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Benefits and Impediments in Implementing Tqm in Pakistani Construction Sector

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Abstract:

Construction Industry acquires a significant financial position and stature towards the development of physical infrastructure in Pakistan. It is regarded as, amongst the major contributors in the growth of Gross Domestic Product (GDP). Nexus to this, it has also rendered enormous contributions in offering job opportunities and eradication of poverty in the country. Despite all these meritorious contributions, the industry's performance and potential is severely been affected by quality related issues like, wastage of construction material, re-works, scraps and customer dissatisfaction. The tools and techniques being used currently for measurement of quality are outlived and outdated. This paper is an endeavor to highlight the potential benefits of implementing Total Quality Management (TQM) philosophy. Also to seek out kinks and impediments which down play the adoption of TQM in the industry. For this purpose a survey questionnaire was designed for carrying out survey on this subject. The target respondents were architects, design professionals, engineers, contractors, sub contractors, suppliers, sponsors and the clients. The major findings were, misconception about the implementation of TQM in construction and its benefits, lack of quality policy, lack of training, lack of resources, lack of management support, current bidding and tendering process and traditional project management concepts. To offset these problems, it has been suggested that adequate awareness and training must be imparted through effective quality policy and top management support.

Keywords: Benefits, Construction sector, Impediments, Pakistan, TQM.

1. Introduction

Construction sector forms part of among major contributors in the development of a country. Like any developing country, construction sector contributes 2.3 percent of Gross Domestic Product (GDP) of Pakistan. [Raza Ali Khan, (2008)] It has a wide job opportunity base and demand for laborers has risen to double digit. This industry is today facing serious challenges under recurring devaluation of local currency, high escalation of building materials and fragile economy. Under such domestic constraints, construction industry cannot afford to bear the cost of poor quality, rework, scrap, scope creep and over expenditures on projects. To achieve this drive, companies should consider and adopt philosophy of Total Quality Management, commonly known as TQM. This is the modern quality approach which was developed in 1920s. TQM can be termed as a journey, not a destination [Ali Jaffari, (1996)]. Its philosophy fosters continuous improvements in the performance of an organization. It is a systematic, integrated, consistent organization-wide methodology involving everyone and everything, which focuses on internal and external customer satisfaction. The basic principles of TQM are; delight the customer, management by fact, people based management and continuous improvement. The core concepts for improvement are; customer satisfaction, internal customers are real, all work is process, measurement, team work, people make quality, PDCA cycle (Deming cycle), and prevention over inspection. [Frame work Economic Growth Pakistan retrieved from WWW.pc.gov.pk/feg/PDFs/pr-growth-framework-pdf - Abdussalam Shaibani, Implementation of Total Quality Management in the Libyan Construction Industry]

The vulnerabilities posed by economic constraints to the construction industry of Pakistan can be overcome by taking advantage of TQM philosophy. Though there are certain issues which retard the process of implementation; like lack of expertise, resources incurring on TQM, too much paper work, difficulty in measuring results, rigid

management issues, lack of TQM knowledge and low bid subcontracting. Despite all these issues, there is a gradual awareness and scope for implementation within the construction industry. [Treek et al (2008)-Nafees Memon, (2012)].

2. Scope and Objectives

The scope and the objective of this research is to define the advantages and benefits as well as highlight the difficulties of adopting Total Quality Management (TQM) in the construction industry of Pakistan.

3. Literature Review

Construction industry possesses a great degree of similarity with manufacturing industry like supply chain processes [Raza Ali Khan, (2008)]. Contrary to service industry, however, customers satisfaction level is not as high as in production industry. The process and products of construction industry are very unique as well as complex. As the manufacturing industry gained a high stature, superior performance in waste management, reduction of scrap and re work and reduction in cost of Quality (COQ), it did influence the construction industry in Pakistan. Quality, which was not given due importance, has become one of the critical factors in the construction projects. TQM is a philosophy and companywide culture to which helps in achieving customer satisfaction through continuous improvements [Raza Ali Khan, (2008)]. Organizations have become more efficient, more customer oriented and more competitive in the field. Construction industry is one of the major sectors which has substantial contributions in the Gross Domestic Product of any country, and day by day it is growing on rapid scale. Unfortunately, it faces problems like instability, low production, inadequate quality and absence of quality standards [Abu Hassan, et al (2011)]. With these reasons customers are not satisfied with outcome despite the fact that majority of construction projects is over budgeted and slip out of schedules. These indicators give construction industry, a major challenge to meet competitive edge over contemporary industries [Abu Hassan, et al (2011)-Bhimaraya A, (2005)]. Quality Management has become a prominent field in management and performance of construction projects.

The edifice of visible success rests on certain factors which can be citied as; organization wide training, benchmarking, Statistical Process Control (SPC), culture of quality in the organization, empowerment of employees, Quality Management Information System (QMIS), and customers satisfaction and delight [Abu Hassan, et al (2011)]. For effective implementation of TQM, commitment of top management is mandatory. Similarly all stakeholders associated with construction projects must be quality oriented and quality focused. These include contractors, sub contractors, suppliers, skilled and unskilled manpower. [Abu Hassan, et al (2011)-Cavic WM, et al (2007)].

There is general concept that concept of TQM is purely and exclusively applicable to service and process related industry like manufacturing and service operations industry. This concept was adopted by Japanese contractors who have successfully implemented in their construction industry in 1980s [Bhimaraya A, (2005)]. The one glaring factor which is a demotivator towards implementation of TQM in construction sector is its associated costs. This is a gross misconception because of lack of knowledge of TQM philosophy and framework. Construction companies can continuously improve their processes, gain customer's satisfaction and delight and excel in business promotions and opportunities by controlling wastes, scraps, reworks. [Nafeez Mamon, (2012)-Dr. Theo C Haupt, et al (2003)].

This can be easily achieved through evolving quality training programs, conducting quality projects, improving on job quality and regularly measuring results and taking action in line with PDCA (Plan-Do-Check-Act) Deming Cycle [Bhimaaya A, (2005)]. Further to this, there is also need to shed off the stereo-type retrogressive culture prevailing in the organizations which does not accommodate new concepts.

The performance of TQM is affected by organizational culture and mismatch of skill sets within the departments [Traek Elghamarawy, et al (2008)]. In order to get benefits of TQM philosophy, there must be an effective quality policy and clear understanding of the company's quality goals. The competitive global market demands construction companies to consistently furnish high quality and reliable products at a low costs. This links with the improvements of social, political, and technological skills. [Frame work Economic Growth Pakistan retrieved from www.pc.gov.pk/feg/PDFs/pr-growth-framework-pdf-Rizwan Ul Farooqui, et al] All these skills can be harnessed under TQM which consolidates the common goals and beliefs and shared values. Organizational culture is transformed into synchronized minds and skill sets under the umbrella of TQM frame work. [Vivian, et al (2009)] The common organizational culture is comprised of four parameters which are; hierarchical authority, least control of processes by men on floor, favoritism, fragmented policy [Traek Elghamarawy, et at (2008)]. There are human

factors in construction industry which lay serious implications towards implementation of TQM [Cavis WM Cheng et al, (2007)]. It is the obligation of every worker, sub contractor, supplier, quality assurance engineer and concrete laboratory technicians to be quality conscious at their own level. This will definitely assist in improving industrial efficiency and raising levels of productivity, lowering base costs of the service and manufacturing processes, improvement in core competencies and skill set and encouraging continuing training, innovation and investments in R & D within industry [Cavis WM Cheng et al, (2007)].

In addition to this, various measures at macro and micro level should be adopted to successfully implement philosophy of TQM. These levels descend from government level, industry level and project level. The lowest level is project level where every rank and file is generally convinced the value and necessity of achieving improvements in existing processes and delivery methodologies [Cavis WM Cheng et al, (2007)]. This will eventually furnish the inherent dividends of adopting Total Quality Management in Construction Projects in terms of lesser rework, no scrap, no scope creep, less cost of poor quality and good customer's satisfaction. In general it can be inferred that the single most determinant of the success of construction organization in implementing TQM is its ability to translate, integrate, harness, and finally institutionalize TQM behavior into daily practice on the job. [Ali Jaafrei, (2008)]. TQM approach has successfully implemented in Japan, Singapore, UK and USA [Ali Jaafrei, (2008)]. For a successful construction company, all internal (top management, employees and sponsors) and external (customers, suppliers, and users) stakeholders must meet their obligations towards implementing TQM in a holistic manner [Ali Jaafrei, (2008)].

With this adaptive approach, Pakistani Construction Industry can not only overcome the present day challenges and economic constraints but can reap the material benefits out of Total Quality Management methodology.

4. Research Methodology

This research was spanned over two phases i.e. data collection and data analysis. For the purpose of data collection, a questionnaire was designed by incorporating the most critical issues related to quality in construction projects. The questionnaire was divided into two parts. In part A, general information about respondents was asked so that reliability and validity of the data can be ensured. In part B, specific questions were asked in different domains. The major categories of respondents were; contractors, consultants, sponsors, owners, civil engineers and project managers.

First the authors discussed about the questionnaire, with industry related contractors, construction managers, architects, design professionals, suppliers, sub contractors and supervisors for ascertaining and confirming whether this questionnaire was enough for data collection. After thorough discussions with renowned and well reputed industry professionals like M/S Ahmad Zaka & Associates, M/S Amin Tariq & Associates, M/S Suhail Ahmad & Associates, M/S Shami Associates, M/S Tijaarat Developers, M/S Shareefain associates and M/S Adeel Associates, the questionnaire was finalized with minor modifications and adjustments.

