Abhishek Pandey, Alok Aggarwal, Richard Devane, Yevgeny Kuznetsov

India's Transformation to Knowledge-based Economy – Evolving Role of the Indian Diaspora

July 21, 2004

Contents

1 Introduction

The key objectives of this paper are:

- To analyze the increasingly important role of the successful Indian Diaspora (in the developed countries such as the US and the UK) in facilitating growth and improving process management within the knowledge intensive industries -- (particularly the IT industry and other high-end sectors – in India, and
- To identify and analyze the future opportunities for the Indian knowledge-intensive sectors (such as Information Technology (IT), Business Process Offshoring and Offshoring of complex high-value-add services to India including the R&D work) in the global economy.

This paper begins with an examination of the Indian Diaspora, particularly in knowledge economy (such as that in the US or the UK), its current state and the role that this community has played in the emergence of the Indian knowledge intensive services sector. To demonstrate this, Section 3 and 4 provide the evolution of the IT industry in India during the last 25 years and the vital role of the Indian Diaspora in facilitating this evolution.

Section 5 of this paper provides an overview of the evolving trends in the global economy (particularly in offshore outsourcing space) and the drivers fuelling this trend. In addition, we discuss the inevitable migration from low-skill and low complexity work to knowledge-intensive high-end work (which we call Knowledge Process Outsourcing, or KPO). Since India has both labor-cost and talent pool advantages in this context, Section 5 also examines India's knowledge intensive services sectors. In this context, we forecast the expected role of Diaspora in facilitating this growth and further developing the Indian offshore outsourcing sector. Finally, we have analyzed some additional opportunities for India, such as healthcare related export services and 'Medical Tourism', where Indian Diaspora will play a very significant role. Section 6 provides conclusions.

1 Success of Indian Diaspora in Knowledge-based Economies

The Indian Diaspora constitutes an important and a unique force in the world economy. Indians have been migrating for centuries. However the most massive emigration among Indians took place in the nineteenth and the twentieth centuries. There are more than 20 million people of Indian origin settled in 70 countries across the globe, constituting over 40 percent of the population in Fiji, Mauritius, Trinidad, Guyana and Surinam. Further, they constitute prominent minority communities in Malaysia, South Africa, Australia, Sri Lanka, Uganda, the United Kingdom (UK), the United States of America (US) and Canada. Table 1 provides a brief history of the Indian migration during the last two centuries.

Table 1: Brief History of Massive Indian Emigration in Last Two Centuries {Ref. 1}

	PERIOD	REASONS FOR EMIGRATION / PROFILE OF EMIGRANTS
EMIGRATION TO THE BRITISH, FRENCH AND DUTCH COLONIES	1834-1920	• Migration of unskilled (mostly as indentured) Indian laborers to Mauritius, Uganda, Nigeria, Guyana, New Zealand, Hong Kong, Trinidad and Tobago, Malay, Japan, Surinam, Jamaica, Fiji, Burma, Canada, Thailand, Ceylon, etc.: New plantations, industrial and commercial ventures in European colonies required large supply of labor There was a severe shortage of laborers to work in the sugar, tea, coffee, cocoa, rice and rubber plantations due to an abolition of slavery in the British (1834), French (1846) and Dutch (1873) colonies India and China provided alternative sources of labor Most of these migrant unskilled laborers settled overseas, although the indentured system[1] was abolished in 1917
	Late 19th - first half of 20th centuries	• This was followed by free emigration of traders, skilled artisans, bankers, petty contractors, clerks, professionals and entrepreneurs to East Africa, Natal, Mauritius, Burma, Malay and Fiji. Their primary purpose was to tap the new opportunities, the booming trade and industry offered in these countries.
EMIGRATION TO THE INDUSTRIALLY DEVELOPED COUNTRIES	Post-World War II	• After India's independence in 1947, large number of educated Indians started migrating to developed countries like the UK, US, Canada, Australia and New Zealand in search of better opportunities. Although some Indians migrated to the UK during the British Raj, however, major influx of Indians in the UK took place after 1947. Additionally, some People of Indian Origin (PIO) from Africa and the Caribbean migrated to the UK and Netherlands. In contrast to the ex-indentured populations, these migrants have maintained close ties to India, particularly due to their affluence, through flow of remittances and investments.

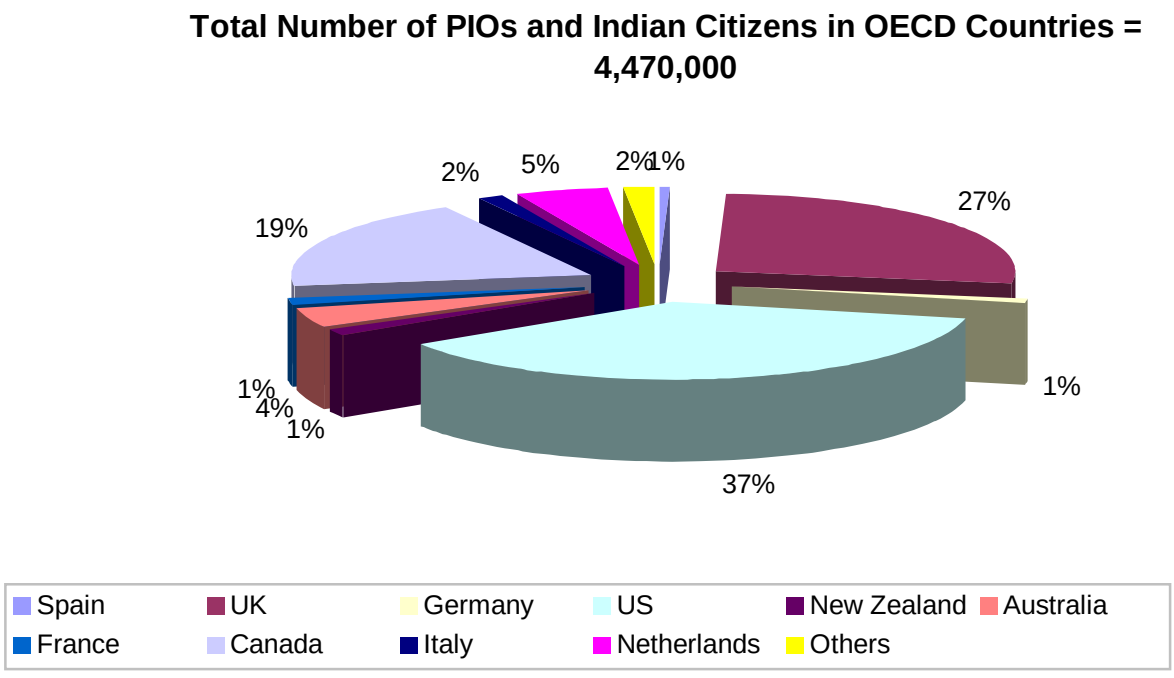
[1] Indentured system refers to ..

		• Large-scale migration of Indians to the US happened after the repeal of the Immigration and Nationality Act in 1965. By 2001, there were approximately 1,500,000 Indians in the US. They primarily belong to the educated and professional elite class such as engineers (primarily IT), scientists, teachers, accountants, medical doctors, managers, hoteliers and businessmen.
RECENT EMIGRATION TO WEST ASIA	Mid 1970s - 2004	• Most skilled and unskilled migrants to West Asian countries have been working on a contract basis, and have been hired for building up, managing and operating the infrastructure needed by the oil-export industry in these countries. Their major impact has been flow of large remittances to India.

Source: Center for the Study of Indian Diaspora, Evalueserve Analysis

The following figures (Figures 1, 2 and 3) provide a country-wise distribution of the 20 million strong Indian Diaspora (including both 'Persons of Indian Origin' or the PIOs and the Indian citizens living abroad) in the most prominent[2] OECD countries; Middle-Eastern and African countries; as well as other important countries.

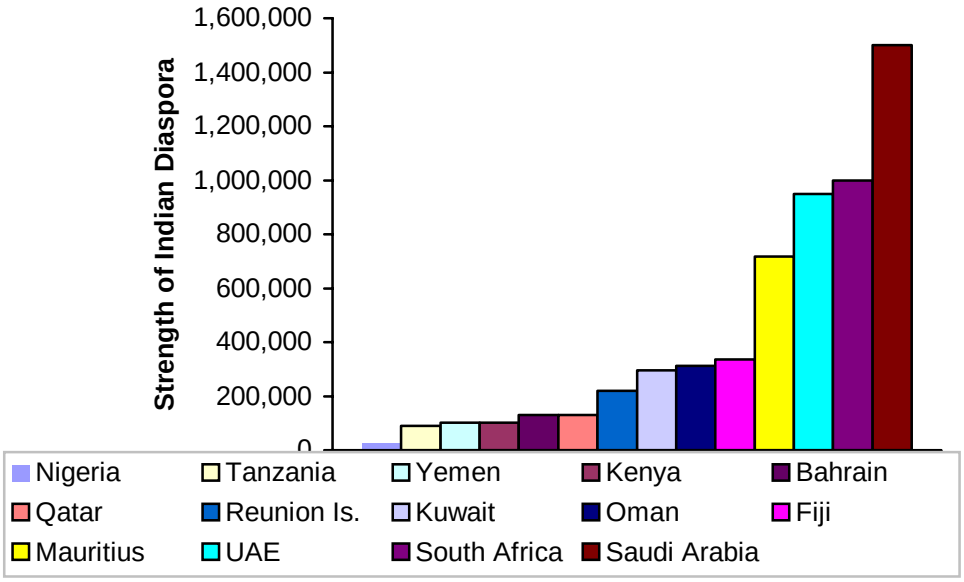
Figure 1: Country-wise Distribution of Indian Diaspora in Various 'OECD Countries' (as on December 2001)



Source: http://www.indiandiaspora.nic.in, Evalueserve Analysis

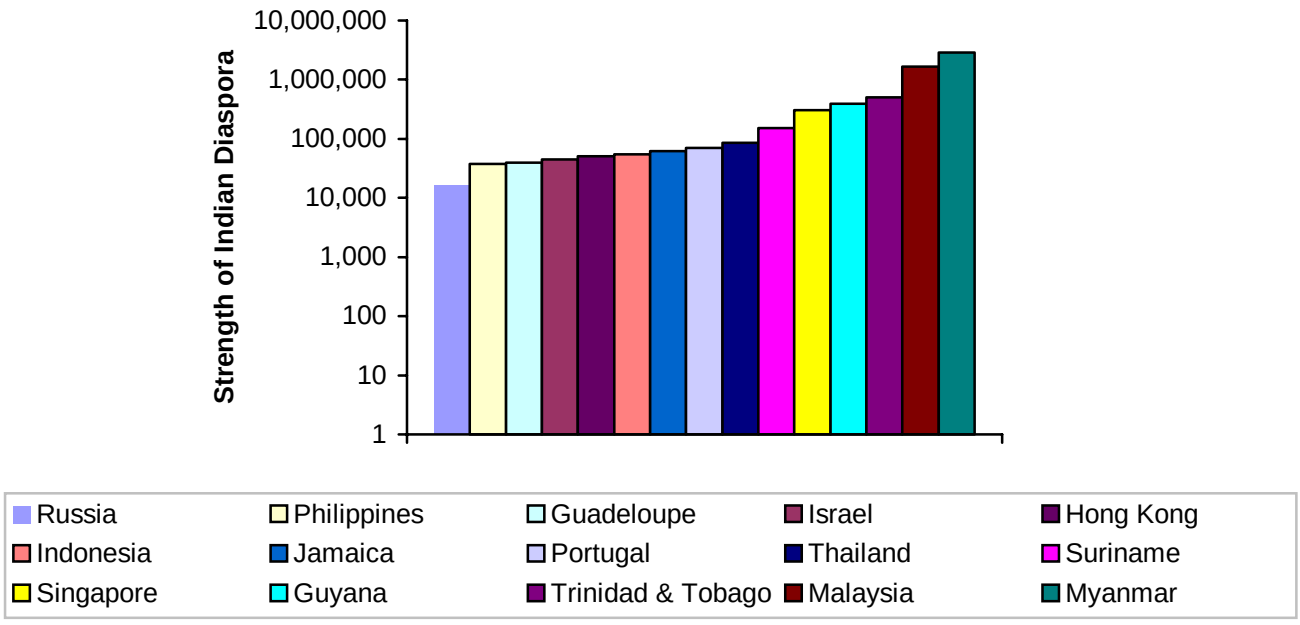
[2] Prominence, as referred here, is with respect to the strength of Indian Diaspora community (i.e. number of PIOs and Indian Citizens) in these countries

Figure 2: Indian Diaspora in Prominent Middle-Eastern and African (MEA) Countries (as on December 2001)



Source: http://www.indiandiaspora.nic.in, Evalueserve Analysis

Figure 3: Prominent Presence of Indian Diaspora in Other Countries (as on December 2001)



Source: http://www.indiandiaspora.nic.in, Evalueserve Analysis

Interestingly, the combined 'annual personal earnings' of more than 20 million PIOs is approximately USD 364 billion annually[3] as compared to the Gross Domestic product (GDP) of entire India, which is USD 550 billion (with over a billion people). The following subsection attempts to analyze the worldwide success of Indian Diaspora, particularly in terms of its economic impact.

