THE EFFECTS OF PROCUREMENT SYSTEMS TOWARD PERFORMANCE OF THE REFURBISHMENT PROJECTS

Susie Chieng Ling and Azlan Shah Ali
Faculty of Built Environment, University of Malaya, Kuala Lumpur, Malaysia
Correspondence: susiecl@sunway.com.my

Abstract
Different types of procurement systems have different methods and process of designs and constructions whereby it described different systems and different organization structures in terms of roles, responsibility and the authority of each member in the team. However, it’s still inconclusive to what extent that different types of procurement systems could have different methods, process and organization structure would affect the performance of refurbishment projects. The paper aim to investigate, evaluate and analyses the most suitable procurement method to be implemented in refurbishment project. In order to achieve this goal, the objective of this paper is to identify types of procurement methods used in Malaysian refurbishment projects and their effect toward project performance. Triangulation technique was used in the study. From the questionnaire sent out, 368 questionnaires were found to be useful for data analysis, giving a final response percentage of 24.53%. Semi-structured interview has been carried out with 15 contractors to ensure the result is reliable. Descriptive and mean comparisons were used in data analysis. The findings shows that 54.3% of the projects are using traditional procurement systems, 39.9% using design and build, 4.3% using management procurement, whereas 1.1% of the refurbishment project using turnkey system and 0.3% using built-operate-transfer (BOT) system. Refurbishment projects using traditional procurement systems were found performing well if compare to others.

Keywords: Malaysia, procurement systems, performance, refurbishment

1.0 INTRODUCTION
Compared to new build project, the refurbishment projects are more risky and complex, in which makes it more difficult to manage (Egbu, 1988, and Ali, 2008). A review of current practices in Malaysia shows different approaches to the refurbishment procurement systems. The introduction of different types of procurement systems has contributed to higher difficulties in managing refurbishment project under various circumstances (Ali et al., 2011), Hardcastle and Tookey (1998) also has highlighted that the refurbishment industry has been heavily criticized for its inefficient and ineffective procurement strategies and processes. The inefficient and ineffective procurement strategies and processes have been considered as a factor that has affected the industry's performance.

The different types of procurement system have different methods and process of designs and constructions. It described a different systems and a different organization structure in term of roles, responsibility and the authority of each members in the team. However, it’s still uncertain on how far do the different types of procurement system have different methods, process and organization structure and how it can affect the performance of a refurbishment project in term of cost, time and

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quality. Therefore, it is essential to understand today’s practice procurement method and to identify the most suitable procurement systems for refurbishment projects and the impact of the different types of procurement systems towards project performance in term of cost, time and quality.

2.0 TYPES OF PROCUREMENT SYSTEMS

There are numerous types or variations of project procurement systems being widely used in the refurbishment industry from the range from the traditional system to the many variations of “fast-tracking” systems such as turnkey, design and build, build-operate-transfer and management contracting, (Rosli et al., 2006; Jim Smith et al., 2004; Masterman, 1996; Huges et al., 2006).

2.1 Traditional System

The traditional procurement system is predominant in the Malaysian construction industry and, until 1992 at least, able to satisfy its requirements (Masterman, 1992). It is characterized by the contractor not being responsible for the design or the documentation work (Goldfayl, 1999; Rwelamila and Meyer 1999) and with a clear division between the design and construction process responsibilities (Rowlinson, 1999; Martin, 2000). The main advantages of using a traditional approach to procurement are produces lowest bid, assuring quality control and familiar in the industry whereby its disadvantages are builders not involved in design process, slower speed and potential adversarial (Peter et al., 2008).

2.2 Design And Build System

The term “Design and Build” refers to the procurement strategy that entails the contractor carrying out the work; the design works as well as the construction and completion of the work. The main advantages of using a design and construct approach to procurement are contractor act as single point of responsibility, Price Certainty, Effective communication and Multi-disciplinary approach and the disadvantages are higher costs, the limitation of competition in the public section, Difficulties in

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Figure 1: Types of Project Procurement Systems in Construction Industry

**Types of Project Procurement Systems**

<table>
<thead>
<tr>
<th>Traditional System</th>
<th>Design and Build</th>
<th>Management Procurement</th>
</tr>
</thead>
</table>

**Turnkey**

**Develop & Construct**

**Management Procurement**

**Built-Operate-Transfer (BOT)**
preparing an adequate and sufficiently comprehensive brief, requires early confirmation of concept design and absence of a bill of quantities (Peter et al., 2008).

