

Quality assessment system in construction



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1. 0 Introduction

Quality assessment system in construction industry is a system or method to measure and evaluate the quality of workmanship of a construction work based on the relevant approved standard. This assessment sets out the standard on quality of workmanship for various construction elements of building and infrastructure construction work. The quality of workmanship of a construction work is assessed according to the requirement of the relevant standard, and marks are awarded if the workmanship complies with the standard, (CIDB, 2011).

According to Wong, (2007), one of the hallmarks of a developed construction industry is in the output of quality buildings and structures. It is therefore critical to inculcate among professionals, contractors and end-users the awareness of quality products and good designs, not only to raise the standard of the industry's products, but also to reduce wastage arising from rework. The Quality Assessment System in Construction (QLASSIC) developed by CIDB is an independent method to measure and evaluate the quality of workmanship and finishes of construction works based on objective comparison through a sampling and statistical approach. The Malaysian construction industry stakeholders are looking forward to action plans by CIDB in implementing QLASSIC with incentives as has been the case for the Construction Quality Assessment System (CONQUAS) in Singapore.

Mahmood. et al. (2010) stated the quality management system is being increasingly applied to the construction company to solve quality problem. The implementation of this system required a culture change and change in

management behaviour. The organization need to shift from their current culture to a quality management system culture that focuses on quality as a key strategy. A review of literature identifies ten important culture elements that contribute to successful implementation of quality management system, which include leadership and top management commitment, customer management, training and education, teamwork, people management and empowerment, supplier partnership, quality planning and strategic, process management, rewards and recognition and effective communication.

2. 0 Problem Statements

Nowadays, the quality of the building becomes an issue when many accidents occurred related to the building failure such as building collapse. Many criticisms received from public about this quality of the building. This has proven when Mahmood et al. (2010) stated that construction industry in Malaysia has been viewed as one of the sectors that have a poor quality compared to other sectors such as agriculture or automotive sector.

This is supported by Said et. al. (2009) when he claims that there were misunderstandings among the organization player on Quality Management System (QMS) concepts has become a stumbling block for its successful implementation. Said et. al (2010, c. f SIRIM 2005) also found that QMS could be implemented either at the organization level or at the project level itself.

Looking at the construction industry scenario in Malaysia, there are approximately 4000 ISO 9001: 2000 QMS certified organizations in the Malaysian construction related industry. However, the number is still relatively small when compared to the total number of 63, 204 organizations

in this industry. Looking at the current scenario in the Malaysian construction industry, QMS compliance is a required factor to improve the quality of the Malaysian Construction Industry. Keng and Hamzah (2011, c. f Haupt et al. 2004) also found several problems found in implementing the quality assessment system on construction site such as too much paperwork, transient nature of workforce, field employees regard quality management as irrelevant, difficulty in measuring results, and subcontractors and suppliers not interested in assessment

3.0 Aim and Objectives of the Study

The aim of this research is to study the impacts of implementation of quality assessment system in construction projects.

Objectives:

To identify the advantages from implementation of Quality Assessment System in Construction (QLASSIC) system in construction project.

To determine the challenges in implementing quality assessment system in construction project.

4.0 Scope and Limitation

Among the parties involved in construction, the contractors are the one who know the real situation in the construction compared to others. Beside that, the contractors also know the whole process in construction starting site possession until the projects is completed. Therefore, this research will be conducted with focusing:

Only to contractor G6 or G7 (CIDB) that already engaged with high cost construction project that focus on quality of the building and client's satisfaction as a main priority.

The limitation of the research survey only focus on Klang Valley area because this area was highly developed with new buildings design.

5.0 Research Methodology

Primary Data

A set of questionnaire will distribute to collect valuable data for this research. This interview may conduct to the targeted group in construction projects or organization.

Secondary Data

The researcher found literature review as his secondary resources with aim to investigate the previous research and body of knowledge about the quality assessment system in Malaysian construction industry.

Problem statement

Objective 2

To determine the challenges in implementing quality assessment system in construction project.

Objective 1

To identify the advantages from implementation of Quality Assessment System in Construction (QLASSIC) system in construction project.

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Literature review

Questionnaire

Case study

Comments and conclusion

Impacts of implementation of quality assessment system in construction projects.

