

**Human Issues and Challenges
In Indian Software Industry**

By

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Abstract

Indian software industry has been experiencing a phenomenal growth for the last few years. The software industry is expected to play a vital role in the growth of Indian Economy. However the ability of the software industry to sustain its growth will depend upon its ability to integrate needs of its international customers and aspirations of Indian software professionals. Software professionals from India aspire for and are capable of being global citizens. As a consequence, the task of retaining and meeting the aspirations of Indian software professionals is complex and challenging. Based on in-depth interviews in nine organisations, the papers explores the human issues being experienced by Indian software organisations. It also suggests measures to overcome some of the human challenges. The findings have implications for societies that are aspiring to become software service suppliers to USA and other developed countries.

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Introduction

India, the world's largest democracy and home to nearly one billion people, is quietly but quickly emerging as a leader in the field of software engineering and development. The Indian software industry is having a phenomenal compounded growth of about 60 percent per annum. Indian Prime Minister's National Task Force on Information Technology and Software Development has set a target of US \$50 billion of annual software exports by the year 2008. During the year 2001-02, the software industry in India would be close to Rs. 60,000 crore or US\$ 14 billion. Due to increased Government spending towards IT in the domestic market, the domestic software market has fetched record revenue of almost Rs. 8,200 crore in 1999-2000 (NASSCOM, 1999). Government of India has directed that 1-3 percent of the budget of every government department would be towards IT hardware and software. In addition, the government has also withdrawn import duty on software. Both these policy initiatives from the government has further brought encouraging signals to the domestic software market. Microsoft's Chairman Bill Gates in his maiden visit to India stated that India would emerge as a software superpower in the coming years. Based on the health of Indian software industry, Bill Clinton, President of USA in his recent visit to India had predicted that India would have tremendous growth in the next two decades.

Thus every body is projecting and anticipating that Indian software industry will play a very vital role in the growth of Indian Economy. However, the projected growth of Indian software industry will largely depend upon the industry's ability to manage human issues and challenges being experienced by it. The cost of Indian software professionals has been increasing by 25-30 Percent per annum. As a consequence, software industries from China, Philippines, Russia and Mexico are increasingly emerging as competitors to Indian software industry.

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Presently, Indian software organisations have been working on the lower end of the value chain such as providing business solution, programming and body shopping. For retaining its competitive edge, Indian software industry has been striving to move up the value chain. However, moving up the value chain implies working on technology and product development. In turn, these initiatives require availability of experienced and more competent software professionals for sufficiently long period of time. Software professionals with 3 years or more experience are in short supply in USA, Europe and literally every part of the world. Indian software professionals having proved their competence and capabilities are increasingly in demand in USA and other developed countries. As a consequence, large number of Indian software professionals has been moving to USA and Europe. US Government is seriously contemplating to increase the visa-quota for Indian software professionals.

Projects on the lower end of value chain require many times working on legacy systems and technologies of the earlier era. Indian software professionals aspire to work on the latest technology and platforms. It is leading to a situation whereby software organisations exclusively working on lower levels of value chain increasingly find it difficult to attract and retain competent software professionals.

Thus the growth of Indian software organisation in the next decade will substantially depend upon the ability of the industry to resolve conflicts emerging from the requirements of the market and the aspirations of software professionals who can make the growth a reality. It is in this context that this study explores and strives to explain human issues and challenges experienced by the Indian software industry. The study also examines and shares initiatives taken by Indian software organisations to resolve these challenges. Finally, the paper also suggests some measures to overcome some of the human problems being experienced by the industry.

Methodology and Sample Size

Indian software industry is comparatively young and not enough literature is available about the industry and challenges being experienced by it. Accordingly, this study was envisaged as an exploratory study and it was decided to use qualitative research methods that would provide a richer and fuller understanding of human issues and challenges in Indian software industry.

According to McClintock, Brannon and Moody (1979) qualitative research methods are thick, deep and holistic. They capture the frame of reference and definition of the situation of a given informant and thus avoid instrumentation artifacts of standardized measurement procedures. Qualitative methods permit detailed examination of organisation process and elucidate those factors peculiar to the case that may allow greater understanding of the causality. Accordingly, it was planned to use in-depth open-ended interviewing technique.

It was felt that the large, medium and small organisations might have different types of human problems. Hence, the study has covered a total of nine organisations consisting of large, medium and small organisations (Table 1).

