

RISK FACTORS INFLUENCING CONSTRUCTION PROCUREMENT PERFORMANCE IN NIGERIA

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Abstract

One of the challenges facing construction procurement performance is the failure to determine the risk related factors limiting its success. These risk factors can cause a significant increase in the procurement cost leading to an increase in the overall project cost. The purpose of this study is to identify and evaluate the risk factors influencing construction procurement performance with a view to achieve the overall project performance. The objectives are to establish a relative significance index score for the most important risk factors limiting the procurement performance of the projects. A self administered questionnaire was employed to the construction industry professionals for responses. A total of 78 questionnaires were distributed to these professionals (architects, quantity surveyors, engineers, and contractors) but 62 were returned and analyzed using influential index and later ranked in order of importance. Results of the analysis indicate a disparity in terms of ranking of the factors influencing construction procurement performance. Corruption related risk, conflict of interest, ineffective project technical feasibility, and lack of commitment to transparency were found to be the most significant factors limiting construction procurement performance. Communication barriers and unconfidential tender evaluation process were found to be the low weighted risk factors. The findings can serve as a supportive mechanism for risks management in public construction procurement management. Therefore, construction procurement personnel at all levels of government may find this study relevant, while improving construction procurement performance in the country. It is recommended that construction procurement system should be focused on risks related to corruption, conflict of interest, and effective technical feasibility for improving the overall project performance.

Keywords: Construction project, procurement performance, risk factors, risk management.

1. Introduction

The pace of change in the construction procurement performance has imposed additional demands on risk management. Risk management is a vital project procurement performance tool for reducing uncertainty and improving decision making. Risk cannot be avoided but must be recognized, assessed and managed for better procurement performance. The aim of this study is to assess key risk factors affecting construction procurement performance from stakeholders' perspective. The study is concerned with performance risk as it is often argued that if procurement planning procedure is adequately supported with a comprehensive strategy with regard to the most significant risk factors affecting procurement performance will improve the overall project performance (Tipili and Ilyasu, 2014). Construction procurement efficiency and effectiveness largely depends on the identification of critical factors limiting its performance. Risk is an uncertain event or set of circumstances that could occur, have an effect on the achievement of the procurement planning objectives. Risk factors is inherent in every construction procurement planning procedure and sometimes is impossible for these risks to be avoided (Abba, 2008).

Furthermore, during the procurement planning process of the project development, most of these risk factors are not properly identified and assessed (Faruk *et al.*, 2013). Fabi *et al.* (2015) has also advocate that no procurement system is risk free. Therefore, it becomes imperatives to identify and assess risk factors related to procurement planning procedures for improving the overall procurement performance.

1.1 Risk Factors Influencing Construction Projects Generally

The Nigeria's construction industry is like other developing countries, is dramatically experiencing a highly risk prone, due to the complex and dynamic environments (Tipili and Ibrahim, 2015). Thus, such nature is creating an atmosphere of high uncertainty and risks. This consequently affects the overall project performance. In an effort to identify and assess construction risk factors, Tipili and Ibrahim (2015) have jointly identified and assessed 27 key risk factors affecting public construction project from project stakeholder perspectives (clients, contractors and consultants). The study reveals that these risk factors spread through the whole project life cycle and many risks occur at more than one phase, with the construction stage with risky phase. On the risk categories level all the stakeholders agreed on the finance category as the main factor threatening project completion, and the labour and equipment category as having the least impact. Furthermore, clients and consultants have different perception on the impact of design category. Moreover, the study had elaborated the stakeholder role and responsibility on the management of the 27 identified risks and include: seven (7) key risks related to clients such as: tight project schedule; decision making process; payment for completion work; delay in site mobilization; design modification; financing project by client; and excessive change order ranked the least factor in order of priority. Tight project schedule was ranked as the most significant risk factors among the seven identified factors related to clients, which infers that formulating an appropriate schedule in the conceptual/feasibility phase is never more constructive to the project delivery. The clients should prepare a practical schedule allowing sufficient but not redundant time to accommodate all design and construction activities. As time and cost are always closely correlated, a lengthy schedule will undoubtedly wreck the project cost benefit.

