

Supplier Selection Procedure in Telecommunication Industry

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Managing supply chain is important for every organization because it has become a major element in a global economy. The supply chain is a primary system that moves the products or services from supplier to customer. Poor performance in delivering the services will essentially affect customer satisfaction. Previous studies have shown the effects of supplier selection on the organization performance in the services or products delivery. This research focuses on civil infrastructure and pulling cable suppliers in one of the telecommunication players in Malaysia and also on its supplier selection procedure, which is known as Price Rate Table (PRT). This paper initially reviewed the concepts of PRT pool and PRT zoning. We then assessed the level of staff satisfaction on PRT and also its advantages and disadvantages in terms of project performance. This assessment was conducted qualitatively via semi structured interview to a specific project team in the organization. Results showed that for small projects the PRT concept has offered more advantages than disadvantages in terms of project performance. On the other hand, the disadvantages are emphasized more for mega and urgent projects. In this paper, we proposed two selection processes to overcome the issues and also evaluated the processes using strategy canvas. Only the best selection process upon the highest accumulated point obtained is recommended to be adopted in the current organization.

Keywords: Price Rate Table, supply chain, supplier selection module, mega projects

1. INTRODUCTION

Suppliers play a vital role in ensuring a business organization continuously performed and hence to be successful. The supplier can be broadly categorized into three: potential supplier, supplier in the pool and supplier ousted the pool. Ersoz, S and *et.al* (2009) underlined that the selection of supplier is not only one of the important decisions but also a critical success factor that contributing to the company performance. Kilincci & Onal (2011) described that the supplier selection process has gained importance due to the cost of raw materials and component parts constituted the main cost of a product, and this eventually affect the company revenues.

Supply chain management involves with the selection, coordination and motivation of independently operated suppliers (Agrell, Lindroth & Norrman, 2004). Thus, it is crucial to ensure that the supply chain in one organization is effective because the supply chain has become a major

element in the global economy (Wu & Olson, 2008). In telecommunication industry, the concept is similar whereby it connects component suppliers, inbound logistic, manufacturing and work on process, finishes goods and outbound logistic to customers (Laura, X., 2006). Nevertheless, a supply chain can be vulnerable to various types of disruptions caused by uncertain economic cycles, consumer demands and natural and manmade disasters. Due to that, a supply chain disruption owing to long-term negative effects on a firm's financial performance (Wu & Olson, 2008), (Wagner, Gross-Ruyken & Erhun, 2012). This can be seen in several cases, such as in Boeing's 787 Dreamliner (Lunsford & Glader, 2007), General Motor (S.Terlep & M.Remsey, 2012) and Foreign Tire Sales (D.Welch, 2007).

Supplier selection, a part of supply chain management, is the process for the firms to identify, evaluate and contract with suppliers. The process has deployed a great amount of organization resources and thus the organization expected to gain substantial benefits.

Nevertheless, selecting a viable supplier is a big challenge since the supplier's ability to meet the organization requirements must be verified. According to Bindu & Ahuja (2010), supplier selection gave a direct impact on the efficiency and responsiveness of the entire supply chain. Previous studies have proposed various models for the supplier selection. Kilincci & Onal (2011), Wang & Yang (2009) and Chan & Kumar (2007) used Fuzzy Analytic Hierarchy Process (AHP) in selecting the right supplier for different industries. These three models can be distinguished in terms of supplier criteria and attributes, for instance, project quality and project cost.

This paper investigates a supplier selection procedure adapted in a telecommunication industry in Malaysia, as a case study. Semi-structured interview method was used to perform this research. Based on the interview, the existing procedure employed was initially reviewed. Nevertheless, the existing procedure was found to be useful in selecting suppliers for small projects and yet not for the case of mega and urgent projects. Supplier here is referred to Price Rate Table (PRT) contractor. Therefore, in this paper we have proposed two supplier selection procedures for all kind of projects (small, mega and urgent) and evaluated them using the strategy canvas. Based on the results, we then recommended the feasible supplier selection procedure to be applied in the organization.

2. SUPPLIER SELECTION PROCESS

A civil work infrastructure is known as the backbone and core to transmit the data via fibre optic or copper. The deployment is performed by one of the divisions called Network Delivery (ND) in the organization. The implementation of the projects is the responsibility of the suppliers or vendors who are only registered with the organization, which are called PRT. The respective division will essentially appoint the registered supplier (or PRT) to execute the work, such as civil infrastructure work, installation of cables and poles, jointing, termination, testing as well as to prepare the final documentation. All the registered PRTs with the organization are often known as "PRT pool".

