

Effect of Project Procurement Management Practices on Project Performance in Nigeria,

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ABSTRACT: *The development of any country has become increasingly dependent on project management. Project management techniques have been employed by several enterprises to close the gap between project implementation success and failure. Despite businesses' growing knowledge of project management, projects continue to fail to meet their planned objectives. These challenges raise questions as to what extent procurement management practices might improve project performance. Hence, the study was carried out specifically to evaluate the effect of procurement planning on the timely delivery of a project and the effect of supplier selection on the quality of the project delivered in China Civil Engineering Construction Company Nigeria Limited (CCECC Nig. Ltd). A survey research design was used in this study. The population of this study consisted of 124 staff of CCECC Nig. Ltd. Census sample size determination was used due to the small population size. Out of the total number of 124 copies of the questionnaire distributed, 91 usable copies were found valid and used of the analysis. The questionnaire was validated using content validity. Cronbach's Alpha was used to determine the reliability at $\alpha = 0.795$. Mean and standard deviation was used for the descriptive analysis, while regression analysis was used to analyze the formulated hypotheses. The findings of this research revealed that there is a significant impact of procurement planning, supplier sourcing on timely delivery of project and quality of project delivered with $R^2 = 0.776$ and 0.384 respectively. It was recommended among others that CCECC Nig. Ltd and other construction companies should continue to ensure adequate procurement planning with a focus on selecting the right supplier to ensure effective procurement management which improves project performance and introduction of research and development unit.*

KEYWORDS: *Project, Procurement, Procurement management, Procurement planning, Project quality*

I. Introduction

A significant element of the economy of the nation is the building industry (Omondi, Diang, Gwaya & Onyanyo, 2017). Its benefits society's economic and social well-being. It frequently represents between 7 and 10 percent of the GDP. The effects of construction activities on society, health, and the environment are significant (Mgawa & Masanja, 2018). Since the results of it immediately touch every human in contemporary civilizations. It is impossible to put aside the requirements for a well-organized and efficient building sector. Construction projects are strategic activities carried out to create economic value and competitive advantage for both the private and public sectors (Omondi et al., 2017). However, the construction industry has come under criticism in many countries for being inefficient, which has resulted in schedule and cost overruns, low productivity, poor quality, and poor customer satisfaction. To improve the possibilities of a construction project is implemented successfully, experts, researchers, and society at large have urged for a shift in perspective, conduct, and method. However, it is necessary to create procurement management procedures to improve the achievement of various project objectives. Throughout history, procurement practices have been the only way that human purchases what they need. The requirements could be for goods or services. This reliance does not preclude the construction project.

According to Anyanwu, Ohamma, and Ejekwu (2021), the achievement of construction activities in Nigeria is influenced by the procurement practices used to provide the construction. This is because procurement management is intended to proffer clarifications to particular project requirements or conditions, it has a significant impact on the success of construction projects. (Anyawu et al. 2021). The optimal procurement procedure will vary depending on the type of building, the amount of work to be done, the resources available, and the client experience.

One of the most crucial jobs completed by procurement committees when procuring a project is choosing a qualified supplier (Nzuma, 2022). The application of procurement management differs from one organization to another. It is widely practiced all over the world. Many projects are being carried out by CCECC. Close observation revealed that

some of these projects are experiencing unnecessary delays, poor quality standards, and cost overrun, while some are executed slowly. These challenges are caused by certain constraints, which could be traced to poor application of procurement management practices. These constraints could be related to the cost, time, quality or scope of the project (Jeptepkeny, 2015).

Similarly, the studies of Jeptepkeny (2015), Naluyima (2016) and Enyima, Ihuoma and Ikeazota (2021), identified organization strategy, user satisfaction, technology parameter and government policy as the most important factors influencing sustainable procurement of construction material on project delivery, but these studies did not show the extent procurement management processes such as procurement planning and supplier selection affect the overall project performance.

In addition, there are several studies on project performance but few of these studies provide enough evidence on how procurement management practices influence project performance (Jeptepkeny 2015; Ingle & Mahesh, 2020; Burkar & Ibrahim, 2021; Djaelani, Sinambela, Darmawa & Mardi, 2021; Unegbua, Yawasa & Dansabe, 2023). Based on the gaps stated above, this study tends to assess effect of project procurement practices on project performance in Nigeria, a study of CCECC.

