

The Influence of TQM on Project Performance: The Case of Construction Organizations in Malaysia

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Abstract: Total Quality Management (TQM) is well-known and recognized as a working method to improve the overall construction performance in terms of speed and quality on many countries (Harrington, Voehl and Wiggin). It has been widely accepted as the stimulator for performance improvement in the construction industry. However, there is a lack of relevant studies that exclusively focus on the relationship between TQM and project performance. Hence, the objective of this study is to explore the relationship between TQM and project performance in the construction organizations in Malaysia. Data will be collected from organizations listed in the Construction Industry Development Board (CIDB) Malaysia. Two elements will be explored: TQM and project performance. A structured questionnaire comprising three sections: respondent profile, tqm and project performance distributed to the respondents through emails and/or post. SPSS analysis will be conducted for pearson's correlation analysis and regression analysis on the data collected. The outcomes of this study provide useful insights on the implications of TQM on project performance on construction organizations. It helps industry practitioners to determine their area of improvements in TQM for better project performance to gain and sustain competitive advantage in the construction industry.

Key words: Total Quality Management (TQM), project performance, construction organizations, construction industry development board, gain and sustain competitive

INTRODUCTION

The construction industry is vital for the development and growth of any nation. However, attainment of acceptable levels of quality in the construction industry has long been a problem. In fact, the construction industry has been regarded as one of the poorest quality emphasis compared to other sectors such as manufacturing and service (Alotaibi *et al.*, 2013). Reports such as the Latham report and Egan report have criticized the construction industry, especially in terms of productivity, quality and quality systems (Ali and Rahmat, 2010). Delays, cost overruns, reworks, variations, claims and disputes become common problems happen in construction (Ali and Rahmat, 2010). A great amount of time, money and resources, both human and material are wasted each year in the construction industry because of inefficient or non-existent quality management procedures (Polat *et al.*, 2011). Due to the reasons above, many construction clients expressed dissatisfactions with the quality performance achieved in their construction projects (Kometa and Olomolaiye 1997; Lam *et al.*, 2008; Metri, 2005). The construction industry is under tremendous urge for better quality in construction (Mahmood *et al.*, 2006).

Intense worldwide competition and ever-changing customer demands have dramatically changed the business environment in which quality becomes the priority in every organization in order to sustain competitiveness in the market. With escalating demands for a higher standard of products and services from the clients, the construction industry, which previously only focused on financial measures instead of quality measure is now pressured with the effort to improve quality through various management systems (Lam *et al.*, 2008; Torbica and Stroh, 1999; Low and Tan, 1996). Unfortunately, high fragmentation, low productivity and lack of standards continually contributed to the major problems of construction companies. Whereas, the quality of construction services and facilities is still the root cause of many problems (Chan and Tam, 2000). Highly differentiated and loosely structured of construction setting, make it becomes a deterrent in implementing quality management where sustaining quality consequently becomes extremely difficult. The construction industry is still in the efforts striving for better methods of working to achieve quality objectives in totality (Lam *et al.*, 2008).

As suggested by Oakland and Aldridge if ever an industry needed to take up the concept of Total Quality Management (TQM) it is the construction industry (Wong, 1999) and TQM has become a tool implemented by companies around the world in pursuit of quality output. It has become a fundamental strategic approach by many construction organizations to solicit quality as a strategic weapon for market share and improved organization profitability. It is considered as a global phenomenon to improve quality in the construction industry in order to gain a competitive edge in the national and global market. TQM originated from manufacturing industry has been proofed with remarkable performances such as increased productivity, decreased product cost and improved reliability (Gunaydin, 1995). As a result of successful implementation of TQM in the manufacturing industry, it turned out to be a source of innovation for other industries to adopt and implement this concept including the construction industry. However, the construction industry has been noticed lagging behind other industries implementing TQM (Metri, 2005).

