

RISK MANAGEMENT PRACTICES IN CONSTRUCTION INDUSTRY IN NIGERIA**G. A. Shehu¹ and W. Wang²**Zhejiang University of Science and Technology, 310023, Hangzhou, China
adamshugiwa@gmail.com**ABSTRACT**

Construction projects impacts significantly in nations in terms of job creation, development of infrastructure and more, however they are associated with various kinds of risks such as financial risks, management risks, technical risks, safety risks, socio-political risks, legal risks, and environmental risks which have been briefly explained in this report. For construction projects to be successfully delivered, implementations of risk management practices are crucial in minimizing risks and the negative impacts on projects. Therefore, this study aims at analyzing risks and risk management practices in construction industry in Nigeria in the perspective of contractors.

Introduction

Project risk is regarded as an event or occurrence that is uncertain which could positively or negatively impact on the objectives of a project i.e. project scope, cost, project duration and project quality (Baloi and Price, 2003). Risks are considered as threats to project success, and are triggered by lack of proper management (PMBOK, 2000). In construction industry, risk management is broad and requires systematic process of identifying, analyzing and responding to risk in order to achieve the desired project outcomes (Adeleke et al, 2018). Unlike other industries, the construction industry is challenged with an enormous degree of risks and uncertainty (Salleh et al, 2020).

Lack of appropriate risk management practices have been linked to waste of time, cost and effort inputted in a construction project. Although risks in construction projects are inevitable and almost impossible to completely eradicate, implementing appropriate risk management practices is crucial in managing various types of risks (Adeleke et al, 2018). Effective risk management approach requires the implementation of appropriate systematic methodology, particularly from the area of knowledge and experience.

Studies have shown that project managers, contractors and consultants hardly apply systematic risk management approaches in the construction industry in Nigeria, consequently causing a negative impact on project performance (Salawu and Abdullah, 2015; Adeyemo and Smallwood, 2017; Adeleke et al, 2018). Furthermore, Ireogbu (2005) asserted

that construction industry in Nigeria hardly place emphasis on risk management practices during construction project which usually results in project failure in the long run. Serpell et al (2014) believed that construction firms (both private and public) in emerging countries have been applying insufficient risk management practices which resulted in poor project outcomes often time. This study aims at assessing risk management practices in the construction industry in Northern Nigeria.

The aim of this study is to identify various risks associated with construction industry in Nigeria and the various risk management practices that are in place to reduce risks among construction firms.

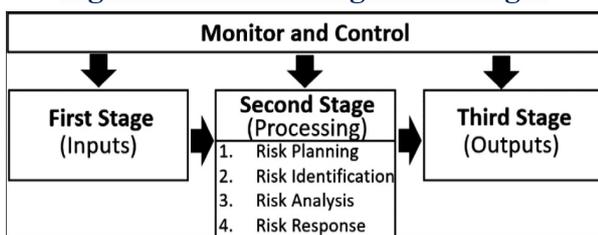
Unlike other industries, the construction industry is challenged with an enormous degree of risks and uncertainty (Salleh et al, 2020). Lack of appropriate risk management practices have been linked to waste of time, cost and effort inputted in a construction project (Rohaninejad, M., & Bagherpour., 2013; Zhao et al, 2013). Risks in construction projects are inevitable and almost impossible to completely eradicate which could significantly impact on productivity and performance of construction projects. According to Baloi and Price (2003), "there is a gap between risk management techniques and the practical application by construction contractors, despite the frequent use of construction projects in management research and the development of several tools and techniques for risk management".

Risk management process consists of techniques and tools used in mitigating risks

and uncertainty, and exploiting the opportunities of positive occurrences. Bahamid and Doh (2017) defined risk management as tools and methods that are comprehensive and organized towards identifying, analyzing and responding to risk factors with the end goal of accomplishing the project goals. Mhdawi et al (2020) defined risk management as “a systematic approach to planning for evaluating, treating and monitoring the risky events of the project”. Risk management process which includes identification, analyzing and responding to risks should be implemented in all phases of construction projects (Bahamid and Doh, 2017; Adeleke et al, 2018).