II. Literature Review

Conceptual Review: Procurement

In accordance with the definition provided by the Chartered Institute of Purchasing and Supply (2018), procurement is described as actions associated with the purchase of goods, services, or works that involve sourcing, contract administration, and other post-contractual operations. A company's procurement practices are a collection of actions it takes to support efficient supply chain management (Nzuma, 2022). In order for a business's daily operations to run smoothly and effectively, procurement can be defined as the acquisition of commodities and services (Naluyima, 2016). Project implementation has relied more on procurement practices. According to Jeptepkeny (2015), it is important to comprehend how various procurement processes affect project performance. Additionally, the design of procurement processes should support the accomplishment of various project goals.

The study adopts Nzuma 2022 and conceptualize procurement as collection of action taken to support an effective supply chain to achieve efficient business operation.

Project Procurement Management

According to the Building and Construction Procurement Guide (2014), project procurement management is a crucial component of maximizing the results of infrastructure investments in terms of value for money. With the aid of thorough procurement management that demonstrates meticulous investigation and analysis of all available options, project owners will be able to select the delivery model and procurement strategy that is most appropriate for the project in issue. Since risks will be managed most effectively and the frequency of contractual disputes, cost overruns, and time overruns is likely to decrease when using an appropriate delivery model and procurement strategy, project owners should anticipate greater value-for-money outcomes (Anyawu et al., 2021).

Procurement Planning

An effective procurement arrangement explains how to find and select suppliers, contractors, or experts. The key objectives of planning procurement is to organize and incorporate the purchase of product, material and services in order to achieve the on time and cost-efficiency by disrupt in procurement processes, which is incompatible with a good procurement practices (Nzuma, 2018).

The selection of procurement methods considers a number of factors, including the project's estimated value, flexibility in accommodating design changes, quality specifications, project complexity, and proclivity for dispute resolution (Benedicta, 2015). CCECC uses a variety of procurement methods, including open proposal, submission of proposal by the public, and submission of quotation, limited tendering, self-procurement, dual stage tendering and force account. Open proposal, is the most preferred means of procurement because it promotes effective competition and provides the procuring entities with good value for money (Owang, 2018).

2.1.4 Supplier Selection

Buzzetto, Bauli and Carvalho (2020) asserted that choice and assessment of the supplier based on accomplishment is a key role in project development. The assessment of a potential supplier's capacity to regulate quality, delivery, quantity, pricing, including the conditions to be included in a procurement contract is known as a supplier appraisal or evaluation (CIPS, 2018). During the tendering stage, the supplier evaluation process is carried out to determine the supplier's capability in terms of capacity, financial stability, quality standards, performance, and organizational structure. It may

take the form of a questionnaire, interviews, or site visit. It also considers the processes in place through which current and potential suppliers are evaluated for suitability and either accepted or rejected from the approved vendor list (Jelagat & Bii, 2017).

The supplier due diligence, financial assessment, and supplier competence aspects of supplier evaluation was the focus of this study. Supplier due diligence is a pre-contract procedure used by businesses to determine whether a possible supplier is sincere, competent, and reliable, as well as financially stable and well-respected (Wagner & Choi, 2020).

The study adopt (CIPS, 2018) and conceptualize supplier selection as the appraisal of a potential supplier's capability to meet up the quality, delivery, quantity, pricing, including the conditions to be included in a procurement contract.

Project Performance

According to Djaelani et al. (2021), enhancing quality must typically come after performance improvement in building projects. This decision will raise the expenses incurred, exceeding the allocated budget (Burkar & Ibrahim, 2021). On the other hand, choosing to cut expenses necessitates sacrificing the project's timetable and level of output. According to Unegbua et al. (2023), the primary goals of performance evaluation are to help define standards and targets, provide methods for development, inspire people, communicate organizational goals, and influence behavior change. Every construction business places a high value on good project performance since it serves as a standard for assessing expectations in regard to the objectives given to the client's executors (Djaelani et al., 2021).

Quality of Project Delivered.

