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Contract Type Selection and Project Performance: An Optimal Strategy for Achieving Procurement Planning of Swimming Pool Construction Firms in Rivers State, Nigeria

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Abstract:

The study examined the correlation that existed between contract type selection and project performance of swimming pool construction firms in Rivers State. The determination to maximize utility and to create comfort for both customers who seek recreation or adventure and private or personal relaxation with swimming pool facilities as a social stratum has increasingly gained acceptance and recognition in our society today. However, the early finished time of such a project has often been characterized by delays associated with contract variation from the performing firms. The study adopted a census population of 7 registered firms. Questionnaires were administered to 61 respondents. Spearman rank statistical tool and regression analyses were adopted for correlation and effect determination. Amidst the findings, a strong positive correlation existed between the dimensions of contract type selection and project performance. The study concluded that contract type selection is a veritable conduit for stabilizing project completion timelines among firms in the studied section.

Keywords: Contract, cost reimbursement, lump sum, time and material

1. Introduction

The economy of our country today is challenged with different means for creating economic empowerment or self-empowerment to create or expand sectors of the economy to generate income both for individual and gross domestic product. Showers, Iwhu & Opara (2023) posited that this had stimulated an increase in other areas or sectors that have been ignored or neglected over time to create or generate income by direct or indirect investment. One such sector that has witnessed this boost is the tourism sector. Agumadu, Elvis, and Muarice (2022) asserted that the increase in the number of residents or people engaging in recreation or leisure is significant. One of the recreations that are highly sought after is swimming or the fun of relaxing at the swimming pool side for comfort and pleasure. It has stimulated high demand for the construction of swimming pools in most hospitality organizations or recreation centers in Rivers State (Apatorme, David & Akwume. 2023). Ediefien and Jaja (2023) avowed that the effective completion of the swimming pool project is a sequel to a constructive engagement in the delineation of shared responsibility through a contract. Contract and responsibility entered into dictate the terms that are enforceable in the shared responsibility. Alingar & Calista (2023) posited that it becomes critical in the type of contract selected to meet the early finished time of projects such as swimming pools. Thus, lump sum contracts, cost reimbursement contracts, and time and material contracts are functional dimensions of contract type selection and are considered adequate for optimizing or expediting the completion date of the swimming pool project (Chuklwuka & Bgadebo, 2023).

1.1. Problem of the Study

Projects are usually complex, and the complexity of each project determines the sets of activities required for an effective schedule from its early start time to early finish time. These activities ultimately depend on the use of material across the activity line of the project. These materials are to be supplied by a vendor or directly procured from the performing firm. However, oftentimes, as observed in the studied industry, the completion date of such projects has been altered due to variations as a result of inadequate procurement planning. Studies have been carried out on procurement planning, but much is still required, especially as it relates to the timely completion of swimming pool projects as this study.

1.2. Conceptual Framework

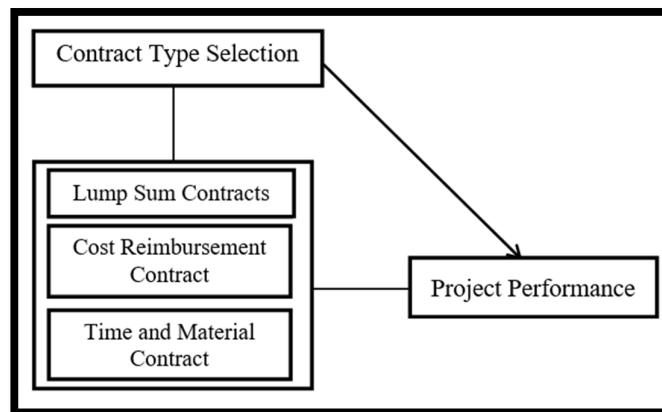


Figure 1: Adapted Conceptual Framework

Source: Gbako, Lee & Igwe (2023) Ofor & Okwu (2023) and Researcher's Conceptualization (2023)

1.3. Objectives of the Study

- To determine how lump sum contract influences performance in the studied organizations
- To determine how cost reimbursement contract influences performance in the studied organizations
- To determine how time and material contract influences performance in the studied organization

1.4. Research Questions

- What is the relationship between lump sum contracts and performance in the studied organizations?
- What is the relationship between cost reimbursement and performance in the studied organizations?
- What is the relationship between time and material contract and performance in the studied organizations?

