

APPLICABILITY OF TQM FOR CONSTRUCTION CONTRACTING ORGANISATIONS IN SRI LANKA

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ABSTRACT

The construction industry in any country is a dominant, huge, complex and highly risky industry. In the Sri Lankan context, the construction industry has become a major component of rapid economic development over the past years. However, the industry itself suffers from many problems, such as defects in workmanship, defects in quality and overflow of time and cost. Thus, these industry problems have challenged the successful project performance and total quality of the output. Nevertheless, these problems will persist until every organization in the industry begins to take responsibility for developing new changes within its own organization. Such changes can be initiated via effectively implementing the philosophy of Total Quality Management (TQM). However, globally, the usage of TQM in the construction industry is not so popular than in the manufacturing industry. Therefore, the research aims to identify the applicability of TQM in Sri Lankan construction contracting organizations.

A qualitative research approach was followed in order to achieve the aim of the study. Thus, semi-structured interviews were conducted among a total of ten top management professionals are associated with contracting organisations and had in-depth knowledge in TQM and its practice. A content analysis using NVivo 11 software was adopted to summarise and analyse the collected data. The findings revealed that TQM can be followed by the construction contracting organizations in Sri Lanka. However, it is not that much easy, because the TQM implementation process encompasses a series of barriers. Thus, the research found financial barrier, insufficient collaborative work, lack of skill, resistant to change, time barrier and less involvement of top management are such barriers in adopting TQM in Sri Lanka. Further the study suggest that barriers must be mitigated cautiously for a better consequence.

Keywords: Barriers; Solutions; Total Quality Management (TQM).

1. INTRODUCTION

“Construction industry in any country is a massive, complex and high-risk sector, dominated by contracts” (Gunathilake & Jayasena, 2008). According to Gunathilake and Jayasena (2008) the construction industry has a direct impact on the national economy and is generally used as an indicator of economic well-being of the country. For the past six years in the Sri Lankan context, the construction industry has become a major part of Sri Lanka’s rapid economic development and construction organizations are the major representatives of the industry. In the current global competitive environment, the importance of quality has been increased. Nowadays, due to the quality demanding, customers and the massive competition, organizations are more concerned in adopting their own innovative strategies for quality and excellence (Al-Dhaafri et al., 2016). Moreover, the construction industry in many parts of the world suffers from problems such as workmanship defects, quality defects, time, and cost overrun (Harrington et al., 2012). According to Al-Dhaafri et al. (2016) organizations need to implement an advanced management philosophy that can help them to achieve competitive advantages over their rivals for face these problems. Such management philosophy can be initiated through the effective implementations of a Total Quality Management (TQM) philosophy (Harrington et al., 2012). However, TQM in the construction industry is not much popular compared to manufacturing industry. Moreover, Lakhe and Mohanty (1994), stated that there are several obstacles encountered in implementing

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TQM specially in the developing nations. The anecdotal evidence suggests that the application of TQM is poor in Sri Lankan construction firms. However, according to Bardoel and Sohal (1999) TQM helps to improve better control of processes resulting in consistency from design through to delivery in a construction organization. Therefore, research tends to investigate the applicability of TQM for the Sri Lankan construction contracting organizations.

2. TOTAL QUALITY MANAGEMENT

TQM can be defined as a holistic management philosophy aiming at continuous improvement in all functions of an organization with customer satisfaction to produce and deliver commodities or services in line with customers' needs or requirements with the participation of all employees under the leadership of top management (Demirbag et al., 2006). TQM started to be used in the mid-1980s and became a recognized part of the quality-related world in the late 1980s (Martínez-Lorente et al., 1998). Powell (as cited in Martínez-Lorente et al., 1998) reported that TQM's origins can be traced to 1949, when the Japanese Scientists and Engineers formed a group of engineers and government officials to improve Japanese productivity, and enhance their quality of life after the war. The early evolution of the total quality movement was hardly influenced by few quality pioneers such as Deming, Feigenbaum, Ishikawa, Juran and Crosby (Krüger, 2001). According to Krüger (2001) the contribution of these quality gurus is greatly substantial to today's understanding of TQM. However, most of the quality gurus who have contributed to the improvement of TQM, find their genesis from Deming (Zairi, 2013). The word 'total' in TQM means all functions of the enterprise (Vincent & Joel, 2004). Moreover Besterfield et al., (2005) stated that total stands for "made up of the whole". The second word of TQM is 'quality'. Quality is not a modern concept. Its origins runs towards the ancient history. The concept of Quality has been used through different civilizations for several ages. For example, ancient food collectors had to think about which food is good and which is not good to eat (Elassy, 2015). As for the literature, quality is not a unitary concept. Green (as cited in Elassy, 2015) reported five approaches to define quality. Moreover, quality pioneers such as Deming and Juran explains quality in different manners.

