



Exploring the Factors Influencing the Implementation of Risk Management Techniques in the Execution of Public Building Projects in Damaturu, Yobe State, Nigeria

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Abstract: Implementation of risk management techniques on construction projects by most construction companies is still considered inconsistent. The paper aimed to explore the factors influencing the implementation of risk management techniques in the execution of public building projects in Damaturu, Yobe State, Nigeria, with a view to enhancing the successful delivery of public building projects. The paper used descriptive design and survey strategy for data collection. The paper used proportionate convenience sampling techniques and questionnaire was used for data collection from building professionals which served as the population for this work. Descriptive analysis was used for data analyses. The finding in this paper observed that the factors influencing the implementation of risk management techniques which ranked high in the study area are economic instability, bureaucracy of government, lack of continuity in the different project phase, labor shortages, productivity issues and inadequate integration of knowledge management with a mean item scores of M 3.86, STD of 0.968, M 3.70, STD of 1.156, M 3.56, STD of 1.030, M 3.49, STD of 1.128, M 3.45, STD of 0.990 respectively, while the factors that were ranked least are environmental protection, lack of formalized procedure and the issue of sub-contractor's default with a mean item scores of M 2.40, STD of 1.178, M 2.39, STD of 1.221 and M 2.36, STD of 1.192 respectively. The paper recommended that the construction firms should invest in human resources: this can address labor shortages, productivity issues and inadequate integration of knowledge management in capturing and sharing lessons learned from previous project, through effective workforce planning and training programs. This can significantly influencing the implementation of construction projects risk management practices in the execution of public buildings project.

Keys: Factors, Implementation, Risk Management, Techniques, Execution, Public Building, Projects

Introduction

Risk management technique involves the establishment of risk consciousness, integration of basic principles of risk policy and organizational integration. This allows through proactive action, the project to be prepared for unavailable problems and an increased transparency (Marotta & McShane, 2018). Hassel and Cedergren (2021) reported that risk management is an ongoing process throughout the entire project life cycle as risk will continually change. Risk management is the process of identifying, assessing and responding to risk and it is important to work as an integrated project team from the earliest possible phases in order to identify and efficiently deal with risk when they arise. The benefit of the process is clearer

understanding of the specific risk associated with a project supported decisions by detailed analysis and a buildup of historical data that can be used to assist future risk management techniques. Unfortunately, many project managers have still not realized the importance of implementing project risk as an integral part of project delivery (Hada, Shaw & Pokhrel, 2021).

However, an inefficient implementation of risk management techniques is often caused by the lack of formalized procedure, the lack of continuity in the different project phases and an inadequate integration of knowledge management and interaction between process and parties. During the construction process the major responsibility to deal with risks is laid upon contractors by deciding if the risk should be reduced, avoided, transferred or retained (Boateng, Ameyaw & Mensah, 2022). Construction project due to its nature allows a lot of possibilities for many environmental, socio-political and other problems during pre-contract and post contract stage leading to completion time problem, cost overruns or exceeding budget in project and poor quality finish (Khan, Kim, Mathiassen & Moore, 2021),

Therefore, there are cases of construction projects underperformances in Nigeria which are very much attributable to non-implementation of construction project risk management. One of such case is reported by Abbas *et al.* (2021) that about 56,000 construction projects commissioned by various Nigeria administrations as far back as 1962, to date have failed or abandoned. Some of these projects according the National Bureau of Statistics (NBS, 2019) which ranges from railroads to steel mills, highways to airport which are estimated to have a combine value of about 17 Trillion Naira are said not to have been to an effective project risks management implementation. Risks as earlier noted are inherent in all projects but this paper intends to address the implementation of construction project risks management in Yobe State, Nigeria.

Literature Review

In construction perspective, risk are generally considered as incidences that influence the principal objectives of a particular project (time, cost and quality), as a result of its construction activities that are perceived to be unique features as; project taken long period, with process that are complicated, financial intensity, environment that are abominable and organization structures that are dynamic, also when dealing with risks, most construction industries are known for their poor reputation, this is because many project do not meet their cost targets and proposed dateline, which in turn adversely effects each of its participants (clients, consultant and contractors) (Bahamid & Doh, 2017). According to Wehbe, Al Hattab and Hamzeh (2016), risk may be described as “a systematic way of looking areas of risk and consciously determining how each should be treated”. The strategies to manage risk include transferred the risk to another party, avoiding the risk, reducing the negative on probability at the risk. Or even accepting some or all of the consequence of a particular risk, failure to adequate deal with uncertain, unpredictable and undesirable event has been shown to cause serious effects of risk that can be summarized as: Failure to keep within cost estimate Failure to achieve the required completion date, Failure to achieve the required quality and operational requirement, Risk perception by the construction industry requirement, Organization of risk management, Management of risk, Risk premium in construction projects, Current usage of risk management technique.