According to Smith et al (2013), the two main objectives of risk management in construction projects are avoidance of threats and exploitation of opportunities. Kendrick (2015) asserted that effective risk management emphasizes on reducing risk consequences and supporting the practices that adopt an innovation for sufficient and significant benefits to be achieved. For effective risk management to be applied in construction projects, Mhdawi et al (2020) asserted that 3 main stages should be performed successfully which includes: Inputs, Processing and Outputs. The diagram below (Figure 1) illustrates the 3 main stages of risk management.

Figure 1: Risk Management Stages



Source: Mhdawi et al (2020)

Risk Management Stages

Stage 1: Inputs

The first stage requires assembling and regular update of basic data regarding construction project. The basic data consists of detailed and overall project scope, project schedule, project cost, construction methods, contractual obligations, quality management plans, health and safety plans, and historical data (Project Management Institute, 2013).

Stage 2: Processing

In this stage, activities such as planning, risk identification, risk analysis, risk response and risk control are conducted. These activities are conducted with the main goal of increasing the possibility and effect of positive occurrences and minimize the possibility and impact of adverse occurrences that may likely occur in the construction project (Mdhawi et al, 2020).

Planning

This planning stage provides apparent and comprehensive information on the operations needed to be achieved by the risk management team. All tasks are defined and scheduled, and risk factors that are linked with the project are observed, evaluated and documented. For risk management plan to be helpful and successful, it requires ample data which must be obtained through the project work breakdown structure (WBS), cost schedule and project performance standards (Mdhawi et al, 2020).

Risk Identification

This phase is highly important in the process of risk management, as failure to identify any risk factor could result in poor implementation of the whole process. At this phase, all risk profiles are constructed (Mdhawiet al, 2020). Risk identification enables firms involved in risk management to: detect the most effective and essential input data; have increase knowledge of the importance of the practice; detect risks and their impacts; and furnish decision makers with adequate and relevant data (Bahamid and Doh, 2017; Salleh et al, 2020). Techniques applied in identifying risks especially in developing countries include: brainstorming, checklists, past experience, and interviews with experts.

Risk Analysis

This involves critically evaluating prospective risks, placing them in the order of priority, and enabling the risk management team to choose the ones that are crucial (Serpell et al, 2015). The goal of risk analysis is to understand clearly the circumstances and consequences of the risk which enables risks to be sorted out in the order of priorities with regards to a specific risk management strategy (Bahamid and Doh, 2017). In construction projects, risk analysis enablesthe importance of risks to be realized by

utilizing two approaches- Quantitative and Qualitative risk analysis (Mdhawi et al, 2020).

Risk Response

This involves developing response actions based on the risk management strategy with the aim of minimizing threats to the project goals. Risk management response consists of 4 diverse actions which include Risk Avoidance, Risk Mitigation, Risk Transfer and Risk Acceptance (Mdhawi et al, 2020).

Stage 3: Outputs

This stage involves providing meticulous risk management plan which is available in a risk register and obtained from the outputs of the operations stage. In the risk register, identified risk factors, risk analysis techniques and outcomes, and risk response actions are embedded therein (Project Management Institute, 2013).

Risk Control

For risk management to be successfully implemented, monitoring and controlling all operations firmly is crucial (El-Sayegh, 2014). Mdhawi et al (2020) asserted that various monitoring techniques are required for various risk factors by various individuals at different time duration. Thus, control and monitoring of risks must systematically track and assess the efficiency of all risk response actions that have been adopted (Gorecki and Bizon-Gorecka, 2017).

Risk Management in Construction Industry

Construction industry is risk-filled as a result of complicated operations. The implementation of risk management has been widely embraced in various firms in construction industries across the world as it is regarded as a major approach for minimizing risks, which can be achieved by identifying strengths, weaknesses, opportunities and threats in a firm (Salleh et al, 2020).

