CHAPTER TWO

Profile of Software Industry
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2.1 Software Industry - Global View

Introduction

Every society determines reality, truth, beauty, and values in accordance with its own worldview and its unique historic path. A common view among casual observers of Silicon Valley is that its extreme technology emersion can lead to a one-dimensional perspective of the world and its problems. According to San Jose State anthropologist, Jan English-Lueck, “The notion that a culture can be identified with its economic specialization—and the technology associated with it—is a very old and widespread idea. Of course, the worldviews held by individuals or by groups are very influential in determining behavior, as well as in determining motivations, attitudes and actions. Working with technology, thinking about technology, and producing technology change the way Silicon Valley people construct reality by giving them new metaphors” (English-Lueck 66).

As such, critics of Silicon Valley note that, while it is clear that technology has the power to enhance lives, it is not always as clear to the developers and consumers of high technology products that the same beneficial technology might also lead to an oversimplified public discourse of social problems, a loss of richness in human interactions, and a sense of personal alienation. As a literary character Dr. Faustus sold his soul to the devil for the riches of today, one must ask if Silicon Valley, as a harbinger of future capitalistic global society, provides a glimpse of the risks to a healthy multifaceted society. In such a technology-intense society, does the singular focus on technology and rational thinking crowd out or devalue the emotional, intuitive, creative, and spiritual aspects of civilization? Does Silicon Valley’s worldview take into consideration the untidy
emotional factors inherent in the social ‘ends’ that justify the technological ‘means?’ Do the citizens of Silicon Valley practice a one-dimensional worldview that shuns rich social interaction, or do they use technology to create a new form of futuristic culture, complete with the art, literature, and passion for community?

In Silicon Valley, people transfer engineering and entrepreneurial approaches to their understanding of the social world, such that efficiency, utility, instrumentality, and economic rationality become the philosophical underpinnings of the Silicon Valley worldview (English-Lueck 74-77). She notes that, “In Silicon Valley, people view the daily conflicts of life as ‘social engineering problems’ that can be ‘solved’ if given thoughtful and systematic appraisal” (English-Lueck 76). So, one wonders as to what degree and in what manner is Maslow’s adage—“If the only tool you have is a hammer, every problem is a nail”—is relevant or irrelevant in the social discourse of Silicon Valley?

Robert, an African-American CEO of a startup, strongly disagreed with the premise, “This is a terribly mistaken concept. It’s a very complex environment. There has been a chance for wealth, not a chase for technology. The focus may be on technology, but there is not an over reliance on it to solve social problems.” Grant, a transplanted New Yorker human resources director, agreed, “There is a tendency for people to take that approach, but if you scratch the surface, they are getting by with more than computers. There’s more there than meets the eye. People are more than one-dimensional. They are not stereotypical. It’s wrong to make that assumption.” Steve, a senior marketing executive of established and start-up companies took the opposite view, “I think it is profoundly real. Every aspect of my life has been associated with work—dating, social life, etc. What we have here is a recreated company town on a different scale.” David, a senior marketing executive originally from Yugoslavia, took the middle view, “Being in technology, we are believers here. However, technology cannot solve all problems but it can be a facilitator and it can make it easier to solve.”
However, Silicon Valley provides certain challenges to one seeking to keep a reasonable balance between work and home life, technology and art, which seem unique in comparison to other places. Robert remarked that, “It has a frenetic pace. The environment you live and work in can’t be separated.” According to David, “It’s a big challenge. The Valley is the most competitive place on the planet. It’s the top of the world. Highly competent people push you. You work hard, keep in touch; it takes time. There’s very little time for anything.” Grant noted that, “You are expected to be at work or on call all the time. Real or imagined, the pace is required. The arts organizations have to fight to get on the agenda. The Tech Museum can thrive, but the ballet and symphony cannot.” Alternatively, Steve commented that, “I don’t think they are unique. You have to balance hours of work, family, and contributions to social programs.”

Technology has both helped and inhibited the community dialogue. Robert observed that email has changed communications, “We are more connected, but we have less face time.” Grant agreed, “Email and instant messaging are tremendous benefits, but it’s a problem when people hide behind it rather than being physically present. It’s a mixed bag because I’ve seen a mentoring project done exclusively over emails. This can be beneficial, in that the kids might not have otherwise had access to these mentors at all, but it’s limiting; you are present with part of your being.” Likewise, David commented, “Technology can help or be counterproductive. People seem more comfortable with technology than face-to-face. Real-time direct interactions create new ideas and exchanges of ideas. For example, when the only way to reach people is by email, we lose a lot by taking the path of least resistance.” Steve agreed, “Net, it’s a huge help: mobile phones let me have more conversations, but the PC has created a segment that is isolated.”

The Humanizing Role of the Arts in a place that’s so focused on technology, what is the role of the arts, social interactions, and community groups? John Kreidler, Executive Director of Cultural Initiatives Silicon Valley, believes that, “It’s no different than anywhere else. The arts’ function is the same as anywhere else.” Robert agrees, “It’s similar to any other place. It enhances the
quality of life, creativity, and relaxation. People in technology are so stressed, they could use the outlet.” Grant echoes the sentiment; “Given the extreme focus on technology in Silicon Valley, the softer areas are even more critical.” “The arts are for basic entertainment and diversion,” noted Steve. David put it bluntly, “The arts keep us sane. It’s intense, focused, and concentrated. We can become obsessed with our work. R&R time doesn’t help. It’s difficult to unwind. The arts let me escape.”

While Kreidler is bullish on the arts, noting, “The arts are intrinsically valuable; they are among the ends of life, “he understands the unique way in which the arts must be positioned to civic leaders and patrons,” but I don’t say that much in Silicon Valley Kreidler cautions, “You can’t make an intrinsic argument for art here. People want tangible analysis and numbers. The great number of people in leadership positions here is focused on the practical; one might say that the area is usually driven by practicalities.”

Immigrants are more active in the participatory arts, which are more concerned about production rather than consumption, and more concerned about transmission of culture than developing individual expertise. The style of participatory arts is open entry/open exits, rather than elite gate keeping. According to Moriarty, immigrants use the arts to reclaim their cultural identity so that they can attain membership in the new society as whole persons. In addition, the participatory arts are the immigrants’ strongest tools for connecting with the mainstream community. Civic engagement through participatory arts includes:

Social service agencies, movie theaters, libraries, parades, and street festivals serve as venues for these activities. “So, in a way, I’m not surprised that the San Jose Symphony went out of business. The age and race demographics of the South Bay vs. the symphony patrons (whose average age was 68) showed us that the supply was there, but the demand was going down,” notes Kreidler.

Arts and civic organizations have had to modify services to fit the needs and interests of Silicon Valley. Robert mentioned that a big issue is the proximity
to San Francisco. “People spend money in San Francisco, but San Francisco people don’t go south. So, people in Silicon Valley have to spread the wealth. They need fewer, but more high-quality arts. Also, private, community, and Stanford arts give people in Silicon Valley many options,” notes Robert. David made an interesting analogy to the lifestyle, “You know people here like a relaxed, casual, outdoors setting, like Villa Montalvo. You can even have a glass of wine with the concert. It’s what this place likes. There’s also tremendous variety, not just jazz or country. It’s different than buying a subscription to the San Francisco Symphony where it’s the same style of music and you have to get dressed up to go there.” Steve tied it to the work-life balance, “They need to cater to Silicon Valley families. For example, the San Francisco Ballet has a very liberal exchange policy for people with very busy lives and open rehearsals for stay-at-home moms.” Steve also commented on the type of entertainment that works best, “People attracted to Silicon Valley are highly motivated. Passive entertainment doesn’t work. We are so multidimensional that it’s hard to keep our attention.”

