1 Introduction

The contribution of the Information Technology (IT) Industry in business and management has been recognized the world over and India is no exception. A paper on Indian Software Industry and its evolving service capability has stated that the success when measured against growth in sales, employment and exports contrasts sharply with other industrial sectors (Suma. S. Athreye, 2005). This success has truly transformed the employment scenario in the country. It is in this context that the emergence of a developing country like India, as a leader in supplying software services, has attracted worldwide attention. A study by Nagesh Kumar states that the Indian Software Industry, while recording phenomenal rates of growth in the last few years, has achieved the unique status of an economy driver for India; an emerging superpower of the Twenty First Century (Nagesh Kumar, 2001). Its contribution to India’s GNP (Gross National Product), foreign exchange realization, gradually increasing share in the world market, providing jobs to highly talented engineering graduates and other enterprising young populace, has been a success story that has left everyone happily shocked. An Industry report even states that the Indian Software Industry is set to achieve a $40 billion turnover by 2010 (John Ribeiro, 2007). Another revised exports predictions of NASSCOM expects a turnover of $56-57 billion in 2010-11, marginally less than the $60-62 billion projected earlier (NASSCOM, 4 Feb 10). While this is only one side of the coin, it has simultaneously awakened some sleeping nations like China, who too seem to be taking rapid strides in attempting to replicate the Indian model and herein lays the necessity to look into the future.

The ever persistent threat of brain drain that loomed large is now a past. There are distinctly visible signs of reversal of brain drain, due to rewarding employment opportunities now available in the Indian IT industry in general and the software industry in particular. The vast reservoir of IT savvy human resource has moved away from the era of “Body Shopping”
Leading companies like TCS, Infosys, HCL Technologies, WIPRO, etc are providing consultancy today but the major share of export earnings remains from software development. Although the impact may not be felt immediately, in order that our human resource is able to maintain the edge in the coming years, incisive thinking and detailed planning for an efficient human resource employment system with an effective recruitment and selection system assumes great significance for our over populous country. A few years ago, Sumeet Chatterjee writing for the Indo Asian News service in India’s IT Sector stated that IT Industry base in India crossed 1 million mark in fiscal year that ended on 31 Mar 2005. According to his assessment, the indirect employment was also stated to be about 2.5 million (Sumeet Chatterjee, 2005, p. 3). With this as the backdrop; the quantum of human resource being considered is substantial. It affects not only the social aspirations and the economic needs but also the image of the Nation, striving to seek its position in the comity of nations in the new emerging world order.

1.1 Background

The ever-increasing focus on a lean workforce, combined with economic aspirations of the populace, management of human and financial resources assumes great importance. In such a social, technological and economic environment the policy makers in the Government, require to synchronize their strategic thinking, to give a vision to the IT Software Industry and shape it for the future. This aspect has special significance, as need to augment availability of workforce to help meet the ever increasing global demands has always been a key factor (Ronald Fernandes, Ashish Aurora and Jai Asundi , 2001, p. 2). In this regard, the Government vision for the IT Industry in general and Software Industry in particular has been fairly well articulated to meet the challenges of the future. Technical Education Annual Report 2004-05 states that apex bodies like University Grants Commission (UGC) and All India Council for
Technical Education (AICTE), have been taking steps towards implementation of strategies laid down in the Policy Framework (Annual Report 2004-05, Technical Education, All India Council of Technical Education, p. 186). The author of another study, Nirvikar Singh, however differs. He views the provisioning of infrastructure and the use of capital in Government as inefficient (Nirvikar Singh, 2002, pp. 10-11). An agreement, that in the form of The National Association of Software and Services Companies (NASSCOM) and UGC, Memorandum of Understanding (MOU), laying down the objective of NASSCOM to act as a catalyst of growth, is significant indicator of Government concerns, (Memorandum of Understanding between University Grants Commission and National Association of Software and Service Companies, 2005, p. 1). Though this may be a significant step in the right direction, yet several other aspects require greater deliberation. There is need for greater articulation of strategic thinking on the issue that deals with not only the educated mass of the Indian youth but also the national economy and the image of the Nation in the world.

1.2 **The Problem Definitions**

Each IT Software company undertakes recruitment and selection based on internal and external factors considered by them. Stating briefly, the internal factors predominantly consider the policy, its size, total employees on rolls and the cost involved in the recruitment and selection process, expansion plans, financial state of the company and future technology requirements. The external factors influencing the decision are like the supply and demand of specific skills, legal considerations, statutory provisions of employment, reservation of jobs as specified for reserved categories, and local/ state requirements. The current system of evaluation of human resource, for recruitment and selection in IT Software Industry, may be meeting the needs of the day but whether it is an effective system, in the emerging environment of globalization, is open to study. While the requirement of the software IT Industry would be
based on the software development skills in potential candidates, currently each company has evolved its own yardstick of attributes they look for and evaluate these by various systems of tests. Thus organizations adopt various systems of testing potential employees. These tests vary from simple review of resume, written tests, group discussions/group tests, interviews, technical tests to psychological tests including a combination of these tests. Also some IT Software Companies outsource the requirement while a few have the process of recruitment and selection being undertaken by their Human Resource (HR) Department. It is imperative that a well planned recruitment and selection system, that is aligned with an organizations’ interests as well as that of the Software Industry, is a need of the hour.