Fig. 1 shows the numbers of PRTs across Malaysia per region basis. All PRTs are restricted within their own regions, which is called as "zoning PRT". In overall, there are 104 PRTs whereby 42 PRTs in Central, 19 PRTs in Northern, 14 PRTs in Eastern, 17 PRTs in Southern, 7 PRTs in Sabah and 5 PRTs in Sarawak.

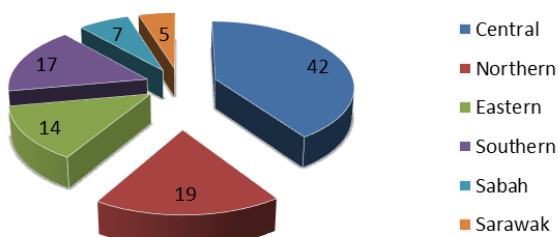


Fig. 1. Number of PRT nationwide per region basis

The location of the supplier play an important role in

supplier selection. As mentioned by Sevkli, M., Lenny Koh, S. C., Zaim, S., Demirbag, M., & Tatoglu, E. (2007) that geographical location is one of the criteria in selecting supplier for their case study in Turkey.

However the restriction or zoning PRT concept adopted seems to have a drawback in terms of a limited options can be selected, like Sabah and Sarawak, by the organization to award the project. This is because the organization can only choose the "zoning PRT" subject to the project site. Several zones have insufficient PRTs to accommodate mega or urgent projects whereby the existing PRTs might be overloaded with other concurrent projects. This considerably affects the project performance including the project delivery of the organization. To solve it, PRT will increasing layers of subcontractors' results in various problems such as communication errors, poor supervision on the bottom-layer contractors as discussed by (Tam, Shen, & Kong, 2011) in multi-layer subcontracting system.

Fig. 2 depicts the PRT selection procedure in the current organization. The selection of PRT to be awarded with a particular project is upon the Facilities and PRT Management (FPM) advice to ND planner. The FPM initially checks the availability of the PRT in the pool at a specific zone. Then, FPM proposes the PRT name based on their merit-demerit performance and also the balance of PRT's contract value. ND will then implement the project based on the FPM recommendation.

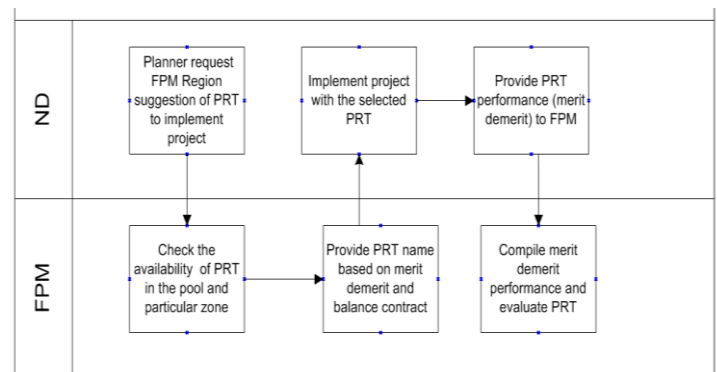


Fig. 2. Current Supplier Selection Process Flow

3. RESEARCH METHODOLOGY

Because the research is to investigate the perceptions of the current supplier selection procedure, a qualitative method was selected as a doable approach to conduct the study. Several in-depth interviews approximately between 30 minutes to one hour were held at the organization main office. These semi-structured interviews consist of several open-ended questions. In this case study, all seven respondents were male from various background and designations, as listed in **Table 1**.

Table1. Respondents' background and designation

Roles	Number of respondents	Designation
Project Manager	2	Executive
Engineer	4	Executive
Site supervisor	1	Non-executive

4. RESULTS AND DISCUSSION

LEVEL OF SATISFACTION

The respondents' satisfaction on the current PRT selection procedure was analysed based on Likert scale Malaysia, which was used by Bashir, S., Sarki, I. H., & Samidi, J. (2012) in their research. The Likert scale is commonly employed in a survey research to measure the respondents' opinion by asking the extent to which they agree or disagree with particular questions or statements (Hall.S, 2014). The feedback perceived from the interviewees yield the level of their satisfaction on the current selection practice and also their challenges encountered. **Fig. 3** shows the distribution percentages for the level of satisfaction of the respondents. Only 29% of the interviewees is satisfied with the current PRT while 14% felt dissatisfied. Meanwhile, the remaining percentage, 57% is neutral with the current practice.

