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Proper Identification and Assessment of Risks/Hazards in the Construction Industry in the South West of Nigeria

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Abstract:
A risk/hazard is anything that could hurt you or someone else. Risk or hazard is a certain occurrence in human life and it occurs in day to day construction activities. Risk can be explained as possible loss resulting from the difference between what is anticipated and what actually occurred. Construction industry in Nigeria like other businesses is fraught with risk that is unpredictable, volatile and at times complex. Risk is inherent in the design and construction of buildings, civil and other heavy engineering works. This paper examines the risks experienced by some construction companies in the South West of Nigeria. Structured questionnaire was used to carry out a field survey. A total of seventy questionnaires were distributed, out of which fifty one were returned. Result of the study revealed that many hazards with their attendant risks/hazards could not be foreseen at the conception of many of the projects. It is recommended from the results of the study that risk/hazard management should be the responsibility of the clients, consultants, construction company's employees and management.

Keywords: *Construction, Risk, identification, hazards, assessment*

1. Introduction

Construction work is and always has been a risky business. Despite the nature of the construction work, many contracting authorities expend little or no time and effort on assessing and strategically planning for probable or even known risks. Most of the risks that occur during construction project affect the cost, time and quality of work which may result in cost overruns, time overruns, and low quality of work, disruptions and disputes (Ijaola, 2012). In some cases, risks may lead to delay and abandonment of project. Risks during construction of most projects are inevitable, different risk management techniques are used to manage these risks. Aibinu and Jagboro (2002) opined that the Nigerian construction industry experiences such risks, as projects are frequently characterized by cost overrun and times overrun which resulted in delay of the projects. Yet few emphases are placed on risk management practices in Nigeria. Identifying, allocating and managing risks at the front end of the project – planning process is the best possible way of ensuring a successful result for everyone involved at all stages of construction, including development, planning and actual construction. Risk assessment planning (RAP) is a process that assists all project participants in strategically planning how to handle construction risks before they became construction problems (Building Futures Council Committee, 2000). RAP is a concept that requires first identifying and understanding risks through a systematic process, then following an organized method of managing and allocating these risks. The RAP system is most effective when these four steps are followed:

Identify the project risks by using the RAP check list.
Communicate among the disciplines and develop mutually agreed – upon methods for managing the risks.
Develop voluntary methods of resolving problems before they occur.
Require contract language to reinforce the resolution agreed upon.
RAP is a system of collaboration early in the work cycle to minimize problems before they occur

2. Literature Review

U.S. Department of Transportation, Federal Highway Administration, April 19, 2014 as modified stated that the objectives of proper identification and assessment of risks/hazards are to identify and categorize risks that could affect the construction project and document these risks. What is done with the list of risks depends on the nature of the risks and the construction project. On noncomplex, low- cost construction projects with little uncertainly (few risks), the risks may be kept simply as a list of red flag items. On complex, high-cost construction projects that are by nature uncertain, the risks can feed the rigorous process of assessment, analysis, mitigation and planning, allocation and monitoring and updating. The risk identification process begins with the team compiling the construction projects risk events. The identification process will vary, depending on the nature of the construction project and the risk management skills of the team members (see fig. 1 below for details.) Risk is a certain occurrence in human life and it occurs in day to day construction activities. It occurs in construction because of the complex

activities involved. According to Ashworth (2006), risk is inherent in all human endeavors; including construction activities and the risk element involved are diverse and varied. Dada (2010) identified financial, political and physical risks as the most important risk factors. Ojo (2010) carried out an empirical study and found out the risk factor with the highest occurrence is design changes during construction, followed by inadequate specification while Obiegbu (2010) found out that awarding the design to unqualified designer is the most important ranked factors in risk categorization. Risk Management process starts with risk identification. Lyons and Skirtmore (2004) and Tang et al carried out research and found out brainstorming is the most common risk identification technique used whereas Bajaj et al (1997) concluded that the top-down approach is the most frequently used method of risk identification techniques, where project are analyzed from an overall point of view while the bottom-up risk identification techniques are not common unless questionnaires and checklist approach. Wang and Chou (2003) conducted multiple case studies using a systematic analytical procedure to identify risks on highway project in Taiwan.

