Compulsory of Malaysia’s Quality Assessment System in Construction (QLASSIC)

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Abstract. Nowadays, the quality in the construction industry has become very important because it contribute to the nation’s economic growth and quality of life of the house occupants. Therefore, CIDB is proposed to enforce the implementation of QLASSIC as the main element of project approval for issuance of Certificate of Fitness (CFO) or Certificate of Compliances (C.C.C) in construction industry of Malaysia. The objectives of this study are to identify the views of contractors toward the compulsory of the QLASSIC and to determine the impacts of the QLASSIC in the construction industry. The methodology used are literature review and the questionnaires. The descriptive statistic like the frequency and percentage were used for describing the respondent background. While the mean distribution analysis was used to analysis the views on the compulsory of QLASSIC and the impacts of the QLASSIC. The result of the study shows that, the views of the respondents toward the compulsory of QLASSIC and the main impacts of the QLASSIC were identified. The significance of this study is it can help contractors to understand the impacts and the important of using QLASSIC.

1. Introduction
Quality in the construction industry play an important role to ensure the quality of life of the residents. Therefore, the quality of the construction projects should be improved from time to time. Rumane (2011) also stated that, the awareness on quality management is increase from time to time. Improvement of the quality in the construction is also important as the construction industry contribute a high percentage to the growth of economy of the country [1]. Thus, it is important to develop a quality management system or quality assessment system to improve the quality of work in the construction industry. In Malaysia, the Quality Assessment System in Construction Industry (QLASSIC) is developed by the Construction Industry Development Board (CIDB). QLASSIC becomes a special guideline to measure the quality of the construction work as well as the standards for the level of quality achieved by the construction project. The purpose of the QLASSIC is to improve the quality of construction industry in Malaysia.

According to CIDB (2006), Quality Assessment System in Construction (QLASSIC) is a system or method to measure and evaluate the workmanship quality of a building construction work based on Construction Industry Standard (CIS 7: 2006) [2]. In 2006, QLASSIC was introduced in Malaysia to enable the quality of workmanship between construction project to be objectively compared through a scoring system [2]. The number of usage of QLASSIC in construction project is still lower after implemented for a few years. There are only 3% of the housing projects have implemented the
QLASSIC in the year 2014. This means there was only 272 from 5000 construction projects had used the QLASSIC assessment method.

According to eQlassic (2011), the percentage of the QLASSIC assessment projects toward total annual projects from 2008 to 2010 only increased from 0.79% to 1.84% [3]. It only shows a small increase of the QLASSIC usage. Besides, some of the states in Malaysia have no construction project that assessed by QLASSIC. One of the reasons that the QLASSIC system have a low practice in Malaysia’s construction industry is the QLASSIC is not a compulsory requirement for the construction projects.

Therefore, CIDB plans to make the QLASSIC system as compulsory in the construction industry by year 2020. CIDB plans to make the QLASSIC compulsory by proposing it under the 11th Malaysia Plan which will be launch in 2015. The construction projects must undergo QLASSIC assessment when apply for the Certificate of Completion and Compliance (CCC) once the proposal is accepted by the 11th Malaysia Plan.

The main goal of the research is to identify the contractors view on the compulsory of QLASSIC in the construction industry and to determine the impacts of implementation of QLASSIC in the construction industry. The scope of study provides a guideline in obtaining the data require for the study. The aspect show below will be the guides of the study: 1) Contractors with the experience in using QLASSIC in the construction industry will be the respondents for the study, and 2) The area of the study is Malaysia. The purpose of this research is to identify the impacts of the implementation of QLASSIC in the construction industry. Significance of this research are as to help contractors to understand the impacts of the implementation of QLASSIC and to help contractors to know about the important of the QLASSIC.

2. Literature Review

Quality control in construction industry is important to ensure the development of the construction industry [4,5,6,7,8,9]. It can establish a competitive construction market and to make sure the satisfaction of the building users. Therefore, it is important to make compulsory some of the approaching method of quality measurement for the housing.