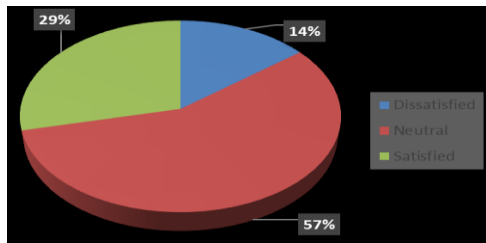


Fig. 3. Distribution of Satisfaction Level

ADVANTAGES AND DISADVANTAGES

Based on the interviews, the respondents have highlighted the advantages and disadvantages of the PRT pool and the PRT zoning concepts in the current PRT selection procedure. In summary, there are three critical perceptions captured. The only advantage of PRT zoning is that the resource and material management can be simply controlled by hiring the PRT that familiar with the zone. This is essential to ensure the project implementation is smooth and time-saving. However, we identified two key disadvantages of PRT zoning: (i) the timeliness of project delivery, and (ii) the quality of work. The PRT zoning becomes a disadvantage when all PRTs in the zone are overloaded with on-going projects, and new mega or urgent projects may interrupt the delivery of the existing projects. Secondly, the quality of work can be jeopardized with the limitation of number of suppliers, high workload as well as the urgency to complete the work.

5. SUPPLIER SELECTION PROCESS IMPROVEMENT

Based on the information gathered from the interviews, the primary concern of the current selection procedures is for the projects fall under mega or urgent projects. Research interviews obviously showed that the current procedure is unable to cope with the increasing demand of mega and urgent projects categories. In

addition, it can be argued that the procedure is obsolete and may backfire for such categories. The study proceeds to seek improvement by studying the needs for PRT zoning and pool concept in the case of mega and urgent projects.

PROPOSE SUPPLIER SELECTION PROCESS I

García et al. (2013) has proposed the evaluation supplier selection from two types of suppliers: (i) new supplier, and (ii) historic supplier. Based on the feedback gathered from the interview, this research proposed to eliminate the pool and zone concepts by using an open tender process in selecting PRT for the project. As a result, the project team will have more options in selecting the supplier that originated from new or historic suppliers.

Fig. 4 shows the proposed enhancement in current supplier selection procedure by eliminating the pool and zone concepts. The project will be implemented by selecting the supplier using open tender in which it can be retrieved from historic PRT and new supplier. The supplier then will be evaluated based on certain criteria such as price, technical ability, quality and delivery performance and resources. All the suppliers will undergo a bid process, and the final selection will be decided by Public Relation (PR). FPM will then evaluate the new supplier via merit demerit performance and also will keep the record.

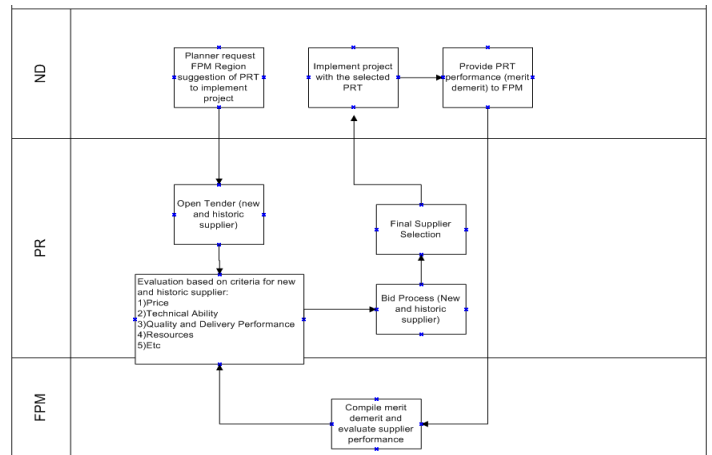


Fig. 4. Eliminating the PRT Pool and Zone Concept

PROPOSE SUPPLIER SELECTION PROCESS II

The zoning concept that is being used in the current organization has restricted the ND option in selecting PRT for the project. This limitation somehow has affected the project delivery. In order to solve the issues in terms of quality and delivery of mega or urgent projects, the current selection procedure can be enhanced by enabling the PRT selection outside of its zone for projects that fall under pre-determined categories. By categorizing the projects before selecting PRT is beneficial to the project team. The project team is able to evaluate the importance of the project and also to avoid poor project performance during the project

implementation. **Fig. 5** shows the proposed enhancement in the current supplier selection procedure by eliminating the zone concept focused for the categories of mega and urgent projects. We proposed the enhancement at FPM in classifying the type or categorize the project before awarding the project to PRT. If the project falls under mega or urgent projects, FPM will check the workload of the PRT in the zone. In case of the zoning PRT is overloaded, FPM needs to evaluate PRT outside the zone. The selection will be for the PRT outside zone that has minimal workload, team availability, good project quality and delivery.

