

Influence of Traditional Procurement Method on the Quality of Work done in Imo State Nigeria

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Abstract— Achieving quality of works in building project delivery has been a major concern in society, this study aims to assess the influence of traditional procurement method on the quality of works the factors influencing quality in this method, and measures that can be taken to improve quality in the traditional procurement method. To achieve this, a well-structured questionnaire was distributed among the built environment professionals in Owerri, Imo state. A total number of 140 questionnaires was administered with 122 of them properly filled and returned, giving a percentage response of 87%. The data was then analyzed using the Statistical Package for Social Sciences (SPSS 20) and the factors were ranked according to their Relative Importance Index (RII). The findings show that the traditional procurement method has a major influence on the quality of works and it is being adopted by the respondent organization in delivering the building project. It was also shown in the analysis that material testing and inspection with an RII of 0.89 is the predominant factor influencing the quality of works in the traditional method of procurement. The findings further show that in order to ensure the quality of works in this method, a professional Builder should be involved with an RII of 0.95. It was recommended that there should be adequate funding of the project in order to prevent the use of substandard material in constructing the proposed structure and inspection of building materials delivered to the site by the project team at the time of purchase to ensure it meets the requirement as specified in the specification.

Keywords— Procurement, Traditional procurement, Quality.

I. INTRODUCTION

The generic term used to describe all activities undertaken by clients to make the best selection of contractor or procedure of construction or refurbishment of a building is referred to as the procurement (JCT, 2008). According to the Nigerian Public Procurement Act, Procurement is defined as the acquisition while the procurement procedure is defined as the initiation of the process of effecting a procurement up to award of procurement contract. (PPA) (2007).

Similarly, procurement method is defined as a comprehensive comprehensive process by which designers, constructors, and various consultants provide services for design and construction to deliver a complete project to the client (Molenaar et al. 2009).

In the same vein, the study of Rasid *et al.* (2006) indicates that different procurement methods offer a different allocation of responsibilities, activities sequencing, process and procedure, and organizational approach that would affect

project performance Ismail *et al.* (2009) thought that assessing the success or failure of the construction project is to evaluate performance concerning the extent to which client's objectives are achieved. Quality of works in building construction is employed with conformity with which specifications are met. As quality has no specific definition, it is vitally important that briefing document set out the level of quality can generally be defined, prioritized, and measured quite precisely and criteria weighting can help in the appraisal of design options, in particular where conflicting views exist among stakeholders. The standard of quality that the design team tries to achieve should reflect in the briefing document. The contractor must carry out and complete the works in a proper workmanlike manner as shown on the contract documents.

The scope of this study is to assess the influence of the building procurement method on the quality of works, which is primarily based on the client's requirement and satisfaction that will be stated clearly during the brief. Thus, we'll be looking into the traditional procurement method and how well it influences the quality of works.

Conventional procurement selection criteria are based on the concept of time, cost, and quality. While the use of such criteria can be used as a guide to assist decision-makers with an initial understanding of the basic attributes of a particular procurement method they should not be used as the sole basis for selecting the procurement method. This is because of the underlying complexity associated with matching client needs and priorities with a procurement method to be used should be made as early as possible and underpinned by the client's business case for the project

Due to the high rise of using sub-standard material or involvement of quark in the construction of building project, which may end up leading to building collapse or not meeting with the client's requirement. Achieving quality of works in building project delivery has been a major concern in society, therefore the need to review the procurement method used for delivering projects arises and also to assess the influence it has on the quality of works.

The type of procurement method to be adopted by the client has a great effect on the performance of the project. Many projects face poor performance when the appropriate method of procurement is not used. Some tend to have higher project costs

exceeding the estimated cost; others end up not selecting the right contractor capable of completing the works which delay the works and causes the client not to achieve value for money as intended.

