

Quantitative Model for the Systematic Evaluation of Standard Form of Civil Engineering Contract

Sim Nee Ting, Chee Khoon Ng

Abstract: This research presents a quantitative model for standard-form review that is systematic and concise with the aim to reduce dependency on individuals' opinions and the subjectivity in standard-form review. Construction industry in Malaysia has always has a heavy reliance on the standard-forms of contract as its General Conditions of Contract to outline the obligations and the rights of the parties contracting in civil engineering projects. However, according to the literatures available, the existing forms and all their subsequent revisions are still falling short in certain areas. Studies on standard form including those of form revisions are typically conducted qualitatively and in a rather random manner but the search for contractual documents idealization still remains. In this research, eight (8) attributes for standard form study and their relevant parameters were selected. A structured questionnaire survey was done to establish the rankings of these attributes and their importance weighting, W_i . Then, a structured technique to evaluate the clauses based on the Level of Adequacy, A_i against the number of problematic issues, is designed for form reviewer to evaluate each clause. Each clause in the standard-form will have a final Total Evaluation Score (TES). Magnitude of Evaluation of TES is designed to check the magnitude of positivity or negativity of the clauses. It is hoped that with a structured and quantitative model for form evaluation, both the positive points and conversely the problematic areas and issues in standard-forms of contract, not only in Malaysia but worldwide, can be determined in an objective manner, which in turn enhances future form drafting and revisions in the quest for an 'ideal' form.

Keywords: Systematic, Quantitative, Standard-Form, Review, Engineering, Contract

I. INTRODUCTION

All engineering construction projects in Malaysia are carried out with a contract, where it is governed by the Malaysian Law of Contract. All parties contracting are to abide the contract, which they have on their free will embarked onto. An engineering contract can be defined in various ways. A contract in engineering and construction signifies a meeting of mind between individuals who have agreed upon a transaction. This agreement will give rise to responsibilities/obligations, which then allows the other party to exercise their rights in the contract. In the case of a construction contract, it is a legally binding agreement that binds both the Client (the paymaster of the said works) and the Contractor who agree to carry out the said works in return for the specific amount of monetary compensation from the

Client. The contract also includes how the compensation will be distributed (Rodríguez, 2019).

Construction contracts can vary depending on the types of works and the method of procurement selected. The selection of the contract type depends on the basis of pricing and the contracting strategy that best meets the project objectives (Tatarestaghi et al., 2011, Urquhart & Whyte 2018).

According to Singh (2009), the documentations which constituted the contract documents, which form the main content in construction contracting in Malaysia, are given as follows:

- i. Conditions of contract (General and Special)
- ii. Agreement or articles of agreement
- iii. Appendix to the conditions
- iv. Bill of quantities
- v. Technical and Material Specifications
- vi. Schedule of rates
- vii. Drawings and plans
- viii. Design and build documents
- ix. Work program and/or work method statement
- x. Miscellaneous

Bubshait and Almohawis (1994) also mentioned that one of the important (if not the most important) part of a construction contract is the General Conditions of Contract. This is because the General Conditions document first and foremost seeks to define the relationships (obligations and rights) of the parties contracting in construction projects. Furthermore, this document registers the general rules and regulations of the project with respect to the relevant commercial terms.

General Conditions of Contract in Malaysia is generally in a form of a standard printed documents. It is usually published by an authoritative or professional body from the construction industry that is recognized by both the contracting parties. The document is referred to as the standard-form of contract. Robinson and Lavers (1988) points out that most of standard-forms of contract are commissioned by specific government agencies for use in the contracts they funded, or by a professional body that has taken upon itself to represent its private sector clientele.

