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Quantity Surveyors' Perception of Risk Management Techniques in Construction Projects

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Abstract *-The duties of Quantity surveyors, who are the construction economists is to support cost-effective of construction spanning through the pre-construction stage to post-construction stage of projects. Despite being recognised as a professional discipline, quantity surveyors are not immune to the threats and risks in their operating environment. Consequence of which when poorly managed may be detrimental to quantity surveying practice and overall performance of construction project. Therefore, this paper assessed the risk management techniques adopted by the quantity surveyors in construction projects with a view to enhancing a better performance in project delivery. It identified the risk factors affecting quantity surveying practices also assessed the existing risk management practices that are being adopted by quantity surveyors in Lagos State. Fifteen (15) risk factors were identified and assessed by the consultant and contracting quantity surveyors through the administration of questionnaire. Fifty-Two (52) quantity surveyors were randomly selected in Lagos State, Nigeria. Data collected were subjected to descriptive statistics. The most significant risk factor associated with quantity surveying practices was design risk. This was followed by statutory compliance risk and financial or resource risk. The current practice of risk management include risk avoidance, risk mitigation/reduction, risk transfer and risk acceptance. The paper therefore concluded that risk factors affecting quantity surveying practice in Lagos State exist and they are managed by avoidance, mitigation/reduction, risk transfer and risk acceptance.*

Keywords: Quantity Surveyors, Risk Factors, Risk Management Practices.

1. INTRODUCTION

Professional quantity surveyors accommodate risk by the inclusion of a contingency allowance at tender stage (Hogg, 2000). While formalised risk management strategies are available, they are seldom exercised by the quantity surveyor (Hogg, 2000). Moreover there is a lack of consistency, in the techniques for assessing and managing risk among professionals within the construction industry (Mulholland and Christian, 1999, cited Shang et.al., 2005). It is important that there should be an obligation on the quantity surveyor to take the lead in identifying the real issues that impact on building costs and on risk management. In addition, they must make informed suggestions on how to solve the cost disparity between initial budget estimate and final building cost. Managing risks in construction projects have been recognized as a very important process in order to achieve project objectives in terms of time, cost, quality, safety and environmental sustainability (Mills, 2001). Construction project activities are to be well calculated in order for the deliverable to be of great use and benefit to its stakeholders. The effective implementation of risk assessment and management practices is indispensable to the success of construction projects (Banaitienė et al., 2011) and the successful management of risks in projects facilitates the achievement of the projects' objectives (Zou et al., 2006). In order to complete most of the construction projects on time at minimized cost and wastages, proper risk management techniques must be employed (Tchankova, 2002). Despite the existence of some studies of risk management within the construction industry, the majority of these studies failed to focus on identifying risks associated with quantity surveying practice. In view of this, this paper assessed the risk management techniques in construction projects from quantity surveyors' perception.

2. OVERVIEW OF THE QUANTITY SURVEYING PRACTICE

The role of the quantity surveyors (QS) within the construction environment is of great importance to both clients and other industry professionals (Perera et al., 2007). The roles played by the QS are essential in the construction industry. Being in charge of financial matters carries with it a great responsibility and the QS has the expertise to provide independent advice on these matters (Dada and Jagboro, 2012). This advice affect clients' decisions on whether to build or not, and if the client decides to build, what effect does cost have on other criteria within the clients/users value systems including time and quality, function, satisfactions, comfort and aesthetics. As it is usually the case, even under the traditional procurement system where the QS is not usually the lead or prime consultant, all other members of the team, including the client relate with him and supply valuable information to the QS to enable him prepare 'accurate estimates' to make meaningful contributions towards the successful completion of a project. Regardless of the

procurement strategies adopted, the roles of QS are prominent for a successful completion of projects. Hence, quantity surveyor role is categorized into three stages which are pre-contract, procurement and post-contact stage. Role of QS at pre contract stage include feasibility study, cost planning at concept design stage, cost planning at schematic design stage, cost planning at detailed design stage as well as value engineering inputs to the design teams, furthermore, at procurement stage, QS role include preparation of bills of quantities, preparation of tender document, tenderer selection & appraisal, tender evaluation, negotiation and final award, contract agreement, notwithstanding all these roles, QS also perform his role at post-contract stage, these include interim valuations, change management, value engineering, contract administration and final account settlement.