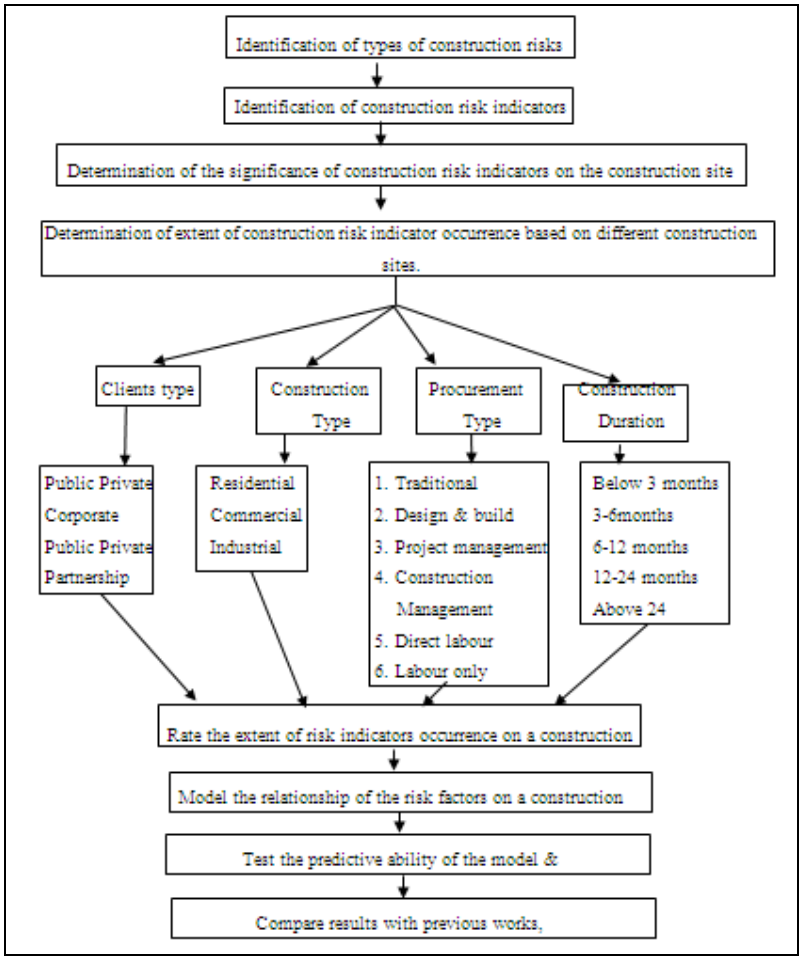

Figure 1: Conceptual framework for evaluation of Risk management practice in the construction industry (Modified)
Source: International Journal of Pure and Applied Sciences and Technology; 16(3) (2013), P. 23

Cano and De La Cruz (2002) as stated in Ijaola (2012) developed Delphi analysis to assess project risk while Warrzawsk and Sacks (2004) as stated in Ijaola (2012) proposed a multifactor method to risk assessment in which economic risk is inherent in a construction project can be calculated with input information of varying level of details. Choi and Mahadevan (2008) developed a risk assessment methodology for construction project by combining existing large quantities of data and project specific information through updating approaches, Tar and Carr. (2000) as stated in Ijaola (2012) used a hierarchical risk breakdown structure representation to develop a formal model for qualitative risk assessment.

Under hazard identification, risk assessment and risk control Department of Education and Early Childhood Development in April 2014 as modified stated clearly that there are three steps to use to manage health and safety at work namely:

- Spot the Hazard/risk (Hazard/risk identification)
- Assess the risk (risk assessment)
- Make the changes (risk control)

At work you can use these three "Thinksafe" steps to help prevent accidents:

Spot the Hazard/Risk- A hazard is anything that could hurt you or someone else.

Examples of work place hazard include:

Frayed electrical cords (could result in electrical shock)
Boxes stacked precariously (they could fall on someone)
Noisy machinery (could result in damage to your hearing)
During construction work experience, you must remain alert to anything that may be dangerous. If you see, hear or smell anything odd, take note. If you think it could be a hazard, tell someone
Assess the Risk - Assessing the risk means working out how likely it is that hazard will harm someone and how serious the harm could be.
How likely is it that hazard could harm me or someone else?
How badly could I or someone else be harmed?
Always tell someone (your employer, your supervisor or your health and safety representative) about hazard you can't fix yourself, especially if the hazard could cause serious harm to anyone, For example:
Ask your supervisor for instructions and training before using equipment
Ask for help moving or lifting heavy objects
Tell your supervisor if you think a work practice could be dangerous
If you are not sure of the safest way to do something on site work experience, always ask your experienced supervisor.
Make the changes - It is your employer's responsibility to fix hazards. Sometimes you may be able to fix simple hazards yourself, as long as you don't put yourself or others at risk. For example, you can pick up things from the floor and put them away to eliminate a trip hazard.
Empirical study carried out by Tang et al (2007) reveal that the construction industry has shifted from risk transfer to risk reduction while Dada (2010) concluded that the Nigerian construction industry considered risk transfer as the highest mitigating tool used, followed by risk reduction, risk avoidance and risk retention. Baker et al (1999) carried out a study in which the choice and the use of the most successful risk response technique within the oil and gas industry were compared with that of the construction industry. They concluded that risk reduction as a response to assessed risks is most commonly used by both sectors and the construction industry concentrates almost exclusively on reduction of financial risk.

3. Research Methodology

This work was conducted through:

3.1. Literature Review

A wide literature review was done using text-books, the internet and conference materials in order to articulate the existing knowledge on the subject.

3.2. Field Survey

Field survey was undertaken using structured questionnaires as an instrument of the study. A total of seventy questionnaires were administered to professionals in the construction industry. More attention was paid to two cities in the South West of Nigeria namely; Lagos and Ibadan where many of the consultants are based and where most of the construction works in Nigeria are concentrated.

