

# A Conceptual Framework for Procurement Decision Making Model to Optimize Supplier Selection: The Case of Malaysian Construction Industry

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**Abstract.** This paper intends to fathom the current state of procurement system in Malaysia specifically in the construction industry in the aspect of supplier selection. This paper propose a comprehensive study on the supplier selection metrics for infrastructure building, weight the importance of each metrics assigned and to find the relationship between the metrics among initiators, decision makers, buyers and users. With the metrics hierarchy of criteria importance, a supplier selection process can be defined, repeated and audited with lesser complications or difficulties. This will help the field of procurement to improve as this research is able to develop and redefine policies and procedures that have been set in supplier selection. Developing this systematic process will enable optimization of supplier selection and thus increasing the value for every stakeholders as the process of selection is greatly simplified. With a new redefined policy and procedure, it does not only increase the company's effectiveness and profit, but also make it available for the company to reach greater heights in the advancement of procurement in Malaysia.

*Keywords: Supplier selection, procurement, Malaysian construction industry, metrics*

## 1. Introduction

Supplier selection has always been a major strategic decision for clients of many industry. Supplier selection can be defined as a multi-criteria decision making problem which takes into account both qualitative and quantitative factors. With the advancement of procurement especially in the construction industry, a supplier selection must be able to take on the complicated modern day procurement practices systematically and with utmost transparency. This paper focuses on developing a procurement decision making model to optimize supplier selection in the Malaysian construction industry. This paper will provide the fundamental framework supplier selection metrics for Malaysia's infrastructure building and determining which metrics contributes most in creating a successful procurement in construction projects. To obtain this metrics, studies have to be done on the end user's perspective on the definition and viability of metrics. Degraeve and Roodhooft [1] research states that the main factor supplier selection were given to the price consideration. However, not many studies are being done on determining and weighing other criteria of supplier selection in Malaysian construction industry.



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With that said, this conceptual paper proposed a framework to evaluate criteria that influence supplier selection by identifying the importance of each criteria. For this paper, a mix method approach which comprises of qualitative and quantitative methods is used. Next, the scope is towards identifying and defining criteria that stakeholders in Public Works Department (PWD) believe should be use in supplier selection. The product from this paper is foreseen to bring PWD to an advancement in procurement and to the next strategic supplier selection level. The outcome of this research also provides a more in depth understanding on supplier selection drivers in the construction industry. This will not only benefit PWD but every other construction agencies and supplier selection decision making groups in the future. Finally, the value of this research can be put into good use as an initiative to increase awareness in transparency of decision making among stakeholders and policymakers therefore greatly increases integrity in procurement practices.

## **2. Review on Current State of Procurement Decision Making for Construction Industry**

The construction industry is an important role in generating wealth and improving the quality of life for Malaysians. The construction industry makes up an important part of the Malaysian economy. The construction industry in Malaysia has scarcely conducted studies to determine the appropriate supplier selection metrics. However, the actual fundamental constructs of supplier selection in construction projects is rarely addressed. Day and Barksdale [2] states that most published studies offers only few insights into the purchasing process. This is because many if not all researchers did not study who comprises the decision-making process. Hence, the purpose of this research is to study the supplier selection metrics for construction projects and the importance of each metric that has been assigned in the Public Works Department (PWD).

According to Lu and Swaminathan [3], supply chain management (SCM) is a critical aspect in conducting any business. In supply chain management, the emphasis is on how well a group of companies perform in order to create value for the end user [4]. Since the nineties, there has been an increase in interest towards supply chain management system research and theories. Segerstedt and Olofsson [5] says that this is to understand and characterize the deficiencies and to propose solutions to improve the coordination of the often many subcontractors and supplier in the construction supply chain.

In recent years, both private and public sector's organizations have placed more attention on cost reduction and flexibility, concentrating on core competences and outsourcing non-core activities. This was the initial step for construction companies towards becoming more competitive in the ever growing market. A study done by Ancarani and Capaldo [6] states that the relevance of these activities for the organization's performance requires an accurate analysis of what it is outsourced. Project procurement provides an excellent environment for ethical issues with its low-price state of mind and competition. Procurement process has many openings that could contribute to illegal activities or unethical behaviour especially in the construction industry. In 2006 alone, 17.3% of 417 Malaysian government contract projects were considered unhealthy due to the poor performance by the contractors. Therefore, it is important to govern the project procurement, especially during the entire procurement stage to ensure the accountability and transparency of the decision made in awarding the right contract to the best contractor [7].

