Chapter-4

AN OVERVIEW OF INDIAN SOFTWARE INDUSTRY

Today, India is home to some of the finest software companies in the world. The software companies in India are reputed across the globe for their efficient IT and business related solutions. The Indian Software Industry has brought about a tremendous success for the emerging economy.

India, the world’s largest democracy and home for nearly 1.25 billion people is quietly but quickly emerging as a leader in the field of software engineering and development. The Indian software industry is having a phenomenal compounded growth of about 60 percent per annum. The software industry is for main component of the Information technology in India. The technological revolutions has brought about tremendous and unexpected opportunities in the field of information technology which lead to the remarkable success story of Indian software industry. It has grown more than 30 percent over last 20 years. India exports software services to more than 95 countries.

Indian software industry has built up valuable brand equity for itself in the global market. The software firms quickly moved up the value chain, from performing low cost programming abroad to providing comprehensive software development services from India for overseas clients an abundant pool of Indian technical manpower, created a series of elite technical and management institution that responded to serve global shortage of technical manpower.
4.1 HISTORY OF SOFTWARE INDUSTRY

The word "software" was coined as a prank as early as 1953, but did not appear in print until the 1960s. Before this time, computers were programmed either by customers, or the few commercial computer vendors of the time, such as UNIVAC and IBM. The first company founded to provide software products and services was Computer Usage Company in 1955.

The software industry expanded in the early 1960s, almost immediately after computers were first sold in mass-produced quantities. Universities, government, and business customers created a demand for software. Many of these programs were written in-house by full-time staff programmers. Some were distributed freely between users of a particular machine for no charge. Others were done on a commercial basis, and other firms such as Computer Sciences Corporation (founded in 1959) started to grow. Other influential or typical software companies begun in the early 1960s included Advanced Computer Techniques, Automatic Data Processing, Applied Data Research, and Informatics General. The computer/hardware makers started bundling operating systems, systems software and programming environments with their machines.

When Digital Equipment Corporation (DEC) brought a relatively low-priced microcomputer to market, it brought computing within the reach of many more companies and universities worldwide, and it spawned great innovation in terms of new, powerful programming languages and methodologies. New software was built for microcomputers, so other
manufacturers including IBM, followed DEC's example quickly, resulting in the IBM AS/400 amongst others.

The industry expanded greatly with the rise of the personal computer ("PC") in the mid-1970s, which brought desktop computing to the office worker for the first time. In the following years, it also created a growing market for games, applications, and utilities. DOS, Microsoft's first operating system product, was the dominant operating system at the time.

In the early years of the 21st century, another successful business model has arisen for hosted software, called software as a service.

4.2 ORIGION OF SOFTWARE

The birth of the software industry in India began in 1970 with the entry of Tata consulting Services (TCS) into the domain of outsourced application migration work. In the late 1960s, the Tatas created TCS as a central service center for Tata Group companies. A few young MIT-trained Indian professionals were recruited, and a large computer system was imported. With IBM having been thrown out of India, the concept of outsourcing application development work had become a necessity for Indian companies. Utilizing its excess computer capacity, TCS began doing outsourced application work for organizations such as Central Bank of India and Bombay telephones. Within a few years TCS began sending young Indian engineers to a joint venture partner in the United States, Burroughs, for training. The trainee engineers excelled at doing platform conversions, and TCs started earning conversion assignments for its engineers in Germany and elsewhere.
Later a new company named Tata – Burroughs was formed. Tata was keen to exploit the personnel placement or “body shopping” opportunities whereas Burroughs was interested in selling hardware to the Indian market.

The industry was begun by Bombay based conglomerates which entered the business by supplying global IT firms located overseas with programmers. Their success owed to the innovative exploitation of a new global market opportunity and protection from transnational corporations and startups by policy. The explanation on origins is the same as used to explain industry origin in countries such as Korea and Japan – with the difference that while government policy favored large domestic firms and discouraged TNCs and small firms in those countries, in India, government policy disfavored all types but was least hostile to large, domestic firms. In economic terms, the effect was the same as the more typical protectionist policy.

The protected environment restricted the growth of project management and domain skills so that, despite access to a large pool of programmers, the industry could not grow in value – addition.

A decade later, mainframe – based programming and manufacturer-specific operating systems and languages gave way to workstation based programming and standard operating systems and high level languages. These changes modularized the programming function i.e., programming could henceforth be done independently of the hardware platform and from the other functions of creating software, such as system design. This, along with policy reforms that reduced costs of imported hardware and software, caused the
Indian software industry to shift from supplying programmers to supplying software programs. As work moved to India, infrastructural costs increased as a proportion of total costs. This caused the industry to relocate from Bombay to Bangalore.