The engineering and construction industry in Malaysia, although small in its relative size uses a variety of standard-forms of contract. The most commonly used standard-forms of contract used in construction and engineering are drafted by a few key public-authorities and professional bodies (Ali, 2006). They are namely:

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- Government Of Malaysia' Public Works Department (PWD), also known as Jabatan Kerja Raya (JKR)
- Architect Association of Malaysia (Pertubuhan Arkitek Malaysia (PAM)
- Institution of Engineers Malaysia (IEM)
- Construction Industry Development Board (CIDB)

The increasing use of custom-made standard-form for the specific agencies and organizations and subsequently supplemented with revised versions has seen numbers of standard-form available increasing. Having more 'altered' options may not necessary be beneficial for the industry as a whole, but instead reflect on the extent of fragmentation of the industry (Rajoo, 2014).

II. PROBLEM STATEMENT

As seen in Lim (2007), Noushad, (2008), Singh (2009), Cheong (2009), despite the high ratio of standard-forms over the quantum of Malaysian economy, the construction industry had been seemingly plagued with various long standing yet recurring contractual issues and problems. These issues had in many occasions resulted in industry wide arguments and disputes of which many are related to delays, non-performance, budget overruns, poor workmanship, late payment and even nonpayment. With standard-forms being created on the principle of all similar issues are adequately covered under the umbrella of standard-form, such repetitive occurrences of problems point towards the lack in the existing forms in specific areas like completeness, clarity, comprehensiveness and among others. The question remains why such lacks are not resolved with the myriad of standard-forms available and their continuous customization/revisions/redrafting.

Researches carried out by the authors in part (Ting, 2015) argued that stakeholders in Malaysian think that the standard-forms in Malaysia have still fallen short of being 'ideal'. Studies carried out on forms in Malaysia and its associated problems have created a 'need' to persist in producing "better and improved" conditions of contract. Issuance of new forms as alternative and on-going revisions, either in a modified, updated or a major revamped version indicates that the stakeholders, who have insisted on the usage of Malaysian forms, have according to Othman (2008), unwittingly subscribed and held on to the idea of a theoretical concept that there is a 'best' standard-form for contracting. The question remains whether the forms and their respective clauses are inherently not well written or the form studies carried out during form drafting and revisions are actually inadequate in properly covering the necessarily issues in form evaluations.

In addition, Whyte & Macpherson (2011) also suggested that the large number of alternative standard forms of contract being developed in the search of a better standard form have added to the complexity in the decision-making process when making contract and standard-form choices. This has not only made the decision making process difficult for the administrator (in many cases requiring considerable time and monetary effort), contract administrators and project team's knowledge and skills during contract administration are somewhat compromised. The element of 'Jack of all trades but the master of none' has emerged because as administrators could not fully grasp the details in every specific form due to the number of the available

standard-form options. This indicates that numbers of standard-forms can be an issue and the search of contract idealization may need to halt until form studies and evaluation are properly unified and standardized.

Form review works on Malaysian standard forms done in parts by the authors such as Rajoo (2014), Ting and Whyte (2009) and Zakaria et al (2013), it is also worthy to note that there is standardized form study that has been carried out with one predetermined method that encompasses a set of evaluation criteria/parameters with a standard set of measurement. Instead most studies are in the form of commentaries, qualitative reviews and academic studies done at the university level. Most standard-form evaluations have been done are carried in a rather random, ad-hoc manner carried out by a plethora of interested and concerned but unaligned, parties who are drafters of various organizations, arbitrators and legal personnel who had previously dealt with the disputes resulted from the standard form/s. Most formal studies on forms have been done on a specific form or a specific issue and sometime on particular clauses.

The above discussion points towards a need for a more standardized method for form evaluation for Malaysian standard forms based on a structured and quantitative approach that is less dependent of human subjectivity and repeatable with a predetermined set of criteria that can provide results that is applicable across the construction industry. This is critical for form evaluation, enhancement and revisions and to address any lacks in the current Malaysian standard forms.

The impending section describes the model for standard form evaluation, which was in part presented by the authors in Ting et al (2015) and Ting (2015). The model describes the selection of attributes and parameters for form evaluation; the validation and ranking of these attributes via an extensive survey; the design of the structured techniques to quantitatively calculate the level of adequacy of the clauses; and finally, calculation of a Total Evaluation Score (TES) for each of the clause.

