RETENDERING STRATEGIES AND SUCCESS CRITERIA OF INFRASTRUCTURE PROJECTS IN NIGERIA

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Abstract

The essence of retendering infrastructure project is to ensure that the client conceived objectives on revised projects are fully achieved. This paper aim is to identify and examine retendering strategies and success criteria necessary for infrastructure projects. A questionnaire which comprised of 50 questions entitled "Retendering Strategies and Success Criteria of Infrastructure Projects" (RSSCIP) was developed to evaluate 60 randomly sampled mega infrastructure projects in Nigeria using qualified project engineers/managers as project respondents to evaluate the retendering strategies and success criteria of infrastructure projects with mean, standard deviation, factor and regression analysis as analytical tools. The study findings identified higher client involvement/commitment/support, appropriate procurement method, and improved project risk management as major retendering strategies. Additionally, conformance to the project duration, number of rework activities, and the number of disputes/complaints on record were also identified as major success criteria of infrastructure projects. It further indicated a significant relationship between variables which constitutes retendering strategies and success criteria of infrastructure projects through regression analysis.

Keywords: **Client, contractor, infrastructure projects, Nigeria, retendering strategies and success criteria**

INTRODUCTION

Mega infrastructure projects are usually considered to be complex and characterized with time and cost overruns. The size, cost, time, quality of the contractor, project complexity, geological considerations, equipment, materials and other specific needs are fundamental in meeting project goals, hence compelled project clients to consider the retendering option as one of the valid measures of revamping terminated/failed infrastructure projects which litter Nigeria. Studies on procurement practices has clearly shown lapses leading to huge loss of resources (Ameh and Ogundare, 2013; Ogunsanmi 2013). Additionally, these negative trends have culminated into insufficient resource materials, project site-condition and design-related problems as major reasons leading to the termination of projects (Udofia et al., 2015).

This study identifies and examines retendering strategies considered relevant which include, higher client

involvement/commitment/support, improved contractor capabilities, review/assessment of the project scope, appropriate procurement method, viable budget, improved project risk management and the specific project management techniques. This study further identifies and examines success criteria which include the numbers of variations or change orders, number of claims, disputes/complaints, risk activities, rework activities, and as well as total conformance to the project quality, budget, and the duration.

Infrastructure project retendering strategies in Nigeria

Retendering strategies refers to the salient modalities adopted in the review of failed/terminated contract provisions to ensure satisfactory completion through the assessment/auditing and the redesigning prior to another tendering process. In order to retender infrastructure projects in Nigeria, the Bureau of Public Procurement (BPP), the National Council on Public Procurement (NCPP) and other delegated bodies are saddled with the oversight function of managing projects. Nwachukwu et al., (2010) shared that the revised framework should takes cognizance of the lapses in technical, financial and management techniques of the default projects. Olatunji and Aje (2005) equally maintained that contractors must be prequalified through advertisements in major national publications in response to which intending contractors are expected to submit certain information considered imperative to achieve cost savings and expertise in the revised project operations. The study reviewed literature on previous studies and also cross-cased nine (9) different infrastructure projects in Nigeria using qualified project/site managers and engineers as project respondents in obtaining information on the infrastructure projects retendering strategies and success criteria before subsequent administration of the questionnaire on 60 different randomly sampled projects. Seven (7) salient retendering strategies of infrastructure projects through factor groupings were addressed:

The review and assessment of the project scope

Cho and Gibson (2001) identified poor project scope definition as one of the leading causes of project failures adversely affecting projects in the areas of cost, schedule, and operation. During the retendering of project, scope must be re-defined as a process of identifying salient information using project check-list which provides the basis for the development of functional estimates. Lee et al., (2009) emphasized that systematically assessing project scope elements is considered as one of the most appropriate ways to identify risk sources challenging projects through functional scope definition.

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Higher client involvement/commitment/support

Some people in a given project develop negative attitude which cripples the functional activities of road projects. Notably, project client/owners are sponsors/financiers of construction projects who are concerned with time, cost, quality and safety needs. Project client focuses more on decisions that are relevant in reshaping the nature and the expectations of the project. Rusell and Skibniewski (1988) affirmed further that increased commitment/involvement/support of the project client provides viable back-ups to the project goals, especially in the areas of site management, schedule, and resources control.