1.1 Worldwide Success and Impact of Indian Diaspora

Among all the above-mentioned emigrants, some have been particularly successful and have had a significant impact on both the economy of the countries of their migration and that of India. Some notable groups are given below:

Many Gujarati traders migrated to East Africa in the early part of the twentieth century. They, along with earlier Gujarati migrants, have dominated some of the key old economy sectors such as trade in diamonds, etc. In the post-World War II period, Indians, and other South Asians, provided the labor that helped in the reconstruction of war-torn Europe, particularly the United Kingdom and the Netherlands. The Indian Diaspora of more than 1.2 million has become particularly prominent in the UK with significant presence in various businesses and high skill professions such as Information Technology (IT) and medicine.

The medical professionals from India are in great demand in the National Health Services (NHS) in the UK. According to the NHS, of the total 100,000 doctors in the NHS, nearly 6 percent are of Indian origin.

Out of the 18,250 emigrant IT professionals who entered the UK in 2000, 11,474 were from India {Ref. 2}.

In 2000, there were more than 300 influential Non-Resident Indian (NRI) businessmen and 150 rich and prominent Indians in the UK. These include:

Lakshmi Mittal - involved in the iron and steel industry.

Lord Swaraj Paul – involved in the manufacturing and supply of steel and engineering products.

Jasminder Singh - involved in the hotel industry.

Manubhai Madhvani - involved in the sugar industry.

Gulu Lalvani - involved in electronics industry.

The Indian community has also been active on the political front in the UK. In 2000, it had four elected Members of the Parliament and 11 Members in the House of Lords. At the lower level of political participation, there are 250-300 councilors of the Indian origin across the UK {Ref. 3}.

In recent years, unskilled laborers - along with some skilled ones - from India have been the main force in transforming the physical landscape of Saudi Arabia and some other middle-eastern countries. These contract workers have repatriated most of their earnings to India, thereby contributing significantly to the Indian economy.

In developed countries - particularly in the United States and Canada – Indians have been very successful in most knowledge intensive professions including engineering, Information Technology, medicine, finance, business administration and accounting.

In this section, we will focus on the success of highly skilled Indian Diaspora in the 'Knowledge Economies', particularly the US. Further, we will identify and analyze the drivers behind the Indian Diaspora's success in these sectors.

1.2 Success of Indian Diaspora in the Knowledge-intensive Sectors in the US

Asian Indians in the US may be the most successful immigrant community in the US history. A recent survey by Merrill Lynch found that despite the economic slump, Indians in the United States not only retained their wealth, but also added to it. Of the 1.7 million-strong Indian Diaspora in the US, 200,000 families are millionaires and the median annual income of Persons of Indian Origin in the US (PIO-US) is USD 60,093, which is substantially higher than the US median income of USD 38,885 {Ref. 4}. Further, 67 percent of foreign-born Indian Americans have college degrees, three times greater than the US average, and out of these approximately 44 percent hold managerial or professional positions.

[3] We arrived at this figure in the following way.

A majority of the Persons of Indian Origin (PIOs) in the US seems to be engaged in medicine, engineering, management and managing businesses. During 1960s and 1970s, a majority of Indians who migrated to US were engineers, doctors and lawyers. After moving to the US, many went to US schools many earned a PhD or Masters or an MBA, and then started working on critical projects in the US government owned labs or in private research laboratories such as IBM, Boeing, Bell Labs, and DuPont.

1. Information Technology: There are over 300,000 PIOs working in the Information Technology sector in the US. Although this number represents only three percent of the total IT workforce in the US, a substantial number of these are executives in mid and large-sized companies and at least 15 percent IT start-ups have been created by them. Some of the most prominent Indians in the Information Technology sector include Gujuraj Deshpande (CEO, Sycamore) and Arun Netravali (ex-president, Bell Labs). In addition, several PIOs are reputed professors in prominent Engineering and Technology Institutes such as the Massachusetts Institute of Technology, Stanford and Carnegie Mellon University.
2. International Finance and Management: Several Indians have climbed up the corporate ladder in US businesses. In addition, some of them also hold executive positions in high-profile management consulting and investment banking sectors. Some prominent Indians who are current of former executives of well known organizations include:

   Rajat Gupta, Managing Director, McKinsey and Co.;
   Victor Menezes, Senior President, Citigroup;
   Rono Dutta, CEO, United Airlines;
   Vijay Gordia, CEO, Vinmar International Ltd.;
   Shailesh Mehta, CEO, Providian;
   James Wadia, Managing Director, Arthur Anderson & Co.;
   Rakesh Gangwal, CEO, U.S. Airways;
   Vikram Pundit, COO, Morgan Stanley;
   Ramani Nayar, CEO, Hartford Insurance & Financial Group.
3. Health Care Industry: There are more than 38,000, physicians of Indian origin, accounting for approximately five percent of all the doctors practicing medicine in the US. Additionally approximately 12,000 Indians and Indian-Americans are medical students and residents, constituting approximately 10 percent of all the medical students in the US. Cumulatively, Indians constitute the largest non-Caucasian segment of the American medical community.

Finally, the Indian Diaspora, especially in the US, has done extremely well in owning and running small businesses. Given below are two examples:

- PIOs in the US own approximately 77,000 out of the 135,000 convenience stores and these stores provide employment to more than 300,000 people. The total sales by convenience stores (in the US) in 2003 was US$ 337 billion with pretax profit of US$ 4.04 billion and we estimate that the convenience stores owned by PIOs had total sales of approximately US $ 195 billion with a pretax profit of approximately US $ 2.2 billion. This community recently started an American Asian Convenience Stores' Association (AACSA). Please see www.aacsa.org and www.nacsonline.com for details.
- The Indian Diaspora in the US owns approximately 17,000 hotels out of a total of 47,040 hotels and these hotels provide employment to more than 700,000 people in the US. The American Asian Hotel Owners Association (AAHOA) represents this community and it estimates the cumulative market value of these hotels to be approximately US$ 36 billion. Please see www.ahla.com and www.aahoa.com for more details.

1.2.1 The Tech-Success Story – Indians in the Silicon Valley {Ref. 5}

The PIO-community's success and the impact that it has had, seems to be the most notable in the information technology industry.

The Asian Indian population of approximately 200,000 in the San Francisco Bay Area represents one of America's most successful immigrant groups. Collectively, their companies account for USD 235 billion in market value. Further, the process is accelerating as those who 'struck rich' are now investing in new ventures. For instance, two of the first investors of Google - the leading Internet search company – are of Indian origin.

A Dun & Bradstreet study found that in 1998, Indians had already started 778 Silicon Valley start-ups and generating a total of 16,598 jobs. *Business Week* reported in 1998 that nearly 40 percent Silicon Valley start-ups in the 1990s had at least one founder of Indian origin. Evalueserve's estimates show that currently, there are between 650 and 700 companies in Silicon Valley that are either partly (or totally owned) by PIOs or have at least one PIO in its executive management team.

Currently, there are more than 20,000 Indian millionaires in the US and many of them are engineers and living in the San Francisco Bay area. Some of these successful 'technocrat millionaires' are not only investing money, but also their time and expertise to mentor other PIOs. In fact, in 1992, they started an organization called The Indus Entrepreneurs (or TiE) that acts as a conduit for experienced Indians mentoring others and that also provides a broad forum for networking. Doug Leone, a venture capitalist and a partner at Sequoia Capital, said, "At Sequoia, we love Indian entrepreneurs because they are extremely smart, they know the value of a dollar, and they hate dilution. That is an attitude that we like to be on the side of."

Major factors that have contributed to the success of Silicon Valley Indians include their:

- Technical expertise,
- Familiarity with the West and the ability to work within the US system,
- Proficiency in English language,
- Combination of technical abilities with good management skills, which some of them have also used to move up the corporate ladder in the US, and
- Connections with companies and entrepreneurs in India, which they can exploit for offshoring work and reducing their operational costs (without sacrificing quality).

1.2.1.1 Contribution of the IITs to Indian Diaspora's Success in the US Industry

In 1947, India became independent and many Indians realized that the country did not have sufficient number of engineers, medical doctors or scientists. Hence, in 1953, the Indian Prime Minister, Jawahar Lal Nehru, established the Indian Institutes of Technology (IITs) in order to build an engineering and technological talent within India. Today, there are seven such schools and they are strongly competitive and so desirable that they have stimulated a USD 400 million admissions' test preparation industry within India!

The students entering IITs do not necessarily have privileged or even commercial backgrounds and in fact 80 percent come from the Indian middle class, whose parents are educated but work in low paid and often in the Indian Civil Services' sector. The undergraduate education provided by the IITs is by most accounts superb. However, the US universities still continue to provide the best post-graduate education. So, beginning in the 1960s, many IIT graduates started moving to the US to pursue graduate education and subsequently they joined US information technology companies. Many IIT alumni today occupy the upper echelons of the US industry. Some of these include former senior president of Citigroup, ex-CEO of US Airways, formal head of McKinsey & Co., cofounder of Sun Microsystems as well as hundreds of others now working in the top ranks of US corporations and Silicon Valley firms.

In January 2003, the Indian Institutes of Technology celebrated their 50th anniversary in Silicon Valley and we interviewed several prominent Indian born IT executives, entrepreneurs and investors in the United States. Our focus was on their role in fostering and shaping the Indian IT industry, especially through the 1980s and 1990s, and in later sections, we would discuss some of their views and responses.

1.2.1.2 Indian Presence in US Technology Sector – Likely to Grow Even Further

According to a report released by US' National Science Board (NSB) released in May 2004, the Indian presence is likely to grow even further in the US technology sector.

'US Census 2000' data indicates that in science and engineering (S&E) occupations, foreign-born professionals constitute approximately 17 percent of bachelor's degree holders, 29 percent of master's degree holders, and 38 percent of doctorate holders. Indians account for approximately 14 percent of the science and engineering degrees given by American universities, closely followed by the Chinese who account for 10 percent of such degrees awarded.

Increasing percentage of Indian scientists and engineers are now planning to stay back in the US. For example, the percentage of Indian S&E doctorate recipients who are planning to stay back in the US has increased from 85.6 percent in 1990-93 to 94 percent in 1998-2001. Similarly, the percentage of Indians who have decided to stay back in the US, owing to post-doctoral research appointments or jobs with enterprises, has increased from 62.6 percent in 1990-93 to 73.2 percent in 1998-2001. Further, out of the total 13,000 Indian S&E doctorate recipients at US universities between the period 1985 and 2000, approximately 57.8 percent accepted job offers from various firms to stay back in the US. Out of these, 23.9 percent were engaged in post-doctoral work and 33.8 per cent were employed in industry. In 2001, 77 percent Indian S&E doctoral degree recipients accepted offers for employment or post-doctoral research in the US.

Currently, more than half of the total technology workforce (with S&E degrees) in the US is older than 40 years of age. This implies a significant gap exists between the demand and the supply of talent in technology sector. This gap is likely to be filled by the increasing number of Indian technocrats staying back in the US, after completing their education from the US universities. Between 1985-2000, Indian students constituted the largest group among all foreign-born communities in terms of the number of US doctoral degrees awarded in computer and information sciences. Thus, this translates into an increasing number of Indian technocrats entering the US workforce, particularly in the science and technology sector, in the years to come.