Figure 1. 1: flow chart of research process

CHAPTER II: LITERATURE REVIEW

2. 1 Quality Assessment in Construction (QLASSIC)

2. 1. 1 Introduction

According to CIDB (2006), Quality Assessment System for Building Construction Work (QLASSIC) is an independent method to assess and evaluate the quality of workmanship of building projects based on the standard stated as a guideline. Yin (2012), added that Quality Assessment System in Construction (QLASSIC) is a system to measure and evaluate the quality of workmanship of a construction work based on the relevant approved standard. QLASSIC enables the quality of workmanship between construction projects to be objectively compared through a scoring system. The purpose of this scheme is to enable a construction project to be undergone in standard of procedure in order to ensure the quality of workmanship in the works

The construction industry and the private sector plays an important role in creating wealth and improving the quality of life of Malaysians through interpretation of socio-economic policy of the government's social and economic infrastructure and buildings. In addition, the construction industry creates multiplier effects to other industries, including manufacturing, financial services, and professional services.

The Construction Industry Development Board (CIDB) (2006), has published a special guideline for measuring the quality of construction and become As a parameter for the level of quality achieved in a construction project in Malaysia. Rating of the workmanship will be made through site inspections. Assessments will be conducted by a qualified evaluator of QLASSIC registered, trained and have passed the training conducted by the CIDB

2. 1. 2 Objectives of QLASSIC

Masters Builders Association Malaysia (MBAM) (2006), stated that CIDB list down objectives of the QLASSIC system:

- To elevate the level of quality in the construction industry.
- To have a standard quality assessment system as a benchmark for quality of construction works.
- To assist contractors to achieve defect-free when carrying out construction work.
- To be used as criteria to evaluate the performance of contractors based on quality of workmanship.
- To be used for data compilation for statistical analysis in estimating the level of quality and productivity of the construction industry.

2. 1. 3 Scopes of QLASSIC

CIDB (2006), stated that this assessment is set out for the quality of workmanship for the various aspects of the construction elements for the general building works. It will cover four main components which is, Structural works, Architectural works, Mechanical and Electrical (M & E) works and External works. Assessments on the workmanship are carried out based on this standard and marks are awarded if the workmanship complies with the standards. These marks are then summed up to give a total quality score (%) for the building project.

However, the assessment excludes works such as piling, foundation and sub-structure works which are heavily equipment-based and called under separate contracts or sub contracts. The building is assessed primarily on workmanship standards achieved through site inspection and field testing. The assessment is done throughout the construction process for structural and M & E works. For completed building projects the assessment is done for architectural, M & E fittings and external works. Apart from site inspection, the assessment also includes field tests, test results on the material and the functional performance of selected services and installations. These tests help to safeguard the interest of building occupants in relation to safety, comfort and aesthetic; these defects may surface only after sometime.

In addition, MBAM (2006), stated that QLASSIC sets out the standards for various construction elements in building work and other infrastructure work. The quality assessment on the workmanship and finishes of the construction work is based on these standards and points are awarded if the workmanship and finishes comply with the standards. These points are then summed up to

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give a total quality score called the QLASSIC Score (%) for a project. The assessment is conducted at the construction site through inspection and field testing. The score will be done on construction works that are inspected for the first time. Construction works that are rectified and corrected after the assessment will not be rescored. The objective of this practice is to encourage contractors to “do things right the first time and every time”

2. 1. 4 Components to be assessed

According to QLASSIC (2006), the quality standards for building construction work are divided into four main components:-

a) Structural works

The structural integrity of the building is of paramount importance as the cost of failure and repairs are very significant. The assessment of structural works comprises:

Site inspection of formwork, steel reinforcement, prefabricated or pre-cast elements, etc. during construction.

Laboratory testing of compressive strength of concrete and tensile strength of steel reinforcement.

Non-destructive testing of the uniformity and the cover of hardened concrete.

b) Architectural works

Architectural works deal mainly with the finishes. This is the part where the quality and standards of workmanship are most visible. Architectural works
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are works such as floors, internal walls, ceiling, door and window, fixtures and fittings, external wall, roofs, driveway, porch and apron.

c) Mechanical and Electrical (M & E) works

The quality of M & E works is important in view of its increasingly high cost proportion and its impact on the performance of a building. The assessment covers electrical works, air-conditioning and mechanical ventilation works (ACMV), fire protection works, sanitary and plumbing works, lifts, escalator and other basic M & E fittings.

d) External works

External works cover the general external work elements in building construction such as the linkways/ shelters, drains, road works, car parks, footpaths, turfings, playgrounds, gates and fences, swimming pools, hardscapes and electrical substation.

