

# **Investigation of Total Quality Management in Libya: A Proposed Guideline of Implementation**

**Abdussalam Shibani, Messaoud Saidani and Amrit Sagoo**  
**Department of Built Environment**  
**Coventry University**  
**West Midlands CV1 5FB**  
**United Kingdom**

**Nawal Gherbal**  
**Knowledge Management**  
**Coventry University**  
**West Midlands CV1 5FB**  
**United Kingdom**

## **Abstract**

Over the past decade or so, TQM has been used to focus on improve profits, market share and competitiveness. Whilst TQM is used as a verified approach in creating success within manufacturing and services and it is used for improvement in the public sector, several organizations have failed in implementing TQM correctly; this is due to many reasons such as lack of top management commitment or ignoring the customer demands etc. This paper studies specific factors that influence the success of TQM implementation. One of the important findings from the research shows that while most organizations begin TQM as a way of having success they are regularly exposed to certain factors that could cause TQM labours to be delayed or even fail. TQM is a definite way of reversing poor performance, however, when the results expected are not obtained it is deemed a failure. This review will, firstly, identify the common problems leading to the failure of TQM implementation within organizations, secondly, is will recognize what the critical success factors of TQM is. The overall results of this research denotes that understanding the key elements that cause TQM implementation to fail will provide help for companies that use TQM for long term continuous improvement efforts. Organizational excellence can be achieved if the new TQM approach is followed correctly.

## **1. Introduction**

Quality has become one of the most important competitive strategic tools and many organisations have realised that it is a key to developing product and service that support continuing success. As competition increase and change occurs in the business world. Total quality management (TQM) programs are an important and prominent approach to management to improve overall organisational effectiveness. Quality management system becoming more popular as evidenced by an increasing number of organisations worldwide now applying quality theories, principles, and methods to every business function (Boone and Wilkins, 1995; Lawler, 1994; Porter and Parker, 1993). While some organisations focus on specific areas such as quality management systems or statistical process control, others take a holistic approach and attempt to implement TQM programs covering all the key areas (Porter and Parker, 1993). The latter are more likely to achieve organisational effectiveness as it has been shown that quality does not work if implemented in a piecemeal fashion; success is usually achieved (or conversely failure is avoided) as the result of a single, defined effort by all departments and processes in the organisation. The main purposes of this study were to identify the critical success factors (CSFs) that affect the implementation of total quality management (TQM) in Libyan construction industry (LCI) and to develop a guiding framework through which Libyan construction companies could implement and maintain improved quality systems. To achieve the aim, the author used both quantitative and qualitative methods.

Total Quality Management (TQM) is often termed as a journey, not a destination. (Burati and Oswald, 1993). A great deal of research has been done with regards to the implementation of TQM, it is believed that the benefits of higher customer satisfaction, better quality products, and higher market share are often obtained due to the adoption of TQM by construction companies. A complete turnaround in corporate culture and management approach is required (Quazi and Padibjo, 1997) to change from the traditional method of the top management giving orders and employees merely obeying them. It is believed that the single most important determinant of the success of an organization in implementing TQM is its ability to translate, integrate, and ultimately institutionalize TQM behaviours into everyday practices.

TQM delivers the opportunity to reflect on goals, organizations, processes and people in order to ensure that the correct things are done the first time round. Motwani (2011) feels that the implementation of TQM is a major organizational change that requires a transformation in the culture, process, strategic priorities, beliefs, etc. of an organization. The TQM approach will improve the competitiveness, effectiveness, and flexibility of the whole organization. Oakland (1995) observed that TQM is essentially a way of planning, organizing and understanding each activity that depends on each individual at each level. Ideas for continuous learning are related to concepts such as empowerment and partnership which are facets of TQM.

## **2. Research Methods**

The objective of the research was to assess TQM implementation initiative in a number of contracting organisations to explain and, on the other hand, to identify CSFs of the TQM implementation. As Arabic is the main language spoken in Libya, not many people can speak English especially in the construction industry? It is, therefore, necessary to provide the questionnaire in Arabic. However, some English terms are commonly used in the construction industry in Libya, and there are only a small number of non-Arabic speakers working in this sector.

