

DETERMINING PROJECT PERFORMANCE CRITERIA AND KEY PROCUREMENT METHODS IN NIGERIA: CLIENTS' PERSPECTIVES

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The choice of procurement method is vital to client satisfaction and success on construction projects. But the procurement method selected needs to be a best fit with clients' performance criteria in an increasing complexity of construction processes. Very often the procurement teams' selections are limited to a few familiar procurement methods with little in the way of rational selection for successful project delivery. The study examines whether the clients' performance criteria fits the success/performance of a project based on the procurement method selected. The study presents the findings of a pilot study, which prepared the ground for designing the main study questionnaire. An interview questionnaire used as the instrument in personal interviews of five client organizations who are registered members of the Real Estate Developers Association of Nigeria (REDAN) (a private client group) in order to determine their project performance criteria, their perceptions of different procurement methods and facts and figures from previously completed projects. The results of the survey reveal clients' project performance criteria and priorities when selecting procurement methods, the key procurement methods used in Nigeria, and the relationship between project performance and procurement methods. The paper will propose procurement methods that best fit clients' performance criteria in Nigeria.

Keywords: client, criteria, performance, procurement, project

INTRODUCTION

Various project procurement methods exist within the construction industry, which determine the contractual relationship between the client and other parties at the design and construction stages of a project. According to Love et al. (1998), clients require their buildings to be completed on time, within budget and of the highest quality. The method by which the project is realized or the procurement method selected as noted by Love et al. (1998) and Chan et al. (2004), is a key factor contributing to overall client satisfaction and project success. The selection of the most suitable procurement method consequently is critical for both clients and project participants (Love et al., 1998), who have to decide on which of these methods best fits their overall demands and expectations.

However, according to Bowen et al. (1999), who studied the client briefing processes and procurement methods in South Africa, very often, clients' selections are limited to a few familiar procurement methods with very little in the way of rational selection for successful project delivery. In addition, Bowen et al. (1999) also found out that clients are generally offered advice on only a limited selection of procurement systems. Further, Love (2002) noted that the traditional lump sum methods are the most popular forms of procurement used in Australia, despite calls for the adoption of more integrated methods, such as design and build. While in South Africa, Bowen et al. (1999) determined that with the exception of contractors, the preferred procurement system of choice amongst the respondents was the conventional system.

Bowen et al. (1999), citing Bowen et al. (1997), noted that individual categories of clients determine project success by different criteria, and that it is necessary for the industry to be aware of these various groupings and their characteristics in order to assist in the selection of the most appropriate procurement system for their particular project. The methods by which construction projects are procured became increasingly important also, because of the technical features of different construction projects and the client and contractor needs (Alhazmi and McCaffer, 2000). Further, Alhazmi and McCaffer (2000) stated that the nature of the procurement system selection requires an effective decision-making technique to evaluate procurement systems against criteria such as time, cost, quality and general needs and found in their study of public sector projects that client's needs and project characteristics are considered to be the most important criteria influencing the procurement selection process. According to Bowen et al. (1999), every attempt should be made at the briefing stage to match the characteristics of the particular procurement system with the client's objectives as stipulated in the brief. Bowen et al. (1999) discovered that in the selection of procurement systems, an attempt is frequently or always made by the procurement team to match client needs and systems characteristics.

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Currently, there is little known about the client needs in Nigeria and if these could influence the procurement method selection process or if the procurement selection process is limited to the few familiar ones. The purpose of the paper therefore is to examine whether the clients' need/performance criteria can be matched with the success/performance of the project based on the procurement method used; that is, did the client get what he wanted through the process selected? Choice of procurement method selected should fulfil the needs of the client. The Latham report states that clients do not always get what they ask for (Latham, 1994). The objectives of the paper are therefore to evaluate the client procurement criteria when selecting a procurement method; identify the key procurement method used in Nigeria; and to assess the relationship between project performance and procurement method selected.