Twelve (12) key risks related to contractors were evaluated and include: inadequate program planning; material delivery; contractor experience; labour performance; material waste handling; availability of material in the market; compliance of material to specification; design team experience; complexity of project design; necessity of specific skill; labour and management skill relation; and payment for completion work ranked the least risk factor. Thus, inadequate construction program planning was ranked the most influential risk factor related to contractors. This finding may result from inadequate program scheduling, innovative design or contractors' lack of knowledge in planning construction programs. To reduce the negative influence of the two risks, an informative program scheduling should be worked out in the design phase, and the constructability of innovative design should be examined. More importantly, the

abilities to manage construction programs and implement innovative design should be used as key criteria in appointing contractors.

Eight (8) key risks related to consultants were also discovered by the researchers and these are: design modification; unclear responsibility; compliance of material to specification; cost estimation accuracy; delay in site mobilization; design modification; clarity of details in drawing; excessive change order. The survey indicates that design modification was ranked the most important factor related to consultants in limiting public construction projects. This popularly arisen in the design phase of a project and may result from issues such as variations by the client and defective designs. To avoid defective design, the design teams need not only to fully understand what the clients want as defined in the project brief, but also to establish an efficient communication scheme among the designers. Inadequate program scheduling often appears in projects with a tight schedule when some programs need to be reduced to meet the project timeline. Moreover, uncertainty surrounds most facets of construction projects, which makes it impossible to accurately predict the time required for various programs. Choosing experienced designers can help to minimize the difference between the proposed and practical program schedules. Incomplete or inaccurate cost estimate is directly related to the designers/consultants' knowledge and attitude towards work.

1.2 Risk Factors Limiting Construction Procurement Performances

Procurement performance refers to proper planning and scheduling of procurement procedures in terms of efficiency and effectiveness for improving the overall project performance. Risk identification is defined as the process of systematically and continuously identifying, categorizing and assessing the initial significance of risk associated with construction procurement performance (Odeyinka & Lowe, 2000). Managing changes has led to the introduction of techniques for risk assessment as a major part of the planning process. Risk assessment concentrates on quantifying identified risks by using statistical analysis, since the identified risk in most cases can be either quantitatively or subjectively assessed factors (Augustine *et al.*, 2013).

Risk factors appear to influence the objective performance of procurement process. If not adequately identified and managed may affect the overall project success especially in terms of achieving value for money. Risk identification is the first phase of risk management process, which can be divided into four major phases: risk identification, risk analysis, risk response, and risk monitoring and evaluation (Tipili & Ilyasu, 2014). According to Augustine *et al.* (2013) the objectives of risk identification are as follows: to identify all significant types and sources of risk and uncertainty associated with the objectives and their key parameters; to ascertain the causes of each risk; to assess how risks are related to other risks and how risks should be classified and grouped for evaluation.

Risk identification is a beginning step of risk management. It yields types, sources, causes, characteristics, and relations of risks associated with the problem considered, all of which will be used to analyze and respond each risk in the subsequent phases. Tipili and Ibrahim (2015) had defined risk identification as a process for uncovering any risks that could potentially affect a process. This step is of considerable importance as other processes such as risk analysis and response can only be undertaken on the potential risks that have been identified (Odeyinka & Lowe, 2000). Risk identification is a simple but difficult task as there are no absolute procedures that may be used to identify risks in a procurement planning procedure. Project managers often rely heavily on their experience and on the insight of other key personnel involved in the process (Odeyinka & Lowe, 2000). Depending on the process documentation available and the nature of the process, a variety of considerations may prompt risk discovery. Regarding risk, Augustine *et al.* (2013) noted that managers need to focus on the interface between the consultant and the client, between departments of the client organization, between phases or tasks of a client process, or between geographic areas. They further suggest that the procurement planning and schedule should clearly show dependencies between tasks in order to help pinpoint risk-prone areas. Alternatively, managers may use process maps that show interfaces between processes or tasks. At the stage of risk identification it is important to identify the risk source and its effect. Within the framework of risk management, there are four alternative strategies: risk avoidance, risk reduction, risk transfer, and risk retention (Odeyinka & Lowe, 2000; Augustine *et al.*, 2013).

Risk Avoidance: This method of mitigation involves the removal of the causes of the risk and therefore the risk itself. The most simple form of risk avoidance is not to tender for a project. Also risk avoidance may involve considering and adopting alternative courses of action or using the exemption clauses in contracts. Risk avoidance approach should be addressed whenever the level of risk is high enough to render a project unfeasible.