Quality is one of the key factors determining the success of a building project. The construction sector has embraced quality primarily because, like in any other industry, a company must satisfy its customers to succeed or remain in business (Jegan & Kothai, 2017). Shewhart incorporated the idea of quality into his conception of production as creating value for the consumer (Koskela, Tezel & Patel, 2019).

Arguments about quality's definition and implementation have persisted over time. While some academics view quality as a means of carrying out tasks to the necessary standards and reducing waste, others regard it as a product or service feature that ensures its acceptance over rivals Obunwo et al. (2017). Emphasizes that from the standpoint of construction, obtaining good quality is equivalent to satisfying or meeting the net expectations of the project participants, who are considered stakeholders. This study conceptualizes project quality as meeting the project participant's expectations.

Timely Delivery of Project

Project delivery time is when a construction project is completed within the expected cost and to the level of quality requirements settled by the owner is a key to successful project delivery (Ullah, 2017). The golden triangle of time, money, and scope or quality is used in project management practice to gauge project completion (Shariatfar, Beigi, & Mortaheb, 2019). According to the PMBOK, published by the Project Management Institute, the criteria for successful completion of construction projects include the three pillars of time, cost, and quality as well as the satisfaction of the project's major stakeholders and their integration into the process. The important thing to remember is that three of these success factors must satisfy stakeholders when there is a connection between their interest and these factors.

III. Theoretical Review

Resource Based View Theory

Wernerfelt (1984) developed the RBV hypothesis, which supported the notion that enterprises are composed of a range of unique resources. The RBV hypothesis contends that businesses have a competitive advantage because of the range of heterogeneous resources that make them up (Barney, 1993). According to the resource-based viewpoint theory, a company is a collection of unique internal resources that enable it to prosper and stand out from rivals (Rubin, 1998). A company's unique internal resources determine its capacity to develop a competitive advantage. Barney (1993) asserts that organizations' resources can be divided into three categories: organizational, physical, and human capital. Organizational capital resources include the design of the planning and coordination processes as well as the relationships between the firm's employees and other stakeholders Robinson (2016) contends that a company's distinct resources help it to outperform other businesses in the same sector, giving it a competitive advantage and enabling it to carry out its strategic plan.

The RBV theory can be applied to procurement planning to help businesses understand how to wisely use the resources they have purchased to improve their performance. This is accomplished by efficiently preparing for the firm's resources

through budgets for procurement, planning for the materials to be purchased, and planning for the best times to make purchases. The hypotheses are pertinent to the study since the level of service delivery for any entity would mostly depend on the institution's resource capabilities.

IV. Empirical Review

Procurement Planning and Timely Delivery of Project

Eyinna et al (2021) examined the success determinants of construction procurement and its effect on project delivery in Nigeria. The study focused on the obstacles preventing Nigeria from achieving the intended sustainable procurement of building materials for project delivery. The study was conducted using a survey research design. In determining the outcome, average mean score and relative important index were also considered. It was determined that the success factors of sustainable procurement have a positive impact on the acquisition of construction materials for project delivery in Nigeria as the most significant factors influencing sustainable procurement of construction materials on project delivery, which is governed by the rules and regulations of the government, are organizational strategy, contract management, user satisfaction, technological parameters, and government policy. With relative impact indices of 2.09, 2.02, and 1.88, respectively, other variables like informal contracts, improper supplier assessment, and lack of transparency were evaluated quite highly.

Ebekezien et al. (2023) investigated into the underlying reasons for the alleged impediments to procurement management in infrastructure development projects. Unexplored exploratory virtual interviews and chosen instances from secondary sources were used to acquire the data. The acquired material was analyzed using thematic analysis. The study found that a lack of competition and transparency, misappropriation of public funds, bureaucracy that moves slowly and creates bottlenecks, and a lack of skills and expertise are the main causes of the problems. The development of cartels, collusion, bid-rigging, price-fixing, lack of professionalism, irrational politicking, misappropriation of public funds, incompetence of tender boards, and lack of transparency are further issues.

Supplier Selection and Quality of Project Delivered

Buzzetto, Bauli and Carvalho (2020) investigated the important facets of procurement in the context of project management and their connections to project success. In particular, the effects of selection criteria, supplier integration, and acquisition dynamics are examined. The study used a systematic review of the literature that included both bibliometric and content analysis. The importance of suppliers to the efficient completion of a project was highlighted in the study. According to the report, selecting and evaluating the supplier based on their performance is crucial to the success of any project.

