally means from state-owned enterprises) is counterproductive. It is contrary to national treatment principle and will not make state-owned enterprises competitive. Government support to state-owned enterprises should be in the form of production subsidies. The regulatory authority should strictly have no economic linkage with business operators. The Telecommunication law to be formulated should ensure the unification of all different laws and regulations promulgated by different government institutions. There should be only one single regulatory authority for the enforcement of law. Licensing procedures should be simple, criteria be transparent and automatic. Therefore, the government should review current law and legislation to assure that barriers, such as market domination, were removed and to foster a business climate that encourages competition among various companies. It is important to create a concrete, comprehensive and more transparent telecommunications legal framework that increases competition and improves the investment environment. Consistent national rules will reduce discretionary behavior and such consistency will reduce discretionary interpretations rules by different ministries. For example, the government can simplify licensing procedures, which will increase investor's confidence. Also, increasing regulatory transparency and implementing the rule of law to the regulatory environment will help the government fulfill the WTO commitments. Transparent policies can create a relatively good legal environment to attract more foreign telecoms operators to invest in China. To sum up, regulatory risk should be reduced to encourage FDI and facilitate the government economic goals. The Government may wish to conduct further study on concrete elements for a competitive regulatory framework.

5.2.2 Addressing looming talent shortage

The shortage of talents is 3 folds. First the shortage of top management staff with global vision and the skill to lead large technical teams to undertake complex outsourcing jobs. Secondly the lack of language skill to understand the specific outsourcing requirements, the lack of knowledge of business culture of outsourcing enterprises and therefore unable to offer competitive service products to outsourcing

enterprises. Thirdly, the basic workforce lack practical experience in providing services to foreign enterprises. Survey conducted by foreign enterprises showed that only 10% of Chinese college graduates with engineer degree are qualified to work in foreign service companies. As the growth of service sector accelerates, the talent shortage looms larger. McKinsey & Company reported that large foreign multinationals and joint ventures will take up 70 percent of China's suitable graduates before smaller multinationals or Chinese companies enter the picture.

To address the talent shortage, the Government will have to input more resources on higher education and professional training. More important is the reform of the education system to raise the quality to international standard. If the ratio of qualified college graduates increases to 20 percent, the total number of qualified talents will double. Greater emphasis should be placed on ability, not just theory. The Irish experience in providing the age group 25-34 with tertiary degree level qualification (e.g. diplomas from technical colleges) might be a useful experience. The education system should encourage cooperation between universities and enterprises to allow students to acquire practical experience and better serve the need of enterprises. Firstly, the government can produce more currently needed high quality engineering graduate by investing more in higher-education and by continuing to improve English language instruction. On the other hand, students should be encouraged to learn a diverse set of skills, such as, to master foreign language and gain practical working experience. The government could, for example, sponsor awareness programs highlighting career prospects in the IT and BPO industries and create excitement among graduate job seekers about the industries.

In IT development, common language between client and service provider team is essential when a high degree of interaction is mandated due to loosely defined requirement. Therefore, efficient communication and cultural familiarity are critical to the success of a project. This means that language ability and communication skills are as important as professional working knowledge. The best way of improving language skill is through instructions delivered in foreign languages. It might be useful to provide extramural language training facilities in science and industrial parks and employers grant incentives for staff reaching different level of language skill.

Secondly, the government should nurture and encourage developing public/private partnerships at various levels that link academic education and practical training together. Policy makers and university leaders can work with companies to bring training courses more related to practical usage and more in line with the needs of industry. As such, other than extensive employee training provided by individual companies, the government, universities and companies can pilot industry-owned and government-facilitated integrated skill development programs together. Some multinational enterprises have already entered into cooperation with Chinese universities to train qualified experts. Some Indian companies have involved in training outsourcing experts in China. Indian companies have global strategies to

expand their business in the burgeoning market in China and take China as a bridge head to advance to the Japanese and Korean markets. Such cooperation should be encouraged to create win-win situation. Large multinationals such as IBM, Microsoft, HP, Intel and many others also have keen desire in training qualified experts to meet their demand. Such professional training is most efficient in enhancing the ability of the trainees. Educational institutions and the private sector should explore the possibility of sending interns to enterprises which will facilitate the selection of employees and preparation for job seeking.