To speed up the response, the questionnaires were distributed and collected personally by hand during the interviews. This method is effective because there is direct communication between the researcher and the respondent. Data were obtained through questionnaires supported by a set of interviews; this was achieved by visiting firms and projects under construction in Tripoli. Then, the data gathered was analysed by using Statistical Package Social Science (SPSS package).

## **3. Questionnaire and Interviews**

As the first step of delivering the questionnaires, a formal letter was sent to all organisations providing a general outline about the survey. In addition, the letter emphasised the importance for the participants to complete the questionnaires on time. 200 hard copies of the survey questionnaires were distributed to the construction companies in Tripoli (Libya). Each copy of the questionnaire was accompanied with another letter from the researcher providing explanation about the outcomes expected after conducting this survey. A total of 130 fully completed questionnaires were returned giving a response of 65 percent. Among the participating organisations, 36.2% were from private sector and 63.8% were government organisations. So, the research questionnaires and interviews were sufficient to support the preliminary review. The interviews helped in identifying the major problems in the industry (LCI), such as lack of top management commitment, culture and employees barriers, and managerial barriers. The preliminary stage of this research focused on the observation and analysis of the construction industry in Libya. The approach was also used to collect other data about TQM in Libyan construction industry.

### **Demography Questions**

To identify the demographic data of the key factors in the Libyan construction industry (LCI) respondents were asked questions relating to their gender, age, education, qualification, years of experiences, size of company and number of employees and so on. Participants were asked to indicate their gender by placing a tick to the relevant options (male or female). All 130 participants responded. Of the 130 respondents 106 (81.5%) were male and 24 (18.5%) were female. This indicates majority of respondents who working in the construction industries were male. Forty three percent of the overall respondents had first degrees, thirty percent of the total respondents had a master, and 13 percent had a secondary school. Ten of the respondents had a PhD. This demonstrates that the respondents were an educated workforce having a high level of literacy and numeracy ability. The respondents were asked to indicate the length of time they had been working in the construction industry and their current firms or organisations for whom they had worked. The purpose of these questions was to identify the respondents experience and the stability in their work background.

- 6 % less than 5 years
- 16 percent of the sample had been working in construction Industry for 6-10 years
- 26 percent had been working in the construction for 11-15 years
- about 23 percent worked in the construction industry between 16-21 years,
- 27 percent more than 21 years.

These results indicate that most respondents were experienced in the construction activities and operations. The number does not add up to 100 percent due to rounding errors.

### **Factor analysis (FA)**

According to (Kirlinger, 1996), factor analysis is “powerful and indispensable method of construct validation”. Factor analysis can be defined as a group of statistical techniques whose common objective is to represent a set

of variable in term of a smaller number of hypothetical variables or factors. Chatfield and Collin, (1992) define the factor analysis (FA) is 'a data reduction techniques that uses the correlation between data variables'. The underlying assumption of factor analysis is that a number of factors exist to explain the correlation or inter relationships between observed variables. Firstly the FA performed on all the variables (53) variables using principle component extraction (Tabachnick and Fidell, 1999), the main objective for this technique to extract the maximum variance from the data set within each factors.

#### 4. Results of Factor Analysis

The result of the output obtained in this could be presented as follows. The Likert Scale is an ordered, one-dimensional scale from which respondents choose one option that best aligns with their view. The 53 items in the survey were made on a four point Likert Scale where 1 implied strongly disagree and 4 Indicated the respondent strongly agree with the statements. The 53 item of the questionnaires were inter correlated and subjected to an exploratory factor analysis (EFA) based on the principle component analysis (PCA) with Promax rotation was conducted using SPSS package version 16.0 to detect the factor structure in the variable. EFA is recommended when researchers have no hypotheses about the nature of the underlying factor structure of their measure. Inspection of the correlation matrix reveals the presence coefficient of 0.3 and above the Kaiser Meyer Oklin (KMO). The Bartlett'S Test of Sphericity as shown in Table 1 reached statistical significance, supporting the factorability of the correlation.