In the next step, the authors carried out random sampling for the selection of the respondents. A total of 150 questionnaires were distributed among the respondents from government departments, contractors, consultants, clients, professional civil engineers and project managers. The author received 125 completed questionnaires, which comes to about 83.33 percent of response. Once this major milestone was achieved, the authors analyzed the data by using statpro software. The breakdown of the respondents and their staff is as under:-

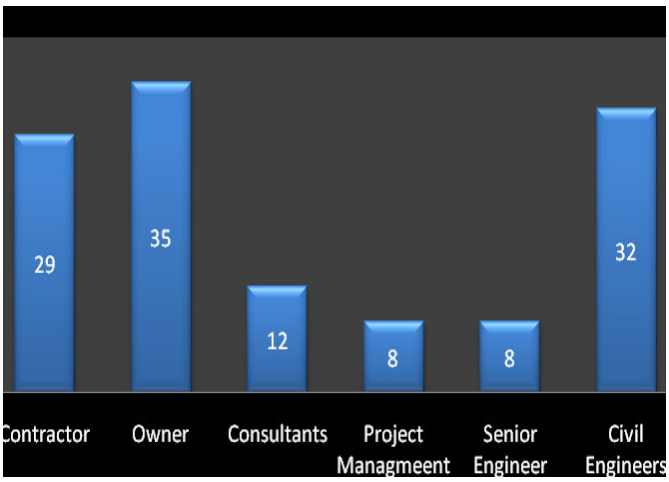

Figure 1: Composition of Respondents

5. Results and Discussions

The responses were collected, collated and analyzed using statpro. The results and their inferences are described in succeeding headings:-

5.1 In your opinion, which of the following words best define quality?

In this domain, respondents were given option to answer the question for more than one options as indicated in the questionnaire in appendix-1. Figue2(a&b) reflect that 53 percent of respondents were in opinion that superior quality means Excessive Costs for implementing TQM in their organizations. This untrue and speaks of their deficiency in TQM knowledge and philosophy. TQM philosophy helps saving costs through wastage controls, empowerment of all employees and involving everyone in ensuring the concept of prevention over inspection as well as decision making even by men on floor. The data signifies the role of training and awareness among construction and civil engineering industry professionals The rest of the results can be seen in Figure 2(a&b).

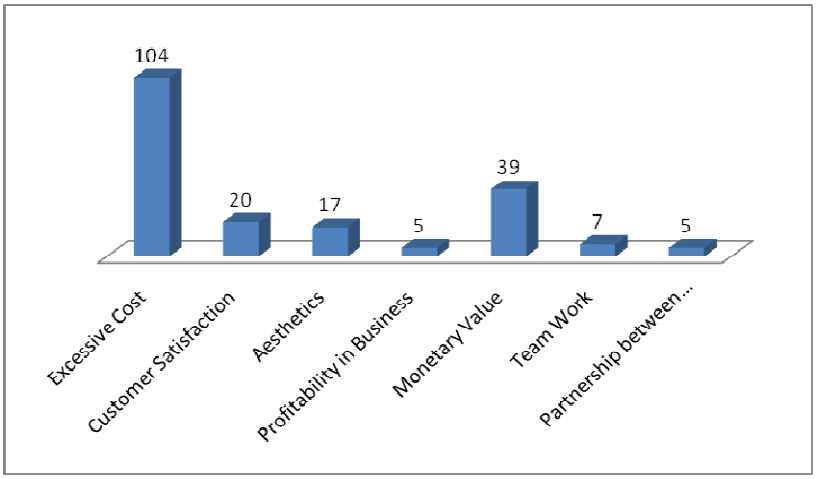

Figure 2 (a): Definition of Quality

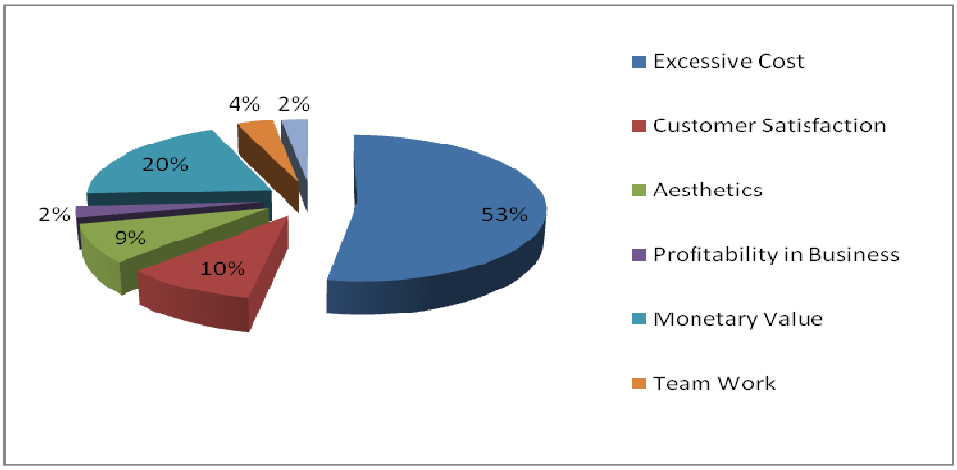

Figure 2 (b): Definition of Quality

5.2 Is TQM workable in your company's environments?

The aim of this question was to learn about the applicability of TQM under Pakistani construction and contracting environments. The response count in this question was 125 out of 150. Figure 3(a&b) Indicates that only 20 percent of respondents strongly agreed that TQM can be implemented in their companies and organizations. The majority of respondents i.e., 78 percent of respondents were in partial agreement to this question and they were unsure of implementing TQM in a holistic manner. One percent did not support the idea while one percent declined to offer their response.

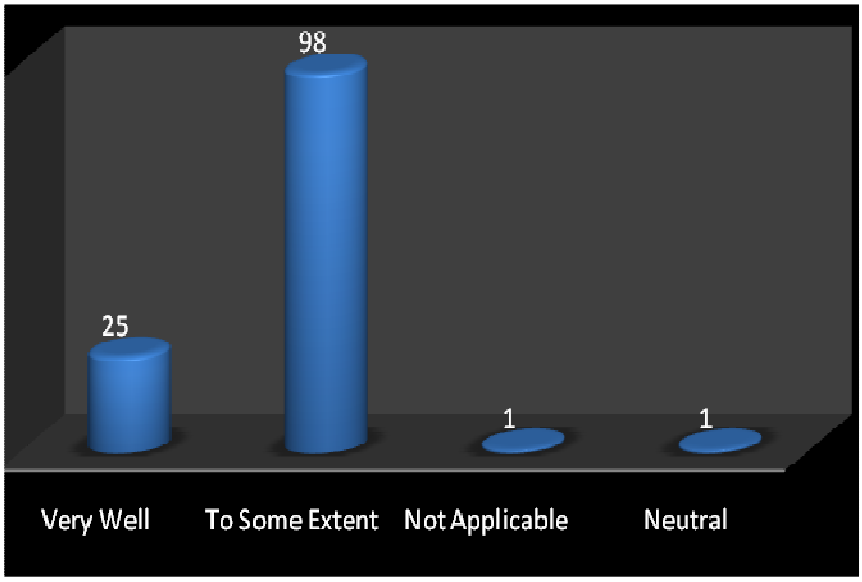

Figure 3 (a): Workability of TQM

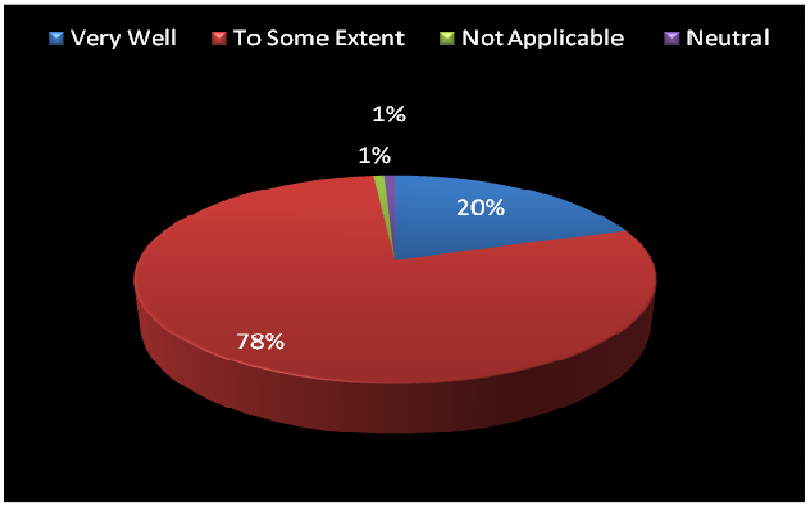

Figure 3 (b): Workability of TQM

5.3 In your opinion, is TQM beneficial to your company or organization?

Merely having implemented TQM in the companies or organizations is not sufficient as long as it does not bring dividends to the organizations. Its benefits can only be reaped when a companywide quality culture is inculcated by the top management. Though TQM could not occupy enough space in the construction industry of Pakistan but at least there exists a will to do. Figure 4 (a&b) indicates that 61 percent of respondents strongly opined that TQM is a useful philosophy which can be very fruitful if implemented. However, 38 percent of respondents remained unsure about it. This point ends up with a conclusion that more efforts need to directed towards the training and awareness of policy making institutions like Pakistan Engineering Council, Public Procurement of Pakistan(PPRA) and Planning Commission of Pakistan.

