Developing a Decision Support System for the Selection of Appropriate Procurement Method for A Building Project In Nigeria

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***Abstract* –In an industry where the choice of a procurement method is haphazard, developing a decision support system to guide clients in their choices is needed. This research work was aimed at developing a framework using the multi-attribute utility approach. Public clients' prioritized factors for cost categories of building types and the suitability of a procurement method achieving a selection criterion (utility coefficients) were established. Then using the weighted sum model (i.e. additive utility), the procurement method with the largest preference value was determined for each cost category and building type. The model revealed that, for a residential project of up to N100 million (Naira) cost category, taken into consideration public clients' priority rating, design – bid – construct (D-B-C) was the most appropriate procurement option. A trend emerged that for a building project of up to N100 million (Naira), the design – bid-construct, was the most appropriate for all building types. While for a building project of above N500 million (Naira), the management contracting was the most appropriate procurement option for all building types.**

Keywords-decision support system, procurement, multi-attribute utility building project, Nigeria.

I. Introduction

The decision to select the appropriate procurement option to implement a construction project is crucial. Though it does not necessary lead to a successful project but with other factors taken into consideration can influence the success of the project. But in Nigeria, clients and consultants as observed by Ojo (1999), do not have a specific procedure in choosing their procurement method to implement projects but base it on familiarity with a particular method. Hence clients use procurement methods compatible with their corporate environments. So public clients in Nigeria use the design – bid- construct (traditional contracting method) because of public accountability while private clients use the design - build because they do not have the relevant experts for design and supervision. As observed by Masterman (1992), the way many clients choose their procurement methods to implement projects Lacks logic. This is as a result of the fact that there, is no theoretical framework on which to derive either an ideal or an optimum approach to procurement (Rwelamia, et al. 2000).

The benefits of implementing projects using the appropriate procurement method are to both the client and the nation. According to Kumaraswamy and Dissanayaka, (1998) it could lead to longer terms benefits through the development and upgrading of domestic contractors and other construction organizations. This has been the cases in Malaysia, Singapore, Sri-Lanka and Australia. (Abdul-Aziz and Ofori, 1996; Ofori, 1996; Kumaraswamy and Dissanayaka, 1997 and Sidwell, 1997) respectively. This strategic change in procurement practices and procedure is inevitable in the Nigerian construction industry. Okpala (2000) saw this need and suggested a complete overhaul of the existing construction industry's framework if the industry is to survive in the present Nigerian ailing economy. The aim of this research work was to develop such a framework. The weighted sum model of the multi-attribute utility approach (MAUA) was used to match clients' prioritized factors with the benchmarked performance of the procurement methods in achieving a selection criterion (utility coefficient), to select appropriate procurement method for a building project.

II. Multi-attribute utility approach

Since NEDO's (1985) suggestion that, client and advisers could rate the different procurement options using client's priority, many researchers have developed different approaches to procurement selection. These approaches vary from the simple rating system to a more complex multi-attribute, the analytical hierarchical process and matrix based approaches. According to Ng et al. (2002), these approaches have been proposed to overcome identified weaknesses of the selection practices.

The multi-attribute utility approach (MAUA) is used mostly to solve complex problems that involve the consideration of several criteria in relation to different outcomes. The decision makers assess the value of possible outcomes based on utility i.e. relative desirability of each possible outcome (Fellows et al; 1983) the MAUA is developed where the expected utility of choice j is

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determined by:

$$U_j = \sum_{i=x_i}^{n} w_{ij} x_i \qquad (1)$$

Source: Chang and Ive (2002)

Where xi is the value given to the attribute i of utility function decided by the decision maker's subjective evaluation and wij is the utility coefficients relating attributes to options (Chang and Ive, 2002). Fellows et al. (1983) opined that, the MAUA could be used as a tool to measure objectivity in an otherwise subjective area of management. Love et al. (1998) regarded it as the foremost technique appropriate for examining the criteria of clients and preferences of experts' weights. As applied to construction management, it involves four steps: (Chang and Ive, 2002).