During the early years of the industry’s third decade, beginning in the mid 1990s, the establishment of the Internet facilitated the separation of services, such as software maintenance and email management, from the site where the software was located. Following telecommunications policy reforms in 1999, this opened new opportunities for domestic firms.

4.3 GROWTH OF SOFTWARE INDUSTRY IN INDIA

The Software Industry in India has gained a brand identity as a knowledge economy due to its IT and ITES sector. The IT-ITES Industry has two major components. IT Services and business process outsourcing (BPO). The growth in the service sector in India has been led by the Software Industry contributing substantially to increase in GDP, employment, and exports. The Industry has increased its contribution to India’s GDP from 1.2% in FY 1998 to 7.5% in FY 2012. According to NASSCOM, the Software Industry in India aggregated revenues of US$100 billion in FY 2012, where export and domestic revenue stood at US$69.1 billion and US$31.7 billion respectively, growing by over 9%. The major cities that account for about nearly 90% of this sectors exports are Bangalore, Delhi, Mumbai, Chennai, Hyderabad, Pune, Kolkata and Coimbatore.
Export dominate the software industry, and constitute about 77% of the total industry revenue. Though the Software Industries is export driven, the domestic market is also significant with a robust revenue growth. The industry’s share of total Indian exports (Mechandise plus services) increased from less than 4% in FY 1998 to about 25% in FY 2012.

This sector has also led to massive employment generation. The industry continues to be a net employment generator – expected to add 230,000 jobs in FY 2012, thus providing direct employment to about 2.8 million, and indirectly employing 8.9 million people. Generally dominant player in the global outsourcing sector. However, the sector continues to face challenges of competitiveness in the globalize world, particularly from countries like China and Philippines.

India’s growing stature in the information Age enabled it to form close ties with both the United States of America and the European Union. However, the recent global financial crises has deeply impacted the Indian Software companies as well as global companies. As a result hiring has dropped sharply, and employees are looking at different sectors like the financial service, telecommunications, and manufacturing industries which have been growing phenomenally over the last few years.

**Recent developments in software industry**

The economic effect of the technologically inclined services sector in India-accounting for 40% of the country’s GDP and 30% of export earnings as
of 2006, while employing only 25% of its workforce-is summarized by Sharma (2006):

The share of IT software in total exports increased from 1 percent in 10 to 18 percent in 2001. IT-enabled services such as back office operations, remote maintenance, accounting, public call centers, medical transcription, insurance claims, and other bulk processing are rapidly expanding. Indian companies such as HCL, TCS, Wipro, and Infosys may yet become household names around the world.

Today, Bangalore is known as the Silicon Valley of India and contributes of Indian IT software exports. India’s second and third largest software companies are head-quartered in Bangalore, as are many of the global companies.

Mumbai too has its share of IT companies that are India’s first and largest, like TCS and well established like Reliance, Patni, LnT Infotech, i-Flex, WNS, Shine, Naukri, Jobspert etc. are head-quartered in Mumbai. And these IT and dot com companies are ruling the roost of Mumbais relatively high octane industry of Information Technology.

Such is the growth in investment and outsourcing, it was revealed that Cap Gemini will soon have more staff in India than it does in its home market of France with 21,000 personnel+ in India.

On 25 June 2002 India and the European Union agreed to bilateral cooperation in the field of science and technology. A joint EU-India group of scholars was formed on 23 November 2001 to further promote joint research
and development. India holds observer status at CERN while a joint India-EU Software Education and Development Center is due at Bangalore.

4.4 CHARACTERISTICS OF THE INDIAN SOFTWARE INDUSTRY

The Indian software sector displays many unusual features from an Indian perspective. The most obvious one is its export orientation, accounting for 65% of the total software revenue. There are important qualitative differences between the export market and the domestic market. The first relates to different types of software developments which, gives the composition of the domestic and export software development and services market, domestic market has a higher proportion of revenues from the sale of software packages and products. Whereas products accounted for nearly 40% of the domestic market, they account for a little under 10% of exports. Over 80% of exports are software services including custom software development, consultancy and professional services.

The second difference between the domestic and export sectors relates to the stages of software development as described earlier, Indian firms usually provide low-level design, coding and some types of testing services for export. For domestic clients the industry provides a wider range of services that usually spans the entire lifecycle of software development. Some of the domestic projects are much larger and more challenging than export projects, with the screen based trading system for the Bombay Stock Exchange and the
Reservation System for Railways, both by executed by CMC, an experienced public sector firm, being two recent examples.

**Domestic**

A large fraction of the domestic software industry consists of resale of software packages developed by foreign, principally US, firms, thus overstating the extent of software written for the domestic market. On the other hand, there is a great deal of in-house software written by users, especially large Indian firms that is not being captured by these figures.