III. MODEL FOR FORM ANALYSIS

The method for designing form analysis is described as follows:

1. Selection of attributes for Form Evaluation is carried
2. Selected attributes are quantified based on their degree of importance with an industry-wide survey.
3. The importance weighting, W_i for each attributes are analysed and obtained.
4. Level of Adequacy, A_i for each clause is designed.
5. Evaluators are required to determine the problematic-issues within each clause according to each attribute to determine the level of Adequacy, A_i
6. An instrument of evaluation is designed to obtain the Total Evaluation Score (TES) for the specific clause.
7. TES is compared with the Magnitude of Evaluation designed to check the positivity/negativity of each clause

A. Selection of Attributes

In year 1994, researchers Bubshait and Almohawis proposed an evaluation of the general conditions of a construction contract with their identified eleven (11) elements for 'good' general conditions of contract.

Bubshait and Almohawis' method had required an evaluator to rank the eleven (11) attributes and state their level of agreement with statements representing the attributes when reviewing the particular general conditions of contract.

The method is herewith adopted and improved in this project in order to evaluate the individual clauses in the standard forms of contract chosen for analysis and review. The evaluation method/procedures presented here is designed and used for specifically for standard-form of contract analysis, analyzing both the clauses and the form. Method can be replicated to review both Malaysia and international standard forms of contract.

Based on the various ideas of an 'ideal' standard form of contract, as discussed by Eggleston (2006), Chong & Rosli (2010), Brockbath (2000) and Bubshait and Almohawis' (1994), eight (8) attributes with their respective parameters are selected and proposed for the evaluation for standard-form of contract. The eight (8) attributes for evaluation are as follows:

- Clarity
- Completeness
- Comprehensiveness
- Consistency
- Flexibility
- Risk distribution
- Fairness/role distribution
- Clear framework for project management

The attributes' respective parameters and descriptions are further elaborated and explained in Table I. The following explained on how the importance weighting of each attribute is further determined.

B. Importance Weighting, W_i of Attributes

In order to quantify the degree of importance on the eight (8) attributes based on their importance to standard-form of contract evaluation and analysis in the Malaysian construction industry, five hundred (500) structured questionnaires were distributed to construction contract procurement and administration personnel. Their level of agreement or otherwise to the selected attributes and their opinions on the importance of these attributes and their respective parameters were collected. Engineers, architects, construction manager, project managers, quantity surveyors and other professionals who are involved in contract administration works, and in the capacity to deal with various standard forms of contract, are represented in the respondents.

There were one hundred sixty-two (162) returned questionnaires survey forms from the respondents. One hundred fifty-two (152) out of the total returns were analysed as appropriate to be further used to analyse the importance weighting of each attribute.

The One hundred fifty-two (152) survey forms received represent a 30.4% response rate. This rate is deemed to be appropriate and fulfilling the minimum 20% response rate required for a survey to be valid (Visser et al., 1996). Therefore, the results from the survey are considered valid to reflect the views and opinions of the construction industry at large on the attributes of evaluation.

Table II summarizes the ranking results of the one hundred and fifty-two (152) questionnaires. The survey results indicate the rankings for the attributes, which are summed up as the weighting points for the attributes. Largest weighting

point indicate lowest ranking attribute and vice versa. Highest ranking attribute indicates a lowest importance weighting and vice versa.

The Importance Weighting W_i in percentage is determined by using Equation (1) as follows:

$$W_i = \frac{\text{Weight}}{36} \times 100\% \quad (1)$$

The importance weighting of each attribute calculated using Equation (1) is shown in Table III. The results in Table III form the first component of the calculation of the total evaluation score (TES) for each clause when evaluating the clauses. The impending section further discusses the Model for Form Analysis.