According to ISO 8402:1994 from the International Organization for Standardization (ISO), the definition of quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs. This is work by compares the characteristics of the product to the requirement and will provide result in a degree of quality. Degree is referring to a level to which a product or service satisfies. Quality is also can be defined as meeting fully or exceeding the expectations of those to whom you are providing a product or service [10]. This definition is useful because it embraces the internal customer as well as the external customer or the person who receives the output.

Quality in the construction projects is different from that in manufacturing [1]. Quality in construction projects encompasses not only the quality of products and equipment used in the construction. It also considered the total management approach to completing the facility per the scope of works to customer or owner satisfaction within the budget. Forthwith, the specified schedule to meet the owner’s defined purpose.

Quality control in construction typically involves ensuring compliance with minimum standard of material and workmanship. In that case, to ensure the performance of the facility according to the design. These minimum standard contained in the specification documents. Random samples and statistical method are commonly used as the basis for accepting or rejecting work completed and batches of material when ensuring compliance of the project. QLASSIC is one of the system that uses the random samples and statistical method.

Chung (1999) defined the quality of building work is difficult, and often impossible, to quantify since a lot of construction practices cannot be assessed in numerical terms [10]. Besides, Oberlender (2000) defined quality in construction is achieved by the people who take pride in their work and have the necessary skills and experience to do the work [11]. The actual quality of construction depends largely upon the control of construction itself, which is the principle responsibility of the contractor.
According to the CIDB, the quality assessment system in construction work is an independent method to assess and evaluate the quality of workmanship of building projects based on a standard that had been set. The main purpose of the quality assessment system is to improve the quality of work in the construction industry.

Quality of workmanship is important in the construction industry. The high quality achieved in the building projects ensure future marketability and enhances the confidence of clients. Therefore, there are so many of quality assessment systems are developed in different countries. For instance, QLASSIC in Malaysia, CONQUAS in Singapore and the PASS in Hong Kong.

CONQUAS was first introduced in Singapore in 1989. The full name of CONQUAS is Construction Quality Assessment System. CONQUAS is developed by CIDB in conjunction with other major public sector agencies including the Housing and Development Board (HDB), Public Work Department and Port of Singapore Authority [12]. CONQUAS is a standardized, quantifiable and systematic assessment system to grade the construction quality of completed buildings or finished work. The assessment of the CONQUAS consist of three components, which is the structural works, architectural works and mechanical and electrical (M&E) works. Each component is further divided into different items for assessment. However, the assessment does not include the works such as piling, heavy foundation and sub-structure works which are heavily equipment-based, buried or covered and usually called under separate contracts or sub-contracts.

The demand for housing and requirement for quality have always been experienced in the Hong Kong construction industry [12]. Mass production of the housing units was achieved at the expense of quality construction. But the poor quality of the housing in the construction become uncommon in Hong Kong since 1980s. This is because the Hong Kong Housing Authority (HA) developed a quality assessment system for building which is the Performance Assessment Scoring System (PASS). The development of PASS is based on the Singapore’s CONQUAS of 1989. This system is established to objectively measure the performance of the Hong Kong contractors and the quality of work done by the contractors for Housing Authority projects against defined standard. Thus, it can provide a fair means of comparing their individual performance.

Quality Assessment System in Construction (QLASSIC) is an independent method or system to measure and evaluate the quality of workmanship and finishes of the building construction works based on Construction Industry Standard (CIS 7:2006). QLASSIC is a system for measuring and assessing the quality of workmanship of the building. Therefore, the objective establish by the QLASSIC are 1) To benchmark the quality of workmanship of the construction industry, 2) To establish a standard quality assessment system on quality of workmanship of the construction work, 3) To assess the quality of workmanship of a construction project based on the relevant approved standard, 4) To be used as a criterion to evaluate the performance of contractors based on quality of workmanship, and 5) To compile data for statistical analysis.

