The Nucleus **47**, No. 2 (2010) 91-123

The Nucleus
A Quarterly Scientific Journal of Pakistan
Atomic Energy Commission
NCLEAM, ISSN 0029-5698

BARRIERS AGAINST IMPLEMENTING AND MANAGING QUALITY IN INFORMATION TECHNOLOGY INDUSTRY OF PAKISTAN

*ALI AHSAN

Center for Advanced Studies in Engineering (CASE)
19 – Attaturk Avenue, Sector G-5/1, Islamabad, Pakistan

(Received November 24, 2009 and accepted in revised form May 19, 2010)

This research paper presents major barriers to implement quality in IT sector of Pakistan. The paper not only explores (exploration w.r.t quality management covering discussion like what is done, what is not done, what are the loopholes, what must be done and / or what must not be done), but also presents detailed explanation of the main highlights by performing necessary qualitative analysis. In addition to exploration and explanation of barriers (the paper specifically talks of barriers concerning behavior, management and culture) to quality within IT sector of Pakistan, the paper also explains all the important issues arising due to the deprived quality management. As a result of detailed analysis performed, the paper finally identifies important remedies for revitalization of quality management function as recommendations. Mainly, exploration, explanation and analysis of reasons and remedial actions are focused. Discussion and analysis is limited to behavioral, cultural and managerial perspective.

Keywords: Barriers, Culture, IT, Management, Quality.

1. Introduction

1.1. Background

Quality management is an important function for organization's overall productivity, efficiency, effectiveness and for the long term organization's stability and sustained performance [1, 2] In high competitive industries such as IT industry, quality management plays imperative role for the organization's planning, organizing, controlling, monitoring, perfection, expansion and development [2]. Pakistan's IT organizations face tremendous challenges in competing with other Asian (particularly South Asian) counterparts [1]. This high competition requires high quality, customer satisfaction and fast services [3]. In other words survival of only the fittest is possible in this scenario.

With global IT outsourcing being directed from developed to developing nations [3], Pakistan has a lot of chances to achieve large part of IT market in the international arena [3]. This calls for Pakistan's IT industry's focus on basic organization key performance measures such as 'Quality' [3]. India today falls in the first tier of IT economies and one lesson that we can surely obtain from the Indian IT industry is that we need to ensure high quality within the organizations for better and faster performance, customer satisfaction and for more market share [3].

1.2. Research Question and Objectives

The main objective of this paper is to obtain answer(s) to the following research question:

"Why IT organizations fail to implement quality due to behavioral, managerial and cultural issues, concerns and problems?"

In order to answer this question it is important that the following questions need to be addressed:

1. What are issues, problems, concerns and deficiencies related to 'Quality Management' (concerning behavior, management and culture) in view of lead quality managers in IT organizations of Pakistan? It is important to note that this question will not be focusing on 'what to do'. Rather address to this question will be limited to discussion of what fails quality implementation and what the problems are?
2. How quality suffers due to identified issues?

* Corresponding author : al_ahsan1@yahoo.com

3. How can we change the organizational culture so as to welcome change through quality enhancement?
4. How various identified issues must be addressed?
5. Which issues are to be addressed at organizational and government level and how?

1.3. Purpose

The main purpose of this paper is to help IT organizations' management, quality management experts, quality management staff and general staff members gain understanding of how they can achieve better quality by considering the soft side of the general working. The paper identifies and analyzes problems (concerning behavior, management and culture) that help us to understand the barriers to management of quality function within the organizations. Another purpose of this paper is to identify the problems (at the national level) that hamper organizations quality management and quality improvement abilities.

1.4. Significance

It is important to emphasize the fact here that historically no similar exploratory, explanatory and analytical research has been conducted for the IT industry of Pakistan that formally helped in understanding, clarification, explanation and analysis of behavioral, cultural and managerial 'Barriers to Quality Management and Implementation' for the IT industry of Pakistan. Till date there is no understanding of which management, behavioral and cultural practices are most suitable for the management and implementation of quality in IT organizations in Pakistan.

1.5. Limitations and Constraints

This paper specifically focuses on the behavioral, cultural and managerial aspects only. The paper does not focus on the technical issues pertaining quality implementation and management. Literature concerning this study was rare and data collection and research was overall very time consuming due to choice of ethnography as research tool and due to specific focus on behavioral, managerial and cultural issues, concerns and problems.

1.6. Paper Structure

Section 1 of this paper presents the introduction. Subsequent to Section 1, Section 2, 3 and 4 present the 'literature review', 'short explanation of some widely used industrial terms' and the 'research methodology' respectively. The literature that is reviewed in Section 2 limits mainly to behavioral, cultural and managerial aspect of quality management and implementation. Special focus has been laid on literature concerning Pakistan only. Section 5 specifies the data collection methodology, sources of the data and tools used for data collection. Section 6 presents the main body of this paper. It presents explanation and analysis of the issues and barriers (cultural, behavioral and managerial) to quality management, implementation and improvement. Finally based on the discussion in Section 6, Section 7 presents the set of recommendation.

1.7. Abbreviations

IT : Information Technology

TQM : Total Quality Management

GoP : Government of Pakistan

CMMI : Capability Maturity Model Integrated

PCMM: People's Capability Maturity Model

ISO : International Organization for Standards

SEI : Software Engineering Institute

MoE : Ministry of Education of Pakistan

MoIT : Ministry of Information Technology of Pakistan

PSEB : Pakistan Software Export Board

HEC : Higher Education Commission of Pakistan

2. Literature Review

PCMM (People Capability Maturity Model) [4] and CMMI (Capability Maturity Model Integrated) [5] standards are most widely used for understanding quality management discipline particularly in relation to software and IT industry [6] Unfortunately, although PCMM and CMMI largely focus on people, product, process and project quality, but together they fail to present discussion concerning behavioral, cultural and

managerial barriers to quality. Many of the authors present culture and quality together as a discussion point. Several of authors like for instance (Djerdjour and Patel, 2000) present quality management and culture specific discussion for specific culture. In many cases, authors combine the best practices from experiences of various organizations world wide that can be straightly used for improving quality management function organization wide. In most of the cases discussion such as this, does not cater the cultural and the behavioral issues.

Literature reviewed can be grouped in the following main categories:

i. The first category of literature concerns Pakistan IT / Software industry.

ii. The second category of literature concerns global IT / Software industry.

Much of the literature concerning Pakistan is rare and that too limits the discussion to the importance of quality management discipline in IT. In some cases, the discussion in most of the literature reviewed (first category) also covers the role of quality management as an organizational betterment tool. Literature concerning Pakistan's IT industry also involves some discussion concerning the barriers to quality management. In such cases much of the barriers that are discussed limit to national level IT strategy flaws. None of the discussion concerns behavioral, cultural and managerial barriers to quality management. The most important literature found in relation to Pakistan is that of (Kashif Manzoor, Undated), who talks about challenges to CMM (Capability Maturity Model) implementation in Pakistan.

The international literature reviewed also rarely presents quality management barriers in context of culture, behaviors and management. In most of the cases occasionally, discussion is made concerning quality management, management, culture and / or behaviors. In some of the reviewed literature reviews [6] concerning cross cultural issues and its influences on quality management are presented. In this regard, (Pheng, Sui, Alfelor and Winifredo, 2000) specifically explain regional cultural influences and their affects on quality management. Similarly, (Anbari, Khilkhanova, Romanova and Umpleby, Undated) explain project management issues by focusing on the implication of cross cultural environments on the work culture. (Martinsons, 2003) like many other authors, focus on the overall importance of IT and management together as a discipline. (Nauman, Aziz, Ishaq and Mohsin, 2004) speak about Pakistan as an outsourcing destination and also focus on quality as an important discipline. In short literature falling in the international category most widely concerns culture, technical aspects of quality management, importance and significance of quality management (but not limited to).

3. Short Explanation of Some Widely Used Industrial Terms [7]

Quality: Quality has many definitions. It is difficult to specify all the definitions within this paper but most importantly term 'quality' (in perspective of IT sector) refer to quality of work, quality of people, quality of information, quality of process, quality of organization, quality of service, quality of company, and quality of objectives (but not limited to).

Quality Management: Quality management specifically means the overall management of quality function organization wide. In simpler words quality management is ideally a concept similar to TQM (Total Quality Management) and focuses on improvement of quality of organization's various elements like for instance people, processes, products, projects etc.

Quality Engineering: This is a sub function of quality management and is used for process, procedure and policy engineering. By engineering we mean formulation of processes, policies and processes etc.

Quality Control: This is a sub function of quality management and in software development organization this is used for product quality improvement. Software testing is a quality control activity.

Quality Implementation: This is also a sub function of quality management and is used for implementing quality. When we use the term implementation, we essentially refer to the implementation of processes, procedures and policies. Further to this it is also important to note that quality implementation relates to implementation of quality by training employees and also by guiding them. It is also important to note that quality implementation also relates to implementing quality certification programs.

Quality Assurance: Here this term is being defined as per the standards of CMMI. Essentially quality assurance covers the CMMI level two 'Key Process Area' i.e. 'People and Product Quality Assurance' (PPQA). In extremely simpler words this sub function of the quality management function deals with the auditing, reviews, inspections etc.

Quality Monitoring: This is a sub function of quality management and relates to monitoring of quality function and its implementation organization wide.

Quality Management Staff Members: Members of organization who are responsible for the management of quality, organization wide. It can also be stated that quality management is the responsibility of these staff members.

General Staff Members: Members of the organization other than the staff members who manage quality.

Quality Management Function: The quality management job / department within the organization.

Quality Certification Process: The process of acquiring quality certification like for instance CMMI or ISO (International Organization for Standards) certification process etc. It is important to note here that certification process here includes the overall certification process of a particular quality body like for instance CMMI and the internal process that the organizations follow for acquiring the certification.

Quality Certification: Certification from some quality expert body like CMMI certification from SEI (Software Engineering Institute).

Quality Certification Service Providers: In Pakistan some organizations provide consultancy, training and general support services for acquiring some international quality certification like for instance, Netsol and Moodys are two such organization that help other organizations achieve quality certification such as that from CMMI, SEI.

Implementing Quality: Similar to 'Quality Implementation' as discussed earlier.

Quality Management Program(s): Quality management programs are made specifically for the uplift of general organizations' quality. In some cases such programs are also made for acquiring quality certification like for instance CMMI certification.

Quality Management Department(s): The department(s) that manages quality management function organization wide.

Quality Management Team(s): The team(s) that manage quality management function organization wide.

4. Research Methodology

This research basically deals with the concepts of 'Industrial and Organization Psychology'. Sub consciously the author works like an I/O psychologists and like every I/O psychologist works with the psychological theory, research methods and intervention strategies to workplace issue. In other works researcher exhibits 'Human Relations Movement'. Important to note is that this research as defined by Guion (1965) deals with the study of scientific study between man and workplace and focuses on the 'Human Factors'. Human behavior is the center of focus within IT organizations of Pakistan and in simple words the entire study can be termed as an exploratory and analytical study that highlights the industrial problems and strategies and the organizational theories that guide them.

This research performs in depth examination of context, studies cross cultural and socio-cultural affects and also places importance on long term achievements. The author of the research has been affiliated with the IT industry of Pakistan since the last 10 years as a student, academician, engineer, consultant, manager and a senior executive. It is due to the involvement of the author with the industry that he uses the concept of 'Anthropology' for conducting this study or more precisely 'Socio-Cultural Anthropology'.

'Social Influences', 'Social Behaviors' and 'Social Networks' are carefully studied in this research, making sure that bridges are built and gaps are filled between the business practices, the requirements and social issues so that management can perform effectively and efficiently and right decisions can be made. Although the research stems from concepts of 'Applied Anthropology' but more precisely it uses the concept of 'Ethnography' as the author performs most of the findings and performs analysis by being part of the culture himself. 'Online or Virtual Ethnography' is also used for performing this research due to limited access to various resources outside the author's home station.