A number of Indian software firms have also developed software packages aimed at the domestic market. However, with very few exceptions, these packages have not been very successful. Although it is tempting to point to weak intellectual property rights as a culprit for the failure of Indian firms to develop successful packages, our interviews suggest that at least as important, if not more, has been the lack of experience, especially design and marketing experience, necessary to produce a successful product.

Firms that have had domestic experience with consulting do not appear to derive any advantage from it in the export market. Given the simpler and more routine tasks involved in current software exports, the sophisticated capabilities and expertise that firms had developed from serving domestic customers have not been of great value to them in the export market.
Exports

As we have seen, Indian software exports consist primarily of software services. The activities carried out by most firms in India are essentially maintenance tasks for applications on legacy systems such as IBM mainframe computers, development of small applications and enhancements for existing systems, migration to client-server systems, often referred to as porting or re-engineering. Y2K projects were an important source of revenue, most of the leading Indian software firms have limit their dependence on such projects. US accounts for over half of all export revenues (58% in 1997-98) compared with 21% for Europe and 4% for Japan.

Managers at most of the US firms we interviewed agreed that the type of work outsourced was neither technologically very sophisticated nor critical to their business. Requirement analysis and high-level design is typically done either in-house or by US based consultant.

Many MNCs have set up liaison offices and subsidiaries as well. Increasingly, however, the objective is to use India as lace for software development as well, rather than merely as a place to sell. Some companies have established, or are in the process of doing so, software development centers in India, and are exporting packages or components of systems to other countries from India. The work being done at these development centers is fairly sophisticated.
### 4.5 SWOT ANALYSIS OF SOFTWARE INDUSTRY

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<td>• Highly skilled human resource</td>
<td>• Absence of practical knowledge among fresh graduates</td>
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<td>• Low wage structure</td>
<td>• Dearth of suitable candidates</td>
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<td>• Quality of work</td>
<td>• Less Research and Development</td>
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<td>• Initiatives taken by the Government (setting up Hi-Tech Parks and implementation of e-governance projects)</td>
<td>• Contribution of IT sector to India’s GDP is still rather small.</td>
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<td>• Many global players have set-up operations in India like Microsoft, Oracle, Adobe, etc.</td>
<td>• Employee salaries in IT sector are increasing tremendously. Low wages benefit will soon come to an end.</td>
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<td>• Following Quality Standards such as ISO 9000, SEI CMM etc.</td>
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<td>• English-speaking professionals</td>
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<td>• Cost competitiveness</td>
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<td>• Quality telecommunications infrastructure</td>
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<td>• Indian time zone (24 x 7 services to the global customers). Time difference between India and America is approximately 12 hours, which is beneficial for outsourcing of work.</td>
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<th><strong>Opportunities</strong></th>
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<td>• High quality IT education market</td>
<td>• Lack of data security systems</td>
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<td>• Increasing number of working age people</td>
<td>• Countries like China and Philippines with qualified workforce making efforts to overcome the English language barrier</td>
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<td>• India ’s well developed soft infrastructure</td>
<td>• IT development concentrated in a few cities only</td>
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<tr>
<td>• Upcoming International Players in the market</td>
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4.6 SCOPE OF SOFTWARE INDUSTRY IN INDIA

The Software industry has great scope for people as it provides employment to technical and non-technical graduates and has the capability to generate huge foreign exchange inflow for India, India exports software services to approximately 95 countries in the world. By outsourcing to India, many countries get benefits in terms of labour costs and business processes. Also, the Indian companies are broadening the range of services being provided to the customers, which is resulting in more off shoring. Talent acquisition, development and retention initiatives taken by the companies have brought down the employee attrition rates, thereby providing more stability to the employees and increasing their job commitment.

Many financial institutions are providing funds for the expansion of IT and ITES businesses. In order to support software industry the Indian Government is also taking many steps. For example:-

1. The Govt. has provided incentives including tax holiday up to 2010 and competitive duty structures.
2. The Govt. is trying to reduce the international communication cost.
3. It is providing infrastructure support through organizations such as software technology parks.

All these factors collectively crate a number of opportunities in the IT Sector.
4.7 FUTURE OF SOFTWARE INDUSTRY

Software will continue to go momentum; telecom and wireless will follow the trend immense expansion in networking technologies is expected to continue into the next decade also. Software will bring about a drastic improvement in the quality of life as it impacts application domains and global competitiveness. Technologies that are emerging are Data Warehousing and Data Mining. They involve collecting data to find patterns and testing hypothesis in normal research. Software services that are being used in outsourcing will go a long way.

