



Assessment of Procurement Plan in the Nigeria Construction Industry: A Case of Selected Firms in Port Harcourt, Nigeria

C. C. Emekoma^{1*}

¹*Department of Geography and Environment Management, Centre for Disaster Risk Management, University of Port Harcourt, Choba, Rivers State, Nigeria.*

Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/JEMT/2019/v25i3330194

Editor(s):

(1) Dr. Ehlinaz Torun Kayabasi, Associate Professor, Department of Marketing and Advertising, Kocaeli University Arslanbey Vocational School, Turkey.

Reviewers:

- (1) J. Dario Aristizabal-Ochoa, Universidad Nacional de Colombia, Colombia.
 - (2) Sergei N. Polbitsyn, Ural Federal University, Russia.
 - (3) Wasantha Rajapakshe, Sri Lanka Institute of Information Technology, Sri Lanka.
- Complete Peer review History: <http://www.sdiarticle4.com/review-history/52135>

Original Research Article

Received 20 August 2019
Accepted 26 October 2019
Published 05 November 2019

ABSTRACT

The Procurement plan and procedure in Nigeria have gone through a number of changes, with main objective of reducing or at best eliminating corruption in public procurement, realizing values for money, efficiency in procurement process among others. The data of assessment of procurement plan in the Nigerian construction industry was collected through administrating questionnaire to selected members of the companies and was analyzed using three statistical tools, namely; percentage analysis, chi-square and measures of dispersion. The table from which was drawn the analysis of assessment of procurement plan in the Nigeria construction industry reveal that among the professionals who responded to the questionnaire 27.6% are members of the Nigeria Institute of Quality Surveyors (NIQS) , 13.2% belong to the Nigeria Institute of Architects (NIA), and 22.4% belong to the Nigeria institute of Builders (NIOB), while 3.9% are members of Nigeria Society of Engineers (NSE), those who belong to other professional body other than the those above are 9.2% and 23.7% are not registered with any professional body. From the chi-square test of independence, it was found that at 5% level of significance opinion of respondents is not independent of their professional background. The Likert summary table also show reveal the

*Corresponding author: E-mail: machrisgroup@yahoo.com;

following (i) procurement system affect project cost (ii) procurement system affect quality of work (iii) procurement plans affect design team performance. Also, the statements with low variance and standard deviation are more reliable than those with high variance and standard deviation. Therefore, on commencement of construction projects consultant must advise their clients on the building procurement system available.

Keywords: Procurement; construction industry; corruption.

1. INTRODUCTION

All around the world, public infrastructure services needs are fast outpacing the resources for providing them. These socio-economic realities have intensified the search for more innovative means of delivering public services and the need to achieve value for money and this necessitated the need for introduction of Public Procurement. Public Procurement is the process of acquiring goods and/or services at the best possible total cost of ownership, in the right quantity, quality, time and place for use by government and public organizations via contracts [1].

Procurement plan and procedures in Nigeria have gone through a number of changes, with the main objective of reducing or at best eliminating corruption in Public Procurement, realizing value for money, efficiency in the procurement process among others. A major change was the passing of the Procurement Act, Act 663, in 2003. As much as the usage of Act 663 has streamlined procurement plan in the country and established a high level of sanity in the procurement environment, the International Trade Centre UNCTAD/WTO (ITC) advises developing and transition countries on the techniques of effective Public Procurement plan while supporting the policy goals established by governments. Its main focus continues to be assistance to less developed countries. Public procurement remains a big part of the economy of developing countries, accounting for an estimated 9-13% of their gross domestic product (WTO, 2001). Nevertheless, it is an area in need of attention since resources are not being properly managed in many countries. Governing administrations in developing countries can reap benefits from improved management of their public procurement plan. With a more focused approach on benefit realization management, greater value can be achieved in national budgets while developing local industry [2].