Appropriate procurement method

Procurement involves the transfer of the design and construction affairs, their relevant risks by the owner to the other parties who could better manage same (Gransberg et al., 2006). It is a common occurrence that most road projects are often completed at costs that are greater than the original estimate yet not completed. In choosing a delivery model suitable for a retendered project, client must also consider the nature, the uniqueness of the project; technical qualifications; time and the level of price certainty among others as major determinants. McDermott (1999) concluded that a viable procurement is the framework within which construction is brought about, acquired or obtained.

Viable budget

Budget refers to the total financial package readily available for perfect execution of project from the commencement to commissioning. Most of the infrastructure projects crashed because of the misapplication of the budgeted funds, thus making it difficult to keep the final bid price. The release of fund should be based on proper and thorough assessment of contract provisions based on articulated work scope to avoid financial crises during execution. Hegazy and Ayed (1998) reasoned that the season, location, type of project, contract duration and contract size had significant impact on individual contract costs. Viable budget provides the mental power for project conception and development.

Improved project risk management

Risks in road projects are uncertainties which are noticed lately and greatly influence cost, duration, and quality of the project. Risk have not been adequately addressed leading to many failed contracts through poor planning, poor budgeting, and poor resource management (The World Bank Group, 2001). To overcome these problems the infrastructure risk plan should not be limited to the formal documentation only but also utilized project check-lists in designing a compatible risk model.

Specific project management techniques

Non-utilization of the required project management tools and techniques (PMTT) have significantly contributed to a monumental economic loss of resources, time and projects with no concrete completion time in sight (Nwachukwu et al., 2010). Infrastructure projects meant for retendering are by their nature complex which requires different methodologies and most of the contracting firms are lacking in the use of tools and techniques in addressing these constraints/challenges. PMT are tools capable of defining work packages and tracking the cost and schedule for a given project instead of continuous usage of hard systems centered project management tools (Mc Calman and Paton, 1992).

Success criteria in road construction retendering

Sanvido et al., (1992) defined success for a given project as the degree to which project expectations are met. Success is achieved when a project is completed within the approved time, budget, specifications, and to the stakeholders' satisfaction. In infrastructure project, measurable evidence is necessary to indicate that a planned effort has achieved the desired result. This study considered eight (8) identified criteria based on in-depth reviews and interviews on infrastructure projects

Number of variations

Variation orders in infrastructure are legal means to change previous contract provisions involving time, quality and cost disruptions after the award of a contract. Mohamed (2001) mentioned that although none can ensure that variation can be avoided completely, their occurrence and subsequent waste can be prevented if their origin and causes are clearly known. The selection and adherence to the appropriate contract conditions would be helpful in controlling variations.

Number of claims

The quantification of variations by different contractors has been admitted as one of the main causes for dispute amounting to claim because of its complex methods of valuation. Kassab et al., (2010) had warned that construction exists in an adversarial environment and that conflict is unavoidable on projects, which conflicts remain a challenge in the construction industry. Variations in contracts are attributed to faulty specifications leading to claims. Studies by Bramble and Callahan (2000) identified correct

documentation, reasonable contract conditions, complete information, advance notice and partnering as measures to curtail claims.

Number of disputes/complaints

A major criticism facing various infrastructure projects is the growing rate of delays in the project delivery attributed to dispute and complaints among project parties with the potentials of leading to project failures litigation, abandonment and outright project termination. It is evident that most contracts prescribe dispute resolution at times of conflicts that do not offer the required remedy to damaged relationships among parties which further hamper both project performance and success. The practice of pre-bidding, fair risk allocation, design reviews, constructability reviews can significantly serves as effective dispute resolution process.

Conformance to the project quality

The principle of quality compliance in infrastructure project is controversial and greatly compromised by most project stakeholders for selfish motives. These selfish intentions influences quality and means of meeting these needs varies resulting in specifications and design defects; quality and delivery failures (Iyer and Tha, 2006). In other to overcome these weaknesses in infrastructure projects, the installation of quality orientation and follow-ups through client commitment is pertinent in achieving timely project delivery.

Conformance to the project budget

Project cost is not only confined to the tender sum but also include variations, modification cost and the cost created by the legal claims, such as litigation and arbitration from inception to completion. Thomas (1999) stated that the employment of financially incapable contractors not only affects the success of projects, but may also result in unrecoverable second order cost once they become insolvent. Significantly, the financial worth of a construction company is closely related to the strength of its working capital and to the adequacy of its cash flow. During estimate prepar ation, attention should be directed to specific project needs.

