Chapter 7

CONCLUSION AND SUGGESTION

The software sector in India is heavily dependent on a highly skilled workforce to sustain its indigenous software sector as were to attract overseas investment. In addition, the large number of software engineers leaving the country to work abroad means there is a shortage of skilled people. Nevertheless the findings of this study demonstrates a low level of support to the human element in software engineering. Human resource practices focus on managing software engineers as individuals and neglect the fact that software development takes in a team environment. The research concludes that the next stage of development within the software engineering field should be centered on team based approaches to human resource management.

7.1 Human Resource Management in Software Sector

Software development in the 1990s needs both a revised procedural paradigm and an emphasis on the human dimension (Highsmith 1992). At present the attention of researcher in the software engineering field is oriented towards improving the process-the process maturity movement (Jones 1991, McGowan nad Bohner 1993, Paulk et al., 1993). Much of the emphasis on human resource management and the human dimension of software engineering has been deflected to this maturity movement, in the hope that process improvement will only take place on a good base of people management within software organizations. However, process improvement has brought its own particular focus to software engineering, which to some researchers will on above to overshadow human resource management as a viable means of solving the traditional and perpetual problems of software engineering (Curtis et al., 1998).

The software industry is slowly shifting its emphasis towards the human dimension, with the lead being taken by the U.S. Army and the office of the Secretary of Defense through the sponsorship of people management projects at
Carnegie Mellon University (Curtis 1994.) People and organizational issues have gained recognition as being at the core of effective software development project management (Semprevivo, 1980; De Marco and Lister, 1987; Beohm and Ross, 1989). 'Peopleware' the singularly apt neologism introduced by Neumann (1976) and permanently encountered in the lexicon of the software engineering field by DeMarco and Lister (1987) is seen as central.

Powerful programming languages and fast compilers do not produce good software. Advanced development methods and software engineering practices may help, but offer no guarantees. In the real world of software and applications development, even the most rapid of prototyping takes time and even mildly sophisticated system need the contributions of multiple developers. Under these real circumstances, how the human resources of programming are organized and managed become the crucial factors in the success or failure of development projects. Only good people, well organized and well managed can enhance productivity and produce good software (Constantine, 1993a).

7.2 Few Suggestions

7.2.1 Suggestions for Software Managers

- The software manager has an instrumental role to play in the human resource management of software engineers. It is software managers who are in close contact on an ongoing basis with software engineers. A software manager's role by virtue of his or her management position inherently involves human relations (Yeats, 1986). Thus, the software manager has enormous responsibility to effectively manage the human relations of the software team. Previous research has highlighted the fact that software managers are, for the most part, not adept at managing human relations due to their technical backgrounds, (DeMacro, 1994) and because of the emphasis of the software engineering discipline on the technical demands of the software manager's job (Jemarco and Lister, 1987; Thomsett, 1990; Abdel-Hamid and Madnick, 1991), rather the 'softer' dimensions of the job.
Software teams should be a fundamental concern of organization and more especially of the management of the human resource component of software engineering projects. The objectives of supporting the software team should prescribe the direction of the management of software projects. It should be accepted that a software engineering team needs to be more than mere collection of individuals if it is to be truly effective (Sepmrevivo, 1993b.) The problem for software teams should be taken care of by instituting an organization-wide program to ensure team effectiveness and (2) resources should be allocated by organizations to team development (Dyer, 1987).

### 7.2.2 Management Practices and Approach

- Organizations cannot respond properly to the challenges ahead if they rely on the management practices of the past. The old sluggish ways of doing business will not work in future. The success of organizations in future will depend on fundamental changes in management practices and approach. Management in future will be required to assume more active, growth-oriented and a creative role and not a routine role. There will be an increasing need for a flexible innovative and rational approach to management. This calls for development of effective management systems in our organizations for facing the challenges ahead successfully. Effective management system brings a degree of order and consistency to key dimensions of the organization. With it complex enterprises of future will become chaotic in ways that threaten their very existence.

- Management will have to do many things to develop effective management systems in their organizations and make them successful enterprises of future. First of all, management should be willing to move far beyond the issues on which it can claim expertise it should realize that its expertise is based only on the past and it should be willing to debate about the future as equals not an omnipotent judges. Then management should analyze every aspect of how organization works, cut away bureaucracy, unnecessary levels of management and restrictive work rules. Classical, hierarchical layered
systems of control and management needs to be replaced by flatter organizations. Corporate objective; and values must be understood and accepted right through the organization. Old ideas about the simplistic man-machine-money structure of business have to be eliminated and efficient wealth creation accepted as the kernel of modern business.