QLASSIC sets out the standard on quality of workmanship for various construction elements of building construction work. For example, the Construction Industry Standard (CIS 7:2006). Marks are awarded if the workmanship complies with the standard and these marks are then sum up to calculate the QLASSIC Score (%) for the building construction project. It is impractical to assess all elements in a construction project. Therefore, the QLASSIC assessment uses a sampling process to carry out the assessment. Before carrying out the assessment, the assessor will determine the samples (elements or locations) that need to be assessed. The samples must be distributed as uniformly as possible throughout the project and various construction stages. The samples are selected from the drawings and plans of the relevant construction project. All locations in the construction project must be available for the assessment. There are four main components that will be assessed for the building construction. The summary for each component is show in Table 1. QLASSIC Assessment will be carried out after the completion of a building construction works and before hand over of the completed projects. The processes of the QLASSIC is shown in the Figure 1.
Table 1. Summary of components will be assessed for the building construction

| Component               | Explanation                                                                                                                                 |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 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:  
I. Site inspection of formwork, steel reinforcement, prefabricated or pre-cast elements and so on during the construction.  
II. Laboratory testing of compressive strength of concrete and tensile strength of steel reinforcement.  
III. Non-destructive testing of the uniformity and the cover of hardened concrete. |
| 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 are works such as floors, internal walls, ceiling, door and window, fixtures and fittings, external wall, roofs, driveway, porch and apron. |
| 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. |
| External works          | External works cover the general external work elements in building construction such as the link ways or shelters, drains, road works, car parks, footpaths, turtings, playgrounds, gates and fences, swimming pools, hardscapes and electrical substation. |

Figure 1. QLASSIC process flow
The weightage for structural, architectural, M&E and external works of QLASSIC score are allocated accordance to four categories of building. The total quality score of a building project is the sum of marks awarded to the four components in each category of a building.

The view of the professional practitioners in the construction industry towards the QLASSIC are increase quality of work, increase value of product, simple procedure, cause delay of work, and effect the cost of the construction project. The property developers and contractors perceived QLASSIC is able to increase the quality of work and the value of the product. And at the same time, it is found that the QLASSIC is simple to be adopted. On the contrary, part of the respondents in Norizam research had a perception that the QLASSIC is causing delay in construction and have effect on the cost of production.

Besides, QLASSIC can well measure the level of quality achieved by the contractor [13]. QLASSIC score deemed to indicate the level of quality for a given construction project [14]. The higher the QLASSIC score will proportionately reflect the higher the quality output of the assessed construction project. Furthermore, the QLASSIC can use to benchmark the level of quality of the construction industry in Malaysia [14]. The scoring point attained can be used to benchmark project performance of similar project scope internally and externally.

The other views of the professional practitioners in the construction industry toward the QLASSIC in the Ali (2013) research are the QLASSIC score can be used to reflect the effectiveness of the developed Quality Management System (QMS) and assist the contractor prioritize the areas that need to be improve [14]. The implementation of QLASSIC brings many impact to construction industry. The summary impacts from organization’s perception is shown in Table 2.

| Authors/organization | Impacts of Implementation QLASSIC |
|----------------------|----------------------------------|
| [7]                  | • Increase the performance of the project.  
                        • Increase the level of marketing of the company.  
                        • Increase the competitiveness of the company. |
| [13]                 | • Ensure less rework and defectives of the construction project.  
                        • Enhancing the image of the company.  
                        • Solidifying company position in the market.  
                        • Development of quality culture.  
                        • Positive growth of the construction industry.  
                        • Increase quality awareness among the employees.  
                        • Improvement of corporate reputation.  
                        • Increase the competitiveness of company.  
                        • Extra cost required.  
                        • Less attention will be pay to the development of the company personnel.  
                        • Discouragement of the critical and analytical thinking within the personnel.  
                        • Improvement of workmanship quality. |
| [14]                 | • Improve the performance of construction project.  
                        • Improve the quality of the construction project.  
                        • Enhance business opportunity of the company.  
                        • Increase the company marketability.  
                        • Reduce rework for the projects.  
                        • Save time and money.  
                        • Increase the market share of the company. |
3. Methodology
The research methodology for this research is as described in Figure 2.