Risk Reduction: Risk reduction is another approach that might be used to mitigate risk. This method is directed towards decreasing the contractor's potential exposure to risk by two ways: reducing the probability of risk; and reducing the impact of a risk. Risk reduction methods may sometimes require some initial investment which should then reduce the likelihood of the risk occurring. Risk reduction should be addressed whenever the level of risk is unacceptable and alternative action is available. Risk reduction invariably leads to greater confidence regarding the project's outcome. However, risk reduction will result in an increase in the base cost but should offer a significantly greater procurement performance leading to the reduction in the level of the overall project cost.

Risk Transfer: Through negotiation, the contractor can transfer risk to other parties such as the owner, subcontractors, or suppliers. Commonly this can be achieved through a provision in a contracts or a new contract placement. Transference of risk comprises the passing of risks to those who are more capable of maintaining control and influencing the outcome of the risk.

It's worth mentioning that some texts view insurance as risk reduction whilst others consider it as risk transfer. Both of the two views are considered correct. When some risk is transferred and some is retained this is known as risk-sharing. This approach should be adopted when the risk exposure is beyond the control of one party and it's important that each party acknowledges the value of the portion of risk for which he is responsible.

Risk Retention: This method of risk retention should be used when all the avenues for other risk mitigation strategies are blocked. In other words, this method should only be used for the residual risks that cannot be mitigated by the previous three strategies. In this method, residual risks undergo a detailed quantitative analysis in order to allocate an appropriate level of procurement performance. This does not imply that these risks would by then be ignored and not monitored throughout the cycle of the project. In fact, they should be under the eye and control of management in order to ensure that they are contained within the procurement performance.

1.3 Construction Project Delivery and Procurement Performance

Construction projects are becoming increasingly complex thereby resulting in complex procurement processes. In an effort to improve the procurement planning procedures capable for improving procurement performance, several studies have indicated the key factors influencing public construction procurement process and include: economy; value for money, ethical standards, competition and transparency and accountability (OECD, 2005; Dahiru, 2014; Babatunde *et al.*, 2010). To obtain the best service and performance from the construction procurement system, risk related factors should be identify at each process for realizing project's success (Odeyinka & Lowe, 2000; Babatunde *et al.*, 2010; Augustine *et al.*, 2013). Successful construction projects should result in project delivered on time, to cost, and to the desired quality capable of performing the specific business function of the client (Bureau of Public Procurement 2007); Fabi *et al.*, 2015). Procurement process in Nigeria involves a wide range of challenges that stakeholders face on project delivery and according to Fabi *et al.*, (2015) these include: absence of internal management structure, lack of social drive, low technical and management capacity as well as low multi stakeholder approach. These challenges have led to difficulty in procuring public projects and are a major concern to all stakeholders because the Nigerian construction industry is perceived as one engrossed with corruption and bureaucracy (Alfred, 2008).

2. Research Methodology

The study covers a systematic approach to review some literature on the nature and application of construction procurement systems in Nigeria. This provided the foundation upon which the study was premised. The constraints surrounding the application of construction procurement systems was reviewed which also provides good basis for understanding where the problems exist and the resultant gap in procurement performance. A quantitative approach using a well-structured questionnaire survey was chosen for this research since a wide range of responses are

required and in view of its ability to facilitate comparison of themes (Sambo, 2005). A vast amount of information was collected using a semi-structured interview with construction procurement practitioners in government sector, construction consultants and academics who were in one way or the other involved in the delivery of construction projects in Nigeria.

Project participants in construction projects delivery (such as: contractors; architects; quantity surveyors; and engineers) in the northern part of the country were considered for the study. Data were specifically collected from Kano, Kaduna and Abuja. These places were selected because of frequent construction activities that are carried out in these regions. Alongside with this, more construction and consulting firms were commonly found available in these areas and this led to have more experienced construction procurement stakeholders as been the respondents.

Questionnaire was designed and administered on 78 randomly selected construction professionals involved in a nearly completed or recently completed construction projects in the study area. The questionnaire was based on a rank scale of 1-5 to be ranked among the various effects of risk factors that can occur to construction procurement performance. A total of seventy eight (78) questionnaires were distributed but sixty two (62) (79%) of the data were retrieved as shown in Table 1. Of these, 30 responses came from the private sector and 32 from the public sector. All the respondents were either directors, principal partners or managers belonging to either client's organisation, consultants or private financiers and developers. The data provided by the questionnaire were analyzed using influence index.

