Quality Management Practices Among Large Scale Building Contractors

H.S. Wickramage[1] and N.D. Gunawardena[2]
Department of Civil Engineering, University of Moratuwa, Sri Lanka

ABSTRACT: Construction industry is predominantly project based and quality is one of the main concerns of customer. Hence achieving quality is one of the major tasks of a contractor. Many contractors in Sri Lanka use ISO 9001 based Quality Management Systems (QMS). This research is focused on quality management practices among C1 grade building contractors in Sri Lanka. The investigation is based on a questionnaire survey which gathered 32 responses for the analysis. Most construction companies used ISO 9001 as the QMS. Suppliers and subcontractors' plays a major role in achieving quality construction. Most construction companies believe lack of quality management practices among suppliers and subcontractors is the biggest issue for managing quality in building construction projects. Top management perspective on quality and quality communication to the bottom level was engrossed in the analysis.

1 INTRODUCTION

Construction industry is vital for the development of an any country since it directly represent the level of infrastructure development in the country. Construction industry is one of the largest contributors to the GDP in a country which helps to grow a country's economy (Ramachandra & Rameezdeen, 2006). The construction industry in Sri Lanka which is growing at a rate of 22 percent (Central Bank Sri Lanka, 2015) contributes 7 percent of the Gross Domestic Product (GDP) of the country. Sri Lankan construction industry has experienced a massive growth during the last decade. Once exponential growth is experienced, some of the important aspects in construction such as quality can get diluted due to various reasons. Hence it is important to maintain adequate standards in building constructions.

There are many factors influencing project success. But success of a construction project will heavily depend on contractors' ability (Palaneeswaran and Kumaraswamy, 2001; Yaweli et al., 2005). Hence, the parameters like quality of a construction project will depend on the contractors' quality practices. This research will focus on the quality management practices of large scale building contractors' in Sri Lanka.

2 OBJECTIVES

This research is mainly focus on identifying and assessing the current quality management practices among large scale building contractors in Sri Lanka. C1 grade companies (according to the Construction Industry Development Authority categorization-CIDA) have been selected as the large scale building contractors in Sri Lanka. Following objectives were also derived for the research.

i. Assess the current level of quality management practices implemented in building construction industry in Sri Lanka
ii. Identify the barriers to quality management practices in building construction sites
iii. Assess the knowledge and the perspective of top management at the building construction sites regarding quality management systems
iv. Assess the level of communication of the quality management system to the bottom level of the construction staff.

3 LITERATURE SURVEY

There are so many factors affecting quality of a project and those factors are varying locally. Critical factors affecting quality are Quality of the design process, the standards used for design, Construction process, materials and other products used in construction, operation without any problem (Atkinson, 2013). Other than these Gunawardena, 2005 presents that labour force, construction equipment, weather conditions, coordination between the project parties, commitment of the management, procurement and working conditions are also affecting the product quality.

According to the Bakar, Khalid and Eziaku, 2011, Knowledge on Quality Management, Perception of quality, Data acquisition method and training are also should consider as factors affecting the quality of the final product.

QMS provides a framework to follow the necessary procedures. There are general requirements and documentation requirements, which needed to

1 Former Student 2 Professor e-mail : ndg@civil.mrt.ac.lk

be satisfied in order to have a successful QMS. A QMS requires a quality manual, which is an essential need for an organization to plan its quality management activities (Gunawardena, 2005).

The most popular standard follows in Sri Lanka is ISO 9000 & ISO 9001. Sri Lankan contractors are still not ready to embrace a strategic quality management plan for the construction projects (Senaratne & Jayarathna, 2012). Difficulty in developing a long term quality plan (Senaratne & Jayarathna, 2012) is another challenge faced at construction industry.

Philip B. Crosby highlighted that Quality measurement, cost of quality evaluation, Quality awareness, Training is very important in Quality managing. Furthermore, Quality Control Hand-book (Juran and Gryna, 1988) emphasis that Providing training, communicate results is play a major role in quality management.

