Innovations

Project Risk Management and Performance of Public Building Projects in North Central Nigeria

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Abstract: *Project risk management provides a robust approach for managing project risks from the start to the end to help ensure that intended objectives are realized. This approach is still at the infant stage in developing countries and Nigeria is not left out. This can be viewed from the report of project failures and abandonments leading to cost and time overruns recorded by Nigeria in 2022 when about 56000 public projects were valued at ₦17 trillion (CIPMN). The study critically examined the impact of risk identification on project performance, determined the impact of risk assessment on project performance, assessed the impact of risk response on project performance, and evaluated the impact of the mediating effect of knowledge management in the relationship between risk management and project performance. The study used a cross-sectional survey research design and a closed-ended questionnaire of a 5-point Likert scale, with 5 being strongly agree and 1 being strongly disagree based on the population of 1156 where a sample size of 297 comprising the contracting companies, consulting firms and the client was drawn. The data was analyzed using Smart PLS-SEM 4. The results from testing the hypotheses using p-values are Ho_1 ($p \leq 0.000$), Ho_2 ($p \leq 0.000$, Ho_3 ($p \leq 0.000$) and Ho_4 ($p \leq 0.000$) indicating that all the null hypotheses were rejected based on the significance value or level of 5% (0.05). Thus, it shows that the impact of risk management on the performance of public building projects in the North Central Nigeria region is statistically significant. It is, therefore, recommended that the practice of project risk management should and must be imbibed by all the stakeholders such as contractors, consultants, clients and regulators of public building projects for the delivery of more successful projects.*

Keywords: *Project risk management, risk identification, risk assessment, risk response, project performance, project completion cost, project completion time.*

1.1 Introduction:

Project risk management is an action-oriented approach for handling project risks in any area of work to prevent failures and achieve project successes, especially in the Construction industry which is huge and of strategic global importance in infrastructure provisioning including but not limited to residential,

administrative, commercial, recreational, and industrial building projects, highways and bridges, airport construction, etc. The global construction market was valued at USD 7.28 trillion in 2021 and is predicted to hit USD 14.41 trillion by 2030, with a CAGR of 7.3% from 2020-2030 (GlobeNewswire, 2022).

Project risk management processes is viewed as the identification, appraisal and prioritizing of risks followed by the coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events and this help to adequately manage the risks and prevent project failures(Serpell*et al.,* 2017; Ali *et al.*, 2020; Kharlanov *et al.*, 2022). Unfortunately, the Nigerian construction industry is plagued with many industry-specific challenges, especially the projects handled by indigenous contractors (Abdulrahman *et al.,* 2019). Characteristically, Nigerian indigenous contractors are predominantly small and medium-sized sole proprietorships, generally known for poor project performance (Ogbu &Adindu, 2019).

Inadequate project working tools, awareness about modern risk-handling techniques, poor risk assessment; poorly trained risk personnel; poor communication among project stakeholders and, poor budget allocations for training on risk management practices of the construction firms operating in the region has even further complicated the problems (Hatamleh, 2020; Parvari& Rostami, 2021). The informal practice involves heavy reliance on personal experience and skills through a comparative analysis of similar projects by project managers, rather than a more scientific approach to risk management (Abdulrahman *et al.,* 2019; Adeleke *et al.,* 2018). Sadly, these problems and many more constitute critical risk factors that threaten the overall performance of public buildings within the study area, and a major source of worry to project management practitioners, scholars, and stakeholders in the region.

The identified challenges also account for the low project performance of construction firms operating in the region in comparison to their counterparts across the globe, especially those in other developing economies. A review of extant literature reveals a dearth of contemporary empirical research establishing the nexus between project risk management and project performance in Nigeria's building construction industry with specific emphasis on the North Central Nigeria region, hence a major factor that underpins the critical importance and needs for this study to bridge the gap.

1.2 Research Questions:

To address the above research problem, the following questions are raised:

i. What is the impact of risk identification on the performance of public building projects in North Central Nigeria?
ii. What impact does risk assessment have on the performance of public building projects in North Central Nigeria?
iii. To what extent does risk response impacttheperformance of public building projects in North Central Nigeria?

iv. What impact does knowledge management have in mediating the relationship between project risk management and the performance of public building projects in North Central Nigeria?

