

Impact of Culture Based on Human and Soft Issues on Software Quality in Pakistan

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Abstract

Pakistan's IT industry has been rising steadily since the last three years [1]. Being a relative new industry, it is struggling for maturity and better quality (140 out of 1161 companies achieved international process or product quality certifications like CMMI or ISO certifications). Most of the struggles for software quality focus on the technical aspects of development process with little or no regard to Human and soft issues [2]. These issues can be an important factor to achieve high productivity and quality. Unfortunately it is generally believed in most software companies in Pakistan that soft issues like *Motivation, Job Security, Salaries and Incentives, Employee's Sense of Ownership, Team Building, values, Individual Self Respect and Dignity, Open Communication, Skills Enhancements and Leadership Style* are not important by respective managers. The paper analyzes the software industry of Pakistan with respect to human and soft issues. It explores whether these soft issues have considerable impact to achieve, enhance and sustain productivity and quality. If yes, then how these issues relate to quality, and if not then how its influence could be highlighted to the policy makers.

Value of Research

This study will help the software development companies, especially in Pakistan to identify the key cultural human issues and will help them to transform the organization's culture toward better environment that would be the indicator of better quality.

Purpose

The aim of this paper is to analyze the role of human and soft issues for achieving better quality. This study will explore how software companies can consider these issues that could help them to strive for inexpensive, yet least known ways to achieve *product quality*. Findings of this study will also assist Pakistani software houses in increasing the productivity of their employees. It will also enable organizations to realize the importance of *Cultural* and *Human* issues in their working environment.

Research Methodology

Commonly practiced research method was used for analyses. A comprehensive survey was conducted in selective software houses operating in Islamabad and Rawalpindi. This survey focused on identifying the soft factors satisfaction level in the software industry of Pakistan.

This research will compare the cultural and soft issues in different categories (organizations with quality certification, organization without quality certification and such companies which are reputed well in the IT industry) of the software industry and then shows the impact of these factors on the productivity and quality of the work of the employees.

To generalize the results the culture, values and trends at these companies could also be catered. Moreover, the labor laws regarding these soft issues should also be considered while generalizing and implementing these results. The study will also define all soft and human issues.

Research Findings

On the basis of survey instrument, available literature regarding subject and discussion we have so far, we found the followings results.

- Along with the process improvement work environment conditions can effectively be used for performance and quality improvement.
- Emerging IT industries can rapidly get maturity in quality by addressing human related problems
- Organizations in our software industry which are considered better places to work, are giving more attention to human related issues
- Salaries and benefits that do not satisfy employee basic needs, cause dissatisfaction to employee which leads to major human resource issues that at crucial project time may result in low productivity and low quality
- Training and skill enhancements are not practiced satisfactorily in our industry which is also causing poor performance
- Leadership's role practiced here is still supervisory instead of facilitator which is also a major obstacle in low productivity and hence quality.

Keywords: Software quality, Soft issues, Human issues.

Paper Type: Research Paper

Introduction

Much of the studies involving software quality has focused mainly technical aspects of the process improvements and ignored human and soft issues which are inevitable to achieve a high quality product / project. Studies have shown that process improvement ensures limited increase in productivity. The maximum influence of process maturity on the project's productivity is 1.43 times. Moreover this effect varies as the project size changes [2]. The study does not deny the role of process maturity instead it emphasis that along with technical improvements human and environment related problems should be considered to gain full benefit and to maximize productivity and quality. Following is the brief description of soft factors which should be considered to enhance productivity and quality on the basis of available literature on the subject.

Motivation

Although a lot of studies have been conducted that deal purely with employee motivation (that influence productivity and quality) but it is such a vast subject that can't be quantified exactly. Studies have proved that motivation is the most important factor for productivity and quality [4].

A lot many factors involve in determining the motivation level of a particular person and these factors vary person to person. Besides this reality we can't deny its role as a best tool to achieve high productivity and quality in any situation.