Conformance to the project duration

It is rare for infrastructure projects to be claim-free, even if when projects are successfully bided and executed. Time in infrastructure project must be managed efficiently to avoid delays and unnecessary spending (Atkinson, 1999). Aje et al., (2009) agreed that the selection of a competent contractor also boosts performance because these personnel are responsible for formulating and taking decision at the right time for project to be completed within cost, time, and quality. Variations in contract usually culminate into a change involving all the facets of the project.

Number of risk activities

Infrastructure projects are characterized by time and cost overruns caused by fluctuation in prices, equipment failures, labour related issues, bankruptcy, and insecurity, among others. Significant number of these infrastructure projects are terminated due to some unseen ground conditions, hence soil testing and geological consideration provides an in-depth guide to contingency planning. In order to control risk activities, its handling strategies should be determined by their sources and then remedies spelt out in a way that eliminate or reduce their occurrence and capable hands assigned (Saleh, 2011).

Number of rework activities

Rework activities exist in the form of quality deviations, nonconformance, defects, quality failures, effect of bad weather and natural disaster culminating into a redoing (Kaming et al., 1997). In infrastructure projects, failed budgeted cost, erroneous workmanship, poor machine or tools handling or mistakes in material selection constitute reasons for rework. In order to track project progress and performance, Palaneeswaran (2006) had mentioned a structured systems for rework management and the adoption of several direct and indirect controlling measures

METHODOLOGY

A questionnaire which comprised of 50 questions, entitled "Retendering Strategies and Success Criteria of Infrastructure Projects" (RSSCIP) was developed and aimed at evaluating the retendering strategies and success criteria of 60 randomly selected mega infrastructure projects in Nigeria valued between $3,015,016,127.8-12,562,567,199.21billion which were awarded between 1993 to 2013. This questionnaire was administered personally on 60 qualified project/site managers and engineers working on these infrastructure projects and who have been in the practice for more than 10 years in Nigeria. They were chosen as project respondents. These project respondents were given adequate time span of four-six weeks to fully understand the questionnaire before indicating their choices. This same number of questionnaire items was personally retrieved and analyzed, which represented a 100% response rate. Mean values and standard deviation for the variables were used as preliminary analysis to examine the items as retendering strategies and success criteria, with a computed mean above 3.0 considered high enough for factor analysis based on a 5-point scale used in this study.

Results and discussions

In this study, mean scores with standard deviation ranges from 3.017*±1.186 to 3.483**±0.892 were obtained for the retendering strategies as shown in table 1. These procedures were used in obtaining 25 variables of retendering strategies from the initial 42 variables which are grouped in Tables 2. Additionally, 8 factors were also considered as success criteria shown in table 3.

This study therefore proposed that there was no significant relationship between the retendering strategies and success criteria. The null hypothesis shall be rejected if the p-value is lower than the critical p of 0.05, and the alternate hypothesis which states that there was significant relationship between the retendering strategies and success criteria accepted. Regression analysis was used to establish whether a relationship existed, the strength and form of the relationship, between the retendering strategies and success criteria as shown in table 4.

Factor analysis of retendering strategies

The KMO's of 0.792 and Bartlett's test values of 1827.339 with corresponding significant levels of 0.000 obtained were all appropriate for the factor analysis of the retendering strategies. From table 1, the high communalities of 0.484 – 0.957 for the retendering strategies indicated that the extracted components represented their variables well. In this study, the 25 retendering variables shall be reduced into seven (7) groups that summarized the essential information and characteristics using factor analysis which indicates an Eigen value of 11.629 with a cumulative variance of 65% using the Kaiser-Meyer-Oikun (KMO) as an index. Tables 2 and 3 below indicate the groupings/names for the retendering strategies and success criteria respectively.