4 METHODOLOGY

Following flow chart will show the methodology followed during the course of research.

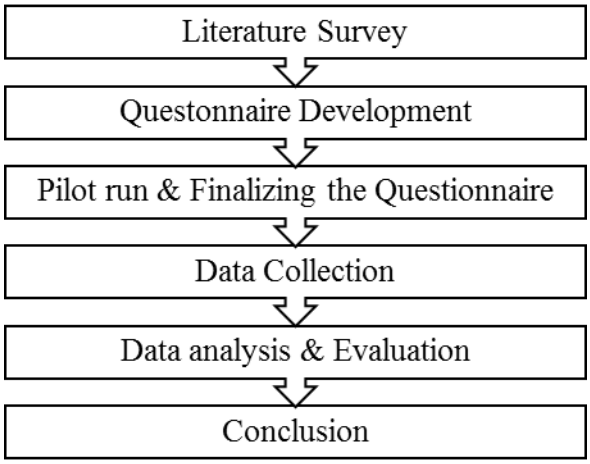

Figure 1. Research methodology

An Online questionnaire survey form was used as the prime method of data collection. Other than that, direct interviews and posting printed questionnaires were also used.

5 SUMMARY OF RESULTS AND DISCUSSION

5.1 *Sample justification*

The questionnaire was sent to all C1 grade companies in Sri Lanka (33 companies) that are currently having building projects within Colombo district. Hence, the sample size of the research is 33. 32 responses were collected from 16 different companies. A response rate of 48.5% can be regarded as adequate for questionnaires distributed through online (Postal) in construction industry (Fellows and Liu 2008). Required response rate is 25% - 35% according to Fellows and Liu

Moreover, Central limit theorem says that a minimum of 30 responses are needed to assume a sample to be normally distributed. Hence the 32 responses collected is adequate to assume the sample to be normally distributed.

A summary of the contractor experience in the industry and respondent experience in the industry is shown in Table 1 and Table 2.

Table 1 Contractor experience

Contractor Experience	%
Less than 5 Years	3
5 - 10 Years	3
11 - 20 Years	3
More than 20 Years	91

Table 2. Respondent experience

Respondent Experience	%
Less than 5 Years	25
5 - 10 Years	19
11 - 20 Years	41
More than 20 Years	16

5.2 *Existing quality management system*

According to the survey data, all 16 companies (out of 31 C1 grade companies), follow ISO 9001 quality standards and all the 26 projects have a quality manual at their building construction project sites. This behaviour has been confirmed by past researches in Sri Lanka (Senaratne & Jayarathna, 2012).

88% of the contractors using ISO 9001 quality standards, to “improve quality” in their projects. Other motives include, to “improve corporate” image and to “get market edge”.

94% of the projects had separate quality management team or an officer. Above analysis shows that the existing implementation of quality management system is at satisfactory level. 78% of contractors believe that implementation of QMS provides reduction of rework. At the same time, this option has the highest mean value over other options. However, 66% of the respondents believes that the achievement of the quality targets only reflects partially in their performance evaluation. Anyway, this is a good improvement when it comes to employee motivation.

5.3 *Barriers to quality*

Around 63% of the respondents believe that lack of quality management practices among suppliers and subcontractors is the biggest issue for managing quality in building construction project. Around 47% of the respondents tells that lack of

1 Former Student 2 Professor e-mail : ndg@civil.mrt.ac.lk

understanding in quality management practices makes achievement of quality construction impossible (Alzahrani & Emsley, 2013)
Table 3 shows the barriers in achieving construction quality

Table 3 Barriers to construction quality

Barrier type	Median score	Rank
Worker attitude	2	1
Lack of proper supervision	3	2
Lack of skilled workers	3	2
Law quality material	4	4
High labor turnover	4	4
Unrealistic deadlines	5	6
Lack of proper equipment	6	7

Worker attitude is the biggest barrier to construction quality according to the responses obtained. Lack of skill workers and lack of proper supervision are ranked as second biggest barriers when achieving construction quality. However, the building construction industry believes that adequate quality equipment and realistic deadlines area present at construction sites and they are not a barrier to construction quality.

