Systematic Organization of Multi-criteria for Effective Tender Evaluation using Balanced Scorecard Approach

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ABSTRACT

The purpose of tender evaluation is to help an organization in identifying and selecting suitable contractor for a particular project. The effectiveness of tender evalution is influenced by several factors such as the relevancy and suitablity of criteria used, measurement weights for the criteria and experience of the evaluators. In general, for IT projects, lowest price is not the only criteria that had been used in tender evaluation. Quality of services offered has equal importance. Several criteria relating to contractors' performance such as technical experience, structure of the organization, past performance and so on also need to be considered in selecting contractors. Currently, criteria for tender evaluation is not been standardized yet where different researchers propose different set of criteria. This paper presents a proposed framework for tender evaluation which consists of identified criteria for tender evaluation. The criteria has been organised in four different perspectives of Balanced Scorecard (BSC) approach. Experts from the financial and technical tender committee of UUM were consulted in constructing, validating and verifying the framework.

Keywords
Tender Evaluation, Balanced Scorecard, Financial Measure, Non-financial Measure

1.0 INTRODUCTION

In Information Technology (IT) industry, large IT projects are often acquired through a tender process where the organization announce the project requirements and suppliers or contractors will bid for the tender. The bidding will be evaluated based on certain criteria and only one suitable contractor will then be selected and awarded the project (Chan et al., 2007). In current practice, tender evaluation involved with humans or decision makers judgements. The evaluation of the bidders and their ability must be coherent and maintained with fairness, probity and transparency to ensure the quality and consistency of the tendering process thus ensuring the best outcome (SPS 2007).

As tender evaluation took place at the early stage of the project life cycle, the effectiveness of the process of selecting the winning bidder is certainly important and directly related to the project success and the achievement of specified measurement objectives (Lopes & Flavell, 1998). The procedure is considered crucial and critical where the performance of the project will be affected if the evaluation is carried out without proper and accurate method (Faridah, 2007) thus affecting the organization and contractor reputation in future (Mohamad Noor et al. 2003, 2008). Among the factors influencing the effectiveness of tender evalution is the suitability of criteria used, assigning appropriate measurement weights and experience of the evaluators. Currently, there is no standardized indicators or quality criteria and methods for tender evaluation. Different researchers suggest different criteria or also known as indicators or measures for tender evaluation.

Moving on, as selection of suitable criteria is important, this study proposed a conceptual and systematic framework for tender evaluation by using Balanced Scorecard method. The framework describes the objectives for the evaluating criteria and organizes the measures or criteria for tender evaluation based on four different perspectives: financial, internal business process, customer and learning and growth perspectives. Later, the

proposed framework will be used to design and develop an e-tender evaluation system for awarding contract on IT project. This paper presents the proposed conceptual framework for tender evaluation which has been constructed using the BSC approach. The framework describes the objectives and organizes multiple criteria for effective tender evaluation based on financial and non financial perspectives.

The structure of this paper is as follows: the next section reviews the current practices in tender evaluation. In Section 3, an overview of BSC is presented. Section 4 discusses the research method, and Section 5 elaborates the proposed tender evaluation framework. Finally, Sections 6 concludes the paper with recommendations for future work.

2.0 CURRENT PRACTICES IN TENDER EVALUATION

In general, current practice for selecting suitable contractors involves various procedures such as open tendering, prequalification, tender evaluation, and negotiation (Topcu, 2004). Initially, an organization will open a tender by issuing the project requirements. Contractors will then bid for the tender. Prequalification is a screening phase where the contractors with minimum capabilities are established. Next, in the evaluation process, only qualified contractors who are able to fulfill the project requirements will be considered where the most suitable contractor will be awarded with the contract. Finally, a negotiation procedure will took place.

Research in the area of competitive bidding strategy models has been in progress since the 1950s (Fayek, 1997). Other studies focused on introducing IT for effective decision making and managing tender (Mohamad Noor et al. 2008; Chan et al. 2007).

Some of the studies were specifically focused on designing models for construction industry (Stark & Rothkopf, 1979). Chan et al. (2007) introduced the use of electronic based tendering system to handle problems occured in traditionally tendering process. Mohamad Noor et al. (2008) conducted a study to produce a complete electronic tender evaluation systems. They used Multi Criteria Decision Making (MCDM) analysis to assist evaluators in evaluating multi criteria of tender selection.