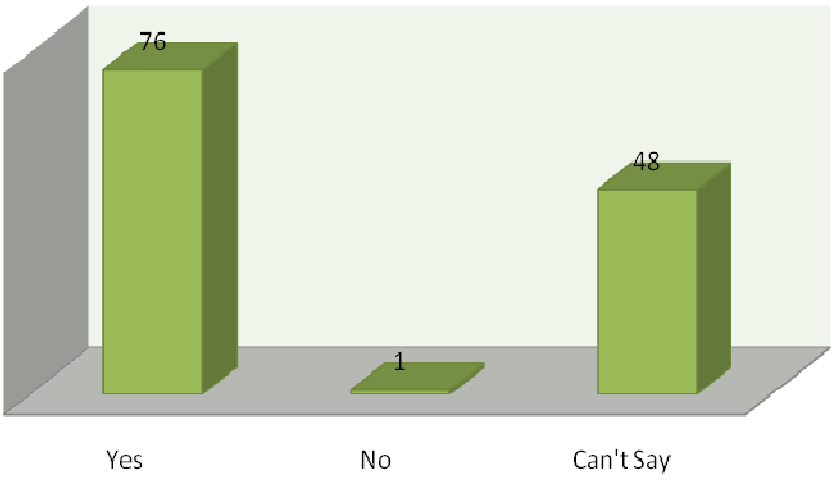

Figure 4 (a): Usefulness of TQM

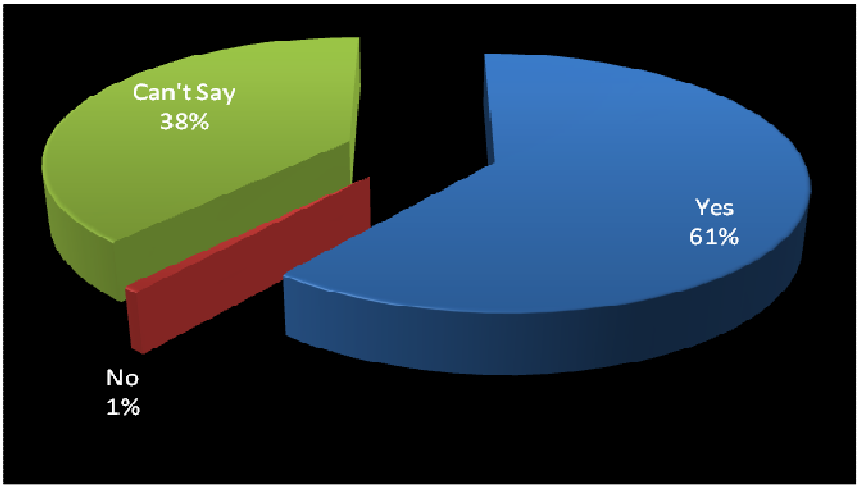

Figure 4 (b): Usefulness of TQM

5.4 Are you aware of industry program to implement TQM or the ISO 9000 standards?

It was to assess whether most of the respondent individuals, companies and organizations working in the construction industry are unaware of TQM or ISO standards or otherwise. With this rationale behind, the question was included in the survey questionnaire. Figure 5 (a&b) clearly shows that 96 percent of respondents know the modern quality management standards which have successfully used by contemporary industries working in abroad. Now this calls for how to harness this knowledge for implementation of TQM in the construction industry.

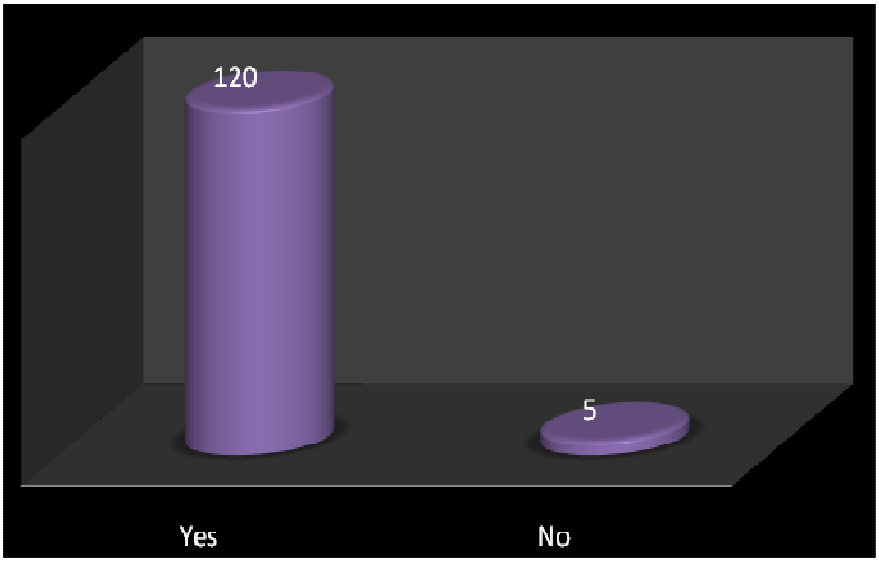

Figure 5 (a): Awareness on Industry Programs

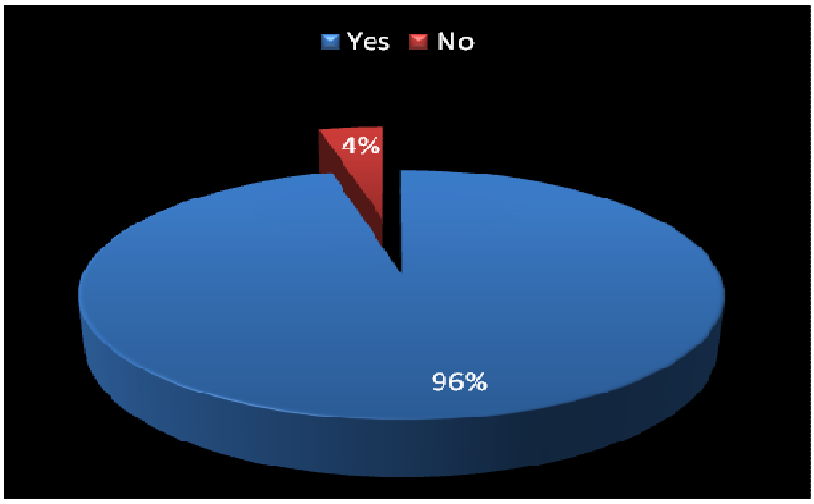

Figure 5 (b): Awareness on Industry Programs

5.5 What is the perception of quality in your company or organization?

There are certain misconception in quality dimension. In every construction company or public service department in Pakistan, people interpret the quality to their own perceptions. 91 out of 125 respondents believed that quality is just restricted to "Elimination of Defects" only. Similarly 22 percent are in favor of achieving 'Competitive Advantage' over other organizations. While 5% view it a 'Tool to Increase Profits'. It is very much imperative to integrate these diversified perceptions to a well understood, workable common goal of quality i.e. customer satisfaction through waste controls, conformance to requirements and fitness for use of finished products. The results of data are depicted in figure 6 (a) and (b) below:-

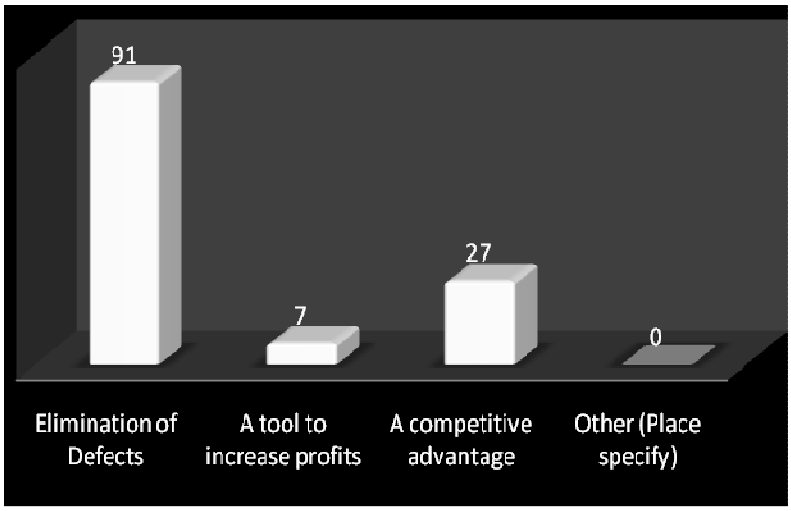

Figure 6 (a): Perception of Quality

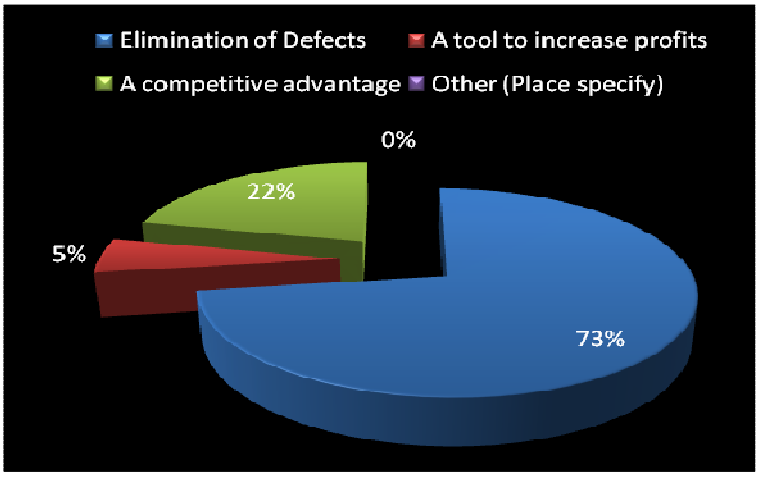

Figure 6 (b): Perception of Quality

5.6 What is your sequence of priority?

As per Project Management Body of Knowledge (PM BOK) of Project Management institute, USA, every project possesses three constraints i.e. Time, Cost and Scope. According to the Theory of Constraints(TOC) quality revolves around these three constraints. That means, quality occupies very significant space towards performance of a project. It is a general belief that quality entails certain costs which is termed as Cost of Quality (COQ). People fear to invest in the quality dimension. Due to this reason, the authors endeavored to explore from our respondents, the place and position of quality in the construction projects. Table 1 below indicates the ratings concluded from data which has been organized in sequence in figure 7 (a&b) respectively. According to figure 7 (a), cost has been considered the most critical and the important factor. It was followed by the Time Factor and then 'Scope Factor'. It is point of serious consideration that 'Quality Factor' remained the least priority during this survey. The draws the attention towards more training and awareness in TQM so that traditional methods of contracting and bidding an be revised with respect to quality. As long as quality is not given a legal standing, it can not be implemented in a confident manner.

