3 Review of Literature

This Chapter will provide an overview of the various works leading to recruitment models and selection techniques which will form the basis of the current study. The first section reviews the current state of recruitment and selection in IT Software Industry in India. The following sections review literature, prior recruitment models and their subsequent applications in the real world.

3.1 Current State of Recruitment and Selection in IT Software Industry
In today's rapidly changing business environment, organizations have to respond quickly to requirements for people. With technology and processes undergoing rapid transition, the investment in human resource and its development can reap rich dividends. Consequently software firms chose the high road to export competitiveness, investing in developing organizations capabilities (Suma.S.Atherye, 2005, p. 9). The quality and cost at which these are being made available to clients is indeed most competitive the world over. However countries like China are following closely, having achieved a great deal in a short span of 10 years. Its capabilities in future too are likely to pose a major challenge (Nagesh Kumar, 2001, p. 33). Some countries are likely to pose challenge by training low wage IT labor force, often taking assistance from Indian training companies like National Institute of Technical Training (NIIT), Applied Pavement Technology (APTECH) etc. It is a recognized fact that the quality maturity of the Indian software industry has been realized globally. There is also a thought in America to have a Management School imparting such training so as to reduce the costs, in the form of setting up an educational institution like University of California Santa Cruz (UCSC) School of Management: Global Management for Knowledge Based Economy, (Nirvikar Singh, Ram Akella, and Kyle Eischen, 2005). However, whatever be the challenge to its current position, IT
Software Industry in India should be prepared to face such a challenge that could undermine the growth and prospects of the Indian IT Software Companies. It is therefore important to have a well-defined recruitment policy in place, which can be executed effectively to get the best fits for the vacant positions. Selecting the wrong candidate or rejecting the right candidate could turn out to be costly mistakes for the organization. Selection is one area where the interference of external factors should be minimal. The HR departments of the IT Software companies should therefore use their discretion in framing selection policies and use various selection tools for the best results.

The development of IT Industry has been a boon to our country. With a single stroke, several problems facing the nation such as large number of unemployed educated youth, low quality standards of education, poor quality of life and fragile economy have changed. A study has brought out that in India, national IT capabilities were built up in a planned manner by providing tight protection from imported technology that was followed by a series of trade and other liberalizations. Consequently prices fell, technology lags shrank to zero, and some parts of the local industry became highly innovative (Mihaiea Grundey & Richard Heeks, 1998). Rafiq Dossani states in his study that India is among the choices for low cost programmers because of several factors and one of them being the widespread knowledge of English (Rafiq Dossani, 2005, p. 11). The author also states in the same study that the world has indeed been awakened with India emerging as a major IT services provider, in terms of competition, quality and cost. Some of the other important factors that contributed towards this success are the availability of human capital, especially the stock of engineers available in India. The shortage experienced in availability of the manpower for IT services was met with rapid expansion of the education system. An important factor that has helped has been the geographical location of the country that has helped several nations explore capability to operate round the clock. It can
also be stated that the base of Indians in every part of the world also helped bridge several gaps related to red tape and human networking.

A dispassionate reappraisal of the education facilities to meet the IT boom amply highlights that the current system is at best only meeting the present “demand and supply”. The gradual development, coupled with switchover of engineering students from various disciplines into IT Industry has served as a vast reservoir of manpower to meet the demands (Ronald Fernandes, et.al, 2001, p 5). This has proved to be generally successful. However the situation has since changed. The IT Industry today comprises professionals who have attained various levels of competence by the degrees/diplomas they hold and also the exposure and experience they have gained. The current “demand and supply” in terms of jobs that are available within the country and abroad is also another factor. This state is on account of a pattern of either taking up IT as a line of studies right from the beginning or switching course after acquiring a given level of educational qualification or by meeting the “demand and supply” requirement, even if not an IT professional. A published NASSCOM report (Kiran Karnik, 2003, p.1) also states that the Government also contributed by launching a massive Rs 1500 crore Technical Education Quality Improvement program with help provided by World Bank. It has also been upgrading the Regional Engineering Colleges. In a study, the liberal policy of promoting Foreign Direct Investment (FDI) and Non Resident Indians (NRI) investment has been a major step for the industry (Chandana Chakraborty and Dilip Dutta, 2001, p 3). Government acceptance of proposals like setting up venture capital funding and positive actions on NASSCOM recommendations, are indeed very significant steps for the Software Industry. India has also signed MOUs for bilateral cooperation in IT Sector with 32 countries (MOUs, 2004, pp. 1-2). This contributed meaningfully and provided markets in several countries. A report (IT for all by 2008, pp. 1-2), high-lights that Government directions, as part of
“Operation Knowledge” are, reaffirmation of the fact that policy makers are deeply aware of the need of the hour as also the future of the Software Industry. Such involvement at Government level is highly essential. A prominent report, co-authored by NASSCOM and the American accounting firm Klynveld Peat Marwick Peat (KPMG) in 2003, suggested a cycle of continuous attracting, educating, certifying, deploying, and then ultimately retraining workers to focus on graduates of the Indian origin as they had a strong theoretical or conceptual background, but required training. It further stated that at a later age, the students could get certification through a common examination that tests skills in computer proficiency, analytical abilities and language (Networking and Information Technology: Final Report, May 2009, p 159). An article on the subject, published some time back, confirms that even in the US, Information Technology Association of America (ITAA) solicits support from its Government to promote growth of IT Industry (ITAA Press Release 2005, p1). Though these measures would upgrade the quality and also the quantity in terms of engineers’ available, effective utilization of the human resources will require several other issues to be addressed.

The past few years have been the most threatening period for enterprises that use, manage or deal in IT services. The source of the tumult has been IT employees as people – i.e. the demand, supply, selection, recruitment and especially retention of IT professionals, worldwide (L.Ermel and D.Bohl 1997, p. 25-29). India as a country had tided over the problem much better than many others in the IT field. One of the heartening features has been the flexibility shown in growing acceptance and adoption of the newly emerging standards of quality management by the Indian software industry. Reports state that India has more than 200 companies being quality accredited and serving the needs of some 255 Fortune 500 companies, and more and more suppliers in the United States prefer to get their software developed in India because of the quality and cost advantage. This has been a noticeable achievement as it has
translated into better relationship between management’s perception of total quality service and customer perceptions of service quality. It may not be a coincidence that companies, in keeping with the global trends, have seen better results and in that the mean revenue and mean net income improved at a faster rate after quality certification than before certification (V.B. Wayhan, E.T. Kirche, and B.M. Khumawala, 2002).

Linked with the problem has been the emerging demand of IT professionals who want to navigate their career on their own terms. This has awakened China that fiercely wants to assume the role of IT Power and IT resources provider of Asia. Sumeet Chatterjee in the article in Indo Asian News Service has categorically stated that China outstrips India in almost every sphere of business except in software industry. China is racing to take on India as the second largest software exporter, after USA (Sumeet Chatterjee, 2005, p. 4). This requires an urgent review of our current system of recruitment and selection of IT Professionals. A study states that the Indian software industry may have to face a challenge when the labor cost advantages diminish due to competition from other countries with increased supply of educated and underutilized workers, (Ashish Arora, V.S. Arunanchalam, with Jai Asundi, and Ronald Fernandes, 1999, The Globalization of Software: A case of the Indian Software Industry). The problem of the future will therefore not be numbers alone but effectively utilizing the professional manpower to maintain a cutting edge from any competition that is likely to emerge. Such a vision will not only propel the nation to its rightful place in world hierarchy but also ensure that it stays there for good, warding of challenges posed by others. The true picture also requires attention. Astonishingly even in Asia’s boom countries India and People’s Republic of China, the lack of highly trained employees is a serious problem for the national economies, politics and research institutes. The situation in China can be attributed to reasons demographic profile and number of highly educated potential work force (D. Farrell and A.J.
Grant, 2005). This has also been stated in other studies where a declining birth-rate, below the necessary number to maintain the same population size results in just 10 years in an overall dropping of Chinese labor force (R. Jackson and N. Howe, 2004). Another study brings out the issue of available high-qualified university graduates in the People’s Republic being far too small number that can meet the manpower requirements of the large scale national companies. It is assessed that such a situation can lead to talent shortage and will be a serious threat for People’s Republic of China’s economic growth if the area of education is not reformed (D. Farrell and A.J. Grant, 2005). In contrast, India is confronted by a different situation. The subcontinent does not have a dropping birth-rate and a declining labor force. Nevertheless due to high turnover rates, as a result of individual workers who sell their skills for higher payment, India also faces possibility of an upcoming talent shortage problem (P. Acharya and B. Mahanty, 2008). The current situation brings out that there is a need to manage 2,00,000 engineering student passing out every year. Of these about 90,000 join the IT industry along with another 60,000 from non IT background. There is undoubtedly a requirement to upgrade the existing infrastructure, provide better employability to this rich human resource and ultimately retain this talent to compete at global level. As stated by Narayan Murthy, 'they represent the most powerful wealth' (Ashok Som, 2006).