Table 1
Classification of Organisation by Size which Participated in the Study

Type of Organisation	No. of Software Professionals working in the Organisation	No. of Organisations Covered in the Study
Large Size	2, 000 and more	2
Medium Size	300 and more but less than 2,000	4
Small Size	Less than 300	3
Total No. of Organisations Participated in the Study		9 Organisations

The owners of an organisation, being major stakeholders tend to define vision and values for the organisation. And hence, ownership might play a role in the nature of the problems being experienced by software organisations. Accordingly, based on ownership following three types of Indian software organisations were covered by the study:

- ◆ Indian initiated and substantially Indian owned software organisations (3 Organisations)
- ◆ Non-Resident Indian owned software organisations (3 Organisations)
- ◆ Indian subsidiary of multinational corporations (3 Organisations)

A total of 26 interviews were conducted covering representatives from the top management, project managers, software professionals, HR managers and supporting departments. However, due to non-availability of the participants, we could not interview representatives from each category in some organisations. For each group of respondent, namely, top management, project managers, software professionals and HR managers a semi-structured interview schedule was

developed. The schedule was used as a guide to ensure that at the end of the interview, most of the items listed in the structured interviews were covered by the interview. However, to the extent possible, interviewees were not disturbed or questioned in the initial phase of the interview. Depending upon the convenience of the interviewee, either the interview was conducted in the office of the interviewee; or the interviewees were invited to visit the institute of the researcher and the interviews were conducted at the institute. Every interview was conducted for a minimum period of one hour with the average duration of interviews being about one and half-hour. It was important to ensure that the interviewees were absolutely relaxed and comfortable so that they could share whatever was upper most in their mind. Hence, it was decided not to tape-record the interviews and only take the notes. Most of the time, a research assistant accompanied the author to supplement notes taking. Interviewees were assured that their or their organisations' identity would not be revealed and would be appropriately camouflaged while discussing a problem. However, we have mentioned names of organisations while describing systems and practices, which are unique and which helped those organisations to avert or overcome a problem.

All the interviews were transcribed. Based on the interviews, some common characteristics of Indian software professionals emerged which is described in the next section. Software professionals in other countries share some of these characteristics as well. However, in context of Indian software organisations and Indian society, these characteristics create some unique problems and challenges. Problems, which were common and experienced in at least fifty percent of the organisations, 5 out of 9 organisations covered by the study, are discussed and described in detail. Findings, which were unique to a type of organisation either by size or by ownership are discussed briefly later in the paper.

Software Professionals: Some Common Characteristics

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

- Software professionals invest substantial time, efforts and resources to acquire relevant and valid knowledge. Over time, the knowledge acquired by them becomes their self-concept.
- Software professionals look forward to use their existing knowledge and acquire new knowledge on a continuous basis. This is significant for software professionals to experience a sense of growth and nurture their concept of growth.
- Software professionals tend to be highly analytical and hence they expect rationale for every activity. They expect that they should be involved in defining and planning every organisational change affecting them.
- Software professionals tend to be high achievers and hence they expect periodical and tangible feed back and recognition for performance. Since reward system is perceived, as a part of the feed back system, linking performance with reward and experiencing equity in reward becomes very important issues with them.
- Software professionals want to work on new technologies, new platforms and with new organisations to improve their learning and curriculum vitae.
- Software professionals are more committed to their profession than the organisation they work for.
- Due to existing demand and supply situation, software professionals are able to move from their existing organisations to new organisations in India or abroad rather fast.
- Software professionals value autonomy, professionalism and innovativeness.