Construction industry can be threatened by internal and external factors which can impact negatively on the eventual outcome of the project. In the construction industry, risks are considered as a mixture of operations that can affect the project with regards to the duration of completion, project scope, project cost, and project quality. Thus, risks in construction industry include financial risks, management

risks, technical risks, safety risks, socio-political risks, legal risks, and environmental risks (Kumar and Narayanan, 2020).

After a construction contract has been gained, the contract can be threatened by financial risks such as price fluctuation, price increase of materials, and FOREX fluctuation which can result in project loss, cost overrun, project failure and abandonment of project (Dziadosz et al, 2015). Management risks can such as poor communication among construction team members, poor feasibility study, poor project organization structure, poor planning, poor leadership, poor project evaluation with regards to scope, time and duration can have significant impact on construction projects which can lead to project delay or project failures (Kumar and Narayanan, 2020).

Technical risks that can significantly affect the performance of construction project include shortage of skilled and competent workers, poor/ lack of training of workers, shortage/ poor quality of construction materials, government restrictions, delay in decision making by the organization, lack of planning and scheduling, incomplete design, poor site conditions, etc. (Osaghale et al, 2015; Amarasekara et al, 2018; Kumar and Narayanan, 2020).

Safety risks in construction industry include slips, trips and falls, risks from construction equipment/ machinery, working with hazardous materials, etc which can cause accidents, harm, injury and death to workers (Kumar and Narayanan, 2020).

Construction projects can be impacted by socio-political risks such as changes in government policies, poor infrastructural development, poor economic growth, bureaucracy, red tape, bribery and corruption (Damoah and Kumi, 2018).

Legal risks in construction industry occur due to lack of proper documentation of construction contract, lack of records and poor maintenance of files and bills throughout the progress of the construction project which could result in disputes, conflict and litigation (Rauzana, 2016).

Construction projects are impacted by environmental factors such as climate change,

natural resources, ecosystems which can cause risks such as pollution (air, noise), dust generation, and vegetation removal which can affect the health and safety of workers at the construction site (Rizqa and Abusharar, 2014).

Objectives

The broad objective of this work is;

1. To examine the factors contributing to poor risk management practices in Northern Nigerian construction industry.
2. To examine the factors that will help towards the development of risk management practices in Nigerian construction industry.
3. To determine the various kinds of risks related to construction project with a high potential of occurring during construction projects in the Nigerian construction firms.
4. To develop a risk management model that will be suitable in addressing risks in Nigerian construction industry.

This research study will be conducted with the aim of providing answers to the following questions:

1. What are the risks present in construction projects in Nigeria?
2. What are the risk management practices implemented in Nigerian construction industry?
3. How can risk management practices in Nigerian construction industry be improved?
4. What are the factors that can enhance the development of risk management practices in Nigerian construction industry?

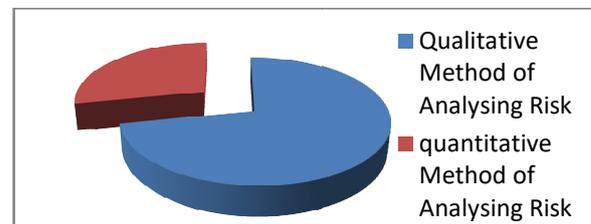
Conceptual Clarification

This study focuses on assessing risks and risk management practices within the Nigerian construction industry based on the perspectives of professionals in the industry (i.e. contractors, developers, architects, engineers, quantity surveyors, etc) from small and large construction firms. This study is limited to the perspective of professionals within the Northern part of Nigeria and does not gain certification an in-depth perspective of the Nigerian construction industry as a whole.

The work is limited to Risk Management practices in construction industry in Northern

Nigeria. And it will clarify the claim on the use of Risk Management practices methods and procedure in Northern Nigeria.