Identification of priority variables (i.e. criteria);

Fixing of utility factors by experts relating achievement of priority variables as outcomes to procurement routes;

Determination of relative importance attached to each criterion and

Summing up the weighted priority variables of each procurement route and choosing the one with highest score.

Chan (1995), Love et al. (1998); Ambrose and Tucker (2000) all used the idea of MAUA to develop models to aid practitioners select the most appropriate procurement system in Australia. Similarly, Kumaraswamy and Dissanayaka (1998) and Chan et al. (2001) applied the MAUA to guide clients in the Hong kong construction industry choose the most appropriate procurement method.

III. Data Collection Procedure

A survey instrument in the form of questionnaire was used to capture the necessary data in this study. Clients (public and private) and consultants who are involved in the decision of choosing a procurement method were asked to identify the criteria they consider in their choice of a procurement method. In addition they were asked to prioritize these criteria based on the type of building and cost. The project types considered were residential, office and commercial buildings. These were categorized into N10 million (Naira) – N100 million (Naira), N101 million (Naira) – N500 million (Naira) and above N500 million (Naira). Respondents were asked to indicate their priority preferences of the selection criteria on a 5- point scale; 1 – "not important" to 5 – "very important". The reliability of the five – point Likert scale was tested using Cronbach α of the SPSS package at 5% significant level. Also Kendall's coefficient of concordance test was used to determine the degree of agreement of rankings within groups. The selection criteria considered were speed, cost certainty, time certainty, price competition, quality, risk avoidance (in the event of time slippage) and risk avoidance (in the event of cost slippage). Results of the prioritization (i.e. the relative importance attached to these criteria) of these criteria based on the type of building and cost categories were as published in Ojo (2009a). These criteria were identified and priorized by senior managers of 13 public clients establishments and 26 private clients establishments.

In a further research, respondents (clients, consultants and contractors) were asked to rate the suitability of procurement options in achieving a selection criterion based on cost categories using a Likert scale of 1 to 10. A rating of 1 means, low suitability in achieving a selection criterion and 10 means, very high suitability in achieving a selection criterion. The procurement options considered were those in use in Nigeria such as design – bid- construct; design – build system, management contracting, direct labour system and build – Own – Operate – Transfer (BOOT). The benchmark performance values (aij) of these procurement options against the selection criteria were as published in Ojo (2009b). For details on questionnaires distributed and the number of correctly completed questionnaire among the three classes of respondents, see Ojo (2009b).

IV. Data Analysis, Results and Discussion

Considering a decision – making problem with M alternatives and N criteria whereby the alternatives is denoted as:

Ai (for i = 1, 2, 3,M) and criteria as Cj (for j = 1, 2, 3, ………….. N). It is assumed (Trianbtapyllou et al, 1997) that the decision maker knows the performance values aij (for i = 1, 2, 3, M and j = 1, 2, 3, N) of each of the alternatives in terms of each of the decision criterion. Also that for each decision criterion, the decision maker has determined its relative importance denoted as Cj (for j = 1, 2, 3, N). lastly that the relative importance of the N criteria satisfies the following normalization constraint:

$$\sum_{j=i}^{n} C_j = 1 \qquad (2)$$

This is termed the rationalized priority rating and is calculated as:

$$C_j = \frac{RI_P}{\sum_{P=1}^{K} (RI_P)} \qquad (3)$$

Where RI_P – is the relative importance index.

It is used to calculate the performance of the alternatives by an additive utility (the weighted sum model) of the following form:

$$\text{Pi} = \sum_{j=i}^{n} aijCj \qquad (4)$$

For i = 1, 2, 3, ………… M where Pi is the preference value of alternatives Ai (i=1, 2, 3, m) when all the criteria are considered simultaneously. For maximization case (as in this study) the best alternative is the one which has the largest preference value.

For illustration and constraint of space, the rationalized priority rating by public clients only is published as in Table i in this study. (NOTE: The fuller results are being used to develop a computer soft ware to select a procurement method).

