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Validating the Influence of Effective Communication, Team Competency and Skills, Active Leadership on Construction Risk Management Practices of Nigerian Construction Companies

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Abstract

The purpose of stressing the importance of risk management among construction companies is to reduce the effects of risk on projects and make the construction activities more profitable, completed to quality standards, time and budget. This significant deliberation has stimulated various research interests by construction companies, specifically viewing the risk in construction activities that affect project performance; (time overrun, cost overrun and low quality) as the significant risks attached to the projects from the global point of view. Using Partial Least Squares-Structural Equation Modeling approach, this study validates construction risk management (CRM) as a construct from the perspectives of 238 local, national and multi-national construction companies in Nigeria. A cross-sectional survey was conducted where data was gathered from companies through a structured questionnaire. Findings from this study disclosed that effective communication, team competency and skills with active leadership have a significant influence on construction risk management (CRM) practices of the Nigerian construction companies.

Keywords: Construction Risk Management (CRM); Effective communication; Team competency and skills; Active leadership; Partial least squares – Structural equation modeling.

1.Introduction

Risk management is an important role undertaken by a project manager. However, the project manager's duty is predominantly difficult and wasteful if proper risk management has not been put into practice from the initiation of the project until the closure (Adeleke *et al.*, 2016b). Efficient and effective risk management approach entails proper systematic methodology and, importantly from the aspect of experience and knowledge of the project manager. Previous research findings in Nigeria have disclosed that; owners, contractors and consultant do not systematically apply risk management practices in the Nigerian construction industry which on the long-run results in negative consequences on the projects' performance (Bakar *et al.*, 2012).

Therefore, lack of an effective project risk management function has a lot of adverse consequences for participants in a project due to improper risk plans that address the risks and uncertainty that any project may encounter. For instance, lack of prevention against the risk of poor project scope, environmental hazards, communication risks, poor- site management, or slow decision making among others, leads to delays, significant increases in costs and contractual disputes and litigation among others (Lewis *et al.*, 2003).

Previous research in Nigeria have shown that industries that employ construction services on a periodic basis do not systematically apply risk management practices in projects, which has resulted in poor project performance. For example; total abandonment of project (Aibinu A. and Jagboro, 2002). Also, the research investigated by Ojo (2010) on claims and contract disputes on some of construction projects, reflected the event of risks occurrence that was not well analyzed or integrated either by the clients, contractors and consultants as one of the leading causes of claims and disputes on the projects.

Presently, there considerable literature on risk management from global perspectives; (Aibinu A. A. and Odeyinka, 2006) identified 44 risk factors affecting Nigerian construction companies, While Sambasivan and Soon

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(2007), (Ali *et al.*, 2012) recognized 28 and 8 risk factors respectively as affecting Malaysian construction companies. Similarly, Lo *et al.* (2006)associated 30 risk factors to Hong Kong construction companies. However, the influence of effective communication, team competency and skills with active leadership as internal organizational factors influence on construction risk management in Nigerian local, nation and multi-national construction companies have not been giving considerable attention. Therefore, this study examines the influence of the previously mentioned internal organizational factors on the risk management practices of Nigerian construction companies.

2. Literature Review

2.1. Construction Risk Management (CRM)

In this study, construction risk management is conceptualized with five (5) dimensions which are management risk, material risk, financial risk, design risk, labour and equipment risk, following (Adeleke *et al.*, 2016); (Aibinu A. A. and Odeyinka, 2006).

Zavadskas *et al.* (2010) posit that the contractor's assessment of risks and the selection stages should consider some factors that influence the process of construction efficiency.

Similarly, it was found by Moe and Pathranarakul (2006) as cited by Ghoddousi and Hosseini (2012) that lack of proper care by the management of construction projects studied in Iran resulted in the following factors that made construction workers less productive while working on the construction site are; poor housekeeping, poor lighting in the work area, excessive moving of skillful people from one project to another, inadequate ventilation, uncontrolled breaks, inadequate tools and equipment, high employee turnover, shortage of restrooms and drinking water and impromptu decision making by the supervisors.

Jarkas *et al.* (2015) also affirmed late delivery of materials as the principal construction risks confronting Qatar construction companies, while the findings of Manavazhi and Adhikari (2002)shows that delays in the delivery of materials to the construction site, have a high impact on the overall schedule cost for the entire project.