3. RISK FACTORS ASSOCIATED WITH IN QUANTITY SURVEYING PRACTICE

Professional QS manages all costs relating to building and civil engineering projects, from the initial calculations to the final figures. They seek to minimise the costs of a project and enhance value for money, while still achieving the required standards and quality. But few of these professionals understand the risks to which they are exposed or the standard of skill and care which the law expects. A risk is the probability of incurring misfortune or loss while, a risk factor is a factor such as a habit or an environmental condition that predisposes an individual to develop a particular diseases (Collins English Dictionary and Thesaurus, 2006). Ojo (2010) emphasized that the effect of risk is assessed through the risk factors. Professional quantity surveyors who is affected by many risk, accommodate these risks by the inclusion of a contingency allowance at tender stage (Hogg, 2000). Traditionally, during the pre-contract stage of project, most of these risks are not properly identified and assessed for the likelihood of its occurrence and its impact on project performance. Rather a 10% contingency is added to the total project cost in order to accommodate the effect of unforeseen circumstances. In most cases the 10% contingency is bases on intuitive guesswork and this explains the attendant high cost overrun (Odeyinka 2000). Thus, a need to assess the risk impact on construction project is still desirable. Proper risk analysis and cost control will ensure certainty of project price i.e project will achieve its cost and will be within budgets, timely delivery of project, project will also receive the best quality and the expenditure must give value for the money spent (Awodele 2012). While formalised risk management strategies are available, they are seldom exercised by the quantity surveyor (Hogg, 2000). Moreover there is a lack of consistency, in the techniques for assessing and managing risk among professionals within the industry (Mulholland and Christian, 1999, cited Shang et.al., 2005.

It had been shown by researchers, for example Akintoye and Fitzgerald (2000), Mak et al. (1998) and Macsporran and Tucker (1996), that errors in assessing cost and design variations create irregularities that can extensively affect the overall budget prediction, particularly in countries with developing building industries. Moreover, elements of risk have to be incorporated when forecasting building cost. While the professional building cost consultant insists on having the information to determine the cost, these details are not available when the budget estimates are needed most. In spite of this, professional building cost consultants must attempt to identify the most important risks, to produce a credible building cost budget (Samid, 1996). Meanwhile, budget prediction cannot be improved without an empirical knowledge of risk factors and their sources. It could thus be argued that, awareness of, and subsequent implementation of risk management practices could contribute to the enhanced project performance of the construction industry. Additionally, empirical evidence has shown that some construction organisations don't implement risk assessment; management practices and the techniques as part of managing their projects, often resulted in project costs exceeding budget and behind schedule (Kululanga and Kuotcha, 2010; Kikwasi, 2012). The table below shows the identified risk factors that affect quantity surveying practice.

Table 1: Risk factors affecting quantity surveying practice

Risk factor	**Sources**
Country risk	
Environmental and geological risk	Odeyinka et al., 2007, Nicholas C. and Adwoa B., 2014
Statutory Compliance Risk	Nicholas C. and Adwoa B., 2014
Project Execution risk	
Financial or Resource Risk	Odeyinka et al., 2007, Ajator, 2017, Nicholas C. and Adwoa B., 2014
Design risk	Odeyinka et al., 2007
External risk	Laila M. K. and Ahmed H.M., 2015
Organizational risk	Ajator, 2017
Project management risk	
Construction risks	
Estimating risk	Odeyinka et al., 2007

Site operation risk	Nicholas C. and Adwoa B., 2014
Information risk	
Design team performance risk	
Cost related risk	Luka and Muhammad, 2014
Valuation Risk	

4. RISK MANAGEMENT

Risk management provides a systematic method of allocating risks in construction projects enabling projects to be managed with greater degree of anticipation and forethought. The risk analysis and management techniques have been described in detail by many authors (Kartam et. al, 2000; Mills, 2001; Odeyinka, 2000; Office of Government Commerce (OGC), 2003); Despite the wealth of risk management techniques and strategies available to construction industry professionals, the evidence from construction projects worldwide highlights that risk is being dealt with incorrectly (Thompson and Perry, 1992 cited Rahman and Kumaraswamy, 2002 and Edwards and Bowen, 1998). There is a lack of understanding of the systematic processes required to adequately manage risk while inappropriate risk management coupled is a major hindrance to the improvement in construction performance.