It has been found that the use of risk management techniques in building construction in Northern Nigeria is low (Ishak S. 2009). Most of construction industries in Northern Nigeria are applying Qualitative methods when analyzing and identifying the risky event over the quantitative method. The absence of the risk management team in Northern Nigeria within the project Management culture, weak risk planning, the lack of risk management training and knowledge within the construction firm were found to be the main barriers preventing the execution of effective risk management process.



Methodology

This research study will apply 2 methods of data collection which are primary data and secondary data. Primary data will be obtained by using a well-structured questionnaire which will be administered via emails and online platforms to 300 respondents within the northern part of Nigeria. To obtain a large amount of data from a large number of respondents in a cheaper, fast and efficient manner, questionnaire is a suitable tool and data collection method for this study. Secondary data will be obtained from relevant academic journals, articles, research study, and other publications.

Bahar et al (1991) describe the first step in risk analysis and evaluation processes as the collection of relevant data to the risk exposure, which might be historical data collected through past project experience by the contractor. Furthermore, they describe the modeling of uncertainty of a risk exposure where the likelihood of occurrence is presented in terms of probability and potential consequences in financial monetary terms. Having form the uncertainty of various risk

events the next step according to them is to assess the overall impact of these risks through techniques such as Monte Carlo simulation.

The quantification of risks is the magnitude and frequency of each event, and every event can be a collection of incidents or a single of incident. In order to quantify and evaluate the risks one can implement various analysis methods, everything from subjective estimation to probability analysis etc. (Williams, 1995).

One of the most common used methods for assessing risks sources according to (Winch, 2010) is the probability an impact matrix as

illustrated in *fig. 4*. The classification of the risks is made in terms of their probability of occurrence and the extent of their impact. It allows a prioritization of the risk on the project in terms of them being manageable or not. Qualitative high to low scales can be used for the assessments known knowns (Winch 2010). PMI (Project Management Institute) describes the probability and impact as dimensions of risk that are applied to specific events, as oppose to the overall project.

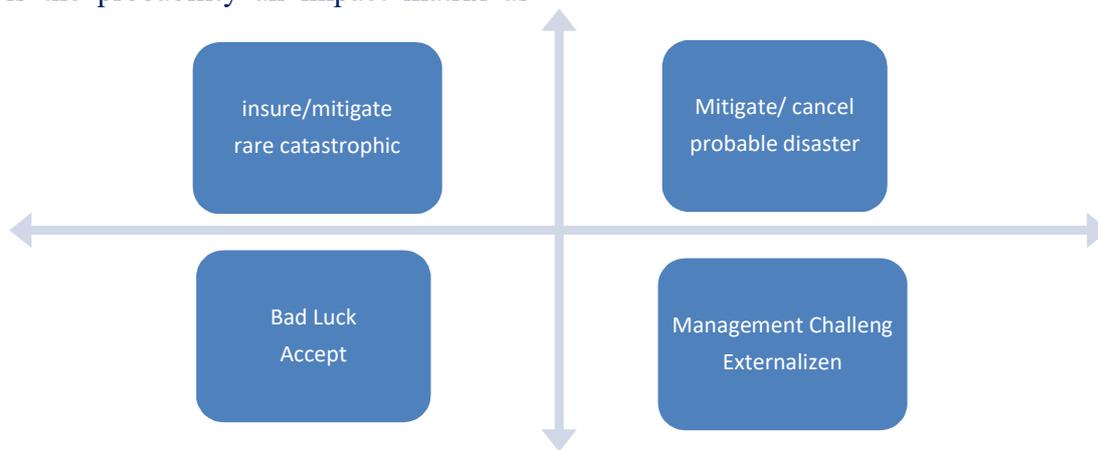


Illustration of Probability & Impact Matrix (Winch 2010).

The usage of a risks matrix is often applied when dealing with static risk, i.e. risk that only

have a negative effect. It resembles the probability matrix.