Table I: Rationalized Priority Rating By Public Clients

Selection criteria	Residential (Multi-Unit Housing)			Office			Commercial		
	10m – 100m	101m – 500m	Above 500m	10m – 100 m	101m – 500m	Above 500m	10m – 100m	101m - 500m	Above 500m
1. Speed	0.15	0.16	0.15	0.15	0.16	0.15	0.16	0.15	0.15
2. Cost certainty	0.15	0.15	0.15	0.15	0.16	0.15	0.15	0.15	0.15
3. Time Certainty	0.14	0.14	0.14	0.15	0.14	0.14	0.15	0.15	0.14
4. Price competition	0.12	0.11	0.12	0.13	0.11	0.11	0.12	0.11	0.12
5. Quality	0.17	0.16	0.16	0.17	0.16	0.17	0.16	0.16	0.16
6. Risk Avoidance (Time)	0.14	0.14	0.14	0.14	0.14	0.14	0.13	0.14	0.14
7. Risk Avoidance (Cost)	0.13	0.14	0.14	0.12	0.14	0.14	0.13	0.14	0.14
Totals	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: Field Survey (2006).

The weighted sum model results for residential, office and commercial projects based on cost categories are as in Tables ii, iii, iv, v, vi, vii, viii, ix and x respectively

Table II: The Weighted Sum Model Results for Residential Projects Costing N10 Million – N100million by Public Clients.

		A		B		C		D		E	
Selection criteria	**Cj**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**
Speed	0.15	9.1	1.37	8.0	1.20	7.7	1.16	8.6	1.29	6.7	1.01
Cost certainty	0.15	8.2	1.23	8.5	1.28	8.0	1.20	7.9	1.19	5.7	0.86
Time certainty	0.14	7.9	1.11	7.7	1.08	8.8	1.23	9.3	1.30	9.0	1.26
Price competition	0.12	8.0	0.96	7.7	0.92	7.4	0.89	5.8	0.70	4.7	0.56
Quality	0.17	8.6	1.46	8.7	1.48	8.9	1.51	9.1	1.55	9.3	1.58
Risk avoidance (time)	0.14	8.1	1.13	8.0	1.12	8.0	1.12	8.3	1.16	8.7	1.22
Risk avoidance (cost)	0.13	8.0	1.04	7.3	0.95	8.2	1.07	7.9	1.03	7.7	1.00
Totals	1.00		8.30		8.03		8.18		8.22		7.49
Rank Order			1		4		3		2		5

Source: Field Survey (2006).

Legend: A – D-B-C, B – Design-Build
C – Management Contracting, D – Direct Labour
E - BOOT
Cj – Rationalized Priority Rating
aij – Utility factor of each procurement method

Table III: The Weighted Sum Model Results for Residential Projects Costing N101 Million – N500million by Public Clients

		A		B		C		D		E	
Selection criteria	**Cj**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**
Speed	0.16	9.1	1.46	7.6	1.22	7.8	1.25	8.1	1.30	6.7	1.07
Cost certainty	0.15	7.9	1.19	8.4	1.26	8.7	1.31	7.8	1.17	5.7	0.86
Time certainty	0.14	7.6	1.06	8.0	1.12	8.5	1.19	8.6	1.20	9.0	1.26
Price competition	0.11	8.0	0.88	7.8	0.86	8.3	0.91	6.1	0.67	4.7	0.52
Quality	0.16	8.4	1.34	8.8	1.41	9.2	1.47	8.4	1.34	9.3	1.49
Risk avoidance (time)	0.14	8.4	1.18	8.2	1.15	8.8	1.23	7.7	1.08	8.7	1.22
Risk avoidance (cost)	0.14	8.4	1.18	7.6	1.06	8.5	1.19	6.9	0.97	7.7	1.08
Totals	1.00		8.29		8.08		8.55		7.73		7.50
Rank Order			2		3		1		4		5

Source: Field Survey (2006).