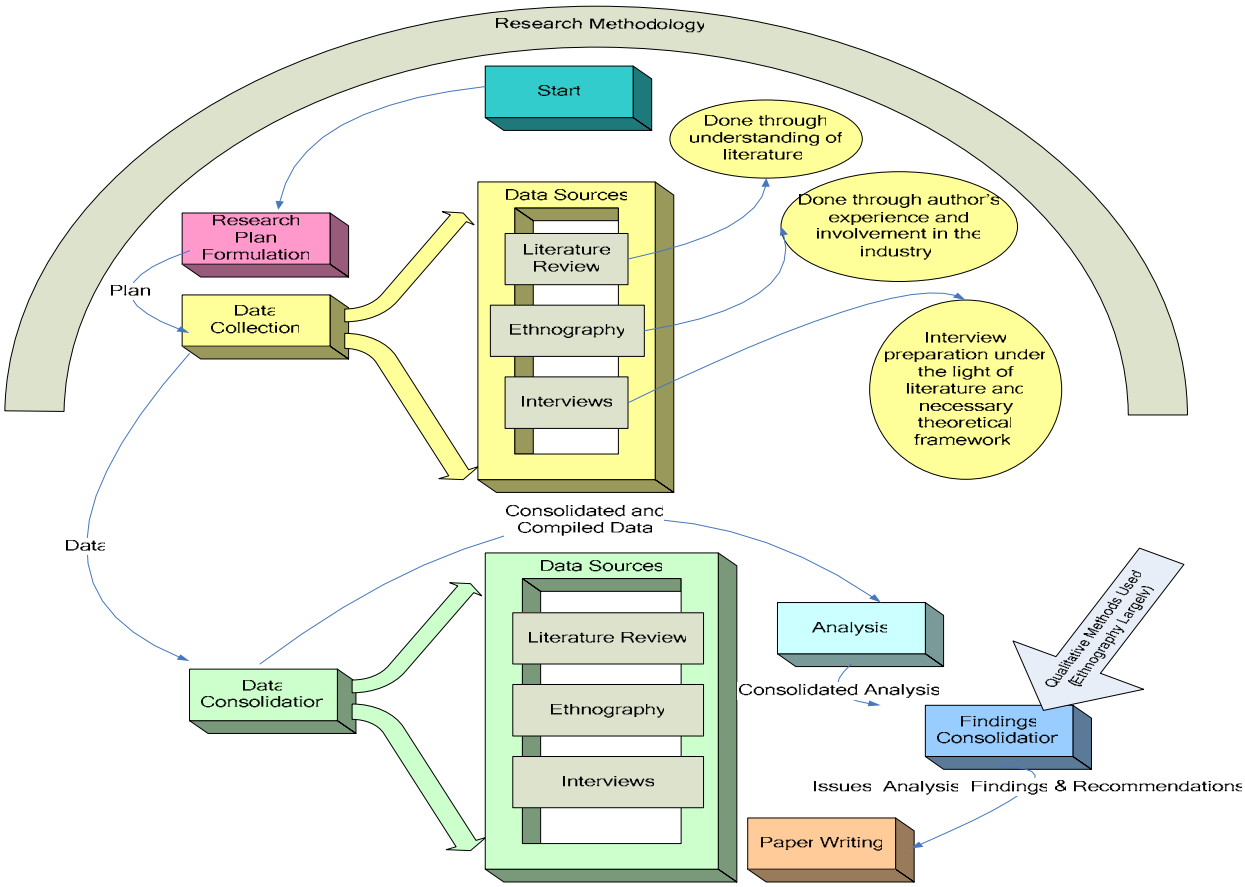

Figure 1. Research Methodology, Incorporating 'Ethnography' to IT Based Researches.

Results, findings and analysis obtained by the researcher are double checked in order to minimize skewness. In other words this has been purposely done in order to minimize the 'Observer-Expectancy Effect'. Qualitative research is conducted in form of interviews, participation in meetings, 'Appreciative Inquiries' and 'Focus Groups' mainly. Since this research essentially deals with people therefore it also uses the concept of 'Ergonomics'. The study also encourages application of collective intelligence and proposes findings in form of changes. It discourages 'Hawthrone Effect'.

5. Data Collection

Sources of the data for this research have been mainly Literature, Ethnography and Interviews. Data collection methodology for the first two sources would not be explained here due to the simplicity of discussion. For the interviews, data collection was mainly done using long discussions with the relevant stakeholders (in our case major focus is on quality managers and quality management experts mostly). 89 interviews were conducted for the data collection from various senior quality management employees. Employees interviewed worked in different IT organizations (IT organizations running any category of IT related business) of Islamabad as part of quality management departments / functions. It was also ensured that each employee interviewed must have at least more than two years working experience as a quality staff member in his / her current organization. This was purposely done in order to make sure that each employee well understood their respective organizations and the implementation of quality function in it. All the organizations' quality management practices and general staff's behavior towards quality was carefully observed by the author and highlights were captured. Special focus was laid on managerial, behavioral and cultural perspective.

Random sampling method was done for choosing the interviewee. 'Online and Virtual Ethnography' was also used for data collection. It is important to mention here that due to the contextual nature of the subject being studied in this thesis, the researcher had to deeply immerse in the subject by being part of the IT industry itself. For the data collection no specific tool was used rather interviews sessions and observations were mainly focused at for data collection.

6. Analysis of Barriers (Cause and Consequence)

6.1. Sponsorship

Implementing quality organization wide requires proper sponsorship. By sponsorship we mean that quality management team in actual convinces and buys the decision maker's agreement for implementing quality program organization wide. Sponsorship essentially deals with sponsorship of manpower, finances and other resources for implementing quality organization wide. Unless and until proper sponsorship is not given to quality management program, it is not possible for the quality management team to run the quality management program organization wide.

In Pakistan's IT industry, in very few cases; quality management function / team within the organizations is able to acquire necessary sponsorship from the organization's decision makers. These few organizations are mainly the organizations that have plans to undergo a quality certification programs, or have already undergone the quality certification process. On the other hand generally in most of the organizations, quality management function within the organizations is limited and confined to software testing mainly. In some cases quality management departments / functions within the organizations do not possess the right kind of expertise so as to convince management that they can actually deliver. In such cases; naturally, the management and the decision makers do not pay attention to sponsoring the quality management function. The worst case is of those organizations in which quality management team exists and they possess the right (or at least relatively suitable) expertise for implementing quality programs organization wide. In such organizations, quality teams are assigned responsibility of uplifting the quality of the organization or in other words their main goal / target is to acquire quality certification. What makes the situation worst in these kinds of organizations is that in some cases, such organizations are not provided with the appropriate sponsorship. Results of this deficiency are endless dead loops of problems. Without proper sponsorship these organizations cannot pursue the quality management program and at the same time quality management departments within these organizations are assigned responsibility of uplifting organizational quality. These kind of situations cause chaos, frustration and most importantly extreme confusion for the quality management team lowering down their moral, work efficiency, productivity, interest and motivation for work.

Core reasons as to why sponsorship is not given by the decision makers to the quality management include (but not limited to): thinking that quality management is a secondary job, thinking that why we should waste money on quality, unawareness about how quality indirectly benefits organizations, thinking that money and resources would be wasted, thinking that quality management team does not possess the right expertise (which may be true in some cases) and other..

6.2. Commitment

When we use the term 'Commitment' in quality management discipline, then essentially we refer to the fact that for any job / work / task / activity / project / program / etc. relevant human resources would commit their availability, time, involvement, responsibility, effort, energy etc. for its completion. By committing, an individual gives assurance that he / she would maximize the completion of any activity, using his maximum capacity and abilities.

Generally in Pakistan work culture lacks commitment due to socio-economic reasons and this is a big problem. The same can be observed in Pakistan's IT industry. This situation becomes even worse in cases when the task against which commitment is being acquired is related to quality management. Lack of commitment to quality management task is a problem at two levels. Firstly, commitment within the quality management teams is questionable and secondly commitment of the staff other than the quality management team members is also a problem. The later being a more intense problem. Lack of commitment of quality management staff members to their basic work i.e. quality management; leaves quality implementation

work incomplete. This lack of commitment leaves loop holes in quality engineering, quality assurance and quality control activities mainly. Lack of commitment of staff members other than the quality management teams to quality management function trigger problems related to quality implementation organization wide.

Why people fail to commit to quality management function within the organizations is a big question. Reasons of quality management staff members not committing to their work i.e. quality management are (but not limited to): lack of interest in job, lack of sense of achievement, poor compensation and benefits against the work they perform, people management overhead, office politics, lack of necessary sponsorship, lack of team work, lack of job satisfaction due to the feeling that we are doing work related to support, personal issues, infrastructure problem, general job dissatisfaction and lack of motivation.

Reasons of staff member (other than the quality management staff members) not committing to quality management function are (but not limited to): lack of interest, thinking that quality management is a redundant activity, thinking that what benefit will such commitments bring to our work, thinking that commitment to quality management would make us deviate from our basic goal, thinking that implementing quality is the job of quality management staff members only, office politics, fear of individual's work deficiencies being exposed, customers' pressure, supervisors' pressure, deadlines, workload, thinking that what good will such work do to my career or how will I be compensated, lack of vision, lack of knowledge about benefits of quality, general arrogance, thinking that quality management team does not know anything about the core business details and requirements, poor leadership, poor organizational infrastructure, personal problems, job dissatisfaction and lack of motivation.

6.3. General Perception that Quality Management is a Secondary Activity

In most of the cases staff members generally feel that quality management is an important organizational function. But when it comes to stepping down to the real implementation of quality within the organizations, many staff members treat quality management function as a secondary activity.

Many of the general staff members, also to some extent staff members belonging to quality management function within the organizations, believe that quality management does not directly help in completion of organizations' core business. In other words they believe that functions like for instance project management, product management, software development, IT and other similar functions are extremely important for completion of business activities like for instance project completion or product launch.

What most people fail to understand is that although it is true that quality implementation works at the organizational level but the results / improvements that appear in an organization due to quality management essentially improves working within the projects, products, people and virtually everything else. Since the output of the quality management is indirect i.e. improvement within organization, people, projects, processes and products therefore it becomes a secondary activity in view of those who work on those organizational functions that contribute directly to organization's products / projects etc.

Another myth observed about quality in Pakistan's IT industry is that quality is subjective and theoretical whereas in actual and in view of international quality standards like for instance CMMI, quality is extremely objective and to the point.

Wrong perception about the importance of quality as a primary function naturally results in less attention to quality program organization wide.

6.4. Employees' Fear of Quality Management Staff

A serious dilemma that hampers quality management and its implementation within organizations is that members of staff that do not belong to the quality management departments / teams, to some extent fear employees who belong to quality management department.

Reasons of this problem could be many among which few are as follows:

i. It is generally an observation that most of the quality management staff members present themselves as a work and individual auditing and inspecting body. Although auditing and inspection are important quality management

functions but by no means, these two functions must be used against the audited / inspected employee. In some cases tendency is that quality management staff members exploit the negative audit and the inspection results by pumping supervisors against the staff members or through general office politics. One of the reasons of this attitude can be that quality management staff members like to tell the management / superiors and supervisory figures within the organizations that general work quality decline is the result of improper focus of inspected / audit employee on his / her work. Secondly, through these actions quality management staff members would like to highlight their importance and their work efficiency in order to explain to the management that it is them who can identify problems within the organization.

ii. Another reason of the fear that we are discussing is the general absence of transparency and the fear of being exposed. These two problems generally force the employees to hide work from auditors / inspectors and therefore generally the employees fear quality management staff members.

Employee's fear of quality management staff members discourages transparency, discourages openness in attitude for resolution of problem, encourages information hiding, increase late or zero detection of problems related to quality, results in unsatisfied customers (not the client only) and gives rise to general problems in implementation of quality organization wide.

6.5. Financial Arrangements for Implementing Quality

Much of the discussion concerning this item has already been made under the head of 'Sponsorship'. Here however; we specifically focus on the availability of necessary funding for implementing quality organization wide.