Probabilty Impact	Unlikely	Uncommon	Common	Very Likely	Likely
Negligible	Keep	Keep	Keep	Keep	Keep
Small	Keep	Keep	P.I	P.I	P.I
Medium	Keep	P.I	Insure Against	Insure Against	Insure Against
Big	Insure Against				

Illustration of a risk matrix (Flanagan et, al., 2007)

By positioning various risks on the matrix it facilitates an overall view of them, which makes the most urgent and important risks more visible. Additionally, it helps to indicate if the risks can be mitigated through a decrease of their probability or of their consequences (Chan & Wang, 2013).

Qualitative and Quantitative Analysis

A compilation of the most commonly used methods when assessing the identified risks are listed below, including a description of each one.

Qualitative Methods

Probability & impact assessment can be applied in order to evaluate the likelihood of a specific risk to occur. The risk impact on project objectives is assessed in terms of opportunities and positive effects as well as threats and negative effects. It is important to adapt and define the probability and impact to the specific project.

The risk matrix method can be used additionally by having probability and impact

as a basis for further analysis. The priority score can be computed as the average of the probability and impact and the priority score range, rate and color are given to illustrate each risk's significance.

The high priority score threats, meaning high impact and likelihood, are viewed as high-risk and could necessitate an urgent response while low scored threats could be further monitored and given attention only if needed.

Risk categorization is applied as a way to systemize the threats according to their sources, in hopes of identifying areas with the highest exposure to those risks. The usage of this method breaks down activities into small units and creates hierarchical series of activities, additionally the method can include risk dependencies and a prioritization of them depending on how quick response they require.

Quantitative Methods

Sensitivity analysis is implemented in order to identify uncertain components in the project, which will have maximum impact on the outcome. The aim is to look at the sensitivity of various elements of the risk model on project outcome, by changing the values of one variable at a time and then showing the impact on the project.

Probabilistic analysis is a method used to show the potential impact of different level of uncertainties on project objectives. It quantifies the effect of risks on project schedule and budget and it uses three point estimates such as worst case scenario, most likely scenario and finally best case scenario for each task. Monte Carlo Simulation is most often used for this type of analysis.

Decision tree is a useful method to frame the problem and evaluate various options. The usage of this method consists of decision tree diagrams used to represent the project and show the effects of each decision (Mhetre et al., 2016).

Risk Register

The risk database as shown in fig 6 is a central tool in risk management for monitoring the risk management process (Cooper et al., 2005). The design of the register depends on the organization, the type of projects and the people involved. It is essential that the

organization creates a customized version of the register that suits them in order for it to be fully used as intended, as opposed to being an additional burden in a demanding work schedule. In order to facilitate registration, storage, management and sorting of information the register should be incorporated in a database (Flanagan et al., 2007). All the identified risks and results of their analysis, associated action plans and evaluation as well as the status of the particular risk are registered within this list. Throughout the entire project life cycle there should be updates and reviews of the risk register. The register is a central component because it facilitates monitoring and correcting progress on risk mitigation measures, it helps identify new risks and close down expired risks as well as adjusting the assessment of existing risk etc. (Potts, 2008) Risks that are no longer relevant due to avoidance or if they already are managed can be removed from the register together with the associated action plans. The status of action plans and specific risks should be reviewed consistently (Cooper et al., 2005).

According to (Schieg, 2006) new additional risks, risk status and the progress of the measures is required to be included. The risks that already have occurred must be documented including the amount of damage they have produced. Furthermore, he states that a big part of the monitoring of risk (which is the last phase) is the internal control system, where the responsibility of monitoring early indicators is allocated to specific people. In order for this process to work effectively there should be a reporting and meeting arrangement in place for the project and the organization as a whole.