To achieve these purpose and objectives, the paper will first of all review the different types of project procurement methods available; identify the determinants of clients' choice of procurement methods; and client needs/project performance criteria. Secondly, the paper will present findings of a pilot study of members of the Real Estate Developers Association of Nigeria (REDAN) on the project procurement methods, factors informing choice of procurement methods, performance criteria required on selected retrospective projects and the project outcome. Thirdly, the paper presents results of an evaluation into whether there is a relationship between procurement method, client's performance criteria, and level of project performance. Fourthly, the paper discusses the implications of these findings to project procurement and delivery and proposes suitable procurement methods that better fit clients' performance criteria in Nigeria. Although procurement methods for project delivery apply to both public and private clients, this study is limited to private clients in Nigeria because they are not bound by non-disclosure Acts, thereby making it easier to source otherwise sensitive and classified information much more easily from them.

OVERVIEW OF PROJECT PROCUREMENT METHODS

According to Love et al. (1998), the terms 'procurement systems' and 'contractual arrangements' are usually used synonymously. Love et al. (1998) defined a procurement system as an organizational system that assigns specific responsibilities and authorities to people and organizations and defines relationships of the various elements in the construction of a project. Harris and McCaffer (2001) noted that the client or adviser/project leader according to need or preference would select the type of contract. Established methods of project procurement identified by Masterman (1992) and cited by Harris and McCaffer (2001), which determines the contractual relationship between the client and other parties at the design and construction stage can be categorized as:

- Traditional (separated and cooperative) method
- Design and Build (integrated and holistic) method
- Management (management-oriented) method
- Discretionary

These methods are further sub-classified into the methods shown in Figure 1. Osanmi (1999) characterizes the traditional procurement method by a clear separation of design and construction process. Harris and McCaffer (2001) notes that traditionally, clients have often preferred to engage someone able to interpret their needs into a clear design before proceeding with the construction phase. An architectural firm, engineering firm or consortium acting as consultants is responsible for design, while a general contractor handles the construction phase after entering into a construction contract with the client through competitive bidding or negotiation. According to Love (2002), an architect is typically the first point of contact for clients and, because their advice is heavily relied upon, it is often in the interest of the architect to persuade the client to use a traditional method, as they can take a lead role in the project as well as maximize his/her fees. The traditional method of project procurement is a widely used procurement method in Nigeria (Osanmi, 1999).

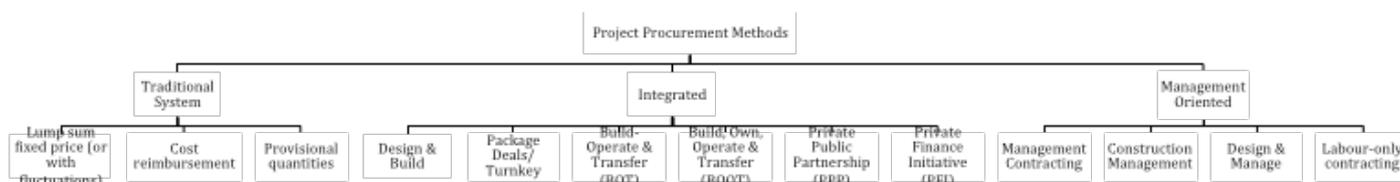


Figure 1: Classification of Project Procurement Methods

Sources: Adapted from Love et al. (1998), Osanmi (1999) and Alhazmi and McCaffer (2000)

Osanmi (1999) explains design and build or design and construct as a procurement method where the contractor provides the design and construction under one contract as different from the traditional system where design is separate from construction. Molenaar and Songer (1998) noted that design and build has steadily become a procurement method of choice for many public sector agencies in the United States. Osanmi (1999) cites that all design and build contracts have two principal characteristics:

1. The contractor is responsible for both the design and construction and employs the services of other relevant professionals (architects, engineers etc.) that may be required, with the client having a professional agent who advises him. Contrary to this assertion, Bowen et al. (1999) found that clients are generally offered advice on only a limited selection of procurement systems.
2. The contract between the client and contractor has a final and inclusive price that does not vary unless the client requires changes to be made.

Love et al. (2000) stated that Project management is not considered as a procurement method because it could be applied to any procurement method, and that the term merely means that the client has employed an agent to assist in undertaking a supervisory and coordination role within the project. The construction management procurement method differs from Project Management in that there are several trade contractors involved in this procurement process. The characteristics of the construction management procurement method are as follows:

- There is no single main contractor;
- The client enters into several trade contracts for work package comprising portions of the project;
- A construction manager runs the project.