With an exception of one organization (at least in knowledge), hardly any organizations are there that truly provide funding for the quality management and implementation program. This however is certainly not true when it comes to acquiring quality certification. It is important to specify here that very few organizations are there that focus on quality certification and therefore it can be easily said that very few organization fund the quality management and implementation program. It is important to note however that by genuine funding we do not mean funding for certification only rather we mean funding for the general organizational improvement irrespective if the organization is seeking or not seeking any quality certification.

Lack of funding poses operational barriers to quality implementation and management. It introduces issues related to resource shortage, fewer than required trainings, fewer chances of improvement in quality of organizational infrastructure, lesser chances of acquiring quality human resources, lesser chances of acquiring necessary material like for instance books and affiliations with international quality focused organization like for instance CMMI, ISO and IEEE etc, lesser chances of acquiring external consultancy, fewer chances of retention of team members from quality department etc.

Lack of funding may be due to multiple reasons out of which few important ones are: lack of trust of management on quality team's performance, lack of management realizing that quality will help improve organization and increase the rate of return by improving organizational productivity, quality, efficiency and effectiveness, presence of feeling within organizations' management that quality is a secondary job and is limited to theory only, etc.

6.6. Administration and Logistics Support [8]

It is a unique observation, but indeed observed in many of the organizations that staff members from administration and logistic support department experience upper hand as compared to the rest of staff members in other functions within the organization. This strong; yet very much correct statement seems valid because most of the employees in other departments within the organization depend on administration and logistics function within the organization for their work execution. Unfortunately; in Pakistan, a general work norm is that in order to get work done, reference is a must. This is very much also true in case of IT industry of Pakistan. In most of the IT organizations the education level of the administration and logistic staff members is not sufficient. In many cases staff members who are in charge of administration or logistics function are

retired army personal who are not very much familiar with the dynamics of modern organization.

Untrained, unprofessional, ineffective, inefficient and uneducated staff members in the administration and logistics teams hamper productivity thereby hindering the quality implementation directly. Much of the work by the administration and logistics departments within the organizations is also not monitored to closure.

Many of administration and logistic support staff members practice red tape management style. Many others have bureaucratic method of working. Delay in completion of work and processes not only hamper general productivity, rather it forces the other employees to feel frustrated.

In most of the cases, nearly all the staff members in the IT organization think that quality management function within the organization is limited to employees who in actual fall in the project management or product management / development departments. This feeling, that is more like a practice, in actual, hinders the implementation of quality in departments such as administration and logistics, thereby eliminating the concept of TQM. Summarizing our discussion, in plain words administration and logistics department do not support the work of quality management department. This practice is not only true for the quality management department rather all the functions within the IT organizations. Secondly, administration and logistics department consider them out of scope of quality management thereby eliminating quality control within these departments.

6.7. HR Support [9]

Like administration and logistics department, the support of the HR department is extremely important for the implementation of quality; organization wide. General behavioral practices discussed for administration and logistics departments and the issue of educational level also applies in case of HR departments in IT industry of Pakistan.

Most of the organizations in the IT industry of Pakistan do not formally make use of quality management function and the ones that do; limit their focus to software testing mainly. Extremely few organization (particularly the ones that are striving for some quality certification or the ones that have some quality certification; for instance CMMI, ISO etc) make use of quality management function within the organization for managing quality of products, projects and processes. In nearly all the cases however, there is hardly any emphasis on people quality management. Very few organizations (needle in a hay stack) understand the concept of PCMM and therefore make use of it.

The discussion in the above paragraph, puts emphasis on the involvement of HR department for people quality management, which in actual is absent from the industry. This is one issue. The second issue covers the general support that the HR department should provide and provides in actual for implementing quality.

In regard to our second issue, it is important to explain here that functions for instance staffing, performance appraisals, recruitments and general policy making must be in lined with the quality management requirements of the organization. Quality management function acts as a major method of organizational understanding. In case if HR and quality management departments do not work side by side then it is extremely difficult to implement the quality requirements within the organizations. Here by quality requirements we mean quality requirements particularly concerning HR.

Support from the HR is also required for the selection of the right employees for managing quality. In some cases quality management implementation must also be linked to the HR performance appraisals so as to make people implement quality for acquiring necessary benefits. In short, for implementing people quality management, HR department must work side by side with the quality management teams. This however, unfortunately, is not happening.

6.8. IT Support

Modern quality management uses modern process engineering practices. An extremely modern, efficient and effective method of process engineering is to have automated workflow based applications that maintain the process flows and also enables reasonable monitoring. In addition to these automated workflows; the modern concept of TQM heavily relies on paperless office concept, fast communications and strong networking. All these important requirements of quality

management need support from IT management support department / function.

Here it is also important to mention that general trend of IT staff members in Pakistan's IT industry is to fix computer and network related problem mainly. Limited work scope of IT staff members and nearly zero involvement in quality management support creates barriers to quality management and implementation.

In most of the cases, in nearly all the organizations IT staff members are not quality assured and neither they are involved in any quality management activity. Mostly IT staff members do not pay any attention to quality staff members and feel that their working has no link with the quality management staff.

6.9. Office Politics

Generally office politics is the biggest source of hampering organizational activities. Office politics cause de-motivation and dissatisfaction among employees. In many of the cases, observations and interviews with industrial quality management experts suggest that they face tremendous amount of office politics within the organization in one way or another. Many a times; major cause of this office politics is quality policy, process and procedure formulation. Normally during process, policy and procedure engineering, organizational team members who are stakeholders of a particular policy or process or procedure, create hurdles in making the right decisions for the right policy, processes and procedures. In most of the cases, stakeholders create hurdles in order to cater some personal demand from work or in order to implement their own particular methodology of working no matter how incorrect it is. Generally mankind is resistant to change. This is also true for Pakistan's IT team members who like to continue with their own method of working. Sub grouping within the organization due to personal interests of employees trigger opposition within the office and becomes a reason of office politics. Generally office politics acts like a hurdle in quality engineering and implementation.

6.10. Employees' Key Performance Indicators

The concept of key performance indicators is widely used by the Chinese. The summary of this concept is that each employee is communicated set of indicators that will ultimately determine his / her performance appraisal. In most of the Pakistan's IT organizations, this practice is conducted informally, where the management gives some tasks to the employees and then decides employee performance appraisal based on his / her task completion and correctness status. Although this seems like the right method but in actual, from the perspective of quality management, it is important that quality work delivery should also be included in the key performance indicators list of all employees. Since, normally this is not a practice therefore producing quality work and following quality practices is not in the 'Things To Do List' of most of the employees who are not part of the quality management team. Reason of not keeping quality work delivery as part of key performance indicators is general unawareness about quality, lack of interest in quality, poor understanding of benefits of high quality, generally wrong perception that employees who are not part of the quality management team will be deviated from their original work if quality is part of their key performance indicators list and finally wrong perception that quality management is the job of quality management team only.

6.11. Performance Appraisals and Quality Management

Like our last point of discussion; most of the organizations do not base their performance appraisal criteria for employees' appraisals on quality of work done by the employees. This eliminates employee awareness and concern for quality thereby making quality implementation and management difficult. Reasons of why quality is not used as one of the parameter for performance appraisal are similar to the reasons discussed in the last sub section when we were discussing the employees' key performance indicators and their role in quality implementation and management.

Further to the discussion above; absence of quality in the performance appraisal criterion list makes the employees feel that focus on quality would not benefit employee financially or in their career growth.

6.12. If I Work for Quality, The Quality Head Would be Pleased, What about my Boss?

A global phenomenon is that every one likes to please their boss. This is also true for the Pakistan's IT industry. Generally; supervisory figures (as also discussed above) in Pakistan's IT

industry are not interested in quality, they do not consider quality important for the benefit of organization, they think that quality is limited to academics and theory only and they think that quality is the job of quality management department only. It is due to these few and other similar reasons that supervisory figures do not focus on quality. Also quality is usually not part of their performance criterion list as stated above. Under this situation most of the supervisors never force their sub ordinates to focus on quality. Normally in all cases subordinates are forced to work on those aspects of work, which determine their and their supervisor' career growth and benefit enhancement. In such a situation employees fail to focus on quality as their focus is to satisfy the requirements of their bosses only.

6.13. Project Managers and Project Management

Project management is in actual one of the most important function of any IT based organization and in particular in case of software development organization. In most of the cases, project management function experience sense of urgency. Similarly; the project manager is an extremely busy employee within the organization. Not only time is a matter of concern of project manager but other elements of project like for instance cost, scope, resources, skills, customers, vendors, budgets and other similar elements are matter of great concern of the project manager. Although this is a reality that project manager is an important and busy employee within an organization but at the same time an equally important but correct statement is that project management function and thereby the project managers heavily rely on the quality management function. Similarly; it can also be said that quality management function is strictly dependant on project management function and commitment from project manager in order to implement quality organization wide.

We have already discussed the importance of project management and quality management and their dependency on one another. It is now important to highlight some of the core behavioral issues that the quality management staff faces when dealing with project management staff. These issues are as under:

i. Since project management is an important, objective and core function of an organization therefore focus on quality is required from the project staff. Unfortunately this is not the case because normally the project management staff is extremely busy due to which their focus on quality management is minimized.

ii. Since project manager's key performance indicators list does not normally contain quality as an important indicator therefore his / her focus on quality management is low, thereby triggering ripple affect in the lower staff.

iii. Since project managements staff within the organization experience pressure from support departments like for instance admin, HR, quality management etc and higher management staff, customer and vendors too, therefore it is normally the case that project management staff starts feeling frustrated. In this scenario it becomes almost impossible for any project manager or project management related staff to focus on quality management.

iv. In most of the organization (particularly in case of organizations that are not pursuing any quality certification), quality processes, policies and procedures are not in lined with the organization's best practices and requirements. This results in frustration among project management staff members as they feel frustrated about the general work methodology that is not very much in lined with the actual work efficiency and effectiveness requirement.

v. Generally speaking project management staff does not commit to quality management.

vi. In most of the cases project management staff feels that quality management is a redundant function and that quality management is extremely limited to theory and academics.

vii. Most of the project managers and the project management staff feel that quality is the job of the quality management staff. It is also a general feeling that quality management staff is not aware of the project requirements and therefore the quality processes, procedures and policies are not favorable for project execution. In many cases this later statement is false and in some cases it is indeed true.

viii. Project managers and project management staff feel responsible for business revenue and organization's profit. They think (also the management feels), that they are superior to

other departments as it is them who in actual run the organization.

ix. High employee turnover rate in most of the IT organizations forces employees to lose focus on project and quality management together.

x. Although quality management staff members play a vital role in project execution but in actual in most of the cases; during benefits and rewards distribution; much of the importance is not given to quality management staff members.

xi. In many cases project management staff members consider the role of quality management limited to project's product testing only.

Much of the causes against all the problems enlisted have already been discussed. A major consequence of poor coherence between quality management and project management is that in most of the cases project execution and working and the project deliverables normally do not meet the right quality standards. On top of this, since for any organization, various projects are a great source of repeating the best quality practices therefore in case of poor project and quality coherence repeatability is lost and organizations fail to institutionalize working [6].

6.14. Customers

Customers impose pressure on their vendors. This results in natural tendency of general staff members at the vendor end to deliver fast solution. In many of the cases fast solution delivery to the customers is done at the cost of low quality solution and low commitment to quality processes, procedures and policies. This fast solution delivery at times results in customer dissatisfaction as well. It is usually the case; that if the customer is dissatisfied from the project / product quality or project / product team work methodology and style then entire blame is put on the quality management staff members leaving them frustrated and confused.

It is also important to mention here that the above mentioned situation occurs mostly due to the tight and internally disagreed timelines and most importantly due to poor project planning estimations. Normally the project manager and the senior management are responsible for the dissatisfied customers as in most of the cases false deadlines are quoted to clients in order to acquire business from the market.