The selection of an appropriate procurement method is one of the most important problems in the construction sector. The need for selecting and using an appropriate procurement system for a particular construction project, together with the proliferation of different procurement systems, calls for more systematic methods of selection. Clients, therefore, need to understand the various forms of procurement methods before selecting a procurement type to reduce variations in course of the construction process to avoid the quality of works being tampered with.

Consequently, this paper seeks to identify the influence of the traditional procurement method on the quality of work delivered concerning the study area. The study will serve as a guide to the professionals by reviewing the factors that influence quality in these procurement methods to prioritize their effort on the factor with the most predominant effect in order to achieve the desired quality.

II. LITERATURE REVIEW

Effect of Procurement Method on the Quality of Works

According to (Oladinrin *et al*, 2013) construction quality can be explained as the general features that are needed to satisfy a particular need which is fitness for purpose. Some of the requirements that hurt quality are the level of monitoring projects, the project consultants' experience, the contractor's past performance record as well as the number of variation orders that will be issued on the project. The effects these factors will have on quality can be avoided if they are coordinated competently. The project manager must make sure to bring together all the factors to achieve good quality performance. A quality performance is a very critical procedure which when adopted in the project execution process, will yield good results (Alarcon & Sarpel, 1998). Those procedures include the form or method of procurement as well as the tendering method to be used.

Some of the procedures that need critical attention include the procedures that the organization uses to select the designers, supervisors as well as contractors too. Normally through a competitive tendering process, a construction team is selected but at other times the selection is made through negotiation based on a fee. In the situation where both the design and construction are done together, it undergoes competition. Usually, the different methods of selection that we have always have an impact on the success of the project (Chan, 1995).

When it comes to the selection of project consultants, it has been overlooked by many due to the less attention granted. This needs to be avoided since quality is seen as a very critical issue when it comes to project development. (Harris & McCaffer, 2002) posited that it is important to note that when delivering projects, one must take into account the quality performance and safety rather than the cost and time even though they are all interdependent and interrelated. (Tam *et al.*, 2000) maintained that achieving quality management in the construction industry is most difficult as compared to the other industries.

III. RESEARCH METHODOLOGY

The study adopted a descriptive survey design. The population size, method, sampling method and method of analysis are as presented in the section below:

The population of the Study

The target population of a study normally constitutes the group of persons, objects, or institutions that defines the objects of the investigation (Patton, 2002). The respondents for this study consist of professionals, clients, and employees within the construction industry, who at one time participated or still participating in building projects

Research Area

The research is to be undertaken in Owerri the capital of Imo state, which is situated in the eastern region of Nigeria. The suitability of Imo state for this research was because some of the construction companies have their head office or at least a branch/operational office in the state.

Sample Size and Sampling Techniques

A Simple Random sampling which is a probabilistic sampling technique will be adopted for this study because each of the respondents has an equal chance of selection. Sample size pertains to key questions like "how big" or "small" a sample must be for it to be representative (Sarantakos, 2006)

The sample size which represents the targeted population was determined from the formula below since the targeted population is unknown

$$n = \frac{z^2 pq}{\alpha^2}$$

Where;

n = The desired sample size

p = Population proportion (normally between the range of (0.1 -0.5))

q = 1.0 – P

α = Margin of error (level of confidence)

z = The ordinate on the Normal Curve corresponding to α or the standard normal deviation,

considering that:

- i. A 95 % level of confidence has α = 0.05 and critical value of Z α/2 = 1.96

For the purpose of this study, a confidence level of 95% was adopted in an attempt to get a reliable data. Consequently, the sample size is determined thus,

α = 0.05, p = 0.1, q = 0.9, z = 1.96

$$n = \frac{1.96^2 \times 0.1 \times 0.9}{0.05^2}$$

n = 138 = 140

hence total number of 140 copies of the questionnaire will be distributed to the professionals and employees in the construction industry within Owerri in Imo state.

Data Collection Procedure

The data gathering procedure will be done by dispensing the questionnaire to the respondents who are professionals in the construction industry. The questionnaires would be distributed by hand to respondents while at some places; copies will be

dropped with their front desk personnel and come back for the response. The secondary data were sourced from Journals, textbooks, seminar papers, etc.