The subject of women’s under-representation in information technology is of interest as a case of gender imbalance. Their ratio in the IT field is less as compared to other companies. A stage has come when “reverse brain drain” is being experienced and many of these, particularly China and India, are electing to go back and work in the countries where they were born (Nancy Ramsey and Pamela McCorduck, 2005, Where are the Women in Information Technology? Report of Literature Search and Interviews Prepared for the National Center for Women & Information Technology University of Colorado, Boulder). The issue of the future of
IT Software Industry and the global technological environment that it is likely to experience merits attention. As intellectual capital is the key competitive advantage in the knowledge economy, people management should naturally become an integral part of corporate strategy and a key responsibility of all managers (Mohan Thite, 2004). Today the IT Software Industry has attained so eminent a position in the social and economic planning of the country that it is linked with the future of the people from all walks of life. As per reports, Department of Electronic Accreditations of Computer Courses (DOEACC) has already initiated steps to grade courses as per the competence of candidates but that may only be one issue. There are several other issues that require to be addressed if the system for recruitment and selection system is to be made effective. The country has traversed a great distance in the entire gamut of IT-related services including software and services. The sector has emerged as a large knowledge based sector of our economy. The Software Industry has come into its own, both in terms of investment and employment and it is contributing to increased productivity and competitiveness across a wide range of activities. The industry has gained confidence in its ability to compete, with skilled professionals and excellent management capability. Today, a majority of the companies in India have already aligned their internal processes and practices to international standards, PC World (2007).

One of the important decisions in initiating the screening process include psychological and other tests for selection and recruitment and the decision on the “point in time” when such intervention needs to be taken. It is known that aptitude tests have been used to measure abilities that are useful in learning specific skills. They are known to show abilities in areas in which the student can excel and can be a predictor of how well the student will do. In the process, Standard Age Score (SAS) or IQ is derived from such aptitude tests only (Stephanie Lang, 2006). It is only logical that such psychometric testing will prove to be scientific and
result oriented but whether the IT Companies are undertaking such processes and incorporating it in their recruitment and selection system is the purpose of this research. Psychological tests can be defined as ‘Psychometrics to denote that they are concerned with identifying the mental characteristics of people (psycho-) and putting a measurement (-metric) against such characteristics’ (Roberts, 2005). Psychometrics tests for testing cognitive ability and personality are designed to facilitate employers in making effective selection and development decisions. If these are used correctly, they can prove as an extremely cost effective supplementary tool for initial selection, subsequent development of employees and in managing underperformers. Studies show that Psychometrics is best used in conjunction with other assessment and selection tools such as interviews (Catherine Corcoran, 2005). The Psychometrics testing has several scholars having differing views and their applications. A statement that “Psychometrics is pathology of science”, is in contrast with conventional definitions provided by leading texts (J.Michell, 2000). The difference lies even in design of tests and one such set of test available is the Universal Nonverbal Intelligence Test (UNIT) test used sometimes for individuals with limited English proficiency like the Asians, Hispanics and Native Americans. The test is different from the typical nonverbal intelligence tests that measures only one narrow aspect of intelligence. The UNIT is a multidimensional measure of intelligence, yielding several broad-based indices of intelligence (Bruce A. Bracken, R. Steve McCallum, 1998). With quality and cost assuming greater importance, helping the firm save money by reducing turnover would help to cut expenses and paperwork in recruitment and contribute to the organization. Several companies are turning to specialized firms providing prescreening assessments, including skills and psychological testing and a data bank of potential employee’s skills and experience. This has helped firms to make a better assessment of desirable employees and thus retain people longer and save the company heavy expenses.
Coupled with this, is the system of recruitment advertisements being currently undertaken. Though there are some reservations about internet versus traditional methods of hiring, there is consensus that the cost via internet is far less and the recruiter thus saves a major amount as per capita cost of recruitment. Several other advantages come to light. The speed, efficiency and total-in-time recruitment can really reduce the time to hours and days rather than weeks (Parbudyal Singh and Dale Finn, 2003). Another study has found that the costs of temporary replacements, advertising for open positions, signing bonuses, moving expenses, and the like add up to the costs to the companies. An assessment is that the estimate turnover costs range from a conservative 30 percent of annual salary plus benefits to as much as 150 percent of a worker's yearly pay, (D.I. Amaram, 2005).

Even in China, there are a series of tests that are often used, such as technology tests, technical tests, problem solving tests and English proficiency tests but traditional Chinese companies rarely use psychological or aptitude testing because they result in a potential loss of face for applicants, something culturally unacceptable in China (I Bjorkman & Lu, 1999). The resistance to psychological tests is not restricted to the Chinese but in also experienced in a few other countries. In actual fact, differences in points of view even resulted in a serious controversy that was reported to have erupted when the historical association between racism and standardized testing returned to haunt the American Psychological Association (APA) and the American Educational Research Association (AERA) at a time when the APA was scheduled to present a lifetime achievement award to Raymond B. Cattell, a leading developer of standardized personality tests. An anti-racist group revealed serious charges against Cattell's work in the eugenics movement. Eugenics presents itself as a science which seeks to improve genetics by preventing people with "inferior" genes (as evidenced, for example, by their IQ test scores) from having children. Historically, it has tried to claim that Europeans, particularly
those from northwestern areas of Europe, are genetically superior intellectually, physically and morally. This fact was contested by another researcher who has argued that IQ tests prove genetically-based racial inferiority. To support the claim, Linda Gottfredson released a survey a few years ago noting that most "intelligence researchers" agree with her position. (Fairtest, Article, Racism, Eugenics and Testing, The National Center for Fair and Open Testing, Apr 1998 Issue, http://www.fairtest.org/racism-eugenics-and-testing-again). Some recent studies and an American Management Association survey in 2000 found a decrease in the use of psychological measures such as cognitive ability, interest inventories, managerial assessments, personality measures, and physical simulations. A trend towards more job-specific personality tests such as integrity and customer service orientation tests rather than the general personality assessments was observed by experts. In actual fact applicants were less willing to take general personality tests if they did not see a clear relationship with the job or if they found some of the questions to be excessively invasive. The recent trend has shown that computer based administration and scoring of tests having become general practice and most firms are designing software to meet such demands. The research has found that increase in computerized testing has led to favorable equivalence with paper-and-pencil tests. Another view of psychometric testing is that there is not much of correlation between psychometric tests and intelligence (Psychometric Testing, PC Magazine 01 Jan 2004). The use of computer-adaptive testing (CAT) has substantially increased in recent years. Recent efforts have resulted in industrial/organizational psychologists discovering that job-related personality constructs such as integrity, service orientation, and conscientiousness helped in statistically differentiating between highly productive and dependable workers from counterproductive and irresponsible workers. Also assessment constructs that have recently surfaced include emotional intelligence, technology readiness, and job loyalty, to name a few. Professionally
developed testing Human Resource (HR) lifecycle assessments, related to jobs, are considered valid, and fairer than alternative selection procedures using interviews, and resume ratings. Such testing is also extremely cost and time efficient. Companies find that they can save time and money by well-developed personnel tests and also increase accuracy and fairness. A well developed test can be used for pre-screening and recruitment, selection and placement and in actual fact the entire HR lifecycle whereby both the organization and the employees benefit (John W. Jones, Kelly D. Higgins, 2000).