Kreidler comments on how Cultural Initiatives have had to adjust to the demands of the Silicon Valley lifestyle.

“This place works harder than other places. We need the basic tools, we are active ourselves, and appreciate others who are world class. Because we believe that giving people the tools and experiences in the arts creates demand, not just supply. So, we have focused on grants to schools that impact 60,000 students. Our Creative Education program provides grants to everyday schools (not magnet schools) and onsite assistance to teachers.”

In addition, in order to speak to Silicon Valley in its own vernacular, Cultural Initiatives has developed a software program—The Great Cities Simulator—that demonstrates the positive impact the arts can have on the quality of life and the ability for businesses to recruit talent.
Largely due to Silicon Valley, we are in the midst of an economy that defines success by the ownership and control of information and the tools that access and exploit abstract representations of knowledge. Our economy requires identification numbers, credit records, medical, dental, educational, criminal, and family records to be stored, matched, updated, and archived by computers. We live in a world where our 2003 is not as totalitarian as George Orwell's 1984, but every electronic signature, fingerprint, or transaction record we leave is a non-transitory record that is more easily monitored, more cheaply searched, transparent to the person being searched, and can lead to the erosion of personal privacy (Lessig 7-12). Likewise, government initiatives to use data mining techniques to profile terrorists, corporate monitoring of employees' computer use, and Internet commerce sites routinely capturing and selling personal preference information are merely a few of the similarities between America in 2003 and Orwell's Oceana of 1984. We live in a culture that is quickly moving towards a paperless and faceless society. However, the faceless or non-human contact of our Information Age only enhances our vulnerability. As we dash into the electronic society, with written records and receipts fading into the "inaccuracy of individual memories," as Orwell's Party would state it, the reality of our transactions, our lives, and the lives of others become flexible. From the bureaucracy's perspective, our reality exists at its discretion. In addition, New York Times reporter Jeffrey Rosen's interview of Oracle executives indicated a profound lack of ownership of 'policy issues,' such as the balance between personal privacy and security. As Tim Hoechst, a senior vice president of Oracle is quoted as stating, "At Oracle, we leave that to our customers to decide. We become a little stymied when we start talking about the 'should Wes' and 'whys' and the 'hows,' because it's not our expertise" (Rosen 5-6).

Since technology is the use of scientific knowledge toward a defined set of goals, it always has social implications. The public is increasingly concerned that the benefits of scientific knowledge are being outweighed by our inability to control the negative consequences. The layperson's remembrance of history is that if anyone is to be adversely impacted by a new technology, it is generally the poor, the powerless, and those of color.
Do scientists and engineers have a responsibility to society, and if so, what is that responsibility and how does it play out in Silicon Valley? As Steve observed, “It is common for execs here to not be involved in community activities, unlike what would be expected of executives of older traditional companies.” However, since humanity’s needs, wants, and desires are realized through technology, it seems that there is at least verbal support among the scientific community to encourage active roles by scientists and engineers in the decision-making processes of new technology implementation. Certainly it is no longer adequate for scientists to lock themselves in their laboratories and blindly search for ‘neutral’ facts. Science ethicists Skillen, Bronowski, Harrison, and Yellin all show a common thread that has been running through the technology community for decades—the argument of the supposed neutrality of scientists and engineers is no longer an acceptable shield behind which technologists can hide.

This survey underscores the need for a reconciliation of the technology community with the emotional, artistic, and religious schools of thought in a manner, which recognizes that they are not inconsistent with each other. One begins to see a glimpse of this when one goes beyond the perspective of casual external observation and looks closely at the manner in which Silicon Valley is using its multicultural technological worldview to redefine ‘culture’ and ‘arts’ according to new metrics. Silicon Valley’s citizens believe that they have a rich social and arts scene, but admit that it cannot be judged by the European classical arts definitions. In Silicon Valley, the arts are local, participatory, influenced by global diversity, and frequently use the medium of technology. Venues are decentralized, small, community-based, and informal. Individual financial donations are small, often intangible, but are large in aggregate impact. The range of arts options available is broad, the quality is high (as defined by Silicon Valley’s standards), but the visibility is low. The fact that these metrics are different from the classical arts of ‘old money’ cities does not negate their existence or significance in the lives of the people of Silicon Valley.

The citizens of Silicon Valley themselves accept a major portion of the responsibility to establish a work-home, technology-arts balance that works for
them and works in aggregate for the overall Silicon Valley community. In spite of intense workloads, long commutes, and an extreme focus on technology, the people we interviewed found ways to force the balancing act. Robert, who was influenced in the early days at HP, saw role modeling by Bill Hewlett and Dave Packard who were actively involved in the community. So he got involved in United Way. “These perspectives let you be a more effective executive,” says Robert. Grant noted, “It might be easier for me because I’m an HR guy that happens to be in technology, not the other way around. I keep balanced through a variety of things: the spiritual realm, Eastern philosophy, Buddhism, Sangha (congregation), meditation, and I make sure to make the time for lunch (not many do). My wife and I attend lots of movies, an occasional play, and small parties. I run three times a week and eat healthy.” David goes to Villa Montalvo (outdoor concerts at a mountain winery), a comedy club, the Museum of Modern Art, and concerts at Shoreline Amphitheater. A patron of the classical arts, Steve and his wife are regulars at the San Francisco Ballet. “I exercise and I’m involved in community organizations, such as the YMCA of the Mid Peninsula, where I am a volunteer and Board member,” says Steve.

Silicon Valley’s cultural institutions also have a definite role of importance in balancing the technocratic worldview. In such a complex world, perhaps there is a role for art to help with nature’s ‘unconcealment,’ as Heidegger would state it (Heidegger 2:649-701). Understanding the history, belief systems, ethics, shared assumptions found in the literature of a people, economic shifts, political context, class/race struggles, and the critical adoption rate or “tipping point” associated with major scientific discoveries and their related technological uses, will allow engineers to develop an approach to technology assessment that is balanced with a humanist worldview. This art form can be inherently superior to the sterile analysis of trends because it will take into consideration the untidy emotional and cultural factors inherent in the ‘ends’ that justify the technological ‘means.’ In the process, Silicon Valley will be able to minimize the separation between technology and ethics, culture and tools. It may even be able to usher in a new age of complementary thinking styles based on harmony between science and religion, tangible and intangible, fact and
faith, optimism and fate. In this sense, Silicon Valley’s unique balancing act may be a harbinger of what post-industrial society has in store for the world.