Many of the soft factors under study are directly or indirectly involved with the motivation or to each other. Like Sense of belonging /ownership, Job Security, Rewards and Incentives, management Style and good work life balance are considered as extrinsic motivators for productivity and quality while Team Building, Trust and Respect, Employee participation and Appreciation are categorized as Intrinsic motivators for productivity [5].

Job Security

With the advancement of new and emerging communication means especially internet, the world has become a global village. These new technologies played a very important role in the development of other industries as well as it enhanced itself. Many foreign organizations are now out sourcing their projects to developing countries like Pakistan. In addition to the benefits it has encouraged people to establish their own small companies and many of them are forced to close if they don't find enough projects to sustain their expensive and hence the life of the company. This has created a type of job insecurity in the IT work force that is also affecting the productivity and quality of the software.

Salary and Incentives

Hertzberg's motivation theory addresses two factors *Motivation* and *Hygiene*. Hygiene factors like salary, working conditions etc are needed to ensure that employees are not dissatisfied [8]. Salary if not comparable with the employee duties and responsibilities will lead to job dissatisfaction. Moreover employees need to be cared about and praised and recognized for quality work [6].

A survey conducted by PSEB (Pakistan Software export Board) has shown that average salary of the employee working in the organization that is involved in domestic development is less than that of the employee working in the organization involved in the export of the software. This factor has created an environment of job switching on the basis of the more material benefits which is producing an environment of very unstable resource level. Frequent jobs switching are not only creating human resource problem but also badly affecting the quality and productivity of the organization.

Employee Sense of Ownership

All companies have to deal with issues regarding their employees. It is no secret that employees who feel a part of their organization and feel as though they are making contributions to the growth and success of the company will give the extra effort.

Large organizations like Microsoft win the trust of their employee and make them feel a very important part of the organization. This motivates the employee to the extent that they become willing to go beyond the limits to help make their organization succeed. The key factor in motivating employees is creating a sense of affiliation within the organization. Higher level of belonging sense not only increases productivity but also increases retention rate.

Employee Self Respect and Dignity

Quality culture emphasize that all the co workers should be treated and behaved well irrespective of their designation and role. The beliefs, values and rules (regarding ethics if defined in the company) lay the ethical culture and environment of the organization in which people would behave and treat each.

Open Communication

Communication is another very important factor which plays central role in success of the software. Effective and efficient communication is inevitable to achieve the desired output. Informal and out of the routine communications are very helpful for workforce to solve their small problems and thus save them a lot of time and rework. Moreover, these informal discussions give the opportunity to the employees to learn more and develop very friendly relations with each other that positively add toward a better working place.

Skill Enhancements

Information technology perhaps is the only industry which is changing so rapidly. Everyday new tools, techniques and methodologies are emerging. This ghastly changing technologies demands high and frequent training and skill enhancement needs. These training and education activities can motivate employees and enable them to be more creative and innovative.

Leadership Style

The role of the leader or manager for achieving goals is very pivotal. The purpose of leadership should be to produce pride in people by empowering them and to create loyalty and sense of belonging by making them responsible. Studies have proved that personal appreciation or acknowledgement of the worker's success plays a very important role to increase his/her interest in achieving goals that ultimately will have positive effect on the productivity and quality.

A manager that prioritize the tasks or job of his/her employee will be able to manage his/her schedules timely and efficiently than who does not care for it. Moreover regular feedback on the worker's performance is more effective than annual or six month appraisal. To enhance quality and productivity managers' role must be as a facilitator rather than as an executive.

Team Building

In Software development Team Building plays a very basic role. Although team building is a Hygiene factor but its absence de-motivates people [3]. If employee is considered as an important member in the team and his/her contribution is valued then undoubtedly he/she will go beyond the limits to maintain hi/her image.

Analyses of Data

A comprehensive survey is used to collect the data about the above mentioned factors. We have gathered 51 responses from 17 different organizations in which professionals of both genders (male and female) having experience ranging from junior developer to senior level manager participated. In the figures (1-3) soft factors are mapped in short name which are given in the table below.

