A quantitative analysis study on the implementation of partnering in the design and build construction project

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Abstract. Design and Build construction project involved the biggest scale of the cost of investment as compared to the traditional approach. In Design and Build, the client hires a design professional that will design according to the client's need and specification. This research aim is to explore the concept of partnering implementation practiced in the design and build procurement approach. Therefore, the selection of design professionals such as Contractors and consultants in the project is crucial to ensure the successful project completion on time, cost, and quality. The methodology adopted using quantitative approach. Administration of the questionnaire was distributed to the public client by using postal survey. Outcomes of the results, the public clients agreed that project management capabilities and commitment to budget as a crucial element of partnering from the design professional in design and build construction project.

1. Introduction
Cartlidge [1] defines partnering as cooperation and teamwork, openness and honesty, trust, equity and equality between the parties in the construction project. This concept of the relationship depend on the mutual trust established between two parties. The trust occurs between client and contractor after the first project partnering successfully completed on time, cost and quality. Therefore, certain client maintains the relationship and the next project was given to the same contractor in client’s development, it’s called strategic partnering. [2] Anita & Fellows explained strategic partnering as the parties create a longer term relationship through a cycle of projects for which contracts are usually negotiated. Agreed by Bennet & Jayes [3] strategic partnering occurs when two or more company use partnering for a long term basis to undertake more than one construction project, or some continuing construction activity [3]. The client initiates to maintain the relationship with a similar contractor in project due to the trust has been established between both parties. Reported by Cartlidge [1] most of the clients across all sectors have been adopting partnering in response to the proven long-term benefits that can be achieved through this approach and achieved savings up to 40% on costs and 70% on time by using partnering approaches. Therefore, through a good services reputation showed by the contractor in the construction project, the continuity project was established between client and contractor.
1.1 Partnering
In the construction industry, partnering refers to a long-term mutual agreement between two companies to achieve an unusually high degree of cooperation to accomplish main objectives. This mutual agreement allows the two parties to work more effectively and efficiently. Both parties received a benefit such as increase workload stability and reduced overheads cost. The long-term relationship is considered critical to partnering success because it generates an atmosphere that lends itself to problem-solving, frees each party from constant re-evaluation and permits 'lessons learned' to be passed from one project to the next [4]. The crucial need of this kind of collaboration to be practiced in the construction project is to ensure the successful completion of the project on time, cost, and quality. Through this approach of partnering that encourages openness and trust between the parties to a contract. In the design and build project is a very risky project that involves risk in design liability and disputes among parties. Therefore, the selection of partner involved in design and build project is crucial. Through partnering the selection of an appropriate partner can reduce the risk of delay and dispute in the construction project. This type of selection of partner in design and build project requires that contractors have well experienced and have a good knowledge in design and strong project management team to ensure the project complete on time, between the cost, stipulated and good quality. The identification of good contractors can be evaluated by the clients through previously completed projects received and based on this situation, continuous projects only will be given to the contractors that completed projects as mentioned above. The benefits of partnering received in design and build as follow;

a) Reduce risks of cost overruns and delays due to better time and cost management;
b) Increase concern for and commitment to the user needs as a basis for design;
c) Effective overall project management in design and build project;
d) Open communication with familiar parties involved;
e) increased degree of trust and parties;
f) Financially successful projects completion on time, cost and quality.

1.2 Design and build
Design and build system of procurement are not new in the Malaysian construction industry. This kind of procurement method mostly practice in the public sector project as compare to the private sector. Turner [5] described design and build as the procurement practice where one organisation is responsible to the client for both design and construction. The elements of the design and build system consist of the following:

a. Establishing the need to build
b. Establishing the client’s requirement
c. Selecting and inviting tenderers to bid
d. The contractor preparing their proposals for design, time and cost
e. Evaluation and acceptance of a tender which then becomes a contract
f. Design and construction of the works

From the above, showed that in design and build procurement, the client need to have in-house skills to ensure the client’s requirement is clearly identified. Scriven [4] explained that the intention of design and build contract is to place the entire responsibility for the construction to the contractor, if any problems arise in project, the contractor is responsible, subject to specific exceptions. Others benefits achieved through this procurement approach in terms of well management of cost control, completion period is faster, less dispute and others. As compare to the adversarial relationship practice in traditional approach, it is more difficult to ensure value for money due to the un-familiar contractor involved in the construction project. The primary reason for applying the design–build delivery method is to potentially shorten the project’s duration [6]. Design–build in the public sector is mostly used for schools, hospital, government office or highways to achieve a targeted completion date that cannot be achieved through traditional methods.
1.3 Partnering concept in Design and Build Procurement approach

Partnering occurs in design and builds throughout continuity of working repeatedly by the contractor for the same clients. Normally, the clients were only searching reputable contractor to be involved in the design and build the project from successful previous project completion. [1] stated that partners must have confidence in each other’s organization, and each organization needs to have confidence in its own team, which means careful selection of the people involved in the development of the client’s project. Figure 1.0 show the concept of partnering practice in the design and build procurement approach.