- Management should focus on processes rather than on structures. Processes which add value must be retained while those which do not should be eliminated. Management must emphasize psychodynamic quality of employees rather than their abilities and, skills; on creativity rather than on mechanical task; on organizational culture rather than material worth; on greater answerability to society as opposed to shareholders alone. Further, management must continuously review existing product lines and focus sharply on improvements. This allows the company to remain fresh and vigorous in the market place rather than becoming prematurely stale and stodgy.

- Traditional management has embraced a controlling philosophy being cautious of taking risks and emphasizing prevention of errors. This approach needs to be changed. Management should develop a new environment in their organizations in which risk-taking is encouraged in an experimental fashion and errors are allowed as learning experiences. Corporate culture must permit failure, otherwise managers will not try aggressively to success. In Telco there is a licit assumption. If a manager does not make a major mistake in five years, throw him in TISCO and in NFLa, mistake costing crores of rupees may be tolerated provided not committed consciously and occurs despite the best intention of the concerned person. Management of these companies realize that the mistakes are the inevitable byproducts of innovation. This kind of environment encourages management members to develop more confidence and attitude of risk-taking and courage to go beyond the limited responsibility of their role. All our organizations need to develop this kind of climate for future success.
Knowledge has become a direct competitive advantage for companies selling ideas and relationship and indirect advantage for all companies attempting to differentiate themselves by how they serve customers. From now on successful companies will be the ones that are the most adept at attracting, developing and retaining individuals who can drive a global organization that is responsive to both customers and burgeoning opportunities of technology. Thus the challenge for organizations is making sure they have the capability to find, assimilate, develop, compensate and retain such talented individuals.

The companies must be able to learn rapidly and continuously, innovate ceaselessly, and take on new strategic imperatives faster and more comfortably. Organizations must create a healthy discomfort with the status quo, an ability to detect emerging trends quicker than the competition, an ability to make rapid decisions, and the agility to seek new ways of doing business. To thrive, in other words, companies will need to be never ending state of transformation, perpetually creating fundamental, enduring change.

With the employee becoming IT companies' most valuable asset, HR managers will have to understand, "If customer is king, employee is emperor". Similarly, viewed from the chairman's eagle nest, "while R&D and marketing/sales are king, HR is the new emperor".

Similarly, employees are to be seen as key resources, which are to be carefully nurtured and constantly developed. In future how management used and involves its employees will determine business success. The extent of an employee's contribution depends on sense of Commitment and belonging to the organization and on the challenges, excitements and the opportunities that the organization provides to those who work in it. To get the best out of its employees, the management must first create a culture in which individuals identify themselves with their organization and find it psychologically rewarding to confront, proceeds and discover solutions for
them. Therefore, management will have to place more focus on developing a work climate. Which can motivate the employees for their better contributions and commitments. In this context, it is necessary that employees should be implicitly trusted, respected and encouraged to use their creative potential. Their legitimate demands must be continuously reviewed and fulfilled. They should be directly involved and empowered. Decision making powers must be pushed down to the lowest practical levels so that those closest to the problem can generate line-solution. Empowerment will bring along the spirit of taking risks and enjoy of winning. Moreover, future prosperity and growth of employees should be linked to the organizations prosperity and growth. The system must automatically ensure that they get a fair share of the benefits of increasing productivity and prosperity of the organization. The System that encourages employees to give their best should be introduced.

7.2.3 Getting the best out of Human Resource

- Full use of HR is an absolute prerequisite for building a healthy work culture where all individuals contribute their maximum for the growth of the organization.

- Full utilization of the human resource (HR) is possible only when a sound policy of recruitment, induction and in-service training is in place in organization.
  It involves immediate commitment and involvement.
  It provides the most effective process of learning by actual doing, guiding or supervising where reinforcement and knowledge of results are perceivable and available.
  It provides the organization to assess and appraise the employee to know his strength and find ways to enhance it.
  It is sheer quality of manpower that distinguishes one organization from another. Unlike other resources i.e. plants, machinery etc., human resource potential has no limits, physical or otherwise.
  Idle, underutilized manpower poses serious threat to a dedicated workforce.
as idle persons create problems not only for themselves but also for the organization.