5.4 *Knowledge and perspective of top management*

The questionnaire survey was distributed among the top management at the construction sites. Their knowledge and perspective is highly important in implementing good quality practices at building construction sites. 75% of them think, “customer satisfaction” best defines quality. This has been confirmed by many researchers and quality gurus in the world. (Juran and Godfrey, 1998). Adding to that Overall customer satisfaction is considered as the best measurement in indicating the level of quality of the building projects. 66% of the respondents confirms this, while 41% is stating that repeated contracts from previous clients can also measure the level of quality of a building project.

Table 4 shows the top management perspective on key aspects of a building project. The ranking was based on rank 1 as the most critical aspect. Rank 1 has been offered to safety where quality is ranked as no 2. In this ranking, scope of the project was ranked as the least important aspect to be focused on a building project.

Table 4. Ranking of key aspects of a project

Key aspect	Rank
Safety	1
Quality	2
Cost	3
Time (Meet the schedule)	3
Scope	5

Quality improvement is a vital factor in contractors which need to start from the top management. Management commitment is being considered by 72% of the respondents as the most important aspect for improving quality.

5.5 *Communication of the QMS to bottom level staff*

Clear communication of the quality management practices to the grass root level of a building project is essential for effective quality management. Figure 1 shows the participation for the quality awareness meetings at the site.

Figure 2. Composition of quality awareness meetings

88% of the respondents are having quality awareness meetings at the site premises. More than 50% of the respondents conducts weekly meetings to convey the quality targets. Adding to that, similar percentage using printed schedules with monthly or weekly updates to convey the quality targets.

An effective way of increasing the quality awareness among the bottom level staff is to train them continuously. The frequency of providing training to the staff is represented by figure 2.

According to the results obtained, top management involvement in communicating the importance of the quality, setting quality policies and conducting management reviews are at a higher level. Over 90% of the project top management involve in above mention activities to enhance the quality in the building construction sites.

1 Former Student 2 Professor e-mail : ndg@civil.mrt.ac.lk

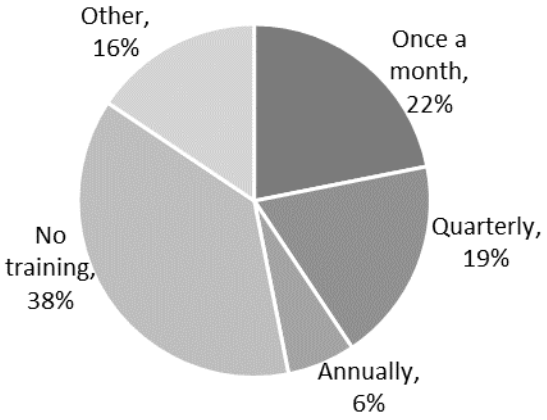

Figure 3. Frequency of training for staff on quality

6 CONCLUSION

The implementation of QMS in Sri Lankan building construction projects are satisfactory. The management motive behind the implementation is justifiable. However, the top management perspective regarding the quality is reactive rather than being proactive. Lack of QMS in subcontractors and employee attitude towards quality seems to be a big problem in achieving quality in building construction industry. The level of communication of the quality targets to the bottom level of the staff should be improved since it is very important in measuring quality (Rahman, H.A. et al, 2011). Special focus must be given to employee training and increasing awareness about the quality management practices within the construction staff. Overall quality management practices can be considered as satisfactory in Sri Lankan building contractors.

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1 Former Student 2 Professor e-mail : ndg@civil.mrt.ac.lk