The labour-only form of procurement, which is popular in Nigeria, involves the client in the purchase of materials while leaving construction to a labour-only contractor who gets paid for the cost of engaging labour and for his/her overheads and profits. An agreement is normally reached upon who hires plants for the works, be it the client or the contractor.

PROJECT PERFORMANCE

Project performance from the client's point of view can be assessed by its various criteria. Criteria identified by Love et al. (1998), Molenaar and Songer (1998) and Alhazmi and McCaffer (2000) that will assist the client in identifying their principal goals and objectives are as follows:

- | | |
|-------------------------|---|
| 1. Completion time | - is early completion/completion on time necessary? |
| 2. Flexibility | - can design changes be accommodated? |
| 3. Price certainty | - is completion within budget necessary? |
| 4. Technical complexity | - does the project require a high level of structural or mechanical services or other complexity? |
| 5. Quality | - is a high state of quality important? |
| 6. Client satisfaction | - is the owner satisfied with the overall project? |

Time is an important factor in construction projects. Generally, the more time spent on a project the more money is incurred on overheads. Moreover, for commercial projects where early completion is desired, delay translates into loss of earnings. Time can be examined from the perspective of design time, construction time and overall completion time. Some procurement methods have an in-built facility with which the client can order changes during the design and construction stages and hence create some degree of flexibility.

Sidwell (1984) pointed out that quality is a difficult variable to define. However, he proposed that it should be seen as an amalgam of client satisfaction, architectural excellence, standard of finish and utility. Naoum and Langford (1990) also expressed the view that the quality of construction was difficult to compare, because it is difficult to define precisely what is meant by quality and that there is no successful measure save for subjectivity as the function of client satisfaction in respect of quality. However, viewed simply, it is essential that a project be achieved as it was conceptualized in terms of design documentation and standards.

Some projects are more complex than others, especially when viewed from the perspective of the level of mechanical, structural or

other complexities involved. Usually complexity and size go together and it may require the use of different specialists appointed by the client to carry out the construction work. Sidwell (1982) views complexity in three different areas including:

1. the initial complexity of the problem as posed by the client in the brief;
2. the complexity of the solution to the problems as elaborated by the design team in the design solution; and
3. the complexity of the production assembly operation required to implement the design by the builder – the technology of the building.

Sidwell (1982) maintains that the issue of complexity is further compounded by the experience of the client, design team and contractor.

Another project performance criterion, which may be influential in assisting a client in determining his project goals and procurement process, is risk – the amount of risk to be borne by the client, design team and contractor in the contractual agreement.

EFFECTS OF SELECTED PROCUREMENT METHODS ON PROJECT PERFORMANCE

According to Wahab (1994), four factors, which determine the selection of the project procurement method used by clients, include:

- Type, size and location of the project;
- Quality of the finished product as well as the cost of construction itself;
- Owner's expectation to satisfy investment objectives during the project life-cycle with consideration of the cost of operation and maintenance; and
- The experience of the owner in dealing with various professionals in previous projects undertaken.

When considering the benefits of specific construction project procurement methods, Wahab (1994) and Adejuyigbe (1992) note the positive effects of the traditional method on clients' performance criteria as:

- Provision of good checks and balances between client, engineer and contractor;
- Each contractor can tender lump sum figures for work which have been fully described in the contract document;
- A high degree of cost planning is carried out during the design stage and monitoring during the construction phase;
- The possibility of introducing many specialist designers as are necessary into the design operation.

Conversely, Sidwell (1982) noted the following negative effects of the traditional procurement method:

- The level of project integration is least when compared to management contracting and the project management methods of procurement;
- The traditional approach lacks effective communication leading to time and cost overruns;
- Construction expertise does not benefit design; and
- It allows for too many design variations.

Further, Franks and Harlow (1984) provides the following effects of the design and build process on the client's performance criteria:

- It provides single point responsibility;
- The client has a direct contract with the contractor – thus improving direct lines of communication that enables the contractor to respond and adapt more promptly;
- There is closer involvement of the design to the building process, which allows design to have a greater appreciation of construction materials.