Thirdly, the government could adopt appropriate policy to attract students studying abroad to return home to contribute their expertise. A relatively high proportion of them have the skills needed, with both high-caliber business skills and international exposure. Most companies indicated that Chinese returnees with extensive experience in studying and living in other countries are particularly helpful to business dealings with western companies. These companies count on them to share their management skills and experience with their Chinese colleagues. India's engineers who have studied and worked overseas have played an important role in the growth of the Indian IT and outsourcing services while helping to alleviate the country's management shortage. At the early stage of development, Indian engineers went to the United States and Europe to supply services on site named as "body shopping". Later they played key role in Indian IT companies in outsourcing business. Chinese returnees seem to be less successful and frequently face criticism of being ignorant about Chinese specific conditions. The difficulties confronting Chinese returnees may be attributable to problems of both sides. Not every returnee learned the right kind of expertise. Enterprises must have good human resource managers and set clear rules to select truly qualified persons not simply by looking at their diplomas. Top managers must have their own skill to select the right expertise and make good use of the expertise of returnees. Chinese managers must learn modern management concepts to cope with new situation arising from the knowledge and IT based world economy. Knowledge of foreign business practice and of Chinese advantages and disadvantages are equally important. The role of returnees is to contribute their knowledge of foreign business practices and Chinese managers are responsible to solving domestic issues. It is even more important to create a favourable business environment for returnees to open private business in services with venture capitals.

Talents are the key factors for accelerated regulatory reform in the service sector such as IT-enabled services, banking and financial services, transport services. The Government may wish to review its human resources development policy with a view to mobilizing and training a large contingent of highly qualified personnel for the service sector.

5.2.3 Further open to FDI in IT and telecommunication services

Empirical evidence in the manufacturing sector shows that foreign direct investment played important role in upgrading product quality and pushing products made in China to international market through foreign investors' own marketing and distribution channels. The paradox of China lagging behind India in receiving outsourcing of services in spite of better ICT infrastructure is attributable to the lack of supply of service or in other words lack of contents to be provided through the ICT infrastructure. Foreign enterprises are eager to enter the Chinese market of value added telecom services. But they are frustrated by complex licensing procedures, high threshold of entry and inadequate IPR protection. This is in sharp contrast to the rather generous access conditions offered by India (see Chapter 3). If China is to catch up with India in outsourcing it will need to substantially low entry barriers for foreign investment to bring in new expertise to meet outsourcing requirements. More foreign investment in IT and the telecommunication services will quickly lift Chinese service quality standard to international standard. In order to accelerate the development of the service sector particularly the ability to receive business process outsourcing, China might consider open wider to foreign investment in the service sector. The Chinese Government might consider autonomous liberalization going beyond what are contained in the schedule of commitments for services.

5.2.4 Target Multinational Corporations already established in China as Clients

Most of the world top 500 multinationals have set foot in China. Annex 1 provides a list of major multinationals engaging in outsourcing business. It is more convenient for Chinese enterprises to begin by targeting these companies as their outsourcing partners. This would to some extent alleviate the concern of outsourcing countries e.g. the United States and the European Union about job implication although various sources of research already concluded that outsourcing has minimal impact on jobs in the outsourcing countries. Some of these multinationals such as HP, IBM, Microsoft are already deeply involved in captive offshoring. Chinese enterprises should take initiatives in fostering business relationship to engage in non-captive offshoring of services. With full implementation of China's commitments in banking and insurance business, rapid growth of banking and insurance services is expected this year and next. Outsourcing opportunities are enormous. The administrative authority may consider building a platform for foreign investment enterprises and domestic enterprises to explore areas for cooperation.