6.15. Institutionalization

Institutionalization requires repeating a process, a procedure and a policy within an organization not by force but by making a practice as organization's standard work methodology i.e. mutually agreed and applied by all the relevant employees. Institutionalization requires strong process engineering methodology, a dedicated quality team that understands the organizational quality requirements objectively and it requires staff members besides the quality department who realize the importance of quality management. In other words institutionalization only takes place in an organization once the quality implementation methodology exactly suits the organizational work requirements and that it is agreed by all the relevant stakeholders. In simpler words any practice in an organization can be termed as institutionalized if it is practiced without anyone telling anyone how to do it [5].

In most of the IT organizations in Pakistan (with an exception of few that are CMMI quality certified or pursuing quality certification) institutionalization does not take place. This is mainly because of the fact that employees' and management's commitment to quality management function is poor, which makes it impossible to implement quality in organization on first go. Remember! Institutionalization only occurs, once a quality practice is well implemented within an organization. Poor management's and staff's commitment to quality management function does not allow quality practice repeatability and therefore institutionalization cannot be achieved. In addition to poor commitment there are also other sources of improper institutionalization including office politics (hampers quality implementation), leader's limited vision towards quality, tough customers, false deadlines, improper criterion in key performance indicators, improper quality engineering, less interest in quality and others…

Lack of institutionalization does not allow changes in the quality and general work culture within an organization.

6.16. Interdepartmental Coherence

Poor coherence, communication and synchronization between various departments

within an organization hamper organization's quality management. It is the utmost role of the quality management staff members to identify the contact points between various departments (formal in particular; for instance one of the contact point between development and testing department is that they have to submit code to each other) and set standard processes against communication / coordination through these contact points. In general, departments within the IT organization work in isolation and do not allow organization development through openness to other sub departments.

Poor coordination, communication and poor synchronization between various departments could be a result of team / department leads' attitude where they like to control their staff members through minimum interaction with others. This severally damages the quality process, procedure and policy implementation and management by creating hiccups.

6.17. Quality Certification Service Providers [10]

The role of quality certification service providers is not only to help assist an organization in acquiring quality certification, rather it must also assist organization in truly uplifting the organization's quality. In case of Pakistan's IT industry the first case is mostly true.

Quality certification service providers massively influence the employees working in the organizations because their presence assures managements' commitment to quality function. In case if quality certification providers only limit their discussion and focus to acquiring certification then their presence does no good to the real quality uplift. In most of the cases the service providers are careful about their image. In order to preserve their image as a successful certification provider, they focus on clearing the requirements of the certification by hook or by crook, thereby resulting in false quality picture of an organization that does no good to organization in perspective of quality in the longer run.

6.18. Role of Pakistan Software Export Board

PSEB is largely focusing on quality management for IT organizations in Pakistan by assisting the local companies in acquiring CMMI certifications. Although this is an important and correct method of improvement but unfortunately several of the CMMI certified organizations still have quality loopholes because of their focus on CMMI certification only and limited focus of true quality improvement.

Although CMMI certification support program is an excellent move by PSEB, but limited vision of PSEB in acquiring of certification only hampers the national IT quality uplift.

6.19. Role of Universities (Software and IT Education)

Quality management in IT industry of Pakistan suffers greatly due to the misconceived role by universities that provide IT education in Pakistan. This is because most of the universities that provide IT education in Pakistan limit their curricula to only IT based core subjects. Very few universities provide management education (including communication, general management, languages etc) as a support education for IT learning. Result of this issue is that most of the students as they graduate from the universities do not understand the managerial requirements of running an organization. It can also be said that our universities produce engineers, computer scientists and IT experts who do not know anything about the management of their work.

Other than the issue mentioned above very few IT institutions and universities in actual teach subjects like software engineering, software project management, software quality management etc. to their students. Awareness of only the core technical side of IT industry does not help students develop visionary approach towards working in IT industry of Pakistan. The worst part on top of these issues is that in many cases the IT education quality does not meet the desired international criterion.

Low quality education and unaware students, as they enter the industry, lack the vision for working in the IT sector. Result is low productivity, confines of options in business and certainly unawareness of the quality requirements of the industry.

6.20. Standardization

A major problem in quality management in IT industry of Pakistan is standardization. By standardization we here refer to standardization of the processes, policies, procedures, methods, operating procedures, documents, deliverables etc.

Normally the standardization of process, procedure, documents, methods and deliverables is done against some international or self defined standard. Standardization is extremely important within the organization in order to have a common work approach within the organization. Standardization requires understanding of the best practices, documenting it, training all other staff against the best practice and then using the best practice.

Unfortunately in Pakistan's IT industry standardization is a cumbersome process because (but not limited to):

i. Staff members are generally resistant to change and would like to work in their own way.
ii. Quality management staff members are not fully skilled of producing the right standard for the organization that best suits the organizational needs.
iii. Generally quality management staff members are not skilled enough to understand, use and implement some international standard.
iv. Since, generally, the staff members in the organizations do not take quality management and its related activities seriously; therefore they resist using the standards.
v. Conflicts between staff members and quality management staff members result in zero usage of the standards.
vi. Major consequences of poor standardization are that it discourages quality implementation and makes quality management exercise cumbersome. Further to this it gives rise to chaotic and confusing work practices.

6.21. Repeating Quality Practices

Repeating quality practices requires standardization and institutionalization as discussed earlier. If standardization and institutionalization is not done; practice repetition cannot take place. Repetition of practices and methods identified as a result of quality engineering is important for the general uplift of quality organization wide. In Pakistan's IT industry no focus is laid on standardization and institutionalization, therefore processes and best practices repeatability is impossible and questionable.

6.22. Follow Someone Else!

As per the conversation and discussion with various quality experts in IT industry of Pakistan, many believe that generally employees' attitude is that they would not like to follow anyone else's working methodology. Everyone in general likes to work the way they like. This attitude can be due to the reason that generally as a nation we are never taught to work in a team. Most of the employees limit their work and its quality to themselves only. They fail to understand and realize the consequences of their work on other employees' work. Result is again poor standardization, lack of institutionalization, difficult quality management and its implementation.

6.23. Attribution by Quality Management Staff Members

A major part of work of quality management department is to inspect and audit work and other staff members. In formal terms of CMMI; this process is known as quality assurance. Quality assurance is the most important corrective action for process and quality improvement. Quality assurance requires that the audits and inspections must be done for the employees by the quality management staff, so that improvement opportunities can be found. After the audit, improvements can be made by reengineering the process or a procedure against which the employee was audited or inspected or by controlling the process or a procedure, or by training staff members against a particular process or procedure so that they can avoid mistakes in future.

In Pakistan, quality management staff uses audits and inspection for attributing the failures to particular employee. This is also true for higher level audits where the organizations plan to seek some international quality certification. Attribution introduces office politics and plays its role in provoking management to think negatively about an employee. Attribution also causes a sense of information hiding among employees whereby they try to minimize their interaction with the auditor or inspector. In books of quality management discipline, attribution is an unhealthy act and introduces negative attitude towards quality management. Attribution also discourages fault finding and information spread within an organization thereby creating barriers for quality management and improvement.

An important question is why attribution is done by quality management staff? A simple answer to this could be that in most of the cases the management believes that quality is the job of the quality management team only. It is due to this reason that management always expects from quality management team. The truth however is that quality management team is just a quality facilitator within an organization and in actual quality depends virtually on everyone. Based on this negative ideology of the management, quality management team members normally tries to convince the management that reason of low quality are other employees and not quality management staff members themselves and for this they attribute the failures to individuals.

6.24. Deadlines

Another major problem is the establishment of the false, internally unapproved and uncommitted deadlines. In most of the cases deadlines are set based on customers' requirements and based on the reason that organizations tend to present solution to their customers in shorter span of time as compared to others and thereby establish / develop business. Although this does not look like a problem in the short run but uncommitted deadlines have long term problems as follows:

i. Uncommitted deadlines cannot be met usually. In many cases; organizations' employees who are stakeholders of any particular deadline fail to buy in the uncommitted and disagreed deadline thereby working inefficiently for the completion of deadline.
ii. Uncommitted deadlines introduce less sense of ownership among employee, higher workload, deprived resource management and de-motivation.
iii. Uncommitted deadlines normally result in low quality solution thereby displeasing the customers in the longer run.

Above we have discussed few of the problems associated with the uncommitted deadlines. A major consequence of uncommitted deadline is the decline in the internal quality management. With uncommitted and tighter schedules; workforce within the organization fails to give due importance to quality management (which in itself is considered as an unimportant activity). Uncommitted deadlines means uncommitted employees and uncommitted employees means that employees would try to complete their work without taking care of the necessary measures required to maintain the quality at the product and organization level.

6.25. Documentation / Technical Writing

In majority of the cases, documentation and technical writing becomes a major source of quality mismanagement. Major reasons are as follows:

i. In most of the cases IT staff members (from any sub function of an IT organization) try to avoid documentation and technical writing. In short, interest of general staff members in technical writing and documentation is extremely less. Major reason of this attitude could be the educational background through which most of the IT employees go through. In most of the universities in Pakistan, that teach IT discipline, less importance is given to technical writing, written communications, languages and core software engineering. The result is that most of the students are prepared for handling programming and theta betas type of work only.
ii. In many cases technical writing and documentation is correct grammatically and as per the rules of the English language, but unfortunately the documentation does not comply with the international engineering standards at all. This again is due to universities' less focus on engineering and communication together as a discipline.
iii. Documentation and technical writing is normally thought to be female's area of interest. Most male employees find themselves more comfortable in other functions within the organization.
iv. Low quality and improper documentation poses a lot of quality management issues. Some of the problems that are related to quality management which become evident from low quality and deprived documentation and technical writing include (but not limited to): less chances of standardization, poor quality control, rework in quality management, higher requirement of training and less efficiency and accuracy etc.

6.26. Process Definition and Engineering Methodology

In most of the IT organizations process definition and engineering methodology is inefficient and ineffective.

Many organizations do not in actual understand what process engineering and definition is all about. Out of this set of organizations, most of the organizations that understand process engineering and definition completely or largely are the ones that have CMMI level three or above certification. Others; that are not CMMI certified understand and implement process engineering and definition partially and their process engineering and definition methodology is either ineffective or inefficient.

Normally process engineering and definition methodology requires mature stakeholders and well skilled and trained quality management experts. Normally process engineering and definition is considered to be the job of quality management staff members only, which in actual is partially true. In actual, process engineering and definition is only facilitated by the quality management staff members. Essentially process engineering and definition requires involvement of a process engineering group comprising of important stakeholders who understand the process requirements of an organization. Normally such important process group members must be mature and experienced staff of the organization.

Process engineering and definition largely depends on quality management staff members' abilities in identifying the correct process requirements and discussing and engineering the requirements with the process group members. It also depends on the ability of quality management staff members in finalizing the requirement through conflict resolution between the group members. Ideally and most importantly how well process engineering and definition is done within an organization also depends on the quality management staff's ability in writing the process technically and communicating it to others.

Process engineering and definition also largely depends on process group member's ability to communicate, resolve conflict and identify the right requirements for any process. [6]

In Pakistan, large employee turnover does not allow mature process engineering. This is because the process group members are not capable enough to identify the right organizational process requirement in short period of time. Secondly; employees (belonging to quality management and process group) are not otherwise capable enough to work with process engineering discipline. Poor language ability of general staff members, improper technical writing skills, improper communication and engineering skills; all become causes of deprived process engineering and definition.

Other than the technical aspects; several quality management staff members have also reported that process engineering and definition also suffers from individualistic attitude, office politics, lack of team work, excessive job rotation and limited process group members' vision.

Quality management discipline largely depends on standardization of processes, procedures, policies and documentation standards. Standardization in turn depends on process engineering and definition. In other words organization's internal quality management, implementation, control and monitoring; all depend on efficiency and effectiveness of the process engineering and definition process. In Pakistan, unfortunately, low quality process engineering and definition, poses a lot of problems to general quality implementation within the organization.