One of the major issues that comes up is the requirement to define a position for which a proper job analysis and job specification should be prepared and documented by the IT software companies. While job analysis is a systematic study of the tasks, knowledge, skills and abilities required of the job, job specification, on the other hand, specifies the qualifications in terms of knowledge, skills and other competencies, relevant experience, training, education, certification, as well as physical and mental demands required of the incumbent to perform a job well. Analyzing the background and experience of current high performers may be helpful in documenting job specifications. Putting job analysis and job specification together enables the recruiters to gain full clarity of the person they want to hire in a well-written vacancy notice. The ground reality about the IT Companies is that they have been found to be wanting in explicitly specifying them. As brought out in a study, job analysis can be stated as the process of collecting information about what is done on the job, whereas job specification is the process of inferring the human traits or abilities required for successful job performance and that job analysis should necessarily precede the job specification (Shanan Gwaltney Gibson, 2001). Going by this, the complexities of software companies seldom facilitate the requirement.

Some author’s view that the relationship between a person and an organization begins before the person’s first day on the job. Instead, the relationship can be a beginning at the first
point of contact between the person and organization. With the emergence of the World Wide Web and associated technologies, this first point of contact is, increasingly, at the organization’s website or other web-based employment advertisement. Such modern innovations and technologies have revolutionized many aspects of business operations, offering tremendous potential for recruitment, selection processes, just a click away. It also provides hi-tech, customizable recruitment messages to a virtually infinite number of people at relatively little cost to job seekers (Charlie L. Reeve, Scott Highhouse and Margaret E. Brooks, 2006). In another study, necessity for special training of interviewers undertaking selection of candidates from other cultures has also been brought out (Derek S. Chapman and David I. Zweig, 2005). This is substantiated by another author who states that interviewers who receive the training will have more positive perceptions of the Hispanic applicant than interviewers who do not receive the training (Sharon L. Segrest, 2010). Another similar view is that one of the characteristics of assessment today is the international use of tests and assessment procedures. It is more and more frequently the case that a test developed in one language and culture and is used in others. This situation, which in itself is positive, may incur serious problems if the tests are not appropriately translated and adapted to the new languages and cultures in which they are to be used. Agencies have to be aware of this problem, and the facet has to incorporate in the drawing-up of guidelines for the adaptation of tests from one culture to other (José Muñiz, 2004).

In a study undertaken recently, it has emerged that the changing environmental context for organizations has affected the recruitment and selection procedures and there was a necessity to identify recent major developments in personnel selection and identify challenges for future trends, (Filip Lievens, Karen van Dam, Neil Anderson, 2002). The response from the IT software companies has been that in recruitment practices, there is very little difference
between the participating companies. All companies used fairly similar recruitment channels. For non-professional workers, job fairs are still quite popular, while professionals are recruited through newspapers and recruitment agents. Upper level managerial staff is commonly recruited via headhunters. Personal contacts and referrals from employees still seem to play a role, although in our sample only two companies say that they actively encourage employees to recommend friends and relatives. In another study, some corporations still encourage employees to recommend friends and relatives (W.H.Braun and M.Warner, 2002). The companies agree that they regard recruitment as the process of attracting individuals on a timely basis, in sufficient numbers and with appropriate qualifications, develop their interest in the organization and encouraging them to apply for jobs within it. During this process, efforts are made to inform the applicants fully about the selection criteria of the required competencies that will lead to effective performance, as well as career opportunities the organization can provide the employee. Candidates are informed that whether or not, a particular job vacancy will be filled by someone from within, or outside, the organization depends on the organization's human resource policies, the requirements of the job to be filled, the talent to be found and, often, the organizational policies governing the decision. Similarly it is a common understanding by the companies that selection is the process of choosing from a group of applicants the individual best suited for a particular position based on conventional and non-conventional methods. Therefore, the effectiveness of recruitment has a significant impact on the efficiency of the selection process. The selection process should provide as much reliable and valid information as possible about applicants so that their qualifications may be carefully matched with the job requirements.

Recruitment and selection being the most vital, the results of their effectiveness as HR practices can take years to materialize into organizational performance. For example, selective
hiring and training can produce results after years (Ilias P. Vlachos, 2009). At one period of time, the Indian tradition for employment was a lifelong commitment, as it meant a living for an individual and his family. This aspect has undergone a change. Today, the software industry employees know their worth and can bargain with their employers. The productivity of the people being critical, a study was undertaken to find out the commitment of such employees towards organizations comprising the software industry (A.K. Paul and R.N. Anantharaman, 2002). In the empirical study, it has been found that there is a positive relationship between human resources practices and organizational performance. There were however significant differences in human resources practices across multinational and Indian software companies and it is therefore evident that human resources practices were critical in software firms (A.K. Paul and R.N. Anantharaman, 2002).

Effective recruitment and selection are critical to organizational success. They enable companies to have high-performing employees who are also satisfied with their jobs, thus contributing positively to the image and performance of the firm. On the contrary, poor recruitment and selection often result in mismatches which can have negative consequences for an organization. A misfit employee, who is not in tune with the organization's philosophies and goals, can damage production, customer satisfaction, and relationship with suppliers, the overall quality of work and its image. Such an individual can also adversely affect the morale and commitment of co-workers and negate efforts to foster team work. Understanding implications of a wrong hire can be very expensive. Effective recruitment and selection are therefore not only the first step towards organizational excellence, but also have financial implications as they are important cost control mechanisms as well.

Consequently a study was undertaken to identify general practices that organizations use to recruit and select employees and determine the practices that are most effective. The
process was reviewed on the lines that recruitment was taken as the process of identifying and attracting potential candidates from within and outside an organization to begin evaluating them for future employment. It is taken that once candidates are identified, an organization can begin the selection process. This includes collecting, measuring, and evaluating information about candidates’ qualifications for specified positions. Organizations use these processes for hiring individuals who possess the right skills and abilities to be successful at their jobs. Organizations employ different strategies to recruit both managerial/professional and non-management candidates. For recruiting managerial/professional candidates, the Internet is considered the most popular advertising medium by most of the organizations surveyed. Organizations also regularly utilize internal resources, internal job postings and employee referrals when recruiting both internal and external candidates. The agencies used to recruit vary, depending on the positions and levels. It is seen that temporary and government agencies are generally employed for non-management candidates while employment agencies, colleges, and professional organizations are used more often to recruit managerial/professional candidates.

The quality of package an organization offers affects its ability to attract job candidates. Organizations offer candidates a strong company reputation, high-quality benefits packages, learning opportunities, stock options, child care options and several other facilities besides a corporate culture. Organizations offering a positive culture have more satisfied employees and therefore have better retention. The selection practices used were processing applications, manual resume screening and reference checks. Today increased use of computerized resume allows organizations to screen literally thousands of resumes in a fraction of the time. Now a day's organizations generally use behavior-based interviews to some extent when selecting employees. Very few organizations are using testing or assessment methods extensively in their

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selection process. The organizations employed structured approaches to assess skills, abilities, and knowledge can significantly reduce the candidate pool by eliminating those who fail to meet the minimum job qualifications. Some organizations prefer outsourcing (i.e., hiring outside consultants/vendors) for some or all of their recruitment and selection. Most of these outsourcing agencies and head-hunting firms specialized in recruiting top upper-level talent. Also organizations often used outsourcing for the final stages of the selection process, such as drug screening and reference checks. These procedures being expensive, most organizations do not have the capabilities to perform these functions in-house. Organizations can take advantage of the many firms that specialize in creating and conducting valid testing and assessment procedures. Some major barriers to effective recruitment and selection were shortage of qualified applicants, competition for the same applicants, difficulty in finding and identifying applicants. With competition intensifying at every level, there are fewer qualified applicants available thus making all the more important for organizations to be able to effectively attract, select, and retain quality candidates most suitable for the organization (Sheila M. Rioux, Paul Bernthal, 1999).