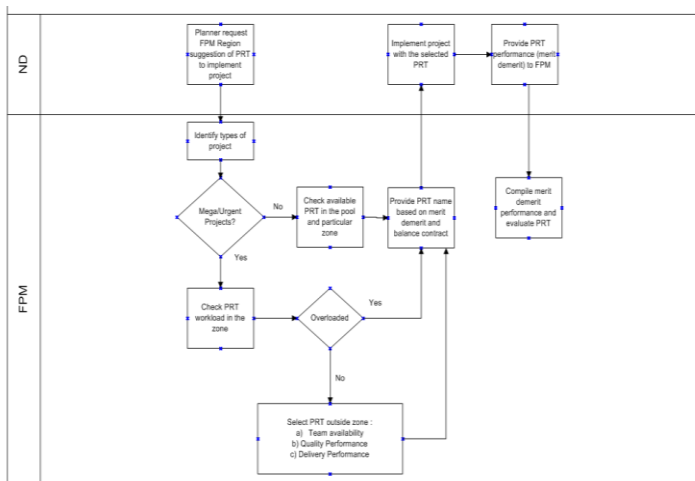


Fig. 5. Opening the zone concept based on the project categories

6. EVALUATION OF PROPOSED PROCEDURES

We then further the analysis by evaluating the proposed supplier selection procedures using the strategy canvas. A strategy canvas is an essential tool that concentrated on establishing differentiation based on competitive advantage and provide key elements to determine the purchase choice (Simister, 2011). Evaluating which procedure is the most suitable and practical to be implemented, we have conducted an evaluation based on criteria and scoring systems as shown in **Table 2**. There are eight criteria we have assessed: (i) cost, (ii) technical ability, (iii) quality performance, (iv) resource management, (v) material management, (vi) delivery performance, (vii) stakeholder satisfaction, and (viii) time taken for hiring. Scoring has been rated from 1 to 5 which represents the most negative value to the most positive value. The rating used in our strategic canvas was based on the advantages and disadvantages of each criterion if the options being implemented as the process enhancement. **Table 2** summarizes the points for each criteria for both proposed procedures. It is demonstrated that an Open zone concept based on the project's category (mega/urgent) has scored 28 points, which is higher than the Eliminate PRT's pool and zone concept that only scored 24 points.

Table 2. Idea Scoring

No	Strategic Criteria	Score of idea based on screening comparison	
		Eliminate PRT pool and zone	Open zone concept based on project's categorize (mega or urgent project)
1	Cost	4	3
2	Technical Ability	3	4
3	Quality Performance	3	4
4	Resource Management	3	3
5	Material Management	2	2
6	Delivery Performance	3	4
7	Stakeholder's satisfaction	4	4
8	Time taken of hiring	2	4
Total Score		24	28

To visualize and graphically depict the criteria above we have plotted the strategic canvas rating in **Fig. 6**. We found that 4 out of 8 criteria for Open zone concept based on the project's category (mega/urgent) scored higher than Eliminate PRT's pool and zone. The results from the analysis suggested that, the open zone concept based on the project category is the best enhancement that will provide better solution. In fact, it could increase the staff satisfaction level, particularly for new supplier selection process.



Fig. 6. Strategic Canvas Rating

5. CONCLUSIONS

In this paper, we studied the current supplier selection procedure known as PRT in a telecommunication industry. The level of staff satisfaction on the current supplier selection was investigated and the advantages and disadvantages of the process were

identified. Two kinds of enhancement were proposed on the current procedure in order to solve the issues (or disadvantages) raised. To determine which the best improvement process is, we then evaluated both proposed processes using strategy canvas. Based on the highest point computation, the open zone concept was found to be the best option. The improvement of the selection process will provide positive impact especially in terms of quality and timeliness of project delivery. Future work the supplier selection process will be optimized using the Analytical Hierarchy Process (AHP).

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