Risk Management framework are identified as risk identification, risk analysis and risk response (Hayes et. al, 1986, cited Edwards and Bowen, 1998). Risk identification is a means of recognizing and clarifying the potential sources of risk (Rutkauskas 2008; Zayed et al. 2008), meanwhile, risk analysis is a systematic approach to understanding these risks and their impact so that the decision makers can account for them in contingency planning, as well as plan for risk mitigation. Risk response strategies as a risk management framework is the process of developing strategic options, and determining actions, to enhance opportunities and reduce threats to the project's objectives. This involve avoidance, transfer, mitigation/reduction and acceptance (Rafferty,1994, cited Baker et al., 1999). Risk can be avoided by removing the cause of the risk or executing the project in a different way while still aiming to achieve project objectives. It involves taking preventative measures to avert jeopardising project objectives to ensure that the risk cannot arise again. Risk can also be transfered by shifting the burden of risk from one stakeholder to another (Edwards and Bowen, 2005) with the aim managing it effectively. Risk mitigation reduces the probability and impact of an adverse risk event to an acceptable threshold, this is more effective than trying to repair the damage after the risk has occurred (Fewings, 2005). The process of risk reduction requires a provision of contingency allowance, to protect the stakeholder should the risk event occur (Mills, 2001). Risk Acceptance is adopted when it is not possible or practical to respond to the risk by the other strategies, or a response is not warranted by the importance of the risk. When the project manager and the project team decide to accept a risk, they are agreeing to address the risk if and when it occurs.

5. RESEARCH METHODOLOGY

The paper focused on the registered quantity surveyors with Nigeria institute of quantity surveyor in Lagos Nigeria. The study made use of structured questionnaire administered to the registered quantity surveyors with NIQS in Lagos Nigeria in order to identified the risk factors affecting quantity surveying practice, it also assessed the existing risk management practices being adopted by quantity surveyors in Lagos State. This is with a view to enhancing a better project delivery in the Nigeria construction industry. Sixty (60) copies of questionnaire were administered to quantity surveyors in the construction industry. Fifty-Two (52) copies of questionnaire were dully filled and returned, which represent 86.67% of the total number of questionnaire administered in the study area (Lagos). The selection is adjudged adequate, according to Trochim (2000) who identify a percentage range of not less than 10% for a small study population. This percentage selection has been adopted in social sciences researches involving larger population like Graham *et al.* (2005) and Kalantari *et al.* (2007). This was also considered adequate based on assertion of Moser and Kelton (1981) that the result of a survey would be considered as biased and of little value if the return rate were lower than 40%. Data collected were analyzed using descriptive statistics such as relative important index (RII), to assess the respondents' views based on each of the risk factors and existing practice of risk management.

RII=£W 0 <RII >I (1)

Where W= the weight given to each factor by the respondents ranges from 1 to 5, (where "1" is very high, "2" is high, "3" is moderate "4" is low and "5" is very low), A = highest weight (i.e. 5 in this case) and; N = the number of response.

6. RESULTS AND THE DISCUSSION OF FINDINGS

6.1 Background profile of the Respondents

The results from Table 2 show that 48.1% of the registered quantity surveying firms are contracting firms, 40.4% are from consultancy firms and 11.5% are from both contracting and consultancy firms. Also, the highest respondents as showed on the table were contractor quantity surveyors (48.1%), 40.4% are consultant quantity surveyors while 11.5% of the respondents came from both contractor and consultant quantity surveyors firms. The Table 2 also shows

that all the respondents are members of the NIQS. Therefore, they are able to provide vital and adequate information necessary for this study. From Table 2, it may be seen that the respondents hold a minimum of HND while 36.6% hold B.Sc. degree holders (36.6%). None of the respondents possess a qualification below HND; The result of the analysis on their working experience also revealed an average of 13 years with 50% of them had more than 10 years working experience. Hence the respondents are competent to provide the needed information for the study.

Table 2: General particulars of the respondents (Source: Authors' fieldwork, 2018)

Respondents' Particulars	**Frequency**	**Percentage (%)**	**Mid-point**
Type of firms			
Consultancy	21	40.4	
Contracting	25	48.1	
Others(Both)	6	11.5	
Total	**52**	**100.0**	
Designation of the Respondents			
Consultant QS	21	40.4	
Contractor QS	25	48.1	
Others(Both)	6	11.5	
Total	**52**	**100.0**	
Professional affiliation of the Respondents			
NIQS	52	100.0	
Total	**52**	**100.0**	
Academic qualification of the Respondents			
OND	0	0	
HND	30	57.7	
PGD	0	0	
B.Sc.	19	36.6	
M.Sc.	1	1.9	
Ph.D	2	3.8	
Total	**52**	**100.0**	
Professional experience of the Respondents			
1-5 years	26	50.0	3.0
6 – 10	15	28.8	9.0
11-15	11	21.2	13.0
16-20	0	0	18.0
0ver 20	0	0	21.0
Total	**52**	**100.0**	**Mean=13yrs**

