

APPLICATION OF TOTAL QUALITY MANAGEMENT IDEAS IN CONSTRUCTION PROJECTS

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ABSTRACT: Despite the widespread use of Total quality Management (TQM) in the manufacturing industry, it is quite a new concept in construction and its potential benefits yet to be exploited. TQM is increasingly adopted by many construction organizations as an initiative to tackle the quality problems and to fulfill the client's requirements. The focus of this paper is to investigate the implementation of TQM within small and medium size construction enterprises. It presents a general overview of the current practice in the construction industry, critical success factors for implementing TQM, primary barriers to the implementation process, and a general proposed framework for TQM implementation in construction related organizations. The methodology used for this research was a combination of questionnaires and interviews. The results demonstrated that quality improvement in the construction industry is possible and a valid mean that can be achieved through the participation of all the employees and parties involved in the process. However, due to the nature of construction industry, there is a limited perception to implement TQM.

KEYWORDS: Total quality management, construction project, Iran.

INTRODUCTION

It is beyond argument that the late 20th century has been a change era for the business world. The market experienced a shift towards a highly competitive environment in which client expectations are the only success criteria. Many scholars have stressed the need for organizations to move towards new managerial systems in order to provide a greater customer value. Bounds, McCabe, McCrary, Hradesky. Achieving this objective entails the implementation of any tool that results in a slight competitive edge. Total Quality Management (TQM) has proved itself as a powerful tool. It is what Hradesky construes as "Total Survival Management (TSM)" and recommends that as the only solution for organizations.

The literature is plentiful with definitions of TQM. Basically TQM is a managerial philosophy which aims to achieve organization's main targets using all sources including employees. The main objective of TQM is satisfying the customers both internal and external. In fact TQM is a holistic and organization-wide approach that introduces a cultural change to the organization in order to improve the quality of products and services, manage the production time, cut down the costs, and finally meet the customer's priorities. Wilkinson believes that TQM is greater than sum of quality, quality

assurance and total quality. TQM is about continuously improving customer satisfaction by quality-led companywide management system. This goes beyond the mere application of total quality as a form of management itself. As Burati state, TQM is a journey and not a destination.

TQM consists of some principle concepts which underline the success of TQM implementation within the organizations operational environment. Different authors present different attitude in relation to the TQM principles. But in general, the principles of TQM mainly contain customer/supplier relationships, with a focus on the primary objective of meeting the stated requirement perfectly. According to Watson, issues to be addressed as principles of TQM include; leadership, commitment, total customer satisfaction, continuous improvement, total involvement, training and education, ownership, reward and recognition, error prevention, cooperation and teamwork.

DATA COLLECTION AND ANALYSIS

Using the survey, a total number of 100 questionnaires were sent out to various construction organizations (8 organizations consisting of 100 experts in total), of which 18% responded. Based on the questionnaires two interviews were also arranged.

Section 1. Shows the characteristic of the respondents and their organizations.

Contractors are the dominant group of respondents (60%, 9 respondents). 20% (3 respondents) are developers, 1 respondent from consultants and 2 respondents from other professions (civil engineering). Respondent organizations employing between 50 and 124 people are the main respondents (47%). 27% are from the classification 5 (125-249 employees) closely followed by classification 3 (25-49 employees) (20%). There is just one company employing more than 500 personnel. This means that majority of the organizations are in the range of small and medium sized companies and the balance is toward the medium size.

Section 2. Examines the implementation of TQM or any other quality management program by organizations and the rationale behind it. As the findings suggest, 87% (13 respondents) of the organizations implement a form of quality management program among which 77% (10 respondents) have been certified by ISO, EFQM or other quality programs, while 23% (3 respondents) operate an internal quality standard within the organization. Considering the size of the organizations which implement quality management program, Ahire and Golhar's argument about applicability of the TQM program in the small firms - their potential for high employee involvement, multifunctional roles of the employees, and encouragement given to employee innovation - is justified. Comparing the critical success factors in TQM and non-TQM organizations reveals that companies implementing TQM consider the top management commitment and customer focus as the most important factors, while non-TQM organizations identify customer focus and teamwork as the main elements.

It is very common especially among the construction organizations that the companies implementing TQM may not use that as a part of daily working tasks. However, the results suggest that 33% of the organizations implement TQM totally, and 47% partially. 13% of the respondents use TQM as a reference and for the rest (7%) it is just a general guidance.

Organizations rationale for implementing TQM is different depending on size, nature of the business and also market requirements. 93% of the organizations point out the 'recognition as a quality oriented organization' as the most important rationale. Obtaining 'customer satisfaction' and establishing the 'effective supply chain system' were the other reasons emphasized by 80%. Interestingly, achieving sustainable competitive advantage is pointed out by minority of respondents (13%). position in

the market and also client's demand were the other reasons pointed out by some respondents.

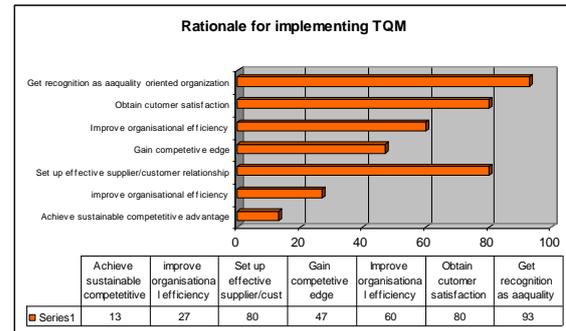


Figure 1: Rationale for Implementing TQM

According to the interviewee, the main rationale for implementing TQM by a organization was getting recognition and obtaining customer full satisfaction through a continuous improvement culture. In addition, introducing the obligatory measures such as having ISO certification by government sector is another initiative. Furthermore, it helps to create a better public image of the company as a quality oriented organization.