Table I: Attributes and Parameters for Standard Form of Contract Evaluation

Attribute	Parameters	Clarification on Parameters
Clarity	1. Use of Language 2. Sentence Structure 3. Sentence Length	1. Simple English, with minimum legal jargon, minimum ambiguities, minimum technical and grammatical errors 2. Brief and concise, easily understandable 3. To be less than 40 words in a sentence.
Completeness	1. Level of Issue Coverage	1. The extent of including necessary issues within the same subject area
Comprehensiveness	1. Procedures of the clause 2. Timeframe for contractual activities	1. Procedurally covering the steps to resolve issues and problems 2. Provision of a specific time frame for contracting parties to respond.
Consistency	1. Conflict with external references 2. Conflict with cross referencing to other clause/external law	1. Conflict of issues between clauses and other clauses within the form. 2. Conflict with external law/policy/ Act/authoritative bodies 3. Make necessary cross reference to external law/policy/ Act/ authoritative bodies
Flexibility	1. Ability to cater for unexpected situations 2. Clauses are open for problem solving by project team	1. Having procedures to handle unexpected situations 2. Clause too loose up to the discretion of certain party 3. Clause is unnecessarily rigid.
Fairness/Role Distribution	1. Balancing of the rights and obligations of parties involved	1. Number of rights and obligations of Employer 2. Number of rights and obligations of Contractor
Distribution of Risk	1. Equal distribution of negative impacts/consequences to the parties	1. Negative impacts sided to the contractor 2. Negative impacts sided to the Employer
Clear Framework for Project Management	1. Procedures/option to enhance project management	1. Able to apply to management criteria including time, cost, quality, safety issues 2. Able to enhance on project contract administration 3. Able to enhance people and management

Table II: Importance Weighting of the Selected Attributes

Attribute	Weighting Points	Ranking	Importance Weighting (out of 36)
Clarity	260	1	8
Completeness	346	2	7
Comprehensiveness	371	3	6
Consistency	450	4	5
Flexibility	482	5	4
Risk distribution	574	6	3
Fairness /Role Distribution	581	7	2
Clear Framework for Project Management	611	8	1
Total of Weight			36

Table III: Importance Weighting of the Selected Attributes in Percentage Form

Attribute	Importance Weighting (out of 36)	Calculations	Importance Weighting (%), W_i
Clarity	8	$\frac{(8)}{36} \times 100\%$	22.22
Completeness	7	$\frac{(7)}{36} \times 100\%$	19.44
Comprehensiveness	6	$\frac{(6)}{36} \times 100\%$	16.67
Consistency	5	$\frac{(5)}{36} \times 100\%$	13.89
Flexibility	4	$\frac{(4)}{36} \times 100\%$	11.11
Risk distribution	3	$\frac{(3)}{36} \times 100\%$	8.33
Fairness/Role Distribution	2	$\frac{(2)}{36} \times 100\%$	5.56
Clear Framework for Project Management	1	$\frac{(1)}{36} \times 100\%$	2.78
Total of Percentage			100

C. Level of Adequacy, A_i for Each Attribute

With the determined W_i for each attribute of evaluation, form evaluator has to deliberate the level of adequacy, denoted by A_i of the specific clause with respect to each of the eight (8) attributes of evaluation. The level of adequacy utilised herein is rather similar to the Likert Scale Method.

No Changes Needed = 10

Minor Amendment required = 8

General Amendment required = 6

Major Amendment required = 4

Clause re-drafting necessary = 2

Analyses were carried out based on parameters within each attribute as set out in Table I in order to have a repeatable structured technique for deliberation. Using a checklist method as presented in Table IV, this method of evaluation quantitatively record the specific clauses' problematic issues as measured against the attributes and their respective parameters. The evaluator's deliberation will be recorded under the attributes and parameters and the number-of-problematic-issues will subsequently be quantitatively summed-up.