6.27. Process Implementation Method

Much of the problems concerning process implementation are similar to problems of process engineering and definition, for instance problems particularly related to communication, conflicts and staff's engineering skills discussed earlier. Some of the specific problems faced by the quality management experts as they implement processes / policies / procedures are as follows (not including the discussion in the last point):

i. Generally processes, policies and procedures engineering is done by one set of employees whereas processes, policies and procedures that are engineered are normally applied and implemented on employees who normally did not engineer them on first place. This situation gives rise to a lot of conflicts as the engineered process normally does not meet the right work requirements.

ii. Mostly staff members are resistant to change therefore they are not comfortable with work method changes. It is important to make them realize that change is beneficial for them.

iii. Process implementation requires highly skilled trainers, which unfortunately is a big deficiency within most of the organizations in Pakistan.

iv. Office politics, general leg pulling and lack of interest of a particular department's / function's supervisors are few major sources of poor process implementation.

v. Management normally believes that process implementation is the work of quality management staff only. In many of the cases where process engineering and implementation is done, process implementation is set as a key performance indicator of the quality management employees. This approach cause de-motivation among quality management staff members.

Issues, causes and consequences discussed above cause general hindrance in effective process implementation.

6.28. Focus on Product, Projects and Processes Only

As discussed earlier, quality management in Pakistan is only restricted to product, projects and process quality improvement only. This is a major set back as because people quality is completely ignored.

Major reason of ignoring people quality management is limited vision of the management. Major consequences of ignoring people quality is lack of employee satisfaction, de motivation among employee, unskilled employees and other problems related to general human resource management.

6.29. Availability of Local HR Suitable for Quality

Many of the quality experts in Pakistan's IT industry believe that local HR is not trained for quality management activities within IT industry. This statement is true both for the general staff that are present within the organization and the quality management staff members as well.

Essential deficiencies related to quality management in local human resource include (but not limited to): Lack of necessary knowledge concerning computer science; software engineering (or related) and quality management discipline, improper technical writing and documentation skills, lack of knowledge concerning soft skills; management in general, languages and communications.

Major consequence (as obvious) of lack of high-quality manpower that matches the requirement of quality management skill set is that the industry is unable to acquire suitable human resource for the management of quality.

6.30. Men, Documentation and Quality Management Function

Generally male employees in Pakistan's IT industry show less interest in pursuing a career in quality management. Generally male employees are also less interested in quality related activities within the organization and observations suggest that their documentation, technical writing and communication skills are generally not better than their female counterparts.

In some cases male employees have also been reported of saying that quality management is a lady's job. Many also think that quality management is the easy part of work.

Attitudes such as discussed above have no solid backgrounds, yet they deeply affect the involvement of male staff members in quality management activities within the organization. Such chauvinistic opinion cause damage to quality management as a discipline and hinders and effects quality management within organizations.

6.31. Compensation and Benefits for the Team Members who Work on Quality

A major observation that has been obtained is that in most of the IT organizations in Pakistan, staff members who work on quality management are not compensated equally w.r.t their co-workers who work at an equal organizational hierarchal level but in some other function (particularly software development, business development and project management departments / functions). Major reason of this differentiation is management's thinking that quality is a secondary activity and that quality management is a relatively easier job. Also, since the management does not take interest in quality management as they should therefore they invest less on this area.

Unjustified, unequal and improper compensation and benefits to quality management staff members leaves major problems in quality management staff's motivation and satisfaction. This creates a lot of problems in quality management in any organization.

6.32. Leadership

Limited vision of leaders severally blocks quality management activities in Pakistan's IT industry. As we all know that it is the leader who determines how an organization would actually work therefore unless and until leaders do not buy quality as an important tool for organizational sustainability, quality function cannot be implemented in an organization. In short visionary leadership style is extremely essential.

6.33. Organizational Reporting Hierarchy

Quality management depends on standardization and repeatability of best practices which in turn largely depends on process engineering and documentation. It is important to note that effectiveness of process definition, process implementation and control depends on consistency and correctness of the organizational reporting hierarchy. Following are few major problems that exist in Pakistan's IT industry in regard to organizational hierarchy:

i. In most of the cases organizational hierarchy is not defined therefore reporting channels are not clear. This confuses the quality experts while implementing quality and engineering it. Definition of organizational hierarchy is not considered as an important task by the management.

ii. In many cases the quality management departments and staff members report under staff members within the organization of whose quality they have to manage. This creates a lot of transparency issues. Further to this, this arrangement does not allow quality management staff members in truly identifying the weakness of any particular individual. Overall result of this situation is that organizations' improvement is simply blocked.

Major reasons of absence of organizational reporting hierarchy and incorrect hierarchy are management's limited vision and interest in this activity.

6.34. Organization's Long Term Goals, Objectives, Mission(s) and Vision

To start with, most of the IT based organizations do not have a defined long or short term objectives, goals, mission and vision. Since mostly; these things are not defined therefore individually people fail to understand their role within the organization and their performance criterion. Absence of mission, vision, goals and objectives also does not allow people in understanding how these four things relate to one another and what should be their direction of work for achieving necessary objectives then goals then mission and then vision.

Some organizations define either mission, vision, objective or goal but they do not define objective to vision relationship as discussed earlier. Absent or unclear objective to vision relationship hinders organization's overall productivity.

Very few (needle in a hay stack) organizations actually understand, document, maintain and clarify objective to goal to mission to vision relationship to their employees. In nearly a wide majority of organizations vision, mission, objectives and goals (defined or undefined) do not include quality as an important parameter of consideration. The result is that general staff members lose interest in quality as an important function of the organization.

Major reasons of discrepancies in this area are management's limited vision and interest in this activity.

6.35. Transparency

As in knowledge of all, transparency is extremely important within an organization for a healthy work environment. Especially in case of people management; transparency helps a lot. Pakistan's IT organizations experience shortage of transparency in their everyday working. Excessive information hiding, closed door management and strict confidential communication channels introduce sense of less ownership among employee making them de motivated and unsatisfied. Why transparency issues exist in Pakistan's work environment is because generally people like to hide information from one another in order to flatter their supervisors whenever possible. There are several other reasons as well that are not being discussed here due to chances of deviation from core agenda.

Other than the indirect causes, since transparency causes information hiding therefore quality management implementation becomes difficult and weaker.

6.36. Superiority Complex

Many of the quality management experts feel that quality management and implementation suffers another major problem and that is when employees within the organization feel that they possess more knowledge as compared to others.

Feeling of knowing everything (or more) forces an individual not to acquire knowledge (if any) from a person who is thought to be less knowledgeable. This feeling introduces flaws in the organizational learning capabilities. It is also important to mention here that normally in Pakistan's IT culture experienced staff members feel that they are certainly more knowledgeable. This feeling among experienced employees eliminates the innovative and novel ideas from the young coworkers within an organization. Barriers to knowledge dispersion and decline in organizational learning curve hamper quality implementation and management.

6.37. Attribution of Failure of Quality Certification

The most de-motivating and inappropriate cause of quality management implementation and decline is attribution of employees to one another in case of failure of any quality certification like for example CMMI. Having interviewed many quality experts, most believe that the management, quality staff members and general staff members all attribute the failure of quality certification to one another. This habit of attributing failure to one another; causes de motivation. In some organizations the worst part is played by the management, where they actually fire the employee from quality management department (in particular) and general staff members who were in one way or another involved in any particular failure of quality certification.

Why this attribution is done is mainly due to fear of management. The quality management staff members always like to convince the management that process definition and engineering was perfect but the certification failed mainly due to any particular person who did not follow the guidelines of process, policy or a procedure. On the other hand general staff members like to convince management that reason of failure is not their inappropriate conformance to processes, policies and / or procedures, rather the reason is incorrect and inappropriately engineered processes, policies and / or procedures. There are other many things that each party attributes to one another. Other than group attribution, many a time attribution is done towards individual. The results and consequences are all the same as discussed earlier.

6.38. Multicultural Environments [15,18,19]

Some of the IT organizations in Pakistan's IT industry have multicultural environment. Ignoring the detailed discussion, it is important to specify that quality management in multicultural environment has its own dynamics whereby the quality management team specially needs to take care of communication and cultural gaps. In addition to this in most of the IT organization there is a wide difference between working styles of international and local staff members. These differences relate to general work practices, cultural practices, general approach, vision etc. and are responsible for the decline of quality.

6.39. Quality Management Staff Member's Career

Career development and growth are most important motivation factors for any employee. Unfortunately in Pakistan's IT industry, staff members belonging to quality management function experience problems in this area. In most of the organizations, employees working on quality management are not given any career growth and development options. In simpler words employees from quality management discipline are usually not given any raises in designation and not many options are made available to them for their general career development.

Reason behind this phenomenon is that management in IT industry of Pakistan usually does not focus on quality management as an important area / function within the organization. Mostly management members believe that staff members belonging to quality management function play a secondary role in organization's core business and their importance therefore; is relatively less. Lack of management's commitment to quality management function results in management's negligence towards quality and the quality management staff members.

Consequence of this attitude of IT organization's management towards quality management staff is that generally; the quality management staff feels de motivated, depressed, they experience less sense of ownership within the organization and general employee and job satisfaction is seriously affected. It is also important to note that mostly these reasons are the core problems due to which there is high quality management employee turnover. Quality management employee's career growth and development problems create barriers for quality management and implementation due to unstable and unsatisfied human resource.

6.40. Returns, Awards to Quality Management Staff in Case of Successful Quality Certification

It is horrible to note that in most of the IT organizations (with an exception of few) that successfully acquire CMMI certification (or any other certification for example ISO etc) quality management employees' services are usually terminated. If not so, in some cases usually the quality management functions experience downsizing. In some cases employees are not laid off directly. In such organizations quality management employees are usually irritated to an extent that they leave the organization themselves.

Very few organizations, that achieve quality certification retain their employee and give benefits to them. This is an extremely rare case.

The reason of this act by the management of IT organizations is much similar to the reasons stated for some other points earlier. In simple words, interest and management's commitment to quality are the core factors responsible for this behavior. In addition to this, management in most of the organization (as discussed earlier) feels that quality management is a secondary job. Some management members feel that quality management staff members are only important for acquiring quality certification. This limited vision for the quality uplift in the IT organizations makes the presence of employees belonging to quality management completely redundant in view of management; once the certification is acquired.

Consequence of this act of IT organizations' management is high decline of general organization's quality after the certification and extreme disappointment and de motivation of the quality management staff members.

6.41. Focus on Certification [10]

As discussed in the last point, management in IT organization is not focused on general quality uplift within an organization. In most of the IT organizations, focus on quality management is laid only for acquiring quality certification. This approach towards quality management does not allow realistic improvement within any organization. Management in Pakistan's IT industry considers quality improvement as a by product of quality certification, whereas the case is quite opposite.

Inappropriate and incorrect focus of the management regarding quality management makes quality implementation and management exercise cosmetic. In this scenario actual improvements cannot be made easily within an organization and quality management staff members experience frustration, less job satisfaction and lack of interest in their work. Further to this, this approach by the management introduces insecurity and makes quality management staff members feel insecure as they achieve any particular certification.

6.42. Reactive or Proactive

Quality management experts believe that quality management suffers mainly due to reactive approach of the management and the general employee towards quality. This behavior also mainly stems form lack of interest towards quality. Consequences of this behavior of organization's employees towards quality imposes extra burden on quality management staff members in convincing the management and the general staff members to work for the quality improvement. General delays reducing productivity of quality management staff members, frustration of quality management staff members and difficult and complex implementation of quality are the main results of reactive behavior of management and general staff members towards quality.

6.43. Business Development / Contract / Account / Legal Management [9]

General view of the business development, legal and accounts management staff members is that quality management is not applicable on them and their work. This approach is incorrect and is a result of lack of interest of both the management

and the staff members belonging to these functions within the IT organization.

Since in most of the IT organizations, business development, legal and accounts / contract management department do not focus on quality therefore this directly affects the efficiency and effectiveness of the project / product management function. Other major consequences include (but not limited to) poor planning, poor costing, extremely incorrect scheduling, unsatisfied customers, difficulties in vendor management (where applicable), internal and external resource issues, poor project and product performance, general quality deterioration and extreme difficulties in quality management of projects, products and people (relevant stakeholders). Some behavioral issues include general frustration among employees, job dissatisfaction and most important lack of interest and commitment to work.