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7.2.4 Manpower Planning
- It needs to drastically ramp up approach to manpower planning and become much more proactive. Whether it is through increased technical institutes or better work opportunities to satisfy the ambitious Internet generation, you need to do more to nurture and retain the talent resource. Otherwise, the demand-supply gap could be a big hurdle in India's dreams of becoming an IT superpower.

7.2.5 Recruitment and Selection Practices
- Another important suggestion is that, IT companies need to concentrate more on their recruitment practices. Besides technical capability and qualification, another aspect that crept into appointments and choice of employer is that the candidate and the company should both fit in with one another's culture. If there is a misalignment in this facet employees leave quickly. If you hire the right people, they stay. Therefore, culture, on both sides, is becoming an important qualification for the prospective employee.

- Companies should invest a lot of time and money on recruiting the right people to fit their needs. Microsoft, for instance, has employed 300 people focused only towards keeping track of the best talent across the industry all over the world. NIIT likes to spend more time in understanding the attitude of the person they hire than look for formal qualifications.
• Furthermore, online recruiting technology should be there, that can help corporations target candidates, sort resumes, and evaluate prospects on the web. Speed to hire is critical in this labour-short economy.

7.2.6 Placement
• Recruitment and selection of competent personnel is only first phase of developing an efficient and effective manpower. The placement of the employee is significantly important and the employees should be placed on the occupational area, which best suits him.

• The employee ought to have the aptitude and attitude for the job for which he is placed. His mental, temperamental, validation, objectivity, reliability faculties could be checked by benchmarking with the best. This would also isolate the characteristics that may need to be attended to.

7.2.7 Training and Development
• In this industry, skill become obsolete very fast. So the companies should invest lot of time and money in training and upgrading the technical knowledge of their people.

• Skill-based training assumed further importance, with 81 percent of the overall training conducted in the domestic segment being focused on re-skilling employees, against 68 percent last year. Among software exporters too, there was a marginal increase, from 80 percent in fiscal 2000-01 to 83 percent in 2001-02. The HR manager should note this.

7.2.8 Compensation
• This is the primary and most obvious incentive and there is no substitute for this. Any amount of facilities will not work if the employee is not satisfied with the salary.
7.2.9 Offshore assignment

- These could range from three month to two years or more tenures but are very attractive as they give the experiences of working abroad without the emotional uprooting usually involved with more permanent shifts.

7.2.10 Challenging work

- Software professionals crave to work on the latest cutting edge technology. They often decide to stay on the same company at lower salaries as they are continuously shifted from one challenging project to another. The belief is that long-term gain from exposure to interesting projects is worth than to wait.

- A very important thing that a software engineer or knowledge worker wants from an organization is a competency path or growth in learning. Everything else, good infrastructure and salary, makes up just the hygiene factors, they have to be there anyway. I surveyed many firms those have no big names, but still attract the best because they do top-of-the-line work. So, these factors must be taken care of.

- Professional satisfaction is to have a job that is exciting, that provides you with a lot of responsibility and intellectual challenge, allows you to work for world class customers in an environment that provides good peers, good resources, good induction and training. Software companies should provide all of that. Sometimes, though, that can work the other way round. Everyone today, for instance, wants to work on leading edge technologies and the inability to do so is a major source of employee attrition in the IT sector.

7.2.11 Conducive Environment

- Companies need to provide amenities to cater all the needs of the employees.

- All IT companies need to create a good work environment that motivates employees and looks after them well. For a good example, a large part of
Infosys' Bangalore campus is devoted to "distressing activities" employees can play a game of golf, use the swank bowling alley or sweat it out on the other game courts. HSS has regular bushes on campus, while the gymnasium in the basement is a hot favorite with the 20-some-things that fill up its staff roster.

- One of the things that can work well for any organization is the "right" environment in its business ethics program. This is implemented by all Hughes companies worldwide. The focus of the program is how to grow business ethically, both within the company and outside. All new employees go through an ethics workshop within four weeks of joining and a refresher program within the year. This is a simple thing but goes a long way to creating the right atmosphere.

- So gone is the old-hog maxim of flexi-timings, casual dressing and round-the-clock pantries, they are today's hygiene factors. These perks are no longer key differentiators, simply because everyone is offering them. (In my survey also more than 80 percent of the organizations offering flexi time facility to their employees). And this leads to the greatest challenge – staving off advances on employees by the competition. While the new economy might have created challenges for HR, it has also spun off HR's earlier role as a mere administrator. Today's HR boss is the software company's forest guard. His mission: keep out poachers... after all; it's a jungle out there.