1.5. Statement of Hypotheses

- H₀₁: There is no significant relationship between lump sum contracts and performance in the studied organizations
- H₀₂: There is no significant relationship between cost reimbursement contracts and performance in the studied organizations.
- H₀₃: There is no significant relationship between time and material contract and performance in the studied organizations.

1.6. Scope of the Study

The content scope was primarily centered on the predictor and criteria variables in accordance with the dimensions studied. The study actually encompassed the area of coverage in the application of these variables studied, with specific limitations to organizations under study in Rivers State. Meanwhile, the unit of analysis was both macro and micro, which consisted of project managers and project engineers.

1.7. Conceptual Review

Procurement planning is a means by which firms identify the materials that are of use and how such material can be brought in from other organizations or vendors. Ukari, James and Ukari (2023) contributed that this process is usually determined within a specified timeline, with a clear description of what to procure, how to procure, how much to procure, and when to procure. White & Wagba (2023) observed that, in such cases, the peculiarity of the operations unit of the performing firm determines the lead time required for receiving materials from vendors in accordance with the solicitation planning into contract closure, which are usually carried out once in every procured material.

Agumadu, Elvis and Muarice (2022) alluded that the project team of a performing firm often requires an expert opinion from an external body that is related to contracting and procurement, as the case may be, and most often, they are directly engaged at the early start phase of the project team. However, Junita and Asiebu (2023) argued that if the project team would have no need to procure material from vendors, the solicitation planning processes for contract closure might be unnecessary. Then, the procurement unit of the performing firm will need to engage directly with prospective dealers or merchants, that is, if the procurement unit would exert minor influence on the contract decision (Melvin & Batistuta, 2022).

1.7.1. Contract Type Selection

For an effective procurement planning process, the form of contract to be entered into considering the complexity or chain of activities required for optimal performance of the project would also reflect on the contract type selection (Thompson, Francis & Trust, 2023). Conversely, three major contract types exist:

1.7.1.1. Lump Sum or Fixed Price Contracts

This form of contract type is most applicable when the material to be procured is clearly defined and known, even as to the risk relationship to be assumed by both parties (Ikwo & Felemor, 2022). The risk component arises when the procurement unit of the performing firm receives substandard or inferior material. On the other hand, the vendor would need to incur additional expenses to prepare the material for procurement (Mafidor, Owurume & Odugu, 2023). Samuel & Walson (2023) emphasized that, as often observed, lump sum contracts do require price subsidization for meeting specific project timelines, milestones, targets, or objectives.

1.7.1.2. Cost Reimbursement Contracts

Here is another class of contract available for project use. It details the vendor's responsibility for providing the material for the performing firm's use (Marshal, Charles & Daniel, 2023). When the performing firm or the project procurement unit has received and certified the material adequate for use, the profit and all expenditures incurred by the vendor are reimbursed (Waribo, Prince & Greg, 2023). Kio & Wari (2022) also pointed out that it also attracts incentives, such as fixed and lump sum contracts. Often, such contracts do attract incentive measures despite the fact that such contract costs are usually direct and indirect. Alagba et al. (2023) alluded that such direct costs are mostly expenses associated with the project (staff salary), while overhead ongoing concerns, which are calculated based on percentage, are indirect.