1.3 Research Objectives:

The specific objectives of the study are to:

i. determine the impact of risk identification on the performance of public building projects in North Central Nigeria
ii. evaluate the impact of risk assessment on the performance of public building projects in North Central Nigeria
iii. ascertain the impact of risk response on the performance of public building projects in North Central Nigeria
iv. assess the impact of knowledge management in mediating the relationship between project risk management and the performance of public building projects in North Central Nigeria

1.5 Research Hypotheses:

Ho_1 Risk identification has no significant effect on the performance of public building projects in the North Central Nigeria region

Ho_2Risk assessment has no significant effect on the performance of public building projects in the North Central Nigeria region

Ho_3 Risk response has no significant effect on the performance of public building projects in the North Central Nigeria region

Ho_4 Knowledge management has no impact in mediating the relationship between project risk management and the performance of public building projects in North Central Nigeria

2.0 Literature Review:

This section covers the conceptual review and framework, theoretical framework and empirical review.

2.1 Conceptual Review:

Project performance generally describes the overall outcome of a project (Le *et al*., 2021). In the construction industry, project performance measures the ability to complete a project according to desired specifications, within a specified budget, and schedule while keeping the customer and other stakeholders happy (Yang *et al.*, 2021; Leariwala& Kamau, 2021). The requirements for project performance are subjective, multi-dimensional and potentially dynamic throughout the life of a project. However, the two common indicators used for the measuring of performance are project cost and time

Project risk management is viewed as the identification, appraisal and prioritizing of risks followed by the coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events (Serpell*et al.,* 2017; Ali *et al.*, 2020; Kharlanov *et al.*, 2022). Karami *et al.* (2020) also viewed project risk management as the orderly process of

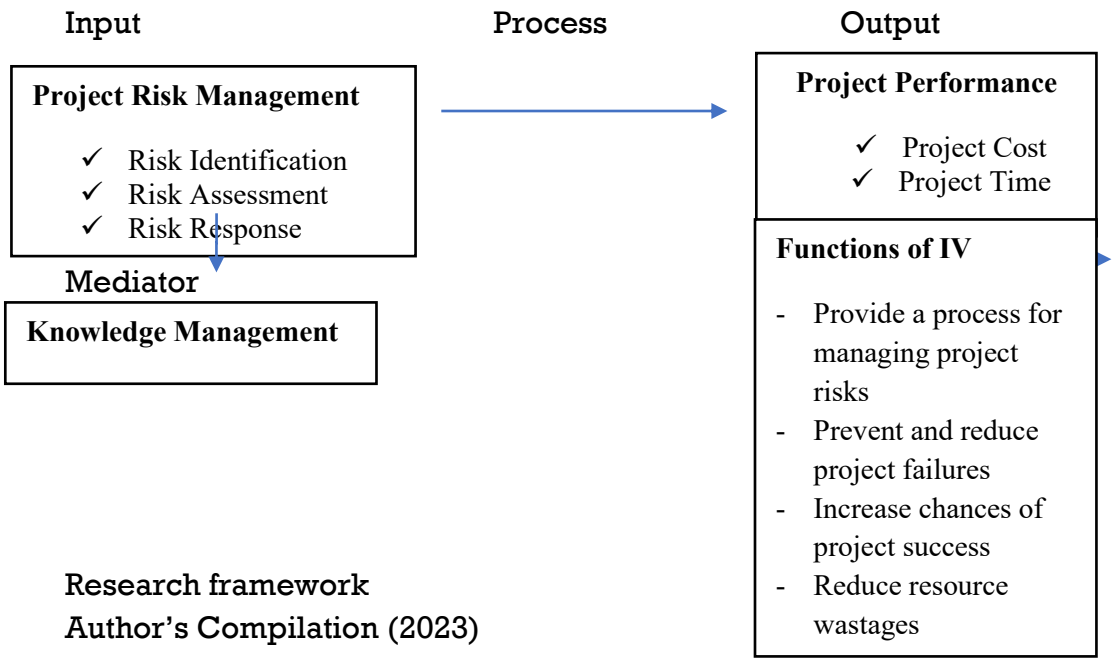
systematically identifying, analyzing and responding to risks to achieve the optimum level of risk reduction or even elimination (Karami *et al.,* 2020).

Risk identification is the process of determining and recording the risks that can affect project objectives (Amoah & Pretorius, 2019). Risk analysis is the intermediate process between risk identification and responsewhichinvolves an estimation of the frequency or possibility of the occurrence of a particular identified risk, and the degree of impact that the risk is likely to have on the objectives of a project(Chattopadhyay& Putta, 2021; Bahamid*et al.* 2022).Risk response and treatment is to minimize the potential impact of the risk when it occurs(National Treasury Republic of South Africa, 2022; Kirira et al., 2022).