The questionnaire then be distributed to the 102 respondents through email to obtain the data and information related to the research. The target respondents of this research are the contractors in Malaysia that involved in the QLASSIC assessment system in their projects. The questions in the questionnaire is design according to the research objectives and the information obtain from the literature review. The questions in the questionnaire design according to the research objectives and the information obtain from the literature review. The questionnaire used Likert scale in Section B and Section C. Likert Scale is a bipolar scaling method, measuring either positive or negative response to a statement. Likert scale is probably more reliable plus it is easy and quick to construct. Scale 1 to 5 (1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree and 5 = Strongly Disagree) is used to represent the level of agreement or satisfaction of the respondents toward the questions in the questionnaire. The quantitative data in the raw form is meaningless if this data is not processed and analysed. Therefore, these data need to be processed to make them useful to the research. The descriptive statistics method is the simplest method of analysis which provides a general overview of the results [15]. So, for analysis and presentation of the result, the data collected from the respondents will be analysis by the descriptive statistics method as this is the best way to analyse closed-ended questions. The data will be presented in tables, pie-charts or bar-charts to show the frequency distribution of the respondents regarding the research questions. Furthermore, Microsoft Excel 2013 will be used to obtain the descriptive statistics obtained through the survey. Besides that, the analysis of mean distribution was used for the question that using the Likert scale method.

Figure 2. Research methodology
4. Result and Analysis
The aim of this chapter is to explain the findings of the research based on the data obtained through the distribution of the questionnaires. The distribution of the questionnaires to the respondents are through the e-mail by using the application of Google Doc. The collected data were analysed by using the Microsoft Office Excel 2013. The data analysis is conducted accordance to the order of the research question in the questionnaire and to determine the accessibility of the research objectives. The result will be presented in the form of tabulation and pie chart as it can help to clearly interpret the results of this research.

In this research, a total of 102 sets of questionnaires were distributed by e-mail to the contractors around Malaysia. However, only 39 sets of the questionnaires were received from the respondents. The percentage of the responses received over the number of questionnaires distributed is 38.2%. The minimum number of the respondents to undergo the statistical analysis is 30. The percentage of the respondents to make a statistical analysis is around 30 to 45 percent (%). Therefore, the feedback from 39 respondents in this research were considered to be sufficient to make a statistical analysis for the survey.

4.1 Demography
Demography of respondents for this study is as in Figure 3.

![Figure 3. Respondents demography](image)

4.2 Views on the compulsory of QLASSIC
According to the Table 3, the element with the highest distribution of mean 4.08, in the views on the compulsory of QLASSIC is can assure the quality of the construction field. This mean that most of the respondents are agree on the compulsory of the QLASSIC can assure the quality of the construction field. This was followed by the element of compulsory of QLASSIC will help the construction industry to achieve positive growth with the distribution mean of 3.87. This mean that the respondents believe that the compulsory of the QLASSIC will lead to the positive growth to the economy of the construction industry. While the third highest view was the all the building construction work should have the QLASSIC with the mean distribution of 3.82. The “compulsory of QLASSIC will make the cost of the construction project increase” and the “compulsory of QLASSIC make the construction project become complicated and cause project delay” ranked second low and the lowest in this part with the mean distribution of 3.62 and 2.51 respectively.

| Views on The Compulsory of QLASSIC                                                                 | Mean  |
|---------------------------------------------------------------------------------------------------|-------|
| Compulsory of QLASSIC can assure the quality of the construction field.                            | 4.08  |
| Compulsory of QLASSIC will help the construction field to achieve positive growth.                 | 3.87  |
| All the building construction work should have the QLASSIC.                                       | 3.82  |
| Compulsory of QLASSIC will make the cost of the construction project increase.                    | 3.62  |
Compulsory of QLASSIC make the construction project become complicated and cause project delay. 2.51