2.3 Management Procurement System
Several variants of management procurement forms exist, which include: management contracting, construction management and design and manage. In the case of management contracting, the contractor has direct contractual links with all the works and a contractor is responsible for all construction work. In construction management, a contractor is paid a fee to professionally manage, develop a programme and coordinate the design and construction activities, and to facilitate collaboration to improve the project’s constructability. The main advantages of using a management approach to procurement are enables improved coordination and collaboration, potential for time savings, roles, risks and responsibilities for all parties are clear and flexibility for changes in design. The main disadvantages are pro-active client is required, poor price certainty, client loses direct close time and information control required and client must provide a good quality brief to the design team (Peter et al., 2008):

2.4 Built-Own-Operate-Transfer (BOOT)
Developers use their own funding sources to build a public facility in return for the right to operate it and charge a fee for its use. At the end of an agreed period the facility may revert to the landholder. This type of contract focuses on final service delivery and relies upon the required performance standards being properly documented. Building contractors involved in this type of development are usually part of a consortium (Department of Infrastructure Building Services Agency, 1998). BOOT procurement system is less implemented in Malaysia refurbishment project. The main advantages of using these approaches is time and cost savings whereby the main disadvantages of BOOT procurement system are due to additional cost and inflexibility.

From this chapter, it can be concluded that there are four main types of procurement systems which are traditional, design and build, management contract and BOOT systems. Different types of procurement systems have different characteristics and it serve a different way in affecting the refurbishment project performance.

3.0 KEY PERFORMANCE INDICATORS FOR PROJECT PERFORMANCE
Thomas et al. (2002) and Josephson and Lindstrom (2007) developed numerous parameters for measuring project performance. Figure 2 shows key performance indicators to measure performance of refurbishment project.

The three performance measure categories form a basis for designing the performance indicators, which are the elements of performance within the ambit of each measure category.
3.1 Meets Budget
Cost is one of the key performance indicators (KPI) used to measure performance of a project. There are four areas that are highly related to the project cost control which are Interim Payments, Variation Orders, Cost and Prolongation Claims, and Budget versus Actual cost Forecast. Project cost performance is used to show the effectiveness of the project adheres to the budgeted cost.

3.2 Meets Time
According to Hatush and Skitmore (1997), time refers to the duration for completing the project. It is scheduled to enable the building to be used by a date determined by the client’s future plans. A success project able to perform by completes the project within the time frame given.

3.3 Meets Quality
The quality of the project can be measured by determining numbers of defects and customers complaints, number of non-conformance report, work rejection rates and sample rejection for the project. Different types of procurements system might serve different impact of quality of the project.

Ling (2004) also stated that the performance of a project is multifaceted and may include unit cost, refurbishment and delivery speeds and the level of clients’ satisfaction. Moreover, research conducted by Atkinson, et al., (1997) reveals that clients will not be satisfied if the end product (project) fails to meet their price, quality, time frame, functionality and delivery performance standard.

4.0 METHODOLOGY
The study approach incorporated triangulation techniques that combined both qualitative and quantitative approaches. The objective of employing a quantitative method is to minimize personal prejudice or bias and to ensure that the social reality would be presented as it is. It is expected to have true value, applicability, consistency and conformability (Guba and Lincoln, 1989). In addition to that, quantitative data collection procedures create epistemological postulations that reality is objective and unitary. On the other hand, qualitative data refer to information gathered in a narrative through interviews, experience and observations (Sekaran, 2005). The combination of both research
methods in a social science study could produce robust and valid findings at the end of the study. This is because the qualitative approach could complement results obtained from a quantitative approach, which would make it more reliable (Ali et al, 2009).

Four hundred and ten, 410 closed-ended questionnaires were obtained and received and the targeted respondents included site agents, project engineer, contract administrator, contract manager, project manager and other parties who are working in Construction Company; which three hundred sixty eight, 368 questionnaires were found to be useful for data analysis, giving a final response percentage of approximately 24.53 %. Findings from the questionnaire survey shows that almost 60% of the respondents were manager and director level and 63.3% of them had more than 10 years’ experience in construction industries. This indicated the data collected from this survey are reliable.

5.0 RESULT AND DISCUSSION

Figure 3 illustrated types of procurement systems used in Malaysian Refurbishment Projects. The result indicated that traditional systems is the most preferred system used in Malaysia with record of 54.4%, followed by design and build with record of 39.9%, Management procurement, 4.3%, Turnkey System with record of 1.1% and Built-Operate-Transfer BOT with record of 0.3%. Besides, based on the findings from semi-structured interview, 12 out of 15 interviewees highlighted that traditional is the most preferred and suitable procurement system for Malaysia Refurbishment Projects if the contract value exceeded RM500, 000.00. Turnkey, management and built-operate-transfer BOT system are less opted in Malaysian Refurbishment Projects as they are found not suitable.

![Types of Procurement Systems in Malaysia](image)

Figure 3: Types of Procurement Systems in Malaysia

As pointed out by Peter et al., (2008), there are three types of traditional procurement method which is consist of lump sum contract, measurement contract and cost reimbursement/cost plus contract. Most of the interviewees mentioned that cost reimbursement/cost plus are the best option opted for refurbishment project due to the activities carried out are uncertain. For this contract, the contractors were being paid for an agreed fee to cover management, overheads and profits.
Thomas et al. (2002) and Josephson and Lindstrom (2007) developed numerous parameters for measuring project performance which are cost, time and quality. The results shows most of the refurbishment projects using traditional system were completed within time, budget and quality (less complaint and NCR received) whereby refurbishment projects using design and build procurement system were completed within time. The results also shows that the refurbishment projects using BOT systems were completed with less non-compliance records (NCR).