Legend: A – D-B-C, B – Design-Build
C – Management Contracting, D – Direct Labour
E - BOOT
Cj – Rationalized Priority Rating
aij – Utility factor of each procurement method

Table IV: The Weighted Sum Model Results For Residential Projects Costing N500million Above By Public Clients

		A		B		C		D		E	
Selection criteria	**Cj**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**
Speed	0.15	9.2	1.38	8.8	1.32	8.0	1.20	8.5	1.28	6.7	1.01
Cost certainty	0.15	8.8	1.32	8.6	1.29	8.7	1.31	7.7	1.16	5.3	0.80
Time certainty	0.14	8.2	1.15	8.2	1.15	8.8	1.23	9.2	1.29	9.0	1.26
Price competition	0.12	8.2	0.98	8.0	0.96	8.5	1.02	5.8	0.70	4.7	0.56
Quality	0.16	9.0	1.44	9.0	1.44	9.5	1.52	8.8	1.41	9.3	1.49
Risk avoidance (time)	0.14	7.7	1.08	8.4	1.18	8.8	1.23	7.7	1.08	8.7	1.22
Risk avoidance (cost)	0.14	8.7	1.22	7.8	1.09	8.5	1.19	7.5	1.05	8.0	1.12
Totals	1.00		8.57		8.43		8.70		7.97		7.46
Rank Order			2		3		1		4		5

Source: Field Survey (2006).

Legend: A – D-B-C, B – Design-Build
C – Management Contracting, D – Direct Labour
E - BOOT
Cj – Rationalized Priority Rating
aij – Utility factor of each procurement method

Table V: The Weighted Sum Model Results for Office Projects Costing N10 Million – N100 Million by Public Clients

		A		B		C		D		E	
Selection criteria	**Cj**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**
Speed	0.15	9.1	1.37	8.0	1.20	7.7	1.16	8.6	1.29	6.7	1.01
Cost certainty	0.15	8.2	1.23	8.5	1.28	8.0	1.20	7.9	1.19	5.7	0.86
Time certainty	0.15	7.9	1.19	7.7	1.16	8.8	1.32	9.3	1.40	9.0	1.35
Price competition	0.13	8.0	10.4	7.7	1.00	7.4	0.96	5.8	0.75	4.7	0.61
Quality	0.17	8.6	1.46	8.7	1.48	8.9	1.51	9.1	1.55	9.3	1.58
Risk avoidance (time)	0.14	8.1	1.13	8.0	1.12	8.0	1.12	8.3	1.16	8.7	1.22
Risk avoidance (cost)	0.12	8.0	0.96	7.3	0.88	8.2	0.98	7.9	0.95	7.7	0.92
Totals	1.00		8.38		8.12		8.25		8.29		7.55
Rank Order			1		4		3		2		5

Source: Field Survey (2006).

Legend: A – D-B-C, B – Design-Build
C – Management Contracting, D – Direct Labour
E - BOOT
Cj – Rationalized Priority Rating

Table VI: The Weighted Sum Model Results for Office Projects Costing N101 Million – N500 Million by Public Clients

		A		B		C		D		E	
Selection criteria	**Cj**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**
Speed	0.16	9.1	1.46	7.6	1.22	7.8	1.25	8.1	1.30	6.7	1.07
Cost certainty	0.16	7.9	1.26	8.4	1.34	8.7	1.39	7.8	1.25	5.7	0.91
Time certainty	0.14	7.6	1.06	8.0	1.12	8.5	1.19	8.6	1.20	9.0	1.26
Price competition	0.11	8.0	0.88	7.8	0.86	8.3	0.91	6.1	0.67	4.7	0.52
Quality	0.16	8.4	1.34	8.8	1.41	9.2	1.47	8.4	1.34	9.3	1.49
Riskavoidance (time)	0.14	8.4	1.18	8.2	1.15	8.8	1.23	7.7	1.08	8.7	1.22
Risk avoidance (cost)	0.14	8.3	1.16	7.6	1.06	8.5	1.19	6.9	0.97	7.7	1.08
Totals	1.00		8.34		8.16		8.63		7.81		7.55
Rank Order			2		3		1		4		5

Source: Field Survey (2006).

Legend: A – D-B-C, B – Design-Build
C – Management Contracting, D – Direct Labour
E - BOOT
Cj – Rationalized Priority Rating
aij – Utility factor of each procurement method

Table VII: The Weighted Sum Model Results For Office Projects Costing N500 Million Above By Public Clients.