Table 1: Rating of Factors

	1	**2**	**3**	**4**	**Rating Average**	**Response Count**
Cost	80.6% (100)	8.1% (10)	8.9% (11)	2.4% (3)	1.33	124
Scope	4.0% (5)	1.6% (2)	86.3% (107)	8.1% (10)	2.98	124
Time	4.0% (5)	87.9% (109)	4.0% (5)	4.0% (5)	2.08	124
Quality	11.3% (14)	2.4% (3)	0.8% (1)	85.5% (106)	3.60	124

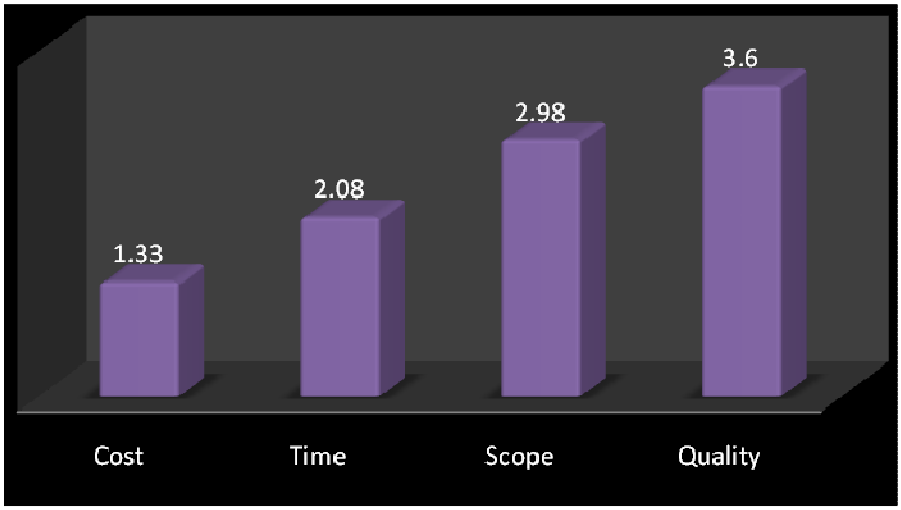

Figure 7 (a): Sequence of Priority

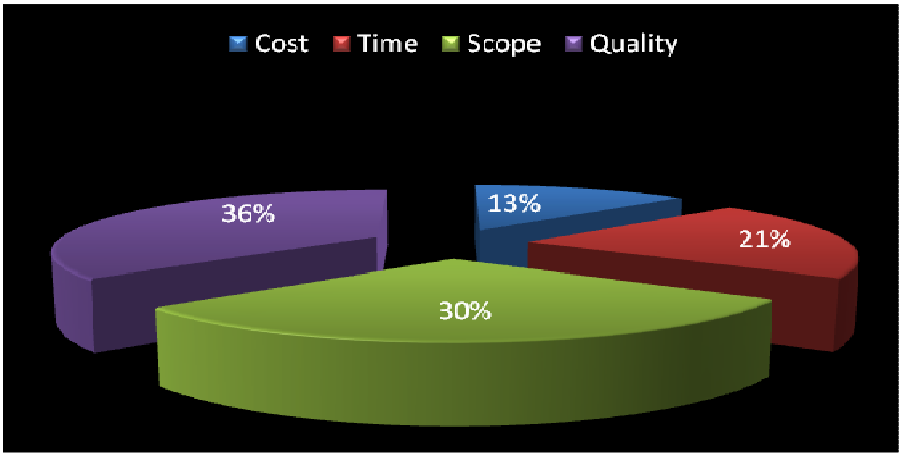

Figure 7 (b): Sequence of Priority

5.7 Do you establish your quality goals to the level of?

In this segment, the authors tried to explore the level of quality goals in the respondent companies and organizations. What are the contributory factors which compel the companies to set some quality goals. Figure 8 (a&b) reflect that 52 percent respondents were in view that these are set by organizations internally and they do not have a role to play. Unlike TQM philosophy, internal quality standards do not offer decentralization of authority to workforce. Similarly there is no motivation in the field of 'Leading the Company in the Field" which is somewhat aligned to TQM.

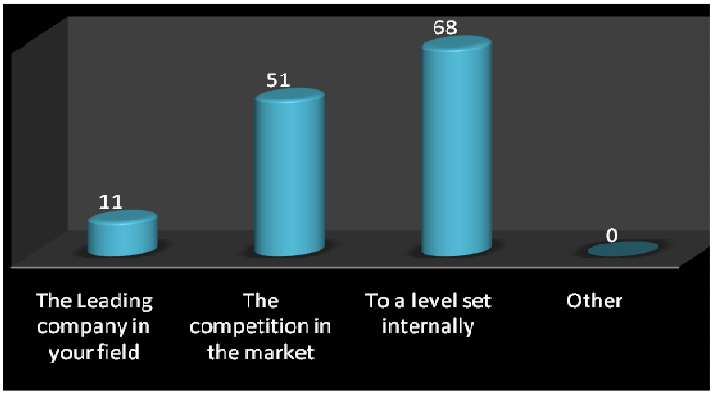

Figure 8 (a): Quality Goals

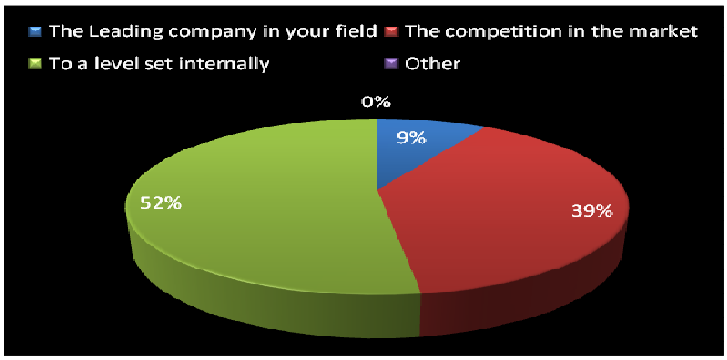

Figure 8 (b): Quality Goals

5.8 How does your organization or company eradicates quality related problems on projects?

This question amply clarifies about which methodology has been adopted by the construction professionals, companies and organizations, for addressing quality related issues. 105 out of 125 respondents said that they "Assign Individuals to Solve the Issues". This speaks that individuals or workers are not empowered enough to take on the responsibility as long as they do not receive instructions and authority from the top management. This can be termed as Traditional style or bureaucratic style of system in which hierarchy is followed.

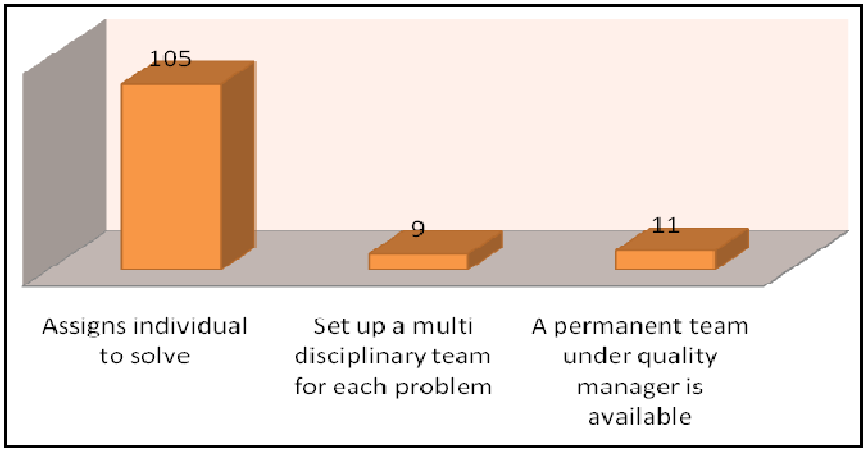

Figure 9 (a): Erradication of Quality Issues

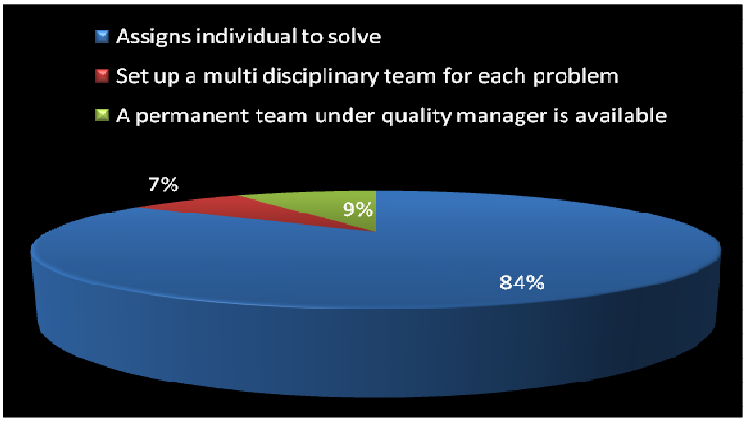

Figure 9 (b): Erradication of Quality Issues

5.9 Has your organization established and implemented a clear Quality Policy?

The objectives, vision, values, and performance of any organization is judged by its policies in that field. Everything is harnessed and synchronized around policy. Without a clear quality policy, the organizations an not run smoothly and independently in quality dimension. Unfortunately 85 percent of the respondents do not have quality policy in their organizations which means that quality culture is missing in their organizations. The results are reflected in Figure 10 (a&b).