2.2 Future Winners and Losers in Global Outsourcing

An overview of the last five years, showed that Indian IT firms have established a dominant position in the global offshore market by capitalizing on two natural advantages: access to a large well educated, English-speaking workforce and a low wage structure compared to that of Western countries like the U.S. However, this localized, wage-arbitrage-based business model, which has worked well for Indian firms in the past, is now being challenged on multiple fronts. Other low-wage countries like China and the Philippines have entered the market, leading to severe pricing pressure and a proliferation of supplier choices for customers. At the same time, traditional onshore consulting firms like Accenture and IBM have realized that they can set up their own operations in India and reap the benefits of lower costs without involving local IT players.

As a result, the requirements for success are changing rapidly in the global outsourcing industry. Between the onshore and offshore models, it is unlikely that either one will entirely triumph over the other in the long term. Instead, future winners in this space will be decided by the ability to deliver the following competing benefits: (1) seamless integration of a low-cost model with high-value-added, custom-built services; (2) reliance on deep client knowledge and tighter relationships to create unique, organization-specific solutions; (3) establishment of highly efficient global delivery networks that optimize cost, schedule and quality to provide maximum value to clients. North America 49%, W. Europe 31%, Asia Pacific, 5%. Japan 10%, Latin America 5% are the major consumers of IT services in the world.
The global market for outsourced IT-enabled services is expected to grow from $125 billion in 2000 to $301 billion by the end of 2004 (CAGR of 25 percent) (Scholl 2001), including $135 billion from business process outsourcing (BPO), $85 billion from IT infrastructure outsourcing (ITO) and the rest from application outsourcing activities. North America is the largest consumer of IT services (49 percent), followed by Western Europe (31 percent) and Japan (10 percent) (see exhibit 1). The industry as a whole is highly fragmented, with the top five players holding a combined market share of less than 20 percent.

Global Consumers of IT Services:

Off shoring currently constitutes about 20 percent of this market. However, since lower costs typically drive the decision to outsource, it is no surprise that off shoring is becoming increasingly popular. For example, total costs for similarly qualified professionals can be as much as 40 percent lower if services are performed offshore (Heeks 1996). Some estimates indicate that offshore outsourcing increased from 12 percent of U.S. IT budgets in 2000 to 28 percent in 2003. A number of developing economies have started to offer an attractive blend of high quality skills and lower costs, making them serious contenders in this space. Foremost 1 BPO refers to the operation and maintenance of non-core business functions like customer service, finance, human resources and R&D by a third-party vendor. ITO consists of activities like network maintenance and back office operations. Application outsourcing is the term reserved for activities like content development, engineering design and animation.

Two Comment by Accenture CEO Joe Forehand in "IT’s Global Itinerary: Offshore Outsourcing Is Inevitable," Computerworld, among these countries are India, Ireland, China, the Philippines and Russia. A comparison of the relative strengths and weaknesses of these countries, as outsourcing destinations. Based on factors like, Government Support; Labor Pool,
Infrastructure, Education System, Cost Advantage, quality, Cultural Compatibility, and English proficiency. India, the Philippines and Ireland appear to have the best overall resources for success in IT services. While the first two countries have performed well, cost advantage is such a powerful factor that Ireland, which has a highly talented labor pool, is being forced out of the basic IT services market by lower-wage countries like China, which are building new resources in infrastructure and skilled labor. The current status of the IT sector in each of these countries is as follows.

Indian Scenario:

India, owing to its low labor costs, large English-speaking population and abundant supply of engineering graduates, has captured the lead in the global offshoring market, with about a 55 percent share. Last year, India's software and services exports grew 30 percent, to $12.5 billion and they are expected to quadruple by 2008, creating more than two million new jobs in the IT sector. After mastering back-office IT services like network maintenance and software development, Indian firms are moving up the value chain to more sophisticated ones like BPO, R&D and consulting.

The rapid growth of the IT sector has spawned hundreds of players of varying sizes and specialties, leading to a fragmented marketplace. However, there are five major players—Wipro, Infosys, TCS, Satyam and HCL—each with annual revenues in the $500 million to $2 billion range. Below these top players are 10 to 20 mid-tier players, with revenues ranging from $50 million to $500 million. The bottom tier comprises hundreds or even thousands of start-ups and small companies. As the industry moves toward high-end value-added services, the Big Five are developing a reputation for quality and on-time delivery that is allowing them to garner a disproportionate share of new and large contracts. In just the last two years, Big Five market share has increased from 19 percent to 26 percent. This is putting pressure on smaller and mid-tier players to consolidate their operations in a bid to retain competitiveness.
Ireland.

Ireland has always been a premier destination for IT services for a multitude of reasons: low taxes, skilled labor, native English language skills and proximity to the U.K. and other European countries. In the early '90s, corporate tax rates as low as 16 percent helped bring significant foreign investment to Ireland. But over the last three years, lower wages in China, India and Eastern Europe have eclipsed Ireland's cost advantages, spurring many global companies to scale back or cancel plans for Irish operations. In response, Ireland has changed its focus in the IT sector from the low-end services market to the higher-end software and R&D segments. This has helped the sector emerge from its recent slump, with 4 to 5 percent growth expected in the coming years.

China.

Like India, China possesses an abundance of skilled technical graduates and low labor costs. However, until recently, the nation's IT industry was focused on hardware, and the lack of English-speaking professionals was a barrier for its entry into Western markets. In contrast, due to its geographical proximity and cultural similarity, Japan has always been a favored destination for China's IT services industry. The leading providers off-shore IT services are, India 55%, China 9%, Russia 5%, Mexico 8%, Ireland 8%, Malaysia 5%, Philippines 5%, Singapore 5%. Lately, the Chinese government has been lending an active hand to industry in developing the domestic IT service sector. The China-India Software Association, formed in November 2003, is collaborating with Indian IT firms to establish 20 technology parks across China. Large Chinese firms like Legend, the PC Giant, are expanding into consulting services through a series of acquisitions and joint ventures. As a result, the Chinese ITES sector is expected to grow from $255 million in 2002 to $1.1 billion in 2006 (CAGR of 43 percent).

Philippines.

In addition to the third-lowest salary levels among countries that provide offshore services ($234/month), the Philippines has the third-largest English-speaking population in the world. The Philippines are also emerging as a serious
competitive force in areas like BPO, software development, animation, transcriptions and engineering design. A private-sector-led group of firms called Outsource Philippines is now collectively marketing the country’s BPO services as a brand, a move that promises to heighten competition in that sector.

Russia.

On a per capita basis, Russia has the third-highest concentration of engineers and research scientists in the world. As a result, the country has carved a niche for itself in higher-level software engineering and R&D. The output of the outsourced software and services sector has grown to $200 million per year. However, a shortage of project management and English language skills, poor telecom infrastructure and the smaller scale of domestic IT firms have prevented Russia from capturing a larger share of the global IT services market. Going forward, as skilled-labor shortages in locations like India are balanced by the then rapid development of the talent pool in countries like China and the Philippines, the choice in suppliers will inevitably broaden, and significant geographic fragmentation is likely to occur.