A good procurement should therefore have benefits realization management, so as to

achieve the outcome and benefits of a project. According to McCartney (2000), projects and programs can only be regarded as successful if the intended benefits are realized. What generally drives projects and programs is a need to realize specific benefits through structured change. Benefits management and realization has recently risen as the "new" practice that seeks to move forward from the traditional investment appraisal approach and focus on the active planning of how benefits will be realized and measured (Glynne, 2007).

Ashurst and Doherty (2003) confirmed that there is little focus on benefits delivery, and very few public procurement entities have a process to realize those benefits but a majority of these entities believe that there can be improvement in this area (Ward et al, 1995: Bennington & Baccarini, 2004).

Project procurement has been described as an organized method or process and procedure for clients to obtain or acquire construction products (Weele, 2010). Apart from the traditional approach, there are now other fast-tracking or innovative procurement plan such as management contracting and design and build used by the construction industry worldwide. The different procurement plan differs from each other in terms of allocation of responsibilities, activities sequencing, process and procedure and organizational approach in project delivery.

These differences in procurement methods according to Chan (1996) influence the time performance of construction projects. Time would be affected by the flow of project that is driven by different type of procurement methods. Similarly, Naoum (1991) stated that the major factor affecting cost and project duration were the procurement method adopted. Bowen et al.[3] supported the view that one of the reasons contributing to the poor performance of the construction industry principally is the inappropriateness of selection of procurement plan.

Innovative or fast-tracking project procurement plan is the attempt by the construction industry to provide better deal to its clients or customers, who are increasingly insisting on —better value for money from their projects in terms of cost, time and quality [4]. The different project procurement plan present different processes and procedures of design and construction of projects for the client. In Nigeria it is realized that though some projects gain 100% completion, their benefits and outcomes are mostly not achieved. The provisions of the Public Procurement Act, (Act 663) do not extend to benefits realisation and nothing about it is mentioned in the associated regulations, manuals and guidelines [5,6,7,8]. Professionals involved in the design, construction and supervision at best have their interests extending up to the project outcome stage (Architect) with the majority terminating at the output level [9,10].

The implication of such problems is the dissatisfaction of beneficiaries and abandonment of the project output. These abandoned projects, cost the country in terms of value and finances: funds used in construction of these projects become waste because they are abandoned. It is in view of these problems that the study seeks to research into the Benefit Realization Practices of Public Procurement Entities in the procurement of infrastructural projects in Nigeria, using Port Harcourt as case study.

The Specific Objectives includes the following:

1. To determine the roles of the stakeholders under the various procurement plan;
2. To determine the critical challenges and risk factors facing different procurement plans;
3. To determine the impact of Procurement plan on project performance;
4. To investigate project success using designated objectives;
5. To compare different procurement plans to arrive at value for money; and
6. To use different procurement route to assign drivers to project as a statistical tool.

Furthermore, the hypothesis postulated for the study included:

- H₀: Procurement system does not affect project cost.
- H₀: Procurement system does not affect quality of work.

H₀: Various procurement plan does not significant affect design team performance.

2. SCOPE AND LIMITATION OF THE STUDY

There are many different project procurement plans, however it is appropriate for the purpose of this study to limit to the common ones i.e. traditional system and design and build. Moreover, this study does not cover all the project team. It is limited to design and construction team (surveyors, quantity surveyors, engineers and architects) in the private and public sectors. The performance indicators considered in this study was time performance, cost performance and quality performance.

3. MATERIALS AND METHODS

3.1 Primary Source of Data

The data were collected from members of the construction team in some selected companies (CCECC, MEK Builders Ltd, TE & C Nig Ltd, Fezzinat-Services Ltd) in Rivers state.

3.2 Secondary Source of Data

They were gotten from internet, online library, textbooks etc.

Population of study: The population of this study was comprised of the following members of the construction team in Construction Companies (CCECC, MEK Builders Ltd, TE & C Nig Ltd, Fezzinat-Services Ltd) in Rivers state:

- i. Architects
- ii. Builders and Engineers
- iii. Quantity Surveyors

A total of 100 (one hundred) questionnaires were distributed and administered to the targeted professionals using decisive convenient sampling technique out of which 76 numbers were returned and suitable for analysis .