Risk Management in Nigeria Construction Industry

Nigeria has the largest economy in West Africa and 3rd largest in Africa. It is ranked 30th in the world in terms of Gross Domestic Product (GDP). The country operates mono-product

economies which depend totally on the export of crude oil. In 2001, the export of crude oil was estimated to be 98.7% of foreign exchange earned (Olaniyan, 2019). He further estate that oil wealth is believed to be a key driver to construction industry across the major oil producing economies like United Arab Emirates, Saudi Arabia and Russia. For instance, the oil price boom of 1970 started the growth in United Arab Emirates (UAE's) construction sector. Nowadays, from the way oil price is booming, we hope that Nigeria's construction sector will achieve its full potential soon. According to survey by Global Construction Perspective (GCP), construction growth in Nigeria would be the fastest of all markets; the survey started construction is the best sector to be and that it is expected to grow at 128 percent from 2011 to 2020 (Olaniyan, 2019).

It has been reported in previous researches that industries that patronize construction services periodically do not practice risk management in project and this has affected the project performance negatively (Ali, 2020). According to Omer and Adeleke (2019) who carried out research on entitlement and contract quarrels in a host of construction project stated that the consequence of risk occurrence that was not appropriately assessed or incorporated by either customer, contractors and consultants as one of the leading causes of claims and disputes in the construction projects. According to Boss and Sifat (2022), who assessed risk management in the Nigerian construction industry, they identified knowledge deficiency as the most intolerant issue that hinders risk management practice as well as small experienced staffs as the primary source of risk in construction activities. They posited that the significant benefit of risk management is its contribution to project success. They opined that a large number of their respondents are conscious of managing risk with regards to safety threat on site compared to identifying the concept with relations to accomplishing the objective of the project concerning cost, quality and time. They proposed that the workforce in the country's construction industry should be trained on how to manage risk (Boss *et al.*, 2022).

Adeleke, Mohd Nawi and Abd Karim (2020) investigated the possibility of occurrence and impact of certain risks factors at pre- and post-contract stages in the construction industry of Nigeria they used questionnaire as a sources of data collection. They found that at the pre-contract stage, the likelihood of occurrence of the identified risk factors are in order of design risks estimating risk, competitive tendering risk and tender evaluation risk. Their impact when occurred is also in the same manner. At post contract stage, the likelihood of occurrence of those risk factors is in order of financial risk, political risk, contractual risk, logistic risk and environmental risk. The impact in case of occurrence did not follow the same manner as the likelihood of occurrence of some risk factors in Nigeria construction industry. But in their study, they concentrated only on some certain risk factors while in the present study the applications and barriers of risk management were also investigated.

Factors Influencing the Implementation of Effective Risk Management Techniques

Risk management can be avoided unforeseen disasters. And avoid from spend more, not only financial resources as well. However, it must be able to manage risks effectively, what does it mean? Often it would be eliminating all risks disproportionately expensive, which is not desirable. Cost of risk management should not exceed losses caused by an omission of any risk. And a cost of risks management has to be included in a budget of a project. Additionally, when you work with risk it is always necessary to take into account the types of project, hence an amount of expended fund, and consider another context, because each project is unique and risk management is needed to adapt to it. In project we should try to proactive

risk management rather than reactive, which consist of ready-made strategies with a character of a preventive measure. The opposite of reactive management is that only responds to no longer risks. After approval of the project plan and resource allocation we can start the implementation of the project and project completion. An essential part of the implementation phase is monitoring and control of the actual progress of the project, which can differ from the previous plan. It is necessary to set milestone such as checkpoint and measurable indicators on the state of the project and its completion and receive regular news about realization.

The following is the comprehensive model composed of nine factors that influencing the effective risk management procedures in construction industries: Commitment and support from top management, Effective communication, Team competency and skill, Organizational structure and culture, Political factor, Information Technology factor (IT), Staff training, Active leadership, and Economic factor.

Commitment and support from top management

Boss *et al.* (2022) investigates the impact of contingency factors such as top management support, business vision, and external expertise. The results show that top management support influences the success level of the organizational system.