Soft Factors	Short Name
Motivation	Mot
Job Security	Sec
Salaries and Incentives	Sal
Ownership	Own
Values, Self Respect and dignity	Val
Open Communication	Com
Skill Enhancement	Skill
Leadership Style	Lead
Team Building	Team

Table I

Pakistan IT Industry and Soft factors

The figure 1 shows the extent to which these soft factors are being practiced and considered in the organizational culture of IT industry in Pakistan. Values, Self Respect and Dignity and Team building are better than rest of all. Salary and skill development are the factors which scored less and need to be given a serious attention. Motivation, Job Security, Sense of belonging and Leadership style has scored a bit better but they should be improved to enhance productivity and quality.

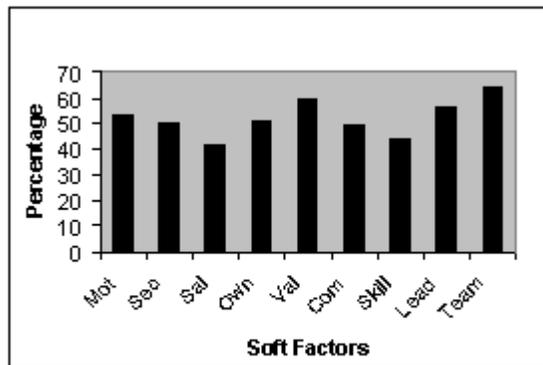


Figure 1: Condition of Sof Factors in IT Industry of Pakistan

According to the PSEB statistics about 13% of the IT organizations in Pakistan have achieved CMMI or ISO software quality certification. Figure 2 shows the comparison of the soft factors being practiced in companies having some quality certification and having no quality certification. The analyses show that with exception of *Skill Development* there is very minor difference of these soft factors condition in both of the categories.

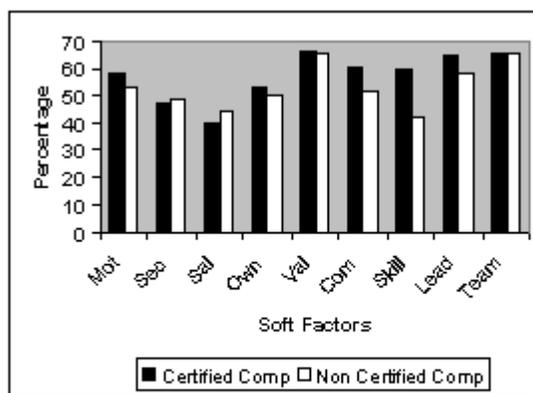


Figure 2: Condition of Soft Factors in Certified and Non Certified Companies

Some of the software organizations in Pakistan are well reputed and are considered a worth place to work at. Figure 3 depicts the consideration of the soft factors in these

organizations in comparison with over all condition of these factors in the IT industry. Again the results are not different from the one we have in figure 2 i.e. some soft factors like *Values*, *Self Respect* and *Dignity* and *Communications* are relatively scored good in generally better perceived software organizations.

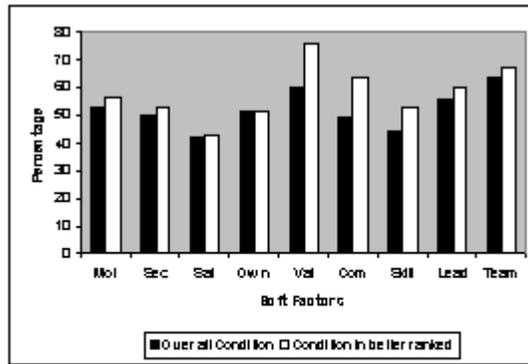


Figure 3: Soft Factors in good reputed Organizations vs Overall Soft Factors Condition in IT Industry

Discussion

Organization culture and Quality of Work environment is the most important factor that affects the employees the most. People are satisfied and motivated in the environment where they enjoy their work and are appreciated for the work they do. It is environment and values of the Microsoft that they have motivated their employees to an extra ordinary degree that people normally work 12-18 hours days [2]. People are more comfortable and productive where their respect and dignity is maintained both by the manager of their team / project and team members.