2.1. WHY TQM FOR CONSTRUCTION CONTRACTING ORGANIZATIONS?

However, notwithstanding such kind of quality management systems, still the construction industry is suffering from range of quality problems. According to Battikha (2003) quality related problems can cause penalties, as well as cost and time burdens for rework which directly leads to loss of market share and profit reductions to the construction firm, while it will result in dissatisfaction to the client from problems related to safety, service, and economy. Therefore, a further developed quality management system should be adopted by construction organizations to get rid of these problems. As it has been noted under the quality evolution topic, the last item of the quality evolution graph, TQM can be a solution for the current situation of the construction organizations. Moreover, The construction industry is a heavily characterized, fragmented and freely structured system with the skills, allegiance and direction of various kind of professionals and practitioners (Pheng & Ke-Wei, 1996). According to Pheng and Ke-Wei (1996) the short-term nature of construction projects do not help to create things worthier. Therefore, new methods of procurement are required to overcome the problems caused by the complex nature of construction. The construction industry and the manufacturing industry both are having certain characteristics, such as both focus on product delivery (Lau *et al.*, 2015). Therefore, the TQM philosophy, which was developed in manufacturing industry, can be used in the construction industry as well, and it will be beneficial for all the parties in the industry.

TQM is relatively new for the construction industry, but it has made a noticeable influence during the past three decades (Maher-Altayeb & Bashir-Alhasanat, 2014). The principles of TQM helped companies to recover their markets in rival business environments. Therefore according to Maher-Altayeb & Bashir-Alhasanat (2014) construction organizations were encouraged to use the concept of TQM in their market sector. However, the level of usage of TQM principles in the construction industries is vary from country to country (Xiao & Proverbs, 2002). While the US and European construction industries began to develop TQM in the late 1980s, the Japanese construction industry introduced TQM in the 1970s. According to Xiao and Proverbs (2002), the usage level of TQM is relatively lower in developing countries than in developed countries.

2.2. TQM ELEMENTS WHICH ARE NECESSARY FOR CONTRACTING ORGANIZATIONS

Over the past few decades, the quality gurus namely; Deming (in 1986), Juran (in 1986), Crosby (in 1979), Feigenbaum (in 1983) and others have improved and developed certain aspects in quality management and their illustration into quality management provide a better knowledge of quality management principles (Karuppusami & Gandhinathan, 2006). However, the same basic drawback has been shared by all of them, that how to manage quality to gain a competitive advantage through a greater customer satisfaction and with a better performance (Aquilani *et al.*, 2017). According to Aquilani *et al.* (2017) in addition for this customer satisfaction, in new business environments such as value co-creation, the importance of quality management is recognized to be dominant. Therefore rather than disposing those traditional quality management principles they must simply be reinterpreted with major elements to ensure the quality of fulfilled experiences. However, according to Salaheldin (2009) the first step before implementing of TQM in any background is to identify its most important and substantial points. There were several studies that have been undertaken on identification of these points, commonly referred to as major elements and also critical success factors (CSFs) (Mehralian *et al.*, 2016). According to Aquilani *et al.* (2017) these elements may be viewed as variables that determine organization's performance through successful execution of TQM. The elements can be defined as the critical areas which organization must implement to achieve its mission by examination and categorization of their impacts (Oakland & Aldridge, 1995). According to Kumar *et al.*, (2011), major elements of TQM are leadership and top management commitment, customer satisfaction, continuous improvement, teamwork, employee training, and effective communication.