![Figure 1. The concept of Partnering in the Design and Build](image)

Partnering occurs during the selection process of the contractor in client’s development project. Therefore, the client should look into who are the reputable contractor not only focus on the financial background but on the aspect of trusting people involved in client’s project. The maximum benefits of partnering are realized when all parties in the chain of partners cooperate.

2. Research methodology

Research methodology is a logical way to solve a problem and involves the procedure by which researchers carry out their work for the purpose of describing, explaining and predicting phenomena are called research methodology [7]. In this research, the method adopted in this study used is a quantitative approach. Quantitative analysis is a scientific approach to managerial decision making whereby raw data are processed and manipulated resulting in meaningful information. The illustration of this method employed as follow;

![Figure 2. Method employed](image)

Therefore, the crucial need to use this method due to the result received represent the whole design and build project practice in the public work department.

2.1 Data collection

Data collection is the process of gathering information which then forms the database for determining what is needed. The process is essential to ensure that information regarding scope, quality, time and
cost is gathered in a way which provides easy access for the researcher to fulfill the research need [8]. This research is to explore the concept of partnering implementation practiced in the design and build procurement approach.

2.2 Sampling
In this research, the method used for sampling is purposive sample. The respondent involve are from the public client. This selection was based on data gathered from the public client, which included the following ministries and departments:

a) Ministry of Finance  
b) Ministry of Home Affairs  
c) Ministry of Youth and Sport  
d) Ministry of Health  
e) Ministry Rural and Regional Development  
f) Ministry of Women and Family Development  
g) Ministry of Transportation  
h) Ministry of Agriculture  
i) Ministry of Human Resources  
j) Prime Minister’s Department  
k) Ministry of Education (Four Departments)  
l) Ministry of Science & Technology & Innovation  
m) Ministry of Defence  

n) KWP-Perbadanan Putrajaya, DBKL  
o) Ministry of Works (Nine Departments)

2.3 Response rate
Administration of the questionnaire was distributed to the public client as listed above by using postal questionnaire. All of this clients involve in the design and build project in the construction industry. By using the purposive sample, only 26 questionnaires was distributed to each of these 26 ministries and department. At the early stage, the response rate is low which is only one respondent replied. However, the researcher took the alternative approach to send a questionnaire through by hand. Lastly, all of the respondents replied to the questionnaire and 100% received from a total of 26 ministries department.

3. Result
The result of the study was measured for the element of partnering need by the client and type of evaluation consider by the client to evaluate the performance of contractor using partnering approach in the design and build project.

Table 1 shows the elements of partnering practice between client and contractor. The result indicates that the client revealed that project management capability at mean 4.27 at highest rank among others factor. It shows that in design and build project, project management capability as primary factor client looking for partnering in design and build project. This is due to the client consider financial and technical risk in project management capability to ensure the selected contractor is capable to manage a design and build project. Follow by good communication at mean 4.26 and timely project goals at mean 4.25. In design and build project communication between both parties is crucial to ensure the project achieved is timely project goals.

| Factors                                          | Mean | Rank |
|--------------------------------------------------|------|------|
| 1. Image and reputation; satisfying client needs | 4.09 | 8    |
| 2. Innovative ways of using technology in construction | 4.00 | 9    |
| 3. Timely project goals                          | 4.25 | 3    |
| 4. Good communication                            | 4.26 | 2    |
| 5. Project management capability                 | 4.27 | 1    |
| 6. Commitment                                    | 4.18 | 6    |
| 7. Early involvement of contractors at the design stage | 4.22 | 5    |
| 8. Trust                                         | 4.14 | 7    |
| 9. Learning culture/exchange of knowledge         | 4.23 | 4    |
Table 2 shows the evaluation of performance contractor in design and build project by the public client. The result indicates the commitment to budget at mean 4.90, in design and build project the client looking for the design professional that commit to the budget proposed. Other than that, supply chain management at mean 4.86 is considered by the client to ensure successful implementation of design and build construction project. Therefore, satisfaction with the project outcomes received through the design professional selected which practice a systematic approach of supply chain management in the organization is considered.

**Table 2. Evaluation Performance of Contractors by Public Client**

| Performance Measure                  | Mean | Rank |
|--------------------------------------|------|------|
| 1. Good progress report              | 4.57 | 3    |
| 2. Key performance indicator         | 3.95 | 5    |
| 3. Environment and sustainability    | 4.33 | 4    |
| 4. Project management capability     | 3.86 | 6    |
| 5. Commitment to budget              | 4.90 | 1    |
| 6. Quality                           | 3.82 | 7    |
| 7. Supply chain management           | 4.86 | 2    |

4. Conclusion

The findings indicate that to secure in design and build construction project from delay and cost overrun, the importance of client to carry out the relationship with an appropriate design professional through partnering approach. The evaluation of the performance of the previous project by the design professional creates trust between both parties. Therefore, outcomes of the results, the public clients stated that project management capabilities and commitment to budget as a crucial element of partnering from the design professional in design and build construction project. These contribute to the successful implementation of a high-risk project in design and build construction approach.

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