5.2.5 Further strengthen IPR protection relating to business services

China has taken prompt action to revise all IPR-related laws and regulation in order to implement its commitments on protection of intellectual property rights particularly those contained in the TRIPs Agreement. The major administrative measures currently being undertaken by the State Council to strengthen the enforcement IPR laws and regulation will certainly have positive impact on protection of IPRs relating

to business services. However, in order to encourage multinationals to outsource non-core business process to Chinese service providers, it is important to further clarify a number of issues relating to protection of IPRs in the application of Internet and the use of information and communication technology in the Telecommunication Law currently in the legislative process. A good communication law providing effective protection of intellectual property rights will create a secure and certain legal environment for cooperation between foreign enterprises and Chinese enterprises in service trade. At issue is protection of software from piracy, protection of data base, confidential information, and copy right, etc.

5.2.6 Foster Government-Industry Collaboration in Strategic Planning

Competent Government institutions should foster Government-industry collaboration in strategic planning for development of IT and related services. Industrial associations representing the interests of public, private enterprises and foreign investment enterprises should play a pivotal role in communicating with competent government institutions and advising enterprises on all policy issues, providing free detailed and reliable information for foreign investors, including various analysis report, suppliers' archives, historical data etc. advising domestic enterprises in cost reduction and access to international market. The industrial association should develop its capacity to monitor and promote development of IT and related services, forge cooperation between enterprises.

5.2.7 Continuing to improve software industrial parks to attract FDI

In order to reduce regulation risks as much as possible, many MNCs prefer captive offshore model to conduct their overseas business. The formation of a foreign subsidiary will allow MNCs greater flexibility in scaling up future operation and closer integration of overseas operations with the rest of the enterprise. The added benefits of establishing an in-house base is the elimination of security and consumer privacy risks that are typically associated with hiring a third-party vendor. Through captive offshore model, companies can avoid the security issues such as data improperly released, leading to identity theft, diversion of funds, and breaches of the confidentiality.

5.2.8 Building an Effective Network Security System

An effective network security system that will guarantee the safety of data base, confidential business information, bank account information, confidential personal data, intellectual properties etc is essential for the development of service outsourcing. In anticipation of rapid increase of financial services following full implementation of China's commitments on financial services, data security will assume great importance in financial services and the development of electronic commerce. The telecommunication regulatory authority and the banking and financial regulatory authority should join hands in developing an efficient and effective data security mechanism to build confidence in the business community.

Annex 1 List of MNCs engaging in outsourcing

	Services		
Hewitt Associates (US)	HR, Payroll, Procurement	India, China, Philippines, Thailand, Malaysia, Czech Republic, Poland, Hungary, Brazil, Mexico, Argentina, Chile	Over \$5 billion
Hewlett-Packard (US)	F&A, Payroll, Procurement	India	Over \$5 billion
IBM (US)	Software Development, Network Support, F&A, HR, Payroll, Procurement, Insurance Operations	India, Brazil, China, Mexico, Belarus, Philippines, South Africa, Romania, and Argentina	Over \$5 billion
ICICI OneSource (India)	Call centers	India	Below \$100 million
ICT Group (US)	Call centers	Philippines	\$100 million-\$500 million
Infosys Technologies (India)	Software Development, Network Support, Banking, Mortgage Processing	India, Czech Republic, China, Australia	\$1 -\$5 billion
Mphasis Corp. (India)	Financial Services	India, China, Australia	Under \$100 million
OfficeTiger (US)	F&A, Financial Services, Transaction Processing	India, Sri Lanka	Under \$100 million
Patni Computer Systems (India)	Software Development, Network Support, R&D/Engineering	India	\$500-\$999 million
Sapient (US)	Software Development	India	\$100-\$500 million
Satyam (India)	Software Development, Network Support, R&D/Engineering	India, China, Hungary, Brazil, Australia	\$500-\$999 million
SITEL (US)	Call Centers	India, Philippines, Brazil, Spain, Mexico, Panama	\$500-\$999 million
Softtek (Mexico)	Software Development	Mexico, Spain, and Brazil.	\$100-\$500 million
SR.Teleperformance (France)	Call Centers	Philippines, Indonesia, Mexico, Brazil, Argentina, Spain	Over \$1 billion
Stream (US)	Call Centers	India, Tunisia, Dominican Republic, Poland	\$100-\$500 million
Sykes Enterprises (US)	Call Centers	India, Philippines, China	\$100-\$500 million
Syntel (US)	Software Development	India	\$100