To explain the supplier selection process further, a pool of suppliers is chosen for procurement according to a predefined set of criteria. Based on current academic literature, Xu [8] have reviewed 78 related articles appeared in the period from 2000 to 2008. They noted that quality is the most popular criterion in which 68 papers or 87.18% of researchers agrees in the supplier selection process. The second most popular criterion is delivery that is with 64 papers or 82.05% agreeing. Surprisingly, price or cost falls in third place with 63 papers or 80.77% which initially thought would be the main criteria in supplier selection. After much more studies, they discover that there was a trend in the supplier evaluation and selection problem to use the multi-criteria decision making approaches. The procurement decision process is concerned with the problem of lot-sizing and other inventory related issues. Finally, in the sourcing evaluation process, overall efficiency and effectiveness of procurement process is assessed [9].

### **3. The Rising Trend of Procurement Decision Making**

Puente [10] defines supplier selection as the process by which firms identify, evaluate and contract with supplier. The selection of the most suitable supplier for a procurement process has a markedly strategic aspect for a company. Supplier selection metrics have evolved over the years from the traditional set comprising of price and quality. With industrialization and globalization phenomena kicking in at fast pace, there have been an emergence of new metrics for the selection for an optimal supplier. This tracks back to the empirical evidence provided by Genovese [11] showing the addition of innovation, flexibility and even environmental responsibility plays an important role to attain a sustainable supply chain. Studies in manufacturing industries have also shown the rise of new metrics to suit the need of current turbulent business environment [12, 13].

The recent upsurge of awareness in corporate governance related matters in Malaysia and other developing countries is a manifestation of its rising importance for strong economic performance of organizations and nations. In reference to Dalton [14], corporate governance refers to a framework of rules and practices according to which an organization is directed and controlled. Therefore, it functions to establish and enforce policies deemed necessary for effective operation of the organization. Autio [15] says that corporate governance can be seen as a mechanism to monitor decision-making teams and advise them in ways that align their interests with stakeholders, improving the quality of the organization's strategies decision-making. Neill [16] assert that corporate governance guides decision-makers to be responsible with the sole intention to maximize the stakeholders' wealth. Effort must be made from within the organization to provide cost savings which can offset any perceived detrimental effects.

By reviewing and improving its internal business processes, PWD could embark on greater cost saving. Scheer and Nüttgens [17] describes a business process as a procedure relevant for adding value to an organization. According to Tan [18], Carr and Pearson [19], the purchasing function is an important strategy of the business process which can support the overall strategy of any firm. Pagell [20] says that this follows the selection of suppliers making it an important activity in purchasing. Verma [21] added that this can be the deciding factor in ensuring superior business performance. Last but not least, Xu and Lin [22] believe that any savings made from supplier selection will benefit the long term financial health of the organisation.

### **4. Adoption of Dual Construct for Supplier Selection: A Way Forward**

In order to achieve a more advance supplier selection method in the future, an orthogonal perspective or also known as dimensions is needed to guide the identification of metrics. The relevant metrics for supplier selection in the construction industry can be viewed in two perspectives. Based on the study done by Thiruchelvan [23], two main constructs namely supplier competitiveness and supplier attractiveness are formed to distinct all the criteria. However, the author thinks that there are criteria which are not included that servers an importance towards the construction industry. Therefore, two new construct consisting of supplier effectiveness and supplier allurements are proposed to cater for the construction industry. Supplier effectiveness shows the main attributes an organization seeks from a supplier and are relatively similar across the market. The main criteria consist of supplier quality, price, delivery and support services. Supplier allurements are attributes that only appears as high priority to certain organizations. This construct includes supplier flexibility, financial performance, customer focus, safety awareness, government policies and others.

### **5. Conclusion**

Based on past papers, it clearly states that the Public Work Department needs to bring procurement to the next level. Instead of focusing merely on the aspect of cost, other criteria in supplier selection plays important roles and carries weight in overall selection. With an investigation into the supplier selection metric, other criteria will be taken into consideration depending on their degree of importance based on stakeholder's views. Results pertaining to this will be used to create awareness and give a better perception on defining the dimension of each metric in supplier selection. This will ultimately bring growth to the organization profit, effectiveness and transparency in the area of procurement. Lastly, this study will cause a significant change in the area of procurement as many other organization in the construction industry begin to practice new optimized supplier selection methods.

## 6. References

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