As the construction industry is considered one of the major contributors to the Malaysia's economy and thus correctly managing the TQM practices towards achieving satisfied project performance is tactically important for gaining a competitive advantage. There is literature that has evolved to examine the relationship between TQM and project performance around the world, especially in Western countries, however, the number of research is limited. Moreover, little is known about the effect of TQM practices on project performance, particularly within the context of Malaysian construction industry. In order to bridge the gap and provide organizations with practical assistance in dealing with TQM's effect on project performance, this research will examine whether the application of TQM practices results in an improvement of organization's project performance. This study focuses on the application of TQM practices in the developing economy of Malaysia to examine such relationship which gives a difference from the existing limited work on the relationship between TQM and project performance in Western countries.

Literature review

TQM practices: Well-known for its holistic management philosophy, TQM centered on quality aims for long-term success by continuous improving the quality of products and processes through customer satisfaction and benefits to all members of the organization and to society. It involves an integration of internal and external of the organization including all levels of personnel,

management, suppliers and customers to meet and exceed customer expectations. TQM is based on the notion that the quality of products and processes is the responsibility of everyone involved with the creation or consumption of the products and services which are offered by an organization. It uses strategy, data and effective communication to integrate the quality discipline into culture and activities of the organization.

The core ideas of TQM were introduced in the mid-1980s by the most notable gurus, Edwards Deming, Joseph Juran, Philip B. Crosby and Kaoru Ishikawa (Hackman and Wageman, 1995). Each quality management guru invariably identified a set of "key practices" that they claimed are essential in achieving superior quality outcomes. For example, Crosby's "14 Steps" for excellent quality outcome, Juran's "trilogy" of the managerial process and Deming's "14 Points". Later, researchers have defined TQM in various ways although they are complementary to each other. The number and priority of TQM elements vary from one author to another author in which the author think is the most suitable. This leads to the non-consensus of the components of TQM from the literature. Problems exist when a diversity of TQM dimensions occurred. Many researchers prefer to develop their own model instead of using constructed model, which has been tested by preceding authors. As a result, a set of common TQM practices is difficult to define from a wide range of TQM frameworks (Prajogo and McDermott, 2005).

The literature reviews that quality awards have been adopted as the TQM framework in many types researches conducted in other countries. Today, there are more than a hundred quality awards existing in different countries. All these quality awards are basically derived from the basic and prestigious awards: the Malcolm Baldrige National Quality Award (MBNQA), the European quality award and the deming prize (Jaeger *et al.*, 2013; Talwar, 2011). In this study, the theoretical framework is based on the Malcolm Baldrige National Quality Award (MBNQA). MBNQA's framework incorporates seven independent quality criteria: leadership; strategic planning; customer/market focus; process management; human resource focus; measurement/analysis and results. The MBNQA, originally introduced by the US government in 1987 to increase quality awareness among US companies is widely accepted as the blueprint of TQM (Evans and Lindsay, 2005; Garvin, 1991). It became the framework for organizations to measure the extent TQM is practiced (Lam *et al.*, 2008; Lee *et al.*, 2006).

Taking into consideration the widespread acceptance of the MBNQA quality criteria, these criteria will be used and best represent TQM for the following analysis of

construction organizations in Malaysia. The rationale for adopting MBNQA in this study is that it has been widely recognized as one of the benchmarks of TQM and many scholars have validated this structure to express the dimensions of TQM practices (Prajogo and McDermott, 2005; Terziovski, 2006; Ooi *et al.*, 2011). This framework as well is relevant and appropriate to both manufacturing and non-manufacturing sectors (Ooi *et al.*, 2011). In this study, TQM practices based on the MBNQA model are adopted for the following reasons (Lee and Ooi, 2015):

- It contains soft and hard elements if TQM
- It has been adopted by many renowned researchers as their conceptual model in their empirical work

It has been adopted and implemented in both developing and developed countries.