		A		B		C		D		E	
Selection criteria	**Cj**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**
Speed	0.15	9.2	1.38	8.8	1.32	8.0	1.20	8.5	1.28	6.7	1.01
Cost certainty	0.15	8.8	1.32	8.6	1.29	8.7	1.31	7.7	1.16	5.3	0.80
Time certainty	0.14	8.2	1.15	8.2	1.15	8.8	1.23	9.2	1.29	9.0	1.26
Price competition	0.11	8.2	0.90	8.0	0.88	8.5	0.94	5.8	0.64	4.7	0.52
Quality	0.17	9.0	1.53	9.0	1.53	9.5	1.62	8.8	1.50	9.3	1.58
Riskavoidance (time)	0.14	7.7	1.08	8.4	1.18	8.8	1.23	7.7	1.08	8.7	1.22
Risk avoidance (cost)	0.14	8.7	1.22	7.8	1.09	8.8	1.23	7.5	1.05	8.0	1.12
Totals	1.00		8.58		8.44		8.76		8.00		7.51
Rank Order			2		3		1		4		5

Source: Field Survey (2006).

Legend: A – D-B-C, B – Design-Build
C – Management Contracting, D – Direct Labour
E - BOOT
Cj – Rationalized Priority Rating
aij – Utility factor of each procurement method

Table VIII: The Weighted Sum Model Results for Commercial Projects Costing N10 Million – N100 Million by Public Clients

		A		B		C		D		E	
Selection criteria	**Cj**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**
Speed	0.16	9.1	1.46	8.0	1.28	7.7	1.23	8.6	1.38	6.7	1.07
Cost certainty	0.15	8.2	1.23	8.5	1.28	8.0	1.20	7.9	1.19	5.7	0.86
Time certainty	0.15	7.9	1.19	7.7	1.16	8.8	1.32	9.3	1.40	9.0	1.35
Price competition	0.12	8.0	0.96	7.7	0.92	7.4	0.89	5.8	0.70	4.7	0.56
Quality	0.16	8.6	1.38	8.7	1.39	8.9	1.42	9.1	1.46	9.3	1.49
Riskavoidance (time)	0.13	8.1	1.05	8.0	1.04	8.0	1.04	8.3	1.08	8.7	1.13
Risk avoidance (cost)	0.13	8.0	1.04	7.3	0.95	8.2	1.07	7.9	1.03	7.7	1.00
Totals	1.00		8.31		8.02		8.17		8.24		7.46
Rank Order			1		4		3		2		5

Source: Field Survey (2006).

Legend: A – D-B-C, B – Design-Build
C – Management Contracting, D – Direct Labour
E - BOOT
Cj – Rationalized Priority Rating
aij – Utility factor of each procurement method

Table IX: The Weighted Sum Model Results For Commercial Projects Costing N101 Million – N500 Million By Public Clients

		A		B		C		D		E	
Selection criteria	**Cj**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**
Speed	0.15	9.1	1.37	7.6	1.14	7.8	1.17	8.1	1.22	6.7	1.01
Cost certainty	0.15	7.9	1.19	8.4	1.26	8.7	1.31	7.8	1.17	5.7	0.86
Time certainty	0.15	7.6	1.14	8.0	1.20	8.5	1.28	8.6	1.29	9.0	1.35
Price competition	0.11	8.0	0.88	7.8	0.86	8.3	0.91	6.1	0.67	4.7	0.52
Quality	0.16	8.4	1.34	8.8	1.41	9.2	1.47	8.4	1.34	9.3	1.49
Riskavoidance (time)	0.14	8.4	1.18	8.2	1.15	8.8	1.23	7.7	1.08	8.7	1.22
Risk avoidance (cost)	0.14	8.3	1.16	7.6	1.06	8.5	1.19	6.9	0.97	7.7	1.08
Totals	1.00		8.26		8.08		8.56		7.74		7.53
Rank Order			2		3		1		4		5

Source: Field Survey (2006).