Another recent study brings into focus the importance of assessment of behavioral traits of prospective employees’ for the effectiveness of management practices. The findings of the study emphasize that checking employee’ behavioral traits during the recruitment and selection process are crucial. It is so for achieving competitiveness and can well be consistent with one of the basic principles that prevention is better than a cure, as often is found that it is hard to modify negative behavioral traits of employees. A simpler solution therefore is best to check for requisite behavioral traits during the recruitment and selection process to prevent mismatch between individual and organizational requirements (Sohel Ahmad, Roger G. Schroeder, 2002). Another study brings out that psychometric testing can assist in both sustained competitive
advantage of the firm, and career success at an individual level. It can provide a competence-based approach to employability by means of a reliable and valid instrument for measuring employability in which occupational expertise is developed and tested among two sources of raters, i.e. employees and their direct supervisors. Such instruments can enable further scientific research and can be of practical value in job and career assessments, recruitment, staffing, and career mobility practices (Claudia M. van der Heijde and Beatrice I.J.M. van der Heijden, 2000).

In a study of recruitment tools in Western Europe, it emerged that the employment in Europe is based on application form, an alternate to Curriculum Vitae (CV). In England, there is the “standard application form” (SAF), while the “standard introduction form” (SIF) is most commonly used by Irish recruiters. The applicant’s photo appears on the application where it is also the norm to put it on a CV. In certain countries, like Sweden, companies using employment application forms do not ask the applicant any open questions, and the applications are only simple administrative files. The reason is that open questions are considered best suited to face-to-face encounters, for example the interview. In actual fact, in certain countries, it is forbidden in to retain certain qualitative information about an individual. There are some information requirements in some European countries. In Spain there is an insistence on professional experience in the application form; in Greece the requirement is of information on military service; while in Italy inputs are asked on surroundings and family history. Certain questions are even considered as illegal in some countries such as the applicant’s financial status, police record and record of marital status. Certain questions pertaining to family and personal life are also considered “taboo” and are seldom asked of the applicant. They are deliberately avoided and evaded (Maud Tixier, 1996). A study states that organizations need to move away from thinking about IT professionals and all other employees
as resources and should think of these people as human capital. It should also be realized that this capital can be utilized to create competitive advantage, (C.V. Brown, 2003). While most companies follow the procedure, a study states that since a bio data instrument is essentially a self reported set of responses gathered for a specific purpose, there has to be some concern about verifying the accuracy of these responses (Frank Kushnereit, 2000). This fact has to be given due attention.

Organizations are aware that hiring and keeping employees is the key to sustainable competitive advantage. With the network infrastructure available, E-recruiting as a general process is job-specific and offers computer-assisted screening interviews and statistical prediction to aid in reducing recruiting costs, time-to-hire and employee turnover. Application of this technology to recruiting and retaining knowledge workers in industry and in an information-intensive environment is therefore the most viable option (Alan D. Smith, William T. Rupp, 2004).

Not withstanding the likely changes in trends of recruitment and selection, IT field remains a choice for education. Corresponding increase in educational institutions to meet increase in demand and provide quality training facilities have been successful. However selection for employment in the IT Field is still based on academic performance and possibly marginally on experience, if considered necessary, by the employer. It is seldom on aptitude or scientific personality evaluation as done in scientifically selecting executives or officers as leaders in other industries and organizations like the services. A query that comes up is if recruitment and selection of a potential IT Industry employee can be undertaken scientifically, based on aptitude for software programming so as to make the employment of the professional effective. It is important that IT companies know what to measure and how to measure when it
comes to recruitment (Dressler Gray, 2005). Equally important is how a potential employee is viewed at the time of recruitment (B. Pattanayak, 2000).

T.Goles (2001) reporting on student perceptions, of IT job attributes, suggests that financial and other benefits are not used to select jobs but rather to eliminate them. He further suggests that the learning of new skills in the job is of significant interest amongst students. S.J.Smits, J. R. Tanner & E. R. McLean (1995) found that salary was only an indicator of career progress and was not a significant indicator of job satisfaction of organizational commitment. P.C.B.Lee (2002) provided some interesting insights regarding career strategies, job and career reaching a plateau and job satisfaction among IT professionals. Guy Pare, Michel Tremblay, Patrick Lalone (2000), in their study explained the turnover intentions of IT staff and identified several factors covering HR practices, remuneration and organizational behavior and commitment that influence turnover intentions. A slightly later study by F. M. Horwitz, T. H. Chan & H. A. Quazi (2003) addressed the issues of attracting then motivating and retaining qualified knowledge workers. A study of students with high cognitive ability and all types of high achievement place greater importance on interesting and challenging work than do other students. These applicants display stronger preferences for organizations that offer challenging and interesting work, selective hiring, flexible job descriptions, broad career paths and strong opportunities for additional training. They also expect different reward and recognition practices. One area in which high achievers might be expected to differ from others is in their preferences for pay systems. Another way in which high achievers may differentiate themselves is by displaying stronger preferences for fast promotion opportunities. Not only are promotions a route to more challenging work assignments, but they are also a public form of recognition that is important to those motivated by competitive excellence, the desire to be distinguished from others and gain social status. Finally, high achievers differentiate
themselves by placing a higher value on performance feedback and expect extensive performance feedback from their superiors and employer. High achievers also attach greater importance to individually-based reward systems, and are more amenable to variable pay schemes. It is also seen that they leave their first employers after very short periods of time, often for much smaller firms or to start their own businesses and are known to possess entrepreneurial capabilities (Christine Quinn Trank, Sara L. Rynes, Robert S. Bretz. Jr, 2002).

Authors of another study have also suggested that in order to effectively utilize IT as a business enabler, organizations must move away from a pure technological view of IT and the personnel within IT and move toward a more ‘rounded’ view. The shift is required to be made away from the historical approach to hiring and managing IT personnel and embrace a new type of IT employee who has the ability to merge technical knowledge and skills and business acumen (Enns, H. G., Ferratt, T. W., & Prasad, J, 2006). A study in 2000 had projected a strong demand-supply gap in the availability of “right” people for the software industry. It was also brought out that the proper recruitment of the candidates and requirement for selection of employees with required skills ability and also possessing capability to function as a member of the team as well as the organization, was a highly critical facet in employment in the case of software industry. Another finding has been that it has been often said that many IT professionals do not rank compensation as the most important factor in their decision for taking up the job (Allen DeMers, 2002). This is an important input that requires to be taken into account during the recruitment and selection process.

Narayan Murthy Chairman Infosys, has said, “If there is one challenge that Indian software industry faces, it is how to recruit, enable, empower, and retain the best and the brightest professionals” (A. Som, 2006, p 225). Several authors have suggested that training as an important factor in both the hiring and retention of IT professional staff (C. Gjestland, J. E.
Blanton, R. Will & R. Collins, 2001). It is experienced that IT employees are sensitive to the importance of skill development when it comes to deciding whether to leave an organization. Most prefer a continuous form of learning to be part of the job. They also feel that training is too often regarded by employers as a perk rather than an investment in intellectual capital. In a study by P. B. Lash & M.K. Sein (1995), the authors stated that in the IT industry, both organizations and IT professionals are motivated by different expectations. A survey brought out that high performers spent more time on their systems and work as compared to low performers (IT Investing for High Performance, A Global Survey of CIOs, 2005).

A study undertaken on Australian police force applicants examined the influence of perceived person-job and person-organization fit, social support network and equal employment opportunity policy on pre-entry career commitment and intentions to remain in the profession brought out that perceived fit perceptions and equal employment opportunity policy were significant predictors of pre-entry career commitment and intentions to remain in the profession while the social support network was a significant predictor of the latter (T.L. Honeycutt, B. Rosen, 1997). A study has brought out that the evolution of the turnover culture is learned from others (both at work and outside of work) through formal and informal communication channels as normal occurrences. It is further stated that looking at intention to turnover within the IT workforce can help to understand how turnover breeds more turnover. It further states that high turnover in the IT workforce allows for situations, those that are not aligned with corporate goals, to go uncorrected since it is easier and more expedient for IT workers to leave the situation than voice objections, feelings, and ideas in the hope of improving the work environment (J.E. Moore & L.A. Burke, 2002).