In his invaluable study, Topcu (2004) noted the different procedures for tender evalution in various countries such as Turkey, Denmark, France, Italy, Portogal, Peru and Korea. According to Topcu (2004), one of the most frequently used procedures for selecting contractors is competitive bidding where the contract will be awarded based on the lowest bid price. In Turkey, the lowest bidder among prequalified contractors is the winner. The prequalified criteria used are the ability to timely complete projects, organizational expertise, availability of experienced technical staff and availability of resources such as machinery and equipment. However, in France, bid prices that are considered abnormally low by the project owner are excluded. On the other hand, in some countries such as Italy, Portugal, Peru and Korea, the highest and the lowest bid prices are excluded and the closest bid price to the average of the remaining ones is then selected. The similar procedure also used in Denmark but with the two highest and the two lowest bid prices excluded.

Study done by Ng and Skitmore (1999) determined the prequalification criteria by conducting a postal questionnaire survey to UK construction industry. The study has successfully identifed ten (10) prequalification criterias which are financial stability, performance, fraudulent action, contract failure, managerial and corporate stability, progress of work, health and safety, previous debarment, competitiveness and quality standard.

As mentioned before, tendering process involves decison making process. The accuracy of the decision will depend on the evaluation of the selected criteria or indicators. Unfortunately, tender evaluation process is still considered as unmatured yet as there is no standardized criteria and methods for tender evaluation. Several studies have been conducted and different researchers suggested different criteria for tender evaluation. Faridah (2007) suggested tender price as a key indicator for determining tender acceptance.

However, according to Hatush and Skitmore (1998) and Holt et al. (1994) in Topcu (2004) the evaluation on lowest price basis is one of the major causes of project delivery problems due to the rises of quality problems during and upon completion of the project. Topcu (2004) recommended the evauation of contractors should be done based on multi-criteria approach with respect to their economic and technological aspects, quality standard, past performances (in term of cost, time and ability to produce completed product with high quality aspects). While, Mohamad Noor et al. (2008) suggested several criteria to be considered such as professional and technical staff, experiences, reputation records, current projects in hand, financial background, current facilities and current projects remain or in progress.

3.0 OVERVIEW OF BALANCED SCORECARD

The Balanced Scorecard (BSC) is a strategic management system that aims to clarify strategy and to translate it into action (Kaplan & Norton, 1992). The BSC was developed by Kaplan and Norton in 1990s. It has been widely used by organization as a tool to assess and manage their organizational performance. Kaplan & Norton (1996) stated that for the achievement of a balance result, the evaluation of a company performance should not be restricted to the traditional financial accounting measures (such as the return on investment (ROI) and payback period) but should be supplemented with non-financial criteria concerning customer satisfaction, internal processes and the ability to learn and grow. They added, results achieved within the additional perspectives should assure future financial results.

Kaplan and Norton proposed four perspectives for BSC: 1) measures of customer satisfaction; 2) financial measures; 3) internal process metrics; and 4) organizational innovation measures. For every perspective, researcher should select and agree on the important measurement criteria in each quadrant. The strength of BSC is the ability to provide insight into dynamically complex situations and allows managers to assess whether improvement in one area may have been achieved at the expense of another.

Therefore, we believe that the proposed framework which combined the concept of BSC would become a useful tool to effectively manage the measurement criteria of tender evaluation process especially for IT projects.

4.0 RESEARCH METHODOLOGY

This study consists of three main stages which are data collection, framework construction and validation of the proposed framework. As for the data collection stage, document reviews and case study approaches were adopted. The tendering process guideline from Jabatan Kerja Raya Malaysia (JKRM) were used as a guidance to elicit the actual practice. This document has been widely used by most of Malaysian organizations (Mohamad Noor et al. 2008). Besides that the criteria of tender evaluation had been also identified from the literature review. A case study was also conducted on the tendering process of the Bursary Department, Universiti Utara Malaysia (UUM). A mini workshop was organized facilitated by BSC expert where the concept of BSC and ways to adopt it into tender evaluation was discussed. This is to ensure the approach has been correctly adopted.

Tender evaluation process for IT projects basically can be separated into two different aspects: financial and technical. An interview was conducted with Bursary Officer who directly involved with tender evaluation in order to understand the criteria and method used especially on the financial aspects. Another interview was also conducted with the IT Officer on matters related to the technical aspects. Both interviewees confirmed that basically the tender evaluation procedure that is currently applied in UUM is based on the guideline prepared by the JKRM. However, UUM tender committees can add their own tender evaluation criteria based on specific project launched for tendering. Next, the collected information was used in constructing the proposed framework using BSC approach.

Finally, to ensure the correctness and completeness of the proposed framework, it has been validated by using expert review approach from the financial technical and BSC aspects. Feedbacks and recommendations acquired from the review session had been used to improve the proposed framework.