The paper from Boss *et al.* (2022) argues that the high importance of top management support is considered to be among the critical success factors for project management. It is also important to emphasize effective top management support for different project scenarios. Critical top management support includes a broad range of activities in an organization, including developing project procedures that include the initiation stage, training programs, establishing a project management office, support quality management and so on.

Adeleke *et al.* (2020) Suggest that “the essence of top management support related to effective decision-making to manage risk and authorize business process change”. A crucial part of a successful project is top management support, the benefit of which is related to improving decision making in order to manage risk. Top-level management responds to business processes and manages risk. Successful mitigation or bearing of risk is contingent upon commitment and support from top management.

These concepts refer to the highly needed support and approval from top management for risk management. The essence of commitment and support from top management supports the effective decision-making process in order to manage risk. Commitment and support from top management is important in every kind of management and it is thus an important factor for risk management.

Effective Communication

Communication is an important skill for leaders and top-level management. The effective leader or managers who are good at communication can set clear mutual expectations, objectives and goals. Communication ensures that the team members understand and support not only where the team is now but also what they want to be (Chukwuebia, 2019). In most cases, effective communication can be seen as hidden element for success. Open, reliable and frequent communication is pivotal for successful project with less risk. However, effective communication is vital for any organization and project team. It is required that authentic and clear information is shared at right time, right place and to right person during the construction project. Flow of information, top down/downward and bottom up/upward communication is an important aspect of project to think about. It reduces conflicts,

improve decision making and effect on team member performance to their project manager, so lack of all these attributes will influence or affect effective construction risk management in the organization. This study also confirms that effective communication positively influenced effective construction risk management.

The communication process provides opportunities for members to understand their roles and responsibilities as the structure of the organization changes. In case, the wide range of people from a broad cross-section of the business. There is involved in the risk identification and assessment process and if there are no “taboo” subject which prevent conventional wisdom within the organization being challenged when necessary. Financial institutions need to consider the concept of verifiability. If a different group of members were making the same decision about the importance of risks, it would come to the same conclusion (Chukwuebua, 2019).

Team Competency and Skill

Team competency and skills is an important variable to be considered, because it provides knowledgeable and technical human resource which is required for contractors, project managers and team members to achieve the project goals. According to research team competency and skills can be seen in terms of skills, knowledge and attitude. Team dynamics are also connected with team competency; that is what type of characteristic team have and what are the characteristics required for the project execution, thus, any organization that lacks team competency and skills, will definitely affect effective construction risk management, a positive relationship between team competency and skills with effective construction risk management.

Organizational Structure and Culture

Organizational culture as the elementary assumptions, values, beliefs and models of behavior, practices, rituals, heroes, symbols, technology and artifacts. This indicated that organizational culture is a strong tool that is associated with “behavior and attitude” of contractors, project managers and team members during execution of project which significantly influenced effective construction risk management positively.

Therefore, one of the most important aspects for effective risk management is organizational structure. Organizational structure and culture provides the concept, guideline, direction and support to the employees that are conducted by steering committee. They design and teach employees to share and use a common vocabulary. The employees work as a team in order to prevent a silo mentality and incorporate resistant employees in the process (Omer & Adeleke, 2019). National Weather Service (NWS) department of state and regional development (2015) believes that setting clear objectives and guidelines is necessary for risk management. The business and financial world is in constant fluctuation. The environmental condition will change and sometime new will develop gradually over time, while others may sweep the market quickly. Organizational structure must be reviewed regularly and adjusted to adapt to changing financial environment. The managements roles is to recommend policies for managing risk, the committees roles is to respond to review and approve them, and it is the managements role once more to implement them and report back on their operation (Omer *et al.*, 2019).

Political Factors

The influence of environmental variables such as safety, community perception, and legal acceptability, political and social impacts on project is mostly high. It was revealed that political factors includes, discriminatory legislative, covering tax regimes, riots, strikes, civil unrest, wars, terrorism, invasions and religious turmoil will positively influence effective construction risk management in an organization. The study affirmed a positive influenced of political factors on effective construction risk management.

Information Technology Factor (IT)

Organizations need to consider IT as an important factor in the face of increasing competition, higher performance level, globalization, and liberalization. IT plays a key role in achieving an organizational objective. IT relates to all aspects of the business process, including access to a shared infrastructure consisting of knowledge, human assets, core competencies, resource allocation, performance management, project tasking and communication support (Mutsaers, Zee & Guertz, 2008).