1.2.2 Prominent Presence of Indian Medical Doctors in the US {Ref. 7}

As mentioned earlier, Indians constitute the largest non-Caucasian segment of the American medical community. Indian doctors are primarily involved in primary patient care in urban and rural areas. Cumulatively, Indians constitute approximately 20 percent of the 'International Medical Graduates' - or foreign-trained doctors, who are operating in the U.S. Considering the fact that Asian Indians constitute less than 0.6 percent of the US population, they definitely represent a disproportionately high presence in the country's medical profession.

Many Indian doctors migrated to the US after India's independence in 1947, to pursue their higher medical education. This trend gained significant momentum in the 1970s, when many international medical graduates (IMG) were actively recruited to meet a deficit in native US medical doctors.

In 1984, some Indian medical professionals founded the American Association of Physicians of Indian Origin (AAPI). The key driver behind the formation of AAPI was to meet the challenges that physicians of Indian origin usually face because of cultural barriers and bias against international medical graduates, which often cause problems in speedy immigration and in obtaining licenses for practicing medicine. AAPI grew rapidly and currently serves as an umbrella organization for approximately 100 professional associations. It is also the largest ethnic medical organization in the US and is quite active in spearheading legislative agendas on health care and influencing the advancement of ethnic medical organizations in the US.

With increasing medical needs of growing and aging population in the US, a potential shortfall of medical professionals is anticipated by the American Medical Association (AMA). Hence, an increasing number of international – particularly Indian – medical doctors and nurses are likely to mitigate this deficit, thereby, increasing the Indian Medical Diaspora even further.

2 The Role of Diaspora in the Emergence of the Indian IT Industry

As discussed in the last section, the Indian Diaspora has been very successful in Knowledge-intensive sectors in the US, and more so in the IT sector. Almost simultaneously, a very competitive and successful IT industry emerged in India. This section analyses various factors that helped in the emergence of the successful IT industry in India (during the last 35 years) and the role that the Diaspora community played in this evolution.

2.1 Evolution of the Indian IT Industry – The 1970s and 1980s

Emergence of a strong Indian IT industry happened partly by design and partly by accident. In the 1970s, there was no separate software industry. Multinationals such as IBM (from the US) and ICL (from the UK) were the largest providers of hardware to the industry, which used to be bundled with the operating systems and a few basic packages that were generally written in FORTRAN and COBOL languages.

Larger enterprises (including the Indian defense and public organizations) that needed customized applications employed in-house teams that did everything from installing systems to writing software. In fact, when specific software applications became popular, stand-alone boxes were made for them. In 1970s, the concept of stand-alone word processing software did not exist. Later, when local companies grew (after IBM's exit in early 1980s), these companies also had their own proprietary operating systems that generally executed only their computer programs.

2.1.1 The 1970s – Initial Driver Behind Exporting Software – Need for Foreign Exchange

Although India was among the first developing nations to recognize the importance of software, the key driver behind exporting software was foreign exchange.

To export software, Indian companies had to design it for hardware systems that were the standard worldwide, which in the 1970s were the IBM mainframe computers. However, Indian import duties on this hardware were extremely high (almost 300 percent {Ref. 16}) and hence during the late 1960s and early 1970s, IBM used to sell old, refurbished and antiquated machines (because that is all that Indian companies could afford). Fortunately, within a few years, the Indian Government lowered import duties on all IT equipment but with a pre-condition that the exporters would recover twice the value of the foreign exchange spent on importing computers within five years – a clause that was modified in the 1980s. Hence, overall, the regulatory scenario was not very favorable for software exporters and this constitutes the nebulous beginning of the Indian software industry.

The first software exporting company from India was Tata Consulting Services (TCS) that started operations in 1968. Fortunately, after a few local orders, TCS bagged its first big export assignment in 1973-74, when it was asked to provide an inventory control software solution for an electricity generation unit in Iran. During this period, TCS had also developed a hospital information system in UK along with Burroughs Corporation (which was at that time the second-largest hardware company in the world) and it became a role model for other Indian IT companies to follow in the 1980s.

2.1.2 The 1980s – The Cost Arbitrage Model

Despite the tough policy with respect to imports, by early 1980s, India was the only developing nation to have any significant software exports – USD 12 million – a substantial leap over the 1979 level of USD 4.4 million and 30 companies were already beginning to export software.

The main competitive advantage for Indian companies was obviously the cost and the ability to communicate using the English language. The total charges for a software developer in India varied

from USD 16,000 to USD 24,000 annually whereas the corresponding charges of sending the same developer to the US varied between USD 32,000 and USD 42,000 annually. Comparing this to the total cost of a US software developer (USD 60,000 to USD 95,000 yearly) in 1980, the savings were clearly quite significant.

Inspite of the cost advantages and a relatively good proficiency in English, the Indian software industry continued to face the following challenges in 1970s and 1980s:

- Lack of availability of hardware: Import of hardware – especially mainframe computers -- was very tedious and expensive.
- Shortfall in trained manpower: Although the education system was producing substantial number of engineers who were very talented, very few colleges were offering any computer training or IT courses.

If we now look back at the 1970-1980 era, it is clear that the following three unrelated incidents contributed heavily in shaping the Indian IT industry:

- In late 1970s the Indian Government passed a controversial law (which was later repealed in 1992) that forced all multinationals to reduce their equity share in their Indian subsidiaries to less than 50 percent. Since IBM did not want to reduce its equity in its subsidiary, it decided to leave India, thereby, making Indian companies less reliant on mainframe computers.
- The advent of Personal Computers in 1980s reduced the cost of importing hardware substantially, thereby, spawning an industry that has over 2,700 companies today.
- Realizing that the Indian college system was unable to provide any computer training or IT courses, three Indian entrepreneurs (living in India) took it upon themselves to provide tutorials and training classes in Information Technology. Their early days were often marked with one person driving a scooter or a motorcycle and the other riding behind with a PC in his lap so that they could impart this training in rented college and school spaces in the evenings. The training institute (NIIT) started by them is today a USD 167 million company and it continues to be number one in providing IT courses and training to Indians {Ref. 8}.

With these as the humble beginnings, the Indian IT industry witnessed the Indian Government policies becoming more favorable in late 1980s, representative industry associations getting formed (one of which eventually became NASSCOM – the National Association of Software and Service Companies) and the IT training and education level gradually becoming strong enough for creating a full-fledged industry.

Finally, in the initial years, export of software initially meant a physical transfer – either of the programmer himself (sometimes called 'body-shopping') or of software on floppies. However, in 1985, Texas Instruments (TI) set up an office in Bangalore with a direct satellite link to the US and, in 1989, an Indian Government Telecom Company (VSNL) commissioned a direct 64-kbps satellite link to the US, thereby, offering software exporters a completely new way of functioning.

2.1.3 The Diaspora Support during the Initial Years

The Indian engineers in the US were quickly recognized as excellent technologists but during the 1970s and 1980s they had to fight a strong perception - in some cases a self-perception - that they did not have front office or general management capabilities. As a partial reaction, many engineers took a conscious decision not to emphasize their ethnicity and there was remarkably little ethnic collaboration (of Indians) with in the US. In fact, their emphasis was on their careers within the 'white-people' managed corporations and they were rarely even aware of the progress being made by Indians in other organizations. However, this situation changed substantially in the late 1980s when several Indians became CEOs of new public companies and it became apparent that the community had the complete range of skills for leadership within the IT industry.

Not only did the Indian engineers and IT professionals in the US not collaborate with each other, they also invested very little in the Indian IT industry. In fact, the few attempts and investments that were made by PIOs in the 1970s and early 1980s were quickly abandoned because of bureaucratic

obstacles by the Indian government and the limited capabilities of Indian partners. Hence, the only crucial role played by these PIOs was limited to being tolerant mentors of early Indian software development companies.

In early 1980s, several small Indian companies came to Silicon Valley in search of low-end contract software development work. Several PIO executives were willing to help but most found the Indian companies' work to be unsatisfactory and many suffered from deficient development tools and computers. This is partly because even until 1985-86, the Indian government was promoting Russian computers over American computers and Indian companies had just started working with PCs; hence, the companies' professionals could not meet, or sometimes even understand, US standards for quality and timeliness. To mitigate this problem, the Diaspora executives sometimes created programs within their US companies whereby Indian programmers could work in the US and with US technology (at Indian wages plus travel related costs). Further, they coached and guided the Indian companies to enable them in improving their quality and performance standards.

Hence, during the 1970s and 1980s, the role of Indian Diaspora in the evolution of Indian IT industry was limited to that of a patient mentor and brand ambassador in most of the cases.

2.2 The Formative Years – The 1990s

2.2.1 The 1990s – The Emergence of Offshore Outsourcing

In 1993, the US Immigration and Naturalization Service made changes that made it difficult to get B-1 visas and the new H-1 visa required a certification from the US Department of Labor that prevailing market wages were being paid to immigrant workers. As a result, US companies had less incentive to hire software engineers from India. Also, Indian software professionals who were brought under the umbrella of the Immigration Act, had to pay social security and related taxes to the US government, which added additional burden on the employees and the companies.

The two factors mentioned above led a few IT companies in India to gradually move to a mixed model, wherein some software programmers would work at the Client's premises (in the US) whereas others would continue to work in the IT company's back-office in India. As the Indian IT industry adapted to this new business model, Indian IT exports boomed from USD 128 million in FY 1990 to USD 485 million in FY 1994. It is worth pointing out that the shift to the new business model was gradual because the savings even after sending Indian IT programmers to the US were quite large and many IT companies continued to follow the old model and send their programmers to the US, the UK, and Canada.

And then came the 'Y2K problem', the Internet-Telecom boom and the Dot.com boom. All these forced companies in the US, UK, and Canada to hire lot of computer programmers and this caused such a shortage in the US that the US government had to increase its H-1 quota from 65,000 in 1998 to 130,000 in 1999 and then to 195,000 soon thereafter. Indeed, this was a very good opportunity for the Indian IT industry, which thrived by sending more and more IT professionals to the US, thereby creating a larger and larger Indian IT Diaspora.

In particular, the 'Y2K problem' presented a unique opportunity to Indian firms. Owing to this problem, the US firms needed software professionals with COBOL programming skills. COBOL had already become obsolete in 1990s and was no longer a part of university curriculum in the US. However, in India, COBOL was still taught, even in the 90s, since most of the local computer science curriculum was quite obsolete. This provided significant advantage to Indian IT services vendors, particularly because working on Y2K contracts helped Indian firms in entering new markets and building trust with their client enterprises.

By the end of 1999, the Indian IT industry was on an all-time high and the Initial Public Offerings (IPOs) of Indian software companies (in India) were getting oversubscribed. This, in turn, led to the creation of a venture capital industry in India. According to figures released by the Indian Venture

Capital Association, VC investments grew from USD 24 million in FY 1996 to USD 480 million in FY 1999, with a substantial amount going to Dot-com companies in India (in 1998 and 1999).

2.2.2 The 1990s – The Emergence of the Indian Diaspora in the IT Industry

While the Indian IT industry was making great strides through the 1990s, this decade also witnessed a strong emergence of the Indian IT Diaspora in the US. Many Indian engineers, who had started moving to the US in 1960s, had by now either become entrepreneurs, or Venture Capitalists or high-level executives in large and medium sized companies. And, these professionals had started to coalesce especially because many had graduated from the same top-notch colleges in India (such as the IITs) and most of them also knew their counterparts in India (who were often also alumni of the same colleges). Some of these relationships quickly matured in forming non-profit associations such as TiE and SIPA (Silicon Indian Professional Association).

TiE, originally designed as a Silicon Valley organization to provide mentoring to promising young expatriate IT professionals, soon developed into a worldwide network of Indian professionals which has had a substantial influence on the Indian IT industry and government policies towards it. Currently, TiE has 38 chapters and over 6,800 members, worldwide.

Since many in these people knew their counterparts in India and since most were closely observing the growing Indian IT industry, in the mid and late 1990s, some of them started their own IT companies in India (e.g., Cognizant, Techspan, Mphasis) whereas others invested in nascent IT and Dot.com companies in India. Further, since US, Canada and UK were facing a shortage of IT professionals during 1996-1999, many in the Indian Diaspora convinced their companies to hire Indian IT professionals and this resulted in the 'Indian IT Diaspora' becoming stronger and the Indians constituting 24 percent of the entire Silicon Valley IT professional population by late 1999.