Antonio (1992) notes the following negative effects of the design and build technique:

- The likelihood that the system may not offer sufficient value for money since the contractor is overall both on the design board as well as the project site;
- The possibility that in order to effect substantial overall savings, the design solution adopted by the contractor may not be the most suitable for the project.

Osanmi (1999) is of the opinion that clients readily embrace the labour method of procurement because it affords them the opportunity

to control the quality of material used, savings made through trade discounts from bulk purchasing go to the client, and it demystifies the unit-rate pricing, as the client is able to better appreciate what he is paying for. He however, is of the opinion that the major effect of labour-only contracting is that it enables the clients to build at their own pace. The draw back of labour-only contracting according to Osanmi (1999) include the probability of the contractor not being judicious in the use of materials resulting in unnecessary waste, the quantity of materials may be inflated leading to waste, incidents of thefts being more likely to arise, and the view that procurement of materials by the clients could create logistic problems, which translates to delays.

ANALYTICAL AND CONCEPTUAL FRAMEWORK

The conceptual framework upon which this study is based is adapted from past studies and the work of Sidwell (1984), Ausguide (1984), Wahab (1987), Molenaar and Songer (1998), Love et al. (1998), Bowen et al. (1999), Osanmi (1999), Alhazmi and McCaffer (2000), and Love (2002). The conceptual model of the interrelationship between the study variables of Client Performance Criteria, Procurement Methods and Project Outcome is illustrated in Figure 2.

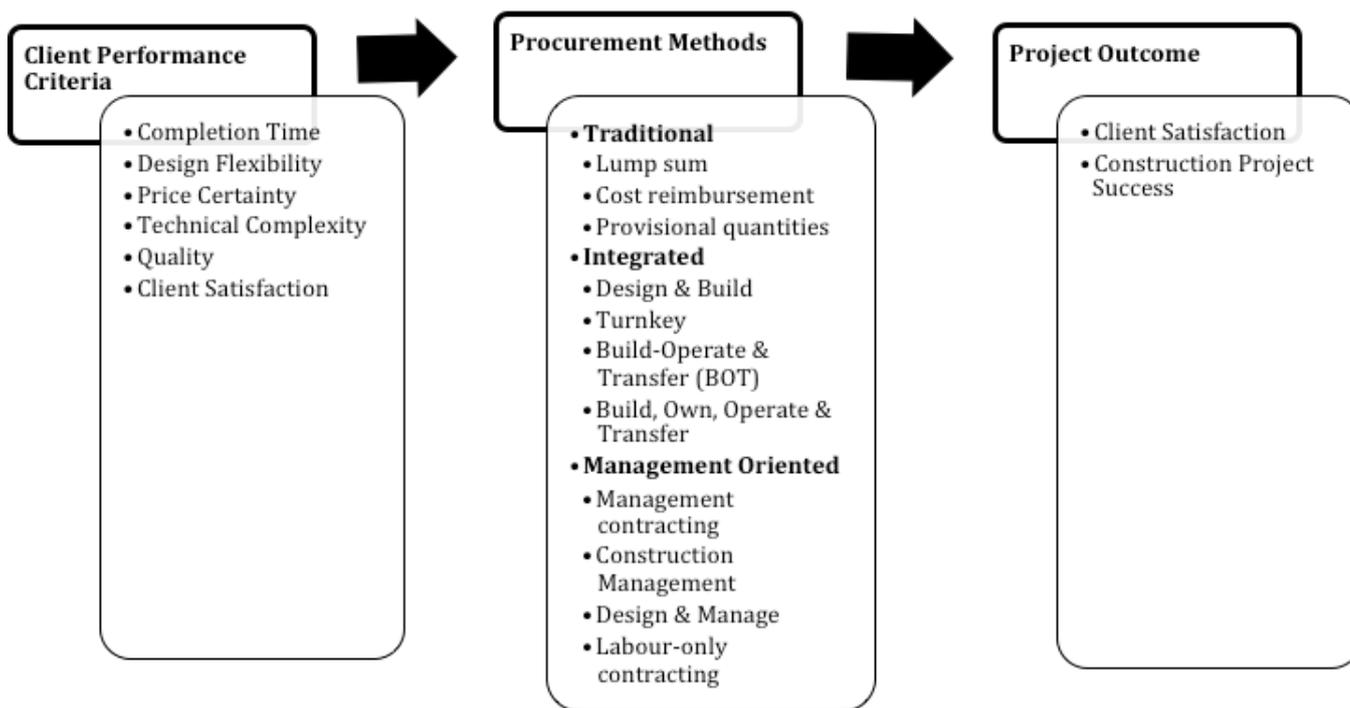


Figure 2: Conceptual Model of the Relationship between Variables used in the study