Section 3. In order to investigate the critical success factors of TQM implementation, a list of 10 factors extracted from the literature review was used. Respondents were asked to express their views about the importance of each factor. This method provides a valuable mean to examine applicability of TQM in a much wider context.

Table 1: Ranking of Critical Success Factors

No	Critical Success Factor	Score
CSF1	Top management commitment	4.40
CSF2	Coordination between quality department and other departments	4.06
CSF3	Training and education	3.7
CSF4	Teamwork	4.27
CSF5	Purchasing policy	3.47
CSF6	Supply chain management	3.53
CSF7	Customer satisfaction	4.53
CSF8	Effective quality control system	4.26
CSF9	Benchmarking	2.67
CSF10	Empowerment	2.73

As can be seen, customer satisfaction and top management commitment have been suggested as the most important success factors. It is already shown that customer satisfaction is the essence of TQM philosophy and senior management commitment is the main requirement of introducing a change culture into the organization - TQM program. Interview results justify the findings. However, it suggests supply chain management as the third significant success factor. Experienced managers can benefit the organization in two ways, planning and controlling the organizational

performance towards the final goal, and coaching and mentoring the employees where necessary (interview).

Section 4. Construction industry historically suffers from severe problems regarding quality issue due to its unique nature. It was tried to address a wide range of quality related concerns and barriers in the construction industry. The same philosophy as the previous section adopted. Several obstacles for the TQM implementation process suggested by literature review were used to identify their importance in the industry.

Table 2: Ranking of Implementation Barriers

Barriers to the Implementation Process	Score
Top management commitment to change the traditional customs	3.20
Top management involvement to improve ways of performing tasks	3.40
Primary customer focus	3.33
Well developed planning	3.13
Access of too much paperwork	2.73
Too tight scheduling	3.2
Effective and established communication systems	3.2
Transient nature of workforce	3.2
Selection of low bid subcontracting	2.93
TQM application to all field operations	2.8
Field employees regard TQM as irrelevant	2.53
Training for staff at all levels	3.06
Low education level of field forces	2.93

As can be seen, all the factors are almost in a same range. It means all these factors are considered as implementation obstacles which should be addressed to ensure a smooth progress towards the organizational objectives.

Section 5. Interview. Additional points which had not been covered in questionnaires are as follows. TQM process usually causes considerable reductions in time and cost of the overall process as it provides a problem-solving means for managers by implementing a corrective approach and minimizing the errors and their impact though the process. In addition, construction industry is highly relied on the client and its requirements. As a result a successful implementation process necessitates the close involvement of the client with the project management team during the initial and tendering stages to ensure the clear understanding of objectives by the project team. To summarize, the survey result revealed the same underlining principles, procedures and problems previously identified. Research has discovered. 87% of the total respondents have indicated the using of a quality improvement program which is a high figure compared with the industry's standard trend. It is advocated that utilizing TQM provided the organizations with a competitive edge. However, the process is

not seen as great importance in the daily workload by professionals. Various barriers hinder organizations of exploiting the full potential of TQM. It has been attempted to deploy the solutions being practiced in the manufacturing industry but unique nature of the construction still does not allow much improvement. However, middle managers are welcomed to be a part of decision making process and in turn influence the employees. Profound steps are being taken to meet customer Satisfaction, mainly via project partnering, supply chain management and employees involvement.

IMPLEMENTATION FRAMEWORK FOR TQM

Developing a sound implementation framework is crucial and should be done before embarking on TQM. The framework will make the organization more aware of TQM itself, and enables the organization to introduce TQM elements and features in a more comprehensive, controlled and timely manner.

According to Naoum, a sound implementation plan should define the final product and the process of doing so in detailed steps. TQM implementation within company is a long lasting project which should be dealt with as a never-ending process. TQM is a new system apart from the current practice which needs new thinking and managing method. Framework is needed:

- To illustrate an overview of TQM and communicate the new organizational vision
 - To clarify the organizational strengths and weaknesses
 - To support and provide implementation means and to improve success of the process
- Watson Suggests that a generic model should be adopted to assist the organization in the deployment process of TQM. The model is presented in Figure 2.

CONCLUSION

Based on the findings, it can be concluded that although there are efforts to implement TQM within the construction company, the extent of actual implementation is still low. There is faint evidence of successful implementation which means the full benefit of the process is yet to be exploited. However, there are several factors stimulating a new movement in the industry in which many organizations are adopting a variety of quality programs to enhance their competitiveness as the research indicated. TQM is the most popular approach as it provides sustainable competitive advantages. Shockingly, it is mainly believed of some importance rather

than great importance to the construction organizations.

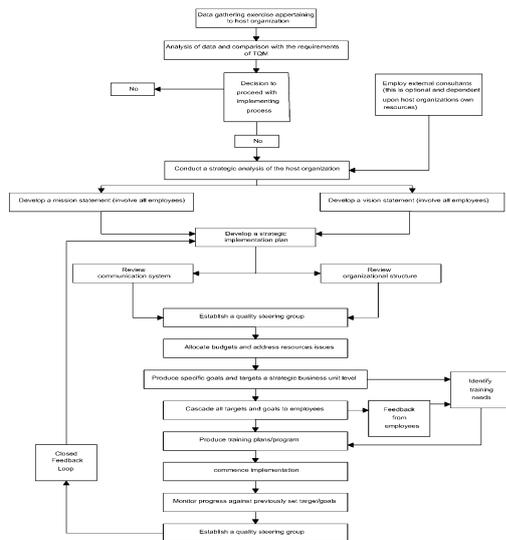


Figure 2: Generic Model for Implementation of TQM

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