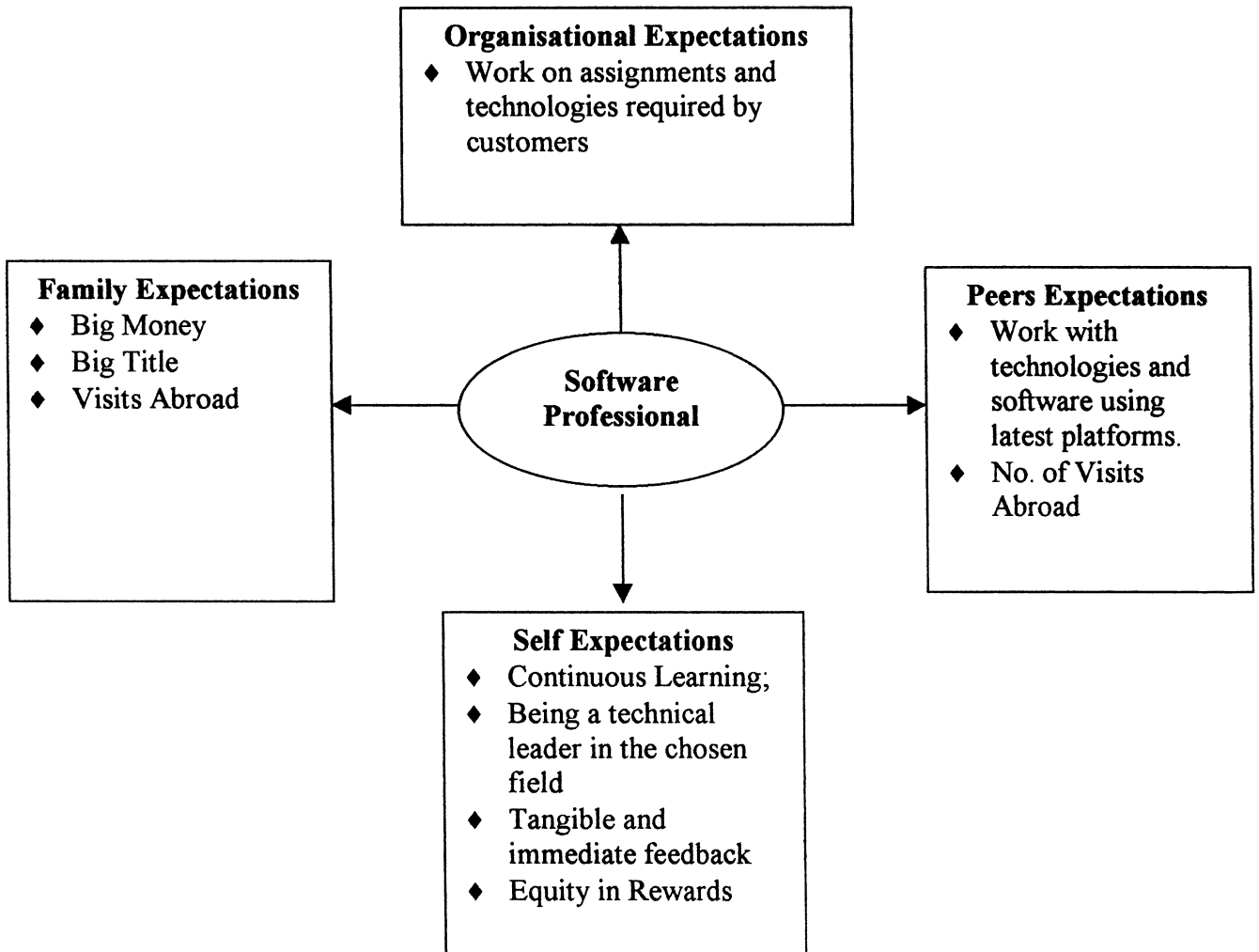
Managing Multiple Expectations

Each one of us can have and do have multiple expectations from the job and career that we choose. However, in case of software professionals, the expectations from the job seem to be too many and many times these expectations are in conflict with each other. Chief Executive of a small software company employing about 200 employees and owned by a NRI said that software professionals when interviewed for job invariably say that they want to learn and be technical leaders in their respective chosen fields. However, after joining the organisation, they tend to use yard sticks to measure their success that tend to be different from their stated objectives of learning and be technical leaders in their chosen field. These yardsticks tend to be tangible and invariably are derived from the expectations experienced by software professionals from their family members and their peers. In addition, organisations have their own expectations from

software professionals. These multiple expectations create pulls and pressures on software professionals.

As shown in Figure 1 and described earlier, software professionals hold certain images about self as a professional. As a consequence, they expect to nurture the image of themselves as

Figure 1: Multiple Expectations Creating Pressures and Pulls on Software Professionals



professionals by learning on a continuous basis and becoming technical leaders in their chosen field. Organisations create very different kind of pulls based on the requirements of markets and customers. They want to deliver what customers require in the defined time and budget. The customers from developed countries sub-contract many of the activities to Indian software organisations because software professionals in those countries want to work only on projects involving latest technologies and software. This means that in many projects, Indian software professional have to work on technologies and languages of yesteryear such as Cobol.