Sources: Love et al. (1998); Bowen et al. (1999) and Alhazmi and McCaffer (2000)

The conceptual model shown in Figure 2 is used to evaluate the concept that the client's performance criteria can be related to the final project outcome, using the procurement method as an aid in explaining linkages between them. Figure 2 shows that the client performance criteria is an independent variable which affects the procurement method –intervening variable – selected by the procurement team, which in turn affects the final project outcome – the dependent variable. In examining the clients' project performance criteria, project performance and the method of its procurement in the projects sampled, the following proposition was addressed:

- The clients' performance criteria can be related to the procurement method used and the procurement method can also be related to the final project performance/outcome, which can be used to explain the procurement method selected by the procurement team.

The cost and schedule growth is defined as the divergence between original and actual contract value and time of completion for each project (Love, 2002) and used as an indicator of construction project success, is calculated using the following formula (Zeitoun and Oberlander 1993, cited in Love, 2002): -

$$\text{Project}_{CG} = \frac{\sum_{CVP} - \sum_{OCV}}{\sum_{OCV}}$$

$$\text{Project}_{SG} = \frac{\sum_{ACP} - \sum_{OCP}}{\sum_{OCP}}$$

Where: CG = percentage cost growth
 SG = percentage schedule growth
 CVP = Contract value on practical completion
 OCV = Original contract value
 ACP = Actual construction period
 OCP = Original construction period

RESEARCH METHOD

The data collection method used for this study is a retrospective case study questionnaire (Molenaar and Songer, 1998). Rather than developing a questionnaire survey that sought respondents' general opinions about project performance outcomes, the authors asked the respondents to select a recently completed project most familiar to them. However, before developing the main study questionnaire, a pilot study was carried out to trial run the questionnaire before the final data from the whole sample is collected (Naoum, 2007).

The pilot study took the form of a case study interview questionnaire, which was developed and used to validate the appropriateness of the main study questionnaire. The questionnaire was used in the interview of five members of the Real Estate Developers Association of Nigeria (REDAN) who have commissioned real estate development projects within the last five years in Nigeria. The questionnaires were administered between 17 and 26 October 2011.

It is intended that the final study will adopt a triangulation data collection approach, which means obtaining quantitative data about fact and figures from previously completed real estate development projects, and qualitative data about the perceptions, opinions and views of the respondents. It is also intended to obtain a large sample of cases. A minimum of 31 respondents is set as being sufficient to analyse the expected primary data statistically, and draw conclusions. According to Ott and Longnecker (2001), the central limit theorem holds true when the sample size is equal to or greater than 30, and when other assumptions are also met. These provide statistically significant results. The findings presented and conclusions inferred from the pilot study in the subsequent sections, are however limited by the small sample size and can only be used as an indicator of client project performance criteria, key procurement method used in Nigeria and possible relationships between the study variables.

The cost and schedule growth is defined as the divergence between original and actual contract value and time of completion for each project (Love, 2002) and used as an indicator of construction project success, is calculated using the following formula (Zeitoun and Oberlander 1993, cited in Love, 2002): -

DEMOGRAPHIC DATA OF RESPONDENTS AND PROJECTS IDENTIFIED

The analysis of the data collected from the initial pilot study is presented under the following headings:

DEMOGRAPHIC DATA OF RESPONDENTS, AGE OF COMPANY & PROJECT IDENTIFIED

The study sought to know the position of the respondent in the property development company, the age of the company, the number of property development projects handled by the company to date and type of project reported on. Results of the data obtained are presented in Table 1.