In a study of the cultural aspects involving Management of Information Systems (MIS) professionals, W.M. Wormley and M. Igbaria (1991) reported on differences experienced by
Afro-American IT industry employees who found less job discretion and career support than their counterparts. Further they found less career satisfaction, lower performance ratings and earlier career plateaus than others. M. Igbaria and D.W. McClosky (1996) surveyed 90 IT employees in Taiwan. They found that job security, service and challenge were rated highest whilst technical competence and autonomy were rated lowest. They noted a number of differences towards entrepreneurship, challenge and autonomy between Taiwanese and American IT employees with the Taiwanese IT employees exhibiting a lower career orientation. For companies employing technical professionals, managing turnover is a challenge because technology professionals are so valuable. At times companies underestimate the cost of turnover and consequently under-invest in reducing it. Some main causes that affect turnover are job content, direct financial benefits, careers and affiliation. At times internal factors that cause staff dissatisfaction have also caused turnover problems (J.Kochanski, Ledford Gerald, 2001). In the endeavor to attract and retain talent, employee retention goes hand in hand with employee engagement. Research adequately shows that the future of organizational success depend an effective engagement of employees and the failure to do so would imply losing them in the competition. Studies show that the turnover costs in the United States economy are estimated to be $5 trillion annually, with employee engagement being a major factor in the overall financial performance and the cost of turnover directly impacting customer loyalty and company profits (F.D. Frank, R.P. Finnegan and C.R. Taylor, 2004).

The situation in India has been a great difference. The main reason that most American companies outsource their IT requirements such as help desk to India is because it combines high quality with low cost. Compared to the United States provider, the hourly fully loaded programming wages are 40% - 60% lower in India. This of course benefits companies by freeing up some capital to do another development. There are of course drawbacks of offshore
outsourcing such as language, politics, and culture but these are accepted (Peng. S, Chan, Dennis Pollard, Seungwook Park, 2006). Over a period of time, India has established its identity as a preferred global sourcing base in these segments and they are expected to continue to promote in the future. The key segments that have contributed significantly (96 percent of total) to the industry’s exports include – Software and services (IT services) and IT-enabled services (ITeS) ie. business services processing, Time zone advantage of approx 10 hours for USA and 5 hours for Europe is indeed unique. The Indian IT industry has been outsourced services that range from knowledge services, engineering design, data mining, performance analysis, financial modeling, research design, audit management, research & development and software products, data entry and transaction etc. The key attributes that have enabled India to establish itself as a preferred sourcing base include the size of skill base, one of the largest English speaking manpower in the world, availability of management talent and also an equally significant effort by the Government of India is taking proactive measures to encourage incentives including liberalized Foreign Direct Investment (FDI) regime.

It is significant that a majority of IT / ITeS activity in India is concentrated in cities such as Kolkata, Chennai, Bangalore, Mumbai, Pune, New Delhi and Hyderabad. These not only provide the developed infrastructure but also the environment necessary for growth and business. The education for IT was a focus for attention even in UK in 1999-2001 and its use was one of the strongest themes to emerge in governmental policies, especially related to national economic development and competitive advantage (Lynn M. Martin, Alison Halstead, and Julie Taylor, 2001). Closer home, the efforts to bring the IT industry to the other parts of India, including the rural sector are seen in a few projects. As part of IT Industry tie-up, TARAhaat Project by TARAnaad Information and Marketing Services Development Alternatives (Technology Action for Rural Advancements), a well-known Indian NGO, aims at education,
e-governance, insurance, mini-credit financing, connecting people to markets and government via an Internet portal. Drishtee, another model is focused on provision of e-governance facilities and information services to the rural community. It envisages small kiosks and with low financial investments, focusing needs of the poor. This has not been easy and there were difficulties experienced but these were resolved to a large extent (P.D. Kaushik, Nirvikar Singh, 2004). To further IT Services in the long term, the Government has also launched a programme as part of its endeavor (Information Technology IT Action-Plan IT for all by 2008).

In the sphere of technical improvements to meet growing standards, the Capability Maturity Model (CMM), a worldwide certification developed by the Software Engineering Institute of Carnegie Mellon University, is becoming the industry standard in the offshore outsourcing market. Going by International norms, CMM covers practices of planning, engineering, and managing software development and maintenance, and improves the ability of organizations to meet goals for cost, schedules, functionality, and product quality. CMM also provides a yardstick to judge the maturity (level) of a firm’s software process so it can be compared to the state of practice in the industry. Judging by international standards, the quality maturity of the Indian software industry can be ascertained from the fact that as early as 2000, 316 Indian software companies had already acquired quality certifications and another 70 more were in line to do so. Of these, 22 companies were at CMM level 4 and 44 were at CMM level 5. The total numbers worldwide was that only 85 were CMM level 5 companies, which meant that nearly 50 percent of the CMM level 5 soft-ware firms were in India. In practice it has been seen that these quality certified software firms had better management practices when compared to non-certified firms. In a study it was found that mean revenue and mean net income improved at a faster rate after certification than before certification. (V. B. Wayhan,
et.al, 2002). Somewhat similar findings emerged in another study (Wynekoop, J. L. and D. B. Walz. 2000).

One of the IT companies that has gained name worldwide has been Infosys. Interestingly Infosys invests heavily in its programs to recruit, train and retain qualified employees. The general employee attrition rate in the software industry is around 30% but Infosys boasts an employee attrition rate of only 9.8%. The company intake is through campus interviews, internet, newspaper advertisements, job fairs and HR Consultants. The resumes are processed and only about 25% are called for the tests comprising arithmetic reasoning and logical reasoning, the emphasis being on learn ability. Selection process is an interview conducted by the HR and Technical representative in which the candidates are asked for their aspirations, expectations, presentation skills and communication abilities. The selected persons are groomed over a period of time with regular feedback given and taken from them.

A study reveals that a heavy investment in the human capital and the implementation of HR practices may contribute to organizational success (J.Pfeffer and F.Veiga 1999), specifically by reducing the turnover of the IT staff (R.Roepke, R.Agarwal, T.Ferratt, 2000). Studies also bring out that as the demand for IT professionals increases, so does the pressure on IT and HR managers to design innovative strategies for retaining talent. A number of empirical studies confirm the important role of organizational commitment in the turnover process for IT personnel (M.Igbaria & J.H.Greenhaus 1992; M.Igbaria and T.Guimaraes 1999). These posit that IT employees who are highly committed to their organization are less likely to leave than those who are relatively uncommitted. It is a fact that the management of the knowledge workers coincides with the competitive challenges of human resources management that includes going global, embracing new technology, managing change, managing talent or human capital, responding to the market, and containing costs (F. Afiouni, 2007).
To meet the demands of the IT industry, information technologies are changing the ways in which instruction is delivered in the classroom. In some countries employers find it difficult to fill technical jobs requiring complicated training and technical skills. It is natural that, if engineers are in high demand and being paid well in the field; students will be attracted to those fields of study, IT being one of them. The private sector being one of the largest employers of science and engineering workers, the Economic Competition Model is currently the dominant approach for studies of employment migration, and asserts that people migrate in order to improve their economic well-being by selling their services in the market that offers them the highest return. This has major implications for organizations looking to recruit the “best and brightest” (Stephanie Ann Tarant, 2001).