Table IV: Clauses Analyzed In Terms Of Parameters Under Each Attributes of Evaluation

Clause Title and No	Attribute: Parameters	Description of Problematic Issues	Total Problematic Issues	Level of Adequacy

The correlation between A_i and the number of problematic issues is shown in Table V. For the specific attribute, if there are more than 6 problem areas derived from the parameters, the attribute will score $A_i = 2$. If no problematic issues are detected, the attribute will score $A_i = 10$.

Table V: Level of Adequacy, A_i as per indicated by the Problem Areas

Level of Adequacy, A_i	No of Problem areas
No Changes Needed = 10	None
Minor Amendment Required = 8	1 to 2 problematic issues
General Amendment Required = 6	3 to 4 problematic issues
Major Amendment Required = 4	5 to 6 problematic issues
Clause re-drafting suggested = 2	7 or more problematic issues

D. Total Evaluation Score (TES)

With the deduced A_i for each attribute, the score named herein as the Attribute Score can be obtained by multiplying A_i with W_i . Each attribute score contributes to the final calculation of the Total Evaluation Score (TES) Scoring System (as adapted from Bubshait and Almohawis's (1994)) using Equation (2). For every clause in each of the standard forms of contract selected for review, a TES score is obtained.

$$TES = \frac{\sum W_i \times A_i}{10} \quad (2)$$

Where:

TES = total evaluation score

W_i = weight (importance) of attribute i

A_i = level of adequacy related to attribute i

Total Evaluation Score (TES) forms the indicator for adequacy level of a particular clause. In order to create a systematic model, a clause evaluation instrument in the form of a table is shown in Table VI. It is designed and modified from Bubshait and Almohawis's (1994). This evaluation instrument allows the evaluation of each individual clause in a particular standard form of contract and is considered repeatable for all clauses in all types of standard forms selected for analysis.

Table VI: Clause Evaluation Instrument Designed

Attributes	Importance Weighting	Redrafting Needed					WXA
			Major	General	Minor	Perfect	
Clarity		2	4	6	8	10	
Completeness		2	4	6	8	10	
Comprehensiveness		2	4	6	8	10	
Consistency		2	4	6	8	10	
Flexibility		2	4	6	8	10	
Risk distribution		2	4	6	8	10	
Fairness or Role Distribution		2	4	6	8	10	
Clear Framework for Project Management		2	4	6	8	10	
Total:	100		Total Score:				



E. Magnitude of Evaluation

For final form analysis, the TES for all the clauses in the specific form can be compiled and compared with the schedule of Magnitude of Evaluation designed. Magnitude of Evaluation as shown in Table VII is a scoring card for the standard form and all its clauses. It indicates the magnitude of positivity and negativity of the clauses and hence, the level of positivity/negativity of the specific standard form.

Table VII: Range of Evaluation of TES

Range of Total Evaluation Score (TES)	Magnitude of Evaluation
20-39	Highly Negative
40-49	Negative
50-59	Low Negative
60-69	Low Positive
70-79	Positive
80-89	Highly Positive

With a score of 80 and above, the clause is deemed as highly positive whilst scoring lower than 60 indicates negativity in the clause. Depending on the number of clauses falling within the specific categories of Magnitude of Evaluation, the standard-form can be rated accordingly. In order to justify the reliability and validity of the results, in depth form analyses were carried out for all the major standard-form of contract used in Malaysia and results are verified and as discussed in the following section.

IV. DISCUSSION

The model for systematic form evaluation presented in this paper was used to evaluate five (5) common standard-forms of contract used in the local Malaysian construction projects. The selected forms are used to deliver projects via traditional procurement method. There were in total 277 clauses in the five forms under this evaluation exercise.

The results of the form analysis of Public Works Department 203A Form (Rev. 2007) Standard Form of Contract (PWD 203A), which has 78 clauses reveal the following:

- Eight (8) clauses in the Positive Category scoring TES of 70-79 point.
- Thirty five (35) clauses in the Low Positive Category scoring TES of 60-69 point.
- Twenty six (26) clauses in the Low Negative Category scoring TES of 50-59 point.
- Nine (9) clauses in the Negative Category scoring TES of 40-49 point.