5.0 THE PROPOSED TENDER EVALUATION FRAMEWORK FOR IT PROJECT USING BSC APPROACH

Table 1 shows the proposed tender evaluation framework which translates strategy into objectives and criteria that uniquely communicate the vision of UUM and Bursary Department. The framework has organised the identified tender evaluation criterion in four different perspectives: financial and non-financial.

The Financial dimension representing that effective tender evaluation is certainly required in managing financial resources in the most optimal way which significantly contributes to the organization success. As a strategy for managing the university's financial resources in the most optimum way, selecting the best bidding price should be considered as the most prominent criteria in awarding the tender.

The non financial perspective consists of customer, learning and growth, and internal business process. The Customer perspective is representing the UUM tender committee or organization which required the service. The strategy for this perspective is to obtain the best service provider and reduce the tender evaluation time. The strategy can be achieved by selecting the most suitable contractor and reducing the duration of tender evaluation process.

Learning and Growth perspective is mainly focused on the future orientation to represent the beneficial

of effective tender evaluation to the organization. Under this perspective, four different objectives have been defined: i) to get the finest support service, training and maintenance, ii) improve staff competencies, iii) accessibility to strategic information, and iv) improve technology infrastructure which directly support acquiring technology transfer.

Finally, Internal Business Process is mainly focused on to increase stakeholder satisfaction by selecting the most suitable contractor through a clearly defined measures and transparency process.

The proposed tender evaluation framework based on balanced scorecard approach is only the starting point for improving the method of tender evaluation process.

6.0 DISCUSSION

The Bursary Department, UUM, now has a systematic framework for tracking its compliance with UUM corporate objective that are reflected in BSC measures. However, the Bursary Department should play its role to analyze the scorecard data of tender evaluation and regularly report it back to the researcher for monitoring and updating the measurement criteria if necessary.

The steps of constructing the scorecard for tender evaluation begun by exploring the concept of tender evaluation and identify the evaluation criteria. Then, the identified criteria of tender evaluation were presented to the officer at the Bursary Department, UUM. The criteria should be specific, measurable, actionable, relevant and timely. After they agreed with the criteria, a brainstorming session was carried out with the BSC expert to map the criteria into the four perspectives of BSC approach.

The most important thing to be considered while constructing the scorecard is that it should translate the strategy into measures that uniquely communicate the vision of the organization. In addition, it also should be constructed based on cause-and-effect relationships. This means that the scorecard should contain a good formulation of outcomes and performance drivers because the performance drivers may indicate how the outcomes are to be achieved. For example Table 1 depicted that the outcome of customer perspective is the timeliness of the process and the performance driver for the outcome is duration of tender evaluation process.

7.0 CONCLUSION

Based on the experience in adopting the BSC approach, it is a useful tool in organizing the measurement criteria for tender evaluation. The proposed framework that had been discussed in this paper is just the starting point for the tender evaluation research. These findings will be used as a basis to proceed to the next step which is to improve the tender evaluation method through the use of Multi Criteria Decision Making (MCDM) approach and integrated with Artificial Intelligence technique.

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Table 1: The Proposed Tender Evaluation Framework for IT Project using BSC Approach

PERSPECTIVE1: FINANCIAL Manage the University's financial resources in the most optimum way		**PERSPECTIVE 2: CUSTOMER** Obtain the best service provider and reduce the tender evaluation time	
OBJECTIVES	**CRITERIA**	**OBJECTIVES**	**CRITERIA**
• Select the best bidding price	• Best offered price (lowes) • Price <= ceiling price ± 15% (lead)	• Select the most suitable contractor	• Cost effective • Satisfy basic analysis and selection requirements • Best service provider
		• Timeliness	• Duration of evaluation process
PERSPECTIVE 3: LEARNING AND GROWTH Receive training and consultancy services in promoting the growth and development of knowledge		**PERSPECTIVE 4: INTERNAL BUSINESS PROCESS** Bestow fair chance to contractors	
OBJECTIVE	**CRITERIA**	**OBJECTIVE**	**CRITERIA**
• Get the finest support service, training and maintenance	• Warranty period • Number of training • Intensity of training	• Transparency	• Accomplish basic requirement and specific requirement analysis
• Improve staff competencies	• Employee capability • Empowerment		
• Accessibility to strategic information	• Information System capabilities	• Well defined tender evaluation processes and measures	• Completeness basic requirement analysis • Completeness document analysis • Financial & capital analysis • Contractor credibility • Contractor capability
• Improve technology infrastructure which directly support in acquiring technology transfer	• Appropriate technology • Motivation		