Mgawe and Masanja (2018) evaluated how Tanzanian construction project performance was impacted by procurement practices. The National Housing Corporation (NHC) was the subject of the study. A detailed description and analysis of the variable under study are possible thanks to the study's descriptive-explanatory methodology. The primary research tool for the study was a questionnaire. Data was coded in accordance with goals to provide clear differences and multivariate regression. Additionally, correlation analysis was performed along with mean, frequency, standard deviation, and others. The study discovered that different procurement strategies affect how well a building project performs in NHC. It was discovered that supplier selection can affect employee productivity by reducing conflicts of interest between the supplier and management of the firm. The study also shows that contract monitoring and control lowers risk and prompts a search for a fix for a problem that has been identified as a danger to the project's success. The study concluded that implementing procurement methods has a significant impact on project performance.

V. Research Methods

This study focuses examining how project procurement management affects project performance and using a survey research approach. The target population for the study is 124 and it constitutes the staff of four (4) departments in CCECC that are involved in procurement activities. The department includes Procurement department, Accounting department, Engineering and Project management department. The population is shown in the table 1 below. The study employed total enumeration also known as Census due to small population of the study and accessibility to the selected population. Primary sources were used to compile the data for this study. Questionnaires were administered for the study. The questions include close-ended types, enabling the researcher to apply scientific methods in data collection and test hypotheses. The data collected was analyzed with mean and standard deviation. Regression analysis was used to test the hypothesis. Content validity was used to measure the validity of the instrument while the reliability of the research tool was examined using the Cronbach's Alpha. All the variables had a construct composite reliability co-

efficient (Cronbach’s alpha) of 0.795. Seifer (2012) asserts that dependability coefficients of 0.7 and higher are considered satisfactory.

Table 1: Population of the study

S/N	Department	Population
1	Procurement	21
2	Accounting	19
3	Engineering	56
4	Project management	28
	TOTAL	124

Source: Human resource Dept. (2023)

4.0 Result and Discussion

Table 2: Response Rate per Department

S/N	Department	No of Questionnaire Distributed	No of Questionnaire Received	Percentage of Response
1	Procurement	21	16	76.1%
2	Accounting	19	13	68.4%
3	Engineering	56	41	73.2%
4	Project management	28	21	75%
	TOTAL	124	91	

Source: Field Survey (2023)

Table 2 indicates the response rate of respondents on the distributed questionnaire. It shows that one hundred and twenty-four (124) copies of questionnaire were distributed while ninety-onewere returned and valid for the analysis of this study.

Table 3 Reliability Statistics

Variable	No of Items	Alpha	Comment
Procurement Planning	5	0.752	Reliable
Supplier Sourcing	5	0.850	Reliable
Timely Delivery of Project	5	0.742	Reliable
Quality of Project Delivered	5	0.831	Reliable

Source: Researcher’s Computation (2023)

Table 4:Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
PP	.172	91	.029	.917	91	.060
SS	.169	91	.024	.941	91	.053
QPD	.151	91	.037	.947	91	.084
TDP	.199	91	.021	.929	91	.064

a. Lilliefors Significance Correction

Source: Researcher's Computation (2023)

Interpretation

For the purpose of this study, Shapiro-Wilk test was used because it can be used for sample size of less than 50 and up to 2000.

Based on the result above, we can say the data for Procurement Planning, Supplier Sourcing, Timely delivery of Project and quality of project delivered were normally distributed because the Shapiro-Wilk significant value of PP, SS, TDP and QPD (0.060, 0.053, 0.084 and 0.064) were greater than 0.05

Table 5: Descriptive Statistics of Procurement Planning

Procurement Planning	Mean	Std Dev
The selection of purchasing strategies during procurement planning improves supplier competitiveness and financial value.	4.58	.500
The organization's chosen method of procurement is open tendering.	4.22	.797
At the commencement of procurement projects, the business consults with users to ascertain their preferences and needs in order to prevent pointless purchases.	4.42	.732
To properly allocate cash to diverse projects, the company undertakes pre-contract project cost estimation.	4.42	.649
The firm values regular market research on procurement since it ensures the accuracy of project cost estimates.	4.81	.467
Grand Total	4.49	0.63

Source: Field Survey (2023)

According to the table 5, The overall standard deviation for procurement planning is 0.63, indicating that responses are clustered around the mean. The grand mean for procurement planning is 4.49, indicating that respondents support the claims about procurement planning on a large scale.