2. 1. 5 Assessment approach

In general, the assessor determines the samples or elements to be assessed to each assessment. The samples are selected from drawings and plans. The selected samples shall be distributed as uniformly as possible throughout the project and construction stages. All locations are to be offered for the assessment. The scoring will be done on the works that are inspected for the first time. When an assessed item does not comply with the corresponding QCLASSIC standards, it is considered failed and an “ X” will be noted in the assessment form. Likewise a “ v” is given for an item meeting the standards. A “-” will be given to indicate that the item is not applicable. The score is

computed based on the number of “ v” over the total number of items assessed. (CIDB, 2006)

MBAM (2006) stated that, it is impractical to assess all elements in a construction project, QCLASSIC assessment uses a sampling process to carry out the assessment. The samples are selected from drawings and plans of the relevant construction project.

a) Structural Works

The assessment is carried out throughout the various construction stages. The numbers of samples are determined based on the gross floor area (GFA) of the building with a minimum and maximum number of samples.

b) Architectural works

The assessment is carried out upon completion of the building project and before handing over of the project. The samples are determined based on the gross floor area (GFA) of the building with a minimum and maximum number of samples.

c) Mechanical and Electrical (M & E) works

The samples are determined based on the gross floor area (GFA) of the building with a minimum and maximum number of samples. For completed projects the assessment is carried out upon completion of the building project and before handing over of the project. For projects in progress the assessment is carried out throughout the various construction stages.

d) External works

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The assessment is carried out upon completion of the building and before handing over of the project. The numbers of samples are determined based on (10m length section/ location) with a minimum number of samples.

2. 1. 6 Evaluation process of QLASSIC

START

Architectural work

Structural work

M&E work

External work

Developers / contractors shall made application

APPLY TO CIDB

- SCOPE OF EVALUATION

Numbers of sample is based on guideline in CIS7

Samples are identified before assessors make an evaluation

- SAMPLING FROM ASSESSOR

Qualified assessors will assess the samples. The quality standard based on CIS7.

- SAMPLING ON SITE
- QLASSIC SCORE (%)

Report from CIDB based on the evaluation by assessors.

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- FINISH

2. 1. 7 QLASSIC assessor

To be an assessor, the persons must attend the QLASSIC training course before being qualified to carry out the actual assessment at the construction sites. The QLASSIC assessors are continuously updated to ensure consistency and effective implementation of the assessment.

Requirements of QLASSIC assessor;

Malaysian citizen

Age: 25-60 years

Possesses an academic qualification in construction related fields such as architectural/civil/mechanical/electrical engineering/quantity surveyor or other fields

Successfully completed the QLASSIC Assessor Certification Programme.

Posses minimum working experience in the construction industry according to academic qualification as follows.

2. 2 Quality philosophy

2. 2. 1 Quality concept

Many definitions had been made in order to explain the terms of quality. Hoyle (1998), defined quality as a degree of excellence, conformance with requirements, the totally of characteristic of an entity that bear its ability to satisfy stated or implied needs, fitness for use. In addition, he also stated

quality as freedom from defects, imperfections or contamination. In other words, quality is focus on satisfaction needs and costumer's demand as a first priority. In construction industry, the offer from clients to contractor to do projects with a terms and conditions need to be followed by contractors and if the projects is completed according the requirements given is a quality products.

According to Besterfield (1998), quality cannot be measured by with number or it intangible and it only can be measure by personnel perception. Quality only can be quantified as follows:

$$Q = P/E$$

Where,

Q= Quality

P= Performance

E= Expectations

According to the formula, if quality is greater, the costumer has a good feeling about the products deliver.

2. 2. 2 Quality parameter

According to Hoyle (1998), difference in design can be classified or group into different class and the results can be good or poor. It is not enough to produce product only conform to the specification or supply services that meet management's requirement. Quality can be classified in three parameters which is:

Quality of design is the extent to which the design reflects a product or services that satisfies customer needs. All the necessary characteristics need to be designed into the product or service at the outset.

Quality of conformance is the extent to which the product or service conform to the design standard. The design has faithfully translating the client's need and it depends on the processes to realize the design into an actual end products.

Quality of use is the extent which the user able to secure continuity of use from the product or service. Products need to have a low cost of ownership be safe and reliable and maintainable in use.

2. 2. 3 Quality management

According to Juran (1989), basic purpose of quality management is to eliminate failure in services or products. Failure not only that products, process or services but it would be fail in their function or their function not satisfy to customer demand. Hence, the quality management consist of planning, organizing, controlling and preventing the products or services from failure. All the methods and technique that use in quality management must be useful to improve and increase the quality of the products or services. This quality management include inspection process. Inspection is a process where quality is measured before deliver the products or services to the customer. However, inspection alone is not enough to deliver quality products or services, it must adopt with the other practice to prevent failure.