According to the Table 4, the main general view of the respondents toward the QLASSIC is the QLASSIC can assist the contractor to prioritize the areas that need to be improve with the distribution mean of 4.38. This mean the QLASSIC can help the contractors to find out their weaknesses in their construction works so that they can improve it. The QLASSIC as the benchmark of the quality in the construction industry is the second highest element with the distribution mean of 4.21 in the general views on the QLASSIC and. The scoring point attained in the QLASSIC assessment can be used to benchmark project performance of the similar project scope internally and externally. While the third highest element in the general views on the QLASSIC is “QLASSIC can well measure or indicate the level of quality achieved by the construction project” with the mean distribution of 4.10. QLASSIC score will reflect the overall quality performance of a given construction project” has the mean distribution of 4.08 and ranked the fourth place in this part. “QLASSIC have a simple working procedure” and “QLASSIC score can be used to reflect the effectiveness of the developed Quality Management System in the organization” both have the same mean distribution of 3.79.

| General Views on the QLASSIC | Mean |
|------------------------------|------|
| QLASSIC can assist the contractor to prioritize the areas that need to be improved. | 4.38 |
| QLASSIC can be the benchmark of the quality in the construction industry. | 4.21 |
| QLASSIC can well measure or indicate the level of quality achieved by the construction project. | 4.10 |
| QLASSIC score will reflect the overall quality performance of a given construction project. | 4.08 |
| QLASSIC have a simple working procedure. | 3.79 |
| QLASSIC score can be used to reflect the effectiveness of the developed Quality Management System in the organization. | 3.79 |

4.3 Impacts of the Implementation of QLASSIC

Section C of the questionnaire is designed to determine the impacts of implementation of QLASSIC in the construction industry. Section C consists of three (3) parts; impacts on construction project, impacts on organization and impacts on construction field. There are eight elements in the part of impacts on construction project, nine elements in the part of impacts on organization and four elements in the part of impacts on construction field.

Based on the Table 5, the research analysis shows that the main impact of the QLASSIC on the construction project is the quality of workmanship of the construction project increases with the distribution mean of 4.38. QLASSIC as a first quality assessment system in construction industry in Malaysia can help to improve the quality of the workmanship of the construction project.

The impact with the second highest distribution mean of 4.15 is the construction project become more trustable to the consumer. QLASSIC can help to raise the credibility of the construction project among the consumers. Both of the “QLASSIC can ensure the construction project less rework and more sustainable” and “consumer more confidence with the construction project” have the same mean distribution of 4.13.

The next impact on the construction project is “the value of the construction project increases” with the mean distribution of 3.95. This is followed by the “the construction project become relatively saleable” and “the cost of the construction project increases” with the mean distribution of 3.77 and 2.97. Lastly, “the construction project will delay” has a mean distribution of 2.44 and is the lowest in the part of the impact on the construction project.
Table 5. Distribution of mean for the Impact on Construction Project

| Impact on Construction Project | Mean |
|--------------------------------|------|
| The quality of workmanship of the construction project increases. | 4.38 |
| The construction project become more trustable to the consumer. | 4.15 |
| QLASSIC can ensure the construction project less rework and more sustainable. | 4.13 |
| Consumer more confidence with the construction project. | 4.13 |
| The value of the construction project increases. | 3.95 |
| The construction project become relatively saleable. | 3.77 |
| The cost of the construction project increases. | 2.97 |
| The construction project will delay. | 2.44 |

According to the Table 6, the main impacts of QLASSIC on the organization is the organization become more competitive with the distribution mean of 4.26. QLASSIC give the advantage to the organization to compete in the market of construction field. “The reputation of the organization increase” and the “QLASSIC increase quality awareness among the employees” both have the distribution mean of 4.15. The next impact on the organization is “QLASSIC helps to enhancing the image of the company and solidifying its position in the market” with the mean distribution of 4.10. It followed by the “consumer become more attracted to the construction project under the organization”, “QLASSIC enhance the business opportunity of the organization”, “the level of marketing of the organization increase”, and “QLASSIC causes the decrease of employee development in the organization” with the mean distribution of 3.92, 3.90, 3.87, and 2.97 respectively. The impact with the lowest mean distribution of 2.92 is “QLASSIC causes the discouragement of critical and analytical thinking within the personnel of the organization”.