The Sector can be classified into 4 broad categories:-

1. software Services
2. Engineering services
3. ITES BPO
4. Services, E Business

Software Services can further be categorized into Information Services (IS) outsourcing, packaged software support and installation, systems integration, processing services, hardware support and installation and software training and education.

IT Enabled Services are services that use telecom networks or the Internet. For example, Remote Maintenance, Back Office Operations, Data Processing, Call Centers, Business Process Outsourcing, etc.

E Business (electronic business) is carrying out business on the Internet; it includes buying and selling, serving customers and collaborating with business partners.

4.8 NATURE OF JOBS IN SOFTWARE INDUSTRY

Introduction With the advent of the PC the information technology industry underwent a quantum change. Suddenly computers were all pervasive and work automation took off in a big way. The software revolution totally changed the way we work. Availability of cheap and easy to use software packages increased productivity levels manifold. Probably no sector is untouched by information technology. Manufacturing, Finance, Banking, Marketing, Entertainment, Education and several other fields are reaping the benefits of I.T. As a result the I.T industry employs not only staff trained in computers but also professionals from all other fields which could also be non-technical in nature. The rapid development of technologies such as networking, multimedia and the Internet have created totally new job categories where none existed a few years ago. This sector is also the one that is witnessing the fastest growth and change rate. New software and techniques come out every month and professionals have to keep pace with the rapid advancements. The hardcore technical jobs in the software industry can broadly be classified as hardware jobs and software jobs. Non technical jobs include functional expert
consultants, web designers, data entry professionals etc. Hardware job Software Jobs Specialised Jobs Internet Related Jobs Multimedia Jobs.

4.9 EMERGING TECHNOLOGIES IN SOFTWARE INDUSTRY

E-commerce The Internet revolution is sweeping the world and is changing the way companies traditionally dealt with customers. Now customers can compare and shop without moving out of their homes by using the Internet. Electronic commerce relates to all commercial transactions that take place through the Internet. It is estimated that the quantum of e-commerce will jump to 400 billion US dollars by the year 2001. In order to enter this field, in addition to a basic degree in computer science/engineering one must have sound knowledge of software used in the front end such as Java, DHTML, Visual basic etc, the backend which is generally databases such as Oracle and SQL server as well as networking and web server maintenance. In addition an understanding of business transactions is also essential.

Supply Chain Management In any industry there are lot of vendors providing various material inputs used in final production. On the distribution side there are channels comprising of wholesalers, distributors and retailers. Supply chain management software cuts down the time taken for the supplies to arrive from the vendor and reduces the inventory levels thus cutting cost. On the marketing side, it ensures that products reach the end customers in time to fulfill their demand.

Customer Relationship Management Companies offering products and services have to deal with a number of customers. Customer relationship
management software provides a record of all previous dealings with customers so that the company personnel can take the right decision while dealing with them.

- Software and Services will contribute over 7.5% of the overall GDP growth of India.
- IT exports will constitute 35% of the total exports of India.
- There will be 2.2 million jobs in IT sector.
- IT industry will attract FDI of US$ 4-5 billion.
- Market capitalization of IT shares will be approximately US$225 billion.

**IT Sector – Career Opportunities in software industry**

Career opportunities in IT sector are bright and growing in India as well as abroad, IT is a diverse industry in which companies are looking for a multi-skilled, tech savvy workforce. Even if you are not planning to enter the sector directly, you will still need IT skills for employment in other sectors. India’s large population is more of a strength than weakness. It is a huge potential market. In the year 2006-07, the industry hired approximately 3, 80,000 people. Out of these, the ITeS sector hired 2 00,000 people and the rest were taken by IT sector.
Entry Level Career Options

As in the earlier years, the salary growth in 2006-07 was to the tune of 12-15 percent. According to the Ministry of Information Technology, Government of India, by 2008, there will be:

(a) 2.63 lakh postgraduates, 7.85 lakh graduates, 7.42 lakh diploma holders.

(b) 10.5 lakh in people in hardware and 7.5 lakh in ITES.

Some of the areas of specialization in the IT Industry are-

- Web branding services
- Custom business solutions
- Internet Marketing
- Outsourcing
- Programming services
- Multi Media Offering
- Consulting
- Designing
- Research and Development in Peripheral Integration
- Product Quality Control and Reliability Testing
- Computer Manufacturing
- Maintenance Service
- System Developing /Programming /Software Engineering a Networking
- Application Programming
- EDP/ E’- Commerce
- Enterprise Resource Planning (ERP)
• Database Warehousing and Management

• Operating jobs, Computer operators, Data Entry

• Education and Training

The software industry is facing problems in hiring talented people. The demand of engineers is more as compared to other graduates in India. Unfortunately, the knowledge level of engineering graduates is not up to the standards of the industry needs. At times, they lack soft skills and good communication. More training is required in these fields. Only around 25% of the technical graduates and 10-15% of other graduates are suitable for hiring in IT and BPO industries.