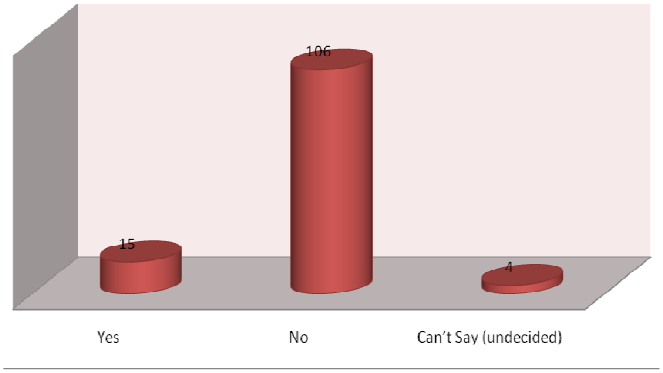

Figure 10 (a): Quality Policy

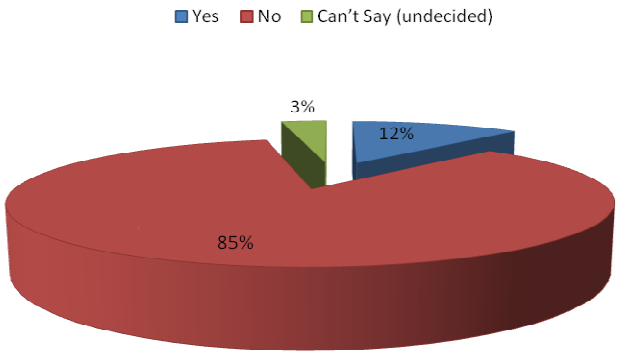

Figure 10 (b): Quality Policy

5.10 Percentage of Employees who are aware of the importance of quality?

In this domain, the response count remained unhealthy. Only less than 25% employees were aware of the importance of quality in their tasks and activities.*5.11 Does your organization has quality improvement training programs?*

Formal Quality Training program help in transforming employees towards quality consciousness. In order to find whether construction companies have formally evolved some kind of quality training program, this segment was made part of the survey. 79 percent of respondents stated that their companies do not have implemented quality training program. That means there is dire need to evolve and conduct quality training programs in order to create awareness on not only quality but implementation of quality policy. The results can be seen in figure 11 (a&b) below.

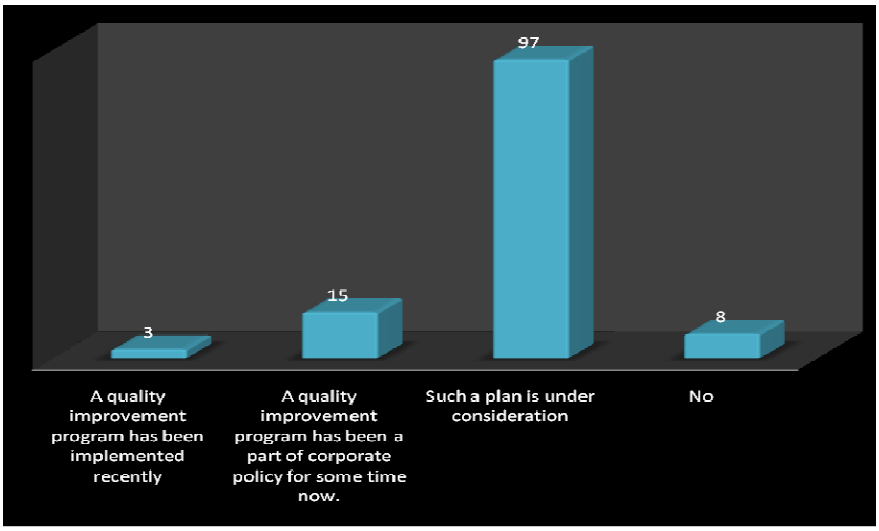

Figure 11 (a): Quality Improvement Training Programs

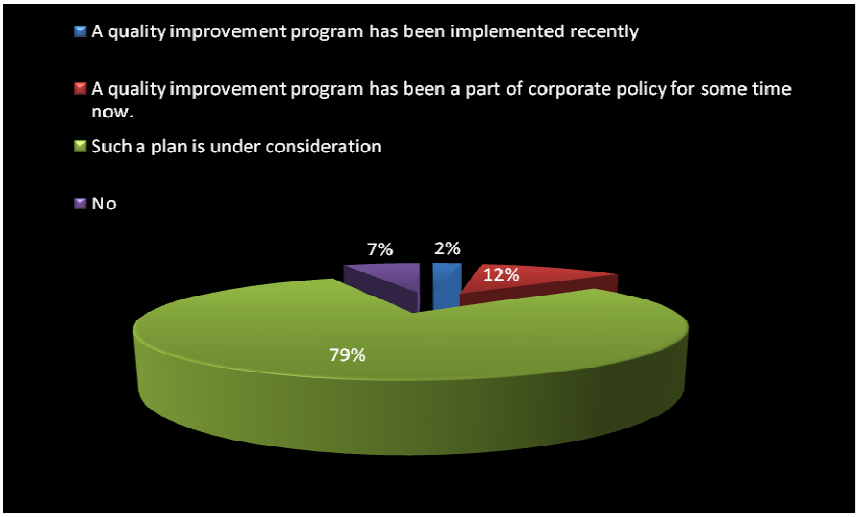

Figure 11 (a): Quality Improvement Training Programs

5.12 Percentage of managerial and supervisory staff who have undergone quality improvement training ?

Unfortunately the response in this category was extremely poor.

Less than 20 percent managerial staff were imparted with training in quality.

5.13 Quality training currently emphasizes (not limited to one answer)?

Figure 12(a) and (b) indicate that 32 percent of respondents opined that quality is for satisfaction of the customers. The response percentage is much less which reflects how serious are the companies in implementing TQM philosophy which also fosters team work, communication, process control and other related areas..

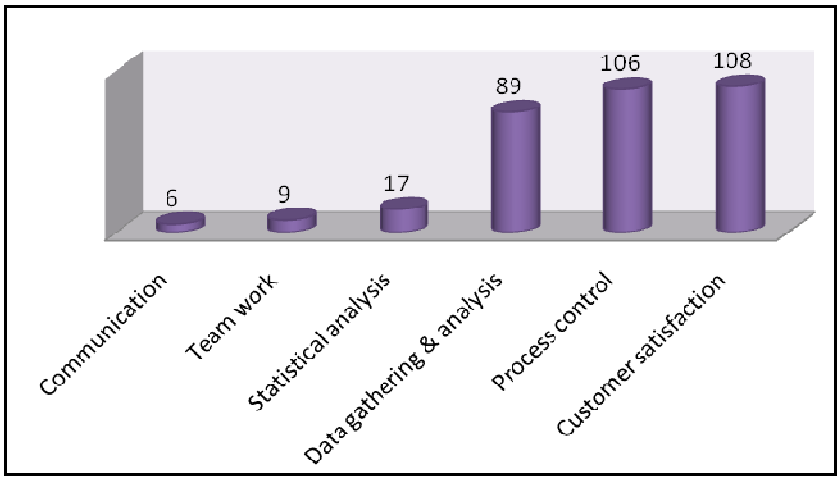

Figure 12 (a): Emphasis of Quality Training

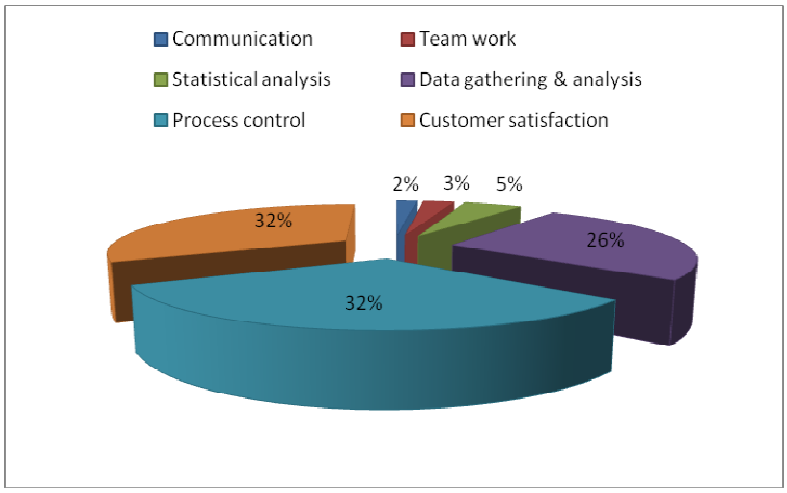

Figure 12 (b): Emphasis of Quality Training

5.14 After the implementation of your quality improvement program relationship with your customers and suppliers have?

In this domain, respondents were unsure about the fruitfulness of TQM application in their companies.Only marginal majority have confirmed the usefulness of quality training programs. It can be concluded that companies need more training, awareness and resources to implenment TQM in tolality rather than in picemeneals.The results are appended in Figure 13(a&b).