Table 1: Mean values for retendering strategies

Code	Item	Mean	Sd
R001	Review the original terms of contract conditions in this project	3.367	0.991
R002	Assess the entire scope of work in this project	3.217	1.106
R003	Assess the quality/level of defective work done in this project	3.467	0.929
R004	Assess the amount expended and cost implications in this project	3.300	1.046
R005	Assess the standard of workmanship in this project	2.950	0.946
R006	Assess the value of assets (materials) of this project	2.850	0.954
R007	Assess possible risk (s) in this project	3.983	0.892
	Redesign phase (Preparation for the revise contract):		
R008	Review checklists for the termination of this project	3.433	0.945
R009	Review factors that triggered this project termination	3.267	1.087
R010	Develop checklists in-line with the scope of this project	2.783	0.993
R011	Review details of geological conditions and feasibilities reports of this project	3.050	1.213
R012	Review details of values and constituent work activities of this project	3.400	0.960
R013	Review fault(s) and complexities characterized in the design of this project	3.300	1.013
R014	Review lapses discovered and procedures in the bidding of this project	2.800	0.971
R015	Develop contingency plan for perceived weaknesses or risk	2.800	1.286

	that may be associated with this project		
	Retendering phase:		
R016	Define concise documents and work-scope based on the revise specifications and engineering drawings for the defective work/project to be rebid.	3.483	0.892
R017	Develop concise estimates/bill of quantities for this project based on new scope of work/milestones to be rebid	3.433	0.927
R018	Outline the most applicable method of pricing/payment and conditions for the defective work/project to be rebid	2.817	0.930
R019	Outline the most applicable method of award/procedures of work execution to achieve targeted objectives of the defective work/project to be rebid	2.917	1.094
R020	Outline the specific method of delivery in-line with this project schedule/timetable to be rebid	2.750	1.068
R021	Define suitable type/form of tender/conditions in line with the nature of this project	3.017	1.186
R022	Secure details of relevant information prior to the commencement of this project	3.20	0.935
R023	Outline proven measures to identify and manage problems/ risk for this revise project	2.90	0.896
R024	Secure fair knowledge of the prevailing market demands in infrastructure to be rebid	3.417	0.962
R025	Secure fair knowledge of the previous project variations in infrastructure	3.100	1.037
R026	Allocate adequate time to fully enhance the completion/ commissioning of this revised project by the new contractor	3.300	0.869
R027	Detail knowledge of quality assurance/safety compliance mechanism by the new contractor	2.767	1.095
R028	Allocate/disburse adequate funds to fully enhance the completion of this revised project by the contracting parties	3.317	1.000
R029	Allocate adequate number of experienced personnel required for this revised project by the new contractor	2.733	1.274
R030	Allocate relevant and adequate number of technical equipment/machineries for this revised project by the new contractor	3.167	1.044
R031	Consider the contractor based on value creation and innovativeness	2.883	1.121
R032	Select new contractor based on in-depth understanding of the technical needs of this project to be rebid	2.967	0.991
R033	Consider specific performance/credential(s) of the contractor	3.283	0.940

	on similar or complex projects completion within time framed		
R034	Require higher financial strength of the new contractor for the rebid project	2.700	1.109
R035	Re-advertisement of bids should be based on the revise specifications/details, of the scope of the project to be retendered	3.017	1.273
R036	Bid submission should integrate the identified deficiencies in the revise package for this project	3.133	1.081
R037	Receipts and clarification should focus on the revise specific needs confronting this project	2.633	1.340
R038	Revise specific financial qualifications to reflects the revise project financial objectives	3.233	1.110
R039	Revise specific technical qualifications to integrate the revise project technical constraints/challenges	3.183	0.873
R040	Revise performance bond to fully capture the financial obligation and probable technical constraints of this project needs	2.917	1.030
R041	Ensure the resources available matches with the estimated work packages	2.900	0.915
R042	Award of the revise contract should be based on satisfactory tender negotiations/modification, site visit by integrating the challenges and complexities associated with this project	3.067	1.023

Table 2. Factor groupings/ group names for retendering strategies

No	Variables	Loadings	Group names
1.	Assess the entire scope of work in this project	. 935	Review and assessment of project scope (GR1)
2.	Review checklists for the terminated project	.954	
3.	Review the factors that triggered the project termination	.959	
4.	Allocate relevant and adequate number of technical equipment/machineries for this revised project by the ne contractor	.951	Procurement related factor (GR2)
5.	Bid submission should integrate the identified deficiencies in this revised package for the project	.931	
6.	Review details of values and constituent work activities of the project	.801	
7.	Secure fair knowledge of the previous project variations in this road construction industry	.607	
8.	Revise specific financial qualifications to reflect the revised project financial objectives	.537	