Hardware and Software areas in this sector require science background and mathematical skills for the technical work. Programmers require analytical power and mental ability. IT enabled job roles require creative, problem solving and technical skills. Good communication is a must for the entire job role.

Pay packages offered in this industry- Entry level pay packages can be:

Systems Analysis: Rs.10,000 - Rs.15,000 p.m.

Data Warehousing: Rs. 15,000 p.m.

E-Commerce: Rs.10,000 - Rs.15,000 pm

Networking: Rs.10,000 - Rs.12,000 pm)
Educational Qualifications

Given below are some of the most common educational jobs in the specific areas within the IT industry:

Systems Analyst: BE, B.Tech, Electronics, Communication, Computer Science
Data Warehousing: BE Computer Science! MCA
Corn Engineer: BE / B.Tech / MCA
Network Designer: BE Computer Science, BE Electrical & communication.

4.10 HUMAN RESOURCES CHALLENGES IN SOFTWARE INDUSTRY

Software organizations are project-based organizations. The output is directly proportional to the number of people employed (Watts, 1997). Moreover, high demand for software professionals world-wide and comparatively lower supply adds to a new set of HR challenges for these organizations. It is one of those industries wherein human capital plays a very dominant and crucial role. Congenial human resource atmosphere, therefore, is vital for the smooth functioning of the business and the task of Human Resource Manager becomes an important one. The Indian IT industry today poses an ultimate challenge to HR professionals from recruitment to retention, compensation to career planning and from technological obsolescence to labour turnover (Sadri, 1996).

One of the most distinctive characteristics of knowledge-based organizations is that they have only the expertise of their staff as assets with
which they trade. They are often called ‘people’ organizations, which deploy its assets in a distinctive way, for it sells a capacity to produce rather than products. Organizations driven by intangible assets have to change its focus from strategy, structure and systems model, to purpose, process and people model. A company that believes in intangible assets must always monitor its people (Ghoshal 1998).

The task of a leader in such organizations is to recruit, train, empower and retain the best and the brightest professionals (Narayanmurthy, 1998).

The software industry is characterized by acute shortage of skilled people. Several recent studies have pointed to this problem.

According to the Department of Labour (USA), by 2006 the demand for database administrators, computer support specialists and computer scientists is expected to increase by 118% to 460,000. Demand for computer engineers is expected to jump by 109% to 451,000, and demand for system analysts will double from 560,000 to more than million (Work Group Computing Report, 1999). According to NASSCOM (1999) also the demand for software professionals is ten times more than the supply.

It appears from the above that the HR context of the Software industry is different from the mass-production manufacturing industry.

As it is to deal with knowledge workers. So the difficulties or challenges to deal with these industry is also difficult. The following are some of the challenges faced by the HR manager to manage software professionals are as follows.
HR Challenges

1. To Cope with Sweeping Environmental Challenges.
2. To Make the Company a Better Place to Work.
3. To Integrate HR with Business Strategy.
4. Upgrading Recruitment and Selection Techniques.
5. Attracting the Best Talent.
6. Recruit People Most likely to Stay, not Just Hottest Talent.
7. To Cope with Shortage of Highly Skilled IT Professionals.
8. Up-gradation of Skills through Continuous Retraining.
9. To Emphasize on Creativity and Innovation through Training.
11. To Design Training that Substitutes Work Experience.
12. To Design an Effective Performance Appraisal System.
15. Managing Technology-Driven Organizational Change.
17. Manage High-Job Stress Among Software Professionals.
18. Develop Feedback Mechanism from Superiors to Subordinates.
19. To Ensure that Employees Know Business Goals.
20. Encouraging Commitment to Quality and Customer Focus.
21. Adjusting to Shifting Values and Workforce Composition.
22. To Keep up-to-date Technologically.
23. Define Skill Requirements. And many more.

**Software Professionals: Some Common Characteristics**

Based on the interviews conducted with software professionals and the way they were described by senior managers, project managers and HR. professionals in software organizations, some common characteristics of Indian software professionals have emerged and these characteristics are:

• Software professionals invest substantial time, efforts and resources to acquire relevant and valid knowledge. Over time, the knowledge acquired by them becomes their self-concept.

• Software professionals look forward to use their existing knowledge and acquire new knowledge on a continuous basis. This is significant for software professionals to experience a sense of growth and nurture their concept of growth.

• Software professionals tend to be highly analytical and hence they expect rationale for every activity. They expect that they should be involved in defining and planning every organizational change affecting them.