In a recent study, some innovative HR practices were recently proposed to enhance effectiveness in organizations and to retain talented employees but the configurations of such practices are narrowly focused and these suggestions are often not theoretically grounded. Some of the reasons attributed are that, for most IT professionals, a significant part of their motivation comes from the recognition they get from managers for a well job done and the feeling that they are an important part of the organization (R. Agarwal and T. Ferratt, 1999). In this study, recognition practices refer to non-monetary means (e.g., extended vacations, tickets to a baseball game, organizational recognition events) and monetary ways (e.g., spot cash awards) by which an organization tangibly signals its appreciation of outstanding performances and accomplishments. In another study, (R. Agarwal and T. Ferratt, 1999) found that successful IT organizations are devoting resources toward empowering IT professionals to take increasing responsibility for their work and for decision making. A study by R. Folger found that IT Companies posit that it is easier to recruit and retain people in an organization where IT professionals have a sense of equity. In the study, distinction is made between distributive and
procedural justice. Distributive justice refers to the perceived fairness with regard to issues such as mandates, compensation conditions, performance evaluations and promotions while procedural justice relates to the perceived equity of the means used to determine mandates assignments, compensation conditions as well as evaluation and promotion criteria (R.Folger 1977). It has also been observed that competence development practices (e.g. job rotation programs, mentoring, training) convey to the employees that the organization considers human resources to be a competitive advantage (S.Schwochau, J.Delaney, P.Jarley, J Fiorito, 1997), and that it is seeking to establish a long-term relationship with employees (A.S. Tsui, J.L Pearce., L.W Porter, J.P. Hite, 1995). Such a gesture is likely to be an important factor in retaining productive IT professionals (B.Guptill, 1998). With the shortfall of IT staff unlikely to disappear in the near term, it is only sensible business practice to accommodate those employees who may not join the workforce for a typical 9-to-5 workday because of other constraints in their personal life (Agarwal and Ferratt, 1999). Here, work-life policies correspond to work conditions provided by organizations to take into account the needs of the IT workforce and to minimize the consequences of conflict between the work and family issues. It was also felt that IT professionals need to be made aware of the larger context within which their work fits and to develop a sense of community (Agarwal and Ferratt, 1999). One path to accomplish this is through information sharing practices (e.g., group meetings to discuss timely issues) which aim at clarifying the expectations of the organization along with efforts made by the organization to listen to preoccupations and employee suggestions. Indeed, it is well-known that IT professionals have a vested interest not only in keeping in tune with the industry, but also in staying several steps ahead of the experience and skill curve. It is therefore only obvious that efforts for quality improvement in organizations should start from the top and
A team has also made an attempt to make a model for leading IT retention practices, (Agarwal and Ferratt, 1998).

The authors of the study also feel that IT professionals responsible for managing people should possess management skills (Agarwal and Ferratt, 1998). The same authors in another study have brought out that the relationship between the IT organizations and HR have not always been harmonious as IT often views HR as slow and unresponsive while the HR finds the IT personnel upsetting compensation schedules (Agarwal and Ferratt, 2002). The view of the HR is that in order to retain productive employees, it is necessary to pay such employees well but such conventional wisdom has not yielded the desired results for the IT professionals and so more innovative approaches may be necessary (Agarwal and Ferratt, 2002).

Comparing India with China, China has an inherent strength as an outsourcing destination. It has a huge domestic software market that attracts domestic software firms as well as foreign software firms. Especially, after its accession to WTO, China will promote social and economic development through the wider use of information technology. China has absorbed foreign direct investment (FDI) many times than that by India. A major part of the FDI is going into the China’s IT sector, specifically in recent years, the software industry. The information and telecommunication infrastructure of China is considered superior to that of India. Greater political and social stability also give the investors and enterprises more confidence and lastly competitive advantage of lower cost of manpower in China, is one of important factors. However, there are some aspects, such as quality control processes, communication/culture where India is far ahead of China. Now India software industry is at the third stage and is referred to as “the world’s back office”. With the reputation and credentials built in past years, many Indian software companies have an advantage. China requires to deal with legal problems of software piracy, improve general education and professional training and also manage the
shortage of people with skills in both management and computer science. The Chinese government should increase the quality and process maturity to meet the demand of the outsourcing providers. Chinese firms needs to explore Capability Maturity Model (CMM) certification, build the correct channels to the global outsourcing market and cooperate with India while competing with each other. The Chinese government can encourage joint ventures so that Chinese firms can learn from Indian firms (Hu Hongli Zhangxi Lin and William Foster, 2003, p. 4).

A query often posed is how India has the lion’s share of IT Software market and not China. In a study undertaken in 2001, there were several factors that were mentioned. It was assessed that India would unlikely be able to produce the qualified manpower required to meet burgeoning world demand sufficiently by itself. Some significant variations in the Chinese industry are like, China has 5700 software companies of which 70% employ less than 50 employees each and a further 20% employ only 100–500 employees. Only 50 companies have more than 1000 employees. As for revenue, most of these earned less than $10 million and only 18 companies made above $50 million. Other international software companies dominated most of the China software product markets. Domestic suppliers only managed to dominate accounting applications, anti-virus tools etc. In a total of 250,000 professionals working in the software industry in 2001, the entire software and services market was $9.6 billion, comprising $4 billion software products, $4.9 billion services and only $700 million exports. Some of the policy initiatives of Chinese Government policy have been to attract the software industry, both domestic and foreign investors by preferential taxation and special zoning arrangements, including high-tech parks, tax subsidies such as corporation and individual income tax deductions, low interest loans, 3 years rent-free offices in software science parks and investment in the education of IT labor etc. However the Chinese Government believes there
are a few problems that hamper the software industry and so key policy initiatives for addressing them have been taken. One of them is the shortage of qualified labor. Here the response has been to go for expansion in education and training.

The Chinese higher education sector has achieved considerable growth in the last 3 years and the graduates would increase from 1.08 million in 2002 to 3.767 million in 2004 and the trend is to continue (Ministry of Education, Peoples Republic of China, web site, www.moe.edu.cn). There is also a planned expansion in IT training by taking assistance of IT training firms like Microsoft, IBM and some Indian IT firms. Thus, the supply of new IT professionals should not be an issue after some time. Another perception is that China is way behind India in terms of quality when it comes to IT supply. China may be able to compete with India in terms of cost, but it lags well behind India (and other high-cost suppliers such as Ireland, Singapore and Israel) when it comes to quality. A major indicator of quality is whether or not a supplier has quality certification. The Chinese government believes that the problem will be partly addressed by its education and training measures, but its major initiative is to encourage firms to seek quality certification by means of an incentive refunding plan. Generally, buyers only deal with suppliers that have a level 3 or higher CMM certification. Compared with India, China lags far behind on CMM certification. At June 2002, only six Chinese software companies had CMM level 3 or above certification and these awards were all recent. The only level 5 company is the Motorola China R&D centre, which focuses exclusively on internal business anyway. Huawei Technology, a telecom equipment manufacturer and a level 4 company, actually out sources to Indian suppliers. Thus, there were only four Chinese companies that have much chance of getting onto the shortlist of a prospective client. Compared to this in India were 45 companies having level 5, a further 28 level 4, and 16 more have level 3 certification. Another important reason is the fragmented
nature of the Chinese software industry noted above. According to Orbys Consulting, the average contract size of an offshore outsourcing is $7.2 million and the average contract duration is 3.3 years, which works out at $2.18 million per year. Seeking CMM certification is also an expensive undertaking for smaller vendors. It would appear that the fragmented nature of the Chinese software industry is severe and requires to be addressed.

One obvious factor lies in language and culture. The language barrier and culture fit are two of the most serious obstacles preventing China from entering the offshore outsourcing supplier market. On the other hand, language is an immense advantage for India. English is the official language in business and education in India and that is perfect for the US and UK markets. But even while considering business in the Japanese market, wherein China ought to be more compatible culturally and linguistically besides having a geographical advantage, it appears it is still not enough. India provided $300 million worth of offshore services to Japan in 2001, which was 4% of its total revenue. At the same time China made approximately the same from Japan (approximately $300 million), but that represented 42% of its total revenues as per China Software Industry Association. Even though China has substantial advantages in culture, language and geography, it seems it still cannot beat India in the Japanese market. This conveys that culture fit and language barriers are indeed very important for offshore outsourcing. Due to these advantages alone, China has at least managed to compete with India on an equal footing in the Japanese market, even though they are not in the same league in terms of the global offshore outsourcing market. Also, there must be some other drawback hindering China’s performance; otherwise China would dominate the Japanese offshore outsourcing market in the same way that India dominates the US and European market. However, a comparison between the top 20 Chinese and Indian software companies suggests that this view may be mistaken. Facts show that, in size terms, the top 20 Chinese and Indian software companies are very
similar. In addition, 18 of the top 20 Chinese software companies are listed on the Chinese stock market, which guarantees them access to plentiful capital. So, at an industry level, it cannot be said that China’s software companies are too small to deal with offshore outsourcers. The top 20 companies in China contribute 37% of China’s software and service revenues, whereas the top 20 in India contribute 35%. An interesting study on successful outsourcing from USA lists experience as an important factor (Warren S. Reid, 1996). It can be taken to compare the performance of Indian software companies vis a vis Chinese software companies.