Quality management is both technical and behavioural subject. Therefore, the management of quality involves many aspects of an organization and the <https://assignbuster.com/quality-assessment-system-in-construction/>

organization must make sure all its function inter-related and work efficiently and effectively because whenever any function fail to perform, they will effect to another.

2. 2. 4 Quality control

Quality control is the operational activities or techniques used to fulfil the requirement for quality. In other words, it is a process to maintain standards and prevent from failure. Standard can be control by process of selection, measurement and correction of work. Quality control can be applied in the processes that produce products by measuring the overall quality performance of the organization.(Juran, 1989)

There are steps to control the quality;

Determine what elements need to be controlled.

Determine whether it needs to be control before, during or after the result.

Establish details for the parameter to be controlled.

Establish plans for control which specify the means by which the characteristics will be achieved and variation detected and removed.

Organize resource to implement the quality control.

Install sensor at an appropriate point in the process.

Collect the data.

Analyze the results.

Propose solutions and decide the technique to overcome the problems.

Take the action and check again whether it has been corrected or not.

2. 2. 5 Quality improvement

Quality improvement can be defined as an action taken by the organization to increase and improve the effectiveness of activities or processes to provide satisfaction to the customer. (ISO, 2000). In other words, process of changing the quality for the products or services that can improve the level of satisfaction to the customer. This can be done by control or increase the standard. Control approach can be done by improving the rate at which an agreed standard is achieved. The second approach is by increase the standard and setting new level. New standard can be created by making research and development to a products and services.

2. 2. 6 Quality assurance

ISO (2000), defined the quality assurance as a planned and systematic action necessary to provide adequate confidence that an entity will fulfil the requirements for quality. Customers and managers need a quality assurance, as they cannot oversee the operation for themselves. The assurance of quality can be gained by testing a products or services against prescribed standards to establish in capability to meet them. This approach can give confidence only to the tested products. Quality assurance not controls the quality, it establish the extent to which quality will be, is being or has been controlled.

2. 2. 7 Quality system

Hoyle (1998), stated that system is a set of function or activities that operate together to achieve the aim. A success quality system will lead the organization to achieve, sustain and improve the quality. It is a planning, well evaluates and organized to produce a required quality performance. A quality system is the approach to achieve all desire quality goals. Quality system focus on the quality of the organization produces, the factors which will cause the organization to achieve its goals, the factors influencing the customer satisfaction and identify nonconforming product. Quality system needs to possess certain characteristics for them to be fit for their purpose.

Robustness - ability to withstand variation in the way operation are carried out without failure

Complexity - the number of interconnections, routings, pathways, variations, options, etc, which give rise multiple procedure.

Maintainability - the ease and economy with which system changes can be made.

Flexibility - ability of the system can handle the changes in circumstances.

Consistency - the ability of the documented system unifies communication both within itself and the organizations.

2. 3 Challenges faced by construction project team in implementation of QLASSIC

2. 3. 1 Introduction

CIDB (2008) stated that like any other countries around the world, Malaysian construction industries face the problems that affect the development of construction sector. If these problems not managed and addressed effectively it become worst. The construction sector will continue play an important role as a main contributor to the Malaysia economy. To make sure the construction sector become stronger, Malaysia introduced many ways and one of the ways by introducing the QLASSIC system by CIDB. Although it was introduced several years ago, the implementations of this system still not achieve the target. Only few projects were applied this system. This because there are few problems and challenges regarding implementing this system faced by construction team.

2. 3. 2 Fragmentation and Disintegration of the Construction Industry

The construction industry has remained a very fragmented industry where different activities in the entire value chain of the construction processes are being undertaken by different parties, often undertaken in isolation, thus resulting in inefficiencies. In particular, the segregation of design and construction activities which is widely practiced does not encourage consideration for factors like savings in labour utilisation, ease of maintenance, construction safety and the practicality of construction methods.(CIDB, 2008)

As a result of the lack of such integration considerations in the industry, the process to implement the QLASSIC system to the construction projects is

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difficult. The different players are also become conflict and the implementation of this system become unsuccessful. This because there are many parties involved in construction projects. Thus, some of the parties will implement the system and some are not. So, the systems are not applied on the overall parts or elements that need to be assess in the construction projects.

2. 3. 3 Foreign labour

Labour-intensive conventional methods of construction that are still prevalent in Malaysia. The adoption of such methods are encouraged by the cheaper cost of employment of foreign workers with lower wages and the availability of such workers for short-term periods of work.. Another reason for the heavy dependency on foreign labour involves the fact that the local workforce is reluctant to be employed as construction workers in the wet trades, where the image of the construction industry has always been one that is ' Dirty, Dangerous and Difficult'. (CIDB, 2008)

As a result, the implementation of QLASSIC system in construction projects becomes a problem because foreign workers do not understand this system. They are not expose about this system by the authorities. Thus, it become challenges for construction team to make sure the construction projects meet the standard that need in the QLASSIC system.