Sample size: For the purpose of this study, the researcher made use of response from the various selected members of the companies (CCECC, MEK Builders Ltd, TE & C Nig Ltd, Fezzinat-Services Ltd) in Rivers state). The justification of the researcher for choosing this sample size is that findings and conclusions arrived at will give a better representation of the entire population.

Method of data collection: The method of data collection used for this project is questionnaires method of data collection. The method of data collection was so because questionnaires were distributed to the selected sample using the simple random sampling techniques. These techniques give every members of the population equal chance of being selected.

Method of data analysis: Here, emphasis will be laid on the method implored in the analysis of data collected in the researcher. The researcher intends to approach the problem as follows:

- i. To determine how procurement does affect project cost.
- ii. To determine how procurement affect quality of work.
- iii. To determine the impact of various procurement plan on the design team performance.

Due to the nature of the study, the appropriate statistical tools to be used are:

- i. Percentages analysis
- ii. Measure of central tendency
- iii. Chi-square test of analysis
- iv. Measures of dispersion

The respondents were asked to rank these factors accordingly. The respondents were asked to rate on a 5-point Likert scale rating with 5

being the highest of the rating, for example 1= very low, 2= low, 3= neutral, 4= high 5= very high. The mean rank for a group of respondents is obtained as follows:

$$\text{Mean } \mu = \frac{\sum f X_i}{\sum f}$$

Where, μ = Mean score F = Frequency of responses and x_i = Score given to the criteria which ranges from.

4. RESULTS AND DISCUSION

4.1 Presentation of Data

The results obtained from the analysis of gathered data are presented in this section where Table 1 shows the background of the respondents who participated in survey.

From Table 1, the majority of the respondents i.e. 39.5% have Quantity Surveying as their professional background, 25% of the respondents are of Architectural background, while Building technology is 28.9% and Civil engineering has the least with 6.6%. The result expressed the generation of adequate opinion of the construction industry in the study area as majority of construction professionals are represented.

Table 1. Professional background of respondents

Respondents	Distribution	Responses	% of Response
Quantity surveyors	35	30	39.50
Architects	25	19	25.00
Builders	30	22	28.90
Civil engineers	10	5	6.60
Total	100	76	100

Source: CCECC, MEK Builders Ltd, TE & C Nig Ltd, (2014)

Table 2. Professional qualification of respondents

Respondent professional body	Frequency	Percentage %
MNIQS	21	27.60
MNIA	10	13.20
MNIOB	17	22.40
MNSE	3	3.90
Others	7	9.20
None	18	23.70
Total	76	100

Source: CCECC, MEK Builders Ltd, TE & C Nig Ltd, (2014)

Among the professionals in the Table 2 who responded to the questionnaire, 27.6% are members of the Nigeria institute of Quantity Surveyors (NIQS), 13.2% belong to Nigeria institute of Architects (NIA), and 22.4% belong to the Nigeria institute of Builders (NIOB), while 3.9% are members Nigeria society of Engineers (NSE), those who belong to other professional body other than those above are 9.2% of the respondents and 23.7% of the respondents are not registered with the professional bodies thus expressing their position as able to supply reliable data for the study. Table 3 shows the experience of the respondents where about 37% of the respondents have 1 to 5 years of experience, 33% had between 6 to 10 years of experience, and 29% had 11 to 16 years of experience and 1% of the respondents have above 20 years of experience in the construction industry indicating that these professionals are of current experiences and training in the examined systems. The assessment of procurement system is presented in Table 4.

Table 3. Years of experience of respondents

Years of Experience	% of Response
1-5	37.00
6-10	33.00
11-15	29.00
16-20	0.00
Above 20	1.00
Total	100

Source: CCECC, MEK Builders Ltd, TE & C Nig Ltd, (2014)

4.2 Analysis of Data Using Measures of Dispersion

Recall that three of the questionnaire items under consideration are:

- How does procurement system affect project cost.
- How does procurement system affect quality of work.
- What is the impact of various procurement plans on the design team.