All these developments in turn permitted another crucial Diaspora role. Some Indians had become senior executives at many major US corporations, like IBM, GE and American Express**.** In nearly every instance where these companies invested in or outsourced work to India a well placed expatriate executive crucially influenced the decision. In part the individual's own success supported the emerging positive reputation of Indian engineers. And in part the individual's direct experience of India gave them credibility in vouching that the well-known problems of India's infrastructure and bureaucracy could be overcome. For example, Kanwal Rekhi, one of the founders of TIE, embarked on a well publicized series of speeches and interviews in India in which he challenged the government and people to attempt a set of modernizing reforms. Not surprisingly, one of the IIT-alumnus that we interviewed at the IIT 50th anniversary said, "The expatriate community was the major catalyst. At this point it was no longer a sentiment. They simply recognized the business opportunity". Hence, this US investment and outsourcing drove Indian software industry annual growth to 40 percent during the 1990s and by FY-2003, the Indian IT exports' industry (which includes IT exports as well as Business Process services' exports) had already become a USD 12.2 billion industry.

There were other Diaspora roles as well. Some younger Indians in the US moved to India as 'Expatriates' and started IT Research and Development Laboratories (e.g., IBM India Research Laboratory was started in April 1998) whereas others moved to supervise US investments, outsourcing contracts, and to train and manage Indian professionals to US efficiency and standards.

However, among all these contributions by the Diaspora, the crucial role continued to be that of mentoring of early stage companies and confidence building with major US corporations (that India was a good place to get work done and Indian companies have the required wherewithal to perform the work).

During our discussions with IITians at the fiftieth anniversary, we felt that overtly, some expatriates downplayed their own role in India's success. For them, the sudden skilled labor requirements of the internet's growth and the Y2K problem would have drawn India's engineers and technicians into the world IT industry regardless of whether the Indian Diaspora helped or not. Certainly the timing could not have been better. However, other countries with trained graduates and skilled Diasporas like South Africa, Russia and Pakistan were not similarly drafted into the boom and we believe that the

influence of Indian expatriates' seem to have been quite crucial. We also believe that some of this downplay arises from humility that is pervasive in the Indian culture and some of it also comes from the fact that these PIOs do want to appear as being biased towards their 'fellow countrymen'.

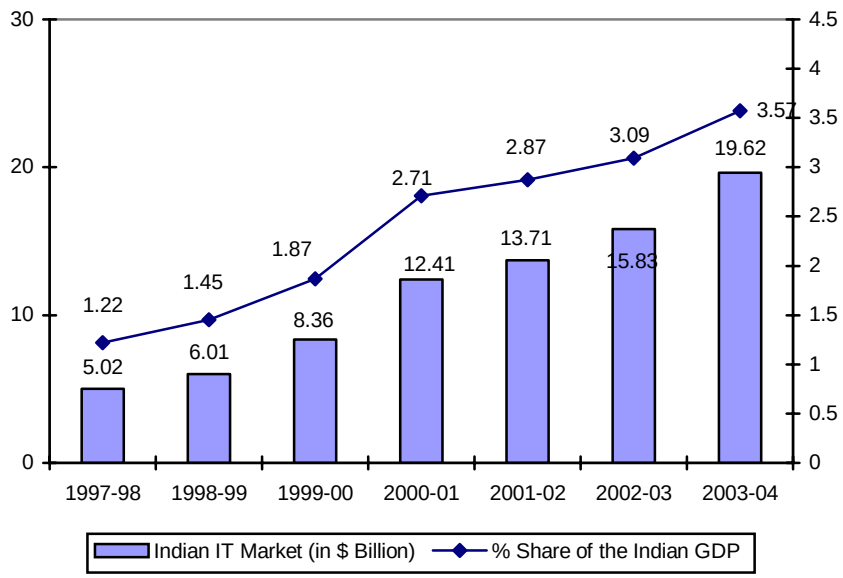
3 Evolution of the Indian IT Industry

In the last section we analyzed how IT industry evolved in India and the increasingly important role the successful Indian IT Diaspora in the US, particularly in the 1990s. In this section, we will focus on the recent years and how the Indian IT Diaspora has been helping the Indian IT industry in growing further. We will also identify the factors that have made India one of the most attractive destinations for offshore IT services.

3.1 Growth of the Indian IT Sector in Recent Years

During the period FY 1997-2003, the Indian IT market demonstrated a compounded annual growth (CAGR) of 25.5 percent. The contribution of IT to the Indian GDP has also risen consistently, from 1.22 percent in FY 1997 to 3.57 percent in FY 2003, as shown in Figure 4.

Figure 4: The Size of Indian IT Market – FY 1997-2003



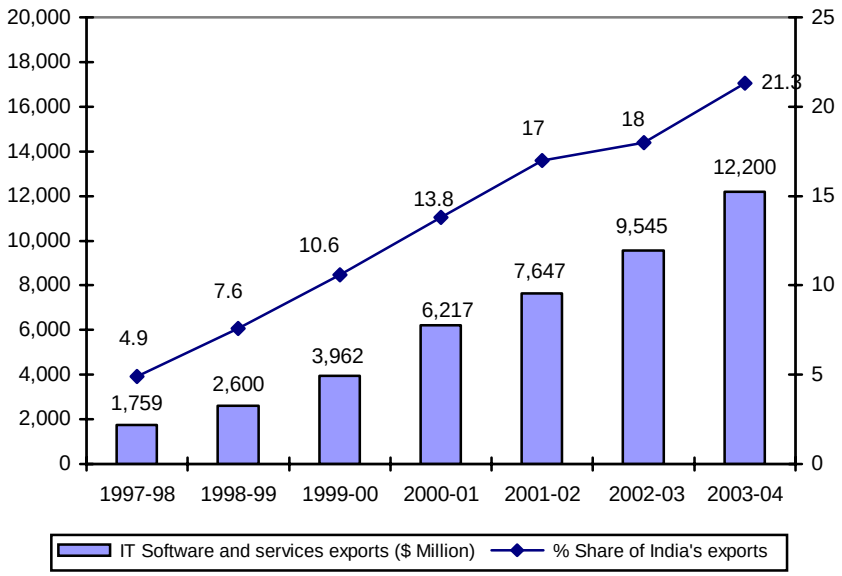
Source: NASSCOM

** The Indian IT market includes hardware, peripherals, networking, domestic and exports market for software, IT services and IT-enabled services.*

3.1.1 Dominance of Export in Indian IT Industry

Software and IT services exports constitute approximately 62 percent (FY 2003) of the entire Indian IT market. Software and IT services exports have shown a fairly high compounded annual growth (CAGR) of 38 percent during FY 1997 and FY 2003. Their share of Indian exports has also risen from 4.9 percent in FY 1997 to 21.3 percent in FY 2003, as shown in Figure 5.

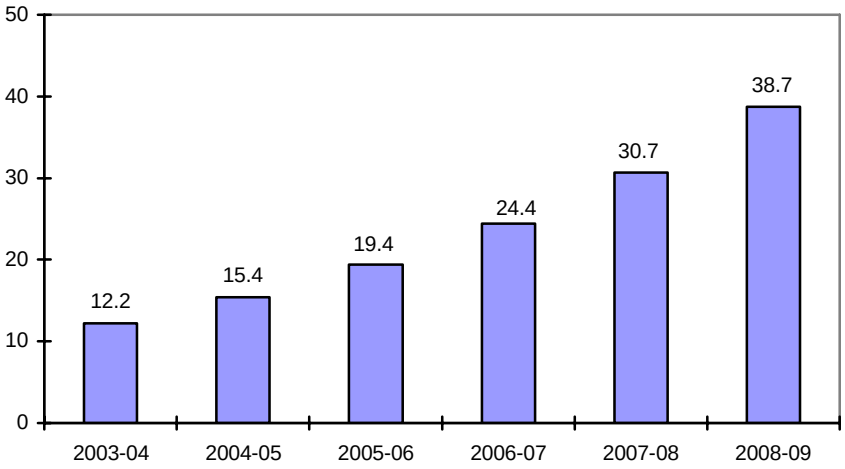
Figure 5: IT Software and Services Exports from India – FY 1997-2003



Source: NASSCOM

Evalueserve predicts that the exports of Indian IT software and services will continue to grow at 26 percent CAGR, thereby, achieving 38.7 Billion USD of export revenue in FY 2008 as shown in Figure 6.

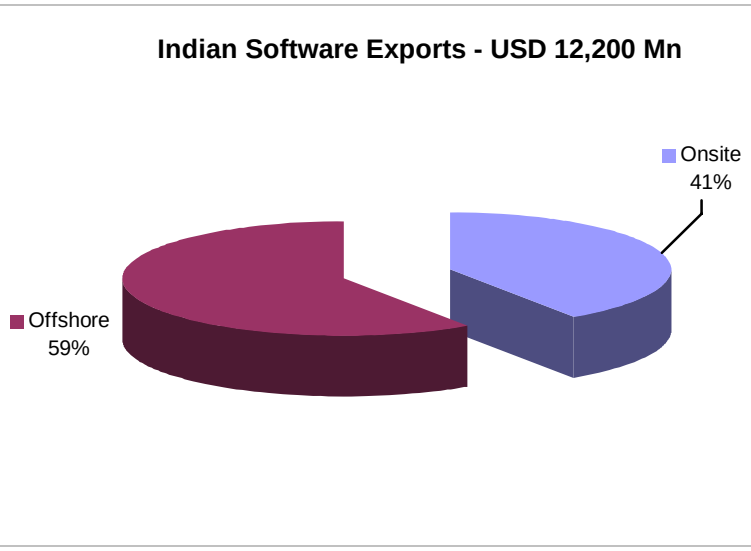
Figure 6: Expected Growth of Indian IT Exports (USD Billion) – FY 2003-2008



Source: Evalueserve

Figure 7 partitions software exports by delivery models (onsite vs. offshore) for FY 2003. Offshore activities dominate with 59 percent of the revenues and Evalueserve believes the onsite revenues will stabilize to 25 percent by FY 2007 because the end-clients are interested in reducing the travel reimbursement cost and because US and UK are becoming more strict with respect to visa rules and regulations for temporary workers.

Figure 7: Delivery Models for Indian Software Exports – FY 2003



Source: NASSCOM

3.2 Year 2000 and the Burst of The Dot-Com & Telecom Bubbles

In 2000, the entire US witnessed an economic slowdown – the Dot.com bubble and the telecom bubble had both burst and most companies had spent enormous money trying to fix the Y2K problem but with nothing to show for the money spent. Hence, these US-based companies began slashing their IT budgets and started asking their IT departments for a 'Return on Investment' (ROI).

The burst of the telecom bubble had also left a glut of unused telecom capacity all around the world and the prices of long distance telecommunication became one-tenth of what they were a decade ago. Not surprisingly, all of this resulted in the onsite-offshore model of IT services (wherein a few people would work physically onsite but most would work offshore) to take off.

3.3 Emerging Reputation of India as a Leading Destination for Offshore IT Services

An early-mover advantage and critical mass had already made India one of the most attractive global locations for companies that were looking to offshore their IT work. India offered strengths in application maintenance and support, application development, software package implementation, IT operations, and IT outsourcing and management. A ten to twelve hour time difference between North America and India also enabled overnight delivery of some of these services. This unique advantage helped American organizations achieve two complete shifts in one working day, and enhance their internal operations and customer service.

3.3.1 Labor Pool

Large and talented labor pool has been the most prominent factor that has contributed to the Indian IT industry's reputation and success.

India produces approximately 73,000 new IT graduates per year and had a total of 656,000 IT professionals as of March 31, 2004. Out of these, 376,000 are involved in exporting IT software and services and out of these 318,500 professionals are involved in providing services offshore while 57,500 professionals are providing services onshore and usually onsite (in US, UK and Canada). Out of the total labor pool of 318,500 professionals, about 212,000 are being billed full-time (i.e., for 1,900 – 2,100 hours per year), whereas, others are usually undergoing training, moving from one job to another, or being billed for part-time work.