9.	Secure details of relevant information prior to the commencement of this project	.519	
10.	Assess the quality/level of defective work done in this project	.920	Budget related factor (GR3)
11.	Assess the amount expended and cost implications for this project	.954	
12.	Review details of geological conditions and feasibility reports of the project	.728	
13.	Review the original terms of contract conditions for this project	.882	Capability of th new contractor related (GR4)
14.	Review fault(s) and complexities characterized in the design of the project	.518	
15.	Define concise documents and work-scope based on the revised specifications and engineering drawings for the defective work/project to be rebid	.433	
16.	Secure fair knowledge of the prevailing market deman in this road construction industry to be rebid	.892	
17.	Allocate adequate time to fully enhance the completion/commissioning of this revised project by the new contractor	.536	Client participation related (GR5)
18.	Allocate/disburse adequate funds to fully enhance the completion of this revised project by the contracting parties	.779	
19.	Assess possible risk(s) in the project	.727	Risk related (GR6)
20.	Develop concise estimates/bill of quantities for this project based on new scope of work/milestones to be rebid	.545	
21.	Define suitable type/form of tender/conditions in line with the nature of this project	.458	
22.	Revise specific technical qualifications to integrate the revised project technical constraints/challenges	.453	
23.	Consider specific performance/credential (s) of the new contractor on similar or complex project completion within time frame	.846	Specific projec management techniques (GR7)
24.	Re-advertisement of bids should be based on the revised specifications/details of the scope of this project to be rebid	.447	
25.	Award of the revised contract should be based satisfactory tender negotiations/modification and si visits by integrating the challenges and complexiti	.417	

	associated with this project		

Table 3: Success criteria considered in the study

Code	Item	Mean	Sd
S001	Number of variations or change orders in this project	3.40	0.960
S002	Number of claims on record in this project	3.39	0.996
S003	Number of disputes/complaints on record in this project	2.900	0.951
S004	Number of risk activities on record in this project	2.983	0.911
S005	Number of rework activities in this project	3.169	0.910
S006	Conformance of this road project budget	3.271	1.006
S007	Conformance of this road project duration	3.441	0.944
S008	Conformance of this road project quality	3.068	0.861

Decision rule:

The retendering strategies (Independent Variables, IV) with seven (7) variables and the project success criteria (Dependent Variables, DV) also comprised of eight (8) factors as used in this study respectively. To determine the statistical relevance of both the IV and the DV variables as used in this study and also to determine whether significant relationship exist between the variables which constitute retendering strategies and success criteria through regression analyses, the null hypothesis which states that there is no significant relationship between retendering strategies and success criteria variables shall be rejected if the p-value is lower than the 0.05 significant level considered in this study and as shown in table 4. The alternate hypothesis shall be accepted which state that there is significant relationship between the retendering strategies and success criteria in infrastructure projects in Nigeria.

To determine whether relationship exists, the strength and form of relationship between the retendering strategies and success criteria of infrastructure projects, regression analysis was used. The results of regression of success criteria (S1 – S8) with retendering strategies (GR1- GR7) are presented on table 4 below.

Fact.	Var.	GR1	GR2	GR3	GR4	GR5	GR6	GR7	Constant	R^2
S1	B	.062	.065	-.031	.029	.183	-.187	.238	3.150	0.241
	T	.504	2.530	-.255	.235	1.490	-1.519	1.938	25.850	

	Sig.	.616	.013**	.800	.815	.142	.135	.058*	.000**	
S2	B	.252	-.065	.062	.063	-.264	.232	.029	3.400	0.486
	T	2.138	-.547	2.522	.535	-2.235	1.967	.247	29.055	
	Sig.	.037	.587	.012**	.604	.030*	.055*	.806	.000**	
S3	B	-.048	-.029	-.286	-.261	.170	-.304	-.155	2.900	0.54
	T	-.451	-.267	-2.677	-2.438	1.989	-2.840	-1.449	27.352	
	Sig	.654	.790	.010**	.018**	.051*	.006**	.153	.000**	
S4	B	-.324	-.140	-.170	-.036	.102	-.300	.062	2.983	0.315
	T	-3.067	-1.328	-1.613	-.344	.961	-2.839	.584	28.489	
	Sig.	.003**	.190	.113	.732	.341	.006**	.562	.000**	
S5	B	-.297	-.108	-.135	.160	-.195	-.258	-.170	3.150	0.523
	T	-2.583	-.944	-1.174	1.391	-1.997	-2.246	-1.480	27.668	
	Sig.	.013**	.349	.246	.170	.056*	.029*	.145	.000**	
S6	B	.048	.001	-.119	.119	-.110	.198	-.065	3.283	0.187
	T	1.863	.010	-.907	1.908	-.837	1.987	-.500	25.257	
	Sig.	.062	.992	.369	.052	.406	.051*	.619	.000**	
S7	B	.146	.181	.108	.377	.364	.266	.191	3.417	0.573
	T	1.688	2.097	1.252	4.368	4.220	3.075	2.209	39.894	
	Sig.	.098	.041*	.216	.000**	.000**	.003**	.032*	.000**	
S8	B	-.055	-.111	-.012	-.080	.104	-.084	.088	3.067	0.267
	T	-1.884	-.967	-.102	-1.702	.910	-.738	1.869	27.049	
	Sig.	.056*	.338	.919	.066	.367	.464	.058*	.000**	