1.7.1.3. Time and Material Contract

This is another form of contract that is also known as hybrid. It is hybrid because it possesses the attributes of both lump sum and cost reimbursement contracts (Dimkpa & Uriah, 2023). It is usually an open-ended contract because the full value required for contract arrangement is usually not detailed or defined at the time such parties entered into it (Ogbe & Ekpelu, 2022). However, neither lump sum nor reimbursement methods nor the combination of both are often used based on the parties' understanding (Ekwo & Elaoniso, 2023).

2. Theoretical Review

The Contract Theory: The contract theory was found to be supportive of the study. The theory was first propounded by Thomas Hobbs in 1588 to 1679 and was later reviewed by other proponents as social contract theory by John Locke and Jean Jacques in 1690. In economics, contract theory studies how capitalists or organizations can and do enter into contractual arrangements, generally in the presence of distorted knowledge about the terms (Pakirima, Agbelo, & Mantsa, 2023). Because of its connections with both agency and incentives, contract theory is often categorized within a field known as Law and economics. The assumption in contract theory is that the incentive contract is less expensive and enforceable and that the contractor can be held accountable for the delivery of any contracted services, typically through the courts (Alagba, Timothy & Apapa, 2023).

Procurement planning is hinged on the theory of supply chain management. The consultant of Booz Allen Hamilton named Ksith Oliver 1982 first used the word supply chain management in his interview with the Financial Times. In 1983, Wirts chafts Woche in Germany published for the first time the results of an implemented and so-called Supply Chain Management project led by Wolfgang Partsch (Okechukwu & Egbo, 2023). Shegbasa, Vashua, & Dogboru (2023) observed that, as of the mid-1990s, the concept of supply chain management has proliferated in various publications and books. Amashika (2022) lauded that the concept was defined as the totality of activities needed for the flow and transformation of material or product from raw state to end user, with the required volume of information needed. Supply-chain management was then further defined as the integration of supply-chain activities through improved supply-chain relationships to achieve a competitive advantage (Datson & Chris, 2022). In the late 1990s, supply chain management (SCM) rose to prominence, and operations managers began to use it in their titles with increasing regularity (Pakirima et al., 2023).

3. Empirical Framework

Lee, Choo & Joean (2023) conducted a study on supply system and organizational effectiveness: contract as a tool for service delivery in Kenya. The study aimed to find how organizational effectiveness was attained through contract formation. The study was necessitated due to variations in the performance of responsibility in the supply chain. It adopted a correlation design on a sample size of 123 respondents. Findings revealed a strong positive relationship in the use of contracts to enforce shared responsibility in the studied organizations.

Anume & Wilson (2022) carried out a study on contract selection and optimal performance of construction firms in Ogun State. The aim was to determine how the performance of construction firms is based on their contractual responsibility. The study was hinged on the nature of uncompleted recreational facilities. A census study was carried out on 73 construction firms, and regression analyses were used as a statistical tool. Findings revealed that performance was positively influenced when strict contractual liability was entered into. Hence, the enforcement of legal terms significantly affects performance.

3.1. Gaps of the Study

Construction activities are one of the major developmental indices of any society. Hence, the nature at which these development structures are implemented dictates the rate at which economic activities are increased in such an environment. Conversely, recreation facilities were one of the many strategies that boosted tourism and contributed to the

work-life balance of the workforce of any society. However, fewer empirical studies seem to have been recorded based on the performing firm's capability to meet projected timelines in the construction of swimming pools.

4. Methodology

The study adopted a correlation design and the use of a questionnaire as a source of primary data. The population size of the study was 7 firms (Finelib.com/cities/port-harcourt/business/-construction/swimming-pool-construction/2023). Hence, it was a census study. The questionnaire was distributed to a sample size of 116 respondents. A judgmental sampling technique was used to spread the respondents from the studied firms, while Spearman rank correlation and regression statistical tools were used to analyze respondent responses.