Due to Internet and e-mail facilities, Indian software professionals are in touch with their peers in India and abroad on a continuous basis. They are aware of the kind of projects and technologies their peers in India as well as abroad are working with. This awareness creates pressures on software professionals to aspire to work on similar platforms and technologies. In the informal settings, peers tend to ask each other about pay, perks and about their foreign visits. All this awareness creates expectations and pressures to expect all these in one's own organisation. Software professionals further increase pressure on themselves and their organisation by selectively picking up what are best pay, perks and other facilities in different software organisations. Interestingly, the benchmarking organisations do not remain same for long and software professionals keep suggesting new organisations for benchmarking to their top management and HR professionals.

In addition, due to hype about software industry, parents in Indian society make lot of investment and sacrifices to ensure that their wards are able to study software courses. Media keeps publishing about the growth of software industry and how people working in software industry have become millionaires. These leads to building expectations of parents that their wards should earn lot of money and support the family. In India, being software professional and having visited abroad gets perceived as status symbol in one's family as well as in one's reference group. In many castes in India, number of visits to foreign countries made by a boy substantially defines the amount of dowry he can command in his marriage. These pulls and pressures being experienced by software professionals are real and are experienced on a continuous basis. These multiple expectations lead to software professionals being confused, tense and not being comfortable with oneself.

A senior executive mentioned that intellectual capabilities of software professionals are not necessarily superior as compared to professionals working in other fields. However, due to media hype and the imbalance between the demand and supply of software professionals, they tend to build an aura around themselves. They tend to believe that they are cut above the others and hence they must be treated differently and all their expectations should be simultaneously satisfied. He further said, "Indian software professionals tend to be 'Demi-Gods' and want to be treated like that".

Technical versus Managerial Growth Path for Software Professionals

Traditional growth path for software professionals in Indian organisations involves moving from being software professional to a module leader to a project leader. Further a project leader is promoted as a project manager and finally a business manager. The initial change to a module/project leader may be only functional. It means that in a given project, software professional may act as a module leader. But in another project s/he may become a project leader or may remain only a team member.

Why do Indian software organisations need so many positions of project leaders and project managers? Presently in a large number of Indian organisations, most projects are outsourced work from foreign clients. Some of the key responsibilities of project leaders in software organisations are:

- Interfacing with potential customers, understanding their requirements, getting their orders and then ensuring that orders are delivered in time.
- Assigning roles and responsibilities and coordinate activities amongst different team members within the organisation.
- Informing a customer about the progress of the project on a daily basis.
- Submitting a weekly project status report to the customer.

These activities may take anywhere between 25 to 40 percent of the time of software professionals on a daily basis. Since these activities are perceived merely as administrative chore, cutting down the opportunities to work on programming activities, software professionals do not like the role of a project leader.

However, from organisational perspective, it is a very important role. Project leader is a very important link between customers and organisation. The project leader facilitates customers to feel confident that the work is progressing as planned on their assignments. A revenue perspective also exists to the position of project leaders. The project leader is usually billed at substantially higher rate as compared to software professionals. Hence, organisations feel the need for promoting software professionals as project leaders very soon in their career.

Number of senior managers had said that software professionals were not interested in performing the role of a project manager. Software professional prefers to learn and grow through a technical career. They only want to work on technical work such as flow diagramming, programming and coding. These tasks provide software professionals opportunities to learn and use new tools and techniques. The technical learning is specific, tangible and becomes part of the curriculum vitae of software professional. Most importantly, many of the Indian software professionals aspire to work in U.S.A. What gets valued for such foreign assignments is their technical knowledge and not their managerial knowledge and expertise. Hence, from the perspective of software professionals, they would like to spend most of their time doing programming and related activities.