• Software professionals tend to be high achievers and hence they expect periodical and tangible feedback and recognition for performance. Since reward system is perceived, as a part of the feedback system, linking performance with reward and experiencing equity in reward becomes very important issues with them.

• Software professionals want to work on new technologies, new platforms and with new organizations to improve their learning and curriculum vitae.
• Software professionals are more committed to their profession than the organization they work for.

• Due to existing demand and supply situation, software professionals are able to move from their existing organizations to new organizations in India or abroad rather fast.

• Software professionals value autonomy, professionalism and innovativeness.

4.11 IMPORTANT FACTS OF INDIAN SOFTWARE INDUSTRY

1. India won recognition for its software writing skills in the late 1990’s.
   India large well educated population.

2. The Highest number of English speaking people

3. Low wages in India as compared to West. Although this factor is slowly becoming one of the main reasons for International Software companies to outsource IT work to India.

4. The Indian Culture itself is a huge contributor. The importance of education is ingrained by them on their children at a very young age. They see good education as the only means to have better standard of living.

5. As much as Indian IT Industry has grown due to off shoring, equal amount of credit should go to growth of domestic companies in auto, retail, banking, telecommunication, manufacturing etc., They have equally contributed in its growth.

6. The young and dynamic working population. More than 60% of Indian People are below age 25.
7. The Opening up of economy starting in early nineties. The outsourcing / off shoring started taking roots due to the change in policies.


9. The rapid growth in IT parks in India in last 10 years, Government setup SEZs (specialized economic zones), and where opening of software services companies would get certain tax subsides. This attracted lot of companies to setup software shops.

10. The tax breaks and sops offered by Indian government for upcoming software firms. This made India one of the most attractive markets for setting up Software shop.

11. The commitment of Indians towards their work. It is a common knowledge that people in Software Industry normally put more than 10 hours a day in their work.


13. The entrepreneurial spirit and innovative tilt of Indians.

14. The time difference is one of the reasons for growth of Indian IT Industry. Western countries get advantage of having a 24 hour work cycle.

The India Software Industry has brought about a tremendous success for the emerging economy. The software industry is the main component of the Information technology in India. India’s pool of young aged manpower is the
key behind this success story. Presently there are more than 500 software firms in the county which shows the monumental advancement that the India Software Industry has experienced.

The Indian software industry has grown from a mere US $ 150 million in 1991-92 to a staggering US $ 5.7 billion in 1999-2000. No other Indian industry has performed so well against the global competition.

4.12 GOVERNMENT ATTITUDE TO SOFTWARE INDUSTRY

The Government has also played a vital role in the development of the India Software Industry. In 1986, the Indian government announced a new software policy which was designed to serve as a catalyst for the software industry. This was followed in 1988 with the World Market Policy and the establishment of the Software Technology Parks of India (STP) scheme. In addition, to attract foreign direct investment, the Indian Government permitted foreign guilty of up to 100 percent and duty free import on all inputs and products.

The software industry in the main component of the IT Industry in India has also help IT sector in India to grow good pace. As per the proceedings taking place the software industry the future of the India Software industry looks promising.

India, compared to its competitors, ranks high on several critical parameters, including level of government support, strong track record of quality and delivery, early-mover advantage of brand recognition, quality of labor pool, English language skills, project management skills, strong focus on
processes, and a favorable time zone difference with the United States that permits 24/7 internal operations. Some of the weaknesses that persist are slow growth in the domestic market and a lack of innovation and product orientation in the bulk of small and medium sized companies. Infrastructure needs improvement in many areas such as roads, electricity, venture capital and airports. Markets continue to be concentrated in North America and are therefore subject to nontariff barriers such as visa denials. There has been some domestic political backlash against outsourcing in the United States and Europe. However, a comparison of India with competitors in software exports on strengths and weaknesses seems to suggest that India’s current position is quite sustainable in the near future.

It is difficult to say whether India’s success can be replicated in other countries. Any country hoping to emulate India’s example would have to define a strategy that matches local capability to global opportunity and discover niches that can be exploited. The niche could very well be in terms of the market to be served on the basis of language competency. Late movers can take advantage of the demonstrated success of the offshore model and how it works. There is only one necessary condition, which is the existence of high quality, trainable manpower and strong entrepreneurial and managerial talent. If countries cannot wait for a high quality technical education system, it may still be possible to mount focused training and certification programs in targeted niche areas’. This would of course require a foundation of a good university education system that is producing easily trainable manpower. Key
infrastructure for offshore services such as telecom could be created selectively through technology parks. Policy support and incentives can also be provided selectively. Since trust is a key issue in offshore work, the country’s Diaspora and intermediaries can play a critical role in the beginning.