The results of the form analysis of JKR Sarawak Form of Contract, which has 49 clauses showed the following results:

- Nine (9) clauses in the Positive Category scoring TES of 70-79 point.
- Eighteen (18) clauses in the Low Positive Category scoring TES of 60-69 point.
- Sixteen (16) clauses in the Low Negative Category scoring TES of 50-59 point.
- Six (6) clauses in the Negative Category scoring TES of 40-49 point.

The following indicated the results of the form analysis of Pertubuhan Arkitek Malaysia 2006 Standard Form of Building Contract (PAM 2006), which has a total of 38 clauses:

- Seven (7) clauses in the Positive Category scoring TES of 70-79 point.

- Eighteen (18) clauses in the Low Positive Category scoring TES of 60-69 point.
- Ten (10) clauses in the Low Negative Category scoring TES of 50-59 point.
- Three (3) clauses in the Negative Category scoring TES of 40-49 point.

The results of the form analysis of IEM Form of Contract for Civil Engineering Works 1989 (IEM 89 CE), which has 57 clauses showed the following results:

- Ten (10) clauses in the Positive Category scoring TES of 70-79 point.
- Nineteen (19) clauses in the Low Positive Category scoring TES of 60-69 point.
- Twenty five (25) clauses in the Low Negative Category scoring TES of 50-59 point.
- Three (3) clauses in the Negative Category scoring TES of 40-49 point.

The following put forward the results of the form analysis of Construction Industry Development Board Standard form of Building Contract 2000(CIDB 2000), which has a total of 49 clauses and 6 Option Modules:

- Fourteen (14) clauses in the Positive Category scoring TES of 70-79 point.
- Twenty one (21) clauses in the Low Positive Category scoring TES of 60-69 point.
- Twenty two (22) clauses in the Low Negative Category scoring TES of 50-59 point.
- None in the Negative Category scoring TES of 40-49 point.

From the results of evaluation of the five standard forms of contract, it is noteworthy that they are all generally found lacking in the areas of completeness, comprehensiveness and do not have a structured framework to enhance project management. All forms admittedly have their own lackluster points. Government forms (those specifically written to cater for government funded project such as PWD 203 A (being used in Federal Government agencies and JKR Sarawak Form of Contract (being used in the Sarawak State Government agencies) faced issues with risk and role distribution . Even though standard forms are supposed to be designed on the 'equitable principle' based on the fundamental assumption of similar projects demand similar contracts with similar responsibilities and rights, both forms did not achieve well in the 'fairness' aspects as pointed out in the negative scores in attributes of roles and risk distribution.

CIDB 2000 which was initially created to override the current PWD 203 forms and was meant to take precedent in the Malaysia's private construction projects was considered to be somewhat a latest comer in the series of standard form in Malaysia. It is rated to be least problematic when compared to the others as this method allows a quantitative comparison with scores on each clause. However the uptake/usage of the form has been minimal and limited as stakeholders persistently falls back to those used/tested/tried forms.

Other forms in this study are mainly revision of their predecessors. IEM 89 CE form was rated as one of the least satisfactory standard-forms. Evaluation found the form to be seemingly outdated. In year 2006 PAM updated its 1998 version of standard-form in the effort to improve the form's clarity and comprehensiveness.

However, when rated with this proposed evaluation technique, ambiguity in many of the clauses remain and instead of being more comprehensiveness, it leave decision making to the judgment of the 'architect' who is the designated superintending officer in PAM form.

Results from form analysis using this stated model corresponds with various literature and study carried out by other authors such as Rajoo et al (2010), Lim (2004), Lim (2007), Noushad, (2008), Singh (2009), Cheong (2009), Goh (2009) on Malaysian standard forms. This verification exercise had successfully identified and discussed the challenges and issues evident in each standard-form. The results were consistent with the general commentaries and the results from previous form studies.