This study adapts the three (3) stagesof the project risk management process identified by Algremazy et al., (2023) who worked on the Effect of Risk Management Practices on Project Performance: A Case Study of the Libyan Construction Industry. The independent variable (risk management practices) was dimensioned into three proxies; risk identification, risk assessment and risk response and monitoring. Also, the dependent variable (project performance) was dimensioned into four proxies; project cost, project time, project quality and project scope, The study used this conceptual framework to create the research framework.

Research Framework:

The study introduced knowledge management as a mediator to strengthen the relationship. A mediator in research is to help understand what exists beyond a simple relationship between two variables (Nurittamont, 2021). The knowledge management as a mediator, though was adapted from Chin et al. (2020), is based on its importance to give a deeper understanding beyond the simple relationship between project risk management and project performance. Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight on a subject matter (Serpell*et al.,* 2019). Knowledge is a critical resource for construction projects as they have become more complex and challenging in recent years. It is the fact of knowing about something with understanding (Deveaux *et al.,* 2021).



Research framework
Author's Compilation (2023)

2.2 Theoretical Framework

Theory triangulation was employed for the study where Contingency Theory (CT), Dynamic Capabilities Theory (DCT) and System Theory(ST) are jointly usedto anchor the study because of their flexibility, support and dynamism in continuous improvement to surmount constraints. They are also the leading theories for strategic management in recent years for competitive advantage (Nayal et al., 2021; Chen et al., 2020).

CT was postulated in 1964 by Fred Edward Fiedler, a psychologist from Austria (Ogeto & Thonga, 2020). CT posits that there is no one optimal way to organize a company's resources to achieve consistently excellent performance (Akinleye and Kolawole, 2020). Rather, a company's management team must decide the best course of action to take on a case-by-case basis depending on the internal and external conditions facing the company (Shala *et al.,* 2021). CT assumptions include i) there is no "ideal" organizational structure that suits all environments and ii) an organization might need to adopt different approaches to deal with different issues (Tangpong*et al.*, 2019).

The DCT was propounded in 1997 by New Zealand born, US-based organizational economist David John Teece and his colleagues, Amy Shuen and Gary Picaso. The theory defines an organization's dynamic capability as its ability to combine, enhance and rearrange its internal and external competenciesto deal with rapid changes and development in its operating environment. The DCT argues that a firm must develop three dynamic capabilities to be able to effectively survive unexpected changes in its operational environment: i) Employees must be able to learn quickly and to develop strategic assets, ii) the strategic assets developed must be successfully integrated into the firm's operations and iii) the firm must be

able to reinvent and reuse assets that have lost some of their value. The ability of a firm to efficiently achieve these three dynamic capabilities is referred to as corporate agility.

System theory was developed by Ludwig Von Bertalanffy in 1940s. The theory states that in a system all things are interconnected and no object can be studied in isolation. The main assumption of the theory is that a complex system is made up of multiple smaller systems and it is the interactions between these smaller subsystems that create a complex system (Isaacs, 2019). Concerning organization, system theory is about managing projects through open approaches for flexibility in decision-making to adapt to changing environments (Njue, 2021).

2.3Empirical Review:

Several studieswere reviewed based on their connection with the research questions and are divided into those focusing onthe construction industry and those focusing on otherindustries.

Hanggraeni*et al.*, (2019) aimed to develop the role of internal factors, external factors, and risk management variables on Micro, Small and Medium Enterprises (MSMEs') business performance in 5 underdeveloped regions of Indonesia (that is, East Java, West Sumatra, North Sumatra, West Nusa Tenggara, and East Nusa Tenggara). Data was collected using online questionnaires from 1401 MSMEs and analyzed using descriptive analysis and a graphical representation, then correlation and multiple regression test. Findings revealed that all independent variables show a significant positive influence on the dependent variables of the MSME's business performance.

Similarly, De-Araujo (2021) sought to investigate how to adapt project risk management in SMEs with a positive cost–benefit ratio. Using exploratory and explanatory research conducted through multiple-case studies involving 10 projects performed in Spanish and Italian SMEs, the findings of the study highlight how project features (commitment type, innovativeness, strategic relevance and managerial complexity) and firms' characteristics (sector of activity, production system and access to public incentives) influence PRM adoption, leading to different levels and types of benefits. Saeidi *et al.* (2019) further explored the effect of Enterprise Risk Management (ERM) on both financial and non-financial firm performance and the moderating role of intellectual capital (IC) and its dimensions on the relationship between ERM and firm performance. Questionnaires were distributed to 84 Iranian financial institutions and structural equation modeling was used to analyze the data collected. The findings of the study revealed that ERM had a positive relationship with firms' performance. Results also revealed that the overall IC had a moderating effect on ERM-firm financial performance.