Legend: A – D-B-C, B – Design-Build
C – Management Contracting, D – Direct Labour
E - BOOT
Cj – Rationalized Priority Rating
aij – Utility factor of each procurement method

Table X: The Weighted Sum Model Results For Commercial Projects Costing N500 Million Above By Public Clients

		A		B		C		D		E	
Selection criteria	**Cj**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**	**aij**	**Result**
Speed	0.15	9.2	1.38	8.8	1.32	8.0	1.20	8.5	1.28	6.7	1.01
Cost certainty	0.15	8.8	1.32	8.6	1.29	8.7	1.31	7.7	1.16	5.3	0.80
Time certainty	0.14	8.2	1.15	8.2	1.15	8.8	1.23	9.2	1.29	9.0	1.26
Price competition	0.12	8.2	0.98	8.0	0.96	8.5	1.02	5.8	0.70	4.7	0.56
Quality	0.16	9.0	1.44	9.0	1.44	9.5	1.52	8.8	1.41	9.3	1.49
Riskavoidance (time)	0.14	7.7	1.08	8.4	1.18	8.8	1.23	7.7	1.08	8.7	1.22
Risk avoidance (cost)	0.14	8.7	1.22	7.8	1.09	8.8	1.23	7.5	1.05	8.0	1.12
Totals	1.00		8.57		8.43		8.74		7.97		7.46
Rank Order			2		3		1		4		5

Source: Field Survey (2006).

Legend: A – D-B-C, B – Design-Build
C – Management Contracting, D – Direct Labour
E - BOOT
Cj – Rationalized Priority Rating
aij – Utility factor of each procurement method

The weighted sum model results by public clients revealed that, for a residential project of up to N100 million (Naira) cost and taken into consideration their priority rating, D-B-C was the most appropriate procurement option. Direct labour system was ranked second most appropriate. It means that if a client has a supervisory outfit, then he can consider the direct labour option. BOOT system was ranked the least appropriate for residential projects of up to N100 million (Naira) cost. For residential projects of N101 million (Naira) – N500 million (Naira) cost range, management contracting was the "best in class" i.e. the most appropriate to implement projects of that cost range. The D-B-C was ranked second while BOOT system was the least appropriate. As regards residential projects of above N500 million (Naira), management contracting was the most appropriate procurement option. Again, the D-B-C was ranked second and BOOT system the least appropriate.

For office projects of N10 million (Naira) – N100 million (Naira) cost, the weighted sum model results by public clients showed that, D-B-C was "best in class" followed by direct labour system. BOOT system was the least appropriate. For projects of up to N101 million (naira) – N500 million (naira) cost, management contracting was ranked the most appropriate procurement option, D-B-C as second while BOOT system was the least appropriate. As regards office projects of above N500 million (Naira), management contracting was the "best in class" followed by D-B-C while BOOT system, the least appropriate. The weighted sum model results by public clients revealed that for commercial projects of up to N100 million (Naira), D-B-C was the most appropriate. Direct labour system was ranked second while BOOT system, the least appropriate. For commercial projects of 101 million (Naira) – N500 million (Naira) cost range, management contracting was the "best in class", followed by D-B-C. The BOOT system was ranked the least appropriate for this cost range. As regards commercial projects of above N500 million (Naira), management contracting was the most appropriate and D-B-C second best. BOOT system was ranked the least

Appropriate. In an open-ended question public clients were asked to indicate which procurement option they would prefer to use to implement projects of the cost categories based on their priority rating. For projects of up to N100million (Naira) cost, majority of the public clients indicated D-B-C. The need for adequate management of design and construction stages informed their choice. As for projects of N101 million (Naira) – N500 million (Naira) cost range, 50% of public clients would prefer the use of management contracting as compared to 32.2% who preferred the D-B-C. And for project cost of above N500 million (Naira) public clients would prefer either the use of D-B-C or the management contracting.

V. Conclusions

A general trend emerged from the results of the weighted sum model by public clients. The trend was that, for a building project of up to N100 million (Naira) cost, public clients would have to use the D-B-C based on their priority rating. However, for building projects from N101 million (Naira) and above, the management contracting emerged as the most appropriate procurement option based on their priority rating. But because the Nigerian public service does not allow the use of management contracting public clients would have to use the D-B-C as their preference indicated.

VI. References

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