2.3. TQM TECHNIQUES AND TOOLS WHICH ARE NECESSARY TO CONTRACTING ORGANIZATIONS

Other than TQM elements, TQM tools are another important aspect regarding TQM. According to Hellsten and Klefsjö (2000) a TQM tool have a statistical basis to support, facilitate analysis data and for decision making. The three components, which are elements, techniques and tools, are interdependent on each other and support each other for success of the TQM. As for example, the element of customer satisfaction cannot be implemented without a suitable technique. One of technique might be quality circle. However, this technique will not work effectively and efficiently without the use of specific tools such as Pareto diagram, histograms. Even more, tools and techniques are practical methods, skills or mechanisms that can be applied to particular tasks and can be used to ease clear changes and improvements (McQuater *et al.*, 1995). Arditi and Gunaydin (1997) stated that for a better feedback which is a major element of TQM, these quality tools are essential. Besides, teams with these tools can identify the causes of quality problems and can verify, repeat, or reproduce measurements based on data, to determine the future status of a work process by examine the past and present, and to make decisions on facts that are based on data rather than the opinions of individuals or other groups (Arditi & Gunaydin, 1997). Namely, cause and effect diagrams, Pareto analysis, control charts and flowcharts can be identified as quality tools which are important to construction organizations. On the other hand, 5S practice is one of the most important technique that will provide base for the implementation of TQM for an any kind of organization. Table 1 will provide basic definitions on such kind of TQM tools.

Table 1: TQM Tools

Tool	Definition
Cause and effect diagram	A schematic tool that resembles a fishbone that lists causes and sub-causes as they relate to a concern, also known as Fishbone diagram or Ishikawa diagram
Check sheet	A form used to collect, organize, and categorize data so it can be easily used for further analysis
Histogram	A graphic display of the number of times a value occurs
Pareto diagram	A bar chart that organizes the data from largest to smallest to direct attention on the important items (usually the biggest contributors)
Process flow diagram	A graphical illustration of the actual process
Scatter diagram	A graphical tool that plots one characteristic against another to understand the relationship between the two
SPC control chart	A graph of time-ordered data that predicts how a process should behave

Source : (Hagemeyer *et al.*, 2006)

3. METHODOLOGY

The research focuses on feelings, attitudes and beliefs of a group of people, about the applicability of TQM for the Sri Lankan construction firms. The research problem is ‘what are the barriers in implementing TQM in contracting organizations?’. Thus, the research problem is subjective. The results have to be presented in a subjective manner. It seeks to explore and understand a phenomenon such as “what?” and “why?” rather than trying to confirm a hypothesis about phenomena such as “how many?”. Therefore, this research has been conducted according to the qualitative approach. However, there are several methods to collect data in a qualitative research such as interviews, focus group discussions, photo voice and picture story. Among those, semi structured interview is the suitable method because it will provide primary data in such a way to gather information to a greater depth in a low rate of non-response with the control of sample more effectively. However, Kothari (2004) stated that this kind of method remains the possibility of the bias of respondent. Therefore, selected professionals were interviewed in a way that bias could not occur.

In content analysis, which is a qualitative data analysis method, start with some ideas about the hypotheses, or issues that may arise, and look for them in the data which has been collected. But in other methods, such as statistical data analysis methods look only for the collected data, not interested in literature (Schutt & Chambliss, 2013). Therefore, the content analysis, which is a research technique based on systematic text description has been used as the data analysis method for this research. A Qualitative research basically focuses on a limited number of respondents (Rajasekar *et al.*, 2006). They will be selected purposefully, with the belief that they have in-depth knowledge of the issue discussing in the research problem. For the current research, snowball sampling was selected. Because it helps to ask from others to identify people who have in-depth understanding about TQM. However, qualitative research generally does not involve the use of a fixed sample size. (Robert, 2011). According to Robert (2011) saturation is a tool that is used to ensure that adequate and quality data are collected to support the study. When the variation of data is degraded, when new perspectives and explanations from data are no longer coming in, saturation point may be approached. According to Kothari *et al.* (2014) saturation point can occur after 12 or most of the cases after 6 interviews. However, while doing ten semi-structured interviews, saturation level reached. Therefore, total number of semi-structured interviews was limited to ten. The profile of interview participants as follows.