A special word is required for psychological tests. Over the years, psychometric tests have been gaining recognition in the corporate sector. In several countries and organizations, pre-employment psychological testing has been accepted as an excellent indicator of future performance and longevity of a prospective employee (Psychometric Testing, 2004, p.1). The problem that faces psychology and its interpretation is that the variables that are of most interest to investigators are latent or unobservable. The variables do not exist as physical objects or material, which can be manipulated in order to determine the empirical relations. Psychological variables such as intelligence, motivation, personality, self-esteem, anger, religiosity, beliefs etc. do not “exist” except as inferred constructs (Paul Barrett, 2003). A report by a company dealing with psychometric tests states that psychological profiling can supplement interview and review resume information, to give an employer a more complete picture of an applicant’s ability to succeed in the job (Blue Egret Content Group, Wet-Fret Corporate Recruitment Solutions, 2005). Companies like the Ambit use the NBI (Neethling Brain Instruments) that provides a battery of instruments that strive to develop whole brain thinking in individuals. It claims that, through the use of the instruments it provides, it is
possible to develop effective teams, receive the best guidance in choosing a new career, improve the level of creativity and leadership in the organization and select the best suited employees for employment and taking up new positions in organizations, based on scientific selection.

The general feedback on the validity, reliability and cost of such tests has been commendable. There are however several issues associated with administering such tests such as the legal aspects as also the view of such tests taken by societies in the country concerned. Notwithstanding these observations, they have provided extremely dependable results. In some organizations, psychological testing has been given equal weight age in comparison to other testing techniques, during the selection process. In actual fact, psychological tests are being used in conjunction with the interviewing technique and group testing technique in the recruitment and selection systems in organizations including the defense services, in India, where the technique has stood the test of time. It is also a view that increased number of tests, helps identifies the potential of a candidate better and has been therefore included as a part of the current study. Another consideration has been the preference given by IT Software companies to factors like educational background, work experience, socio-economic background and the experience in the IT field while undertaking effective recruitment and selection for the Indian Software Industry. A query of this nature is significant due to the massive magnitude of Indian education system. It will require for use a model that is scientifically evolved and conceived so as to take into account the number of students graduating each year. This may entail requirement of partnerships between IT vendors and formal educational institutions that are becoming more common as the demand grows for transient and portable IT. In some countries, educational institutions benefit by gaining access to ready-made, industry-sponsored IT curriculums that are responsive to workforce needs and
easily aligned to state and national IT standards (Michael H. Randall and Christopher J. Zirkle, 2005). In India, the issue has been considered and has already been addressed. A scientific system will also require a corresponding infrastructure to support such an exercise. The problem has been partially considered when the introduction of test for BPO (Business Process Outsourcing) Services was announced by NASSCOM. It considered a governing body being setup and be entrusted with such a responsibility, (Anusha Subramanian, 2006). However one of the vital elements of the model that requires a dispassionate examination is the criteria that IT Software Companies take for selection and recruitment into their companies. The issue has already drawn attention of private software institution like NIIT where-in the Centre for Research in Cognitive Systems (CRCS) has already designed e-Recruitment Kiosk to help IT industry save time and effort in finding right candidates. This attempt only covers English skills, voice skills and learning styles, which have only a marginal use. For an industry that is likely to provide employment to an estimate of 1.1 million people and was of the scale of Rs 100,000 crores by 2008, such an effort may not suffice (News Release: NIIT’s 2002, p 1).

The numbers of IT Software Companies vary in nature of services they provide, size in terms of turnover, number of employees that work for them and the different stations where they are located. These factors require to be taken into account for studying this problem in detail. Thus the research has not be confined merely to studying the testing system, preference given to the back grounds of potential candidates and the nature in terms of size or turnover of the company for the aspiring IT Software engineers, but also identifying a system that would affect the recruitment and selection system for the IT Software Industry in India and make it more effective for the IT Software Industry as a whole.

All these queries have to be researched against scientifically arrived at set of attributes that would constitute variables for input. In addition there would also be other factors that
would combine and form the total set of input variables that have been considered by the IT Software Companies against a set of output variables. There are also factors that would constitute as additional factors when the variables are tested, so as to evaluate if they are providing effective recruitment and selection system for the IT Software Industry in India.

1.3 Research Objectives

Keeping in view the global demand of software development and the unique status acquired by the IT software companies in India in terms of quality, cost competitiveness, availability of trained manpower and the infrastructure, there is a felt need to shape the IT software industry in India, for the future. For keeping India’s competitive advantage from declining, it is imperative that attributes required for the IT software development and an effective system of recruitment and selection be identified. The attributes so identified require to be tested by a system that can be evaluated for its effectiveness against measurable output variables that reflect the output / performance of IT software companies. There is also a requirement to evaluate the domination of certain conditions like academic record, socio economic conditions and work experience for their influence on the effectiveness of the recruitment and selection system. Lastly proper evaluation of other factors influencing effectiveness of output / performance variables require to be studied to arrive at a scientific model that will meet the felt need and address the issue of economic growth of IT Software Industry, so vital in the future. Such an evaluation of manpower wherein, given the environment prevailing, organizations want to find the right individual as an employee while the individual wants to find the right job based on ones aptitude and temperament, needs to be furthered. This would result in immense savings in time, effort and costs to all stake holders and help the Indian software industry to face the challenges of the future.
The purpose of this research is to determine the key variables in an effective recruitment and selection system for the IT Software Companies in India. In order to accomplish the research, the objectives formulated are:-

1. To evaluate the various recruitment and selection techniques that IT software companies in India employ. These include interviews, group tests, psychological tests, intelligence tests, technical tests and others.

2. To determine key employee skill gauges, like academic record, socio-economic conditions, overall work experience and experience in a specific field.

3. To determine key company performance metrics, like growth in sales, net profit margin, revenue/profit growth and average net profit per employee.

4. To determine the relationship between key company performance metrics to selection techniques, thereby obtaining key variables in an effective recruitment and selection.