Changes in the Global Outsourcing Industry

Increased Competition among Suppliers in Low-Wage Countries Until now, Indian IT majors have reaped the benefits of the significant wage differentials between India and western countries. As an example, the average cost per full-time employee for an India-based BPO operation is only 20 percent that of a similar outfit in the U.S. Similarly, according to Nishith Desai Associates, a tax and legal consulting firm, labor costs (including training and benefits) account for only 33 to 40 percent of a typical call. Legend recently purchased a 51 percent stake in Han consulting and received 71 percent in the formation of a joint venture with AI Software that will focus on the development of IT services for the insurance industry.

Alok Aggarwal, “The Future of IT Industry in India and China,” Evalueserve PowerPoint presentation, May 30, center’s costs in India, compared
to 67 to 72 percent in the U.S. or U.K. Numbers like these have allowed Indian firms to post growth rates in excess of 50 percent over the last three years. However, the resulting boom has also attracted the attention of other countries. PricewaterhouseCoopers estimates that in 2003 alone, billing rates among Indian IT firms declined by 15 percent owing to aggressive competition from China and Russia.

While billing rates are dropping, the lack of qualified professionals is making it increasingly difficult for Indian IT majors to satisfy demands from local sources, which is leading to high wage inflation. For example, salaries for Chinese programmers are half of those of their Indian counterparts. Indian firms will need as many as 800,000 software engineers by 2007, compared to 340,000 in 2000. However, the intakes at local technology institutes in 2002 were only 165,000. China, with a total of 470,000 software and hardware Professionals, is expected to fill the gap.

In spite of these challenges, Indian firms are expected to continue their leadership in this sector for at least a couple of years. The project management and quality control processes that these firms have built are helping them reap huge dividends in terms of productivity and cost efficiency. In contrast, Chinese firms have “thin” project management capabilities, necessitating the hiring of expatriate professionals at higher salaries on Chinese projects. However, China is rapidly trying to improve its capabilities in this area.

For example, the Shanghai Pudong Software Park, is accelerating the transfer of process knowledge to local firms by offering free rental space to Indian firms like Satyam Computers.

IT Services market be distributed on a geographical basis

Over the next decade, the industry is likely to evolve into multiple “global centers of excellence” which will garner the lion's share of work in particular service areas based on their unique competencies. The question of which
countries and firms will emerge as leaders in this new space depends on their flexibility and willingness to adapt to changing client demands and business conditions. An example of how the proactive development of capabilities can change the dynamics in a given sector is provided by the scenario unfolding in the call center market. Traditionally, the Philippines were the favored destination for call center outsourcing because nationals from that country speak English with an accent that is favored by U.S. and European customers. However, in recent months, Indian call center firms have eroded this advantage through "accent neutralization".

8 Prachi Verma, "Billing Rates down 15% for Indian IT Cos: PwC," Financial Express, December 4, 2003, training programs for their employees, which is enabling them to capture the lead in this fast-growing market.

Offshore Service Operations by U.S. Clients and IT Consulting Firms:

A number of Fortune 500 clients have realized that they can reap greater cost savings by cutting out the middlemen and establishing their own overseas operations. The formation of a foreign subsidiary also allows these firms a greater flexibility in scaling up future operations, and tighter integration of overseas operations with the rest of the enterprise. The added benefit of establishing an in-house base is the elimination of security and consumer privacy risks that is typically associated with hiring a third-party vendor. In industries like pharmaceuticals, intellectual property protection is also a major issue, as countries like India are still in the process of refining their patent protection laws. All these problems can be avoided by organic expansion. However, while such moves are a smart choice for U.S. clients, they hurt overseas IT vendors on two fronts: they lower the potential revenue base and they raise labor costs by increasing the competition for talent. GE's experience in India is an excellent example of how to execute such a strategy. The company initially entered India in 1992 with joint ventures in its plastics, medical systems, appliances and lighting businesses. However, it soon realized that India's true potential lied in its vast pool of highly skilled manpower. Today, GE has multiple software and R&D
centers in India, which saved the company $250 million in 2001 and could ultimately reap annual savings of over $600 million. GE's India operations generated more than $1 billion in revenues and orders in 2003, and its BPO arm (GECIS) employs more than 17,000 people. Global IT service giants such as IBM and EDS are also eyeing locations like India and China with great interest. While these firms are growing globally at 5 percent to 6 percent a year, some of their offshoring counterparts are experiencing growth rates in excess of 50 percent. Moreover, clients are demanding cost savings that match with what the competitors are offering.

Which factors force these firms to develop an offshore presence? As overseas IT firm moves up the value chain from software code writing and applications development to more complex assignments like BPO and systems integration, they are encroaching on service areas that were once the exclusive preserve of firms like Accenture and EDS. In response, U.S. companies are aggressively moving into the Indian market through acquisitions, partnerships and in-house investments. For example, IBM recently acquired Daksh, one of India's largest BPO firms specializing in call center operations, for $140 million. The plan is to merge Daksh's localized knowledge of process efficiency with other companies. Global leadership in areas like Customer Relationship Management (CRM) and business transformation. With this acquisition, IBM's total strength in India now exceeds 15,000 employees and its local partnership has grown from 200 to 375. Such moves have helped IBM double its revenues from India over the past three years. Therefore global business is growing with an increased pace which has lead to competition in the areas of labor cost, price, quality, location cost and at same time cultural adjustment of foreign MNCs and their Indian counterparts and employees in these organizations and their level of satisfaction and expectation from their employers.
2.3 List of 150 Software Companies of Silicon Valley:

The Silicon Valley 150 ranks public companies headquartered in Santa Clara, Santa Cruz, Southern San Mateo and Southern Alameda counties on the basis of worldwide revenues ("Sales") for the most recent available four quarters. Most results are for the four quarters ended on or near Dec. 2005. The 1-year percentage change in sales is measured from comparable results most recently reported by companies for the same periods during the year before. Ranks for 2004 are based on revenues reported at the time for those periods.

"Profit" rankings are based on net income applicable to common shareholders, and includes results from discontinued operations, restructuring and merger-related expenses, investment gains or losses, gains on extinguishment of debt, as well as any amortized or non-recurring charges. "Profit margin" is calculated by dividing the company's net income for the most recent four quarters by its sales for the same period. Market capitalization -- the number of shares outstanding multiplied by the price of a single share -- is as of March 31, the last trading day of the first quarter of 2006. Dollar figures are in millions. Losses are in parentheses. The information was compiled by Jack Davis from information supplied by Bloomberg Financial Markets, Securities and Exchange Commission filings and company reports. List of 150 Silicon Valley Company's enclosed in annexure.

2.4 Indian Software Industry: Strategic Review

2006 was a year of steady growth with gradually increasing optimism for the global IT-ITES sector. Increasing outsourcing adoption and maturing global service delivery were the key drivers of growth. Worldwide spending on information technology (IT) and IT-enabled business services (together referred to as IT-ITES) grew by nearly seven per cent in 2005, on the back of healthier spending across key markets of the US and Western Europe, and strong growth in emerging markets. Outsourcing continued to be the primary growth engine
with global service delivery forming an integral part of the strategies adopted by customers as well as service providers.

The year 2005 also witnessed the coming of age of the Indian IT multinationals with the traditionally India-centric, indigenous players beginning to build noticeable global presence – through cross border acquisitions and organic growth in other low cost locations. This was complemented by global majors continuing to significantly ramp-up their offshore delivery capabilities – predominantly in India, vindicating the success of the global delivery model and highlighting India's increasingly important role in the new world IT order.