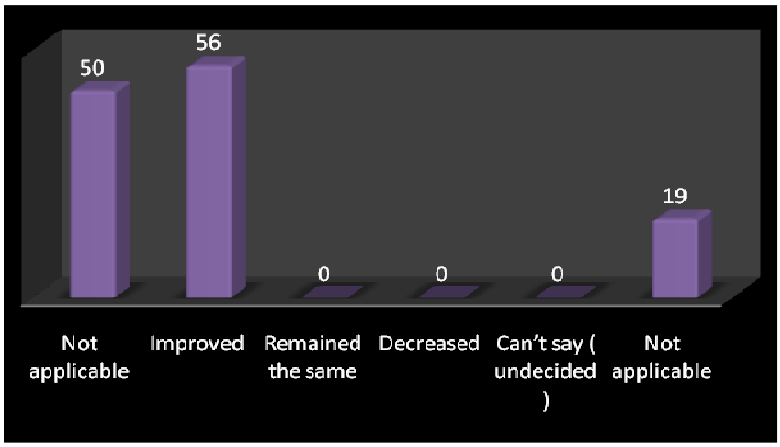

Figure 13 (a): Effect of Quality on Customers Relationships

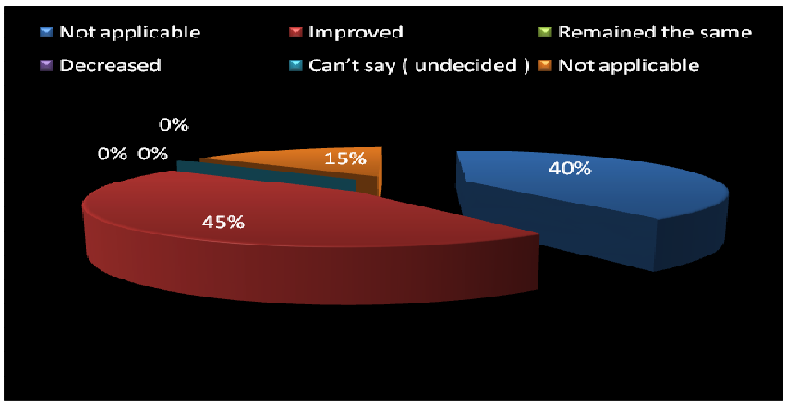

Figure 13 (b): Effect of Quality on Customers Relationships

5.15 Which are the motivating factors for implementing TQM in your company or organization?

Respondent organizations and companies are more interested in lowering costs and expenditures, which indicates that they are not aware of the massive potential of TQM. Figure 14(a&b) show the responses and their percentages**.** The motivation should emanate from customers satisfaction and then followed by other aspects like internal or external pressures or policies of CEOs.

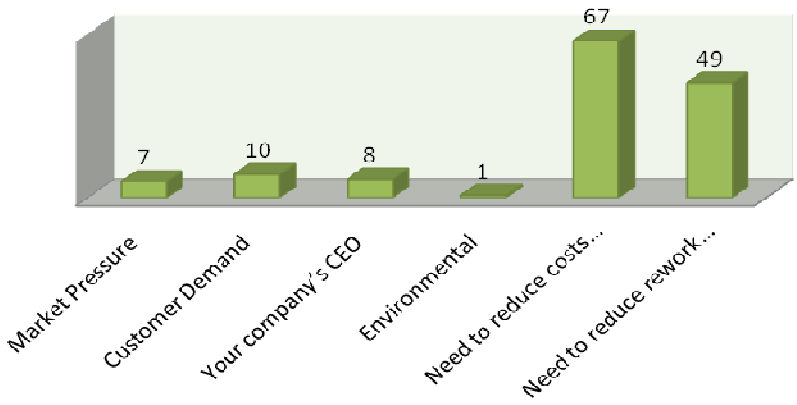

Figure 14 (a): Motivating Factors for TQM

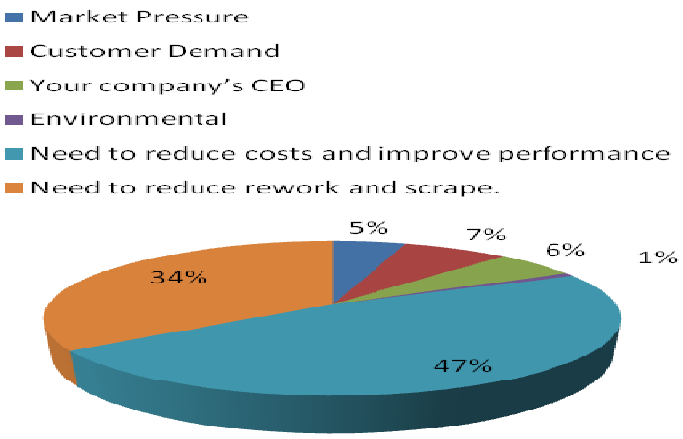

Figure 14 (b): Motivating Factors for TQM

5.16 Did you ever observe significant benefits in your company's business after implementing TQM?

This question was set for those respondents who have implemented TQM in their organizations or companies. Figure 15 (a&b) show a very unhealthy response in which 73 percent of respondents were unsure of any positive effects of TQM in their workplaces. That means there is some flaw or knowledge gap which needs to be bridged up for the successful implementation of TQM.

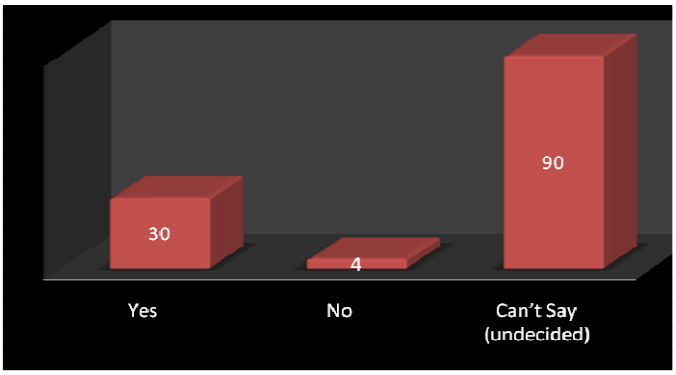

Figure 15 (a): Benefits of TQM

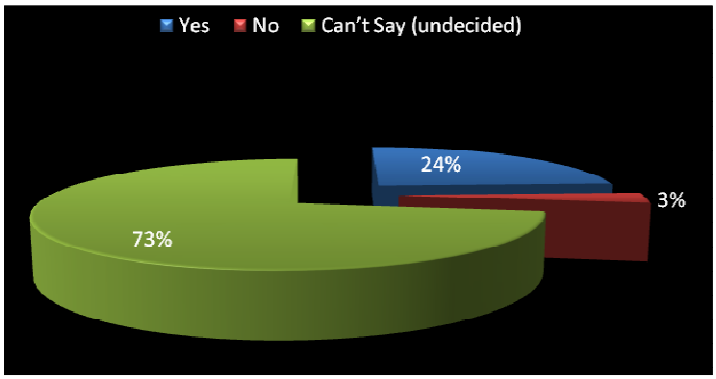

Figure 15 (b): Benefits of TQM

5.17 After the implementation of quality improvement program, services or product quality has?

This question was framed for those companies which are evolved quality training programs. Figure 16(a& b) indicate that quality improvement training has brought good results in the finished products. This can be enhanced exponentially by using TQM.

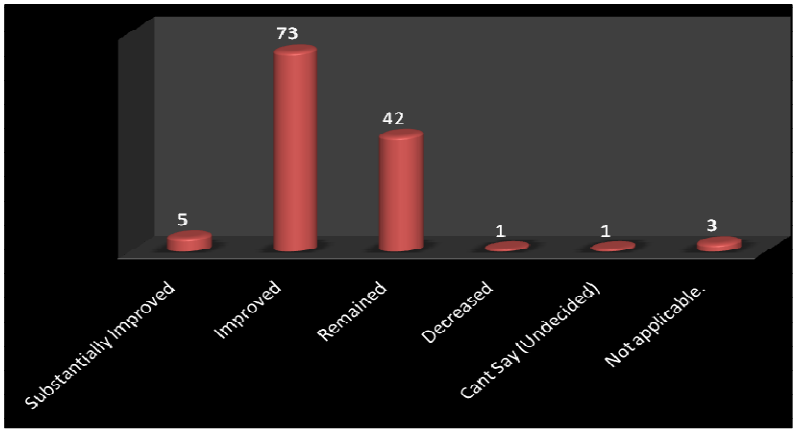

Figure 16 (a): Quality of Products Quality Training

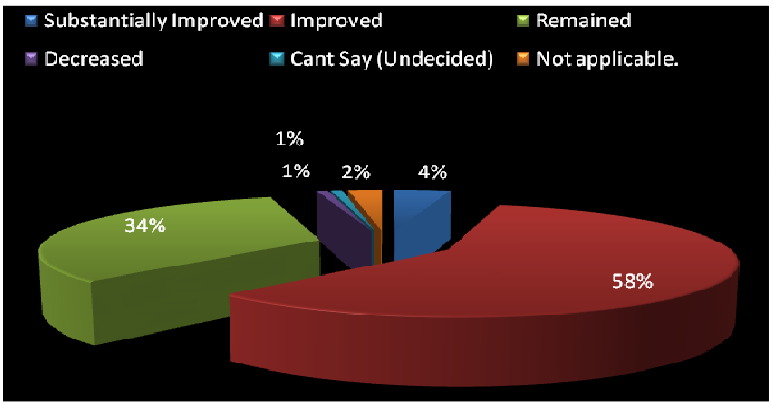

Figure 16 (b): Quality of Products Quality Training

5.18 How do you rank following advantages of TQM?

TQM has variety of advantages that is why Japan, USA and the European countries have adopted this philosophy in the construction industry. The response count was 125 out 150 which is very encouraging percentage. Table 2 indicates the ratings of 14 possible advantages of TQM while their rankings and percentages are described in Figure 17 (a&b) according to their severity scale (1 most critical while 14 is the least one) respectively.