India has set up an efficient organization, the National Association of Software and Services Companies (NASSCOM), which provides abundant quantities of reliable information, including individual supplier profiles, through the Internet. It also builds up a network among Indian suppliers. In contrast, the China Software Industry Association, as a government-managed organization, provides little helpful information for offshore customers. This inevitably pushes up the transaction costs for companies considering outsourcing to China. It is therefore evident that transaction costs assume a much greater importance relative to production costs for offshore outsourcing as compared to its onshore cousin. Moreover, when it comes to the choice of offshore supplier, transaction costs are critical. Yet the difficulty remains that transaction costs are not as transparent as production costs, nor can they be so precisely delineated by a contract. Joint ventures are often not needed with onshore outsourcing because the transaction costs are so low; but with offshore outsourcing joint ventures become more viable. Such ventures have been hampered in China because of the legal difficulties described above. Nevertheless, they are starting to grow. In actual fact, more than 100 multinational companies are using this model in China already. Initially this was for localizing IBM software products for the Chinese market, but now it has become an offshore outsourcing facility working on mainframe maintenance for Hong Kong Telecom. HSBC has moved its call
centre from Hong Kong to Guangzhou. Some multinational companies such as Motorola, Microsoft, NOKIA, NEC, HP, Erickson and Intel, have all set up research and development centers in China hiring more than 100 professionals. These are clearly encouraging trends for China. Some of what is being done, in particular around education and for pursuing CMM certification, is along the right lines. Some important measures that are required are such as the first and most obvious point is to cease trying to promote software export clusters and try instead to encourage the large Chinese software companies to enter the offshore outsourcing supplier market and allow small outsourcing suppliers to develop naturally. Also, both the Chinese Government and offshore service suppliers must enhance their marketing and sales force by going abroad to customer sites. They need to merge and acquire USA and Europe based outsourcing suppliers or set up joint ventures with them or at least set up branches hiring local sales forces. The Chinese Government should invest in setting up an organization similar to NASSCOM in order to provide free and reliable information to potential foreign customers.

The Chinese Government should also invest in overseas advertising in order to improve the international reputation of China and at least let people know more about China. The Chinese Government, as a warrantor or a trust-transferring middleman, could help Chinese suppliers build up their reliability and reputation. Another idea is that they should endeavor to enhance their on-site presence. It may cost more for suppliers, but there is no other choice. Nearly half of Indian IT exports come from on-site delivery. Hiring overseas Chinese students is a possible solution. The important aspect of the Chinese legal system being a big concern for offshore outsourcing clients has to be accepted. A reliable and efficient legal system is fundamental for contractual businesses such as outsourcing. It is impractical to wait for an improvement in the Chinese legal system. Registering companies in the USA and Europe for dealing with customers is a feasible alternative. It is also important that the Chinese do not lose
their domestic outsourcing market to Indian companies. The huge domestic market is the only absolute advantage that Chinese firms possess against their Indian rivals. By developing a domestic outsourcing market, Chinese suppliers can obtain business knowledge, gain project management experience and build reference and reputation, as well as grow their companies. They also need to focus on special projects and regions where language or other barriers are not too high, such as Japan, the European continent and Hong Kong, where the English language is not as crucial as it is for the US market.

The Chinese suppliers should also put more effort into business process outsourcing businesses, where no-one has yet to dominate, rather than IT outsourcing where India is already dominant and enjoys first mover advantage. In particular, Chinese suppliers have the chance for providing business process outsourcing services for the numerous foreign investment businesses that already exist in China and then to stream up to their headquarters offshore. Finally, now that China has entered the World Trade Organization many multinational companies are going to seek to do business in China. Most of them, such as insurance, retail, telecom and bank firms, will have to negotiate with the Chinese Government in order to obtain market entry permits. Others, such as Microsoft, IBM and GE, who want to win huge government purchase contracts from China, also need to negotiate with the Chinese Government. All of these multinational companies have considerable offshore outsourcing business to allocate. As a trade exchange, the Chinese Government could persuade them to outsource to China. For example, Microsoft has just signed an outsourcing contract of $800 million to China for the next 5 years. This can accelerate the growth of China’s outsourcing service business. It would be a difficult question if China has the potential to compete with India in certain markets as a vendor of IT services, but there is not much time. Policy changes
are required before this market matures and the window of opportunity closes. (Qu Zhonghua and Michael Bocklehurst, 2003).

Another aspect has been the necessity of strategic thinking on the employment of manpower and the need for coordination between the HR and Technical Wings of the organizations with regard to recruitment and selection. A recent study stated that Technical Department of the organization should coordinate with the Human Resources Managers in identifying current market conditions that impact the acquisition, retention, and motivations of key talent, (Martin, T. 2006). These cases stress the importance of having an effective recruitment and selection policy. This is not a new problem and prior attempts have been made to present effective models for recruitment. Few quantitative studies have been initiated and those that have been undertaken have a solid foundation on the conceptual models done in the past. The following section presents a review of these models.

3.2 Conceptual and Numerical Models for Recruitment and Retention

With the increasing size and complexity of organizations, the intensive use of technology, complied with changing socio-culture, attracting and retaining the best professionals is a recognized problem in most industries. This is particularly exacerbated in the IT Software Industry in India where the attraction is sometimes offset with the poor retention of talented individuals. A number of factors ranging from economic, academic to socio-economic factors can affect an individual's ability to obtain and continue employment. This section visits prior efforts to examine the challenging problem of recruitment. These efforts spawn varied applied fields like health care, defense industries, unconventional organizations etc. Both conceptual and numerical approaches are examined.

A.M. Schoo, K.E.Stagnitti, C. Mercer and J. Dunbar, 2005 presented a conceptual model for recruitment and retention. Their study focused on Allied health workforce in Western
Victoria, Australia. They observed that among the multiple factors that affect recruitment and retention, like the nature of work, personal needs, or the way an organization is led, some of these factors cannot be changed like geographical location of family whereas others can be influenced. They determined through careful analysis three principal factors for individuals to remain in their current position as lifestyle, career and family ties whereas the three main reasons for leaving are: lack of career path, personal and social isolation. They then proposed a multidimensional model based on balancing needs and responsibilities of health professionals, agencies they work for and communities they service (Figure 3.1: Conceptual Model For Recruitment And Retention For Allied Health Care). Within these three domains, each factor can be changed by members of that group with relatively little effort and those that were more challenging to address (example shown in Figure 3.2: Needs and responsibilities of an Individual.). This model was based on models proposed by (L.A. Crandall, J.W. Dwyer, R.P.Duncan, 1990), who described four types of models, namely; (i) Affinity models (recruitment of rural students into training programs), (ii) economic incentive models (financial incentives that support rural recruitment), (iii) practice characteristics models and (iv) indenture models. The study, though relating to the organization, individual and community needs in terms of social factors, in all cases, little to no statistical analysis was done. It was therefore considered necessary for this study to examine more models on the subject which were having scientific approach and validity and examine them from the perspective of effectiveness for the organization.
Figure 3.1: Conceptual Model For Recruitment And Retention For Allied Health Care

Figure 3.2: Needs and responsibilities of an Individual.
Some of the statistical approaches were examined next. Oliver Fabel and Razvan Pascalau (2008) examined two hypotheses and tested them using data from a large public company with an econometric model using a fitting criterion. They developed a theoretical model which augments the standard textbook utility analysis. Eleven of personnel selection to include three predictors: educational attainment, professional experience, and test scores. The contribution of their analysis is then threefold:

- They empirically confirm the existence of an over-education effect on hiring probabilities. However, this effect is confined to outsider recruits.
- Second, they therefore provide a simple but novel theoretical model to show that this selection behavior may rather be induced by institutional constraints. Since these constraints restrict the use of informative signals, the firm’s outsider recruits are only seemingly overqualified - i.e. without the constraints the firm would have actually advertised higher standards.
- Hence, third and adding to the debate on the effects of hiring quotas derived from models of statistical discrimination, their arguments highlight the informational inefficiency induced by the threat of disparate impact charges.