Evalueserve estimates that this pool of IT professionals will continue to grow by approximately 12 percent CAGR and result in 1.156 million professionals by March 2009. Out of these approximately 809,000 professionals will be involved in exporting IT software and services.

Proficiency in English and cultural compatibility with the US and UK are high in the top ten cities in India but the next four to six cities are struggling in this regard. In order to mitigate these issues, many IT companies have started providing cultural training and accent neutralization programs.

3.3.1.1 Cost Arbitrage

Typical salaries in the Indian IT sector for most IT professionals (with 0 to 2 years experience) range from USD 5,400 to USD 9,000 per annum, and this clearly offers substantial savings for companies in the US, Canada and UK.

3.3.2 Summary

India offers the following major advantages with respect to offshoring of IT services:

- Friendly government policies for IT exports and the creation of Software Technology Parks (STPs).
- Typical salaries for IT professionals range from USD 5,400 to USD 9,000 per annum, and this offers significant cost savings for the end-clients in US, UK and Canada.
- A high degree of proficiency in the English language.
- 24x7 support capabilities because of time-zone differences.
- Indian has a large pool of IT professionals and managers and this pool has been growing quite rapidly (because of sizeable number of private and public IT training colleges and schools).

However, going forward India will need to take care of the following shortcomings to remain an attractive offshore destination:

- Unreliable power infrastructure
- English proficiency among professionals outside the top 10 Indian cities is not that good and nor is the cultural compatibility with western countries; this will take another 5 to 7 years to change.
- Labor costs have been increasing at 14 percent CAGR in US Dollar terms. This will imply that by FY-2010 these costs will increase to 2.5 of the FY-2003 costs, and hence these salaries will range between USD 13,500 and USD 22,500 per year. This expected rise in labor costs poses a risk of reducing India's competitiveness (as compared to other offshore destinations such as China, Russia and Romania).
- Education system: A proper supply chain for talent is still not there. Significant changes need to take place in the way people are trained in Indian colleges and schools, so that the professionals are better equipped to handle high-skill knowledge-intensive jobs. Overall, a stronger focus on more niche areas and specializations in high-end domains is required.

3.4 Increased Involvement of Diaspora

Although the Indian Diaspora played an important role in the development of the IT industry in the 1990s in India, this role was in no way pivotal. However, by 2000, the Indian Diaspora, especially in the IT industry in the US, began to play a vital role in further developing the IT and BPO industry in India. Given below are a few examples that illustrate the vital role that the Indian Diaspora played during 2000 and 2003:

- Since India IT companies (as well as those in other sectors) require a lot of project management and business expertise, the Indian Diaspora started a private school called the International School of Business (ISB). A lot of Indian professors teaching in universities in the US, UK and Canada take one or two term sabbatical and go to teach at ISB.
- Many Indians living in the US, Canada and UK decided to return to India and either join companies like GE, Intel, and IBM in India or start their own companies. Indeed, the number of companies started by returning Indians (in the IT and BPO space) is already over 200.
- The Indus Entrepreneur and the Silicon Valley Bank has already taken two delegations of Venture Capital Companies (who have already invested over 40 Billion USD in the US) to India for exploring

potential investment opportunities. Many of these VCs are actively considering opportunities of investing in Indian companies and some have already done so.

- With the rise of the Indian IT industry and the additional push by the Indian Diaspora, many VCs in the US now require their startup companies to have a back-end in India so that they can save on research and development costs. According to Evalueserve's estimates, over 150 startups already have some form of their back-end in India and front-end in the US (as of March 2004); this number is likely to double by March 2006.
- Some VCs in the US – particularly those of Indian Origin – are actively funding Indian companies who are likely to produce Intellectual Property and innovative products in the areas of wireless technology, semiconductor design and technology, and new business models for conducting Research and Development. Examples include Westbridge Capital, Kleiner Perkins Caulfield & Byers and Norwest Venture Group.

4 Global Offshoring of Knowledge-intensive Services – The Next Big Opportunity for India

In this section and the next, we have analyzed how Indian IT sector have emerged to be one of the prominent, recent success stories in global economy and what role the Indian Diaspora, particularly in the US, played in facilitating this evolution. Since IT services constitute a minor percentage of the total opportunity that lies before India, we believe that the Indian Diaspora will play a very vital role in this transition.

The following sub-sections analyze the drivers behind increase in global offshoring and estimate the high-end opportunity globally, which can be potentially tapped by the Indian companies already successful in the IT or low-end BPO sectors.

We will also explore the role that the Diaspora is increasingly expected to play in this gradual and inevitable migration. Further, we will attempt to identify other emerging opportunities for India, particularly in the healthcare sector and analyze the emerging trends in global sourcing, as well as, the increasingly vital role of Diaspora in emergence of high-skill sectors in India (and other such low-wage countries).

4.1 Global Offshoring of Knowledge Services – An Economic Imperative

To achieve global competitiveness and high profitability, it has become almost imperative for companies worldwide to offshore some of their Information Technology (IT) and some of their non-IT services to lower-wage countries. In this regard, the recent enhancement in telecom capacity (all over the world) has led to the reduction in telecom costs and the increased digitization of services has further helped this 'offshoring' trend in the services sector.

Apart from cost cutting and corresponding savings that are accrued, companies are also offshoring their services because of the following reasons:

- Need to take advantage of the low wage structure in some countries, in order to reduce costs
- Need to take advantage of the time zone differences to enhance flexibility (such as adding another shift of work), thereby, bringing products and services faster to market
- Need to access a larger and better talent pool
- Need to gain access to new markets
- Need for product or service localization

4.1.1 Drivers Fuelling the Offshoring Trend

This section attempts to identify and analyze the key drivers fuelling the global offshoring trend. To understand the economic and other underlying factors behind the offshoring trend, let us analyze two prominent high-wage countries -- the US and the UK -- and identify the key drivers behind offshoring.

4.1.1.1 Case Study I - The United States {Ref. 9}

According to the US Congressional Budget Office (CBO), the real GDP of the US is expected to increase by 3.2 percent annually during 2003 - 2010. Based on the projected real growth in GDP and potential productivity improvement, the demand for labor in the US is expected to increase from 137 million in 2003 to 150.2 million in 2010. According to Evalueserve's estimates, the labor workforce in the US (after taking into account a nominal 5.2 percent unemployment rate over the period 2003-2010 {Ref. 10} and assuming no new immigration) will increase from 137 million in 2003 to 144.6 million in 2010. This will result in the US facing a labor shortfall of around 5.6 million in the year 2010, primarily due to an aging population and the continuing GDP growth (as mentioned above).

A direct consequence of the shortfall in labor will be an increase in wages and salaries. This will impact the US economy with respect to the input labor cost, and thereby increase the prices of goods

and services, which may in turn lead to US companies becoming uncompetitive in the domestic and global markets. Consequently, the overall output of the US will be adversely affected, and this will result in further loss of employment opportunities.

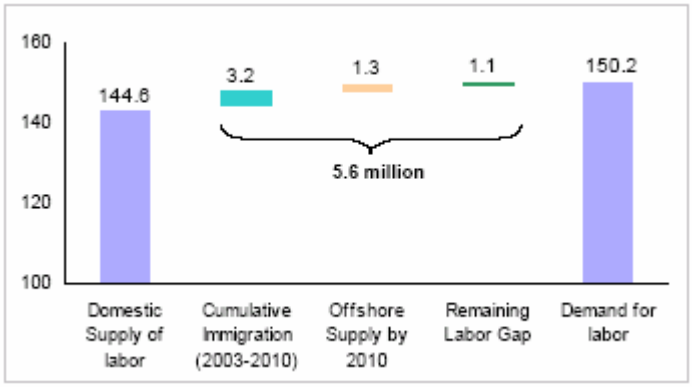
An Evalueserve analysis shows that due to the projected shortfall of labor, the overall output in the US will decline to 2.62 percent for the period 2003-2010. Contrasting this to the US CBO forecast of a real GDP growth rate of 3.20 percent, there is a decline in the rate of growth of approximately 0.6 percent every year, which will translate into a cumulative GDP loss of USD 2 trillion during the period 2003-2010.

In the past, US has mitigated this labor shortage by allowing immigration, and in fact, the large Indian Diaspora, the large Chinese Diaspora (including those from People's Republic of China, Hong Kong, and Taiwan) and other Diasporas were created as a by-product of this immigration. Evalueserve believes that this immigration trend will continue and help in reducing the labor shortage by adding 3.2 million new immigrants by the year 2010 (to the US labor force). Indeed, the addition of these new immigrants will reduce the cumulative GDP loss to USD 2.6 trillion to USD 884 billion but a gap of 2.4 million professionals (i.e., 5.6 million - 3.2 million) will still need to be addressed.

Getting work done from offshore locations (i.e., from countries other than the US) can help, at least partially, in addressing some of this shortfall. Estimates by Forrester Research indicate that a total of 1.3 million jobs are likely to be offshored from the US during the period 2003-2010 but this will still leave a gap of 1.1 million jobs (the difference between the 2.4 million shortfall and the 1.3 million to be offshored) that will still need to be addressed, and temporary workers and further offshoring in the manufacturing sector may help in mitigating this shortfall.

The following figure (Figure 8) summarizes the projected demand-supply situation of labor workforce in the US in 2010, and it takes into account immigration and the off-shoring estimates mentioned above.

Figure 8: Situation of Demand and Supply of US Labor in 2010 (in Millions)



Source: Evalueserve-NASSCOM report: 'The Impact of Global Sourcing on the US Economy: 2003-2010'

4.1.1.2 Case Study II - The United Kingdom {Ref. 11}

On the basis of data from five independent forecasters {Ref. 12}, Evalueserve predicts that during the period 2003-2010, the real GDP of the UK will grow by 2.49 percent annually. Furthermore, Evalueserve predicts that the total demand for labor in the UK during 2003-2010 will grow from 27.66 million in 2003 to 28.63 million in 2010. On the other hand, the domestic supply of labor (after taking into account an average rate of unemployment of approx. 5.5 percent in the UK over the period 2003-2010, primarily due to structural reasons) is projected to grow from 27.66 million in 2003 to 27.92 million in 2010. Hence, the UK economy will face a labor shortfall of about 714,000 workers in 2010.

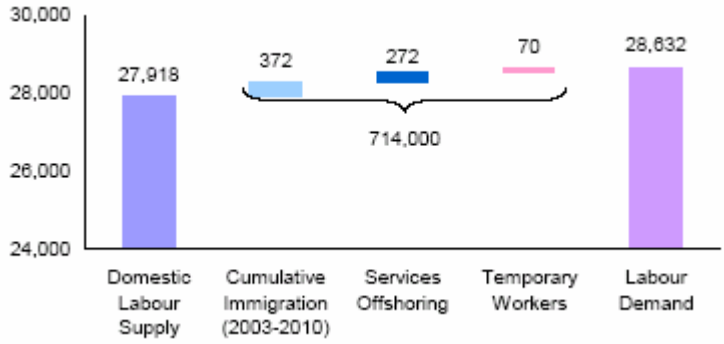
This labor shortfall will result in a loss in potential output, which can lead to a further loss in employment. For the period 2003-2010, Evalueserve estimates that the shortfall in domestic labor supply will decrease the GDP growth rate from the projected 2.49 to 2.08 percent. This will translate to a cumulative loss in output, amounting to USD 200 billion, during 2003-2010 (in the UK) and this will hamper the growth of the UK economy. Global sourcing of skilled professionals (both by letting people to migrate to the UK and offshoring jobs to lower-wage countries) can provide a means of increasing the supply of labor and mitigating this shortfall. Evalueserve predicts that the UK will accomplish this by:

- Immigration: Our analysis shows that a total of 372,000 immigrants will enter the workforce in the UK during 2003-2010.
- Offshoring: We predict that 272,000 jobs will move offshore from the UK during the period 2003-2010, especially to the lower-wage countries. Since 31,100 jobs had already moved (prior to 2003), a total of 303,100 jobs would have been offshored by 2010.
- Temporary workers: After considering the number of employable immigrants and the number of offshored jobs, a shortfall of 70,000 workers is still likely to remain in 2010. Temporary workers and further offshoring in the manufacturing sector may help in mitigating this unmet demand.