Whilst the previous review methods, albeit being qualitative and subjected to the drafters/reviewers' level of experience and judgment, had served the respective drafting bodies fairly well in their form customization exercise, revision and redrafting efforts. However, such methods are limited by the characteristics of the drafting/review bodies and their review styles. Application of such methods to other forms will be generally counter with resistance by other drafting bodies who have different practices, culture and interests. In other words, they are not agreeable across the board. The method of form study developed and proposed herein not only identified and detailed out the positive and conversely the problematic areas within a standard-form, it can serve as a standardized method for form evaluation that can be adopted by different drafting agencies and professional bodies in Malaysia.

V. CONCLUSION

Standard-forms of contract evaluation in Malaysia is traditionally carried out by groups of professionals, aligned with the professional bodies and government agencies, who had drafted the forms in the first place. Subsequent improvements, revisions or revamping were carried out predominantly on a standalone and as-when-necessary basis. Form evaluation and revisions are generally dependent of the judgment, experience and expertise of the individuals doing the evaluation. It lacked the systematic evaluation basis and technique, which in turn leads to subjectivity in the review results that can be varying across individuals and different organizations. Such evaluation and reviews can improve the forms with respect to specific issues and/or particular attributes to a certain degree but has yet to achieve a wholesome evaluation that tie in all the contractual issues within a specific form. The overall desired effect of an ideal best-practice form remains elusive.

It is also noted that the current practice of selecting standard forms is strongly pivoted on the 'familiarity' factor and an unwarranted reliance on the 'tried-and-tested' one, contractual problems, issues and even disputes persistently recurred in the administration of the standard forms used in Malaysia. Hence, it was deemed very critical that the standard forms are being evaluated with a framework and/or procedures that use a standardized method to achieve synchronized improvements and structured revision or redrafting. Form evaluation method needs to be quantitative to rid subjectivity and up the objectivity in the results. From the preceding discussion, it is the aim of this research to strongly advocate for a standardized, quantitative method of standard form evaluation and clause analysis.

The form evaluation method developed here first established attributes for form measurement using an extensive questionnaire survey of five hundred (500) respondents who were professionals involved in construction contract procurement and administration in Malaysia. The research seeks out their responses in terms of their agreement or disagreement on the specified attributes and their parameters adapted from secondary research. Respondents were to rank the attributes and parameters based on their attributes' suitability for the measurement of the adequacy of clauses and ultimately the standard forms. The attributes for evaluation (identified from the original elements) and taken into consideration for the study are clarity, completeness, comprehensiveness, flexibility, consistency, risk distribution, fairness/role distribution and having a clear structured framework for project management

Each attribute with respective aligned parameters, then forms the basis for form evaluation. Upon completion of the survey works, each attribute was weighted in terms of their importance, resulting in an attributes' importance weighting. Each clause in a standard form can then be analyzed with the level of adequacy, specifically designed to be quantitative based on the calculation of problems areas. This method will allow evaluator/reviewer to evaluate a level of adequacy (with a Likert-Scale like range designed) for every clause with respect to the attributes of evaluation based on the number of problem areas in each attribute.

From the evaluation, every single clause in a form will achieve a score, i.e. the Total Evaluation Score (TES) which adds up all the attributes' scores. TES for each clause can be measured against the magnitude of evaluation and classified as positive or negative and varying degrees. This scores will help to pick up the clauses' specific problems and issues to be further analyzed for forms improvements/revisions purposes.

The method of standard-form evaluation was further verified by applying the method onto five (5) standard-forms of contract commonly used in the engineering and construction industry in Malaysia. Every clause (277 clauses in total) was tested with the method. The clauses were carefully pit against the attributes of evaluation, rated with the Level of Adequacy designed and received a TES.

It is envisaged that with this structured and quantitative model for form evaluation drafting bodies and seeking to carry out reviews and evaluation not only in Malaysia but globally, can review and evaluate standard-form in an objective manner, which in turn enhances future form drafting and revisions in the quest for an 'ideal' form.

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