India's unparalleled attractiveness as an IT-ITES destination is now a well-known fact. However, demonstrated IT-ITES prowess is not the only factor attracting international investors to the country. Strong economic prospects backed by sound fundamentals of favorable demographics and investment ratios, human capital, trade openness, increasing urbanization and rising consumption spending make India an attractive investment destination – as a sourcing base as well as a significant market.

For India to fully capitalize on the opportunity and sustain a disproportionate lead in the global IT-ITES space, key stakeholders need to focus on five key areas; a) enhancing the talent pool advantage – focus on skill development to better leverage the world's largest working population, b) strengthening urban infrastructure in existing (Tier I) and emerging (Tier II and Tier III) cities and continued emphasis on proactive regulatory reform to facilitate greater ease of doing business, c) driving a philosophy of operational excellence amongst industry players (across the board) to ensure that India based delivery sustains world-leading benchmarks in performance, d) catalyzing domestic market development, and e) actively promoting an uncompromised agenda towards global free trade.

Recognizing the potential of the sector and the opportunity it holds for the country, relevant constituents of the key stakeholder groups are actively engaged in developing and implementing initiatives that will strengthen India's bid for sustained leadership in this space. Successful execution of these initiatives
affected through a concerted effort by the key stakeholders, including the government, industry and NASSCOM, and the academic community will ensure that India achieves its full potential IT Export may touch $30 billion – Nasscom (National Association of Software and Service Companies). IT and BPO industry is expected to grow by 32% percent and export could be over $30 billion. Releasing the Nasscom-McKinsey Report on the IT and BPO sector, Nasscom chairman B. Ramalinga Raju said if the current growth is maintained export may hit $75 billion by 2010 surpassing the earlier target of $60 billion. Mr. Raju said that even if the industry grows at 24% in the next three years, the industry will achieve the target of $60 billion by 2010. As per the report the industry size globally is $800 to 900 billion and the Nasscom-McKinsey report has pointed out $300 billion as being the addressable market as far as offshore opportunities are concerned. The report found that the BPO industry data operations are generally performing better than voice operations primarily due to higher retention rates resulting from effective training and employee engagement practices. The study found that a Mumbai based provider has been able to deliver superior cost and quality performance compared to BPOs in cities like Chennai because of low attrition rates, and optimal skills and tenure mix among employees and higher infrastructure utilization.

Flexible work culture leads to an increase in profitability and productivity

Anitto Kasvio at the University Of Tampere is working on the changing work culture and development of flexible work arrangements in Finnish companies. A cohort of 5000 British Managers (2001) were taken in a quality of working life survey. It was seen that flexible work culture led to increase in job insecurity, lowered morale, erosion of motivation, and most important erosion of loyalty, though it did lead to increase in profitability and productivity.

The flexible (contractual) culture as in individualistic work culture which neither expects protection nor owes loyalty.

If we consider Hofstede's framework of value we can say that countries which are high on collectivism are characterized by a tight social framework in
which people expect others to look after them and protect them when they are in trouble. In exchange for this security they feel they owe absolute loyalty to the group. The people of a country high on collectivism (i.e. India, Japan) are predisposed towards such a collectivistic culture and exposure to a different work culture produces inherent contradictions. The individualistic work culture, as in flexible (contractual) culture, lacks this psychological contract and people neither expect protection nor owes loyalty. These young professionals do not trust the welfare state (example retirement benefits) as the older generation did. Therefore they try to guarantee their professional career and try to take care of personal finances. Impacts on social and emotional aspects suggest that these people may develop certain narcissism in their attitudes which may develop to the "Corrosion of Character" (Richard Sennet 1998). A new category of net slaves may develop (Lesser and Baldwin 1999). When people have developed a strong emotional dependence to their work and work based social relationships. They have very little to build upon if they lose.

Figure: 2.1 various services Provided by Indian Software Companies:
The Indian IT services industry faces dramatic changes, challenges, and constraints as it uses the global delivery model to transform itself into a knowledge leader competing with established global giants.

Even though the entire Indian IT services industry represents less than a quarter of IBM Global Services, it is having a dramatic impact on the global consulting services industry. Giants like IBM, Accenture, Electronic Data Systems, and Deloitte are expanding rapidly in India to benefit from the low-cost, high-quality workforce, while Indian software firms are expanding in the US to create the closer customer relationships required to compete in providing high-end consulting services. This cross-movement of jobs and labor will create an interesting competitive dynamic as the cost structure converges and firms compete to provide knowledge leadership—concept, technology, and process innovation. To become recognized global brands and move up the value chain, Indian software firms must promote knowledge leadership, create incentives to innovate, and foster efforts to enhance cultural alignment.

Global Delivery Model

The Indian IT services industry continues to make inroads into the global marketplace with its global delivery model (GDM), which uses a mix of onshore and offshore development. In 2005, the three biggest Indian IT service firms—Infosys, Tata Consultancy Services (TCS), and Wipro—surpassed $2 billion in revenue and reported an astounding compound annual growth rate of more than 30 percent). The GDM leverages the low-cost, educated workforce of India and other emerging economies to provide quality, cost-effective services to the developed world. GDM’s impact on the global IT services industry is profound and irreversible.

Two-way job movement

Due to dramatic cost advantages overseas, the GDM puts significant economic pressure on US firms to adopt a competitive offshore-onshore development strategy. Major IT services companies such as IBM Global Services, Accenture, Ernst & Young, Deloitte, and Electronic Data Systems are
aggressively expanding in India to benefit from the GDM. A competitive response leads to a bandwagon effect. When one major firm sets up an offshore subsidiary to generate a competitive advantage, others will follow quickly. Thus, US firms are currently hiring a staggering number of Indian software professionals. However, the movement of labor and work is not just unidirectional. While Indian IT executives often talk about moving up the value chain, their firms are unlikely to capture large projects—more than $100 million—or mega contracts—more than $1 billion—without an extensive onshore presence.

Cultural alignment and closer customer relationships are keys to compete successfully in providing high-end consulting services. Further, the perennial uncertainty of obtaining US work visas creates project planning and management risks. Recognizing these difficulties, Infosys, TCS, and Wipro recently acquired consulting firms and hired hundreds of software professionals from the USA.

Cost structure

The two-way movement of jobs and labor creates interesting implications for the future. As Indian firms expand in the US, their cost structure is certain to increase. In contrast, as US firms expand in India and other developing economies, their cost structure is likely to decrease.

Since US firms often hire managers and software professionals who have gained experience by working at established Indian firms, the labor cost for Indian firms is expected to increase as they compete to retain talent. Unless the Indian educational system can produce a large number of high-quality new graduates to meet the demand for IT workers, there will be a gradual movement of work to other emerging countries.

Such adjustments are already taking place as Indian IT services firms have begun establishing subsidiaries in China. Off sourcing and outsourcing to low-wage countries such as China and the Philippines is obviously a further consideration for US firms. IBM is already expanding aggressively into China by
opening a new development center in Dalian. Thus, the ratio of offshore-onshore development and the extent of each country's presence in the other, will adjust according to labor coordination costs and risks. Coordination costs will decline as both providers and customers learn to work within the GDM. In contrast, labor costs and risks, to some extent, will increase. When equilibrium in the cost structure eventually occurs, the remaining question will be whether Indian companies can develop the characteristics required to compete in the global marketplace and capture large and mega contracts.