4.13 KEY FACTORS THAT EXPLAIN THE SUCCESS OF INDIAN SOFTWARE INDUSTRY

- Software industry can be built entirely on human capital requires limited infrastructure and upfront investment has good cash flows and is highly profitable.
- India had an early-mover advantage: repeated positive experience built trust in outsourcing and validated the Indian brand.
- Role of human capital, including software engineers, project managers and corporate leaders.
- Early investments in engineering education and privatization of education created a large talent pool.
- Body shopping exposed a large population to new ways of working.
- Professionally trained entrepreneurs.
- Vigorous efforts at assimilating new technology and good management practices helped companies offer competitive costs for high quality and delivery performance.
- Selective support to industry in an otherwise constraining environment by a few enlightened bureaucrats and the role of NASSCOM in influencing policy.
• Lack of effective implementation of restrictive policies allowed market forces a significant play in the early phase. The ecology was liberalized in later years.

• Highly entrepreneurial IT training and private education industry. Responded quickly to fill skill gaps and opportunities. Positive government policies and lack of regulation meant few barriers.

• Large population created competition for engineering seats and jobs. Software industry faced no internal competition for technical talent. Competition from MNCs came when indigenous firms were prepared.

4.14 SOFTWARE INDUSTRY IN KARNATAKA

The software industry in Karnataka state in India has become one of the main pillars of economy. Karnataka stands first among all the states of India in terms of revenue generated from software exports. Software exports from Karnataka amounted to excess of 48,700 crores ($1.6 billion) in the year 2006-2007. This achievement has earned Karnataka’s capital city, Bangalore the sobriquet of Silicon Valley of India. This is because of the presence of major software companies in Bangalore and the revenue generated by exports of computer software. Though most software companies are located in Bangalore, some have settled in other cities like Mysore, Mangalore and Hubli in Karnataka.

Bangalore has for long been known as India’s answer to Silicon Valley, and this is the city where most large software companies have set up shop and operate out of state-of-the-art facilities. This is the reason it is fast becoming
the “Techno polis” of India. The Government of Karnataka has also been extremely positive about the software and services marketplace and has helped create the relevant telecom and policy infrastructure conducive to the growth of this sector. The dynamic industrial policy declared in 1996, with comprehensive packages of incentives and concessions, has ensured a productive ground for various industries. The hardware and software industries have now brought about a revolution of sorts under these schemes. Various institutions and computer training centers have contributed to the large number of trained and talented professionals.

The City of Bangalore has positioned itself to help market the software industry. This is also why Bangalore has been playing host to international-class conferences, workshops and exhibitions devoted to the software cause. The city has the highest number of engineering colleges in the world, almost 50 percent of the world’s software companies.

Bangalore is home to numerous success stories. Bangalore already has more than 1000 software companies and the number is still growing. In the year 2001 Bangalore saw a cumulative investment of around US $1.3 billion in the software industry. About 146 new software industries during 2001 and about 110 during 2002 have been established and the total number of software professionals is over 80,000. During 2002-03 about 116 new Software Technology Park Units were established.

Bangalore is a melting pot of different people, cultures, and languages. It is the only city in India in which you will hear Kannada spoken as much as
Tamil or Telugu or Hindi. Because of its cosmopolitan nature, Bangalore attracts people from all over India and is among the fastest growing cities in Asia.

Every year Bangalore conducts conferences, workshops and exhibitions related to software. ‘There are a number of reasons behind the software companies being centered at Bangalore. They are:

• A very favorable climate
• Excellent infrastructure
• Availability of human resources
• International quality research and development centers
• Cosmopolitan ambiance
• Favorable government policies

The work of various software companies in Bangalore are:

Software development

1. Maintaining and re-engineering services on high-end Internet
2. Providing various IT solutions
3. Meeting the multifarious needs of the customers
4. Services in the field of application development, business intelligence and data warehousing
5. Product realization services, etc
4.15 PROFILE OF SOFTWARE COMPANIES OF RESEARCH

1) Accenture India Private Limited

Accenture is a Global management consulting technology services and outsourcing company unparalleled experience, comprehensive capabilities across all industries and business functions and extensive research, Accenture collaborates with clients to help them become high performance businesses. The company supports the global clients in research, consulting, technology services and build world-class skills and capabilities, develop knowledge capital and create, acquire and manage key assets central to the development of integrated services and solutions for their clients. The company employees more than 1200 employees.

2) Alpine Infotech Pvt Ltd.

Alpine Infotech is an electronic medical transcription provides who primary objective is to provide rapid turnaround of quality reports, in a computerized, patient record environment, while assisting the clients in their document management process. The company runs 24 x 7 center and employs over 450 employees among which more than 40% of the employees work from home.