By now, it is obvious that recruitment and selection has varied fields and applications. This is best illustrated by the study of Scott Gerwehr and Sara Daly, who describe the structure, modes of effective recruitment by using a unique example of an unconventional organization like Al-Qaida. The techniques used are most commonly applicable in other situations. They observed that the structure of recruitment is aptly described by the pitches of the recruiting agency/firm/company or organization. Effective recruitment “pitches” are tailored to the audience and its cultural, social, and historical context. Two guiding principles follow for an effective pitch:
First, there is no single, uniform recruitment process for a group; rather, there are as many recruitment processes as there are distinct regions and nodes in which the group operates. While there may be overlap and similarity between the recruitment techniques in one location and those in another, there will as often be stark differences. For example, in one forum (e.g., a training camp) recruiters may enjoy open, public access to the target population while in another (e.g., a prison) they may have to operate more clandestinely with activities restricted to a few and guarded.

Second, and correspondingly, the recruitment efforts of a group will not be mitigated, shaped, hindered, or halted by a one-size-fits-all prescription. Different recruitment patterns will necessitate different counter recruitment interventions. Some counter recruitment methods may be effective in more than one locale, but just as often what works in one situation will prove ineffective (or counterproductive) in another. Thus breaking up prayer meetings and discussion groups with armed force might be an effective intervention if the potential recruits are enlightenment-seekers (as is the case with many new recruits to al-Qaida) but may polarize and strengthen the will of antigovernment revolutionaries [as might be the case with the Liberation Tigers of Tamil Elam (LTTE), that kept the Government of Sri Lanka in turmoil for over two decades].

An obvious inference from above is that Campus recruitment and poaching from companies is a perfect illustration of the first principle. While for the second, it is very well known that different firms employ different strategies for selection. e.g. Indian Tobacco Company goes through seven rounds of interviews which range from personal to group sessions, while U.S. Firm Capital One Credit Cards, goes through multiple screening rounds of analytical tests with interviews following. Some of the IT firms in India are also taking the
candidates for several rounds of interviews. The authors then went on to describe various models for recruitment. These are:

3.2.1  Net

In the “net” pattern a target population may be engaged equitably (for example, every member of a congregation may be sent a videotape or every student invited to a weekend retreat). Some members will respond positively, others negatively; but in general the whole population is viewed as primed for recruitment goals.

The net.

![Image of net pattern](image)

Figure 3.3: Net Pattern of Targeting Population.

3.2.2  Funnel

A recruiter may use an incremental, or phased, approach when he or she believes a target population is ripe for recruitment yet requires a significant transformation in identity and motivation. As the term funnel implies, potential recruits start at one end of the process and are transformed, after some culling along the way, into dedicated group members when they emerge at the other end. It is vital that the long term interests of the organization that rests on seeking the best are not compromised for recruitment of any potential recruit, no matter how willing one may be. It is evident that at this stage, it is the quality that takes precedence over quantity in such a recruitment process.
3.2.3 Infection

Frequently a target population is so insular or so difficult to reach that the most effective method is to recruit from within. A trusted agent can be inserted into the target population to rally potential recruits through direct, personal appeals. This method leverages the significant persuasive strength of (1) source credibility, (2) social comparison and validation and (3) specifically tailored appeals. At least in its early stages, this method of recruiting suits groups that are actively opposed by governments, lending itself to clandestinely and operational security. This nature of effort requires intimate understanding of the local inclinations, social setup, influential locals and amongst them those inclined towards the image of the organization undertaking recruitment. The initial progress would be slow and there would be chances of the effort not meeting the desired results fully. It should however be understood that any wrong
move in the planned activities can jeopardize the process and also lead to snowballing effect on the efforts elsewhere.

**Figure 3.5: The Infection Model.**

### 3.2.4 Seed and Crystal Growth

Often a target audience is so remote or so inaccessible that a trusted agent cannot be put into it, nor can a media net be cast over it (see Figures 3.4-3.5). In this case recruiters may seek to provide a context for self-recruitment. This may be compared to lowering the temperature of a glass until the water inside it cools and then ice crystals form as the seeds of a complete freeze. Once individuals emerge within the population as new recruits, they will often follow the pattern of the infection. In “seed crystal” recruitment, critical variables include the type of environmental forces being used to “chill the glass,” and the durability of the “freeze.” The recruitment process is again intricate and requires delicate handling of the potential recruits as their efficacy is of real value to the organization.
These conceptual approaches will be utilized later in this analysis. Continuing the review, there is a study in a completely different organization, i.e. the Military. A study by Hayriye Canan Sumer developed a conceptual model of military turnover based on the reviewed literature and the work done by the members of the NATO Task Group on Military Recruitment and Retention. The study group, after studying the environment, obtained feedback from the stakeholders and found that there were several factors, some interlinked and some prominent that affected the turnover. A deeper look brought out that these factors could be also grouped into various categories and linked to obtain a larger picture. The Factors expected to play a critical role in military turnover are grouped under three categories: distal factors, (job and organizational characteristics, privations and rigors; individual characteristics, demands both psychological and physical; and perceived job alternatives), mediating factors (quality of life-QoL perceptions including comfort levels of job; work attitudes and liberty, namely job satisfaction and degree of freedom of action, continuance commitment and motivations, and affective commitment), and proximal factors (turnover intentions and transfers; unemployment
rate and security of job). They observed that the finalization of their conceptual framework required the model to be subjected to empirical testing, preferably using a longitudinal approach. Since the proposed model is a generic one, the fit of the model in varying military contexts should be tested and compared. It is only after such tests and validation that the applicability of the model for the use should be applied.

Figure 3.7: Job and Organizational Characteristics.

Bert Schreurs and Fariya Syed, also presented a conceptual model of military recruitment based on a review of recruitment research conducted on both military and non-military samples and on the efforts of members of the NATO Task Group on Recruitment and
Retention of Military Personnel. Their model had two major objectives. First, it was intended to support military HR managers in developing their recruitment policy, as the model shows the impact of organizational measures on the individual’s decision-making process. Second, the model served as a general framework for further recruitment research. The model is composed of organizational- and individual level predictor variables, and outcome variables. The organizational-level predictor variables relate to the actual environment in terms of objective job (e.g., pay level) and organizational (e.g., size) characteristics. The individual-level predictor variables refer to the perceived environment in terms of individuals’ subjective interpretation of the job and organizational characteristics (e.g., image, familiarity). The model’s outcome is defined as job pursuit, which can take many forms (e.g., applying, accepting a job offer) according to the recruitment stage an individual is going through. Job pursuit is broken down into the triad attitude-intention behavior to indicate the mediating role of attitude and intention in the relationship between individual-level variables and job pursuit behavior. We further rely on principles from information and communication theory to describe how information about the organization is transmitted through various information sources to the target population. A distinction is made between sources that are under the direct control of the organization (e.g., advertisements) and sources that cannot be controlled by the organization (e.g., word-of-mouth). Based on the review of literature and the proposed model, several suggestions for future research on the topic are presented. The paper concludes with a list of practical recommendations and guidelines to help our military decision makers solving the recruitment problems our organizations are facing today and will be facing in the future.

Only recently, quantitative modeling approaches to explaining trends and building recruitment models have been explored. One such approach is by Pin-Chang Chen who presented a Fuzzy Multiple Criteria Decision Making Model in Employee Recruitment. The
study was intended to improve the lack of recruitment processes as well as reduce individual senses of supervisory level by fuzzy logic and Analytic Hierarchy Process (AHP) methods (Pin-Chang Chen, 2009). It tried to identify appropriate personality traits and key professional skills through the information statistics and analysis of AHP in order to expect the recruitment process be more reasonable based on the fuzzy multiple criteria decision making model to achieve the goal of merit-based selection. The results showed that the fuzzy multiple criteria model constructed in the study could indeed solve the shortcomings in existing enterprises’ recruitment, and provide more information for decision-making reference. The AHP is mainly used in uncertainty of decision-making issues with many assessment criterions. Application is broadly described in size steps.

- Problem definition
- Construction of hierarchy
- Questionnaire design and survey
- Consistency testing
- Hierarchy consistency testing
- The choice of alternative.
Figure 3.8: List of Recommendations and Guidelines to Help Military Decision Makers.

Drawing upon conceptual and quantitative models reviewed in literature, a similar approach has been used in this analysis of effective recruitment and selection for the software industry in India. The model is unique in that it follows the conceptual framework with statistical testing and builds a full quantitative and predictive model.