Table 6. Distribution of mean for the Impact on Organization

| Impact on Organization | Mean |
|------------------------|------|
| The organization become more competitive. | 4.26 |
| The reputation of the organization increase. | 4.15 |
| QLASSIC increase quality awareness among the employees. | 4.15 |
| QLASSIC helps to enhancing the image of the company and solidifying its position in the market. | 4.10 |
| Consumer become more attracted to the construction project under the organization. | 3.92 |
| QLASSIC enhance the business opportunity of the organization. | 3.90 |
| The level of marketing of the organization increase. | 3.87 |
| QLASSIC causes the decrease of employee development in the organization. | 2.97 |
| QLASSIC causes the discouragement of critical and analytical thinking within the personnel of the organization. | 2.92 |

Based on the Table 7, the research analysis shows that the main impact of QLASSIC on the construction field is the QLASSIC helps in the development of quality culture in the construction field with the distribution mean of 4.26. The existence of the health and positive competition in the construction field and construction field toward positive growth both rank second highest in the impacts on construction field and have the mean of 4.13. Lastly, the impact on the construction field that has the lowest mean distribution of 4.08 is “the construction field become more competitive”.

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Table 7. Distribution of mean for the Impacts on Construction Field

| Impacts on Construction Field                                         | Mean |
|-----------------------------------------------------------------------|------|
| QLASSIC helps in the development of quality culture in the construction field. | 4.26 |
| The existence of the health and positive competition in the construction field. | 4.13 |
| Construction field toward positive growth.                             | 4.13 |
| The construction field become more competitive.                        | 4.08 |

5. Discussion

5.1 First Objective: Identify the Contractors Views on the Compulsory of QLASSIC in Construction Industry

The first objective has been achieved through the distribution of questionnaires. Among the five choices, the “compulsory of QLASSIC can assure the quality of the construction field” received the highest level of mean at 4.08 which indicate that most of the respondents believe that the QLASSIC can make sure the quality of the construction projects are high. Although the “all the building construction work should have the QLASSIC” just rank third in this part, but it still shows that majority of the respondents agree with the compulsory of QLASSIC for all of the building construction work. This is because the mean distribution of “all the building construction work should have the QLASSIC” is 3.82, which mean majority of the respondents agree with the statement.

5.2 Second Objective: Determine the Impacts of Implementation of QLASSIC in the Construction Industry

The second objective has also been achieved through the distribution of the questionnaires. Based on the analysis of mean distribution, the most significant impact of the QLASSIC on construction project, organization and construction field are “the quality of workmanship of the construction project increases”, “the organization become more competitive” and “QLASSIC helps in the development of quality culture in the construction field” respectively. “The quality of workmanship of the construction project increases” has the mean of 4.38. This indicate that most of the respondents agreed that QLASSIC can help to increase the quality performance of the construction project. The finding is coinciding with the research of CIDB that the QLASSIC can increase the performance of the construction project. The research also coincides with the Ali (2013) research that quality performance of the projects [9]. The mean distribution of “the organization become more competitive” is 4.26. It is same with the findings of CIDB that the QLASSIC can help to increase the competitiveness of the company in construction industry. The statement of “QLASSIC helps in the development of quality culture in the construction field” has the mean distribution of 4.26. The research finding is align with the research done by Kenn (2013) that the QLASSIC have the positive impact on the development of quality culture in the construction field [13].

6. Conclusion

Generally, the purpose of this research is to identify the view of contractors on the compulsory of QLASSIC in construction industry and to determine the impacts of the implementation of QLASSIC. The findings of the research show that majority of the respondents agreed with the compulsory of QLASSIC can assure the quality of the construction field. The research also shows that most of the respondents agreed with the compulsory of QLASSIC in all the building of construction work and organization. Therefore, the first objective of this research had achieved. Through the analysis of the data collected, the research found that the main impact of the implementation of QLASSIC on the construction project and the construction field are “the quality of workmanship of the construction project increases”, “the organization become more competitive” and “QLASSIC helps in the development of quality culture in the construction field” respectively. Therefore, the second objective of the research had achieved. In conclusion, this research has achieved the objectives had been set. the
further research can be carry out by using the interview as the way of the data collection. This is because the interview can ensure that the data is collect from the respondents that have the experience on the QLASSIC. Therefore, the result of the interview will be more detail, clear and accurate.

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