Table 4: Regression analysis between success criteria (S) and retendering (GT) factors

1. Number of variations on record (S1): S1 had significant correlations with appropriate procurement method, and specific project management techniques at $P<0.05$ with a coefficient of determination (R^2) of 0.241% implying that 24% of success criteria were explained in the retendering strategies whereas the review/assessment of the project scope, viable budget, improved contractor capabilities, project client involvement/commitment/support, and improved project risk management did not have significant correlation on *S1*. This significant correlation suggests that the variables of appropriate procurement method and specific project management techniques are more

sensitive in affecting the number of variations as a major success criterion. Variation orders often involve additional cost and disruption to work already underway, leading to cost and time overruns, quality degradation, and loss in productivity on construction projects (Chan and Yeong, 1995). The selection of a clear procurement procedures in contract, couple with viable risk allocation plan can significantly eliminate or reduce variation challenges.

2. Number of claims on record (S2): S2 had significant correlations with viable budget, project client involvement/commitment/support, and improved project risk management at $P<0.05$ with R^2 of 0.48% implying that 48% of the success criteria were explained in the retendering strategies whereas the review/assessment of project scope, appropriate procurement method, and improved contractor capabilities did not have significant correlation on *S2*. This significant correlation suggests that variables of the viable budget, project client involvement/commitment/support, and improved project risk management are more sensitive in affecting the number of claims as a success criterion. Claims exist as variations on extra work-done or the occurrence beyond budgeted scope. Bramble and Callahan (2000) have identified correct documentation, reasonable conditions, complete information, advance notice and partnering as measures to curtail claims.

3. Number of disputes/complaints on record (S3): S3 had significant correlations with viable budget, improved contractor capabilities, project client involvement/commitment/ support and improved project risk management at $P<0.05$ with R^2 of 0.54 implying that 54% success criteria were explained in the retendering strategies whereas the review/assessment of the project scope, appropriate procurement method, and specific project management techniques did not have significant correlation at on *S3*. This significant correlation suggests that variables of budget, contractor capability, project client involvement/commitment and improved project risk management are more sensitive in affecting the number of disputes/complaints as a major success criterion. Disputes/complains are internally and externally generated during construction work. Clearly, fair risk allocation will save project clients money in avoidance of inflated bids by the contractors (Jannadia et al., 2000).

4. Number of risk activities on record (S4): S4 had significant correlations with the review/assessment of the project scope and improved project risk management at $P<0.05$ with R^2 of 0.315 implying that 31% of success criteria were explained in the retendering strategies whereas appropriate procurement method, viable budget, improved contractor capabilities, project client involvement/commitment/support and specific project management techniques did not have significant correlation on *S4*. This significant correlation suggests that variables of the review/assessment of the project scope and improved project risk management are more sensitive in affecting the number of risk activities as a success criterion. Risk activities should be examined beyond archival records

during retendering. Saleh (2011) maintained that risks should not be ignored but recognized, assessed and evaluated and such should be allocated to capable parties.

5. Number of rework activities (S5): S5 had significant correlations with appropriate procurement method, project client involvement/commitment/support, and improved project risk management at $P<0.05$ with R^2 of 0.523 implying that 52.3% of success criteria were explained in the retendering strategies whereas the review/assessment of the project scope, viable project budget, improved contractor capabilities and specific project management techniques did not have significant correlation on *S5*. This significant correlation suggests that variables of appropriate procurement method, project client involvement/commitment/support, and improved project risk management are more sensitive in affecting the number of rework activities as a major success criterion. People within projects are often unwilling to conform to set standards which subject projects to rework (Oyewobi et al., (2011). Since the cost of rework are rarely tracked in the projects, the adoption of several direct and indirect controlling measures such as quality management and value engineering and value management can help check the excesses in a retendered projects.