Table 6: Descriptive Statistics of Supplier Selection

	Mean	Std Dev
Before hiring a supplier, the firm investigates them thoroughly and runs background checks to determine their appropriateness.	4.61	.494
Due diligence on suppliers improves supply chain risk management for the firm.	4.64	.487
A supplier's capacity to meet contractual obligations is evaluated for financial viability to reduce this risk.	4.69	.525
During the supplier evaluation process, the appropriate employees clearly conduct a supplier competence assessment.	4.14	.683
By evaluating supplier competency, one may be certain that creative suppliers are hired and that providers fulfill customer expectations.	4.42	.649
Grand Total	4.50	0.57

Source: Field Survey (2023)

According to table 6, The supplier selection standard deviation as a whole is 0.57, which indicates that responses are centered around the mean. The grand mean for supplier selection is 4.5, indicating that a large majority of the assertions about supplier selection were accepted by respondents.

Table 7: Descriptive Statistics of Timely delivery of Project

Timely delivery of Project	Mean	Std Dev
Project is delivered within stipulated time.	4.39	.599
Project are scheduled in line with project delivery time.	4.36	.723
Our procurement planning process enhance timely delivery of a project.	4.28	.659
Our effective stakeholder engagement process promotes timely delivery of a project.	4.00	.756
Project schedule are done in line with project delivery time.	4.31	.710
Grand Total	4.27	0.69

Source: Field Survey (2023).

According to table 7 above, the responses are clustered around the mean, according to the total standard deviation for on-time project delivery, which is 0.69. The overall average for on-time project delivery was 4.27, indicating that a large majority of the claims were accepted by respondents.

Table 8: Descriptive Statistics of Quality of project delivered

	Average	
	Mean	Std Dev
Stakeholder requirements are met.	4.31	.624
Projects are of standard quality.	4.31	.577
Wastage of resources is minimized.	4.06	.924
The project is delivered within the budgeted cost.	4.21	.808
There is a smooth implementation of the project.	4.42	.649
Grand Total	4.26	0.72

Source: Field Survey (2023)

From the Table 8 above, the replies are grouped around the mean, as indicated by the overall standard deviation of 0.72. The majority of the statements on the high scale relating to the quality of the project delivered were agreed upon by respondents, as indicated by the grand mean for the quality of the project delivered being 4.26.

Hypothesis Testing

H_{01} : Procurement planning has no effect on the timely delivery of the project

The hypothesis was tested using linear regression analysis. The independent variable was Procurement Planning while timely delivery of projects formed the dependent variable.

Table 9: Summary results of regression analysis of procurement planning on timely delivery of a project in CCECC Nig Ltd.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R Square
	B	Std. Error	Beta				
(Constant)	.486	.718		2.632	.010		
Procurement Planning	1.174	.061	.881	19.228	.000	.881	.776

a. Dependent Variable: Timely Delivery of Project

b. Predictors: (Constant), Procurement Planning

The model summary table 9 above shows a strong positive relationship between Procurement planning and timely delivery of project (R = 0.881). The model further indicates the extent to which procurement planning explains timely delivery of project. The coefficient of determination (R² = 0.776) shows that procurement planning explains 77.6% of timely delivery of project in CCECC. This result is statistically significant because the p-value of the model outcome (0.000) is less than the 0.05 level of significance used for the study. Therefore, the research hypothesis that Procurement planning does not have a significant impact on timely delivery of project was rejected. It implies that procurement planning has significant effect on timely delivery of project in CCECC.

The table also shows that p = 0.000 which is less than 0.05. This implies that the procurement planning regression model predicts timely delivery of project. Thus, we reject the null hypothesis H₀; Procurement planning does not have a significant impact on timely delivery of project. Thus, procurement planning has significant impact on timely delivery of project in CCECC.