Risk Response

The third step in the process of risk management signifies what actions should be taken towards the various risks and threats previously identified (Mhetre et al., 2016) The planning process of risk response is defined by PMBOK as the development of options and determining actions to enhance opportunities as well as reduce threats to the project objectives. This process involves the assignment of parties to take responsibility for each agreed risk response, and the efficiency of this phase will determine if the risks increase or decrease for

the project. Literature suggests that there are mainly four risk mitigation strategies that can be implemented in order to reduce exposure to the risks associated with a project. Mills (2001) provides an example where incorporated risk control measures resulted in an added value, showing how risk and opportunity go hand in hand. The example he gave was an instance where a hoist was provided instead of ladders to reduce the risk of people falling. The additional benefits from the risk control measures taken were an increase in people's mobility and in turn their productivity.

Avoidance

A response in form of avoidance can be justified if the risk is estimated to have serious consequence on such level that may warrant a reappraisal of the entire project (Potts, 2008). One can use avoidance to cope with risk by changing project plans in a way that makes the risk inappropriate (Klemetti, 2006), it might be necessary to reappraise the concept or maybe cancel the project. This method promotes changing project plans to facilitate the elimination of the risk or to protect the project objectives from the potential negative impact. An example might be avoiding an unfamiliar subcontractor (PMI, 2000). Other examples are extending the schedule or reducing the scope of the project (Karimiazari et al., 2010). The aim of risk avoidance might also be to reduce the risk via contractual countermeasures. Additional measures that can be taken into account is procedural changes, regular inspections, skill and training enhancement, more detailed planning, preventive maintenance and the selection of alternative approaches (Cooper et al., 2005).

Transfer

This response approach involves transferring the risks and consequences to third parties who are willing to accept responsibility for its management and the liability of the risk (Mhetre et al., 2016). This method is most effective in regards to dealing with financial exposure to risk. It includes the use of both contracts and insurance to transfer liability to other parties, for instance by contractor to subcontractor and often involves payment of risk premium to the party that is taking on the risk and responsibility of the consequences

(PMI, 2000). In order to avoid secondary risk in case the agent (third party) fails to meet obligations, the transfer should only be done when the agent is in a better position to manage the risk than the principal (Winch, 2010). The main purpose is to ensure that the risk is owned and managed by the party best able to handle the task successfully (Mhetre et al., 2016).

Mitigation and Reduction

This approach means to mitigate the risk by changing the scope of the project to minimize the likelihood of the damaging event occurring (Winch, 2010). Implementing risk management early in the project to reduce the probability of the risk event occurring is more effective than trying to repair the damage and consequences after the risk has passed. The mitigation of risk may be done by adopting less complex processes or changing conditions so that the probability of impact is reduced, other forms of action is adding resources and extra time to the schedule (PMI, 2000). Flanagan et al (2007) describes implementing an altered construction method and the use of other materials to reduce potential risks, or executing a new or more detailed planning. Additional reduction strategies include contingency planning, quality insurance, separation or relocation of activities and resources. In practice these categories might often overlap in some fashion as in this case where insurance also can be a mitigation strategy, sharing characteristics with risk transfer (Cooper et al., 2005). However, risk reduction can only be used a few times in a project before the project might become unmanageable (Flanagan et al., 2007).

Acceptance

It is impossible in reality to take advantage of all opportunities and eliminate all threats to the project, but it is possible to at least be aware of the threats and opportunities through the documentation and identification of them. The usage of this strategy is justified when it is not possible to respond to the risk by the other strategies, or when the grandness of the risk makes a response unreasonable (Mhetre et al., 2016). This risk response approach essentially means taking a conscious risk and to deal with the consequences as they occur. This indicates a decision not to change any project plans in order to deal with the risk or engaging in any

other response strategies (Cooper et al., 2005). As described above the risk response stage involves planning and execution and should be iterative. Having an effective control process adjacent can ensure the correct execution of this phase (Klemetti, 2006). When it comes to specifically high-impact risks but also with all types of risks, one of the most beneficial risk management strategies is to delay the decision until more information comes to light (Winch, 2010).