What does it mean to be Project Leader? Sukant, a brilliant electrical engineer, has been working for last 3 and ½ years and became project leader after working for about one and half years. Presently, six software professionals report to him. He felt good to be promoted as a project leader. He had perceived it to be recognition of his good work as software professional. As a project leader, he performs many administrative functions such as talking to customers on a regular basis, keeping track of every body's efforts and performance and preparing and sending weekly status report to the customer. The administrative responsibilities take about 50 percent of the time. However, after six months he got bored with the administrative and coordination activities. Sukant said, " After sometime one says to oneself that it's all stupid work"

Sukant further shared that coding was generally perceived to be a superior work as compared to interacting with customers or coordinating the activities of teamwork. Coding is the only activity that helps you to keep in touch with technical developments in the field. Sukant however feels that he has acquired useful interpersonal skills by being a project leader. He also thinks that he has made significant contributions in the organisation as a project leader. However, if he had to apply to another software company, his experience will look equivalent to just one year experience. His experience as a project leader will not be valued much by potential employers. At project leader level, potential employers tend to evaluate your competence in terms of how many software professionals report to you. One's knowledge of organisational processes and interpersonal skills does not seem to get valued. He finally said that if software organisations want to create project leaders, they have to identify high achievers and give them lot of training

Senior managers as well as HR managers had opined that while software professionals do not usually like to spend their time on leadership and interpersonal issues, many of them like to have the title of project leader and project manager. The change in title gets perceived by software professionals, and their families and reference groups as recognition of their good technical work. It is perceived as a reward and in many cases it does increase the perks and facilities enjoyed by software professionals. One reason, they do not like the role of project leader/manager is that many of them do not have leadership skills and competencies and they are not able to perform leadership roles effectively.

How can software organisations resolve conflict between the need of the software professionals to work on technical issues versus organisational need to perform leadership functions? Firstly, Indian software organisations have choice to move on value chain and develop their own products and technologies. This in turn will require less need for software professionals to be in touch with customers on day to day basis. Another choice for software organisations is to nurture the leadership functions and roles within the organisation. At the time of recruitment itself, software professionals with leadership skills and interpersonal orientation should be picked up. They should be provided substantial training to acquire leadership skills. They must be also made to feel that their leadership skills are valued by the organisation and they will have equally good growth opportunities in both the career routes.

Team Work

Software professionals seem to be reluctant to work in teams and they prefer to be with their computers preferably working from their home itself. Programming and coding work requires thinking and working by oneself. Since software professionals in their initial phase of career substantially work on programming and coding, it becomes their preference and nature to work by oneself. Working in teams requires that the team members should be prepared to learn from each other. Software professionals seem to enjoy learning by themselves. They possibly enjoy the joy of exploration and the excitement of finding out something by oneself. Another possible reason for lack of team learning and sharing may be that software professionals seem to be reluctant to accept their ignorance in front of their colleagues and superior, and sometime in front

of one's subordinates. However, from organisation's point of view, reluctance to learn from one's team members and the desire to learn only by oneself is an expensive way of learning.

Many members of a project team are of similar age and experience. Since they are at same level, they struggle to define their status and position in the group vis-à-vis their team members. One way to have a higher position in one's group is to get positioned as a more knowledgeable professional. This in turn leads to a game within a team where by every body tries to prove oneself superior to others and a politics of knowledge becomes part of work setting. These processes adversely affect the team work and team processes in the organisation.

Software professionals also seem to be reluctant to teach and train their team members. Software professionals are often part of temporary project teams. Since the relationship is temporary, leaders are reluctant to make an investment of their time teaching their team members new technologies. The attempt is to have team members with requisite skills rather than investing time in educating them. In extreme situations where the success of a project depends upon a number of team members being able to work with a new technologies, a project leader shows willingness to invest some of one's time to educate one's team members.

The technology in software industry is evolving very fast. Hence, every body including senior executives feels very insecure. One way to manage one's insecurity is to have some exclusive knowledge and try to be unique in the group. Secondly, senior people may like to use their time to acquire further new knowledge rather than teach their team members. Organisations are also not very sensitive to the efforts put by a manager to educate one's team members. The focus is on what is tangible and what is visible. Since mentoring contributions are difficult to quantify and often their impact may not be noticed immediately, managers and leaders are reluctant to make investment of time and effort to educate their team members.

Selecting members for a new team is also a very difficult task. Software professionals are either interested to work on projects involving technology of their choice or location of their choice. If it is posting abroad, software professionals are much more willing as compared to a temporary posting in India. Software professionals who are not picked up for projects of their choice or foreign assignments tend to crib and complain of lack of fairness in the selection process.

