Exploring the barriers in implementation of qlassic in Malaysian construction industry from the perspective of contractors

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Exploring the barriers in implementation of qlassic in Malaysian construction industry from the perspective of contractors

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ABSTRACT: Construction industry is one of the largest contributors to the economy in Malaysia. Many studies have showed the significant of the construction industry contribution but the issues of properties buyers especially still apprehensive in the industry. National House Buyers Association (HBA) has recorded thousands of complaints from buyers who were not satisfied with the condition of their new properties or the way defects were rectified. The main objectives of QLASSIC is to increase the quality of building but after more a decade the implementation of QLASSIC still lagging behind and there are still many developers and contractors are reluctant to use QLASSIC approach in their projects. Therefore, the main goal of this study is to explore the factor hindering the implementation of QLASSIC in Malaysia especially from the contractors' perspective. Questionnaires were used as research instrument for collecting data information, then the data were analysed by using Relative Importance Index (RII). From the analysis, it is found that the main factors that could hinder the implementing of QLASSIC are; lack of coercive and mimetic pressures, lack of capabilities of staff in perform QLASSIC assessment practice due to minor size and type of organisation influence in adopting QLASSIC, higher cost to undergo training to operate QLASSIC's tools and minimal benefits gained when adopting QLASSIC. In conclusion, it's important to tackle the actual factors hindering the implementation of QLASSIC in Malaysian construction industry. Concurrently, every parties in the construction industry should play their roles in promoting the use of QLASSIC in their construction project. Besides that, the government has to make a new strategy in promoting the use of QLASSIC by providing incentive such as tax rebate if the contractors used QLASSIC assessor to access their projects.

Keywords Quality Assessment System in Construction (QLASSIC), Quality, Malaysian Construction Industry, Contractors, Barriers

1. Introduction

In the construction project, time and cost always viewed as an important indicator to gauge the successful of the project and lots of construction players neglect the importance of having a quality product. This happened because quality is subjective and its difficult to quantify. [1,2] believed that the quality level cannot be defined accurately because it depends on the view of customers and every customer have a different view to justify the acceptance level of quality. However, according to [3], quality can be measured once the product is meet or exceeding the customer expectation. This supported by [4] suggested that, in order to gauge the expectation of customers to quantify the quality of the product, customer satisfaction index can be defined by measuring the customer rating based on specific attributes such as measure or rating the product is being free from defects, deficiencies and significant variations [4]. This approach aligns with the definition of quality by Oxford Dictionaries, which is *quality is the standard of something as measured against other things of a similar kind or the degree of excellence of something* [5].

2. Malaysian Construction Industry Scenario

In Malaysia, construction industry makes a significant contribution to the country. Over the past decade, this sector annually accounted an average of 3.5% of the Gross Domestic Product (GDP) and in 2019, the construction industry set the highest value of project which is approximately RM 146.37 billion [6]. The COVID-19 pandemic has overcome the construction sector whereby its impact, which increased approximately RM 10 billion per year before the pandemic. The pandemic and its disruption in Malaysian construction industry thus affected towards economy and facing

serious issues such as shortages of skill workers, quality of the work, delays, low of productivity and lack of innovation [7,8].

There are lots of issues arose related to the quality of the construction product [9,10,11], where there are thousands of complaints from house buyers who were not satisfied with the condition of their new homes which recorded by National House Buyers Association (HBA) [9,10,11]. Furthermore, they are not satisfied with the quality level of their new homes, HBA also recorded the owners also not satisfy the quality of rectification of the defects [9,11]. The Construction players are aware these issues and some of them take an initiative to overcome these issues by produce and apply the quality policies in their projects, provide training and promoting the quality culture within their organisation, but to ensure the issues of quality can be minimised nationwide, the government should play their role by mandating national quality standard in any construction project [11,12].

In order to reduce the issues arose and to increase the productivity of construction industry especially when the issue of quality is concern, there is the needs to change from current method to more innovative method to ensure the quality that produce by the Malaysian construction players up to standard. Therefore, in 2006 Construction Industry Board (CIDB) was introduced Quality Assessment System in Construction - Construction Industry Standard (QLASSIC – CIS 7:2006) which is adapted from Construction Quality Assessment System (CONQUAS) Singapore then some modification being done to tailor suit into Malaysia's construction industry [13,14,15]. To increase the quality of construction works, QLASSIC system require independent accessor to assess structural works, architectural works, external works and mechanical and electrical (M&E) works [14]. An independent assessor will evaluate the items based on QLASSIC scoring system, the higher the score, the better the product quality [16].