Staff Training

Today, almost all companies provide some type of training to their employee. Some company has a very formal process of training while other companies use outside consultants to conduct employee training sessions (Bahamid & Doh, 2017). The training methods used by organization can be classified into two methods. The first method is on-the-job training which provides one-on-one instruction, coaching, job rotation and an apprenticeship internship. The second method is off-the-job training which is conducted away from the worksite. It covers a number of techniques, classroom lectures, films, demonstrations, case study, other simulation exercises and programmed instruction. The endless brief, but vital if risk management is to be brought to the organization. A risk manager should set up training sessions through the directorate manager for members of staff and through the risk management team for consultants (Bahamid *et al.*, 2017).

Alzoubi (2022) shows that the ability to respond to changing condition in an organization. Operations relate to a range of activities including the development of risk training courses and the involvement of staff in responding to early warning systems.

Active Leadership

Most of the previous studies focus on leadership styles, behavior and strategies. Successful project required different kind of leadership from the normal routine project work. In construction project, there are needs for active leaders which can take serious actions on run time in order to avoid making situation worse. Active leader is one of the most important independent variable proposed in the theoretical framework. Project leader's priority is to run project in emergency situation as it will be run in normal condition (Bukar & Ibrahim, 2021). Any organization without active leadership will certainly affect effective construction risk management. The empirical of some investigation concluded that active leadership positively influenced effective construction risk management.

Economic Factor

The economic and financial aspect of an organization depend on the level of universal economic activity, as well as the available resources to execute the work, which includes the economic competition of several level around the appointment of all parties involved in building projects. The empirical investigation also confirms that economic as an external factor positively influenced effective construction risk management.

Methodology

The research design sets the procedure on the required data, the methods to be applied to collect and analyses this data but for this paper descriptive design was used to describe the factors influencing the implementation of risk management technique for public building project in Yobe State, Nigeria. The populations is made of, of an in-house public clients, contractors and consultants who are the major stakeholders in the execution of public building construction projects and the sample frame was 200 while the sample size was 132 respondents. The sampling techniques adopted for this paper was purposive sampling technique and questionnaire was used for the instrument of data collection. Statistical Package for the Social Sciences (SPSS V22) was used as a tool for data analysis while descriptive statistics was conducted to analyze the factors influencing the implementation of risk management technique for public building project in Yobe State, Nigeria.

Results/Finding

Questionnaire Administration

One hundred and thirty two (132) questionnaires were administered to practicing construction professionals in Yobe State and ninety eight (98) questionnaires were retrieved and ninety seven (97) was used for the analysis.

Table 1: Response rates

Questionnaire	Number	Response rate
Administered	132	100%
Returned	98	74%
Analysed	97	73%

Information of Respondent

The demographic information of the respondents was collected, the frequency and percentage analysis were carried out and the results presented in Table 2 below. The demographic information of the respondents where male respondents constituted the highest percentage of 89.7% while female constituted the least percentage of 10.3%. A question regarding an area of your operation most of them are operating under consulting Firm with highest percentage of 40.2%. Educational qualification attained, most of the respondents attained B.Sc/B.Tech with highest percentage of 45.4%. Educational specialization type most of the respondents are quantity surveyors with highest percentage of 28.9%. Professional bodies you are registered to most of them are QSRBN with the highest percentage of 30.9%. Management level of your status in the organization you work also most of them are middle management with highest percentage of 60.8%. Then, how long you have been involved in the construction industry most of them have 10-15years in the construction industry with highest percentage of 30.9%.

Table 2: Demographic Information of the Respondents

S/N	Questions	Options	Frequency	Percentage
1	Gender	Female	10	10.3
		Male	87	89.7
		Total	97	100.0
2	Area of your Operation	Client Organization	37	38.1
		Consulting Firm	39	40.2
		Contracting Firm	21	21.6
		Total	97	100.0
3	Educational Qualification Attained	ND	7	7.2
		HND	20	20.6
		PGD	3	3.1
		BSc/B.Tech	44	45.4
		M.Sc/M.Tech	20	20.6
		PhD	2	2.1
		Others	1	1.0
Total	97	100.0		
4	Educational Specialization Type	Architects	7	7.2
		Building Technologies	23	23.7
		Construction Managers	19	19.6
		Engineers	12	12.4
		Quantity Surveyors	28	28.9
		Others	8	8.2
Total	97	100.0		
5	Professional Body you are Registered to	ARCON	11	11.3
		CORBON	29	29.9
		QSRBN	30	30.9
		COREN	11	11.3
		CIPMN	16	16.6
Total	97	100.0		
6	Management Level of your status in the Organization you Work	Top Management	24	24.7
		Middle Management	59	60.8
		Lower Management	13	13.4
		Others	1	1.1
		Total	97	100.0
7	How Long you have been involved in the construction industry	Less than 5years	11	11.3
		5-10years	29	29.9
		10-15years	30	30.9
		15-20years	11	11.3
		Over 20 years	16	16.6
		Total	97	100.0