The Questionnaire was developed on one hand using some key indicators from the literature review and from information initially collected using a series of semi-structured interviews. A total of 20 risk factors were included in the questionnaire and these factors were obtained from the literature reviewed. The complete questionnaire comprises of three parts: questions about respondent's academic and professional background, experience and questions on perceived risk factors of construction procurement performances in Nigeria.

Table 1: Categorization of respondents found in the study area

Respondents	Frequency	Percentage %	Cumulative %
Architects	14	22.58	22.58
Contractors	17	27.42	50.00
Engineers	15	24.19	74.19
Quantity Surveyors	16	25.81	100
Total	62	100	

Finally, a survey based on a questionnaire was also done to solicit nationwide expert opinions on the relative significance of risk factors limiting construction procurement performances in the country. The results of this survey are presented in this paper. The survey was conducted

amongst and within organisations, ministries, and private practitioners in various disciplines who have been involved in construction projects delivery. Although many studies have shown that, electronic survey elicits higher response rate from the respondents (Alfred, 2008), this research did not find it expedient to conduct any online survey. The survey also adopted a convenient sampling technique rather than random sampling because there is no database for organizations involved in construction procurement system in Nigeria.

Background information on respondents' profile is provided in table 2. This table shows that 17.74% of the respondents have the qualification of PhD, while 20.97% have masters in their respective field area of specialization. 25.81 have first degrees, 19.35% have either HND or ND in their various fields of disciplines. This summarily shows that majority of the respondents have high qualification in their field of endeavours. More importantly, 100% of the respondents are corporate members of their respective professional bodies (Table 3). In addition, 70.97% of them have an average of 12years of experience in the construction procurement systems (Table 4). From the foregoing, it can be concluded that the respondents could be relied upon for the information provided for this study for the purpose of analysis.

Table 2: Academic Qualification of respondents

Respondents	Frequency	Percentage %	Cumulative %
PhD/M.Phil	11	17.74	17.74
MSc/M.Eng/M.Tech	13	20.97	38.71
BSc/B.Eng/B.Tech	16	25.81	64.52
HND/ND	12	19.35	83.87
Others	10	16.13	100
Total	62	100	

Table 3: Professional Qualification of respondents

Respondents	Frequency	Percentage %	Cumulative %
MNIA	12	19.35	19.35
MNIOB	15	24.20	43.55
MNSE	17	27.42	70.97
MNIQS	18	29.03	100
Total	62	100	

Table 4: Procurement Experience of respondents

Respondents	Frequency	Percentage %	Cumulative %
1 – 5 years	6	9.68	9.68
6 – 10 years	12	19.35	29.03
11 – 15 years	16	25.81	54.84
16 – 20 years	18	29.03	83.87
Above 20 years	10	16.13	100

3. Survey Data Analysis and Results

The outcome of the data collected was critically analysed and summarised in order to determine the strength of different opinions and their relative importance. The objective is to collect data on the attitudes, opinion and behavioural disposition of the respondents. The relative importance of 20 risk factors identified from the literature review was explored by means of Likert rating scale. This, according to Sambo (2005), is one of the acceptable methods of scale rating in construction management research.

Based on all the gathered information, influence index was used as to find the most influential risk factors limiting the procurement performance in Nigeria. Respondents were asked to rank the influence of these factors over the procurement performance for which the relative information have been provided on a five point scale (1 = very low; 2 = low; 3 = medium; 4 = high; and 5 = very high). Thus the significance of adopting the influence index is to determine the most influential risk factors limiting procurement performance. This method was previously used by Arif et al (2010) in their effort to determined factors influencing the accuracy of cost estimates of construction projects in Pakistan.

Hence, the influence index of each factor was calculated using the following formula:

$$\text{Influence Index} = \frac{\sum (\text{Influence score} \times \text{Response frequency at that influence score})}{\text{Total Number of Responses}}$$

Table 5: Ranking of Risk Factors Influencing Construction Procurement Performance