6.44. Quality is Subjective

Most of the quality management experts believe that general perception of IT staff members is that quality is subjective and theoretical. This approach towards quality makes staff members lose interest in quality for objective improvement. Although it is true that quality is slightly subjective but as far as quality sub functions like for instance quality engineering, control, monitoring, implementation and other sub functions are concerned, quality is extremely objective. Since most of the staff members like to be objective in their work therefore they perceive quality as a redundant and unimportant part of business. This attitude makes quality management cumbersome for the quality management staff members. In addition to this, quality is generally an ignored function within the organizations.

6.45. Micro / Macro Management

It is important that employees at various management levels realize correctly of how and to what level they should actually manage. Unfortunately this is a problem in Pakistan's IT industry to some extent. In some of the organizations the concept of micro or macro management is not well understood and not well practiced appropriately. In some cases management at strategic level gets involved in micro management whereas in other cases line managers make use of macro management techniques. Inappropriate mix of macro and micro management at various organizations' levels (hierarchies) create operational barriers and reduces organizations' productivity. In general organization's monitoring function is seriously affected at various levels if the managers do not understand and realize appropriately that to what level they should manage. Management flaws at various levels not only hinder operations, but rather it decreases the overall organizational efficiency and effectiveness thereby indirectly hindering the organizational goals, objectives, mission and vision. Inappropriate, excessive or little management control also introduces job dissatisfaction among employees and is also a reason of employees' loss of interest in job. In such situation quality management becomes extremely difficult and quality management staff members in actual have to adjust their work according to the management style of managers at various levels.

Inappropriate management control at various levels within the organizations is mainly due to improper leadership and also due to less reliance on quality function. It is important to mention here that level of management control is directly dependant on quality and human resource management functions, as because it is the quality and human resource management functions within the organization that in actual determines the roles and responsibilities of managers at various organizations' level. Where we say that level of management control is dependant on quality management, the opposite is also true as because quality largely depends on managers correctly realizing their roles and responsibilities.

6.46. Team Work

Quality management experts in IT industry of Pakistan feel that lack of team work undermines the quality management programs. Lack of team work is mostly due to individualistic attitude where every person likes to represent the idea that he / she is the reason of success and not the reason of failure. Lack of team work also occurs due to office politics, job dissatisfaction, de motivation among employees and most importantly due to supervisors and team members who do not allow benefits / rewards to be dispersed equally within the team. Since quality improvement totally depends on collective and unanimous effort therefore lack of team work hinders quality implementation. Lack of team work also occurs

due to unclear organizational objectives, goals, performance indicators, mission and vision.

6.47. Change Management

Change is extremely important for any organization and so is change management. Change management is an approach; necessary for the change of approach of individuals, teams and organizations. Since quality management's core responsibility is to identify and implement macro and micro level changes necessary for organizational improvement therefore it is important that change management must be done carefully and with full devotion within the organizations. Change management process not only controls changes in organizations, work products, projects, processes, working methodology, procedures only rather it also includes change management for change in attitudes, believes and behaviors of individuals.

In Pakistan, employees are generally resistant to change. Not only employees; but organizations, teams and their work and deliverables are not managed through change management process.

Lack of change management within the organization for people, product, projects, teams, processes and procedures etc is because of three reasons mainly. The first reason is that change management experts (in our case quality management staff) are not familiar of how change should be implemented. The second reason of resistance to change is that the new change in itself does not seem better to relevant stakeholders than previous scenario. These two reasons are due to lack of expertise of change agents or in our case quality management staff members. The third reason of deprived change management is commitment towards improvement which is essentially less, organization wide. Some staff members are also resistant to change as they suffer from superiority complex and feel that their working methodology is better than anyone else as because they possess more experience or larger knowledge pool. Resistance to change also occurs due to general individualistic attitude, lack of team work, office politics, less interest of staff members, job dissatisfaction and de motivation among employees etc.

Unsuccessful change management within the organization creates hurdles for quality management.

6.48. Trainings

Quality management process relies heavily on trainings. It is therefore necessary that trainings must be managed, effective and must be able to achieve desired outcomes. Unfortunately, since quality management is not considered as an important activity therefore supervisors and employees within the IT organizations do not commit to trainings for quality management. Lack of interest in quality management trainings results in poor quality management knowledge dispersion, absence of employees from trainings (concerning quality management), improperly managed and ineffective trainings, dissatisfied trainers from quality management department etc. All these factors directly affect the quality management process within the organization.

Another important factor that needs consideration concerning training is that normally the trainers (quality management employees within the organization), who train employees of the organization for quality management, fail to deliver trainings in efficient and effective manner. This is due to poor knowledge of the trainers.

6.49. Staffing and Recruitment

TQM in addition to its various aspects requires heavy focus on management of people. One of the aspects of people management is that people within the organizations must possess the right skills, expertise and attitude. In most of the IT organizations in Pakistan, heavy focus is laid on the technical expertise of the potential staff members during staffing and recruitment process. Although this seems quite correct but certainly this is not enough. It is important that right people must be selected in the organization. When we use the term right people, we essentially not only refer to the people with the right expertise, rather we also focus on people with the right attitude and the right skills. Here by attitude we refer to individual's work ethics, professional and general ethics (but not limited to) [6]. Skills not only refer to technical and work related skills rather our discussion also involves presence of soft skills like for instance communication, conflict resolution skills, planning and strategic skills, documentation / technical writing skills, understanding of engineering

processes, customer, project, product, people and general management skills (but not limited to).

Since focus in most of the IT organizations is laid only on technical expertise of potential employees during the recruitment and the staffing process therefore generally the employees who are hired within the organizations lack visionary approach towards work and in particular quality management. Most of the staff members that are hired do not posses any knowledge of organization's various functions other than their core work. Most of the staff members do not possess that right engineering, management and soft skill knowledge. It can also be said that staff members posses depth based knowledge of one area whereas breadth based knowledge is also essential. These problems overall hinders quality and people management activities within the organizations.

Here it is also important to specify that in most of the organization the recruitment and staffing body (HR departments / Managers etc.) are not trained and skilled enough to conduct the recruitment and the staffing process keeping in view the organization's mission, vision, goals and objectives.

Why focus is limited on the technical expertise only is because generally; the management and the recruitment and staffing body within the IT organizations do not possess visionary approach towards work and organizations themselves.

6.50. Conflict Management, Decision Making and Problem Solving

In most of IT organizations, there is no standard method or process / policy / procedure of internal conflict resolution. This leaves a wide open gap in fulfillment and completion of tasks, discussions, decision making and /or problem solving (particularly in relation to quality management). General cause of absence of conflict management procedure / process is management's unawareness about the importance of this process / procedure, least interested management and unawareness of the negative consequences due to absence of conflict management process / policy / procedure / method.

It is also important to note here that conflicts seriously affect the quality engineering process and does not allow engineering process groups within the organizations to formulate various quality and organizational related polices / procedures / processes etc. The same is true if the engineering group members are trained for effective and efficient decision making and problem solving.

In most of the cases, staff members from all over the organizations are not familiar with the decision making and problem solving techniques. This leaves grey area in organization's efficiency and effectiveness. Lack of expertise in problem solving and decision making is also generally due to management's unawareness about the importance of these two important points.

6.51. Arrogance

Most of the quality management experts within IT organizations feel that arrogant, egotistical and overconfident employees persistently affect quality implementation within IT organizations. In most of the cases such employees simply refuse to listen and follow the procedures / policies / processes set by quality engineering process group. Arrogance introduces superiority complex among employees and makes them feel in control of all the desired knowledge. Unfortunately the knowledge available with such employees is usually always limited and is based on individual ideas and experiences. These individual ideas are not comparable to the knowledge of any engineering process group within the organization that is responsible for the analysis of organization dynamics and for the formulation of necessary processes, procedures and policies.

6.52. General Organization

In view of the author and many other quality experts within IT industry of Pakistan, 'Organization' is the most important element of management discipline for quality improvement within an organization. Unfortunately in Pakistan's IT industry teams, groups, individuals, organizations' work products, organizations' deliverables and work is generally not organized. Lack of organization causes rework, delays, reduces organizational productivity, reduces efficiency and gives rise to general mismanagement. All these elements in turn affect the overall organization's quality and working of quality management department itself.

The worst scenario here is that in some of the organizations, quality management departments

and staff members fail to organize their work thereby hindering quality management.

Reason of not organizing properly is lack of employee's interest in their work mainly, personality issues and improper professional grooming.

6.53. Information Hiding

Many quality experts report that many employees always try to hide official information. This attitude severally damages organization's improvement opportunities by affecting the knowledge acquisition process. Information hiding practice is mainly done by employees who try to get individual recognition from their supervisors, who want to be part of office politics culture or who want to create problems in other employees' work.

6.54. Job Rotation and Enlargement

Pakistan's IT organizations suffer from resource availability issues. In order to cater these issues, job rotation and enlargement practice is widely used. Job rotation and enlargement practices are extremely helpful but their excess creates problems for quality management within the organizations. Quality management heavily relies on implementation of processes, procedures and / or policies. Policies, procedures and processes implementation require clear definition of roles and responsibilities. With changing roles and responsibilities implementation of policies, processes and processes become extremely cumbersome exercise. This directly hampers quality management.

6.55. Roles and Responsibility Definition

Quality management depends on standardization which in turn largely depends on policy / process / procedure engineering, documentation and implementation of these processes / procedures / polices. It is important to note that effectiveness of process engineering, definition, implementation and control largely depends on organizational roles and responsibility definition and consistency in these roles and responsibilities. With rapidly changing internal roles and responsibilities extra rework is required (under change management process) for stratification of processes / policies / procedures according to latest working methodology. Changes in policies / procedures / processes also require change in existing documentation and reimplementation of policies / procedures / processes.

Change in responsibilities and roles occur to resource issues mainly. In usual cases; roles and responsibilities are revised or updated based on the standard employee appraisal process (or based on other genuine reason), whereas in some cases roles and responsibilities are changed / revised in order to satisfy employees, in order to facilitate an employee who is at an important position (and wishes to leave the organization), in order to facilitate personal interest of employees and management, in order to handle termination of services of an employee, in order to move an important employee from important to unimportant position, in order to eliminate office politics, in order to facilitate employee who has linkages with organizations' customers, in order to please those employee that influence other employee's working etc.

6.56. Feedback System

Quality engineering, improvement and overall quality management process largely relies on feedback from all over the organization. In IT organizations, hardly any formal method of collection of feedback exists. In many of the organization no formal or informal feedback collection is done. In some organization emailing, meeting and informal chatting between the quality management experts, the management and the organization's employees is a source of feedback collection. Very few organizations make use of online feedback forums for the collection of feedback.

Out of many organizations that collect feedback formally or informally, extremely few organizations officially make use of these feedbacks for the improvement of organization and its quality.

Major reasons of not collecting feedback or limited feedback collection is management's and quality management staff member's limited interest and vision concerning organizational improvement. A worst scenario is that in case of some organizations quality management departments do not allow feedback in order to avoid changes in their existing work and to avoid change management and rework.

Hindrance to feedback collection and improvement from feedback overall decrease the quality management improvement and the

improvement of quality as a whole within the organization.

6.57. Quality Management Expertise [11]

As discussed earlier, very few IT organizations have dedicated quality management departments. Those that do, have limited working confined to product testing only. Out of the organizations that have dedicated quality departments / functions, some focus on product, process and project quality management, very few focus on TQM and people management as well.

For the discussion above it can be easily said that quality management function is not dedicatedly and completely carried out in organization in IT industry of Pakistan. Further to this a major problem is that quality management department / function within the organizations lack technical and managerial expertise to implement quality organization wide. This limits organization's growth and development in term of quality.

Reason of lack of quality management expertise in the quality departments / functions is universities', employees' and managements' limited vision about quality and deficiency in universities' academic curricula in perspective of quality and general management.