Without offshoring and temporary workers, the UK economy will face a cumulative loss in potential output of GBP 34 billion.

The following figure (Figure 9) summarizes the projected demand-supply situation of labor workforce in the US in 2010, and it takes into account immigration and the off-shoring estimates mentioned above.

Figure 9: Situation of Demand and Supply of UK Labor in 2010 (In Thousands)



Source: Evalueserve-NASSCOM report: ' Impact of Global Sourcing on the UK Economy: 2003-2010'

In summary, in order to achieve its GDP growth rate of 2.49 percent during 2003-2010, companies and organizations in the UK will have to resort to hiring immigrant workers and to offshoring some services and some manufacturing jobs. In fact, this trend is already prevalent in the UK economy and immigrants and temporary workers have made significant contributions to its economic growth over the years.

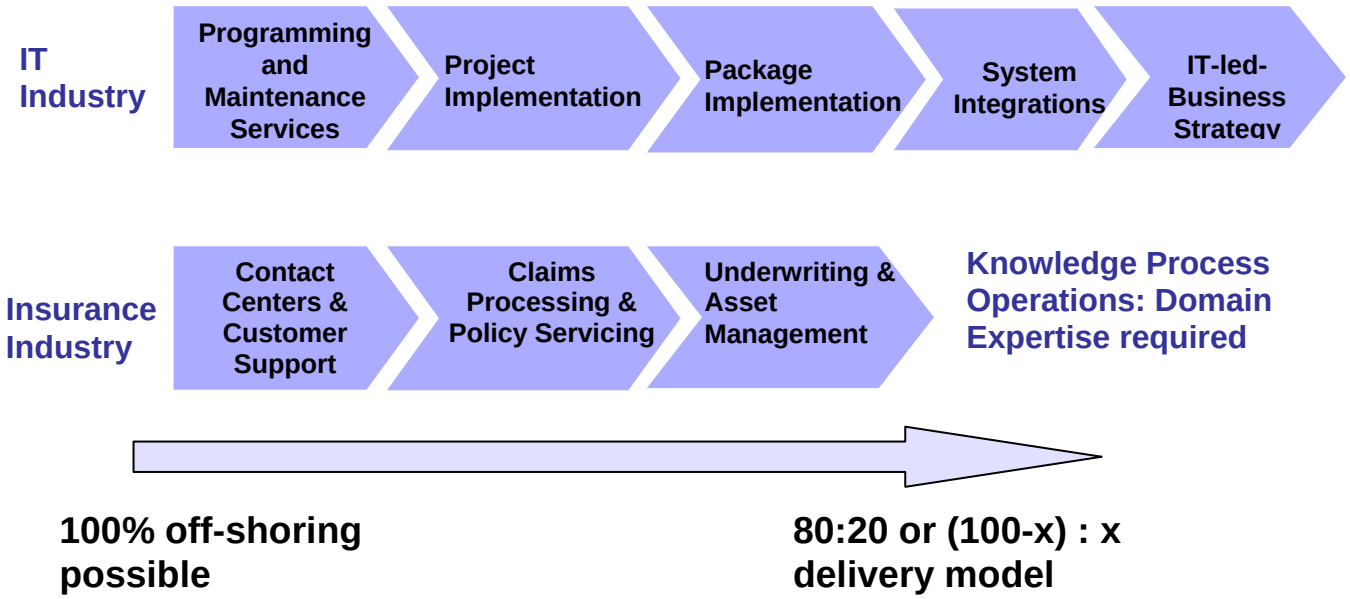
Hence, the forces of increasing globalization, coupled with impending labor shortage will lead the US, the UK and other high-wage countries to continue offshoring services to lower-cost and talent rich destinations such as India.

4.2 Knowledge-intensive Outsourcing (Higher-end KPO) – The Next Big Opportunity for India

With the evolution and maturity of companies' outsourcing strategies, businesses are moving towards outsourcing high-end processes to offshore destinations. This offshoring of high-end knowledge-intensive work is termed as Knowledge Process Outsourcing (KPO) and it involves outsourcing of business processes that require substantial domain expertise or domain knowledge.

As compared to traditional Business Process Outsourcing (BPO), KPO delivers higher 'business' value to an organization (that outsourcers its processes) and it enhances BPO's traditional cost-quality paradigm. The central theme of KPO is to create value for the client {Ref. 13} by providing business expertise rather than process expertise. Hence, KPO requires moving from simply executing 'standardized processes' to carrying out processes that demand advanced analytical and/or technical skills and some decision-making or decision supporting process. Figure 10 below provides two examples – one with respect to IT services and the other with respect to insurance services.

Figure 10: Examples of two industries – Gradual Migration from Low-end (BPO) to High-end (KPO)



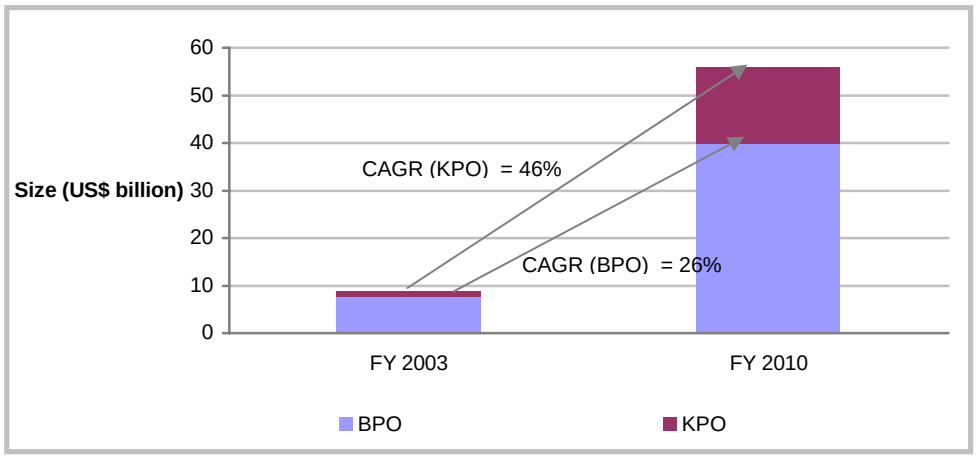
Source: Evalueserve Analysis

As businesses have become more competitive globally, the cycle time for introducing products and services have become smaller, and customers have become more demanding with respect to the quality of service provided. Hence, enterprises are being forced to adopt systems and business models that will not only provide operational efficiencies, but also add strategic value (to these enterprises).

According to Evalueserve, low-end outsourcing services are estimated to grow globally from USD 7.7 billion in FY 2003 (i.e., April 2003 – March 2004) to USD to 39.8 billion in FY 2010 (April 2010 – March 2011), thereby implying a Cumulative Annual Growth Rate (CAGR) of 26 percent.

In contrast, the estimated total revenue for the global KPO market will be USD 1.2 billion in FY 2003, which is expected to grow to USD 17 billion by FY 2010, thereby implying at a CAGR of 46 percent. This is represented in Figure 11. Cumulatively the BPO and KPO sectors present a significant potential for Indian firms, most of which are strategically positioned to tap this opportunity in the coming years.

Figure 11: Expected Growth in Global BPO and KPO Markets



Source: Evalueserve Analysis

4.2.1 Opportunities in the Knowledge-intensive Outsourcing Space

The following are some examples of knowledge-intensive outsourcing or high-end KPO that are increasingly being offered by Indian offshore service providers:

4.2.1.1 Intellectual Property Research (IPR)

- Writing patent applications in the US is quite expensive and a typical application costs about USD 10,000 to USD 15,000 to draft and file with the United States Patent and Trademark Office (USPTO).
- However, an intellectual property specialist (in an offshore location) can produce a preliminary draft of a patent application, which can be then reviewed and modified by a registered US patent attorney and then filed with the USPTO.
- Cost savings from offshoring can easily be up to 50 to 60 percent for the end client.
- In fact, this offshoring model also allows other IP services including Intellectual Property (IP) overlap, IP landscaping of technology domains, IP licensing, IP docketing, IP commercialization and trademark searching and filing services, to be provided at much lower costs from lower-wage countries.
- Not surprisingly, some law-firms from the US have already set up their back-end centers in India and others are joining hands with Indian companies for this purpose.

4.2.1.2 Offshoring R&D in Pharmaceuticals and Biotechnology

- Clinical research organizations are being widely used by pharmaceutical companies.
- The global contract research market is estimated to grow to USD 20 billion by 2004.
- Destinations such as India offer significant cost advantages (as much as 40-60 percent) in the areas of contract research and clinical trials.
- Recently, companies such as AstraZeneca and Glaxo-Smith-Kline have set up drug discovery centers and R&D centers in lower-wage countries like India.

4.2.1.3 Analytics and Data Mining Services

- Companies can significantly save on analytics and inventory management service costs (as much as 60 to 70 percent after taking into account all the costs associated with offshoring, including overheads) by offshoring them.
- Destinations such as Russia and India are ideal for these services because a large pool of engineers and PhDs are available at a low cost. The cost differential between a PhD in Sciences

and Engineering in the US and India can range between USD 60,000-USD 80,000. Similar cost differential exists between US and Russia as well.

- Demand and channel planning, manufacturing scheduling, and transport planning are some of the supply-chain management solutions provided by using mathematical programming, statistical analysis and simulations.

4.2.2 Challenges in Knowledge-intensive Outsourcing for Indian Offshore Services Vendors

Knowledge-intensive offshoring (or KPO – Knowledge Process Outsourcing) presents substantial opportunities to Indian players in the outsourcing business but it also presents the following formidable challenges:

- Processes executed within the KPO domain will require higher quality standards, since the stakes for the clients are very high. Because of these high stakes, the clients may have apprehension about the quality of the services delivered (especially from lower-wage countries) and these may not be easy to alleviate.
- Some of the high-end services will require significant investment in infrastructure; for example, a company doing simulation and Finite Element Analysis will require very high-end workstations. However, in some cases, such as provision of services, which require simple data gathering, cleansing, and analysis will need only moderate amount of capital. In sum, the investment in KPO infrastructure will be higher in comparison to that for traditional BPO.
- The lack of availability of domain expertise will pose a significant challenge to players in the high-end knowledge services. Also, an inadequate number of good middle-level managers in India will compound this problem even further.
- KPO projects will be marked by a higher level of control, confidentiality and enhanced risk management. Laxity in any of these parameters can jeopardize or nullify the expected strategic value for the clients. Traditionally, India has been known for not having any respect for Intellectual Property, piracy of software, and practically no regard for copyrights. Lack of data protection act in India compounds the concern about data privacy.
- Scaling up KPO operations will be difficult, in comparison to traditional BPO services, since it is difficult to find a large number of highly skilled talent pool with significant domain expertise required in KPO sector and the latency involved in training professionals is higher due to the complex skills involved.
- In general, Indian intellectuals and Indian companies have poor knowledge of Intellectual Property and how to use it to make money. Old culture, where teachers or Gurus used to provide knowledge to their students without any monetary rewards, still exist in the Indian psyche to a great extent and hence most Indian IT and BPO companies have not even considered owning any of the Intellectual Property that is being generated by them. In fact, this problem is even more severe in that if an Indian company that is working for an end-client generates Intellectual Property then their contract would typically state that the end-client owns that Intellectual Property, however, if the Indian company – knowingly or unknowingly – infringes on some one else's Intellectual Property then it is completely responsible for all damages and fees (and not the end-client). Unless Indian companies begin to innovate and own Intellectual Property, it is quite unlikely that they will succeed in some of the KPO sub-sectors.

4.2.2.1 Problems in Sourcing, Retaining and Nurturing Right Talent in Indian KPO Organizations

One of the biggest challenges for KPO companies is first hiring very good talent and then imparting continuous training to their professionals. Outsourcing companies venturing into the KPO business are advised to particularly focus on the initial training and development modules and then continue regular training with additional training modules, constructive feedback, appropriate coaching and mentoring and identification of right career paths for their professionals.

Another key challenge in the management of a KPO is the identification of performance criteria with the end-client. This includes setting the right expectations and continuous assessment and monitoring of various projects jointly with the end-client.