3.The definitions of Quality Assessment System in Construction (QLASSIC)

The QLASSIC was introduced by Construction Industry Development Board (CIDB) for the purpose of situation of standard on quality of workmanship for numerous construction elements of building and construction works. The quality of workmanship of a construction work are based on assessment according to the requirement of the relevant typical, and marks are awarded if the workmanship complies with the standards. The QLASSIC assessment are apply for medium to high end built-up developments. This application is compulsory thus will ensure that even the lower end developments are exposed to the same standard of assessment. In other words, the Quality Assessment System in Construction or QLASSIC, form as a vital method to measure and evaluate the workmanship quality of building works in the construction sector in Malaysia. According to [15], the QLASSIC is a system to measure and evaluate the quality of workmanship of a construction work based on the relevant approved standard. The QLASSIC is a system or method to measure and evaluate the workmanship quality of a building construction work based on Construction Industry Standard (CIS:7:2014) [14]. QLASSIC enables the quality of workmanship between construction projects to be objectively compared through a scoring system [13,14].

Furthermore, according to [17] stated CIDB has introduced QLASSIC standing as a standard measure for construction quality. In addition, the QLASSIC was to quantify the workmanship quality of a completed building project. The QLASSIC function as an assessment thus to measure the workmanship quality of completed projects [18]. The need to have an QLASSIC assessment measured created on the three main components such as structural, architectural and external works (CIS:7:2014) [14]. The QLASSIC assessment are based on the contractor’s understanding towards the implementation of quality assessment system in construction. [19] had pointed that [20] stated that encounters in conducting QLASSIC assessment such found the limitations of manpower in CIDB. Thus, QLASSIC score represents that a building is better constructed and achieves a higher quality of workmanship.

By having this system, CIDB targeted the level of quality of construction works will increased but since 2006 the adoption of this system very low and stagnant, in 2020 CIDB reported from 2015-2018 the adoption rate by the construction players in Malaysia about 14.5% [21]. This show how slow the

adoption of QLASSIC system by Malaysian Construction Industry although there are many efforts done by the Malaysian government to increase the adoption of QLASSIC in construction projects, but the rate of QLASSIC adoption is still low, although CIDB in 2014 planning to make the application of QLASSIC mandatory by 2020 [14,16]. Thus, there is a need to study and explore the hampering factors on the implementation of QLASSIC in Malaysia especially from the contractors' perspective and hopefully can facilitate the pace of QLASSIC adoption in Malaysia.

4. Barrier Factors in Adopting Quality Assessment System in Construction (QLASSIC)

Systematic Literature Review (SLR) was conducted to identify the barrier factors based on modified the technology–organization–environment (TOE) framework developed by [22]. The TOE framework is an organization-level theory that explains that three different elements of a firm's context influence adoption decisions. These three elements are the technological context, the organizational context, and the environmental context. Thus, this study will focus on how context of environmental, organisational and technological as the main barrier factors could hamper the pace of QLASSIC adoption in Malaysia from the perspective of contractors.

4.1 Environmental Context

According to [22], some of the components in environmental context are the presence or absence of technology service providers and regulatory environment. In term of technology service providers, lacking of services or lacking of skill workers can contribute to barriers in adopting QLASSIC by Malaysian construction industry. [15], found that insufficient of skilled worker in the construction industry to do self-assessment for quality checking before independent assessor came was the major issue to construction players to apply quality assessment system. In addition, [15,16] found that beside lacking of skill workers, lacking in knowledge about new approach or technology one of the reasons why any organisation reluctant to adopt because they felt low self-confidence to used it. The issues of lacking knowledge or information about QLASSIC can be minimised if the relevant authority promoting the benefit of QLASSIC rapidly, [23,24], believed that promoting or showcasing about QLASSIC could increase the level of the acceptance of QLASSIC among Malaysian construction players because this approach could make consumers aware of the existence of QLASSIC.

While, government regulation falls into regulatory environment category such as mandating the use of QLASSIC in any government projects. By having this step, it could increase the pace of adopting QLASSSIC, this approach aligns with Institutional Theory where, companies are widely affected by the external environment, actions and behaviours like law and regulation by governing bodies [25,26]. [25,26] stress out, any organisations can be affected by any new regulations and to ensure their sustainability they must adapt and if they ignore these regulations, their organisation can be affected detrimentally. Beside regulatory the government, pressure from competitor also play a significant role to any organisation to adopt QLASSIC. Institutional Theory regraded these pressures know as Coercive pressure and Mimetic pressures.