Table 1: Distribution of Respondents by Background Information and Project Identified

DEMOGRAPHY	NO OF RESPONDENTS
Position in the company	
Chief Executive Officer	4
Management Staff	1
Age of the company	
Less than 5 years	2
6 – 10	1
11 – 15	1
16 – 20	1
Number of Property Development Projects Handled in the last 5 years	
One	1
Three	3
Ten	1
Project and Facility Type Identified	
Residential Building(s)/Housing Estate	3
Mixed-Use Development (Commercial & Residential)	2

Table 1 shows that most of the respondents are Chief Executive Officers of the company, three of whom are from organizations that are more than five years old and who have handled at least one property development project. The position of the respondent in the company, the age of the company and the number of property development projects handled so far is of relevance to the study because, the higher the position of the respondent, the older the organisation and the more projects handled by the organisation, the more the respondents would have the necessary experience, would have participated in a variety of project procurement processes and implementation and would therefore be able to provide credible and reliable information.

CLIENT PROJECT PERFORMANCE CRITERIA

The client project performance criteria, which are used in the choice of procurement method used by the client is presented in Table 2.

Table 2: Ranking of the Importance of Clients' Project Performance Criteria

Criteria	1	2	3	4	5	Mean Item Score	Rank	Level of Importance
Completion Time (need for timeous completion)	0	0	1	0	4	0.92	1	Very High
Price Certainty (Completion within the Budget)	0	0	1	0	4	0.92	1	Very High
Ease of Project Administration under Procurement Method	0	0	1	0	4	0.92	1	Very High
Reduced Risks (low exposure to uncertainties)	0	0	1	1	3	0.88	4	High
Quality (need for quality finishes)	0	0	1	2	2	0.84	5	High
Government Policy/Statutory Requirements	1	0	0	0	4	0.84	5	High
Widely understood Procurement Method	1	0	0	1	3	0.80	7	High
Technical Complexity of the Project	1	0	2	1	1	0.64	8	Average
Flexibility (Need for design changes)	2	0	1	1	1	0.56	9	Average

Key: 5-highly important; and 1-very low importance

Table 2 shows that the clients surveyed ranked Completion time, Price certainty and Ease of project administration under the selected procurement methods as highly important criteria in their choice of procurement methods.

PROCUREMENT METHOD USED BY DEVELOPERS

The procurement methods used by the property developers in their goals for property acquisition are presented in Table 3.

Table 3: Procurement methods used by respondents in Property Acquisition

Procurement Method	Number of Respondents
Traditional Lump-Sum	1
Traditional with provisional quantities	1
Design and Build (Integrated and holistic)	2
Build-Operate and Transfer (Integrated and holistic)	1

Table 3 shows that the respondents made use of a variety of procurement methods. The procurement methods used the most being Design and Build, a form of Integrated and Holistic methods of procurement. It was noted that none of the respondents made use of the management-oriented method of procurement in property acquisition.

MATCH BETWEEN CLIENTS' PERFORMANCE CRITERIA AND PROJECT PERFORMANCE BASED ON PROCUREMENT METHODS

The study sought to find out whether the clients' performance criteria fit the project success/performance based on the procurement method selected. Table 4 presents findings on the project type, procurement method used, clients' criteria, project performance outcome and level of fit between clients' criteria and the final project performance.

Table 4: Distribution of Data by Type of Project, Procurement Method, Client's Performance Criteria, Project Performance and Level of Fit

Project Type	Project Procurement Methods	Clients' Highly Important Performance Criteria	Project Performance					Level of Fit
			Time (T)	Price (P)	Quality (Q)	P. Admin Difficulty (EA)	Conform with Expectation	
Residential	Traditional Lump-sum	EA	+ 10%	+ 5%	High	Low	High	100%
Residential	Design & Build	T, P, Q, EA & RR	- 50%	- 34.4%	V. High	High	V. High	∅ (75%)
Commercial & Residential	Design & Build	T, P & EA	+ 40%	+17.9%	High	Average	-	None (0%)
Commercial & Residential	Traditional + prov. quantities	T, P, RR & EA	+ 40%	- 14.2%	High	Low	High	2/3 (67%)
Residential	Build-Operate Transfer (BOT)	T, P, Q & RR	+ 40%	+27.1%	Average	Low	Average	None (0%)

Key: EA = Ease of Project Administration; RR = Reduced Risks
+ = Schedule/Cost Growth; - = Schedule/Cost Saving

Table 4 indicates that the performance criteria common to the respondents in the pilot study that influences the decision of construction industry clients in Nigeria to select a procurement method for use in project delivery include Time, Price certainty and Ease of Project Administration. To a lesser extent, they also select procurement methods that will reduce their exposure to project risks.