Project performance: The complex and unpredictable nature of projects generates serious challenges to the project-based organizations and fundamentally differed project-based organizations from standard organizations. Projects are unique, novel, specifically aimed at a certain goal and have a clear finishing date. The Project Management Institute defines a project as “a temporary endeavor undertaken to create a unique product or services”. Within the context of a construction project, the success of a project may judge differently by the construction organizations depending on their own objectives (Chan *et al.*, 2002). What is viewed as a measure of success on one project may be perceived as an indication of abject failure on another project (Muller and Turner, 2007). Project performance is indicated by the success of a construction project. The common assessment of the success of construction projects is that they are delivered on time, to budget, to technical specification and meet client satisfaction (Morris and Hough, 1987; Slevin and Pinto, 1986; Turner, 1993) which are the so-called “iron triangle” (Meredith *et al.*, 2011; Pinto and Slevin, 1987). Hart stated that quality in the construction industry has three-fold meaning: it means getting the job done on time, it means ensuring the final product fulfill the required specifications; it means getting the job done within budget which are conformed to the “iron triangle” criteria.

Over the years, the “iron triangle” criteria (time, cost and quality) have been criticized because they seem inadequate. Some authors considered them excessive while others considered them incomplete (Angus *et al.*, 2005). Research on project success shows that it is

impossible to generate a universal checklist of project success criteria that suitable for all projects as project differ from each other in terms of size, location, uniqueness and complexity. Due to the complexity of the process success concept and the lack of consensus among authors in the field (Jha and Iyer, 2006) and the traditional dimensions of the “iron triangle”, albeit criticized are still considered central to the measurement of project success (Shields *et al.*, 2010). As being mentioned by Chan *et al.* (2002), the criteria of time, cost and quality have long been used to evaluate the performance and success of construction projects. The criteria of cost, time and quality are sufficient for measuring efficiency during the construction delivery stage (Mumms and Bjeirmi, 1996).

This research uses the basic dimensions, denoted as project efficiency by Shenhar. Project performance will be evaluated according to the planned budget, the schedule, the technical specifications (product/service requirements) and the ability to meet the customer service requirements. Note that the quality dimension is subdivided into two criteria: meeting technical specifications and meeting customer demands. So, in this research we will measure the project performance in terms of project efficiency (time, cost and quality).

TQM and project performance: Although, vast researches have been carried out to study the role of TQM in various industries (e.g., manufacturing, food, service, etc.) there is a lack of relevant studies for the role of TQM in the construction industry. As being mentioned by Bryde (2008), research that specifically focus on TQM and project environments still lacking. This is because; researchers are more interested in looking into quality costing of projects rather than TQM in the construction organizations. Furthermore, a recent study by Leong indicated that to date, limited researches have been performed on the areas of project performance in construction industry. This is due to the fact that only a few studies have attempted to link quality management in the construction industry with the performance of organizations. There is a lack of studies, which examined the relativity of TQM and project performance in Malaysia. Normally the quality management functions that come under the purview of operations management is generally used for repetitive processes while project management is applied for meeting temporary endeavors in order to create distinctive products and services.

From the literature reviews conducted by researchers, it becomes an evident showing that till date no research

work exclusively focused on the relationship between project performance and TQM in Malaysia. Hence, a gap has been spotted in the existing literature of TQM in the Malaysian construction industry which is still under-researched. Therefore, this study focuses on finding empirical evidence for the relationship between TQM and project performance in the Malaysian construction industry. Coupled with current pressures to improve the level of quality in the construction industry in Malaysia, there is indeed a need and urge for a research investigate if the implementation of TQM can improve project performance. This research will not focus only on investigating if a link exists but also on a more refined and detailed examination of how links are constructed in providing a practical contribution for the construction organizations with valuable knowledge in improving their project performance through implementation of TQM.

Objective and research questions: The objective of this study is to explore the relationship between TQM and project performance in the construction organizations in Malaysia. Empirical evidence on the relationship between TQM and project performance interprets how TQM can enhance the level of project performance. The objective of this study will be addressed through the following pertinent research questions:

- Is there a relationship between TQM practices and project performance?
- Which TQM practices have a greater association with project performance?