2. 3. 4 Lack of R&D

CIDB (2008) mentioned, the local construction industry is characterised as one that is labour-intensive, which has resulted in numerous challenges as highlighted previously. There is a need for the construction industry to

progress towards one that is more focused on innovation and automation. However, the pace of innovation through R&D and automation through the adoption of new construction methods are relatively low due to the abundance of cheap foreign labour. Despite the lack of R&D initiatives in the Malaysian construction industry, there has been progress on the local front to encourage and stimulate R&D activities in the construction industry.

As a result, one of the factor this system did not get attention from construction team is because lack of R&D. Before this system introduced to the construction sector, the responsible authorities that doing this research must make sure that the information gather from the research is enough and the opinion from all the parties involved in construction project is taking into consideration. This is because the construction parties are the main target as they will use this system. So, opinion from construction parties is the first priority to suite with construction projects when implementation this system.

2. 4 Effective strategies in implementing QLASSIC

2. 4. 1 Stepping up research and development

Wong (2007), stated that Research and Development (R&D) is critical to productivity and quality. Improvements in the construction industry such as better materials, more cost-effective design and construction methods and labour-saving equipment are often introduced by way of R&D initiative.

However, for R&D to be useful there is a need to ensure that new technologies and capabilities are efficiently shared and adopted by players in the industry to enhance the quality of the building. At the present moment, the amount of Malaysian construction R&D ranges from negligible to non-existent. On the other hand, R&D conducted by local institution of higher
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learning is often perceived as not been able to meet industry needs. Hence, there is a need for stronger collaboration between academia and the industry in stimulating R&D efforts in order to produce quality of the building.

2. 4. 2 Raising the Skills Level

According to Wong (2007), the reality is that so long as the industry has a ready access to a large number of foreign workers, there is very little incentive for the industry to upgrade itself. While recognizing that the industry will continue to rely on foreign workers in the near and medium term, there is a need to reduce the number of unskilled foreign workers. CIDB, in collaboration with the National Vocational Training Council of Malaysia (MLVKM) has developed the National Occupational Skill Standards (NOSS) for the construction industry, for the purpose of developing skilled manpower in the industry by development of training module for the various trades as well as for skill accreditation for career development of construction personnel.

The Malaysian construction industry at present is largely dependent on low skilled foreign workers. As introduce new technologies and push for higher quality the demand for manpower especially foreign workers should be reduced.

2. 4. 3 Enhancing professionalism

Enhancing professionalism of the industry can be achieved at three levels, namely the individual, trade association or professional institution, and the industry. At the individual level, the curriculum of institution of higher

learning should be enhanced to include common modules and soft skills. At trade association or professional institution level, Continuing Professional Development (CPD) Programme should be made mandatory for the renewal of professional membership as is currently practised by the Board of Engineers Malaysia (BEM), Board of Architect Malaysia (BAM) and Board of Quantity Surveyors Malaysia (BQSM). To synchronize professional practice and thinking, it is also necessary for each profession to draw up its own set of code of conduct. (Wong, 2007)

This will help to lay the foundation for constructional skills needed for construction players. Hence it must constantly promote, recognise and reward creativity, quality work, and innovation to integrate the various processes in the industry, but also to project a more progressive image.

2. 4. 4 Training and Education

Firms that establish workplace education programmes report noticeable improvements in their workers' abilities and the quality of their products (Cebeci and Beskese, 2002). The importance of training is to ensure that the skills of the workforce do not become obsolete in an environment of change and an understanding and attitude of quality is developed and maintained. Training should be directed at all levels of the organization to understand the QLASSIC process.

2. 4. 5 Integrated approach to construction

According to Wong (2007), the construction industry is highly fragmented due to the sequential nature of the construction process. One of the major causes of low productivity and quality is the lack of integration of activities

across the construction value chain. Consequently, mistakes in the construction stage resulting low quality of the building.

So, through integration focus on effective interpersonal relationships, jointly planned work, identifying and solving problems will produce better quality. QLASSIC is one of the methods that need the integration by all the construction players to implement it.

2. 4. 6 Rewards and recognition

An important feature of any quality improvement programme is showing due recognition for improved performance by any individual, section, and department or division within the company considers recognition as one of the most important steps of the quality improvement proce