S/N	Firms	Engineers		Total
		Manager	Construction	
1	Allymagax Technical Limited.	1	7	8
2	D'Cannopy & Swimming Pool Expert	1	7	8
3	Greytech Global Construction	1	7	8
4	La Panonic Construction, Limited	1	7	8
5	Pool Master Construction	2	7	9
6	Swimming Pool Construction Company	1	7	8
7	Theophill Galleria & Wirks	1	7	8
	Cumulative	8	53	61

Table 1: Firms and Respondents Status
Source: Field Survey, (2023)

5. Analyses and Discussion of Findings

		Lump Sum	Reimbursement	Time and Material	Project Performance
Lump Sum	p-Value				
	2t-Value				
Reimbursement	p-Value	.95**			
	2t-Value	0.00			
Time and Material	p-Value	.77**	.74**		
	2t-Value	0.00	0.00		
Project Performance	p-Value	.58**	.62**	.82**	
	2t-Value	0.00	0.00	0.00	
	N	61	61	61	61

Table 2: Correlation Matrix on Bivariate Analyses
Source: Field Survey (2023) SPSS Output Ver. 25

Table 2 above revealed that the dimension contract types selection measured had a strong and very strong positive correlation with project performance. It revealed that lump sum correlated at $0.58 \geq 0.00$, cost reimbursement correlated at $0.62 \geq 0.00$, while time and material stood at $0.82 \geq 0.00$, all with project performance. These findings, as lauded by Arugu, Pual & Justice (2023), simply infer that maximizing performance in achieving a swimming pool project completion date is a function of the type of contract in force between performing firms and vendors in the studied industry.

Dimension	B	Std. Error	Beta	t	Sig.
(Constant)	0.18	0.27		0.65	0.52
Lump Sum	-1.08	0.22	-0.96	-4.91	0.00
Reimbursement	1.16	0.22	0.97	5.31	0.00
Time and Material	0.88	0.09	0.89	9.93	0.00

Table 3: Regression Analysis on All Predictor Variables
Source: Field Survey (2023) SPSS Output Ver. 25

Findings from table 3 above were explicit using regression value B for each dimension of project performance studied. It revealed that $-1.08 \leq 0.00$ decrease in the adoption of lump sum contracts significantly affected project performance negatively. Hence, performing firms would need to increase their adoption of lump sum contracts with vendors to meet project completion dates. It was also clear at the value of $0.00 \leq 1.16$; at an increase of 1.16, the adoption of a reimbursement contract affects the project completion date positively. In the study of Bagudu, Aphaleti & Hantop (2022), they affirmed that such outcomes indicated that performing firms are more advantageous in the adoption of reimbursement over lump sum contracts and time and material contracts in their performance. Finally, $0.00 \leq 0.88$ revealed that an increase in the adoption of time and material contracts at 0.88 affected project performance positively.

6. Conclusion

It is imperative to conclude that contract type selection is a veritable strategy for optimizing project performance by performing firms in the studied industry. It implied that dealing with vendors or suppliers of material should be partly tied to a specific contract type that would discourage variation of terms that are not necessarily fundamental to performance. Contrarily, performing firms must carefully understand the terms in the type of contract entered into to ensure that the completion date for deliverables, as in the case of a swimming pool project, is guaranteed.

7. Contribution to Knowledge

Researcher in project management and operations research has contributed immensely to the construction sector or industry in their series of research carried out in major aspects of the industry, such as road, building, pipeline, and civil construction works. This study has unveiled swimming pools as a major construction aspect in the industry, which has received less attention. Also, a general perspective on the adoption of contractual responsibility for optimizing project performance in the studied sector has been brought to light by this study.

8. Recommendations

- Firms should be aware of the distinct peculiarity of each project, as no two projects are the same in performance and execution within the industry.
- The performance of the project in the industry needs to be analytically detailed in the sequencing of activity to enable the adoption of specific contractual agreements that best suit each activity of the project.
- Vendors or suppliers for a given project line should be adequately integrated into the terms required for the internal performance of the project.

9. Areas for Further Study

It would be most desirable to carry out a comparative study among firms in the industry rather than the generalized result derived under the use of construction firms in the industrial sector.

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