As summary, under environmental context, factors of lacking of training related to QLASSIC, lacking of promotion of QLASSIC, lacking having cooperation from relevant authority and missing out the Coercive pressure such as government/authority not mandating the implementation of QLASSIC and lacking of Mimetic pressures such as to match other company performance and to enhance the company's image are the factors contribute to any organisation hesitate in implementing QLASSIC in their project.

4.2 Organisational Context

The construction sector known as a traditional sector and difficult to adopt to new process or technology. [27] found that, in the construction industry, the main reason for this situation happened because having the resistance from people to change from current practice to a new practice [27]. The effect from this resistance causes the failure of organisations to change. They believe that the productivity will suffer when they try to shift from the established working procedure to new working procedure. Resistance from people to change mostly because some people having a low self-confidence especially when related with implementing new technology or process because of lack of knowledge [28]. To worsen

the current scenario, top of management not support their staff to upskilling their skill and knowledge due to cost [28].

Therefore, motivation by the top management could be one of the factors to build up self-confidence to motivate individuals to adopt to new process. By having support from top management, employee will feel of being trusted and it will make them be more dedicated and try to prove that they can contribute something to achieve the organisational goal [13, 28]. Beside support from top management, size of the organisation or graded construction company also one of the important criteria to adopt QLASSIC because according to [13], a medium-graded construction company might contemplate to seek QLASSIC certification to improve its company image or to shift its attention toward an improved target market compare to a small-graded construction company.

Therefore, the barrier factors fall into organisational context are having resistance from the staffs/people, less support from top management, lack of capabilities of staff in perform QLASSIC assessment practice, size of organisation and lack of confident on appropriate technical skill related to QLASSIC.

4.3 Technological Context

QLASSIC in not fully matured, so there is some hiccup in the process of adopting it such as the availability of tools or the level of complexity of the tools in implementing new process. [29], added ease of use of tools is one of the concerns by the early adopter and if the tools that being used is complex the degree to reluctant to adopt is very high. They believed that, more time for training is needed to familiar with that tools and it can increase the cost of training. Mostly people are easy to accept new tools when the complexity to operate is easy and user friendly. On top of that, the time required for training can be reduced and, it is easy for people to accept and use new technology if they are familiar with it.

Beside the availability and complexity of tools as main concern for early adopter to adopt QLASSIC, cost in investing the tools also play a significant factor why many construction companies hesitate to implement QLASSIC in their construction projects. Training cost also barrier factor in implementing QLASSIC because early adopters are concern about return of investment (ROI) when they invest in QLASSIC tools because there is no tangible figure indicates that by implementing QLASSIC could reduce the overall construction cost and benefited to them [13]

Thus, for technological context, the barriers factors in implementing QLASSIC are lack of availability of tools for implementing QLASSIC, higher cost to purchase the QLASSIC's tools, higher cost for undergo training to handle QLASSIC's tools, tools are complex to handle and operate and minimal benefits gained when adopting this assessment.

4.4 Conceptual Model

In conclusion barrier factors in implementing QLASSIC can be figured out in Figure 1.