2.5 Indian IT Growth Stages

For some Indian IT firms, moving up the value chain means providing end-to-end enterprise or vertical solutions for the retail, energy, government, and manufacturing sectors. Five stages in the growth trajectory required for Indian IT firms to compete effectively. So far, the industry has closely followed the first three stages of this trajectory.

- **Stage 1:** Firms rely on very small projects, of less than $100,000, focusing on IT-centric, and low-cost routine tasks such as testing or low-end programming, which is mostly performed offshore. All Indian IT firms began at this stage.

- **Stage 2:** The focus is on small-scale and low-end medium-size projects of up to $1 million. The firms continue to provide low-cost service, but with greater emphasis on quality and reliability. The projects involve some onsite development, which typically constitutes less than 20 percent of the total project cost. Firms establish their software development capabilities and quality-enhancing processes through certifications such as the Capability Maturity Model (CMM) and high-quality infrastructure.

- **Stage 3:** Firms develop capabilities for providing a wide range of products and services such as vertical solutions. They develop a reputation for successfully managing small- and medium-size projects in the $1 million to $50 million range using the GDM. These firms establish a minor onshore presence through subsidiaries while demonstrating their ability to provide high-end business consulting.
• **Stage 4:** Firms set up onshore subsidiaries for consulting and software services and export the model to other developing countries to leverage wage differentials. The percentage of non-Indian employees continues to increase. At this stage, firms are more likely to capture high-end medium-size ($50 million to $100 million) and large-scale ($100 million to $1 billion) projects. They begin to play a vital role in major companies' value chain and establish lock-in and economies of scale. They focus increasingly on R&D for next-generation technologies and business practices, and they play an important role as major trendsetters and knowledge leaders.

• **Stage 5:** Firms rapidly expand globally with country-specific cultural alignment and adjustments. Extending the knowledge frontiers through cutting-edge research and technologies, they are capable of winning and successfully managing multibillion-dollar contracts using an onshore-offshore business model.

• The big three Indian IT services firms are currently transitioning from stage 3 to 4. However, the transition may not be smooth as they are likely to encounter many hurdles. While these firms can continue to grow at 30 percent or more with numerous small- and medium-size low-end projects, scalability and management will become increasingly challenging. To successfully move to stages 4 and 5, firms must position themselves as knowledge leaders.

**Knowledge Leadership:**

The key to continued growth of Indian firms relies on their ability to project themselves as knowledge leaders. In association with IT services, knowledge leadership spans three, somewhat overlapping categories: technology innovations, concept development, and process leadership.

**Technology leadership**

Indian IT firms have established a high standard in software development, but now they must gain credibility by innovating next-generation tools, language, technology concepts, and standards. Previously, Indian IT firms
successfully introduced a few domain-specific packages on platforms built by others. Now, they should develop the ability to influence industry standards, propose architectural framework, and promote concepts such as component technology. Developing such capabilities requires a culture of innovation and a system that offers incentives to reward success. However, rigid processes such as CMM certification that has helped these firms to become known for quality, might not necessarily encourage innovation. In fact, rigidity can stifle unconventional practices even when they might have a positive influence on innovation.

Forming proactive partnerships with universities in both curriculum development and basic and applied research could benefit Indian IT firms. Many such companies have been successful in providing software and packaged curriculum to train students in using specific tools. Although such training may have short-term benefits, it does not prepare future professionals to become knowledge leaders. Thus, Indian firms must focus on the next step in developing the human resources through a greater involvement in local universities, in research and technology creation.

Concept leadership:

Large US-based consulting firms often strive to showcase their leadership through cutting-edge business and technology concepts such as client-server computing, electronic commerce, collaborative computing, knowledge management, grid computing, or peer-to-peer computing.

One example is IBM's OnDemand business environment, which addresses business problems that persist despite numerous technological innovations. Although the on-demand concept is not new, IBM has successfully positioned itself as a leader in using technology to solve business problems and as having the capability to provide end-to-end services for dynamic business endeavors.

While Indian software firms have mastered the onshore-offshore development model, US firms are attempting to catch up by hiring software professionals from large Indian IT firms. It is very likely that in a few years, the
productivity and quality of services in both US and Indian firms in a GDM will converge.

**Process leadership:**

US firms have a long tradition of pushing process innovation. The intense competitive environment and the demand for higher productivity have forced firms to develop innovative processes that provide a competitive advantage, at least for the short term. Process innovation often results from observing inefficiencies or adopting emerging technologies developed at universities and in research laboratories.

One such process innovation is using radio frequency identification tags in the supply chain. Companies can use technologies such as RFID to create new business processes that have a profound impact on the bottom line, in a highly competitive, low-margin, retail business.

High-end consulting firms must articulate emerging processes and help implement innovations. An example of this is Cemex's use of wireless and handheld devices for dynamic synchronization of operations to provide mixed concrete within 20 minutes' time rather than the prevalent three-hour time frame. Although they will encounter both internal challenges and external constraints during the process, Indian firms must acquire these knowledge leadership capabilities if they are to compete successfully for large and mega projects.

**Changes, Challenges, and Constraints**

The internal challenges that Indian firms must face include the need to expand their presence in developed and other countries by hiring local talent and collaborating with universities. Innovation in providing software services often comes from observing existing business practices and identifying the problems that potential customers face. While Indian firms have been benefited from attracting former residents who have returned from the US with a wealth of knowledge and experience in business practices, they now need to seek culture-
specific talents such as familiarity with work culture, laws, social norms, and government bureaucracy.

**Intellectual collaboration**

Even though they might not be beneficial until decades later, IT firms need to create and support long-term collaborative research efforts with universities and research labs. IBM, for example, has supported university research that did not produce immediate benefits, but the efforts attracted outstanding faculty to share their latest research findings and collaborate with universities on next-generation technologies such as copper chips, nanotechnology, and bioinformatics.

While forward-looking Indian IT firms such as TCS and Infosys have affiliations with MIT and the Wharton School of the University of Pennsylvania, respectively, firms generally are not accustomed to the culture of research collaborations. University relationships have been limited to building brand recognition and are confined to case studies, rather than developing knowledge leadership. Collaboration with Indian universities appears to be limited, only for writing case studies or training students by providing software and packaged curriculum for specific projects that might serve the company on a short-term basis, but does not prepare future professionals to become knowledge leaders.

Indian firms must be proactive to partner with universities not only in IT curriculum but also in basic and applied research. They must focus on the next step to develop their staffing resources through increased involvement with local universities in research and technology creation.

**Transformative Training:**

Internal training for professionals must expand beyond IT-centric or project management skills that firms such as Trilogy Software have championed. Transforming an organizational culture requires an entrepreneurial environment that promotes the creation of new technologies, concepts, and
processes. Further, software professionals who interact with the customers must speak both the business and customer language.