Allocation of sufficient time and money at the design phase is one -of - the essential requirements to reduce some of the risk factors like time -delay and cost overrun in the project (Koushki *et al.*, 2005). While the design is one of the most serious categories because the related factors associated with it were identified as the key risks in construction projects byFereig and Kartam (2006).

2.2. Effective Communication

In most cases, effective communication is a hidden element for success. The disposition of the research warrants an examination of this variable and whether it influences risk management practices as stated in the theoretical research framework. Reliable and frequent communication is essential for a successful project with less risk. This variable is vital for any project team or organization. It is necessary that authentic and clear information be disseminated at the appropriate time and place to the right person during the construction project. Also, the flow of information, either top down or bottom up communication is essential for participation and effective project management. It also lessens conflicts, and improve decision making and convey the project team member's performance to their project manager (Doloi *et al.*, 2012); (Adeleke *et al.*, 2017).

2.3. Team Competency and Skills

Team competency and skills are an important variable to be considered, because these provide knowledgeable and technical human resource which are necessary for contractors, project managers and team members to achieve the project goals. Team competency and skills concerns skills, knowledge and attitude. Team dynamics are also connected with team competency; that is what type of characteristics team have and what are the characteristics required for the project execution. These should be the priority of every organization to educate/ train the project managers with the team members on competency and skills. Reduction of risks in construction project cannot be effective without the participation of project team members. Team member's competencies and skills are essential for a successful project delivery, which require effective training to increase their competencies (Moe and Pathranarakul, 2006).

2.4. Active Leadership

Most of the previous studies place emphasis on strategies, leadership styles and behaviours. Successful project necessitates different kinds of leadership from the usual routine of project activities. In a construction project, there are needs for active leaders that can take serious actions on runtime to avoid making the situation worse. Active leadership is one of the most important independent variable proposed in the theoretical framework. Project leader priority is to run the project in an emergency situation as it will be run in normal conditions. For active leadership to respond to standard risk event, there are needs for proactive leaders and not reactive as proactive leaders give instructions in a project while reactive leaders try to bring a solution to the existing and foreseeable events in the projects. Proactive leaders are successful finishing the project based on the estimated budget and time. Proactive leadership is required when some uncertain event occurred in the project. The proactive leaders are the firelighters while the reactive leaders are the fire-fighters. Before a successful project can be attained, it is required to move from reactive to proactive leadership (Barber and Wan, 2005).

3. Methodology

This study adopts a cross-sectional survey research design in which data were obtained from 238 contractors (comprising of contract managers, executive directors, marketing managers, project managers and engineers) operating in Abuja and Lagos among the local, national and multinational construction companies in Nigeria. Contractors were selected as the suitable respondents for this study following the previous studies because they are the best people who have the idea of what risk is all about in construction companies (Karim *et al.*, 2012). More so, local, national and multinational construction companies were selected following. Adams (1997); Ugochukwu and Onyekwena (2013)Abuja and Lagos states were also used in this study because more construction activities are undertaken in Nigeria Adams (1997); Ugochukwu and Onyekwena (2013). Furthermore, a proportionate stratified random sampling techniques was also used in the study to select respondents from a sample frame of contractors. Finally, the scale rating from 0.1 = 'very low,' 0.3 = 'low', 0.5 = 'medium', 0.7 = 'high', 0.9 = 'very high', was used in measuring the response to the questions posed, following (PMBOK, 2000); (Adeleke *et al.*, 2016).

Measurement assessment model which is also known as the outer model is the first step in assessing PLS- SEM analysis. Hence, in order to validate the construction risk management (CRM) practices in the context of Nigerian local, national and multi-national construction companies, this study employed PLS measurement model to ascertain the individual item reliability, internal consistency of reliability, content validity, discriminant validity and convergent validity of all the constructs in this study as depicted in Figure 1 (Hair *et al.*, 2014); (Hulland, 1999); (Bamgbade *et al.*, 1761; Salimon *et al.*, 2016).

Before the pilot study, the content validity of the instrument was conducted. Content validity denotes the level at which the dimensions and items of the constructs in this study have been delineated and measured (Hair *et al.*, 2011). Which comprises consulting experts within the domain of the study to ascertain the validity of all the items. Therefore, this study item was sent out to four experts who are familiar with the constructs of this study. One of the experts was selected from the School of Technology Management and Logistics, University Utara Malaysia. While another three constructions company's practitioners were also contacted for the same validation. Their suggestions were incorporated into the last draft of the study instrument.