7.2.12 Professional environment

- Within where job opportunities in the company, both domestic and offshore, should announced. Whoever is interested may applies and the internal placement should be made after an evaluation of skill set matching. This may prove good strategy for professional environment.
• Internal job rotation, in fact, is an important concept. The internal employees must have first chance to get benefit. Wipro implement this. "If for a project we have a choice between a 100 percent prepared person who has to be hired from outside and a person from within the company who is only 60 percent ready- we pick the Wipro-ite. This is very important to us. we believe in learning on the job," says Ranjekar, Vice president HR. This is also a very important concept of job enrichment.

7.2.13 Rewards and Appraisal

• Instead of waiting for an annual appraisal, IT companies should reward employees for their performance much faster; they could do it bi-annually or quarterly or even project wise.

• Second step would be to provide the necessary system of appraisal and rewards to provide optimum job satisfaction. Not just incentives but also a conscious policy to discourage stagnation in career.

• In public sector companies, turnover is almost negligible due to reasons like job security, hefty perks and allowances, attractive compensation to family in case of death or physical disability of the employee. On the other hand, in private sector, jobs are more challenging, promotions are performance rather than age and once the employee proves himself, he should duly appreciated and given recognition in the form of rewards and profit sharing.

7.2.14 Job satisfaction

• Many talented professionals leave their organizations because the top management does not understand the psychology of work satisfaction; they assume that the people who excel at their work are necessarily happy in their jobs. Although this sounds logical, in reality competency does not lead to job satisfaction. Most of the professional executives can succeed virtually in any job situation because of their high achievement orientation and sound knowledge base. Though the opposite of satisfaction is dissatisfaction. In absence of dissatisfaction not necessarily ensures work satisfaction. To
make people satisfied, we need to understand their deeply embedded life interest and the psychology of work satisfaction.

7.2.15 Retaining Employees

- The shortage of technically qualified manpower seems to have initiated a tug-of-war. Although the domestic industry has grown at a fast pace, the lure of the Silicon Valley continues to attract Indians. So, in addition to the national demand, an increase in international demand by 20 percent will add to the pressure. It is difficult to say whether migration will increase or decrease, but it will certainly continue to be an issue specially with the IT industry. It is the dream of any smart engineering graduate to go abroad and why shouldn't he go if he gets more opportunities there. In the light of this fact, software companies will have to change the strategies to recruit and attract skilled manpower to have the best quality product and to sustain in international market.

- Movement within the domestic industry poses yet another challenge. As the IT professional has more options to choose from, his mobility from one company to another is also very high, Demand creates a supply toggle situation and since IT professionals are operating in the demand market, there is a natural mobility that's found there, there is pull and push factor too that adds in to the dynamism. An average knowledge worker spends about 18 months in a job. The present generation is very ambitious and factors like loyalty are slightly down the score of reasons to stay back. So to retain the employees in the company, organizations have to sort out best strategies.

- While core HR initiatives like career path, learning curve and compensation are important, softer HR environments are also becoming increasingly crucial. For example, the Infosys campus is probably the most spoken and written about corporate campus in the country. Its mere size (44 acres) was
unthinkable a few years ago. In fact, it's so huge that the company parks hundreds of cycles outside each block to help employees get from one block to another. Bangalore is given to sudden unexpected rains so umbrellas hang outside each block. A large part of the campus is given up for distressing activities where software engineers can go play a couple of rounds of golf or unwind at the bowling alley. The company even has a music group of its own called, appropriately, Algorithms.

Infosys has the lowest attrition rate in the industry. And in churning times like these, that's a good measure of how effective their HR policies are. Software companies should learn from this.

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7.2.16 Diversity Management

- The companies should also develop an outlook on diversity that enables them to incorporate employees' perspectives into the main work of the organization and to enhance work by rethinking primary tasks and redefining markets, products, strategies, missions, business practices, and even cultures. Companies should use the learning-and-effectiveness paradigm for managing diversity and, by doing so, may tap true benefits of diversity.

- Loden (1940) advocate a broad definition of diversity where everyone's diversity is valued. Some of these dimensions are more important to be managed and make big difference, so we need to focus more on them. Similarly, each organization will have its own particular diversity issues that they have to address. There is a need to explore the various dimensions of
diversity that is present in the organization. We have to assess the relative impact followed by strategies and actions to manage workforce diversity. Many Fortune 500 companies have diversity initiatives in place such as having the diversity statement, its meaning and value for the organization.