Lack of teamwork in software organisations possibly has its roots in processes of selection, training and rewarding. Software organisation tends to give much greater importance to software knowledge and skills than interpersonal skills at the time of recruitment. Software knowledge can be more easily assessed as compared to interpersonal and team working skills. Senior managers, part of the selection team, themselves being software professionals, tend to value software knowledge and skills more than team working skills at the time of selection. This becomes another reason for due importance not being given to team working skills at the time of recruitment.

In response to the above issue, HR managers had said that partly these observations are true. But they said that today demand for superior software professionals is much greater than the supply. In addition, these days a number of multinational software companies are recruiting software professionals/management graduates from Indian Institutes of Technologies and Management (IITs/IIMs). Due to heavy competition, organisations aspiring to recruit graduates from national institutes of repute have to use selection processes that are not very elaborate and time consuming. Many organisations have deleted group discussions and other processes, which use to provide some useful data about team behaviour of interviewees.

It has also emerged that neither the software professionals nor the organisations tend to give the same level of importance to training for teamwork as they tend to value training for software skills. By nature it seems software professionals are not very keen to acquire soft skills of team working. It was also seen in some organisations that while software training was arranged from Monday to Friday, soft skills training programmes were usually arranged on Saturdays. This creates an impression amongst young software professionals that soft skills are given less importance by the organisation as compared to software skills. However, it was reported that when training programmes for soft skills are arranged on weekdays, even then the response in terms of registration for the programmes remains lukewarm.

The lack of teamwork can also be contributed to lack of substantial team-rewards. While team members are encouraged to go for picnic and have other fun activities together, organisational rewards continue to be substantially individual based. This is possibly another reason for lack of motivation for teamwork.

However, now-a-days many Indian software organisations extensively use outbound training to help software professionals to learn the skills of team working. Most of the organisations, early in the life of a project send team members for a two-day outbound training so that they can learn about each other and the team processes. Senior managers had observed that outbound training does help a group to come closer to each other.

Some Indian software organisations such as Wipro Limited have implemented a 360 Degrees Performance Appraisal. The system, presently covers top and senior managers. In addition to quantified feedback, every appraisee also receives a group-wise summary of what its reference group-members want him or her to continue doing, start doing and stop doing. Such qualitative feedback facilitates creating awareness about interdependencies amongst the team members and how they could help each other to improve their individual as well as group performance.

Long Hours of Work disturbing balance between Work and Non-Work Life

Software professionals enjoy being with their computers and in turn computers tend to be highly addictive. Particularly, software professionals when they are working on a project, they tend to and they are expected to work long hours. Working for 12 to 14 hours per day for long period of time seem to be quite common in software organisations. Long working hours is valued by organisations, but more importantly software professionals tend to believe that they matter for the organisation when they work long hours. However, over time, the process of working long hours disturbs the balance between work and non-work life and software professionals tend to experience burnout.

A person is expected to perform many roles related to work and non-work life. However, since software professionals tend to spend so much of time on work related activities that all the other roles tend to become irrelevant for them. In an extreme situation, for software professionals only role-identity remains and personal-identity tends to get merged with the role-identity. Professionals operating at self-actualization level tend to define their self-concept in terms of their work and hence they may not feel bad when work becomes all encompassing. However, in case of many software professionals work continues to be instrumental in getting tangible rewards from the organisations. Hence, consciously and a number of time sub-consciously, software professionals exchange their free time and non-work life roles for organisational

performance and tangible rewards associated with them. However, the vacuum due to lack of non-work life activities leads to emptiness within and annoyance with the organisation.

Software organisations need to be aware of the alienation and burnout being experienced by software professionals working with them. These organisations should deliberately facilitate and should insist on software professionals taking compulsory breaks. Further, Indian software organisations will stand to benefit by providing sabbatical to their software professionals so that they can nurture their interests and hobbies. This will make software professionals feel good about being part of their existing organisations. Silicon Automation Systems (SAS) provides a sabbatical every four years for a period of six weeks to its software professionals.