Recall also that each of the selected respondents answered to each of the items using the five (5)-point rating below:

- Very high = 5points = X_1
- High = 4 point = X_2
- Neutral = 3 point = X_3
- Low = 2 point = X_4
- Very low = 1 point = X_5

Note: that the mean of the 5-likert scale is defined as:

$$\mu = \frac{\sum X_i}{n} \text{ ; where } n = 5$$

$$\therefore \mu = \frac{5 + 4 + 3 + 2 + 1}{5} = \frac{15}{5} = 3.0$$

Therefore, we need an average score of a little above 3.0 positive responses to the questionnaire items.

Computations

Table 4. Procurement system affect project cost (For Item one)

X_i	F	Fx_i	μ_1	$(X_i - \mu_1)$	$(X_i - \mu_1)^2$	$F(X - \mu_1)^2$
5	50	250	3.63	1.37	1.8769	93.85
4	20	80	3.63	0.37	0.1369	2.74
3	3	9	3.63	-0.63	0.3969	1.19
2	2	4	3.63	-1.63	2.6569	5.31
1	1	1	3.63	-2.63	6.9169	6.92
Total	76	276				110.62

$$\text{Mean of the Responses } (\mu_1) = \mu = \frac{\sum f X_i}{\sum f} = \frac{276}{76} = 3.63$$

$$\text{Variance of } \mu_1 = \text{var } (\mu) = \frac{\sum F(x - \mu_1)^2}{\sum F} = \frac{110.62}{76} \text{ var } (\mu_1) = 1.46$$

$$\text{S.D } \mu_1 = \sqrt{\text{var } (\mu_1)} = 1.21$$

Table 5. Procurement system affect project work (For item two)

X_i	F	Fx_i	μ_2	$(X_i - \mu_2)$	$(x_i - \mu_2)^2$	$F(x - \mu_2)^2$
5	43	215	4.38	0.62	0.3844	16.53
4	24	96	4.38	-0.38	0.1444	3.47
3	5	15	4.38	-1.38	1.9044	9.52
2	3	6	4.38	-2.38	5.6644	5.66
1	1	1	4.38	-3.38	11.4244	11.42
Total	76	333				46.6

$$\text{Mean } \mu_2 = \mu = \frac{333}{76} = 4.38$$

$$\text{Variance of } (\mu_2) = \frac{46.6}{76} \text{ var } (\mu_1) = 0.61$$

$$\text{S.D } \mu_2 = \sqrt{0.61} = 0.78$$

Table 6. Procurement plan affect design team performance

X_i	F	Fx_i	μ_2	$(X_i - \mu_2)$	$(X_i - \mu_2)^2$	$F(X - \mu_2)^2$
5	52	260	4.57	0.43	0.1549	9.61
4	18	72	4.57	-0.57	0.3249	5.85
3	4	12	4.57	-1.57	2.4649	9.86
2	1	2	4.57	-2.57	6.6049	6.60
1	1	1	4.57	-3.57	12.7449	12.74
Total	76	347				44.64

$$\text{Mean } \mu_3 = \frac{347}{76} = 4.57$$

$$\text{Variance of } (\mu_3) = \frac{46.67}{76} = 0.59$$

$$\text{S.D } \mu_3 = 0.77$$

Table 7. Summary table in likert format

Statement	5	4	3	2	1	μ_1	$\text{Var}(\mu_1)$	$\text{SD}(\mu_1)$	N	Ranks
Procurement system affect project cost	50	20	3	2	1	3.63	1.46	1.21	78	$\mu_1 = 3.63 > 3.0$, we accept
Procurement system affect quality of work	43	24	5	3	1	4.38	0.61	0.78	76	$\mu_2 = 4.38 > 3$, we accept
Various procurement plan affect design team performance	52	18	4	1	1	4.57	0.59	0.77	76	$\mu_3 = 4.57 > 3$, we accept the statement