Method for Data Analysis

Data for this study will be processed and analysed with the aid of the Statistical Package for Social Science (SPSS 20), the calculations will be done using descriptive statistics (e.g frequency distribution tables, percentages, and mean item score). Also, random sampling and Relative Importance Index (RII) will be used for analyzing data collected and variables were measured on a five-point Linker-scale scored as follows:1=strongly disagree,2=disagree,3=Indecisive, 4=agree and 5=strongly agree. The data analysis must answer the research questions and satisfy the research objectives. The results will therefore be represented in tables. statistical methods made use of are descriptive methods (e.g., frequency distribution tables and percentages) and the result is presented in tables.

While research questions two, three, and four were analysed using the relative importance index (RII), adopting the five (5) point Linker’s scale. The data analysis, therefore, employed the following steps:

a. Computation of the mean using the formula

$$\text{Mean (m)} = \frac{\sum FX}{\sum F}$$

Where;

x = points on the Linker’s scale (1, 2, 3, 4, and 5)

f = frequency of respondents’ choice of each point on the scale

b. Computation of the relative importance index (RII) for each item of interest, using the formula $RII = m / 5$ (highest linker scale)

c. Ranking of the items under consideration based on their RII values. The item with the highest RII value is ranked first (1) the next (2) and so on.

d. Interpretation of the RII values as follows:

$RII < 0.60$, the item is assessed to have a low rating

$0.60 \leq RII < 0.80$, item assessed to have a high rating.

$RII \geq 0.80$, item assessed to have a very high rating

IV. DATA ANALYSIS PRESENTATION AND DISCUSSION

Percentage Response

A total of one hundred and forty (140) questionnaires were distributed to the professionals in the construction industry in Owerri, Imo state. The table below shows that 87% of the questionnaire administered were received properly filled corresponding to the frequency of 122 questionnaires returned. However, only 13% were not returned corresponding to 18 questionnaires as shown below.

TABLE 1. Percentage Response of respondents

Questionnaires	Frequency	Percentage (%)
Questionnaires returned	122	87
Questionnaires not returned	18	13
Total questionnaires Administered	140	100

Source: survey 2021

Presentation of Demographic Characteristics

This section presents the respondents’ demographic characteristics using frequency distribution tables. These were

achieved with the use of the Statistical Package for Social Scientists (SPSS 20.0).

TABLE 2. Respondents Profile

S/ N	Variable	Option	Frequency (No)	Percentage (%)
1	Gender:	a) Male	102	83.6
		b) Female	20	16.4
		Total	122	100
2	Respondent s’ Profession:	a) Architecture	41	33.6
		b) Building	34	27.9
		c) Quantity Surveying	20	16.4
		d) Engineering	27	22.1
		Total	122	100
3	Respondent s Years of Experience	a) 1-10years	48	39.4
		b) 11-20years	41	33.6
		c) 21-30years	27	22.1
		d) > 30years	6	4.9
		Total	122	100
4	Highest Qualificati on	a) Ordinary National Diploma (OND)	2	1.6
		b) Higher National Diploma (HND)	27	17.2
		c) Bachelor’s Degree	39	32.0
		d) Masters	43	35.3
		e) Doctorate Degree	17	13.9
Total	122	100		
5	Professiona l Membershi p Status of Respondent	a) Graduate	51	41.8
		b) Corporate	60	49.2
		c) Fellow	11	16.4
		Total	122	100
5	Number of Executed Projects by Respondent in the Last 5 Years	a) 1-10	60	49.2
		b) 11--20	40	32.8
		c) 21-30	22	18.0
		d) > 30	-	-
		Total	122	100
5	Type of Constructio n Work Undertaken by Respondent Organizatio n	a) Building	40	32.8
		b) Civil Engineering	-	-
		c) Building & Civil Engineering	70	58.2
		d) Services Engineering	11	9.0
Total	122	100		
5	Nature of Work Carried out by Respondent Company	a) New Construction	73	59.9
		b) Renovation/Maintenance only	7	5.7
		c) Both Renovation and Maintenance	42	34.4
Total	122	100		

Source: Field Survey, (2021)

Table 2 above shows that the majority of the respondents corresponding to 83.6% of the total respondents are male, while the remaining 16.3% of them are female.