The level of fit shown in Table 4 is determined by matching the clients' highly important criteria to the indicators of project performance obtained. The clients' need for reduced risks (RR) was not included as an indicator of project performance in the questionnaire. This is seen as a limitation of the questionnaire in its present form. It therefore emerged that the project performance outcome should also include obtaining data on the subject of reduced risks/if the procurement method provided low exposure to uncertainties.

Visual inspection of Table 4 reveals that the clients project performance criteria is best achieved with the Traditional Lump-sum method of project procurement followed by the Design and Build Method of Procurement and lastly by the Build-Operate Transfer method of procurement. It also emerges from Table 4 that the clients had higher expectations from the choice of procurement method selected, which was found to be much higher in the Integrated Methods of project procurement – Design and Build; and

Build-Operate Transfer (BOT) than in the Traditional System. This might account for the lower level of fit of the latter form of procurement when compared to the former.

For the clients who chose the Traditional System (separation of design from the construction process) method of procurement, the area of commonality in respect of clients' needs and choice of procurement method was in the area of Ease of Project Administration. Table 4 shows that both clients encountered low levels of difficulty in administering the contracts. Table 4 indicates that the use of the Traditional System of procurement fits the client's key requirement of Ease of Contract Administration. The client's requirement for Ease of Contract Administration may explain the major conflict in the finding by Bowen et al. (1999) that the procurement systems preferred by the clients do not match the respondents' overall ranking of procurement systems in terms of attaining clients objectives of time, cost and quality. Further, Table 4 also shows that the client who selected the Traditional System, and who had time and price as an additional criteria, was able to achieve the requirement of reduced cost.

The clients who chose the Integrated Procurement Methods of Design & Build and Build-Operate & Transfer, had Time and Price as a common area of important performance criteria. It emerged that only in one of the cases presented, was this client need achieved. The other cases presented suffered significant time and cost losses. It also emerged that 75% of the client's criteria was achieved in only one of the projects procured with the Integrated System, while none of the clients' criteria was achieved in the remaining cases. An additional finding was that the Integrated System of project procurement is difficult to administer by the procurement team. When asked if another procurement method will have served their purposes better, one of the respondents who made use of the Integrated System of Procurement answered affirmatively, indicating that the Traditional Lump-sum System of project procurement would have served him better, because it would have enabled him to transfer the construction risk and minimize the effect of sharp practices of site operatives.

CONCLUSIONS

It emerged from the study that the project performance criteria/needs of clients that determines their choice of procurement methods in the construction industry in Nigeria are Time, Price certainty and Ease of Project Administration. The case study research carried out also indicates that the procurement selection process is limited to the Traditional System and the Integrated Procurement Methods, which are the familiar methods of procuring projects. None of the respondents in the study made use of the Management-Oriented Procurement Methods and this might be suggestive of the small sample size used in the study. It also emerged that the clients' performance criteria can be matched with the success/performance of the project based on the procurement method used, with the traditional system of procurement having a better level of achievement of client performance criteria, than the integrated methods. This finding casts doubts on the suggestions made by scholars that integrating the design and construction stages of a project will result in better project outcomes and client satisfaction.

Because of the small sample size, it will difficult to conclude on whether the clients' need/performance criteria can be matched with the success/performance outcome of the project as a result of the method of project procurement in Nigeria. A larger sample will need to be examined and data analysed with the use of inferential statistics to establish the relationships (or lack thereof) between procurement methods, project performance outcomes and clients' performance criteria, in order to reach more definite conclusions.

It can be concluded, based on the anecdotal evidence available in this study that the Traditional System is the procurement method that will deliver project outcomes that have the best fit with clients' performance criteria/aspiration in Nigeria. However, it is recommended that construction industry clients and professionals should assess and analyse the clients' project performance criteria against the likely project performance outcomes of the various procurement methods, before a procurement method is finally selected.

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