Table 2: Rating of Advantages of TQM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Rating Average	Response Count
Minimum Rework	59.2% (74)	26.4% (33)	0.8% (1)	11.2% (14)	0.0% (0)	0.8% (1)	0.8% (1)	0.0% (0)	0.0% (0)	0.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	1.78	125
Minimum Scrap	0.0% (0)	56.8% (71)	25.6% (32)	1.6% (2)	11.2% (14)	0.0% (0)	0.8% (1)	1.6% (2)	0.0% (0)	0.0% (0)	0.8% (1)	0.8% (1)	0.8% (1)	0.0% (0)	3.00	125
Higher customer satisfaction	26.4% (33)	3.2% (4)	56.8% (71)	1.6% (2)	0.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	1.6% (2)	9.6% (12)	0.0% (0)	0.0% (0)	0.0% (0)	3.35	125
Easy user acceptance	0.0% (0)	11.2% (14)	3.2% (4)	4.8% (6)	2.4% (3)	3.2% (4)	0.0% (0)	0.8% (1)	1.6% (2)	1.6% (2)	52.8% (66)	1.6% (2)	16.8% (21)	0.0% (0)	9.38	125
On time completion	0.8% (1)	0.8% (1)	0.0% (0)	57.6% (72)	26.4% (33)	14.4% (18)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	4.51	125
On budget completion	0.0% (0)	0.8% (1)	0.8% (1)	1.6% (2)	55.2% (69)	4.0% (5)	34.4% (43)	2.4% (3)	0.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	5.78	125
More business	0.0% (0)	0.0% (0)	11.2% (14)	0.0% (0)	0.0% (0)	52.8% (66)	3.2% (4)	5.6% (7)	1.6% (2)	0.8% (1)	0.8% (1)	20.8% (26)	2.4% (3)	0.8% (1)	7.41	125
Development of Quality Culture	1.6% (2)	0.0% (0)	0.0% (0)	0.0% (0)	0.8% (1)	22.4% (28)	0.8% (1)	2.4% (3)	3.2% (4)	2.4% (3)	2.4% (3)	13.6% (17)	50.4% (63)	0.0% (0)	10.62	125
Improvement in Process	0.0% (0)	0.8% (1)	0.0% (0)	20.8% (26)	0.8% (1)	0.8% (1)	2.4% (3)	0.8% (1)	3.2% (4)	3.2% (4)	3.2% (4)	48.8% (61)	15.2% (19)	0.0% (0)	9.96	125
Minimum Warranty Claims	0.0% (0)	0.0% (0)	0.0% (0)	0.8% (1)	0.8% (1)	0.0% (0)	53.6% (67)	7.2% (9)	16.0% (20)	16.8% (21)	4.0% (5)	0.8% (1)	0.0% (0)	0.0% (0)	8.06	125
Cost Estimation and Optimization	12.0% (15)	0.0% (0)	0.8% (1)	0.0% (0)	0.0% (0)	0.8% (1)	1.6% (2)	52.0% (65)	2.4% (3)	0.8% (1)	5.6% (7)	3.2% (4)	1.6% (2)	19.2% (24)	8.66	125
Minimum Change Orders	0.0% (0)	0.0% (0)	0.8% (1)	0.0% (0)	0.0% (0)	1.6% (2)	1.6% (2)	25.6% (32)	60.0% (75)	0.8% (1)	0.0% (0)	8.0% (10)	1.6% (2)	0.0% (0)	8.93	125
Expansion of Market Share	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.8% (1)	0.0% (0)	0.0% (0)	1.6% (2)	0.8% (1)	71.2% (89)	1.6% (2)	0.8% (1)	9.6% (12)	13.6% (17)	10.78	125
Least Lawsuits	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.8% (1)	0.0% (0)	0.8% (1)	0.0% (0)	9.6% (12)	0.0% (0)	19.2% (24)	1.6% (2)	1.6% (2)	66.4% (83)	12.77	125

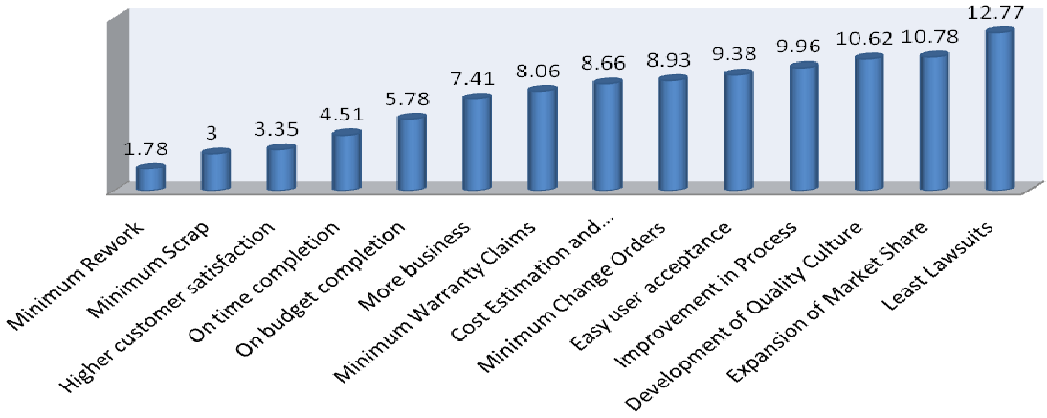

Figure 17 (a): Ranking of TQM advantages

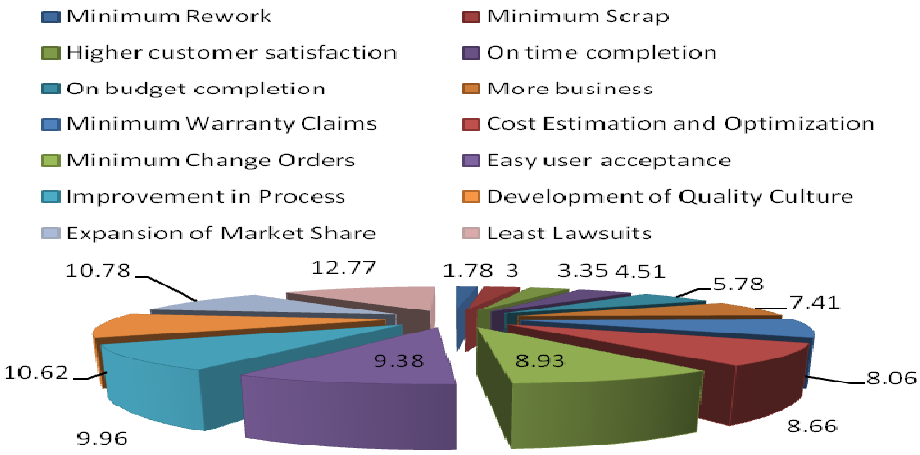

Figure 17 (b): Ranking of TQM advantages

5.19 **How will you rank following impediments?**

Since TQM concept and philosophy is very new in Pakistan, there are various factors which retard its implementation in the construction industry. Total of 17 causes were identified for which responses were solicited from wide range of respondents including primary stakeholders. Table 3 indicates the average ratings which Figure 18 (a &b) show their rankings and percentage levels according to their severity scale (1 most critical while 17 is the least one). The top most is the “Schedule and Cost Treated as the Main Priorities”, while rest tops four are; lack of education, current tendering and bidding process, lack of employees commitment and empowerment.