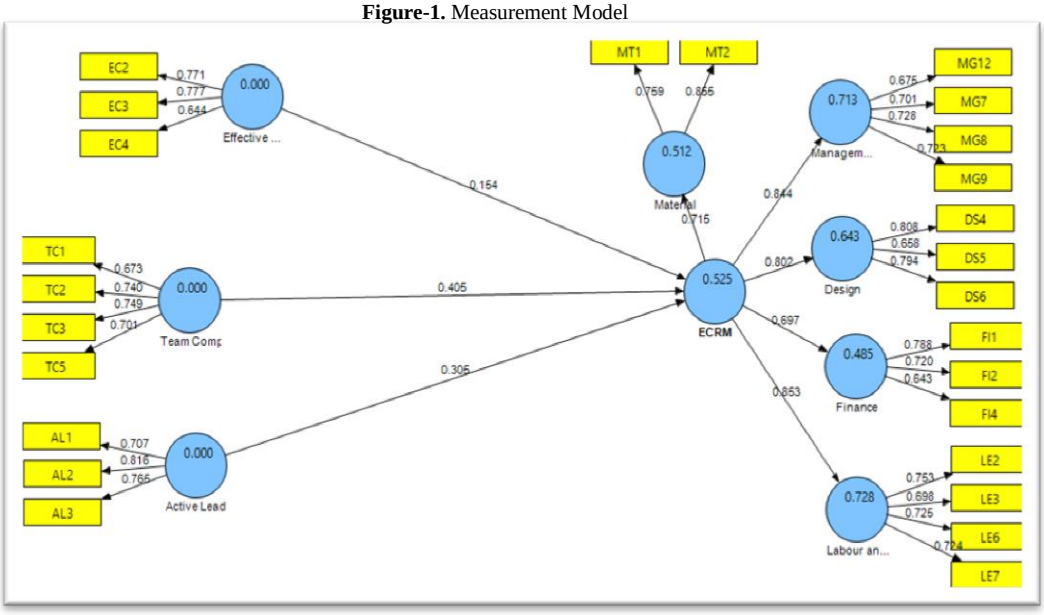
4. Results

This study sought to know the demographic profile of the respondents in the sample. The demographic features observed in this study contain positions in the company, years of experience and gender. The study found that 10.9%, 3.4%, 5.0%, 31.5%, and 30.3% of the 238 respondents were contract managers, executive directors, marketing managers, project managers and engineers, respectively. Likewise, their working experience ranged from 1 to 47 years, while males constituted 76.5% and females 23.5% of the population. Furthermore, the companies' studied specialization were in apartment buildings, roads and bridges with 36.6%, 54.7%, and 6.7% respectively. The types of company owners are made up of local, national and multinational with 63.0%, 6.3% and 30.3% respectively. Their company business location was local market areas, within a few states, regional, across Nigeria and international markets with 60.1%, 3.8%, 2.5%, 16.8% and 18.4% respectively. While the company's employees range from 10 to 7000 within the organizations studied.

4.1. Measurement Model

This study sought to examine the influence of internal organization factors – communication, leadership, team competency and skills, on the risk management practices of Nigerian construction companies. The measurement assessment model used in validating the influence of the internal organization factors on construction risk management (CRM) practices is shown in Figure 1.

Figure-1. Measurement Model



4.2. Indicator/Item Reliability

The assessment of individual item reliability in this study was conducted by examining the outer loadings of each of the latent variables(Chin *et al.*, 2003). Following the rule of thumb that assigns the holding of items with loadings between 0.40 and 0.70 (Fornell and Larcker, 1981). It was found that all the items in this model passed the threshold of 0.40, so none of the items was deleted. Hence, from the model, the items depicted the loadings rating between 0.6416 and 0.8554 (see Table 1).