Organisational Initiatives to Manage and Motivate Software Professionals

In spite of the problems discussed above, many Indian software organisations such as Infosys, Wipro, Satyam, SAS and Aditi Technologies have been having very good growth. Many of them have taken unique initiatives to manage and motivate software professionals. Some of these initiatives are:

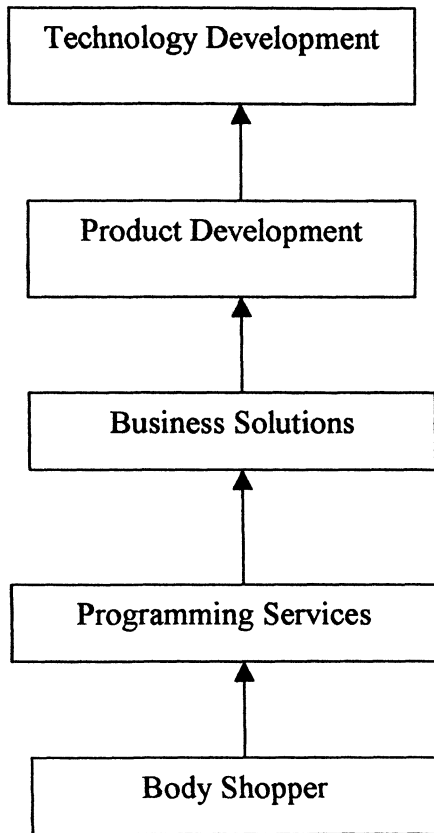
Moving up on Value Chain

The slow rate of progression on value chain for Indian software organisation is partly due to higher level of ambiguity and uncertainty which is associated with the industry. Part of the ambiguity and uncertainty comes from the technology that is evolving very fast. Applications Software Products (ASPs) are developed in environments which are computer intensive and which stand to benefit by automation. Since the Indian markets till recently were not very computer usage intensive, it did not offer opportunities to design and test market a software product.

As shown in figure 2, many Indian software organisations are moving on value chain by being business solution providers. This mode of growing up on value chain requires understanding the business strategies of client organisations, defining business solutions and then providing software support in terms of designing and developing technical architecture and programming code. This growth strategy requires that organisation should develop capabilities and competencies to understand business strategies of client organisations and suggest appropriate

business solutions. Accordingly, Indian software organisations such as Infosys and Wipro have been recruiting Business Management Graduates (MBAs) who work with organisations to

Figure 2
Value Chain in Software Industry



understand their business strategies and design business solutions. Software professionals support these projects by designing technical architecture and programming. These strategies are likely to offer opportunities to software professionals to continue to work on software technologies.

Business graduates who work with customers are likely to develop greater customer orientation and hence would be valued more by customers, and in turn by the top management of the organisation. And software professionals may not like this. Software organisations aspiring to use this path for growing up on the value chain would need to develop organisational systems

and processes to ensure that MBAs and software professionals feel comfortable to work as a part of the same team.

Skills and competencies required to work on different segments of value chain are different. Professionals working on higher segment of value chain are expected to have superior levels of software knowledge and domain knowledge, and should also be paid more. Aditi Technologies has evolved innovative salary structures catering to different segments of the value chain. Initially, the company was mostly in body shopping. But soon it realised that it would limit its growth and its ability to attract the very best from the market. Today, Aditi Technologies operates in different segments of value chain. It has a high technology laboratory working on current technical developments. Software professionals aspiring to work on current and complex technologies on long-term basis are posted in technology lab and product teams. They get paid much higher levels of salary and ESOP as compared to professionals working in service group. However, since, service group members get opportunities to travel abroad and work on-site on a regular basis, they earn substantial amount in US dollars during on-site visits. Software professionals who are posted on contract basis with client organisations such as Microsoft do not receive any ESOP and if they have any previous share holdings from the organisation, it is frozen for the period they spend in USA. Thus, Aditi Technologies is able to operate in different segments of value chain, meet different aspirations of software professionals and also remain competitive in different segments.

Silicon Automation Systems (SAS) has been working on higher segments of value chain from its inception. It is working with multinational corporations who are considered to be standard setters in the chosen field of SAS, namely telecommunication. Due to its positioning, SAS is able to attract best of the software professionals to work with it. The findings suggest that attrition rate at SAS is much lower as compared to the industry average. Interestingly, SAS has plans to move down on value chain to exploit the tremendous opportunities available in business solution segment.