Table 1. KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.728
Bartlett's Test of Sphericity	Approx. Chi-Square	15910.220
	df	1378.000
	Sig.	.000

Kaiser,(1974) recommended accepting a value greater than 0.5 as barely acceptable; values between 0.5 and 0.7 are mediocre; value between 0.7 and 0.8 are good; value between 0.8 and 0.9 are great and value above 0.9 are superb. Field, (2005) indicates the value, in our case 0.728, are good. According to Norusis,(1994) the value of Kaiser-Meyer-Olkin (KMO) below 0.5 are unacceptable and the high KMO measures allows more meaningful analysis to be obtained. This can be confirmed by Bartlett's Test of Sphericity which tested and Chi-Square test was significant, indicating that principle component analysis PCA can be meaningfully applied (Torbico, 1997) used PCA to produce a structure matrix of variables after rotation, where the number of component determined was based on the criterion that the Eigen value for each component must be more than one. This method can be referred also as Kaiser`s criterion. However, this derived five principle component explains 83 percent of variation, in the variable (Table 2).

Table 2. Eigen value, percentage and total variance explained

Component	Initial Eigen values		
	Total	Percentage of Variance	Cumulative Percentage
1	34.940	65.924	65.924
2	3.058	5.770	71.694
3	2.817	5.315	77.009
4	1.758	3.316	80.325
5	1.532	2.890	83.215
6	.965	1.821	
7	.893	1.686	
8	.849	1.601	
9	.780	1.472	
10	.760	1.434	
11	.594	1.121	
12	.540	1.018	
13	.442	.835	
14	.347	.655	
15	.318	.600	
16	.277	.523	
17	.264	.498	

Note: components 18-53 are not shown

### Factor Extraction

Factor analysis with principal component extraction, using a promax rotation, was performed on the fifty -three management practice items to determine the number of factors. Besides using the screen plot as a guide to decide on the number of factors to be extracted, the KMO method (Eigen value greater than 1) was used, explaining 66%, 5.7%, 5.3%, 3.3%, and 2.8% of the variance respectively. Five factors were extracted which are bolded in Table 3.

Table 3. Eigen values and % of total variance explained of TQM elements

Total Variance Explained (Note: components from 15 - 53 are not shown)						
Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	Percent of Variance	Cumulative Percentage	Total	Percent of Variance	Cumulative Percentage
1	34.940	65.924	65.924	34.940	65.924	65.924
2	3.058	5.770	71.694	3.058	5.770	71.694
3	2.817	5.315	77.009	2.817	5.315	77.009
4	1.758	3.316	80.325	1.758	3.316	80.325
5	1.532	2.890	83.215	1.532	2.890	83.215
6	.965	1.821	85.036			
7	.893	1.686	86.722			
8	.849	1.601	88.323			
9	.780	1.472	89.795			
10	.760	1.434	91.229			
11	.594	1.121	92.350			
12	.540	1.018	93.368			
13	.442	.835	94.203			
14	.347	.655	94.857			

We can see that the first few factor explain relatively large amount of variance (especially factor 1 where the factor 1 equal 34.940%. SPSS extract all factors with Eigen value greater than 1 and the percentage of variance explained in the column which labelled Extraction sums of squared loading.

### 5. Conclusions

From the interviews the researcher found that there was a clear lack of implementation of the critical success factors CSFs of TQM demonstrated through features such as, lack of knowledge of QM and lack of management commitment. In the author's view the Libyan organisation are still in the early stage where most of the, Libyan companies was introduced ISO9000 only just prestige because some of local companies have been certified ISO 9000. There are weaknesses in communication and information system in the LCI. The present system in the LCI is based on paper and verbal formats this result low quality and low flow of information. Libya is not yet ready to accept and adopt TQM because the lack of infrastructure, which top management are not keen to adopt due to lack of educational skills. For this reasons the implementing of the quality management in Libyan construction industry is difficult and it is likely to take long time to understanding the exactly meaning of quality management systems and their implementation. Some managers mentioned company and government policy which does not allow employee delegation. In this case the employees could not take a decision without management approval; from leaders or supervisors.

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