Table 3: Work experience

Experience	Mid Value (x)	F	%F	FX
5≤	5	11	11.3%	55
5-10	8	29	29.9%	232
10-15	18	30	30.9%	540
15-20	25	11	11.3%	275
20≥	20	16	16.6%	320
TOTAL		97	100.0%	1422

Mean years work experience = $EFX/EF = 1422/97 = 14.7 = 15$ years.

Factors Influencing the Implementation of Risk Management Techniques

Table 4 below shows the factors that influencing the implementation of risk management techniques that were ranked high by respondents are economic instability, bureaucracy of government, lack of continuity in the different project phase, labor shortages and productivity issues and Inadequate integration of knowledge management ranked highest with a mean item scores of M 3.86, STD of 0.968, M 3.70, STD of 1.156, M 3.56, STD of 1.030, M 3.49, STD of 1.128, M 3.45, STD of 0.990 respectively. While the factors that influencing the implementation of risk management techniques that were ranked least by respondents are environmental protection, lack of formalized procedure and the issue of sub-contractor’s default with a mean item scores of M 2.40, STD of 1.178, M 2.39, STD of 1.221 and M2.36, STD of 1.192 respectively.

Table 4: Factors that Influencing the Implementation of Risk Management Techniques

Factors that influencing the implementation of risk management techniques	theMean	Std. Deviation	Ranking	Remarks
Economic instability	3.86	0.968	1	Influential
Bureaucracy of government	3.70	1.156	2	Influential
Lack of continuity in the different project phase	3.56	1.030	3	Influential
Labor shortages and productivity issues	3.49	1.128	4	moderately influential
Inadequate integration of knowledge management	3.45	0.990	5	moderately influential
Lack of interaction between project process and parties	3.45	1.080	6	moderately influential
Workers health and safety hazards	3.42	1.162	7	moderately influential
Environmental protection	3.40	1.178	8	moderately influential
Lack of formalized procedure	3.39	1.221	9	moderately influential
The issue of sub-contractor’s default	3.36	1.192	10	moderately influential

The study's findings on factors influencing the implementation of risk management techniques in public building projects offer valuable insights. The finding is in line with the study by Kumar et al., (2016) which established that unstable economic conditions can make it difficult to find reliable insurance providers or negotiate favorable contractual risk transfer terms. Also, the finding supported by work of Akintoye and Meng (2003) which established that bureaucracy of government in public procurement processes can be slow and complex, hindering the negotiation and implementation of risk transfer agreements. Also a study by Loosemore *et al.*, (2016) established that lack of continuity in project phases that is frequent changes in project leadership or personnel can disrupt risk management practices and make it difficult to maintain a consistent approach to risk identification, assessment, and mitigation. Wong *et al.*, (2018) also observed that labor shortages and productivity issues that is skilled labor shortage or low worker productivity can increase the likelihood of project delays and cost overruns. Risk mitigation strategies need to address these challenges. Akintoye and Ibbs (2016) observed that inadequate integration of knowledge management in capturing and sharing lessons learned from previous projects can significantly improve risk management practices. A lack of knowledge management can hinder this process.

Conclusion and Recommendations

The study concluded that, the significant influence of socioeconomic factors on public building projects in the studied area. This likely refers to rapid fluctuations in material costs, labor costs, or currency exchange rates. How do these fluctuations impact project budgets and timelines? Are there strategies for mitigating these risks, such as fixed-price contracts or cost-escalation clauses? General economic instability can lead to funding shortfalls, project delays, or even cancellations. How does the current economic climate influence the implementation of construction risk management practice in public building projects in the study area? Are there alternative funding sources or financing models that could be explored to ensure project completion?

The study recommended that, the Construction firms should invest in human resources; this can address labor shortages, productivity issues and inadequate integration of knowledge management in capturing and sharing lessons learned from previous projects, through effective workforce planning and training programs. This can significantly influencing the implementation of risk management practices in the execution of public building projects.

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