Table-1. Convergent and reliability analysis

Constructs Dimensions	Items	Loadings	Composite Reliability	AVE
Effective communication	EC2	0.7709	0.7759	0.5376
	EC3	0.7773		
	EC4	0.6436		
Team competency and skills	TC1	0.6728	0.8081	0.5132
	TC2	0.74		
	TC3	0.7488		
	TC5	0.7014		
Active leadership	AL1	0.7071	0.8071	0.5833
	AL2	0.8157		
	AL3	0.7646		
Management	MG12	0.6757	0.7999	0.5001
	MG7	0.7009		
	MG8	0.7278		
	MG9	0.7232		
Material	MT1	0.7588	0.7901	0.6539
	MT2	0.8554		
Design	DS4	0.8081	0.7992	0.5722
	DS5	0.6579		
	DS6	0.7942		
Finance	FI1	0.7884	0.7619	0.5178
	FI2	0.7213		
	FI4	0.6416		
Labour and equipment	LE2	0.7529	0.816	0.5259
	LE3	0.6979		
	LE6	0.7258		
	LE7	0.7233		

4.3. Internal Consistency of Reliability

Fornell and Larcker (1981) suggested that the rule of thumb to interpret the internal consistency of reliability using composite reliability coefficient is that, the coefficient must not be less than 0.70. Table 2 shows the composite reliability coefficients of this study constructs ranged from 0.7559 to 0.8081, signifying that the internal consistency of the latent variables in this study is acceptable because they all exceed the threshold level of 0 .70. (Hair *et al.*, 2011); (Henseler *et al.*, 2009); (Bamgbade *et al.*, 2015); (Salimon *et al.*, 2017).

4.4. Convergent Validity

Table 1 depicts the cross -loadings and loadings of indicators in the individual constructs in this study. According to Hair *et al.* (2014) the validity of a specific measurement scale is convergent when items/indicators load with 0.5 and above on their respective constructs. Similarly, items are not supposed to load higher on another mother construct than on the main constructs that it is expected to measure.

4.5. Discriminant Validity

Fornell and Larcker (1981) suggests that an AVE score of 0 .50 or higher is considered adequate in a given model, which has been achieved and as depicted in Table 2. Also, in Table 2, a comparison was carried out among the square root of the AVE (appearing in bold) and the latent constructs' correlations; it was found that the AVE square roots for all the constructs along the diagonals are higher than the corresponding off-diagonal coefficients both in columns and rows and columns, suggesting adequate discriminant validity for this study.

Table-2. Discriminant validity

	1	2	3	4	5	6	7	8
1. Active Lead	**0.764**							
2. Design	0.447	**0.756**						
3. Effective Communication	0.524	0.400	**0.733**					
4. Finance	0.370	0.476	0.344	**0.720**				
5. Labour and Equip	0.553	0.583	0.451	0.502	**0.725**			
6. Management	0.491	0.607	0.416	0.485	0.606	**0.707**		
7. Material	0.498	0.471	0.428	0.385	0.556	0.534	**0.809**	
8. Team Competency and skills	0.537	0.467	0.505	0.431	0.555	0.583	0.484	**0.716**

Note. Entries shown in boldface represent the square root of the average variance extracted.

5. Discussions of Findings

The study validated the influence of internal organization factors – communication, leadership, team competency and skills, on the risk management practices of Nigerian construction companies. It was found that the factors validate the risk management practices used on construction projects.

In general, the study's results revealed that the measurements for the four constructs comprising of effective communication, active leadership, team competency and skills with construction risk management practices are valid and acceptable measures of their constructs going by their parameter estimates. The findings also revealed that all the measured items were proper measures and reliable in explaining their constructs (that elucidates construct validity). This was demonstrated by the high loading of the items, composite reliability, average variance extracted (AVE), and square roots of the AVE for all the constructs which are also in line with the previous study of Adeleke *et al.* (2015).

6. Conclusion

The study examined the influence of internal organization factors on the risk management practices of Nigerian construction companies. The study's results revealed that the measurements for the four constructs of internal organization factors comprising of effective communication, active leadership, team competency and skills with construction risk management practices are valid and acceptable measures. Based on these findings, it can be concluded that efficient and effective risk management approach entails proper systematic methodology and, importantly from the aspect of experience and knowledge of the project manager and their communication skills. This knowledge would enable the application of apply risk management practices in the Nigerian construction industry which would result in positive project performance.

Though this study has revealed some understanding of the role of internal organizational factors (effective communication, active leadership, team competency and skills) in construction risk management, this is not without limitations. First, since the present research adopted a cross-sectional design, underlying inferences cannot be made to the study population. Consequently, a longitudinal design can be used in the future research to ascertain changes over time. Second, future study can as well increase or widen the study area within the Nigerian construction companies. Therefore, future research should try to increase the study sample from the 238 being used in the present study for better results, as it was revealed in this present research that the total variance explained on construction risk management as the endogenous variable is 64%; hence future study can focus more on the variance.

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