4.3 Remaining Competitive in the Global Offshoring Space

Indian offshore service providers are likely to offer increasingly lesser cost arbitrage since the salaries in India have been going up at 14 percent CAGR and are expected to go up in the same range in the near future. Hence the most effective way to remain competitive and sustain growth will be by moving up the value chain and taking on knowledge intensive high value work and ensuring that project management as well as process management are given the highest priority.

Among all the other low-wage countries, China is likely to pose a major threat with its huge Diaspora network, strong economy and low wages, but Russia, Ukraine, Belarus, Hungary and Poland could also provide good competition to India (especially in the IT services and the KPO industries).

4.3.1 China's Technology Parks and Overseas Talent {Ref. 14}

With its rapid economic growth and opening up its market to other countries, China has realized the growing importance of the worldwide Chinese Diaspora for its own economic development. To tap into this valuable asset, the Chinese government and industry has designed and implemented various policy incentives. These policy incentives are provided at both central and provincial/local levels.

At the central level, in 2002, the Ministry of Personnel decided to allot 200 million Yuan (i.e., approximately 24 million USD) for the period 2003-2017 for aiding the scientific research of 4,000 returned (long-term) overseas students and 3,000 short-term overseas students. At the provincial/local levels, the most important means of attracting overseas Chinese is creation of technology parks. So far 53 technology parks have been set up all over the country to encourage the development of technology ventures, especially those by overseas Chinese. Some parks are even explicit with names and titles as 'P*ioneering Park for Overseas Chinese'.* Typical preferential policy incentives for these parks include:

- Financial Incentives: Some local government are providing venture capital funds to provide seed money (such as Suzhou in Jiangsu Province), whereas other local governments are providing grants. For example, in Xi'an - capital of Shaanxi Province in China's Northwest - the government is providing 10 million Yuan (or 1.2 million USD) each year to support returned overseas Chinese for setting and running enterprises and in Shenzhen, the municipal government has decided to allocate 30 million Yuan (or 3.6 million USD) worth of subsidies and start-up funds to support returned Chinese entrepreneurs. Meanwhile, banks and financial organizations, such as the China Trust and Investment Company, the Chinese Commercial and Industrial Bank, and the Transportation Bank, are also providing loans to small private firms with dynamism and flexibility.
- *Infrastructure building*. Most parks are already equipped with the necessary infrastructure for start-ups to operate their business, such as an incubation site with Internet connections, conference rooms, multimedia room, technical trading room, information centers, product testing centers, and laboratories. Some parks, such as the one in Suzhou, also provide additional resources such as an accounting office, a law firm, a business planning space, and other services so that they can reduce the upfront burden of various start-ups.
- *Import-export service*. Some parks provide free import-export services, including customs declaration and warehousing facilities.
- *Human Resources (HR) support*. Many parks have human resource database and an HR office that holds recruiting events on a regular basis. In addition, some recruiting firms also help the new ventures to identify qualified people.
- *Management consulting services*. Often, university professors and successful entrepreneurs are invited to give the professionals in various startups management and business training, including seminars and case studies. To promote products, some parks have even set up networks to help the relevant companies introduce their products to the market. Good examples in this regard are the Beijing Zhongguangcun High Tech Park, Shanghai Pudong High Tech Park and Suzhou Technology Park.

4.4 Evolving Role of Indian Diaspora in the Emerging Indian Knowledge Services Industry

As discussed in the previous sub-sections, there will be a gradual and inevitable migration of Indian offshore services sector towards the high-value knowledge-intensive end.

Apart from providing some of the required capital (through investments), the Indian Diaspora is increasingly expected to play the following crucial roles in the gradual emergence of India's High-end knowledge services sector:

- Facilitating the gradual evolution of IT and ITES sector towards higher value-add, knowledge intensive outsourcing through mentoring and coaching the incumbent offshore vendors. This will involve imparting know-how of building knowledge-intensive service firms and relevant transfer of best practices.
- Pitching for the Indian industry without giving a semblance of bias for their home country over other low-wage destinations. Also, their own brand equity as capable and successful professionals will lend increasing credibility to the might and ability of Indian firms, thus increasing the equity of 'Brand India'.
- Leveraging the Indian network to create win-win situations with other Diaspora and other IT communities, e.g., the Chinese Diaspora and the Chinese software and hardware manufacturing communities (in China, Taiwan, and Hong Kong).

Further, the already established model of cooperation between the Diaspora community and the corresponding Indian offshore services vendors in IT and BPO sectors can be replicated in other sectors as well such as KPO or outsourcing of healthcare services.

4.5 Other Emerging Opportunities for India

With increasing maturity of Indian industry and skill-intensive sectors, the successful Diaspora communities in the corresponding professions are likely to play a vital role in facilitating an effective tapping of emerging global opportunities. As a case in point, let us analyze another emerging opportunity that India is most likely to significantly benefit from, i.e. the health care sector, in which the corresponding Indian Diaspora networks (particularly in the US and the UK) are very strong (as mentioned in the first section of the report).

4.5.1 Health Care Services as a Global Opportunity

Healthcare related export services and 'Medical Tourism' are likely to be a significant business for India, thanks to the Indian Medical Diaspora in the US, UK, and Canada, exceptional expertise within India, cost advantage and some world-class facilities. Worldwide, healthcare is a USD 3 Trillion industry, and India is in a position to tap a small segment by highlighting its talent (of well trained doctors and nurses), facilities and services, and exploiting the brand equity of leading Indian healthcare professionals across the world.

The following section provides a case study in order to identify the key drivers fuelling the trend of offshoring of healthcare services and proliferation of 'medical tourism' by analyzing the emerging trend of 'medical tourism' in the UK.

4.5.1.1 Case Study – Emerging Trend of Medical Tourism from the UK {Ref. 15}

The UK healthcare system has been struggling during the past few years because of a shortage of medical facilities and professionals. This has affected the availability of timely medical facilities to patients in the UK. In such a scenario, medical tourism, which allows domestic patients to be treated by medical facilities in foreign countries, is an emerging trend in the UK. The following sub-sections illustrate the present condition of the UK healthcare services and the role that medical tourism can play in mitigating the unmet demand – as time goes by, this phenomenon may include other countries such as Canada.

1. Present State of Healthcare Services in the UK

The National Health Services (NHS) has dominated the healthcare market in the UK and it is the largest public healthcare service in the world. In 2002, the total market size for healthcare services in the UK was approximately USD 129 billion (i.e., GBP 69.73 billion), of which NHS' share was more than 74 percent.

2. Shortage of Medical Facilities and Professionals

The UK invests 8.33 percent of its national income in healthcare, which on a percentage basis, is less than that of the other G7 countries. The UK health care system performs poorly as compared to the US and many other European countries when measured by parameters such as cancer survival rates. It also performs poorly in comparison with other countries in terms of waiting lists of patients – both in time and the number – who require medical attention.

The expanding scope of medical therapies is one of the factors causing a lack of resources and facilities in the UK. This situation is further aggravated by a shortage of medical professionals. Every year, around 9 percent of the NHS workforce leave, leading to a gap of around 100,000 employees. The NHS is forced to recruit a large number of employees in order to maintain overall workforce levels. Some critical areas such as accident and emergency services, intensive treatment and operation theatre nursing currently face the most severe recruitment and retention problems. Hiring and retention difficulties are also common for specialists such as physiotherapists, radiographers, dentists and occupational therapists.

The situation is further aggravated by the fact that a large proportion of the workforce is aging. According to the Royal College of Nursing, over 70,000 nurses are between 50 and 55 years old and are expected to retire during the next few years.

Further, the UK population as a whole is aging. In 2001, approximately 21 percent of the total population was above 60 years of age and the Government Actuary Department projects that 1.8 million more will be added to this age group by 2011 (as shown in Table 2). This will exert an increased pressure on NHS and further strain the available resources.

Table 2: Population Aging in the UK (2001-2011)

	2001	2006	2011
TOTAL POPULATION (IN THOUSANDS)	58,837	59,675	60,524
AGE 60 AND ABOVE (IN THOUSANDS)	12,238	12,874	14,040
AGE 60 AND ABOVE AS % OF TOTAL POPULATION	20.80	21.58	23.20

Source: Government Actuary Department

3. Implications of the Shortfall

According to current estimates, over a million patients requiring treatment for various ailments are on the 'waiting-list' of the NHS. On an average, patients have to wait for over four months for any treatment. The waiting period can be as long as six months for a cardiac operation, and nine months for cataract surgery. The waiting time for treatment of lung cancer is sometimes as long as six months. Since lung cancer is harder to cure and has a survival rate of only 5 percent, there have been cases where the tumors grew so large while the patients were on the wait-list that these patients were later deemed incurable.

4. Meeting the Shortfall

The UK government is making efforts to meet the shortfall in healthcare services. It has announced a huge spending increase and a five-year investment program towards bolstering the NHS. This program was initiated for 2003-04 and its budget will reach USD 161 billion (i.e., GBP 87.2 billion) by 2005-06 and USD 195 billion (i.e., GBP 105.6 billion) by 2007-08. Furthermore, in order to meet the shortage, long-term recruiting targets have been set for various levels of medical professionals.

5. Emergence of Medical Tourism and the UK

Inspire of the UK Government recent efforts, which will not be able to mitigate these problems, the patients in UK will have to move beyond UK's national borders. In fact, the phenomenon of medical tourism from UK has already started and more than 1,000 British patients were treated outside the UK in 2002.

Starting in 2002, NHS has initiated a trial program wherein patients travel offshore to France and Germany for surgery. If these trial programs prove to be successful, more patients could even be sent to other destinations such as India, Poland and Malaysia that offer the required facilities and have attractive cost structures.

Even the patients in UK seem quite willing -- according to a survey conducted in June 2002 by MORI Social Research Institute for the British Medical Association, 42 percent patients responded by saying that they were willing to travel outside the UK for treatment and 51 percent believed that involving other organizations – including the private sector – would improve the current health care system.

4.5.1.2 Emergence of India as a Preferred Destination for Medical Tourism

India is emerging as a preferred destination because it has a large number of hospitals with world-class infrastructure, equipment and many medical practitioners who have been trained outside India. India already has medical facilities and skills in cardiology, oncology, minimal invasive surgery, joint replacement, organ transplantation (liver, kidney, heart or bone marrow), cataract, cancer treatment (including radiotherapy), neurosurgery (including stereotactic surgery), angioplasty and cardiac surgery.

Hospitals such as Apollo, Escorts, Hinduja, Max Healthcare, Manipal Hospital and Fortis Heart Institute are already becoming premier destinations for foreign patients from Bangladesh, Mauritius, Egypt and other middle-eastern countries. Additionally, Indian hospitals are beginning to offer combined and complete packages that include medical treatment, health recuperation, relaxation, recreation and some amount of tourism within India. Hence, many foreign patients who are now coming to India for treatment are beginning to spend 2-3 weeks at various tourist destinations, after their medical treatment.

The setting up of Western Standard Hospitals in India is now in full force and Evalueserve estimates show that India generated USD 430 million in FY 2003 from medical tourism. Such hospitals are likely to generate about USD 2 billion in annual revenue by FY 2010, thereby representing a 21 percent compounded annual growth rate.

The following have been the key developments, especially since 2001:

- Patients from Middle East, Bangladesh, Sri Lanka, Egypt, Mauritius, etc. are beginning to come to some top-notch Indian hospitals for cardiac bypass surgery. It costs USD 5,000 to get this surgery done in India as compared to USD 25,000 in UK and USD 40,000 in US.
- Cataract patients from Europe are beginning to come to get their cataract operations done in India. Once their operation is done, they spend two weeks in Goa -- an Indian island like Hawaii -- to recuperate. These patients avoid the long lines of Europe and the insurance companies in Europe pay their entire costs (including those of recuperating).
- Some Indian radiologists are beginning to read X-ray charts of US patients and send their preliminary findings to US radiologists who verify their findings and do a thorough quality check. In this model, the initial 80 percent work being done in India and the remaining 20 percent work in the US (with proper quality checks by professionals who have US licenses).

4.5.1.3 Other Competing Offshore Destinations for Medical Tourism

Polish medical hospitals and organizations are also offering medical facilities to patients from the developed nations, particularly the UK. Polmedica is offering up to 1,000 operations per year at the Polancia Zdroj Hospital in South-west Poland. These include orthopedic operations and will soon include those related to cardiac surgery.