Resulting from the table the fitted model was derived as follows

$$TDP = 0.486 + 1.174PP$$

Where TDP = timely delivery of the project and PP = procurement planning

Hypothesis two

H₀₂: Supplier selection does not have effect on quality of project delivered

Table 10: Summary results of regression analysis of supplier selection on quality of project delivered

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R Square
	B	Std. Error	Beta				
(Constant)	2.184	.397		5.499	.000		
Supplier Selection	0.469	.120	.620	3.923	.001	.620	.384

a. Dependent Variable: Quality of Project Delivered

b. Predictors: (Constant), Supplier Selection

From the result of the model summary in table 10 above, the result indicates that there exists a moderate positive relationship between supplier selection and quality of Project delivered R = 0.620. The model further shows the extent to which supplier selection explains quality of project delivered. The coefficient of determination (R² = 0.384) indicates supplier selection explains 38.4% of quality of project delivered in CCECC. This result is statistically significant because the p-value of the result (0.001) is less than 0.05 level of significance used for the study. Therefore, the null research hypothesis was rejected. This means that supplier selection has significant impact on quality of project delivered.

The table also shows that p = 0.001 which is less than 0.05. This implies that supplier selection regression model predicts quality of project delivered. Thus, the null hypothesis H₀; supplier selection has no significant impact on quality of project delivered was rejected.

From the result of the table above, the fitted model was derived as follow

$$QPD = 2.184 + 0.469SS$$

Where QPD = Quality of project delivered and SS = Supplier Selection

VI. Discussion of Findings

The study examined the effects of procurement management practises on project performance in CCECC. The population of the study comprised 124 staff of the four (4) department in CCECC that are involve in procurement activities. However, ninety one questionnaires were found valid for the analysis of the study. The results show the extent to which procurement management practices influence project performance in CCECC. This evidently show that effective procurement management practise has a great impact on project performance.

From the result of hypothesis one, it can be seen that procurement planning has positive effect on timely delivery of project. This findings conformed to the findings of Eyinna et al. (2021); Keitany and Chepkesis (2018); Johan (2016) and Nderi (2015) that procurement planning improve service delivery, quality of purchase and encourage adequate usage of resources. Therefore, procurement planning enhances timely delivery of project. The result also aligns with the resource-based view theory. The theory stated that by efficiently preparing for the firm's resources through budgets for procurement, planning for the materials to be purchased, and planning for the best times to make purchases ensures timely delivery of project.

In addition, the result of hypothesis two shows that supplier selection has positive effect on quality of project delivered. It was determined that CCECC method of selecting suppliers of material are effective. This means that company chose suppliers who have a commitment to quality, competence, financial viability, and the capacity to honor the commitment. Also, the company chose suppliers who have the necessary resources to handle the order, are well-established, have a solid reputation, and have a history of operating with integrity. This result is in align with the result of the studies of past researchers like, Buzetto (2021), Waichiuri (2019), Chepkesis et al. (2018) and Muema & Akello (2017). The studies stated that choice and assessment of the supplier based on accomplishment is a key role in project development. Also that supplier sourcing plays a major role in project performance.

VII. Conclusions/ Recommendations

It was clear from the study's analysis that effective procurement management techniques are crucial to the accomplishment of projects. As a result, the study came to the conclusion that procurement management practices should be maintained and sustained in all construction companies since the study's findings revealed that these companies have the greatest chance of succeeding with projects in terms of quality and on-time delivery. The study came to the conclusion that organizations that are aware of procurement management may produce high-quality projects that are delivered on time, and this will help them improve organizational performance.

The following are the recommendation of the study:

- i. CCECC Nig. Ltd and other construction companies should continue in carrying out adequate procurement planning so as to ensure the effective procurement which result in timely delivery of project.
- ii. CCECC Nig. Ltd and other construction companies needs to continually carry out due diligence in order to determine whether the suppliers of products and services have the capacity to fulfill the promised goods and works on time
- iii. The construction companies should ensure continuous engagement of qualify suppliers in order to improve the project quality.
- iv. That CCECC Nigeria Limited and other construction companies should have research and development unit that will help to study the shortcoming, success and other construction firms' variables for quality service.

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