Table 3: Rating of Impediments

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Rating Average	Response Count
Schedule and cost treated as the main priorities	92.8% (116)	0.8% (1)	2.4% (3)	1.6% (2)	0.0% (0)	0.8% (1)	0.8% (1)	0.0% (0)	0.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	1.26	125
Emphasis on short-team objects	0.0% (0)	2.4% (3)	56.0% (70)	0.8% (1)	3.2% (4)	1.6% (2)	1.6% (2)	0.8% (1)	0.0% (0)	10.4% (13)	6.4% (8)	0.8% (1)	1.6% (2)	0.8% (1)	0.0% (0)	3.2% (4)	10.4% (13)	6.63	125
Lack of education and training to drive the improvement process	0.8% (1)	78.4% (98)	4.0% (5)	12.0% (15)	0.0% (0)	1.6% (2)	0.8% (1)	0.0% (0)	0.8% (1)	0.8% (1)	0.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	2.57	125
Too much document commitment / understanding	0.0% (0)	0.8% (1)	1.6% (2)	6.4% (8)	64.0% (80)	0.0% (0)	0.0% (0)	0.8% (1)	0.0% (0)	1.6% (2)	15.2% (19)	7.2% (9)	0.0% (0)	0.8% (1)	1.6% (2)	0.0% (0)	0.0% (0)	6.63	125
Lack of employees commitment/understanding	0.0% (0)	5.6% (7)	0.0% (0)	54.4% (68)	6.4% (8)	0.8% (1)	6.4% (8)	3.2% (4)	4.0% (5)	0.8% (1)	0.8% (1)	12.0% (15)	5.6% (7)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	6.06	125
Tendency to cure symptom rather than get to the root cause of a problem	0.0% (0)	0.0% (0)	0.0% (0)	0.8% (1)	0.8% (1)	4.8% (6)	1.6% (2)	63.2% (79)	1.6% (2)	1.6% (2)	1.6% (2)	2.4% (3)	16.0% (20)	5.6% (7)	0.0% (0)	0.0% (0)	0.0% (0)	9.16	125
Lack of expertise/resources in TQM	2.4% (3)	0.8% (1)	0.0% (0)	0.8% (1)	0.0% (0)	1.6% (2)	6.4% (8)	1.6% (2)	62.4% (78)	1.6% (2)	0.8% (1)	2.4% (3)	1.6% (2)	12.0% (15)	5.6% (7)	0.0% (0)	0.0% (0)	9.62	125
Current tendering/bidding climate	0.8% (1)	0.0% (0)	21.6% (27)	0.0% (0)	0.0% (0)	61.6% (77)	4.8% (6)	4.8% (6)	1.6% (2)	0.0% (0)	2.4% (3)	0.8% (1)	0.8% (1)	0.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	5.79	125
Inadequate knowledge of TQM	0.8% (1)	1.6% (2)	1.6% (2)	21.6% (27)	0.0% (0)	0.0% (0)	0.0% (0)	0.8% (1)	7.2% (9)	63.2% (79)	0.0% (0)	2.4% (3)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.8% (1)	8.41	125
Lack of Resources	0.8% (1)	0.8% (1)	0.0% (0)	0.0% (0)	20.0% (25)	3.2% (4)	50.4% (63)	0.8% (1)	4.8% (6)	5.6% (7)	11.2% (14)	0.0% (0)	1.6% (2)	0.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	7.35	125
Fear of Cost of Quality	0.8% (1)	0.8% (1)	0.8% (1)	0.8% (1)	1.6% (2)	21.6% (27)	0.8% (1)	1.6% (2)	0.0% (0)	0.8% (1)	59.2% (74)	9.6% (12)	0.0% (0)	0.0% (0)	0.8% (1)	0.0% (0)	0.8% (1)	9.64	125
Difficulty in measurement	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	1.6% (2)	11.2% (14)	11.2% (14)	52.8% (66)	11.2% (14)	6.4% (8)	4.8% (6)	13.93	125
A lot of Paper work	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.8% (1)	0.8% (1)	21.6% (27)	0.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.8% (1)	8.8% (11)	12.8% (16)	20.8% (26)	32.0% (40)	0.8% (1)	13.07	125
Diversified Stakeholders	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	20.0% (25)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	1.6% (2)	9.6% (12)	13.6% (17)	15.2% (19)	40.0% (50)	14.42	125
Poor Internal Communications	0.0% (0)	0.8% (1)	0.0% (0)	0.8% (1)	0.8% (1)	0.0% (0)	0.0% (0)	0.8% (1)	0.0% (0)	0.8% (1)	0.0% (0)	0.0% (0)	49.6% (62)	2.4% (3)	13.6% (17)	24.8% (31)	5.6% (7)	13.98	125
Lack of employees Empowerment	0.0% (0)	7.2% (9)	0.8% (1)	0.0% (0)	0.0% (0)	0.0% (0)	4.8% (6)	0.0% (0)	16.8% (21)	0.0% (0)	0.0% (0)	50.4% (63)	0.8% (1)	1.6% (2)	0.8% (1)	10.4% (13)	6.4% (8)	11.26	125
Absence of Quality Policy	0.8% (1)	0.0% (0)	11.2% (14)	0.0% (0)	1.6% (2)	1.6% (2)	0.0% (0)	0.8% (1)	0.0% (0)	12.8% (16)	0.0% (0)	0.0% (0)	0.8% (1)	0.0% (0)	32.0% (40)	8.0% (10)	30.4% (38)	13.22	125

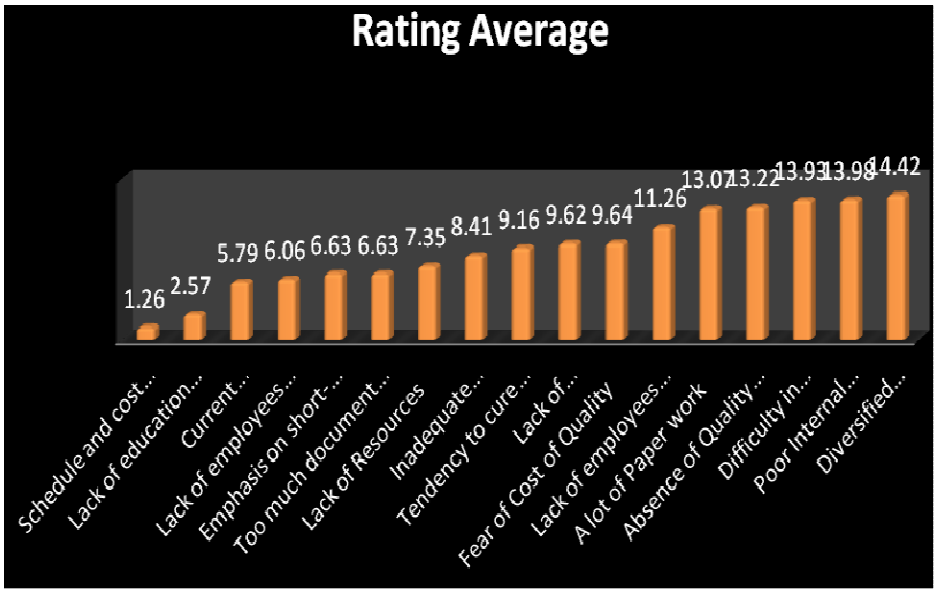

Figure 18 (a): Ranking of Impediments

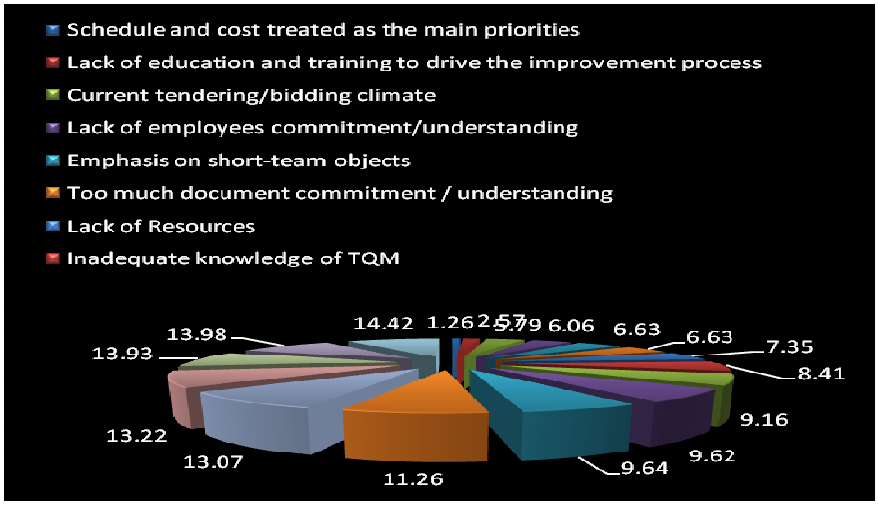

Figure 18 (b): Ranking of Impediments

6. Findings and Conclusions

From the data, and results and discussions followings conclusions have been drawn:-

6.1 There is general cansensus that TQM philosophy is applicable in Pakistani Construction Industry but it lacks confidence towards implementation process.

6.2 TQM encompasses wide range of benefits if implemented holistically but majority of the construction companies view it for Elimination of Defects only.

6.3 Unfortunately construciton companies and organizations do not possess a clear Quality Policy.

6.4 Lack of Training of employees and managerial staff in quality is also a big issue.

6.5 Lack of Management Support towards implementation of TQM is an important factor.

6.6 There is need to change traditional concepts of 'Cost and Schedule' are the only two important factors in the performance of projects.

6.7 Similarly current bidding and tendering procedure is not in alignment to TQM philosophy.

7. Recommendations

7.1 Awareness in TQM Philosophy.

In order to gain wide acceptance in the construction industry, it is imperative that awareness programs be evolved at all forums and tiers. This will shed away the notion of "Kill the New Idea" from the Functional Organizations like public service departments.This can be materialized if TQM subject is made part of university level degree programs so that graduating engineers ,engineering managers and project managers can undertake comprehensive awareness campaigns in their organizations.

7.2 Training in TQM.

As long as management as well as employees are made aware of the benefits of TQM through trainings it is next to impossible to implement TQM in the industry. Through training programs, a healthy quality culture can be inculcated in the construction companies and organizations.Efforts should be made to allocate enough funds for this purpose.

7.3 Support and Commitment of Top Management.

Goals and tasks can only be attained when top management and the employees are quality focused and quality conscious. TQM implementation demands firm commitment from the management in empowering employees, and supply of funds for training and documentation.This will ease out their micro managing roles because employees will be more worried about quality of products and processes when given responsibilities to take control of their part of proesses and technology. Under such a quality culture environment, the performance of employees and productivity of companies increase exponentially.

7.4 Revision of Traditional Bidding Process.

The current bidding and tendering process is confined to scope, time and the cost dimensions of the project. It does not offer space for quality factor. There is need to modify this procedure for inclusion of quality factor in the bidding process. Though it will entail extra costs but will save a lot of effort and resources during execution phase.

7.5 Quality Policy.

Absence of quality policy in an organization means 'Management by Fire Fighting'. Quality policy fosters and gives protection to the TQM philosophy. The employees will be quality conscious and will be in charge of controlling the processes and wastages at their own level. It also lays a positive trikle down effect over subordinate departments of construction organizations.

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