With regards to the respondent’s highest qualification, the majority (35.3%) of the respondents had Masters of Science (M.Sc.) certificate, which is being followed by 33% of the respondents with Bachelor of Science (B.Sc.) certificates, other respondents had the following certificates; 17.2% of them had Higher National Diploma (HND) certificates, 13.9% had Doctor of Philosophy (Ph.D.) certificate, while the remaining 1.6% had National Diploma (ND) certificates.

Similarly, the Table shows that Architect (33.6%) is the predominant, followed by Builder 27.6%, followed by Engineer

22.1%, while Quantity surveyor has the least respondent with 16.4%. Also, it can be deduced that the majority of the respondent 49.2% are Corporate, 41.8% of the respondent are graduates, while the remaining 16.4% of the respondent are Fellows.

With regards to the respondent's years of experience, it can be deduced that 39.4% of the respondent has professional experience of years between 1-10years, 33.6% had their experience ranging from 11-20years, 22.1% had experienced between 21-30years and the remaining 4.9% had the experience of over 30 years. This means that the 1-10 years have the highest year of professional common to the respondents.

The Table also showed the number of executed projects by the respondents in the last 5year and the result revealed that 42.9% of the respondent have executed between 1-10 projects which is the majority, followed by 32.8% of respondents executed projects ranging from 11-30, while 21-30 projects were executed by the remaining 18% respondent. The table also shows that none of the respondents have executed projects ranging above 30 in the last five years.

Furthermore, the table shows that 32.8% of the respondent organization are into Building work, 58.2% of them undertake both Building and Civil engineering work, while the remaining 9% are into Service engineering work. The table also shows that none of the respondent organizations undertakes only civil engineering works.

Finally, it can be deduced from the Table that the majority (59.9%) of the respondent companies deal with new construction, 5.7% of them deal with renovation/maintenance

only, while the remaining 34.4% of them deal with both renovation and maintenance.

Common Type of Traditional Procurement and Frequency of Adoption in Imo State

Table 3 presents the Common type of traditional procurement methods, and frequency of adoption, and the respondents' familiarity with the method in Imo State. The Table shows that all the entire respondents (100%) were familiar with the traditional method of procurement. Similarly, it also shows that the entire respondent organization (100%) adopts traditional procurement in delivering building projects. With regards to the type of traditional method, the Table shows that the majority (59.9%) of the respondent organization uses measurement method, followed by lump sum method 30.3% and cost reimbursement 9.8%

Influence of Traditional Procurement on the Quality of Work

From Table 4, it was established that the most identified influence of traditional procurement method by the respondent was it ensures better quality with relative importance index RII of 0.89, which is strongly followed by good quality assurance and control with RII of 0.88, and improved budget performance with RII of 0.85. others are therefore ranked with their degree of importance as follows; functional building at the right price with RII of 0.84, conformance to design codes and standards with RII of 0.83, achieving client's requirement with RII of 0.82, innovative design with RII of 0.75, and Flexibility in design, to enable changes with RII of 0.67 was ranked the least identified influence.