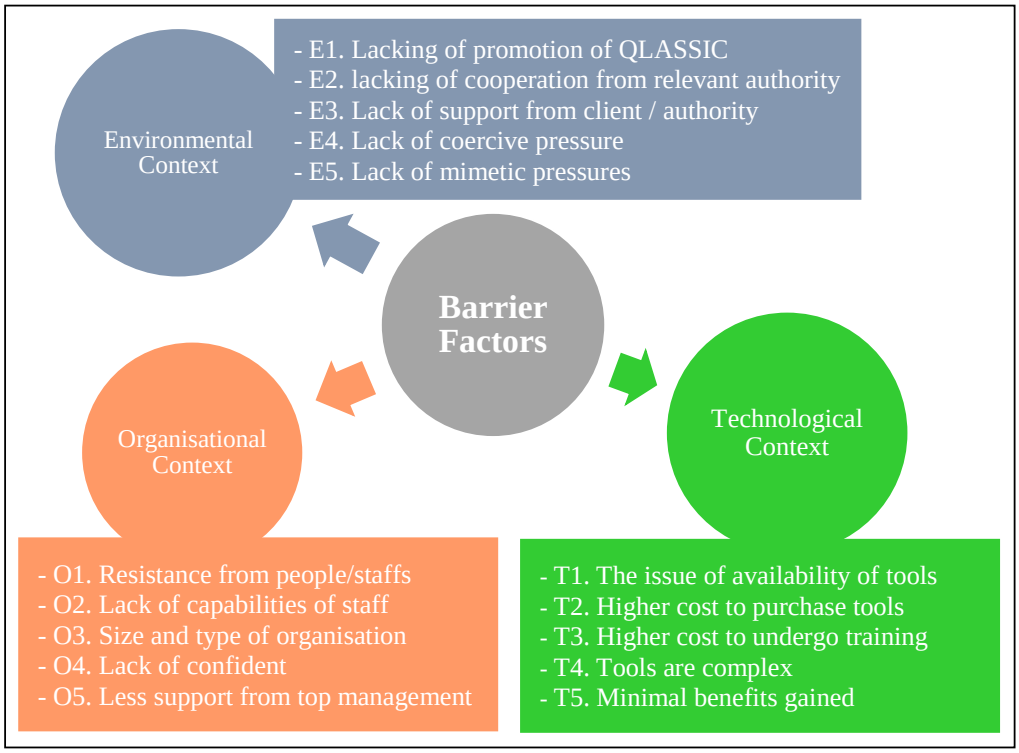

Figure 1. Barrier factors in implementing qlassic

5. Methodology

An exploratory survey was used to discover and identify the relative importance of the hindering factors in implementing Quality Assessment System in Construction (QLASSIC) in the Malaysian construction industry. The survey questionnaire consists of two sections. The first section was to identify the respondents' profiles. The second section of the questionnaire was designed to identify the hindering factors in implementing QLASSIC. A total of 15 variables were used to identify the hindering factors as shown in Table 1. A five-point Likert scale ranging from 1 that represented the least important, to 5 which represented the most important, was used to capture the importance of the hindering factors in implementing QLASSIC in the Malaysian construction industry.

Table 1. Variables to measure the hindering factors in implementing qlassic

Theme	Factors
Environmental context	E1. Lack of training on qlassic application
	E2. Lack of promotion/showcase about qlassic
	E3. Lack of support from client / authority
	E4. Lack of coercive pressure such as government/authority not mandating the implementation of qlassic
	E5. Lack of mimetic pressures such as to match other company performance and to enhance the company's image
Organisational context	O1. Resistance from people/staffs
	O2. Lack of capabilities of staff in perform qlassic assessment practice
	O3. Size and type of organisation influence in adopting qlassic
	O4. Lack of confident on appropriate technical skill related to qlassic
	O5. Less support from top management to implement qlassic

Technology context	T1. The issue of availability of tools in implementing qlassic
	T2. Higher cost to purchase the qlassic's tools
	T3. Higher cost to undergo training to operate qlassic's tools
	T4. Tools are complex to handle and operate
	T5. Minimal benefits gained when adopting qlassic

5.1 Data Collection

Data from Construction Industry Development Board (CIDB) revealed that about 732 construction companies with grade G7 were registered. In this study, a convenience sampling method was used, however, this approach has the potential for bias. But, according to [30], research conducted using exploratory study, and preliminary study convenience sampling was considered appropriate. Using the method suggested by [31], the number of samples for 732 population is about 260. Therefore, the questionnaires were distributed via email to the 260 potential respondents.

Table 2 shows the response rate for this study. From 260 questionnaires were sent out, about 134 respondents were responded, which is about 52% of the response rate. According to [32], since the middle of 1990, the average response rate for the organisational survey is about 30 to 40 percent. Since this is a preliminary study, the response rate of 52% for this study was considered an appropriate fit for further analysis.

Table 2. Response rate

Questionnaires Distributed	Responses Returned	Percentage of Responses
260	134	52%

5.2 Method of Data Analysis

In this study, Relative Importance Index (RII) were used to identify the hindering factors in implementing QLASSIC. First, RII was calculated using Equation 1.

$$\text{RII} = \frac{\sum PiUi}{N(n)} \quad (1)$$

Where;
RII = Relative Importance Indices
Pi = Respondent's rating
Ui = Number of respondents placing an identical weighting/rating
N = Number of samples
n = The highest attainable score (in this study n is 5)

The value for RII ranges from 0 to 1 and the factors which scored the highest value of RII are the most important factors.