4. Presentation Of Results

Data obtained from the study are presented under the following headings:

4.1. Details of the Respondents

A total of 51 questionnaires were properly completed and returned, representing 72.86% of the overall 70 questionnaires distributed. Details of the number of questionnaires distributed and the types of respondents are as follows: 25.49% of the respondents were Architects, Builders, were 23.531% of the respondents, Engineers and Quantity Surveyors were 15.69% each, Town Planners were 5.88%, Estate Surveyors were 7.84% and others made up 5.88%. In terms of educational background, 7.84% of the respondents had National Diploma, 29.41% had Higher National Diploma, 35.29% were Bachelors' degree, 11.77% had Masters' degree, 3.92% had Ph.D. while 11.77% had other qualifications.

4.2. What indicators are used to provide insight in to potential risks into potentials risks in the construction industry?

The respondents had varying answers for the indicators that provide insight to potential risks in the construction industry Table 1 shows their answers as follows using scale of 1-4 where:
1- Strong Disagree, 2- Disagree, 3-Agree, 4-Strongly Agree

s/n	Response	Number of response	% of response
1	Strongly disagree	20	39.22%
2	Disagree	14	27.45%
3	Agree	10	19.61%
4	Strongly agree	7	13.73%

Table 1 : Indicators used to provide insight to potential risks
Source: Field Survey, 2014

Table 1 show that more than 66% of the respondents disagree and/or strongly disagree to the use of indicators to provide insight to potential risks. About 33% of the respondents use indicators to provide insight to potential risks in the construction industry in South West of Nigeria. The above shows the level of ignorance even among professionals on the danger posed by risks to the success of the project in the construction industry in the South West of Nigeria which could be implied on a general note to the whole country.

4.3. Rating scales of different risks' assessments in relation to organizations objectives.

In this survey, major different types of risks' assessment that relates to construction industry organizations' objectives were carried out. The respondents marked their assessment as to the importance they viewed them using scale 1-4 where: 1=Not important, 2=Less important, 3=Important, 4=Very important. Details of the results are presented in table 2.

S/N	Risks Assessments in relation to organizations objectives	Frequency						
		1	2	3	4	f	Fx	Mean ($\bar{X}$)
1	Strategic risk assessment		2	20	29	51	180	3.50
2	Operational risk assessment	2	1	25	23	51	171	3.35
3	Internal audit risk assessment	5	8	29	7	49	136	2.78
4	Financial statement risk assessment	2	2	33	13	50	147	2.94
5	Fraud risk assessment		1	19	30	50	179	3.58
6	Market risk assessment	5	9	16	21	51	155	3.04
7	Credit risk assessment		2	30	19	52	170	3.33
8	Customer risk assessment	1	7	17	26	51	170	3.33
9.	Supply chain risk assessment	2	7	20	20	49	156	3.18
10	Security risk assessment	1	2	20	27	50	173	3.46
11	Information technology risk assessment	2	3	19	27	51	173	3.39
12	Project risk assessment	4	7	29	11	51	149	2.92

Table 2: Risks' Assessment
Source: Field Survey, 2014

Table 2 above shows response on the importance attached to different risks' assessments by different organizations with respect to their objectives. Fraud averaged 3.58 (very important), Information technology 3.39 (Important), Operational 3.35 (Important), Credit and customer 3.33 (Important) each, supply chain 3.18(Important) and market 3.04 (Important), Financial statement averaged 2.94(Less important), Project 2.92 (Less important) and internal audit 2.78(Less important)

5. Discussion of the Results

From the survey report and presentation, it was seen that the field survey result clearly revealed that majority of the respondents (above 66%) do not use indicators to provide insight to possible potential risks. The respondents perceived fraud risk assessment (3.58-very important) and strategic risk assessment (3.50-very important) as the most important measures likely to distort the achievement of the organizations' objectives. All the other measure are important and if proper checks are applied could help different organizations to achieve their objectives.

However, a lot of awareness need to be created in the construction industry in Nigeria as a lot of the professionals does not see the need to carry out risks' assessments so as to help in the achievement of the organizations' objectives.

6. Conclusion

It should be noted that this research work is on effective risk identification and assessment in the construction industry in Nigeria with particular emphasis in the South West of Nigeria. Therefore, it has been clearly established from this research work that:

- Leading indicators are very important to provide the needed insight into potential risks in the construction industry in Nigeria.
- Proper identification and assessment of risks/hazards must begin and end with specific organization objectives in view.
- A proper identification and assessment of risks/hazards effectively will yield forward looking insight; not only allowing organizations in the construction industry to avoid risks, but providing greater and more meaningful clarify around the risks they do face.

7. Recommandations

Based on the result obtained from this research, the following recommendations are proffered:

- Proper identification and assessment of risks/hazards should be done systematically and consistently throughout the organizations in the construction industry so as to help the management to focus its attention on the most significant risks and thereby help them to make more informed risk decision.
- Risks/hazards should not be over-controlled so as not to stifle innovation, as higher the risk higher should be the profit.
- Through proper and effective risk identification and assessment many companies in the construction industry can coordinate multiple risk responses better, thereby reducing the occurrence of negative events with their associated losses.

- As many of the hazards/risks cannot be foreseen at the conception of many projects, the hazard/risk management should be the responsibility of the clients, consultants, construction company's employees and management.

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