6. Conformance to the project budget (S6): S6 had significant correlation with only improved project risk management at $P<0.05$ with R^2 of 0.187 implying that 18% of success criteria were explained in the retendering strategies whereas the review/assessment of the project scope, appropriate procurement method, viable project budget, improved contractor capabilities, project client involvement/commitment/support, and specific project management techniques did not have significant correlation on *S6*. This significant correlation suggests that variable of improved project risk management is more sensitive in

affecting conformance to the project budget as a success criterion. A viable budget is prerequisite in a retendered contract initiation, development and completion. Cabe (2003) posited that a project should be controlled by considering the cost, value and risk periodically throughout its life.

7 Conformance to the project duration (S7): S7 had significant correlations with appropriate procurement method, improved contractor capabilities, project client involvement/commitment/support, and improved project risk management at $P<0.05$ with R^2 of 0.573 implying that 57.3% success criteria were explained in the retendering strategies whereas the review/assessment of the project scope, viable budget and specific project management techniques did not have significant correlation on *S7*. This positive correlation suggests that variables of the appropriate procurement method, improved contractor capabilities, project client involvement/commitment/support, and improved project risk management are more sensitive in affecting conformance to the project duration as a major success criterion. Failures in timely project completion have become a universal phenomenon. Evidently, time can be measured in terms of construction time, speed of construction and time overrun which may influence project outcome negatively (Chan, 1997).

8 Conformance to the project quality (S8): S8 had significant correlations with the review/assessment of the project scope and specific project management techniques at $P<0.05$ with R^2 0.187 implying that 18% of success criteria were explained in the retendering strategies whereas appropriate procurement method, viable budget, improved contractor capabilities, project client involvement/commitment/support, and improved project risk management did not have significant correlation on *S8*. This significant correlation suggests that variables of the review/assessment of the project scope, and specific project

management techniques are more sensitive in affecting conformance to the project quality as a success criterion. Project quality varies and the modalities during retendering process must also be tailored in line with the changing needs for the attainment of the revised project target.

Conclusion

The use of faulty procedures and methods in acquiring contract usually results in a project termination decision which is a yardstick for the emergence of a retendering alternative. There are various approaches of revamping failed/terminated projects which is dependent on the reasons considered pertinent. This study examined the relationship between the retendering strategies and success criteria of infrastructure projects in Nigeria. In the retendering strategies, project client involvement/commitment/support, appropriate procurement method, and improved project risk management were identified and they could be regarded as major retendering strategies as well as the review/assessment of the project scope, viable budget, improved contractor capabilities, and specific project management techniques. In the success criteria, findings indicated that conformance to the project duration had correlations with appropriate procurement method, improved contractor capabilities, project client involvement/commitment/ support, and improved project risk management; the number of disputes/complaints on record was adopted as success criterion based on the correlations with viable budget, improved contractor capabilities, project client involvement/commitment/support and improved project risk management; and the number of rework activities had correlations with appropriate procurement method, project client involvement/commitment/support, and improved project risk management. The number of variations featured as success criterion based on the correlations with appropriate procurement method and specific project management techniques; the number of claims was considered success criterion based on the correlations with viable budget, project client involvement/commitment/ support and project risk management; the number of risk activities was also classified as success criterion based on the correlations with the review/assessment of the project scope and improved project risk management; the correlations involving quality of the project with the review/assessment of the project scope, and specific project management techniques positioned quality as success criterion; and finally, conformance to the project budget based on the correlation with the improved project risk management.

This study clearly identified conformance to the project duration, number of rework activities and the number of disputes/complaints as major success criteria and as well as the number of risk activities, number of claims, conformances to the project budget and quality. These findings affirm and strengthen previous studies and also provide additional explanations on the identified factors in both the retendering strategies and success criteria. This study finding revealed the existence of significant relationship between retendering strategies and success criteria through regression analysis and the null hypothesis is accordingly rejected. The variables of retendering strategies and success criteria in this study

showed strong relationships with each other. This implies that infrastructure project success is dependent on accurate and proper utilization of the identified retendering strategies.

Recommendations

Industrial and construction project stakeholders should always provide concise information in the procurement and management of projects specifically whenever a retendering option is considered relevant in meeting the cost, time, and quality needs of both the client and the end-users.

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