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Critical Key Factors for Implementing TQM Practices in Construction Industries

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Abstract
The aim of this study is to identify the key factors for implementing TQM practices in construction industry. This study was conducted in Tamil Nadu. The researchers administered questionnaire method for collecting data from respondents. The questionnaire was developed and distributed to quality managers, site engineers. In the study eight dimensions of TQM implementation determinants was emerged. These are: commitment by management, employee's commitment, conducting training, improvements, customer assessment, organizational judgment, Leadership qualities and team work. Regarding the views on the factors in TQM implementation the significant difference among the private and public firms has been identify in case of conducting training and organizational assessment. Since their respective t-statistics are significant 5% level. The study also identified that there is a significant relationship among the entire dimension. This study findings would helps the management in formulating appropriate policy release to TQM implementation. This study considers only limited variables in future seven variables can be included to the study the TQM implementation.

Keywords: Determinants, TQM, implementation, questionnaire method, dimensions

Introduction
In the globalized financial system, survival of organizations heavily depends upon delivering quality commodities and services with focal point on customer satisfaction and delighting them incessantly in every aspect of its operations. Organizations are undergoing a shift from a production-oriented philosophy to a customer-oriented approach. Organizations with high service quality pose a challenge to other organizations and act as a benchmark for others to achieve competitive advantage. Therefore, organizations adopt total quality management (TQM) philosophy to retain their existing customers and pleasure new customers. TQM is an innovative strategy which highlights the need to improve the quality of productivity and services in order to better utilize the available property of organization (Collins, 1996). It offers every individual the chance to participate, contribute, and develop a sense of ownership. Over the past few years, the TQM concept has proved to be a systematic approach to the improvements of the organization's overall business performance including products and services (Lau & Iris, 2001).

The scope of this study comes from the fact that the role of the service sector on the world economy over the past two decades has become the dominant element in the growth of the economy.. There is a need to know which managerial practices are critical for the growth of service organizations, for that there is an immediate need for a model that identifies critical factors and can help implementation of TQM in the service organizations successfully. These factors necessitate the need for the present study. The present study reviews the literature on TQM and tries to identify various quality management practices used in service sector. These quality management practices are termed as critical success factors of TQM that can help an organization to attain business excellence. Thus, the focus will be to investigate CSFs and develop a model for proper implementation of TQM in different service organizations.

The results of this research will help managers and researchers regarding methodological issues, managerial practices, and critical success factors while implementing TQM in their organizations as well as providing a scope for future research work in this area. This study involves an extensive literature survey and then critically examining and identifying those factors which are critical to TQM implementation.

Background of the Survey

Ali Mohammad Mosadeghrad (2014) ─ Understanding the factors that are likely to obstruct TQM implementation enables managers to develop more effective strategies for enhancing the chances of achieving business excellence. An examination of 54 TQM empirical studies identified 54 obstacles to successful TQM implementation. An ineffective TQM package, inappropriate TQM implementation methods and an inappropriate environment for implementing TQM are the main reasons for TQM failure. Managers need to be aware of, and address these barriers if the TQM programmes are to have a positive impact on organisational performance.

Muatafa Maher Altayeb (2014) ─ The construction industry has been one of the most important for developing infrastructure and economy of the Palestinian. In this study the author found that success factors necessary for the implementation of TQM at various phases of the project planning, design, and construction in the Gaza strip. The research determined that 7 critical success factors with 38 sub factors out of 8 major factors and 81 sub factors. It was proven that continuous improvement is the most critical factor for the successful implementation of TQM in Gaza strip organization.

Ola Ibrahim (2013) ─ Total quality Management as a philosophy seeking to integrate all organizational functions in all areas of productions and services become an important attractive research field. In spite of the different approaches to address Total Quality Management (TQM) implementations and applications, researchers insists that to achieve excellence, top management should be involved in the application of quality. They strongly believe that all functions, all employees should participate in the improvement process. They reveal the importance of evaluation to achieve continuous improvement.

H. James Harrington (2012) ─ The construction industry in many parts of the world suffers from problems such as workmanship defects, time, and cost overrun. A need for change becomes inevitable in order to improve the condition of the construction industry. Such change can be initiated through the effective implementations of a total quality management (TQM) system. It also concludes that there has been a slow change over from quality control (QC) to total quality management (TQM). Also, a focus on process and measurement would greatly accelerate reductions in cost, defects, and time delays.

Objectives

This study is confined with the following objectives:

- To identify the crucial success factors of TQM implementation in construction industry.
- To evaluate their impact on organizational development.

Scope

The scope of this study is limited only to the spot supervisors, site engineers and Managers of the building projects Tamil Nadu.

Period of the study

This study was conducted during the period of August 2015 to February 2016.

Data collection method

The researchers collected primary data from the respondents through questionnaire method. Questionnaire consists of three important parts. The first part of the questionnaire deals with demographic profile of the respondents. The second part consists of variables leading to implementation of TQM in construction industries. The third part of the questionnaire deals about the variables relating to TQM implementation

Descriptive statistics

The demographic profile of the respondents consists of the Nature of Industry, Years of Establishment, Employees Working, Management Level, Annual Turn Over, Forms of organization and Types of buildings which is constructed in their industry. The total survey was conducted in Tamil Nadu. The Researchers have distributed 250 questionnaires to Respondents. Although Researchers made efforts they can able to collect only133 questionnaires. The response rate of the survey was 53.2 percent. In Terms of the nature of the industries about 72 percent are falls under the small scale industries, 42 percent of the industries was established more than 10 years, whereas more than 250 employees were working in small scale industries, about 100 Crores was the annual turnover of large scale industries.