Table 2: Profile of Interviewees

Interviewee	Designation	CIDA grade of the organization	Industry experience
R1	Acting Head of QA Division	C1	17 Years
R2	Project Manager	CS2	20 Years
R3	Contracts Manager	CS2	10+ years
R4	Manager Projects	CS2	21 Years
R5	Assistant General Manger	CS2	20 Years
R6	Chief Structural Engineer	CS2	15 years
R7	Project Manager	CS2	14 Years
R8	Senior Project Manager	CS2	14 Years
R9	Contract Manager	CS2	11 Years
R10	Senior Project Manager	C1	11 Years

4. DATA ANALYSIS AND RESEARCH FINDINGS

4.1. CURRENT QUALITY MANAGEMENT PRACTICES IN CONTRACTING ORGANIZATIONS

As per research findings, many of the organizations having ISO 9001 quality policy, which is a quality assurance procedure, coming on the way to TQM. However, just having a quality assurance is not enough for TQM. Because just having an ISO certificate will not ensure that particular organization has adopted TQM. Until getting a quality award such as Deming prize, Malcolm Baldrige National Award or European Quality Award, any organization could not mention that they have been awarded as a TQM adopted organization. However, having such quality assurance in hand is a useful thing when going towards TQM.

Leadership and top management commitment is one of the major element in TQM. However, according to the findings, the current level of commitment that top management shows towards the quality is in a satisfactory level or more because the top management commitment towards quality is a major key factor in determining TQM success. Moreover, the top managers are consistently participating in activities to improve the quality of the organization is also agreed by all the respondents which means in each and every project the top managers participate in quality related problems and take necessary actions to improve the quality of the organization. Moreover, the organizations which have a formal mechanism system to recognize its employees through a suggestion scheme or improvement of ideas are very few. All the employees must be recognized through a suggestion scheme. Their improvement of ideas should be evaluated and recognized. Conducting this kind of employee recognizing procedure is top managers' responsibility. However, all the respondents who mentioned that they have an employee recognizing mechanism, is limited to several kinds of employees. Not for all the employees in the organization. Therefore, it is not enough for an organization who are trying to adopt TQM.

Customer satisfaction is another most important element in TQM. Because the quality is based on customer's expectations. TQM is about one hundred percent customer satisfaction. Most of the respondents mentioned that, even they do customer satisfaction surveys it is limited from beginning of the project until the end of defect liability period. However, having a customer satisfaction of that level is not enough for TQM. Organizations should carry out the customer satisfaction surveys even after the end of the defect liability period. That is the way to get customer satisfaction which has been mentioned in TQM. Because as for literature findings, during the consumption and after the consumption of a product or service, customers will develop positive feelings of satisfaction or negative feelings of dissatisfaction. Furthermore, none of the respondents mentioned that he or she disagrees with the organizations assessing of future customer needs and expectations. However, none of them mentioned that they strongly agree with it. Because of the ISO requirement, they only do the complaint handling procedures and seek customer views.

Continuous improvement is an ongoing process which is helpful to develop an organization's quality environment. Learning through mistakes, procedures are most important in continuous improvement. However, within these contracting organizations learning through mistakes procedures are not practicing that much well. Because continuous improvement talking in TQM does not allow for repeat the same mistake again. However, according to the research findings the same mistake is happening again within these organizations. Continuous improvement talking in TQM does not allow for repeat the same mistake again. Continuous improvement is a step-by-step process. As for the literature findings the PDCA (Plan-Do-Check-Act) cycle is the best tool to use in continuous improvement process. However, most of the respondents mentioned that they even do not know about it.

Employee training is another element in TQM, which helps employees to gain particular knowledge and skills to improve their performance. However, training identified in TQM is not that simple, as per literature findings each and every level of employee should be trained to get a better performance to the organization. Without this requirement, TQM could not be achieved. In these contracting organizations this procedure is not happening. All the respondents mentioned that their organizations have various kinds of training programs for employees. But when the question raised whether each and every level of employee is being trained, the answer was 'no'. Additionally no single organization conducts training programs regarding TQM for their employees according to the respondents. Therefore, contracting organizations should think about TQM training for their employees. However, it is important to conduct TQM training for top level managers first, before providing it to lower level employees.

The fifth TQM element which has been investigated in this research was 'Teamwork'. Any construction project is a team effort. However, that team should be purposeful and effective. Further, these teams are not only the project teams, which consists of designers, subcontractors, suppliers and customers. There can be other several number of teams within the organization. For example, quality circles can be within the organization to develop quality procedures within the organization. However all the respondents mentioned that they have a successful teamwork approach in place, when undertaking any project. It is a good sign for TQM adaptation.

Effective communication is yet another major element of TQM. However, the respondents mentioned that there are several communication tools which are being used within their organizations to communicate with each other. However, all the respondents mentioned that they are using progress review meetings as a communication tool. Moreover, emails are also used as an effective communication tool. Only a little number of organizations are using organization magazines and quarterly newsletters as communication tools.