			-\$500 million
Tata Consultancy Services (India)	Software Development, R&D/Engineering, F&A, Telecom, Transportation, Hospitality Operations	India, Hungary, Brazil, Uruguay, Chile, China	\$1 -\$5 billion
TeleTech (US)	Call Centers	India, Philippines, Malaysia, China, Northern Ireland; Spain, Mexico, Argentina, Brazil	Over \$1 billion
vCustomer Corp. (US)	Call Centers	India	Below \$100 million
West Corp. (US)	Call Centers	India, Philippines, Mexico, Canada, Jamaica	\$500 -\$999 million
Wipro (India)	Software Development, R&D/Engineering, Demand Management, Mortgage Processing, Transportation Operations, Healthcare Operations, Banking, Mortgage Processing	India, Canada	\$1 -\$5 billion
WNS Global Services (India)	Transportation Operations, Healthcare Operations, Banking, Mortgage Processing	India, Sri Lanka	Below \$100 million
24/7 Customer (India)	Customer Service	India, Philippines	Below \$100 million

Source: Business Week 2006

Annex 2 China's 15 Software Industrial Parks

- 1 Shenyang NEU Software Park in Liaoning
- 2 Changsha Chuangzhi Software Park in Hunan
- 3 Jinan Qilu Software Park in Shandong
- 4 Chengdu Tuopu Software Park in Sichuan
- 5 The North Software Park in Beijing
- 6 Pudong Software Park in Shanghai
- 7 The South Software Park in Zhuhai of Guangdong
- 8 Beijing Software Park
- 9 Saibowei Software Park in Shenzhen of Guangdong
- 10 Nanhai Software Science Park in Guangdong
- 11 Hainan Software Industrial Park in Hainan
- 12 Software Park in Hanzhou Development Zone of Zhejiang
- 13 Jiangnan Software Park in Zhejiang
- 14 Xietong Software Park in Xi'an of Shanxi
- 15 Harbin Software Park in Heilongjiang

Annex 3 China's WTO Telecom commitment

Maximum % of foreign ownership allowed Geographical limitations

Value-added and paging services

Upon accession	30%	Beijing, Shanghai and Guangzhou
1 year after accession	49%	Beijing, Shanghai and Guangzhou and 14 other cities: Chengdu, Chongqing, Dalian, Fuzhou, Hangzhou, Nanjing, Ningbo, Qingdao, Shenyang, Shenzhen, Xiamen, Xiantaiyuan and Wuhan
2 year after accession	50%	Nationwide

Mobile services

1 year after accession	25%	Beijing, Shanghai and Guangzhou
3 year after accession	35%	Beijing, Shanghai and Guangzhou and 14 other cities
5 year after accession	49%	Nationwide

Fixed line services

3 year after accession	25%	Beijing, Shanghai and Guangzhou
5 year after accession	35%	Beijing, Shanghai and Guangzhou and 14 other cities
6 year after accession	49%	Nationwide

Internet content providers (ICPs)

Upon accession	30%	Beijing, Shanghai and Guangzhou
3 year after accession	49%	Beijing, Shanghai and Guangzhou and 14 other cities
5 year after accession	50%	Nationwide

Internet service providers (ISPs)

3 year after accession	25%	Beijing, Shanghai and Guangzhou
5 year after accession	35%	Beijing, Shanghai and Guangzhou and 14 other cities
6 year after accession	49%	Nationwide

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China National Network Information Center (CNNIC),

<http://www.cnnic.net.cn/en/index/index.htm>

China Software Industry Association (CSIA),

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Ministry of Commerce (MOFCOM), <http://www.mofcom.gov.cn/>

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