6.58. Suppliers and Vendors [12]

In most of the IT organization, quality management function is confined to internal quality management only. Although this approach is extremely correct but it is also extremely important that quality of suppliers and vendors must also be managed. In this regard, only the organizations that are CMMI level two or above certified in the supplier sourcing discipline, manage their vendor and supplier agreements and work deliverable quality (some only do this for acquiring certifications only).

Main reason of not managing the supplier and vendor quality is limited vision, ignorance and lack of realization of benefits of vendor / supplier quality management.

Zero quality management of vendors and suppliers results in mismanagement of the supplier and the vendor contracts. Lack of quality management in this area introduces problems in relation to controlling and monitoring the supplier and the vendor performance. Lack of supplier and vendor quality monitoring reduces chances of high quality of output / deliverables / work from the vendors / suppliers. These discrepancies further make the organizations' customers unsatisfied due to poor quality.

6.59. Issue Management

Very few organizations actually manage their issues to closure. Those that do are mostly the ones that are CMMI level two or higher certified (some only do this for acquiring certifications only).

In most of the cases; issues within the organization are never heard, never analyzed and never handled. In some organizations issues are collected but not analyzed and handled, whereas in others; issues collection is only limited to product development, business development, project management and customers related issues only.

Improper, inappropriate and informal issue management introduces environment with ever increasing and never ending problems. Normally issue management is not done within the organizations due to managements', quality management experts' and general staffs' ignorance and unawareness about the importance of issue management for quality improvement.

6.60. Engineering Process Groups

Quality management heavily relies on quality engineering which in turn relies on capabilities, abilities, performance and working of 'Engineering Process Groups'. 'Engineering Process Groups' (some software organization use the term SEPG: 'Software Engineering Process Group') comprises of experts from various functions within the organization who understand the organizational (respective functions) requirements in relation to quality management for their respective function. Members of these groups are not only responsible for (with the help of quality management staff members) making quality processes / policies / procedures for their respective function rather it is their responsibility to implement the quality (with the help of quality management staff members). Members of these groups simply limit their role to feedback only. They do not actively participate in the engineering and the implementation of the quality procedures / policies / processes. This creates a lot of burden for the quality management staff members. One of the major problems

experienced by the quality management staff members is the lack of expertise of members of these groups and lack of their interest in group discussion, group meetings and work related to quality management. In addition to lack of interest, in most of the cases, members of these groups do not allow implementation of a policy / procedure / processes that is made by someone else in their respective function (at the same time they do not make these policies / procedures and processes themselves).

Problems stated above directly affect the quality engineering and implementation within the organization. Inappropriate, inexperienced and less knowledgeable group members of 'Engineering Process Groups' hinder quality management.

In Pakistan, 'Engineering Process Groups', as stated above only and rarely exist in companies that acquire or strive to acquire some quality certification.

6.61. Internal Influences on Leaders

As per observations of quality management experts, in some cases some employees influence leaders' attitude against the quality management programs. General reason of this influence is conflict of influencing employee with quality management staff members / department / practices, personal self interests and office politics.

Major consequence of this influence on leaders is that they lose interest in quality management and thereby their commitment is limited or nearly absent.

6.62. Employees' Personal Issues

In many cases quality suffers due to employee's personal issues. Personal and family issues of employees hinder employee focus on work in general and the victimized employee loses control and interest in work. In such conditions mostly the employees perform their basic tasks only and completely ignore quality which is perceived as an extra work. This drastically affects quality management.

6.63. Ignorance

General ignorance is one of the main reasons of quality mismanagement. This attitude is present in the organizations' employees if their supervisors are not interested in quality management or the employees are busy or overburdened with their base work.

6.64. Rude Behaviors

Some of the quality experts have experienced that the quality management and /or the general staff become rude with one another during quality management sub function execution like for instance engineering, implementation etc.

Impolite, discourteous, offensive and bad-mannered behavior results in serious conflict and terrible organizational environment, therefore blocking quality management and implementation.

6.65. Organizational Infrastructure

Inappropriate and unhealthy work environment lowers employee satisfaction and motivation which in turn affects people quality management due to job dissatisfaction. In addition to this, quality management function to some extent partially depends on infrastructure requirements such as IT infrastructure, presence of training and meeting rooms, etc.

Main reason of unhealthy and inappropriate organizational infrastructure is lack of funds and limitation of leaders' vision.

6.66. Recognition

Lack of management's interest in quality management, does not allow management to recognize the work done related to quality, organization wide. Recognition of quality related work is a problem both for the general and the quality management staff. Since generally; management does not recognize quality the way it recognizes the achievements of other functions like for instance project management, business development, etc, therefore employee lack motivation in doing quality management related work. Further to this, recognition problem also eliminates employee interest for work related to quality.

6.67. Research

Quality management and in particular TQM requires understanding of various organizational dynamics. It is further important that quality management staff members continually try to improve organization by establishing and institutionalizing the world wide best practices and

by continually evaluating the organizational quality needs. This kind of work requires research within the organization and research in regard to obtaining understanding of the international best practices.

Quality management staff members (with an exception of extremely few organizations) do not perform any research for understanding, analysis, exploration and / or explanation of any international standard / best practice. Similarly they do not perform any research for understanding, analyzing, exploring and / or explaining the organization's internal behavior / shortcomings. Lack of research leaves the quality management and improvement program and activities one step below the desired level.

Lack of research is due to general attitude of the staff members. In most of the cases in Pakistan, staff members are never trained, encouraged and / or required to conduct research during their professional or academic affiliation.

6.68. Employee Turnover and Brain Drain

Employee turnover and brain drain from the organization severely affects the quality management and improvement program organization wide. This is because employee turnover and brain drain (from both general and quality management staff members) largely affects the quality engineering and implementation. Further with changing staff and with elimination of key staff members from the organizations, quality management programs have to largely undergo through the reimplementation and change management process. Employee turnover and brain drain largely occurs due to dissatisfaction of employees. It is also a result of low motivation and inappropriate human resource related policies.

6.69. Understanding of Quality Management Sub Functions

A widely existing problem as identified by many quality experts is that generally staff members and quality management employees within the IT industry do not understand various sub functions of quality management. In this regard confusions exist as to what is quality control, quality monitoring, quality management, quality monitoring, quality implementation, quality engineering etc. Lack of awareness of such basic level knowledge hinders basic quality management and improvement organization wide.

Reason behind this lack of knowledge of the quality management's sub function is lack of knowledge and expertise within the IT industry and lack of knowledge at the academic end.

6.70. Placement of Quality Management Department within IT Organization

In some of the organizations; the quality management department reports to the project management function, whereas in others quality management departments report to the product management executives.

This approach does not allow quality management staff members to control quality of their superior departments / function thereby creating a big loop hole. It is important to note that reason of this mismanagement is office politics, unaware and uninterested management.

6.71. Resource Conflicts

Generally; in most of the organizations (with an exception of a few), there are no dedicated quality management human resources. This scenario naturally creates resource conflicts. Further to this; resource conflicts are also common in case of general staff members who are always confused about how they should manage their core work and their focus on quality.

Few reasons of resource conflicts are (but not limited to) limited funds available to an organization, over burdened staff members, poor resource planning, disintegrated project management, resource mismanagement, less interest of organizations' management in quality management program etc.

Resource conflicts decline productivity, efficiency and effectiveness of quality management program. It further eliminates focus of quality management and general staff on quality management activities. Another major problem is that resource conflicts give rise to general conflicts thereby further affecting the quality management and improvement organization wide.

6.72. Legal Issues

In most of the cases, as the organizations reach a reasonable quality level, they plan on acquiring

some quality certification. This calls for a formal contract between the organization and the quality certification service provider. Unfortunately, a major problem that most of the quality management staff members experience is the lack of abilities to formulate, understand and manage contracts. Similar to this situation, understanding of contracts is extremely important for the quality uplift of project management, product management and business development function. Absence of knowledge concerning legal issues creates a large barrier for general quality management.

Main reason of unawareness about the legal and contractual issues is the lack of knowledge of quality management staff members about business laws and contract management discipline. This issue is due to poor training at both the professional and the educational level.

6.73. Literature

Quality management function most of times requires availability of necessary literature like for instance IEEE standards, CMMI standards etc for research and understanding. Unfortunately in most of the organizations, no importance is given to quality management. This attitude of the management and the general staff members does not allow acquisition and availability of proper literature for quality management staff members. The result is poor and deprived understanding of the quality management staff. Lack of knowledge of staff members severely undermines quality management activities.

6.74. Go Quantitative

Although in most of the organization quality management function is executed but very few make use of quantitative methods for the research, understanding, analysis and exploration of the quality trends within the organizations. Many of the organizations lack the necessary quality management staff that has the ability to use statistical and quantitative techniques for the improvement of the quality. It is also important to mention here that quantitative methods are avoided by quality management staff members because usage of quantitative methods requires deep understanding of the subject. Unfortunately in Pakistan's universities and IT organizations; no specific trainings / coaching are given to students / employees that teach them to use quantitative methods.

Lack of quality management staff members' quantitative expertise hinder quantitative quality management which is extremely essential for quick, error free, objective and precise quality management and improvement.

6.75. External Infrastructure Barriers

In addition to many important points that were discussed earlier, at times external infrastructure barriers also affect the organizations productivity and quality. These external barriers mainly include lack of power supply, poor performance of vendors (as discussed earlier) {for instance water supply, paper supply and supply of other equipment necessary for day to day organization's operation} etc.

6.76. General Mismanagement

General mismanagement and lack of management ability, skills and capability within the organization seriously affects the overall quality management function. This is very much true in case of IT organizations where management is not so strong and capable. Much of the causes and consequences have been discussed earlier, however broadly speaking weak internal management results in lack of achievement of organizational objectives, goals and mission. In addition to this it is in actual the management that determines the overall performance of the organization and its function. Quality management function heavily relies on management's commitment and sponsorship and the right management's vision for its success.

7. Recommendations

- Figure 2a presents set of recommendations framework.
- Figure 2b presents key to Figure 2a.
- Figure 3 presents set of recommendations for improvements required at national level.

8. Conclusions

This paper presents analysis and exploration of issues, problems, concerns and deficiencies related to 'Quality Management' (concerning behavior, management and culture). It explains the effect of the identified barriers on quality. It also specifies improvements that are required for the uplift of quality in relation to behaviors, culture and

Figure 2a. Quality Improvement Recommendation Framework (A Cultural, Behavioral and Managerial Perspective).

Figure 2b. Key to Figure 2a.