6. Findings

According to [33], reliability refers to *"the extent to which research findings would be the same if the research were to be repeated at a later date, or with a different sample of subjects"*. In other words, the reliability is indicating that the instrument offers consistent measurement across time and the various items in the instrument [34]. To test the reliability of research instruments, Cronbach's alpha is used. [35] suggested that any construct that scores more than 0.70 is acceptable, while [36] suggested that a value that is more than 0.60 is acceptable. Table 3 shows the score of Cronbach's Alpha for each variable during pilot testing and actual data collection and found that the reliability of this research instrument is acceptable and fit for further analysis.

Table 3. Cronbach's Alpha value for pilot testing and actual data collection

Theme	Factors	Cronbach's alpha value (Pilot)	Cronbach's alpha value (Actual)
Environmental context	E1. Lack of training on qlassic application	0.771	0.737
	E2. Lack of promotion/showcase about qlassic	0.754	0.743
	E3. Lack of support from client / authority	0.781	0.718
	E4. Lack of coercive pressure such as government/authority not mandating the implementation of qlassic	0.781	0.726
	E5. Lack of mimetic pressures such as to match other company performance and to enhance the company's image	0.745	0.815
Organisational context	O1. Resistance from people/staffs	0.774	0.791
	O2. Lack of capabilities of staff in perform QLASSIC assessment practice	0.706	0.736
	O3. Size and type of organisation influence in adopting qlassic	0.731	0.795
	O4. Lack of confident on appropriate technical skill related to qlassic	0.738	0.724
	O5. Less support from top management to implement qlassic	0.754	0.743
Technology context	T1. The issue of availability of tools in implementing qlassic	0.753	0.749
	T2. Higher cost to purchase the qlassic's tools	0.706	0.708
	T3. Higher cost to undergo training to operate qlassic's tools	0.723	0.769
	T4. Tools are complex to handle and operate	0.730	0.815
	T5. Minimal benefits gained when adopting qlassic	0.731	0.795

6.1 Accessing the Barriers Factors in Implementing Quality Assessment System in Construction (QLASSIC)

6.1.1 Environmental Context

Table 4 shows the overall result of barrier factors that hinder the implementation of QLASSIC from environmental context.

Table 4. Rii result for barrier factors for Environmental Context

Theme	Factors	RII Score	Rank
Environmental context	E1. Lack of training on qlassic application	0.671	4
	E2. Lack of promotion/showcase about QLASSIC	0.671	4
	E3. Lack of support from client / authority	0.753	3
	E4. Lack of coercive pressure such as government/authority not mandating the implementation of qlassic	0.921	1
	E5. Lack of mimetic pressures such as to match other company performance and to enhance the company's image	0.835	2

Table 4 shows that, most respondents agreed that lack of coercive pressure such as government/authority not mandating the implementation of QLASSIC (with score 0.921) is the main

factor that hinders the process of implementing QLASSIC. They believed government and clients should play a significant role in promoting the implementation of QLASSIC by mandating the implementation of QLASSIC in public project likes they mandating the used of Industrial Building System (IBS) in public project. According to [37], in mandatory system, enforcement or push form authorities had a significant impact at the early stage of adopting new technology and it will lessen over time once the early adopters get used with that technology. Lack of mimetic pressures such as to match other company performance and to enhance the company's image (with score 0.835) is the second barrier factor why the pace of adopting QLASSIC is stagnant because there no reward gained if they fully implemented QLASSIC in their project. The least factors that hinder the implementation of QLASSIC are lack of training on QLASSIC application (with score 0.671) and lack of promotion/showcase about QLASSIC (with score 0.671).

6.1.2 Organisational Context

Table 5 shows the result of barrier factors in implementing QLASSIC from RII analysis for organisational context.

Table 5. Rii result for barrier factors for Organisational Context

Theme	Factors	RII Score	Rank
Organisational context	O1. Resistance from people/staffs	0.801	3
	O2. Lack of capabilities of staff in perform qlassic assessment practice	0.951	1
	O3. Size and type of organisation influence in adopting qlassic	0.901	2
	O4. Lack of confident on appropriate technical skill related to qlassic	0.615	4
	O5. Less support from top management to implement qlassic	0.501	5