Pakistan IT industry is newly emerging where organizations are striving for process maturity. Along with the process maturity it is equally important to consider the culture, environment and employee related issues to maximize the productivity and quality of the IT industry. Human factor is often given the less attention than it deserves, in fact this is the element that can be used to gain full benefit of quality management [10]. A lot many studies in software and other industries have been made to signify the importance of the human and culture effects on the productivity and quality of the employee. One of the study reported by the FORTUNE magazine, it presented a model of the relationship of employee and employer based on trust [11].

The result shown in the figure 1 are not satisfactory because about 50% people are not motivated, similarly people are not satisfied with salaries and skill enhancement opportunities. If work force is de-motivated and dissatisfied either due to salaries or lack of learning then it will have sever effect on the productivity and ultimately to the quality of the work. It is the company environment and leadership not process that produce employee's interest and joy in the assigned tasks and jobs by acknowledging work and

prove their fairness by providing expected material benefits. Studies proved that soft factors enhance productivity to an astonishing level [4].

Human and Soft Issues vs. Quality and Productivity

The low motivation of the employees can be due to the environment that hinders them to utilize their best talent to achieve their goals. The data collected from the survey instrument depicted that it is the one of the problems that is present in IT industry which is resulting in low productivity. Moreover employee opinion and suggestions are not considered while making decision and setting goals for the teams and even for the whole organization. They do not feel valued and become dissatisfied which in return affects productivity and of course lack of interest which results low quality of work done. Another major human issue that causes low motivation in our software industry is the long working hour. According a survey about 73% of all the projects in the software industry are required late sitting due to unrealistic deadlines. In addition to this developers are not compensated for over timing. This is also affecting the productivity and quality of the software projects. Moreover it is also creating a problem of employee retention and human resource problem.

According to a survey report presented by PSEB (August 2005) the entry level developers working for the companies that are focusing on domestic projects are compensated on the average 11500 RS (Rupees) monthly. Moreover most of the small and newly established IT organization in Pakistan either does not provide benefits and allowances like health insurance, over timings, pick and drop etc. or provide to higher level officials(Project managers, Operation Managers, Directors, CEOs) [12]. The same effect can be seen in figure 1 which graphically showed that about 40% of the people in the sample study are satisfied with their salaries and benefits. Maslow's hierarchy of human need specify that higher level needs like recognition and appreciation become motivators only when lower level needs like salary and appropriate facilities etc. are satisfied [3]. Promotion of salaries and benefits to an appropriate level that can enable IT professionals to satisfy their lower level needs will of course enhance their productivity and quality of work to achieve higher level needs like appreciation and recognition.

Team Building, Dignity and Self Respect and Communication are very important and inter linked components in the culture of software industry. Software development requires people to be very creative, innovative and most importantly mentally alert. This heavy mental involvement demands that people working in groups, should be more cooperative and friendly having strong working relationship. Studies have proved that effective teamwork has strong relationship to motivation [3]. Furthermore team members want that they should be treated well and their respect and dignity should be maintained. Ensuring the involvement of all employees increase satisfaction level and feel themselves valued which motivate them to achieve even difficult goals. In the software development cycle software engineers especially programmers have to discuss their problems with colleagues and other team members to gain help or guidance. Research has established that software engineers spend most of the office time by informal communication like helping each other or discussing new tool etc. The environment of software industry should allow them

to have effective open communication that would have positive effect on the productivity by reducing wasted time. Figure1 shows that these above mentioned three soft factors are relatively more better and about 60 -70% people are satisfied with the Team Building, Self respect and Dignity and Open Communication culture in our IT industry.

Conclusion

This study has shown that productivity and quality of work are directly influenced by the environment and culture where people work. To gain full benefit of the workforce skills and talent we should provide them working environment where they feel valued, respected and affiliated. As we can not ignore the importance of the process improvement and maturity like wise we should address the human and culture related issues to increase the satisfaction and motivation of the people who execute that process.

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Table of Abbreviations

ISO	International Standard Organization
CMMI	Capability Maturity Model Integration
PSEB	Pakistan Software Export Board
IT	Information Technology

Table II