Risk Monitoring

Continuous monitoring and review of potential risks is an important in regards to the implementation of the risk management process. It guarantees new risks are detected and managed. The project manager should monitor a list of the major risks that have been identified for risk treatment action, which should be a primary tool used management meetings (Cooper et al., 2005). This is the final phase of the process and it is equally important as the others. Given that more information emerges one can reassess the probability and impact of the risks, and once the potential risk event has been passed they can be removed from the risk register (Winch, 2010)

Knowledge in relation to Risk Management

the construction industry is an industry where knowledge is the core competence, execution of construction activities requires expert knowledge and experience-based problem solving solutions. Most of the knowledge in the construction sector is obtained through the firms various projects, it is therefore desirable that lessons learned from previous projects is captured and used again in future projects (Maqsood, 2006). The management of knowledge is a discipline that is associated with risk management, the process of knowledge management both influences employees' know-how as well as enhancing the knowledge distribution among team members (Rodriguez & Edwards, 2008). The new knowledge that is generated within each of the previous projects is often lost as involved parties retire or move to a new assignment, resulting in a loss of both tacit knowledge and a potential source of competitive advantage. It is only possible to truly reflect on the real consequences of actions when they are

evaluated in hindsight (Anumba et al., 2005). A lack of storing, distributing and sharing information and knowledge generated by each project will ultimately affect the decision making process negatively (Serpella et al, 2014). The process of managing knowledge in the construction industry might not be the easiest undertaking given the inherent characteristics of the industry, in which phases are fragmented and temporary in nature (Tan et al., 2010). Construction projects are often inherently complex and filled with uncertainty. Risk- and knowledge management are increasingly becoming an extensive component of the project management of construction projects, in a pursuit to efficiently deal with unexpected events and uncertainty (Banaitene & Banaitis, 2012).

The Concept of Knowledge

The most fundamental distinction, when describing the concept of knowledge, is between "tacit" and "explicit" knowledge. Tacit knowledge inhabits the minds of people and is difficult to articulate (King, 2009). It is the knowledge that you need in order to succeed in an endeavor, it is not formally taught and is can usually not be verbalized. The implicit or tacit knowledge, i.e. experience based knowledge has the potential to be transferred to a community at large or the whole organization at question (Sternberg, 1997). Explicit knowledge is knowledge that is easily conveyed and codified (Frappaolo, 2006). It exists in the form of documents, organized data, and computer programs. A fundamental issue that often is discussed when describing knowledge is the notion of explaining tacit knowledge and then be able to make it accessible for use by others (King, 2009).

Knowledge Management

In orders to establish an efficient risk management, it is of course required to have a systematic methodology but also various knowledge and experience, the latter might be considered even more important in a lot of cases (Serpella et al., 2014). Given the potential economic and technical implication of loss of knowledge that is bestowed on organizations and individuals, it is considered crucial that strategies exist that deals with the

issue of knowledge preservation. Although describing knowledge management might be a hard task given the lack of a singular definition, it can be stated that knowledge management is the leveraging of collective wisdom to increase responsiveness and innovation. Further, it also requires a culture that promotes faith in the notion of a collective thinking and sharing practice (Frappaolo, 2006). Knowledge management is often described as the retaining, using and sharing experiences and knowledge learned and the transfer of best practices, it is the management of experiences and tacit knowledge at a personal and organizational level. The sharing of knowledge and lessons learned is a critical area of knowledge management, hence why it is important to be able to capture experiences learned from other projects (Ly et al., 2005). The contractual parties should adopt and maintain a continuous learning approach, from which they can gain further experience leading to a better future state for the parties when a new risk is encountered. The management of information and knowledge of a construction projects is therefore essential in order to achieve a successful risk management (Perera et al., 2009).