Table 1: Performance of the refurbishment project in Malaysia

<table>
<thead>
<tr>
<th>PROCUREMENT/PERFORMANCE</th>
<th>COST</th>
<th>TIME</th>
<th>% VO</th>
<th>COMPL</th>
<th>NCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRADITIONAL SYSTEM</td>
<td>✫</td>
<td>✫</td>
<td>✫</td>
<td>✫</td>
<td>✫</td>
</tr>
<tr>
<td>DESIGN &amp; BUILD SYSTEM</td>
<td></td>
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<td></td>
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<tr>
<td>TURNKEY SYSTEM</td>
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<tr>
<td>MANAGEMENT CONTRACT SYSTEM</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>BUILT-OPERATE-TRANSFER, BOT</td>
<td></td>
<td></td>
<td></td>
<td>✫</td>
<td></td>
</tr>
</tbody>
</table>

Legend: ✫ - Within targeted (perform)

Walker and Hampson (2003), and (Wearne 1997) emphasize that traditional system is separated into different process with design and construction. The drawings, specification, and bill of quantities breakdown are provided by the client to the contractor during tender stage for ease of pricing. It also gives the client firmer and more competitive price because the design plus the complete working drawings have been fully developed and detailed out prior to tendering. It eliminates any design or construction ambiguity or uncertainty which often causes the contractors to unnecessarily inflate the price. In the case where bill of quantities is used, the bidding tend to be more fair as such the project cost is lower. The system also has a better cost control (Masterman, 1996). In design and Build and Turnkey procurement system, the cost to construct the refurbishment works is often higher than the traditional contracting system. This is due to the lack of design, specification detailing and absence of bill of quantities during tender and contractors are not considering the certain part of the work that are uncertain. This will consequently increase the construction cost and lead to the construction cost exceeded the budgeted cost. Furthermore, client is required to come out with a concept design at an early stage for design and build system.Undecided and incomplete concept committed to contractor at the early stage of the project will lead to higher frequent change order by client during construction stage.

Peter et al. (2008) also highlighted that contractors are more familiar with traditional system as it is the most common types of procurement use in construction industry. Most of the contractors have much experience with this type of procurement method in Refurbishment Projects. In addition to this, the completed or largely completed designs would help contractors in forecasting workloads, allocation of resources, prepare programmes, method of statement. Design and build and Turnkey procurement systems which are also called “Fast-tracking” project delivery system where design and
construction is put in one hand and its pre-tender process can allow fast construction date. In other words, it also allows the details of the project to run almost at the same time to each other, this means that it is going to reduce the overall project development period considerably. In the case where this method of procurement has the single entity responsibility for both design and construction, contractor should be able to control not only the construction aspect of the project at a time but also there should be time reserved for the design of the project; this goes at long run to reduce the overall time duration of the project. In short, the construction time will be reduced because the process of design and build is able to work parallel. Built-operate-transfer BOT, turnkey system and management contracting opted for Refurbishment Project are completed more than the time frame have exceed the time frame given. This implies that contractor have no experience in handling the Refurbishment Project using these procurement systems.

The traditional procurement also known as the design-bid-build system of procurement provides its clients a higher degree of quality project with more functional standards. In terms of quality, traditional procurement provides more opportunities for the clients to combine the best design, management and construction knowledge between the contractor and consultant more than that of the design-build method. The traditional procurement system also provides a high degree of quality certainty and functional standards. It also provides more time for client and consultants to review and fully develop the design and specification thus allowing better documentation preparation. Design-build and Turnkey form of procurement system is not mean to compromise with the use of quality; nevertheless, design-build procurement systems reputation has been suffering from criticism from the owners. It is more often found that the quality of work under this contracting system tend to be questionable. The assigning of the designing and construction to a contractor has caused the client to lose control of the design and supervision of the work. This is extraordinary significant when the client does not have his own team of consultants. As far the contractor is concerned, they tend to cut corners in order to maximize their profit, especially when they feel that they have under-priced the quotation during when tendering for the work. For Instance, contractor can always come out with the cheaper proposal in order to save cost which this indirectly prompt to high defects and contribute to low quality.

6.0 CONCLUSION
The results obtained from the questionnaire surveys and semi-structured interview, it’s concluded that traditional procurement systems are the most preferred system used in Malaysia Refurbishment projects, then followed by design and build. The findings also shows that traditional procurement systems is the most suitable to be used in refurbishment project with contract value more than RM500, 000.00 due to its uncertainty. Management procurement, Turnkey system and built-operate transfer, BOT are less used in refurbishment project.

7.0 REFERENCES


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