Content validity of questionnaire

Before administering questionnaire to the respondent the researcher constituted a committee which consist of one expects in TQM and one academician based on their valuable suggestions some charge were incorporated existing questionnaire.

Analysis and Discussions

Reliability statistics

The most commonly used statistic Cronbach's coefficient α(Available using SPSS). This statistic provides an indication of the average correlation among all of the items that make the scale. Values range from 0 to 1, with higher values indicating greater reliability of measures. The result in Table indicates the value of Cronbach's α 0.908 which is near to 1 which means the scale used for present study is considered as highly reliable.

Tables 1: Reliability Statistics

Cronbach's Alpha	No of Items
.908	28

Determinants for a successful Total Quality Management implementation

To identify some broad determinants of Total Quality Management implementation success, factor analysis has been accomplished. Kaiser-Meyer-Olkin calculate of sampling sufficiency was of an acceptable magnitude (KMO 0.771).Moreover; Bartlett's Sphericity test gave a consequence level of 0.000. Hence, all assumptions for carrying out factor analysis are met. The extraction method chosen was standard components and the rotated method was varimax.

Tables 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**0.771**
Bartlett's Test of Sphericity	Approx. Chi-Square	1110.39
	Df	378
	Sig.	0.000

Table 3: Antecedents of quality management practices in the construction industries

Factors	**variables**	**Initial Eigen Values**	**Variance Explained**	**Percent of variance**	**Cumulative Percent**
Commitment by Management	5	6.165	22.017	10.223	10.223
Employee's Commitment	5	2.070	7.393	9.463	19.686
Conducting Training	6	1.652	5.902	9.180	28.866
Improvements	4	1.571	5.612	6.764	35.630
Customer Assessment	2	1.524	5.443	6.594	42.225
Organizational judgment	2	1.214	4.336	5.936	48.161
Leadership qualities	2	1.173	4.189	5.474	53.635
Team Work	2	1.139	4.067	5.326	58.960

Initially, all the 28 variables were used. After rejecting those items that have inadequate loadings, we reduced to nine factors. The identified factors explain percent of total variance. The factors are named as follows:

- commitment by management
- employee's commitment
- conducting training
- improvements
- customer assessment
- organizational judgment
- Leadership qualities
- Team work

To identify the significant difference among private forms and public forms of organization with regard to implementation of TQM t-statistics has been administered.

Table 4: Site engineers and project manager's opinion on key variables in TQM implementation

Factors	**Mean score among**		**t-statistics**
	Private firms	**Pubic firms**	
Commitment by Management	3.67	3.67	0.228
Employee's Commitment	3.71	3.71	0.588
Conducting Training	4.01	4.01	6.365*
Improvements	3.77	3.77	1.509
Customer Assessment	3.68	3.68	.816
Organizational judgment	3.68	3.68	1.938*
Leadership qualities	4.08	4.08	1.415
Team Work	3.73	3.73	1.493

*=significant at 5%level

The mean score of variables in TQM implementation among the private and public firms have been calculated individual along with its t-statistics. The highly viewed variables in TQM implementation among the private forms are "Leadership qualities and Conducting Training" because their mean score are 4.08 and 4.01 respectively. The highly viewed variables in TQM implementation among the public forms are also same as that of private forms. Regarding the views on the factors in TQM implementation the significant difference among the private and public firms has been identify in case of conducting training and organizational assessment. Since their respective t-statistics are significant 5% level.

Table 5: Interco-relation among the TQM constructs

TQM factors	**CBM**	**EC**	**CT**	**I**	**CA**	**OA**	**LQ**	**TW**
Commitment by Management(CBM)	1	.449**	.415**	.565**	.326**	.350**	.249**	.642**
Employee's Commitment(EC)		1	.459**	.389**	.266**	.403**	.219**	.308**
Conducting Training(CT)			1	.400**	.356**	.317**	.269**	.242**
Improvements (I)				1	.305**	.400**	.116	.316**
Customer Assessment(CA)					1	.245**	.140	.155
Organizational judgment(OJ)						1	.192*	.231**
Leadership qualities(LQ)							1	.204*
Team Work(TW)								1

**=1% significant level

* =5% significant level

The interrelationship between TQM implementation criteria dimensions among the employees is examined with the help of Karl pearson correlation coefficient and its respective significance. Regarding commitment by management the significant positive relationship is identified with employee's commitment, conducting training, improvements, customer assessment, organizational assessment, Leadership qualities and team

work. Regarding employee's commitment the significant positive relationship is identified with conducting training, improvements, customer assessment, organizational judgment, Leadership qualities and team work. Regarding conducting training the significant positive relationship is identified with improvements, customer assessment, organizational assessment, Leadership qualities and team work. Regarding improvements the significant positive relationship is identified with customer assessment, organizational assessment and team work. Regarding customer assessment the significant positive relationship is identified with organizational assessment. Regarding organizational assessment the significant positive relationship is identified with Leadership qualities and team work.

Conclusion

This study has identified eight important dimensions of TQM implementation these are: commitment by management, employee's commitment, conducting training, improvements, customer assessment, organizational judgment, Leadership qualities and team work. Regarding the views on the factors in TQM implementation the significant difference among the private and public firms has been identify in case of conducting training and organizational assessment. Since their respective t-statistics are significant 5% level. The study also identified that there is a significant relationship among the entire dimension. This study findings would helps the management in formulating appropriate policy release to TQM implementation. This study considers only limited variables in future seven variables can be included to the study the TQM implementation.

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