3) Adapt Infotech Pvt Ltd.

Adapt Infotech Pvt Ltd., is a fully owned subsidiary of Adapt, USA. The company operations for India is head quartered in Bangalore. It does software development, Chip Design and Global support service. It provides high quality offshore and onsite services to its customers and end users on a broad range of
leading technologies. The company undertakes software projects and product development on broad technology platforms for India and global clients. The company employs over 250 professionals.
4) **Capgemini India Pvt Ltd.**

Capgemini offers the full spectrum of services from consulting to technology and outsourcing services from India including Business and technology consulting, custom software development, ERP and System integration, application management, infrastructure management and Business Process Outsourcing (BPO). It provides solutions that drive more value from the relationships of their clients have with their customers. Managing these relationships, fostering improvement and adding value to the organisation worldwide to improve their business performance. The company employs over 1000 professionals and supporting global clients.

5) **Cognizant**

Cognizant is one of the leading IT companies providing a complex end to end system integration of varied enterprise. IT environments portals and content, management solutions, SAP, ERP implementation and support, client application support and implementation and support of enterprise data warehouse, business intelligence and corporate performance management solutions. They are committed of using their strategic insight, technology expertise and deep industry and business process experience to help clients harness the force shaping the future work. The company employs over 1200 professionals.

6) **GalexE Solutions India Pvt. Ltd.,**

GalexE solutions offers independent application testing services that help to deliver business solutions and technologies with high quality outputs
with extensive experience in both manual and Automation testing it offers core competencies on an in-depth understanding of our clients business and functionality. The company employs over 200 professionals.

7) Mangium Infotech Pvt Ltd.

Mangium provides global companies web based, SEO, web hosting and web strategy services. The company is into analysis, design, coding, testing, delivery and maintenance of commercial application software. The company employs over 250 professionals.

8) Mind Tree

Mind tree is a global IT and outsourcing company. It delivers technology services deals in e-commerce, mobility, cloud enablement, digital transformation, business intelligence, data analytic, testing, infrastructure, testing EAT and ERP solution.

9) ITC Infotech

ITC Infotech is an IT service company fully owned subsidiary of ITC Ltd. The company has IT services in Advanced technologies, Microsoft, Java, Data warehousing, Mainframe services, ERP and business, services, testing, quality solutions and also offers SAP related services. The company employs over 3000 employees.

10) Quest

Quest Global Engineering is a diversified global engineering service co. The services are product design, product development, product support, safety
and analysis engineering services, consulting and many more. The company offer over 800 professionals.
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<th>Sl. No.</th>
<th>Name of Company</th>
<th>Address</th>
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<tbody>
<tr>
<td>1.</td>
<td>Accenturey</td>
<td>Divyashree T_Echnopark (SEZ) No. 36/2, KR Puram Hobli Whitefield, Bangalore – 66</td>
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<td>2.</td>
<td>Alpine Infotech Pvt. Ltd.</td>
<td>Plot no. 10, Flat No. 302, 1&lt;sup&gt;st&lt;/sup&gt; Floor Alpine Arch Building Lang Ford Road, Richmond Town, Bangalore</td>
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<td>3.</td>
<td>Adapt Infotech Pvt. Ltd.</td>
<td>Solarpuri Infinity, Bannerghatta Main Road, Bangalore</td>
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<td>4.</td>
<td>Capgenini India Pvt Ltd.</td>
<td>Crescent 2, Prestign Shantiniketan Sadaramanagala village Whitefield main road Bangalore 48</td>
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<td>5.</td>
<td>Cognizant</td>
<td>Manyata Embassy, Business Park, manyata Tech Park Nagavara Bangalore</td>
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<tr>
<td>6.</td>
<td>GalaxE Solutions India Pvt Ltd</td>
<td>Unit 1, 8&lt;sup&gt;th&lt;/sup&gt; Floor, Innovator Block ITPL, Bangalore 66.</td>
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<tr>
<td>7.</td>
<td>ITC Infotech</td>
<td>No. 18, Dodda Banaswadi Main Road, Jeevanhalli, Maruti Sevanagar, Bangalore-5</td>
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<td>8.</td>
<td>Mangium Infotech Pvt Ltd.</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Block, RT Nagar Main Road, Jeevanhalli, Maruti Sevanagar, Bangalore-5</td>
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<td>9.</td>
<td>Mind Tree</td>
<td>Global Village, RVCE Port, Mysore Road, Bangalore – 59</td>
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<td>10.</td>
<td>Quest Pvt Ltd.</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Floor, SJR Park Industrial Plot 13415 ITPL Whitefield, Opposite to Satya Saiabha Hospital, Bangalore – 66</td>
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