TABLE 3. Common Type of Traditional Procurement and Frequency of Adoption in Imo State

S/N	Variable	Option	Frequency (No)	Percentage (%)
1	Respondent Familiarity with the Traditional Method of Procurement	a) Yes	122	100
		b) No	-	-
		Total	122	100
2	Organization Adopting Traditional procurement method	a) Yes	122	100
		b) No	-	-
		Total	122	100
3	Type of Traditional Procurement Commonly used in Imo state	a) Lump-sum method	37	30.3
		b) Cost reimbursement method	12	9.8
		c) Measurement method	73	59.9
		Total	122	100

Source: Field Survey, (2021)

TABLE 4. Respondent Opinion on the Influence of Traditional Procurement on the Quality of Work

S/N	Influence of Traditional Procurement Method	Frequency Percentage					ΣF	ΣFx	Mean	RII	Rank
		1	2	3	4	5					
1	FUNCTIONAL BUILDING, AT THE RIGHT PRICE	-	10	10	50	52	122	510	4.18	0.84	4 th
2	IMPROVED BUDGET PERFORMANCE	-	10	10	41	61	122	519	4.25	0.85	3 rd
3	ACHIEVING CLIENTS REQUIREMENT	-	10	10	71	31	122	489	4.01	0.82	6 th
4	ENSURE BETTER QUALITY	-	-	-	70	52	122	540	4.43	0.89	1 st
5	FLEXIBILITY IN DESIGN, TO ENABLE CHANGES	20	20	10	41	31	122	409	3.35	0.67	8 th
6	INNOVATIVE DESIGN	10	10	31	20	51	122	455	3.73	0.75	7 th
7	GOOD QUALITY ASSURANCE AND CONTROL	-	-	-	74	48	122	536	4.39	0.88	2 nd
8	CONFORMANCE TO DESIGN CODES AND STANDARDS	-	-	11	80	31	122	508	4.16	0.83	5 th

Source: survey, 2021

Where 1-strongly disagree, 2-disagree, 3-indecisive, 4-agree, 5-strongly agree

TABLE 5. Respondent Opinion on the Factors of Traditional Procurement Method that Influence the Quality of Work

S/N	Factors Affecting Quality	Frequency Percentage					ΣF	ΣFx	Mean	RII	Rank
		1	2	3	4	5					
1	Professionals	-	-	10	41	71	122	549	4.50	0.90	2 nd
2	Drawing and Specification	-	-	20	41	61	122	529	4.34	0.89	4 th
3	Site meeting	-	20	41	51	20	122	447	3.66	0.73	7 th
4	Contract document	-	-	22	40	60	122	526	4.31	0.86	5 th
5	Material Testing and Inspection	-	-	-	58	64	122	552	4.53	0.91	1 st
6	Skilled and Experienced Labor	-	-	20	31	71	122	539	4.42	0.88	3 rd
7	Stage Certificate	10	20	41	41	10	122	387	3.17	0.63	8 th
8	Plants and equipment	10	-	10	61	41	122	489	4.01	0.80	6 th

Source: survey, 2021

Where: 1-no effect, 2-low effect, 3-moderate, 4-high effect, 5-very high effect

Factors of Traditional Procurement Method that Influence the Quality of Work

The survey in Table 5 shows the mean values which indicate the respondent opinion on the factors that affect the quality of work in traditional procurement method were ranked with the use of success indicators as follows; Material testing and inspection (4.53) and professionals (4.50) has a very high effect on the quality of works, while skilled and experienced labor (4.42), drawing and specification (4.34), contract document (4.31), plants and equipment (4.01) and site meeting (3.66), has a high effect on the quality of work. Stage certificate (3.17) on other hand has a moderate effect on the quality of work.

The Measures That Can Be Taken to Improve the Quality of Works in The Traditional Procurement Method

Table 6 shows that involvement of a professional Builder with an RII of 0.95 was predominant, which was strongly followed by improved communication between the design team and the construction team with an RII of 0.93 (2nd) and conformance to design code and standard with RII of 0.92 (3rd). Others were ranked by their relative importance index as follows; Strict adherence to quality control and quality assurance policy with RII of 0.90 (4th), regular on-site supervision with RII of 0.87 (5th), selection of competent subcontractor with RII of 0.85 (6th) and proper review of building drawing and specification with RII of 0.84 (7th), was ranked the least quality measure by the respondent.