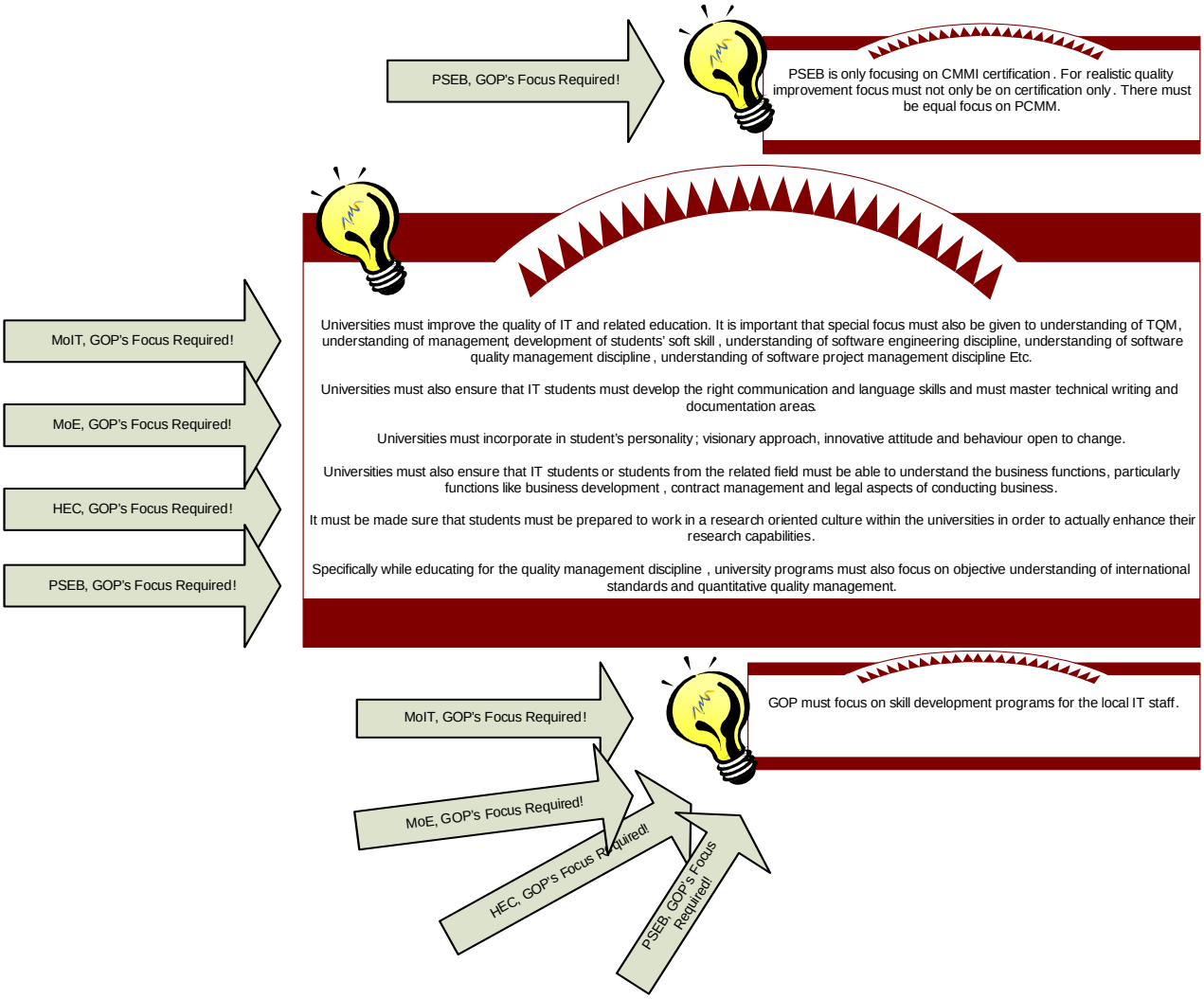

Figure 3. Quality Improvement Recommendation Framework (A Cultural, Behavioral and Managerial Perspective for National Level Improvements).

management. The paper also presents recommendations for the improvements in this area at the national level.

Bibliography

- Dutta, Dilip and Anna Sekhar., Major Indian ICT Firms and Their Approaches Towards Achieving Quality, ASARC Working Paper 2004, University of Sydney (2004).
- McClure and L. David., Human Capital: Attracting and Retaining a High-Quality Information Technology Workforce. Testimony before the Subcommittee on Technology and Procurement Policy, Committee on Government Reform, U.S. House of Representatives, U.S. General Accounting Office (2001).
- Watts Humphrey., Introduction to the Personal Software Process, Addison-Wesley (1997).
- Kim Caputo., CMM Implementation Guide: Choreographing Software Process Improvement. Addison-Wesley (1998).
- Syed Zahoor Hassan and Khalid Sherdil., A Contingency Based Capability Maturity Model for Developing Countries, Pacific Asia Conference on Information Systems (PACIS-97) Brisbane, Queensland, Australia, Undated.
- W. Decker, J. Haskell and F. Mcgarry., Undated, Experiences with CMM and ISO

9001 Benchmarks, Whitepaper by Computer Sciences Corporation (CSC).

- Richard Heeks and Brian Nicholson., Software Export Success Factors and Strategies in Developing and Transitional Economies, Paper No. 12, Development Informatics Working Paper Series (2002).
- Richard Heeks., International Perspectives: Software Strategies in Developing Countries, Communications of the ACM, Vol 42, No 6, p. 15-20, ACM Press (1999).
- W.D. Reitsperger, and S.J. Daniel., Japan V. Silicon Valley: Quality-Cost Trade-Off Philosophies, Journal of International Business Studies, Second Quarter, p. 289-300 (1990).
- G. P. Ferraro., The Cultural Dimensions of International Business, Englewood Cliffs, NJ: Prentice-Hall (1990).
- E. T. Hall and M. R. Hall., Understanding Cultural Differences, Yarmouth, ME: Intercultural Press (1990).
- G. Hofstede., Culture's Consequences: International Differences in Work-Related Values. London, U.K.: Sage (1980).
- Sana Gul., Undated, Dilemmas of Localization in Asia- A Case Study on Localization in Pakistan, Center for Research in Urdu Language Processing (CRULP), National University of Computer and Emerging Sciences (NUCES).
- Kerstin V. Siakas and Elli Georgiadou., Empirical Measurement of the Effects of Cultural Diversity on Software Quality Management, Software Quality Control, Vol 10 , Issue 2, ISSN:0963-9314 (2002).
- B. Curtis, W.E. Heflleey, and S. Miller., Overview of the People Capability Maturity Model, CMU/SEI_95-MM-01 (1995).
- Y. Kondo., Importance of Employee Motivation in TQM, Fifth World Congress On Total Quality, Feb., New Delhi, India, p. 46-52 (1995).
- P. Kuvaja., New Developments in Software Process Improvement, Keynote Speech, Software Quality Conf., Southampton, U.K (1999).
- A. Mohamed Walaa-Eldeen and K.V. Siakas., Assessing Software Quality Management Maturity (SQMM): A New Model Incorporating Technical as Well as Cultural Factors, Third Int. Conf. on Software Quality Management SQM'95, Seville (1995).
- M.C. Paulk., Undated, Comparing ISO 9001 and Capability Maturity Model for Software, Software Quality J. p. 245-256.
- K.V. Siakas, and B. Balstrup., A Field-Study of Cultural Influences on Software Process Improvement in A Global Organization, European Software Process Improvement Conf., Copenhagen (2000).
- K.V. Siakas and E. Georgiadou., A New Topology of National and Organizational Cultures to Facilitate Software Quality Management, The Fifth Int. Conf. on Software Process Improvement, Research into Education and Training, London, U.K (2000).
- Syed M. Aslam., The Dot.Com Culture In Pakistan (2000).
- Rick Perera., Pakistan's IT Industry Hurt And Helped By Attacks, InfoWorld (2001).
- G. Borchers., The Software Engineering Impacts of Cultural Factors on Multi-Cultural Software Development Teams, Proceedings. 25th International Conference on Software Engineering, IEEE Computer Society, Sharp Labs of America, USA, p. 540-545, ISSN: 0270-5257 (2003).
- T. Dybå, T. Dingsøyr and N. Brede Moe., Process Improvement in Practice: A Handbook for IT Companies, Kluwer Academic, Boston, ISBN: 1402078692 (2004).
- T. Dybå., An Empirical Investigation of The Key Factors For Success in Software Process Improvement, IEEE Transactions on Software Engineering, Vol 31, No 5, p. 410-424, ISSN: 0098-5589 (2005).
- B. Wong and S. Hasan., Software Process Improvement in Bangladesh, In Software Engineering Research and Practice, ed. Arabnia, H. R. and Reza, H., SERP 2006, Las Vegas, Nevada, USA, June 26-29, 2006, CSREA Press, Vol 1, p. 246-252, ISBN: 1-932415-90-4 (2006).

- Undated, PIM's Report on IT Industry in Pakistan, PIM, Pakistan.
- J.D. Frame., The New Project Management: Tools For An Age Of Rapid Change, Corporate Reengineering, And Other Business Realities, San Francisco: Jossey-Bass Publishers (1996).
- M. Djerdjour and R. Patel., Implementation of Quality Programmes In Developing Countries: A Fiji Islands Case Study, Total Quality Management, Vol 11, No 1, Routledge, Part of the Taylor & Francis Group (2000).
- Syed M. Aslam., Information Technology Education in Pakistan, [online], Available From: http://www.pakistaneconomist.com/database2/cover/c2000-35.asp [Accessed 30 Jun 2008] (2000).

References

[1] Ahsan., PhD Thesis: Organization Development for Revitalization of IT Sector of Pakistan, UET Taxila, Pakistan (2009).

[2] Moosa., PhD Thesis: Framework of Effective Implementation of TQM in Pakistan, UET Taxila, Pakistan (2010).

[3] Ahsan., PhD Thesis: Organization Development for Revitalization of IT Sector of Pakistan, Chapter 1: Introduction, UET Taxila, Pakistan (2009).

[4] People Capability Maturity Model® (P-CMM ®) Version 2.0 (CMU/SEI-2001-MM-001, [online], Available From: http://www.sei.cmu.edu/publications/documents/01.reports/01mm001.html [Accessed 30 Jun 2008].

[5] Capability Maturity Model Integrated (CMMI), Version 1.2, Carnegie Mellon University, Software Engineering Institute, [online], Available From: http://www.sei.cmu.edu/cmmi/ [Accessed 30 Jun 2008].

[6] Ahsan., PhD Thesis: Organization Development for Revitalization of IT Sector of Pakistan, Chapter 2: Literature Review, UET Taxila, Pakistan (2009).

[7] Ahsan., PhD Thesis: Organization Development for Revitalization of IT Sector of Pakistan, Chapter 11: Barriers To Implementing & Managing Quality In IT Industry of Pakistan (Exploration, Explanation & Analysis of Reasons and Remedial Actions): A Behavioral, Cultural and Managerial Perspective, UET Taxila, Pakistan (2009).

[8] Nasir Islam., Sifarish, Sycophants, Power and Collectivism: Administrative Culture in Pakistan, International Review of Administrative Sciences, Vol 70, No 2, p. 311-330, Public Policy and Management, School of Management, University of Ottawa (2004).

[9] S.Z. Hassan., Software Industry Evolution in a Developing Country: An In Depth Study, System Sciences, Proceedings of the 33rd Annual Hawaii International Conference, Vol 2, ISBN: 0-7695-0493-0, INSPEC Accession Number: 6537647 (2000).

[10] Megan Baker and Anne Rouse, Undated, Software Quality Certification: Identifying the Real Obstacles, Australasian Journal of Information Systems.

[11] Undated, The IT Industry in Pakistan, [online], Available From: http://www.stii.dost.gov.ph/astinfo/frame/jan_to_mar_2k1/pg10_to_11.htm [Accessed 30 Jun 2008].

[12] Larry English., The Essential of Information Quality Management, DM Review Magazine, September 2002 Issue, [online], Available From: http://www.dmreview.com/issues/20020901/5690-1.html [Accessed 28 Jul 2008] (2002).

[13] Kashif Manzoor, Undated, The Challenge of Implementing Capability Maturity Model (CMM) in Pakistan.

[14] Pheng, Low Sui and Alfelor, M. Winifredo., Cross-Cultural Influences On Quality Management Systems: Two Case Studies, Work Study, Vol 49, No 4, p. 134-145, Emerald Group Publishing Limited (2000).

[15] F. T. Anbari, E. V. Khilkhanova, M. V. Romanova and S. A. Umpleby., Undated, Cross Cultural Differences and Their Implications for Managing International Projects.

[16] Maris G. Martinsons., Guest Editorial Cultural Issues and IT Management: Past and Present, IEEE Transactions on Engineering Management, Vol 50, No 1 (2003).

[17] Abou Bakar Nauman, Romana Aziz, A. F. M. Ishaq and Mohammad Mohsin., An Analysis of Capabilities of Pakistan as an Offshore IT Services Outsourcing Destination, IEEE-INMIC 2004 (2004).

[18] Kerstin V. Siakas, Undated, What Has Culture to do with SPI?, Technological Educational Institution of Thessaloniki, 28th Euromicro Conference (EUROMICRO'02) p. 376.

[19] Bernard Wong and Sazzad Hasan., Cultural Influences and Differences in Software Process Improvement Programs, International Conference on Software Engineering, Proceedings of the 6th International Workshop on Software quality, ISBN:978-1-60558-023-4, Association for Computing Machinery, ACM Special Interest Group on Software Engineering (2008).