Therefore, they have to develop communication system within their organizations by using these kind of communication tools.

Moreover, the usage of quality tools is at a very low level within these contracting organizations. As for example, Pareto diagrams are a major tool that can be used in contracting organizations. The purpose of the Pareto chart is to identify the most important elements among a typically large set of factors. In quality control, it often illustrates the most common sources of defects or the most frequent reasons for customer complaints, and so on. However, no any single organization, which has been selected to the research, is using Pareto diagrams. Therefore, these kind of quality management procedures will not help to develop TQM within these contracting organizations. Table 3 illustrates the usage of quality tools within their organizations. According to below table check sheets, process flow diagrams and histograms are the mostly used quality tools in these contracting organizations. However, PDCA cycles, SPC charts, Pareto diagrams and 5Why analysis are not that much popular within these organizations. However, those quality tools are required for quality related matters within organizations. Without using these tools, these organizations are going away from their total quality concept. Moreover, PDCA is a very effective tool or sometimes act as a TQM technique in the continuous improvement process.

Table 3: Usage of Quality Tools

Quality tool	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
Cause and effect diagrams	✓	✓			✓	✓				
Check sheets	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Histogram		✓		✓		✓		✓	✓	✓
Pareto diagrams										
PDCA cycle	✓				✓					
Scatter diagrams	✓					✓				
SPC charts					✓					✓
Process flow diagrams	✓	✓	✓		✓	✓	✓	✓	✓	
5Why	✓									

However only two respondents mentioned that their organizations are using PDCA cycle as a technique for the continuous improvement process. Another important tool is 5Why analysis. It directs the analyser for the root cause of a problem after asking the question ‘why’ several times. Obviously, the reason for this is the lack of knowledge regarding this kind of quality tools. As an illustration respondent R3 mentioned, “*I don’t know much about those tools; therefore I can’t give a valid explanation*”. Especially when the top-level managers do not have a knowledge about these tools, then how the other people would know. Because TQM is a philosophy, which is addressed total. Even the labour at a site should be able to analyze a problem using 5Why. Most of the respondents stated that their knowledge about this kind of quality tools is poor. In addition, one mentioned that lack of experience regarding these tools is also a barrier for usage of quality tools. Even though they have the knowledge, it is not enough. There should be an environment to use these tools within the organization.

4.2. BARRIERS TO IMPLEMENT TQM IN CONTRACTING ORGANIZATIONS

According to the study, several barriers were identified for the proper implementation of leadership and the top management commitment under Sri Lankan context. Most of the respondents mentioned about the financial barrier. Because of the low finance availability, they could not conduct employee suggestion scheme for each and every employee. Moreover, some respondents stated that the lack of skills and knowledge about the quality concept are also barriers to an excellent top management commitment with regard to quality improvement of the organization. In addition, time barrier, resistance to change for a quality environment and insufficient collaborative work also came out as barriers for a proper top management commitment towards the quality, within the organization. Figure 1 illustrates the identified barriers using NVivo 11 software.

Name	Sources	References
Barriers for Leadership and top management commitment	0	0
Financial barrier	5	5
Insufficient collaborative work	1	1
Lack of skill	3	3
Resistant to change	2	2
Lack of knowledge	3	3
Time barrier	1	1
Top managers direct involvement is less	2	2

Figure 1: Identified Barriers for Top Management Commitment

Without the customer satisfaction any organization cannot achieve TQM. However, the research identified several barriers under customer satisfaction. Almost all of the respondents mentioned financial barrier as a huge problem. Doing a customer satisfaction survey is very costly as for their opinions. However, some of them stated about that insufficient time is also a massive problem to do such kind of surveys even before the defect liability period. In addition, one respondent mentioned that if the level of relationship with the customer was at a minimum level then it would be a problem for having a better customer satisfaction. Because having a good direct relationship with the customer is always better. Moreover, changing customer needs from time-to-time was also mentioned as a barrier to a proper customer satisfaction.

Continuous improvement can be achieved through having quality circles within the organization. Almost all of the respondents mentioned about the financial barrier. To adopt continuous improvement procedures, there should be sufficient budget allocation for that. Even in government sector or private sector the financial problem is everywhere. Having insufficient finance allocation they could not conduct additional continuous improvement programs. Secondly most mentioned barrier was carelessness of the employees and the lack of employee involvement. Even the main point of continuous improvement, which is learning through mistakes, they could not do accurately because of employees' carelessness. In addition, the involvement of the employees is also at a low level for this kind of quality improvement procedures. Three respondents mentioned that time is also a big problem because time is a limited thing. Without having time, nothing be done. In addition to these barriers, over workload, lack of competent managers to handle continuous improvement process and insufficient communication system within the organization were also identified as barriers for continuous improvement in the organizations.