Comment: the statements with low variance and S.D. ensures that the responses are consistence and more reliable with those with higher variance and S.D

Table 8. Applying chi-square test of independence on table 3

Opinion	Quality surveys	Architects	Builders	Civil engrs.	Total
Very high	3(4.3)	6(5.4)	7(5.2)	2(3.1)	18
High	1(3)	7(4)	4(4)	1(2.2)	13
Neutral	7(4.5)	3(5.8)	2(5.5)	7(3.3)	19
Low	6(4.3)	6(5.4)	4(5.2)	2(3.1)	18
Very low	1(1.9)	1(2.4)	5(2.3)	1(2.4)	8
Total	18	23	22	13	76

5. STATEMENT OF HYPOTHESIS

H₀: Opinion is independent of professional background.

H₁: Opinion is not independent of professional background.

Decision rule:

If $X^2_{cal} > X^2_{crit}$, we reject H₀ and uphold H₁

Critical value: $\alpha = 0.05$

$$X^2_{crit} = X^2_{1-\alpha; (r-1)(c-1)}$$

$$= X^2_{0.95; (4-1)(5-1)}$$

$$= X^2_{0.95; 12} = 21.0$$

6. TEST STATISTIC

$$X^2_{cal} = \sum_{i=1}^r \sum_{j=1}^c \left(\frac{O_{ij} - E_{ij}}{E_{ij}} \right)^2 = 22.72$$

Where,

O_{ij} = observed frequencies

E_{ij} = Expected Frequencies

Decision: Since $X^2_{cal} = 22.72 > X^2_{crit} = 21.0$ at $\alpha = 0.05$, we reject H₀ and uphold H₁.

Conclusion: we conclude that opinion of respondent is not independent of their professional background.

7. CONCLUSION AND RECOMMENDATION

Based on the findings of this study, the following it was concluded that despite its problems and shortcomings which includes long and bureaucratic processes, lots of variation and change orders and the resultant disputes, the traditional system of procurement still remain most popular, prevalent and frequently used system and it was recommended that There should be an informal education through institutional journals, digests, magazines and

periodic seminars and workshops on the availability of other procurement systems apart from the traditional system for project participants.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Glavee. A comparative study of direct labour and design-tender-construct procurement systems in Nigeria. PhD Thesis. Lagos: University of Lagos, Nigeria; 2008.
2. Wittig I, Tommelein I, Ballard G. Consequences of competitive bidding in project-based production. Journal of Purchasing & Supply Management. 2010;11:173-181.
3. Bowen. Principles of total quality. Kogan Page, London; 1999.
4. Ashurt. Evaluation of the delivery performance of construction projects funded by the district assemblies' common fund (A case study of 4 districts in Ashanti Region), Unpublished M Sc. Thesis submitted to the Department of Building Technology, KNUST; 2003.
5. Cole. Evaluating contractor pre-qualification data: selection criteria and project success factors. Construction Management and Economics. 2007;15:129-147.
6. David Chapel, Lincre House. Jordan, Oxford OX2 8DP. Elsevier Ltd.
7. Global Standard, Four Campus Boulevard, Newtown Square, PA 19073-3299, USA; 2004.
8. Neto JB, Mourao YR, Ferreira de Freitas AA, Aves TL. A method to evaluate and manage client requirements in housing projects, in Proc. of the CIB world building conferenceon construction for

- development. Cape Town, South Africa. 2007;310-321.
9. Masterman JWE. An Introduction to Building Procurement Systems, 2nd Ed. Spon Press, London; 2002.
10. Wittig I, Tommelein I, Ballard G. Consequences of competitive bidding in project-based production. *Journal of Purchasing & Supply Management*. 2018;11:173-181.

© 2019 Emekoma; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/52135>