Research proposition and hypotheses development:

The literature review indicates a significant positive relationship between TQM practices and the project performance in the construction organizations. This lead to the following proposition and hypotheses:

Proposition 1: There is a significant positive relationship between TQM and project performance:

- H_1 : There is a significant positive relationship between Leadership and project performance
- H_2 : There is a significant positive relationship between Strategic Planning and project performance
- H_3 : There is a significant positive relationship between Customer and Market Focus and project performance
- H_4 : There is a significant positive relationship between Human Resource Focus and project performance

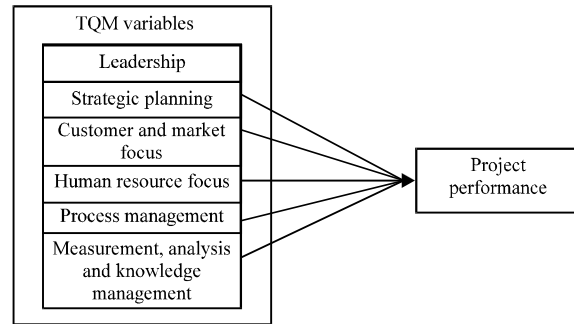


Fig. 1: Project performance of TQM variables

- H_5 : There is a significant positive relationship between Process Management and project performance
- H_6 : There is a significant positive relationship between Measurement, Analysis and Knowledge Management and project performance (Fig. 1)

MATERIALS AND METHODS

A total of 400 construction organizations under category Grade 7 are selected from the Construction Industry Development Board (CIDB), Malaysia database using a random sampling technique. Hair as cited by Forza and Filippini (1998) and Sit *et al.* (2009) "an adequate sample is between 100 and 200 observations, however sample with a number of observations between 50 and 400 are also acceptable".

A structured questionnaire survey method is selected to assess the relationship between TQM practices and project performance. The items to measure TQM practices and project performance are adapted from peer-reviewed publications in the TQM and project performance research areas. The first section gathers information pertaining to the profile of respondents. Meanwhile, the next section deals with TQM assessed on a 5-point Likert scale with value "5" representing a very high frequency of practice and value "1" representing a very low frequency of practice. In study three, data concerning project performance are elicited in the context of a project. A 3-point Likert scale will be adopted to capture project performance with score "1" representing a very high degree of superiority and value "3" representing a very low degree of superiority.

RESULTS AND DISCUSSION

Questionnaires have been sent out to the selected organizations through e-mails and/post. It is still in the process of collecting sufficient data for further analysis.

This research will undertake few analyzes. First, factor analysis and cronbach's α reliability test will be conducted on the independent variables (TQM) and dependent variables (project performance). Next, pearson's correlation and multiple regression analysis will be deployed to examine the relationship between tqm and project performance in the construction organizations.

CONCLUSION

From the literature review, it is evident that there is a lack of studies which examined the relativity of TQM and project management in Malaysia. There is no research focus on TQM and project performance in Malaysia till date. Therefore, this research tends to fill up the gap of existing literature review, focuses on finding empirical evidence for the relationship between TQM and project performance in construction organizations in Malaysia.

The findings of this research will provide empirical evidence of the relationship between TQM and project performance. It also will provide useful insights and practical inputs for the practitioners in construction organizations to have a better understanding between the association of TQM and the project performance. It will explain how practices of TQM can enhance the project performance. Hence, more effective and efficient approach can be implemented in boosting project performance in their construction projects.

Due to time constraints and limited resources, there are some limitations in this research that must be considered. Firstly, this research will only be conducted within the construction organizations in Malaysia. Therefore, it is suggested that in the future study an international study can be conducted by comparing the context within Malaysia with other countries in respect of this topic. Secondly, a cross-sectional method is deployed in this research and it is suggested for future study, a beneficial longitudinal design for more in-depth research. Thirdly, consultancy companies and developer companies, which play important roles in construction projects, shall be taken into consideration for the future study as well.

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