From the perspective of Organisational Context as show in Table 5, majority of respondents believed that their organisation has a limited capability of staff in perform QLASSIC assessment practice (with score 0.951) that why they still hesitate to implement QLASSIC in their construction project. It is difficult to appoint staffs with certified QLASSIC assessor and the believed by having staffs with certified QLASSIC assessor, they can disseminate their knowledge among the unexperienced staffs within an organisation and can smooth the adoption process. The second barrier factor in implementing QLASSIC is size and type of contractor (with score 0.901). Respondents believed, only contractor with grade G7 is suitable to implement QLASSIC in their project due to the value of their projects are unlimited. Therefore, the quality of their project should above standard beside they have sufficient resources such as numbers of staff and fund to send their staffs to undergo training compare to small medium company. The least factor that hinder the implementation of QLASSIC is less support from top management to implement QLASSIC (with score 0.501). Respondents believed majority of top management support to any activities that will enhance the image of company and increase the productivity of their project that why this factor is the least factor that could hampered the implementation of QLASSIC.

6.1.3 Technological Context

Table 6 shows the result of barrier factors from RII analysis for technological context.

Table 6. Rii result for barrier factors for Technological Context

Theme	Factors	RII Score	Rank
Technology context	T1. The issue of availability of tools in implementing qlassic	0.501	4
	T2. Higher cost to purchase the qlassic's tools	0.654	3
	T3. Higher cost to undergo training to operate qlassic's tools	0.824	1
	T4. Tools are complex to handle and operate	0.794	2
	T5. Minimal benefits gained when adopting qlassic	0.824	1

From Table 6, found that the most prominent barrier factors in implementing QLASSIC from the context of technological are higher cost to undergo training to operate QLASSIC's tools (with score 0.824) and minimal benefits gained when adopting QLASSIC (with score 0.824). Respondent believed cost is the main factor why they hesitate to implement QLASSIC, they believe by implementing new process or method will affect their productivity because they need to revamp the current process that has been established to newly new process which is QLASSIC process. Cost not only buying or purchasing new tools but it is also involved in increment salary to staffs who are certified QLASSIC assessor, cost of training and cost of upgrading current infrastructure to support QLASSIC. Beside heavily invest to support the implementation of QLASSIC, majority of respondents questioned in what aspect they will get benefited when they adopting QLASSIC. There is no solid evidence found that by implementing QLASSIC will reduce the cost of the construction project and at the same time will increase the profitably of the project. The least factor that could hampered the implementation of QLASSIC is the issue of availability of tools in implementing QLASSIC (with score 0.501).

7. Conclusion

This study explored the barrier factors from the perspective of environmental context, organisational context and technological context from the perspective of contractors. It was discovered from the environmental context there is need push or urgency from government or clients to enforce the use of Quality Assessment System in Construction (QLASSIC) such as mandating the used of QLASSIC for public project. This step could improve the adoption of QLASSIC from the contractors' point of view. Beside mandating the use of QLASSIC, government/clients can give incentive to any contractors who implement QLASSIC in their project such as tax rebate, recognition etc. By doing this it can reduce the resistance from the industry to adopt QLASSIC and at the same time they can compete each other in order to increase their company image and reputation.

From organisational context, limited capability of staff in perform QLASSIC assessment practice or skilled workers is the main barrier in implementing QLASSIC. [15], reported from the developer's point of view shortage of skilled workers was the major hurdle for them to apply quality assessment. They hoped any institution could increase the production of skilled worked equipped with certified QLASSIC assessors by doing this they can recruited without provide them training to obtained certification and could increase the pace of implementation of QLASSIC. [13], added there is still a lack of knowledge regarding QLASSIC certification especially among small construction companies and this situation could hampered the pace of QLASSIC adaption among contractors.

Most prominent barrier factors in implementing QLASSIC from the context of technological are higher cost to undergo training to operate QLASSIC's tools and minimal benefits gained when adopting QLASSIC. And these two factors intercorrelate with each other's. [15,38], pointed that financial constraints were main reason remains the inability to implement QLASSIC because any construction

project that undergoing the quality assessment system will be slightly higher due to there are additional costs of 10% to 15% in total, in terms of materials, plant and labour [15,38]. While, [14] stressed that because of no tangible figure indicates by implementing QLASSIC could reduce the overall construction cost and benefited to them after they heavily invest in the QLASSIC that why they hesitate to adopting QLASSIC.

Conclusively, this study to help shed light on the barrier factors behind the slow pace of the adoption of QLASSIC assessment in the construction industry, where this finding significantly contributes to the understanding of why some contractors reluctant to implement QLASSIC in their project and could helps any authority to rectify these issues.

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