Management must alter incentives and organizational processes to foster innovative thinking, which is inhibited by cultural traits such as obedience, subservience, or nepotism—affecting organizational performance and dynamics. Indian firms must challenge established practices and support their workers in pursuing unconventional thinking that encourages innovation.

Most Indian IT firms face significant challenges in retaining talent in an expanding market with increased competition from global competitors. Indian IT software executives acknowledge that they have a difficult time recruiting skilled workers and they find it even more challenging to retain their trained staff. Narayan Murthy, the co-founder of Infosys, recently suggested that 75 percent of engineering graduates are not employable. Early evidence also suggests that some experienced software professionals are leaving large Indian software firms to launch their own startups, akin to their counterparts in the US. For example, after IBM acquired Tivoli Systems, its founders and more-experienced employees went on to create numerous other startups. Indian firms are likely to face challenges as they endeavor to retain talent and ideas.

**Infrastructure Impediments:**

In addition to the need to develop an employable workforce, the Indian IT industry must contend with significant infrastructure limitations as well as complex political and socio economic factors which have a significant impact on the domestic business environment. In response to infrastructural challenges, IT firms have explored options such as airlifting foreign clients from airports to work in their facilities and building five-star hotels on their premises. However, these efforts are unsustainable. The infrastructure in major IT hubs like Bangalore has nearly collapsed, leading to huge productivity losses. Most IT professionals spend three to five hours commuting to work every day. Further, an issue that has attracted little attention is the need for coordination with workers in developed countries, which often led to long working hours, eventually resulting in burnout and productivity losses.
While IT firms have taken a keen interest in influencing Indian federal and state governments to improve the infrastructure, the results have been mixed. However, awareness of the existing problems and the need to develop and improve the infrastructure beyond a few IT hubs is growing.

Despite a large number of English-speaking engineering graduates, Indian firms are facing excessive employee turnover (Indian software executives acknowledge that firms have a difficult time identifying and recruiting talent, and they find it even more challenging to retain workers once they have been trained).

Leading Indian software firms have taken significant steps to become truly global. They have begun to acquire US consulting and technology firms, and they have hired experienced consultants to help develop an onshore presence and improve business-consulting capabilities. These initiatives are a radical shift in Indian firms' corporate strategy and culture. There is an increasing awareness of the need to develop a global workforce and to achieve cultural alignment without focusing excessively on Indian software prowess. Infosys, for example, has established InStep, an internship program that recruits employees from more than 30 countries, including the US).
Challenges still exist for Indian firms to project themselves as knowledge leaders. Only a few have actively partnered with universities or have R&D capabilities to create technology, concept, and process leadership. Knowledge leadership will still be elusive in the near future, but without it, current global giants will continue to provide high-margin, cutting-edge solutions. However, Indian IT companies will continue to impose pricing pressure on established, global companies for other types of IT solutions until the cost structures converge. Although leading Indian firms are likely to compete as knowledge leaders globally, in the future, a vast majority will continue to struggle. Many small and medium-size Indian IT firms will have difficulty coping with hiring and retaining talent and cost appreciation. Firms which transition cannot do quickly could become targets for acquisition by US firms.
Most Corporate cultures are articulated through formal policies and 'mission' and 'vision' statements, and are imparted to employees through subjective as well as overt techniques, including induction workshops, collective rituals such as team meetings and social events, visible use of slogans and symbols, the circulation of corporate myths, and the actions and words of charismatic top executives. Most large software companies in Bangalore employ such techniques to infuse employees with their corporate cultures and global work practices. In the case of the software development centers of foreign-based multinationals, the primary task is to transmit the pre-existing corporate culture to the Indian centre and its employees, with or without culturally appropriate modifications. The Indian software majors, on the other hand, have manufactured distinctive corporate cultures that integrate 'global best practices' which are considered to be positive aspects of 'Indian work culture' The idea of culture operates at several different levels in the Indian software outsourcing industry. First, software companies consciously construct specific 'corporate cultures', a strategy that is linked to a shift in the theory and practice of corporate management away from direct forms of control, exercised through hierarchical bureaucratic structures, towards more 'open' and flexible structures and indirect forms of control. Under the new system, employee behavior and loyalty are managed through their induction into a strong company culture, which operates as a system of subjective or 'normative' control (Kunda 1992). The Indian software industry (at least the large service companies and the multinationals) has self-consciously replicated these strategies, at least in theory, so that employees are expected to accept and conform to the company's culture and identify themselves closely with the company itself.

The 'engineered' cultures of software companies are explicitly articulated in documents such as 'mission statements' and statements of company 'values' that are easily available on their websites and in official documents. The 'mission, vision and values' are transmitted to employees through various media, including training programmes, oral traditions about the company's history, and company events such as 'all hands meetings'. Working areas are littered with
inspirational and didactic posters and slogans that reproduce elements of the corporate ‘mission’ or code of ethics, urge employees to work harder and to be innovative, or invite employees to participate in social events. The workspace itself is carefully designed to reflect the company’s culture and to reinforce the corporate image. For instance, most MNC software development centers provide posh facilities for their employees, with spacious workstations, free flow of good coffee and food, and recreational areas. This environment is meant to erase any differences in working conditions between the corporate headquarters and the Indian subsidiary, and the material surroundings promote employee identification with the parent company.

A major avenue for the transmission of corporate culture is the induction programmes held for new employees in most of the companies. In these sessions, senior managers and Human Resources staff conveys the company’s philosophy, values, and purpose, and explains the corporate structure and management policies, and transmit crucial elements of the culture through stories and jokes. Induction programmes are more than information transfer events, and can be interpreted as rituals through which the process of incorporation of subjects into the dominant culture is initiated. For instance, in an induction workshop at Sun’s IEC, the company’s famous founder-chairman Scott McNealy was featured in a video speaking directly to new recruits and enjoining them to ‘be proactive’, ‘think out of the box’, ‘break the rules’, and to ‘kick butt and have fun’. Over the course of the day, the company’s culture is clearly defined in terms of concrete qualities such as ‘innovation’, ‘individuality’, informality, team play, and fun and these values were conveyed to participants through anecdotes and group exercises. For instance, the trainer told stories about the exploits of Scott and the other founders, relayed the company’s founding myths, and illustrated the ‘fun’ culture of the company with accounts of elaborate April fool’s jokes played on top managers.

Another way in which corporate culture is enacted and reproduced is through collective rituals such as meetings and conference calls. Team meetings are often conducted in a ritualistic manner according to clear norms of behavior, communication, and interaction (often including a studied informality and
bonhomie), and as such they are an important means through which employees are socialized into the company culture. For virtual teams or multi-sited projects, conference calls are a frequent and crucial site for the representation of corporate culture - either from the Indian service provider to the foreign client, or from the MNC headquarters to the Indian subsidiary. The management of such interactions is a central area of concern for software companies, which companies attempt to control by training engineers and managers in 'soft skills'.