6.2 Risk Factors affecting Quantity Surveying Practices

The study sought to identified risk factors affecting quantity surveying practice. Relevant data that were collected in this regard are presented in Table 3. Result from Table 3 indicates that 12 factors out of 15 factors (80%) have a high impact on quantity surveying practice. The result shows that the most significant risk factor is design risk (RII= 0.619, ranked 1st). This is not surprising due to the fact that most projects design details are still unresolved at the pre-contract stage. There is a lot of uncertainties as to the final cost and completion duration. It is therefore not a surprise that this risk factor ranks highest. This further validates the argument of Odeyinka *et al*, (2008) who identified design risk as the major risk factor encountered at pre-contract stage while financial and political risks were identified as the major risk factor at post contract stage; These findings have implications as regards the risk factors to focus attention on for risk management purposes at pre and post contract stages in quantity surveying practice. Following design risk on relative importance scale are statutory compliance risk (RII= 0.608, ranked 2nd). Statutory compliance obligations are those obligations that do not arise out of a contract, but are imposed by law which are expose to legal penalties, financial forfeiture and material loss an organization faces when it fails to act in accordance with industry laws and regulations, internal policies or prescribed best practices. Most times statutory compliance risk is

unforeseen at the early stage of the construction project. Financial or Resource risk (RII= 0.592, ranked 3rd). Financial risk to contractor includes whether the building owner has enough money to complete the project, financial failure of the building owner or sub-contractors, availability of money to the contractor in a suitable manner and time to enable the contractor to progress with the work (Akintoye and MacLeod, 1997). Financial risk according to (Perry and Hayes, 1985) also includes adequate provision of cash flow, fluctuations, inflation, taxation and availability of resources are the critical risk factors. Following financial risk on relative importance scale are environmental and geological risk, estimating risk, construction risk, project execution risk, external risk, site operation risk, environmental risk, design team performance risk followed by information risks (RII= 0.581, 0.573, 0.569, 0.554, 0.539, 0.531, 0.523, 0.519 and 0.519 respectively), these risks limit the services rendered by the professionals quantity surveyors in Lagos State. Moreso, organization risk followed by project management risk and country risk (RII= 0.492, 0.492 and 0.485 respectively) were the risk factors that have low impact on the quantity surveying practice. This finding considered appropriate because the impact of these factors on quantity surveying practice is in agreement with to the findings of Liu, Junying, Xie, Qunxia, Xia, Bo, & Bridge, Adrian (2017).

Table 3: Risk factors affecting quantity surveying practices

S/N	Variables	RII	Ranking
1	Design risks	0.619	1st
2	Statutory Compliance risk	0.608	2nd
3	Financial or Resource risk	0.592	3rd
4	Environmental and Geological risk	0.581	4th
5	Estimating risk	0.573	5th
6	Construction risk	0.569	6th
7	Project Execution risk	0.554	7th
8	External risks	0.539	8th
9	Site operation risk	0.531	9th
10	Environmental risk	0.523	10th
11	Design team performance risks	0.519	11th
12	Information risk	0.519	11th
13	Organization risk	0.492	13th
14	Project management risk	0.492	13th
15	Country risk	0.485	15th

Key: RII = Relative Importance Index; R = Rank

6.3. Practice of Risk Management among Quantity Surveyors

Further analysis was carried out to assess the relative importance regarding practice of risk management among quantity surveyors in the construction industry as depicted in Table 4. Table 4 summarises the result of the analysis. From this table, it is evident that risk avoidance is the practice of risk management among quantity surveyors in the construction industry that was ranked highest with RII of 0.619. The findings is in accordance with Tesch et al. (2007) who suggests that the keys to managing risks at each stage of the project are to assign an experienced project manager skilled in change management and monitoring progress. This can act as an avoidance strategy to provide risk solutions. This further validates the argument of Gbajobi, (2017) who identified risk avoidance risk management technique. Risk mitigation/reduction ranked second position [2nd] with RII of 0.577; Risk transfer ranked third position [3rd] with RII of 0.565; Risk acceptance ranked fourth position [4th] with RII of 0.554.

Table 4: Practice of Risk Management among Quantity Surveyors

S/N	Variables	5	4	3	2	1	RII	Ranking
1	Risk avoidance	11	12	9	11	9	0.619	1st
2	Risk mitigation/reduction	2	18	13	10	9	0.577	2nd
3	Risk transfer	7	7	13	20	5	0.565	3rd
4	Risk acceptance	8	4	16	16	8	0.554	4th

7. CONCLUSION

From the study, it was found out that the risk factors that are associated with quantity surveying practice are design risk, statutory compliance risk and financial or resource risk. However, these significant risk factors have corresponding impact on the quantity surveying practice. This is instrumental to the quantity surveyor as regards the risk factors to concentrate on in the risk management process in order to deal with monumental threat to their practice. Moreover, the paper concludes that risk factors affecting quantity surveying practice in Lagos State exist and they are managed by avoidance, mitigation/reduction, risk transfer and risk acceptance.

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