- Understanding the nature of workforce diversity is important for taking appropriate strategies to manage. It would result in a positive and healthy work environment and improved individual and organizational effectiveness in a multicultural society like ours in a changing business environment.

7.2.17 Communication and counseling

- Communication between the superiors and the rest is essential. This could be based on transparency and willingness to share information about the organization to which the seniors may have exclusive access.

- Feedback and counseling is an essential part of HR exercise in organizations. An informal system of counseling should co-exist with formal system for guidance and performance capabilities. Counseling should be a constant exercise.

7.2.18 Manpower audit

- Manpower audit is a crucial area in HR, which predicts the problems as they occur. There are different methods in conducting such an audit. Staffing studies are carried out routinely to compare the objectives, task, ratio of personnel salary levels etc. with that of industry. Direct analysis is a method of periodically assess the employee's contribution to the organization in terms of his time spent, dedication, productivity etc. Turnover ratios are effective indicator of the health of the human resource in any organization, which needs to be periodically assessed. Also regular opinion surveys would find the faults as they occur within organization and may also provide a right set of information for benchmarking the personnel practice with the best of the industry peer.
7.2.19 Human Capital is the Key

- In the knowledge era and a skill-based economy, it has become imperative that human resources become one of the most essential ingredients of success. The growth of IT companies worldwide depends on its people and the intellectual capital it possesses.

- High performing organizations, in order to keep performing, on a continuous basis, must treat their human capital as the most important and valuable asset. We should treat them as adults, as partners and with dignity and respect. These are the underlying themes "In search of excellence" Peter and Austin. "The individual must be respected" is one and the most important one of the three basic tenets of managerial excellence in "The IBM way" F.G. Buck Rodgers, and in many other books on management.

- As we all know, and know it well, that "People who feel good about themselves produce good results" One minute manager by Blanchard and Johnson, P. 19). And "People who produce good results feel good about themselves" (Putting the One minute manager to work by Blanchard Lorber, P.12). Such healthy and virtuous cycle goes on and on, satisfying the individual goals and the organizational goals, too, at the same time, in that the individual derives job satisfaction, which, in turn, induces him to reach out for excellence, culminating in the all round development of the performing organizations.

- 'Knowledge workers' has become a buzzword in today's IT scenario. And if we look at the top software exporters, they have been growing phenomenally in workforce strength. To make it big in the global software market, India needs to increase its mass of knowledge workers. The establishment of Indian Institutes of Information Technology is definitely a step ahead in the right direction, but what the industry needs is experts in niche areas, in other
words, persons with domain expertise. In the era of cutting-edge technologies, it is this skilled workforce that will make all the difference.

7.2.20 Monitoring organizational health (MoH)

- We must always remember that computers and calculators don’t have feelings, but human beings do have. And, therefore, they have to be dealt with, with empathy and compassion, with sincere concern for them all.

- We keep on talking about MIS (Management Information System, MCS (Management Control System, FPM Financial Performance Monitoring), etc. But, we do not sincerely and systematically attempt at MoH as to how healthy and upbeat and mood and morale, approach and attitude of the human resources of the organization are, which can make or mark the progress and prospects, even of a high performing organization. Several poets and short story writers, novelists and dramatists, have so aptly described the feelings of various characters of different shades and shapes, as if they have rather lived each role though not necessarily in their real lives. This is so, because their sense and sensitivity are so high and fine-tuned that they see each and every event and emotion very clearly.

We must ever remember that "we may force people to work, but we cannot force people to work well; we can only motivate them to do so" and "achieve excellence".

7.2.21 Tackling ineffective Manpower

- The flip side of HR is the possibility of existence of ineffective manpower, which has to be identified and tackled.

- Apart from the initial redundancy created owing to faulty job recruitment procedures, people may become ineffective after reaching a stage in their career after which their skill sets may fail. The way to tackle this is to provide continuous job enrichment and training programmers. There is a third
possibility of technology making jobs obsolete a condition that could be easily predicted and HR policies readjusted accordingly.

7.2.22 At the end

- In the knowledge economy, human resource is most vital. In spite of the best practices, technology and resources, organizations differ in excellence in terms of their people and people processes. The process require an ongoing dialogue between an employee and the direct superior of his own department rather than pushing this to the domain or HR department.

- HR manager must now take responsibility for orienting and training line management about the importance of high employee morale and how to achieve it. In addition, the new HR manager should be the employees' voice in management discussions; offers employees opportunities for personal and professional growth; and provide resource that help employees meet the demands put on them.