Creating Learning Opportunities

Moving up on value chain is a powerful way of creating learning opportunities. In addition, Indian software organisations are investing substantial amount of time and resources to help their

organisational members to learn what they value and what is relevant for the organisations. Some unique initiatives taken by Indian software organisations to meet learning aspirations of software professionals are:

- Many software organisations spend about five percent of their manpower budget on training. Every software professional is expected to spend a minimum of five days per year in classroom setting to learn what is relevant for him/her and often these targets are exceeded.
- Leadership and interpersonal skills training is being given increasingly more importance. SAS is planning to progressively send all its senior managers for advanced management programmes to USA and Europe.
- Infosys trains newcomers for a period of three and half months in software basics as well as project and organisation-specific skills. As a part of the training programme, participants work on a project, which gives hands-on training. The programme was evaluated by Foundation for International Services, Washington, an independent agency from the USA, which equated the three-month course with BS in computer science from the USA (Agrawal, 1999).
- Wipro has designed a five-day training programme, the “Wipro Leaders’ Programme”, around leadership capabilities of vision, high energy, self-confidence, ownership, commitment to excellence, aggressive commitment and building star performers and teams. (Agrawal, 1999).
- Software organisations spend considerable time and resources to upgrade abilities of their trainers. They are encouraged to participate in world-class training programmes.
- Senior managers and project managers are being encouraged to spend some time on a regular basis as a trainer in in-house training programmes. Mr. A.H.Premji, Chairman of Wipro Limited addresses participants in every leadership programme sharing organisational vision and values.

Facilitating Wealth Generation

Software organisations have realised that for retaining software professionals, they must facilitate them to generate wealth for themselves. Increasingly, Indian as well as multinational corporations operating in India use Employee Stock Option Schemes (ESOPs) to share wealth with their employees. Indian organisations also use notional shares, having a lock-in period of two years. The difference in value of shares at the end of the locking period is paid to employees.

Indian software organisations are losing a number of software professionals to dot.com companies. In addition to the possibilities of wealth generation, it is a unique experience to be an entrepreneur. Many Indian organisations such as Satyam and Infosys are providing encouragement, support and venture capital to its employees to become entrepreneurs.

Developing Work Environment Full of Fun, Excitement and Caring

- ◆ One has to create a work place full of fun, excitement and passion. Otherwise software professionals tend to get bored very soon. Many Indian software organisations have designed their work place that resembles very much like a college environment. Sports activities such as table tennis, tennis and badminton courts, swimming pool, gym and open cafeteria are very much part of many software organisations.
- ◆ A number of fun activities such as debate, fancy dress and quiz competitions are organised for organisational members and their families. One needs to be innovative in organising these fun activities so that these fun activities are not perceived to be repetitious and bore.
- ◆ Young software professionals like informal environment. Many of the organisations have moved towards informal dress code.
- ◆ Many house hold chores like payment of telephone and water bills, arranging for travel for professionals as well as for their families and purchase of tickets for films and theaters are being taken care of by the organisations. It is a small way of saying to software professionals that we care for you and your families.

Size and Ownership: Some Observations

In addition to common issues and challenges discussed earlier, a few interesting differences emerged relating to size and ownership of the organisations. These observations are briefly described below:

- Small software organisations seem to have higher attrition rates as compared to medium or large organisations. Many of them are owned by non-resident Indians and they have been operating in the lower segments of value chain. Medium and large organisations due to their size and resource availability operate in all the segments of value chain. And hence they can offer opportunities to software professionals with different interests and competencies. Small organisations also seem to have limitations in terms of offering growth opportunities vis-à-vis medium and large organisations.

- Large organisations in their process of growth also seem to acquire bureaucratic systems and processes. A few software professionals had observed that as a consequence those organisations' ability to attract and retain excellent and innovative software professionals gets limited.
- In subsidiaries of multinational software corporations, software professionals had a perception that the projects, which they work on are inferior as compared to projects being worked upon in parent organisation. This is likely to affect their motivation levels.

Conclusions

Some of the human problems presently being experienced by the Indian software organisations are discussed in the paper. However, Indian software industry is aspiring to get integrated in a big way with the global software industry. It has many global customers and the number is increasing at a real fast pace. Indian software industry is considered to be a success story till date and its future success will depend upon its ability to understand and adopt what is being valued by global customers. However, it is feared that many of the values of the global customers are in conflict with the traditional values of Indian society. Evidences suggest that software organisations and software professionals are adopting values of the global customers. However, they also experience tension, stress and many times guilt because of the new adopted values and the changed life style acquired by them. Leaders of the industry and of the Indian society should consciously work on these issues in a proactive way. That is how we would ensure prosperity of the Indian software industry without affecting the prosperity and peace of the Indian society.

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