TABLE 6. Respondent Opinion on the Measures that can be taken to improve the quality of Works in the Traditional Procurement Method

S/N	Measure	Frequency Percentage					ΣF	ΣFx	Mean	RII	Rank
		1	2	3	4	5					
1	Improved communication between the design team and the construction team	-	-	10	20	92	122	570	4.67	0.93	2 nd
2	Selection of competent subcontractor	10	-	10	31	71	122	519	4.25	0.85	6 th
3	Strict adherence to quality control and quality assurance policy	-	-	10	41	71	122	549	4.50	0.90	4 th
4	A proper review of building drawing and specification	-	12	-	60	50	122	514	4.21	0.84	7 th
5	Conformance to design code and standard	-	-	-	51	71	122	559	4.58	0.92	3 rd
6	Regular on-site supervision	-	-	-	81	41	122	529	4.54	0.87	5 th
7	Involvement of a professional Builder	-	-	-	31	91	122	579	4.75	0.95	1 st

Source: survey, 2021

Where 1-strongly disagree, 2-disagree, 3-indecisive, 4-agree, 5-strongly agree

Summary of Findings

The findings are the findings

There is more male respondent t (83,6%) an indication that the industry is largely dominated by male folks. Similarly, most of the workers within the area of study have their highest certificate as BSc certificate, details are as shown in Table 2. From the Table, it can also be established that the respondents have reasonable working years' experience.

The findings show that all the respondents were familiar with the traditional procurement method and all their various organization adopts traditional procurement method in the delivery of building projects as see detail in Table 3. the findings also show the measurement method is the most commonly adopted type of traditional procurement method followed by lump sum method and then cost reimbursement method.

The findings also show in Table 3 that the most predominant influence of the traditional procurement method is that it ensures better quality, which is followed by good quality

assurance & control and improved budget performance. While innovative design and flexibility in design, to enable changes were the least influence of the traditional procurement method on quality.

The analysis further shows that material testing and inspection is the most predominant factor in the traditional procurement method influencing the quality of works, followed by the professionals and then the skilled and experienced labor. While site meeting and stage Certificate were the two last factors influencing quality in the traditional procurement method.

Lastly, the findings show that the most predominant measures that could be taken to improve quality in the traditional procurement method were the involvement of a professional Builder, followed by Improved communication between the design team and the construction team, and conformance to design code and standard. While the selection of competent subcontractors and Proper review of building drawings and specifications were the least measure that can be taken to improve quality in the traditional procurement method.

V. CONCLUSION AND RECOMMENDATION

Conclusion

The traditional procurement method is also known as Design Bid Build (DBB) is a commonly used procurement method in delivering building projects.

The survey shows that the findings are largely by the literature review. The survey further shows that all the respondents were familiar with the traditional procurement method, and the method is being adopted by all the respondent organization. The survey made it clear that the measurement method was the most commonly used type of traditional procurement method and was also tipped as the best method for achieving quality of works. It could also be deduced from the analysis that the traditional procurement method has a major influence on the quality of work, with ensuring better quality being the most predominant, followed by good quality assurance and control, and then improved budget performance. The survey further pinpointed material testing and inspection as the most predominant factor influencing the quality of work in the traditional procurement method and therefore should be given high priority when ensuring quality in the traditional procurement method. Furthermore, it was shown in the survey that the involvement of a professional builder was the best measure to be taken while trying to achieve the quality of works in the traditional procurement method. This implies that a professional Builder should be involved both in the design stage and the construction stage in other to ensure the quality of work in the traditional procurement method.

Recommendation

Logically this research has sampled the views of the professionals on the influence of traditional procurement methods on the quality of works in Owerri. In light of the research finding, the following recommendations were made to improve the quality of work in the traditional procurement method.

- i. There should be adequate funding for the project in other to prevent the use of substandard material in constructing the proposed structure.
- ii. Inspection of building materials delivered to the site by the project team at the time of purchase to ensure it meets the requirement as specified in the specification.
- iii. Timely payment on stage completion or milestone achieved.
- iv. The good working relationship between the design team and the construction team involved in the project.

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