Organizational Structure

Since the 1980s, the preferred structure of the modern corporation has shifted from the earlier hierarchical, bureaucratic, centralized model with direct systems of control, towards a more open, 'flat' and democratic structure that is supposed to empower rather than regulate employees. The change to flexible and dispersed production, facilitated by new communication and information systems, has led to decentralization of work systems, diffusion of power and decision-making, and the proliferation of cultural rather than structural tactics for gaining employee consent. A central feature of the new work systems is self-management of employees, which has been made possible by digitalization and computerization of the workplace (Gephardt 2002:335). Work is driven by the ethics of individualization, in which workers (especially professionals and technical labour) focus on completing individual deliverables (Perlow 1997:34) and on doing high visibility work to achieve personal goals. Because speed of the market is crucial in the new economy, organizational success is contingent on working long hours, and workers view spending the largest part of their waking hours at the workplace as necessary for career success (Perlow 1997, Gephardt 2002). These features of the 'new workplace' are typical of the Indian software industry as well.

Corporate culture and control

Most HR managers of software companies stress that their work culture is non-hierarchical and, informal. Also employees are given a lot of freedom to decide on how to complete their work (for instance, in 'flexi-time i.e. working
At the same time, software development projects are heavily time-bound and involve the close coordination of a number of people and activities across different locations, governed by strict deadlines. Management strategies based on the idea of individual initiative and responsibility within an overarching 'cultural' system are oriented to achieving a balance between these two demands.

Cultural control over the work process is implemented in part through the organization of employees into teams. A team may consist of five to ten engineers or more, led by a team leader, and several teams together may work on a project, led by a project manager. This mode of organization is ubiquitous in software companies, even when there is no clear cohesion within a team in terms of the actual work to be done (often individual engineers are involved in several different projects at once, working with engineers from different teams). Because the logic of team-based organization does not necessarily flow from the organization of software production itself, one must assume that it has a different function – that of normative as well as direct control over the work process. Although corporate spokespersons and employees alike stress the informality of relationships and management style in the workplace, teamwork introduces a subtle yet insidiously coercive system of control, for instance by invoking peer pressure in order to enforce deadlines. Teamwork tends to foster competition among members rather than cooperation: individual team members are assessed on the basis of overall team performance (vis-à-vis other teams), which leads them to put pressure on one another to complete the work in time, but they are also assessed on their individual performance, which drives them to compete with one another.

Despite the ideology of teamwork, the larger culture as well as the structure of work in software company is highly individualized: for instance, engineers are made to feel personally responsible for finishing their tasks on time even when faced with impossible deadlines. They are also driven to work longer and harder than others by competition as well as the desire to be 'visible' to
management. Because of this contradiction between the ideology of teamwork and the individualized nature of work, close attention is being paid to forging and managing effective teams through training programmes and other management strategies.

A central feature of the ‘culture’ of the Indian software industry, one that is partially engendered by the system of self-motivation and peer pressure within teams, is what one of our respondents called ‘time slavery’: 10-12 hours on an average workday, and it is not uncommon for employees to work up to 14 hours a day, or even to stay overnight in the office (known as a ‘night out’), when faced with a project deadline. Long working hours are central to the industry’s ‘work culture’, and it is taken for granted that employees will stay in the office at least till 7.00 or 8.00 in the evening. In part this is due to the time difference between India and the client site, such that conference calls tend to take place in the evening when the working day in the U.S. begins. Another reason is that overwork is built into the structure of outsourced projects: project costs and timelines are usually under-estimated in terms of man-days, and because man-days are based on an eight-hour day engineers have to put in extra hours and days in order to meet the deadlines. Extended working hours are legitimized by the common management practice of ‘flexi-time’, which in theory gives the employee freedom to choose his or her working hours (within limits) but which in practice means that they have to work as long as necessary to finish the task at hand. The rhythm of work is regulated by the tyranny of deadlines and project timelines: engineers are always struggling to meet unrealistic deadlines and ‘firefighting’ last minute crises. But even when there is no real work pressure, they tend to stay late in office either due to peer pressure or because they want to show the boss that they are working hard.

Software is a wealth and job creating industry, which has, in just a few years, grown to US $1 trillion, employing millions of professionals worldwide. The Indian software industry has burgeoned, showing a nearly 50% compounded annual growth rate over the recent years. Being a knowledge-based
industry, a high intellectual capital lends competitive advantage to a firm. Intellectual capital comprises human capital and intellectual assets. The latter being any creative bit of knowledge or expertise. With a global explosion in market-opportunities in the IT sector, the shortage of manpower both in numbers and skills is a prime challenge for HR professionals. The related issues are varied indeed: recruitment of world-class workforce and their retention, compensation and career planning, technological obsolescence and employee turnover. This study presents some of the findings of our recent research on the HR challenges posed by the IT sector.

**Workforce Retention and Motivation**

Retention and motivation of personnel are major HR concerns today. People at Gartner Group Company are specialized in the management of human capital in IT organizations. It has observed that the average tenure for an IT professional is less than the three recent survey of 1028 software professionals from 14 Indian software companies showed, that, while the professional gave importance to personal and cultural job-fit, HR managers believed that the key to retention was salary and career satisfaction. Money was a prime motivator for 'starters', but for those who are in their third or fourth job, holds value-addition to the organization as more important. Monetarily, offering 'the best salaries in industry' is the minimum every company is doing, apart from performance-based bonuses, long-service awards, and stock options. Many organizations frequently conduct employee satisfaction and organization climate surveys, and are setting up Manpower Allocation Cells (MAC) to assign 'the right project to the right person'. In fact, some are even helping employees with their personal and domestic responsibilities to satisfy & motivate their workforce.

**Attracting the Best Talent**

In a tight job market, many organizations often experience precipitous and simultaneous demands for the same kind of professionals. In their quest for manpower, they are cajoling talent around the world. In such a seller's market,
software companies are striving to understand which organizational, job, and reward factors contribute to attracting the best talent. One, having the right blends of both technical and person-bound skills. This would mean a knowledge of 'the tools of the trade' combined with conceptualization and communication skills, capacity for analytical and logical thinking, leadership and team building, creativity and innovation. The Indian software industry suffers from a shortage of experienced people such as system analysts and project managers, and attracting them is a key HR challenge.

**Compensation and Rewards**

Increasing demands of technology coupled with a short supply of professionals (with the requisite expertise) has increased the costs of delivering the technology. This makes incentive compensation a significant feature, with the result that software companies have moved from conventional pay-for-time methods to a combination of pay-for-knowledge and pay-for-performance plans. With the determinants of pay being profit, performance and value-addition, emphasis is now on profit sharing (employee stock option plans) or performance-based pay, keeping in view the long-term organizational objectives rather than short-term production-based bonuses. Skills, competencies, and commitment supercede loyalty, hard work and length of service. This pressurizes HR teams to devise optimized compensation packages, although compensation is not the motivator in this industry.

**Encouraging Quality and Customer focus**

Today's corporate culture needs to actively support quality and customer orientation. With globalization and rapid technological changes, quality is of utmost importance for the Indian companies, which earn most of their revenue through exports. Hence, the HR professional as a strategic partner needs to encourage a culture of superior quality to ensure customer satisfaction, the only real measure of quality of a product or service.
Up-gradation of Skills through Re-training

Rapid and unpredictable technological changes and an increased emphasis on the quality of services is compelling software business to recruit adaptable and competent employees. Software professionals themselves expect their employers to provide them with all the training they may need, in order to perform not only in their current projects, but also in related ones that they may subsequently hold within the organization.