Employee training is another element of TQM. Almost all the respondents identify financial barrier is a critical problem to these kind of training programs. Moreover, insufficient time also came out as a barrier from most of the respondents. Other than that the high employee grievances popped as a barrier for training programs. Since the current procedure is giving training for limited number of employees who were selected, others' grievances are getting high. Moreover, due to poor performance of the above employee selection procedure, unsuitable employees are being selected rather selecting suitable employees. In addition to those barriers, some other several barriers also came out such as negative view of the top managers regarding conducting training programs for employees, employees' lack of commitment for training programs and useless employee problem. While some employees are rising grievances about their non-selection, on the other hand some are giving very low commitment for such kind of training programs. Therefore, these mentalities must be totally removed for a TQM adoption. The respondent R6 mentioned, "Even if we give training for everyone, there are some employees who couldn't learn something and they are incapable". Therefore, this kind of employees, is a problem to the organization.

Teamwork is another element in TQM. However, several barriers were identified for the proper implementation of teamwork in the industry. Different personal attitudes in different people is one of the most significant barrier identified by many respondents. Because team should walk in a common path to a common goal. Because of these different attitudes, it will become more difficult. Respondent R3 gave his opinion like this. "It depends on personal behavior. In a country like Sri Lanka, we can't go for team work and take a win-win scenario. Our people are not accepting that. Always try to argue with each other. Try to fight each other. For example, when a dispute arisen, every party tries to convey their opinion is right, and other one is wrong. Having this kind of attitude, we can't derive the actual benefit from team work". In addition, lack of collaborative work also came out as a barrier for teamwork among several respondents. Another barrier

identified was the carelessness of the employees. When working as a team all the team members work with an effective manner. Without being careless. Other than these barriers there were some other barriers which were identified. Occurrence of the idle time, reducing the decision making process and lack of taking responsibility are those. Respondent R9 stated, *“Sometimes they just pass the time because some work should be completed, before starting their work. Until then they are just waiting. I think these are coming from our culture”*. Nevertheless, because of the teamwork concept, some people do not take responsibility. Respondent R7 highlighted, *“Some employees try to shirk their responsibility because of the team work. They think that “it is not my job, it is up to us” and give the whole work to others”*. Accordingly, there are several barriers to adopt purposeful teamwork with an organization.

Effective communication is the last element of TQM which has been discussed in this research. However, there were several barriers identified for the effective communication. Almost all the respondents mentioned about the language barrier. In an organization, there are people who are working in different nationalities and in different culture. For an effective communication, this is a major barrier as for their point of view. Another identified major barrier is the carelessness of the employees. As per respondent R6, *“Also carelessness is there. Sometimes the message doesn’t reach the targeted people. It stuck in the middle because of carelessness”*. This kind of mistakes should not occur in an organization who are looking for adopting TQM. Furthermore, the lack of management commitment is also identified as a barrier for effective communication. Management commitment should be everywhere. Because the leadership and the top management commitment is one of the major element of TQM which was discussed above”. Moreover, lack of attention is also identified as a barrier for an effective communication system. Respondent R3 stated, *“Also the listening skill should be there, some people do not have the patience to listen. Sometimes in meetings, a particular thing is being said a lot of times. But finally they got it in a different manner”*. Therefore, this kind of bad qualities should be avoided when walking towards TQM. Other than these barriers, some other barriers were identified by a few respondents. They are lack of relationship between employees, insufficient communication skills and the cultural barriers. Respondent R4 highlighted, *“Also in some organizations the bottom level employees haven’t any chance to reach top level managers. So this can also be a communication barrier. Because the relationship between the employees are not that good. Therefore, communication doesn’t work well”*. Therefore, this also occurs because of the leadership and the top management commitment is not in a good position in those organizations.