Malaysia has also launched a scheme under which several companies can provide medical screening at less expensive prices. For example, visitors at the Palace of the Golden Horses Hotel in Kuala Lumpur can undergo a full health check-up, including X-ray, blood pressure tests and liver and thyroid screening for almost one-third the cost that they would incur in the UK. Also, the Gleneagles Intan Medical Center in Malaysia offers a knee replacement for USD 5,000 (i.e., GBP 2,720) and hip replacement for USD 6,000 (i.e., GBP 3,250). In comparison, the estimated costs for similar procedures at private hospitals in the UK are USD 17,700 (i.e., GBP 9,600) and USD 12,000 (i.e., GBP 6,500), respectively.

4.5.1.4 Cost Advantages offered by Medical Tourism

Medical treatment in countries such as India, Poland and Malaysia is available at a fraction of costs in countries such as the US and the UK. Table 3 provides comparative costs for the UK and India for some treatments.

Table 3: Cost Comparison of Various Medical Treatments – India and the UK

TYPE OF SURGERY	COST IN UK	COST IN INDIA
Cardiac Surgery	11,100	4,900
Open Heart Surgery	22,200	4,900
Cataract Operation	3,700	740
Heart Bypass	9,250	4,900
Hip Replacement	12,025	7,300

Source: Evalueserve Analysis

4.5.1.5 Key Challenges in Medical Tourism

As of now, medical tourism has some significant challenges to overcome before it becomes an attractive alternative. A very important challenge that currently exists is that medical regulation and malpractice insurance in India and other low-wage countries (such as Poland and Malaysia) are not well developed. Further, medical associations and courts in these countries are quite slow. Realizing this gap, these countries are now beginning to implement some regulations in order to bring these areas to globally acceptable standards. For example, the Supreme Court of India passed a dictum in 1995 that injured patients could sue doctors and hospitals under India's Consumer Protection Act. However, Indian courts still continue to be slow in adjudication and a person who has been treated by a negligent doctor may not get a quick reprieve. Finally, since most of the payments in the developed countries are either made by the government or by private insurance companies, various hospitals and other medical organizations in India and other low-wage countries will have to form tie-ups with such bodies in the developed countries.

4.5.1.6 Medical Tourism can be a Very Good Opportunity for India

Medical tourism can play a crucial role in helping the healthcare system in some developed nations, in overcoming long waiting periods for patients and in helping those who cannot afford expensive medical facilities (in these high-wage countries).

Traditionally, many Middle-Eastern people who were sick and need special hospitalization used to visit the US for medical treatment. However, after September 11, 2001, the US has implemented 'fingerprinting' and other laws that many foreigners, especially those from the Middle East, find discriminatory. Hence, many such people are no longer going to the US for getting their medical treatment, but instead going to countries such as India and Malaysia that have good hospitals and medical doctors and that also have sizeable Muslim populations. Hence, medical tourism is not only an opportunity for India, but also for several other low-wage countries with good medical professionals and infrastructure.

Furthermore, if India can overcome the challenges mentioned then medical tourism can be become a particularly attractive opportunity for India. This is because over 2 million PIOs live outside India and

they have combined 'annual personal earnings' of USD 363 billion. Also, they annually spend over USD 7.2 billion on medical insurance and hospitalization etc. and on average they visit once in three years anyway. So, the Indian medical organizations and hospitals can attract a substantial portion of these PIOs by performing simple surgeries and treatments (e.g., dentistry work and cataract) or even more complex ones (e.g., angioplasty, cardiac surgery, and knee replacement). Even if India can attract 14 percent of the 'annual personal earnings' spent by PIOs on medical insurance and health care (outside India), it can earn an additional USD 1 billion worth of medical tourism to such PIOs.

Finally, in addition to providing surgery and treatment that is related to western medicine, India can also promote alternative medicine, e.g., Yoga clinics, Health SPAs, and Aryuvedic, Homeopathic and Unani treatment centers.

In addition, the Indian Business Diaspora can play a leading role in the development of the travel, tourism and hospitality industry in India by providing their management experience, process expertise as well as funding to this industry. Hence, although the hotel industry in India is considered among the best in the world, most of these hotels are very expensive from Indian standards and there is a dire need of affordable hotels (that are priced at $10 to $15 per day) for middle class Indians. Interestingly, it is the similar kind of "lower budget" hotels that the PIOs in the US largely own and hence their expertise in managing such hotels can be extremely valuable for India.

6 Conclusions and lessons for other Diasporas

As is evident from our analysis of the emergence of a successful and competitive IT industry in India, the Diaspora has indeed played a crucial role in ensuring a first mover advantage for Indian IT industry players by helping these players in grabbing the market opportunity sooner than players from any other low-wage country such as China. The established model of cooperation between the Diaspora community and the Indian IT services vendors will need to be replicated in other emerging sectors as well, such as KPO, outsourcing of healthcare services, etc. We believe that a further analysis of this experience and an effective adaptation of the existing cooperation model between Diaspora and Indian IT services vendors in several other emerging sectors will prove to be of significant importance in India's development strategy, in the years to come.

Table 4 summarises various stages of growth of skill-intensive industries and role of Diaspora and government in its evolution which we analysed in Sections 3-5 of this Chapter.

Table 4 Evolving roles of Diaspora and the government in India' skill-intensive (software, BPO and KPO outsourcing) industries

Stage of growth	Characterization of the stage of growth of skill-intensive industries	Role of Diaspora	Role of government
Embryonic period: the 70's -- Building a foundation and successful ' first movers'	Key role of very few visionary entrepreneurs who created 'first mover' business projects (both within established and as new firms)	Exposure of Indian talent to US firms Executives of India origin start to outsource through 'body shopping' contracts	Restrictive policies provided 'space' for indigenous industry Space and defense programs Subsidizing good technical education
Infant period: the 80's -- Creating a springboard for future take-off	Emergence of a software cluster (Bangalore) and a critical mass of professional entrepreneurs	Less important role of the Diaspora (then in the previous stage?): continuation of body shopping contracts which are not as critical as before	Visionary secretary in Dpt. Of Electronics Cooperation with NASSCOM: concerted effort of selling India abroad Created software technology parks with adequate infrastructure

Rapid growth stage: the 90's -- take-off	Companies move up value chain and improve productivity. Emergence of high value-added outsourcing (R&D and consulting)	Diaspora is engaged in a concerted effort to promote an image of India as an attractive outsorcing location	Opening and liberalization of economy
Reorganizationor: ongoing starting from the end of 90's – emergence of knowledge-process outsourcing	Emergence of knowledge-process outsourcing In the future India can become to knowledge-intensive services what China is to manufacturing	High-placed executive of India origin pioneer knowledge-intensive outsourcing (R&D and professional services)	Two main actions: Reform of higher education system Reform of innovation system to make R&D relevant for business Liberalization and reduction of administrative barriers are important but less so then these two

Lessons for Other Diasporas

The IIT alumni that we interviewed in the 50th anniversary of IIT formation (in Silicon Valley in January 2003) felt that it will be difficult for other Diaspora communities to duplicate the Indian experience and some of the reasons stated by them are given below:

- India has a deep cultural tradition of mathematics and science education and it also has a tradition of inter-generational mentoring that does not exist in most countries.
- By creating the IITs and other higher institutes of education, Primer Minister Nehru and successive Indian governments, injected large amount of money in higher education in India. Unfortunately, in most cases, this was done at the cost of primary education. For example, India currently produces approximately 2.45 million graduates every year out of which 200,000 are engineers, 73,000 IT professionals, 117,000 medical doctors and 40,000 MBAs. Clearly, this pool is very good for strengthening the Indian Diaspora (outside India) and for creating a strong "knowledge service" backbone within India but even today there are approximately 59 million children between 6 and 14 who are not getting primary education in India! This dichotomy would be very hard to find in other countries, and especially hard to find would be the high number of educated people that are graduating every year. (For example, note that even the US produces only 1.24 million graduates every year.)
- Few governments are likely to maintain a 'hands-off' policy towards such services (i.e., IT services, BPO services, KPO services and Medical Tourism services), especially now that its potential has been demonstrated.
- Large-scale migration of labor – whether it is through permanent immigration or through temporary workers or business visas – from developing countries to the developed ones, is likely to be more difficult especially after September 11, 2001.
- Few Diaspora communities, other than the Chinese, will achieve the critical mass that is necessary to produce substantial numbers of influential people in any given sector (e.g., medicine, engineering, large corporations, startups, Venture Capitalists, hoteliers).
- Persons of Indian Origin in the US, UK and Canada have always had enough friends and colleagues who studied with them in the same schools and colleges in India but who decided to stay in India. Hence the US-Indian stage has always been well primed for 'proper nurturing and mentoring'. In other words, if some PIOs have innovative ideas and want to do some thing in India and they can persuade their age-old friends and colleagues to execute it. Many countries will suffer in this regard because most good professionals in these countries have migrated to developed

countries and there simply aren't enough professionals in these countries to take such ideas forward.

Inspire of the survey respondents' views given above and despite of the fact that only a few other countries can duplicate India's IT experience, we believe that many other countries now have the combination of low wage graduates and benevolent, successful expatriates who are living in the US, UK, Australia, Germany and Canada. Hence, we believe that some form of mentor-sponsor model (that the Indian Diaspora has demonstrated) may also work for some countries in a limited set of industries and sectors – if it is mobilized effectively.

Hence, in sum, although a direct replication of the Indian experience (i.e. emergence of the local IT industry into a global player) may well be beyond the reach for most of the other Diaspora communities, however, Indian Diaspora's experience does have far reaching implications and take-away for other Diaspora communities, as discussed below:

- For small countries, a relatively smaller Diaspora community can bring out a proportionately similar transformation in their home country, as has been demonstrated by the corresponding Indian Diaspora community. Such transformations in these smaller and poor countries may not be very significant from the global economic perspective; however, they may indeed impact the economy of the home country very significantly and positively. For example, for a small country like Armenia, the critical mass of Diaspora executives could be as small as 200 dedicated people, who could become role models for local businesses and NGOs, as well as emerge as providers of reliable business linkages with the rest of the world.
- More than the number and strength of Diaspora, the most significant transformation is brought about by creation of disciplined, dedicated and value driven – visionary Diaspora organizations (such as TiE), which can provide good networking platform for the Diaspora executives as well as incumbent local players in the home countries and facilitate the mentoring and limited sponsoring for these local players.

Bibliography

1. Source: http://www.uohyd.ernet.in/sss/cinddiaspora/center1.html
2. Source: http://skillsbase.dfes.gov.uk/database/SB02020200.htm
3. Source: Employers' Skill Survey 2002, Published by the Department for Education and Skills, UK
4. Source: http://indiandiaspora.nic.in/diasporapdf/chapter13.pdf
5. Source: http://www.bebeyond.com/KeepCurrent/Indepth/Indians.html, http://economictimes.indiatimes.com/articleshow/msid-701176,curpg-4.cms
6. Source: http://www.business-standard.com/special/billion/2003/over.htm
7. Source: AAPI website, Yale Global Online (URL: http://yaleglobal.yale.edu/display.article?id=3340), http://in.news.yahoo.com/040604/43/2dh2f.html
8. Source: Company website - http://www.niit.com/niit/corporate/aboutniit/Org.asp
9. Source: Evalueserve-NASSCOM report: 'The Impact of Global Sourcing on the US Economy: 2003-2010'
10. Source: US CBO – The unemployment will be primarily due to long-term structural reasons.
11. Source: Evalueserve-NASSCOM report: 'Impact of Global Sourcing on the UK Economy: 2003-2010'
12. Cambridge Econometrics, Experian Business Strategies, Global Insight, Item Club, Oxford Economic Forecasting, Evalueserve Analysis
13. Client refers to the organization that outsources its processes
14. Source: D. Zheng, Knowledge for Development Program, World Bank
15. Source: Evalueserve-NASSCOM report: 'Impact of Global Sourcing on the UK Economy: 2003-2010'
16. Source: http://it.asia1.com.sg/newsarchive/11/news004_20011105.html

WB83362
C:\Documents and Settings\wb83362\My Documents\EVS - WorldBank - India's Transformation to Knowledge-based Economy - Evolving Role of the Diaspora - August 11, 2004.doc
August 10, 2004 1:04 PM