Risk Factors Influencing Construction Procurement Performance						
Influential Factors	Influential Index					Rank
	Architects	Q/Surveyors	Contractors	C/Engineer	Weighted Average	
Corruption related risks	6.9	6.9	6.8	6.8	6.85	1
Conflict of interest	6.7	6.8	6.7	6.8	6.75	2
Ineffective project technical feasibility	6.7	6.6	6.6	6.7	6.65	3
Lack of commitment to transparency	6.6	6.5	6.5	6.7	6.58	4
Discrimination of tenderers	6.5	6.3	6.5	6.7	6.50	5
Unequal treatment of tenders	6.4	6.3	6.3	6.6	6.40	6
Non early involvement of consultants	6.2	6.3	6.2	6.6	6.33	7
Expertise level of procurement personnel	6.2	6.1	6.0	6.5	6.20	8
Impact of contract type	6.1	6.0	6.0	6.5	6.15	9
Level of project team integration	6.1	5.7	5.8	6.5	6.03	10
Lack of good governance	5.9	5.6	5.8	6.4	5.93	11
Unavailability of procurement structure	6.0	5.5	5.7	6.2	5.85	12
Unfavourable procurement framework	5.7	5.5	5.6	6.1	5.73	13
Levels of project team commitment	5.2	5.6	5.8	6.0	5.65	14
Inconsistency of government policies	5.2	5.6	5.3	5.8	5.48	15
Inappropriate condition of contract	5.3	5.2	5.5	5.6	5.40	16
Use of inappropriate procurement strategy	5.3	5.2	5.0	5.6	5.28	17
Ineffective procurement approach	5.2	5.0	5.1	5.2	5.13	18
Communication barriers	5.0	5.1	5.0	5.2	5.08	19
Unconfidential tender evaluation process	5.0	4.9	4.8	5.1	4.95	20

3.1 Ranking of Perceived Risk Factors Influencing Construction Procurement Performance

From the analysis shown in table 5, the influence index values for the 20 different risk factors is presented ranging from 6.85 to 4.95 (average weighted). It can be seen that factors, such as corruption related risks (with an average weighted influence value of 6.85), conflict of interest (6.75), ineffective project technical feasibility (6.65), lack of commitment to transparency (6.58), discrimination of tenderers (6.50), unequal treatment of tenders (6.40), non early involvement of consultants (6.33), expertise level of procurement personnel (6.20), impact of contract type (6.15), and level of project team integration (6.03) top the first ten (10) most influential risk factors limiting construction procurement performance.

The top four (4) most risk factors influencing construction procurement performance were corruption related risks, conflict of interest, ineffective project technical feasibility, and lack of commitment to transparency. This shows that lack of contracting mind-set and distrust within the public sector usually affect construction procurement performance. Although, there were no official reports on cases about conflicting of interest in public procurement management, it is however believed that issues such as lack of commitment to transparency and accountability as well as influence of corruption are serious problems that can result to the loss of contracting mindset and distrust between construction project parties. Therefore, unless government commitment in the fight against corruption continues to yield positive results, there would be limited genuine commitment and trust of the public and private parties in construction contract. On issue has to do with ineffective project technical feasibility, it is important to note that procuring construction projects required intensive study and analysis to be able to verify whether it can deliver value for money or not. This is therefore more indicative of the apparent necessity for government to be adequately poised in providing an astute operational framework for such deals.

Good Governance provides sound economic policies, administrative platform that promote construction procurement performance (Babatunde et al., 2010 and Dahiru, 2014). This cannot be achieved with corrupt officials within the public sector. Although it is important to note that government had established an institution and a structure called the Bureau for Public Procurement Act (BPP Act, 2007) to principally regulate procurement process and ensure accountability and probity in the public sector contract award process, there is still an increasing evidence that corruption is one of the problems which still confront project procurement process in Nigeria (Alfred, 2008 and Dahiru, 2014). Today, the World Bank funding for services in developing countries has become inadequate and ineffective due to effect of corruption (Akelere and Gidado 2003).

4. Conclusion

Construction procurement procedures has many challenges on performances and these challenges are evident in risk factors associated with the procurement planning and scheduling and consequent performance of the procurement process. The study had evaluated some mechanisms limiting the performance of construction procurement management with a view to improve integrity in the processes. Factors, such as corruption related risks, conflict of interest, ineffective project technical feasibility, lack of commitment to transparency, discrimination of tenderers, unequal treatment of tenders, non early involvement of consultants, expertise level of procurement personnel, impact of contract type, and level of project team integration top the list of the most influential factors limiting construction procurement performance in Nigeria. Therefore the findings can serve as a supportive mechanism for risks management in public construction procurement management in Nigeria. Hence, construction procurement personnel at all levels of government may found this study relevant while improving construction procurement performance in the country.

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