Moreover, there were several barriers identified for the usage of TQM tools and techniques also within these organizations. Resistance to change, insufficient time, lack of knowledge about those tools, unavailability of funds and finally the carelessness of the employees are those barriers. Resistance to change is one of the major barrier, which was identified by most of the respondents. Respondent R2 mentioned, *“The main difficulty is the resistance to change. Employees already like to maintain the practices, which are being used for a long time. Because of that it’s difficult to adopt new practices at once”*. Moreover, financial barrier represents on this matter also. Hence a developing country this financial barrier is a common situation which has been faced by all the industries within the country. Moreover, the respondent R2 illustrates another major barrier that reduce the TQM adoption in contracting organization. According to respondent R2, the unstable labour force is a critical situation that the industry faces in present. Without having a stable labour force, TQM could not be possible. Furthermore, the respondent R4 stated that adopting TQM within contracting organizations is not enough. According to respondent R4’s opinion, all the parties who involve in a construction project should adopt TQM to get the best outcome from TQM implementation.

4.3. SOLUTIONS FOR THE BARRIERS

According to the opinion of the respondents and the literature findings, there were many barriers against adopting TQM. One major barrier is the financial unavailability. Almost all of the TQM elements discussed above were suffering because of the financial unavailability within these organizations. Therefore, they have not any chance to develop their quality management systems for a better status. However, as a developing country, these organizations could not grant that much of finance for quality improvement procedures. Identify the main problem that causing the financial difficulties, get the financial support from banks and identify new ways which generate income are the solutions for the financial barrier. For an example contracting organizations can become developers to generate additional income. Prepare time tables, change the attitudes of the employees, allocate the work load effectively and conducting training programs are some of the solutions for the time barrier.

Employees' resistance to change can be overcome through identifying the root cause of resistance and prepare necessary plans to address the root cause. The best way to identify the root cause of resistance is through a personal conversation between a resistant employee and their supervisor, which leads to the final tip for managing resistance. With the knowledge of primary root causes, change management teams can adequately prepare an exciting case for the need for change, which is communicated by senior leaders in the organization. Moreover, communicate the change effectively, implement change in several stages and engage top managers as active and visible sponsors of change are some other solutions for the resistance to change barrier. Lack of skill and knowledge is another major barrier in TQM adaptation. However allocate more funds on training programs, implement pre-defined recruitment process and performance evaluation can be recognized as solutions for this barrier.

Besides, the communication barrier can be mitigated through selecting leaders who are having great communication skills, encourage team work, training on communication tactics and organizing extra-curricular activities within the organization. Another industry specific barrier for TQM is unstable labour force. Interview applicants carefully, introduce flexible work structure, pay attention to employees' personal needs and create the path to career growth are some of the solutions for the unstable labour force problem. It cannot be practicable for apply all these solutions at once within an organization. However, it also not be impossible to initiate these solutions in step by step as a continuous improvement procedure.

5. CONCLUSIONS AND RECOMMENDATIONS

This paper signifies the applicability of TQM for Sri Lankan contracting organizations. However, according to the research findings, the present quality management procedures within contracting organizations are not at a very much satisfactory level. When talking about total quality, that procedure is not even at satisfactory level. However, several barriers were identified as major difficulties to adopt TQM in contracting organizations. Insufficient budget allocation and insufficient knowledge about TQM are the most critical barriers. Moreover, the total concept is not practicable sometimes, due to several characteristics in the construction industry. Construction project is consists with several parties such as main contractor, designers, subcontractors, suppliers etc. However, adopting TQM only for main contracting organization is not enough for the perfect quality of the output. All the parties, which were mentioned above, should be adopted TQM within their organizations. Otherwise, the best performance of TQM could not be achieved through the final output.

Nevertheless, the labour problem within the industry is also a significant barrier for the TQM adoption. In Toyota, which is an organization adopting TQM in present, they have stable labour force. However, in Sri Lankan construction industry the labour force is not stable. Even if a labour was well trained for TQM, but what is the point of giving him a such kind of training, if he left the organization two or three weeks later. Therefore, these kind of characteristics within the industry is also reduce the adoption of TQM within contracting organizations. However, when considering benefits of TQM for the construction industry as mentioned above it is give an acceleration for TQM adoption. However, as per the research findings, TQM is applicable for contracting organizations in Sri Lanka. First, the current malpractices within the industry such as labour problem should be avoided. Subsequently, a proper knowledge regarding TQM should be provided. Ultimately, allocating sufficient money and time will supply the foundation to TQM within contracting organizations. After that, other parties who involved in a construction project can also adopt TQM for a most perfect quality output.

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