Knowledge management is an organized and systematic approach in order to improve the firm's ability to mobilize knowledge resulting in an enhanced decision-making, enabling proactive action and delivering results in line with the business strategy (Hsu & Shen, 2005). The use of information in order to capture risk management experience enables project managers to share and learn from others by tapping into a centralized knowledge repository. Data should be stored and organized so that individuals as well as teams can be able to access, evaluate, and share it with colleagues and act upon the findings effortlessly (Tah & Carr, 2001).

Organizational Learning in the Construction Industry

Previous research from Serpell et al (2015) has observed unwillingness among companies to contribute to research in risk management within the construction industry, given their lack of knowledge. A way to conceptualize the relationship between knowledge management

and organizational learning is by motivating the creation and application of knowledge. The initiatives pay off by facilitating the organization to embed knowledge into various organizational processes, such as risk management, in order to continuously improve its behaviors and practices. Therefore, organizational learning is intrinsically important in the pursuit to sustainably improve the organizations utilization of knowledge (King, 2009).

Communities of Practice

The challenge is to incorporate the right method in order to enable the process of uncovering tacit knowledge and knowledge sharing. The best possible solution to the issue might be the implementation of Communities of Practice (Khuzaimah & Hassan, 2012). These are social, interactive networks of individuals, with similar experience and problem solving skills, within a defined topic of knowledge and it is a tool to facilitate knowledge sharing in a learning environment (Wenger & William, 2000).

SECI-model

A specific knowledge conversion model for explaining the transfer of knowledge was presented by Nonaka and Takeuchi (1995), namely the SECI-model. The model consists of several methods, however only two of them are going to be mentioned given their relevance.

Socialization (from tacit to tacit knowledge):

This method is the process of sharing tacit knowledge through practice, participation in various communities, imitation and observation (Yeh, Huang, & Yeh, 2011). The purpose of Communities of Practice is to promote the uncovering of tacit knowledge by encouraging socialization among employees with similar interests, i.e. socialization is bringing together like-minded individuals (Frappaolo, 2006). Hence, new knowledge can be converted through shared experiences when using this approach. This can be applied to the construction industry by implementing apprentice-based professions, where more experienced senior project managers have the opportunity to mentor junior project managers.

Data Analysis

Data analysis is a crucial stage in a research study as it enables the researcher and reader to comprehend the results of the data obtained from the survey in the research study. The data obtained from the respondents of this study who are professionals from the Nigerian construction industry will be analyzed and the results will be interpreted. As discussed above, data will be collected using questionnaire and questionnaires with completed responses will be analyzed. Although hundred percent survey response rate is not expected, a 65% and above response rate is regarded as suitable for this research study.

The results of the questionnaires that have been returned will be outlined and each will be represented as a percentage over the total number of questionnaires, thereby presenting the rate of respondents and the certain responses they chose. The results will be represented by pie chart and histogram.

Descriptive analysis will be used in conducting a statistical distribution of the data which will enable typos to be detected, and correlations among variables can be identified. IBM SPSS v.21 will be used.

Conclusion

The complex nature of construction projects has been a major cause of risks and vagueness in construction industry in Northern Nigeria. Other factors that lack of safety measures, and

poor risk management practices among others. The aim of any project team in embarking on construction project is to accomplish project objectives within the estimated and available cost, producing high quality result within the scheduled duration. This implies that the requirements of clients are to be met with bare minimum available cost, high quality outcome and within the specified duration. An occurrence or action that impedes on the triumph of these objects can be regarded as a project risk. Although risks in construction projects are inevitable and almost impossible to completely exterminate, implementing appropriate risk management practices is crucial in managing various types of risks. Lack of apt risk management practices have been linked to waste of time, cost and effort inputted in a construction project.

Recommendation

This study focuses on assessing risks and risk management practices within the Nigerian construction industry based on the perspectives of professionals in the industry (i.e. contractors, developers, architects, engineers, quantity surveyors, etc) from small and large construction firms. This study is limited to the perspective of professionals within the Northern part of Nigeria and does not gain certification an in-depth perspective of the Nigerian construction industry as a whole.

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