In the area of risk management and building construction, Boateng *et al.* (2020) examined the current risk management (RM) practices prevailing in the building construction project delivery in the Ghanaian construction industry. Qualitative

data were obtained through semi-structured interviews and analyzed using the content analysis technique. Quantitative data was also obtained through survey questionnaires and analyzed using fuzzy synthetic evaluation. Respondents were selected from three public Universities and construction firms in the highest building contractor financial class known as D1K1. Findings revealed that RM is not implemented in a systematic, deliberate and continuous manner, however, risks are dealt with in an ad-hoc manner.

In the same vein, Amoah and Pretorius (2019) also investigated risk management processes in small construction companies and the impact of risk management on their project deliverables in South Africa. The study used 5 indicators in measuring project performance; they include schedule, quality, client satisfaction, budget and lastly, health safety and environment. Using the case study of a single construction company, data was collected through a mixed method of data collection (a structured questionnaire distributed to 16 respondents and interview of 2 Managing Directors who are involved in the case study's project execution). The study also adopted the qualitative means of observation to collect qualitative data which were analyzed using the Excel analytical tool and the content analysis method. Findings revealed that small construction companies do not have specifically laid down risk management processes for their project teams to follow during project execution. Findings also revealed that there is no conclusive evidence regarding the impact of risk management on project performance, as most of their projects met minimum set targets, even though risk management exercises were not done.

3.0 Methodology:

The research design is informed by the positivist research philosophy which sought for neutrality and independence of the researcher to take an objective stance. Therefore, the study adopted a cross-sectional survey research design method which provides for the collection of data from respondents at a particular point in time and tries to establish a connection between two or more variables. The data was collected from the experts/ practitioners in the construction industry and the owners(Sponsors) of the public buildings.

The total population of the study is 1,156 comprising of the sponsor (Government) who is represented by the Federal and State Ministries of Works, the contractors (performing organizations) who are the construction firms that either constructed the buildings or the ones carrying out the construction works and finally, the Consultants (Independent Supervisors) who carried out the designs of the buildings and also provided independent supervision of the construction works (Source: Bureau ofrecords, HRD of Federal and States Ministry of Works and Housing and the HRM of Federal Capital Development Authority). At the construction firms' level, respondents are made up of the project managers of all the building construction firms whose Companies are registered with the Bureau of Public Procurement (BPP) and may, also, be members of the Real Estate

Developers Association of Nigeria (REDAN) and are operating in the North-Central States of Nigeria (made up of Benue, Kwara, Nassarawa, Niger and Plateau States, as well as the Federal Capital Territory). A sample size of 297 was obtained using the "Taro Yamane Formula" of 1967.

A proportionate tratifiedsimple random sampling technique was adopted for the selection of respondents whoparticipated in the study. The technique was adopted because it gives all members of the population an equal chance of being selected (Jamaan & Abdullah, 2019).

The technique also ensuresafair selection of cases among the categories is conducted to promote representativeness (Isaacs, 2019). The formula for the proportionate stratified random sampling was as set by Babbie (2001) which is given below:

$t_b = (N_b/N) \times t$

where: t_b= sample size for the stratum, Nb= population size for the stratum, N = total population size and t = total sample size. The three strata are: 35 for Sponsor; 87 for Contractors and 175 for consultants.The study adopted a primary source of data collection because it provides authentic data; it is specific and up to date as it is reliably collected directly from the source (Dialysa, 2019; Palil *et al.,* 2020). A closed-ended questionnaire containing a list of questions from which the respondents were required to tick the relevant answers in the spaces provided. Data collected from the respondents was used for the quantitative analysis.

3.4 Validity and Reliability of the Instrument:

Convergent validitywas adopted and measured using average variance extracted (AVE) assessed through the PLS-SEM measurement model. The minimum value of AVE should be higher than 0.40 as suggested by Hair, et al. (2019). As can be seen from Table 1below, all the constructs satisfied the requirements and it is then concluded that the convergent validity was met.

Table 1: Construct Reliability and Validity of the Indicators

	Cronbach's Alpha	rho_A	Composite Reliability	Av. Variance Extracted (AVE)
Knowledge Mgt .	0.803	0.854	0.856	0.472
Project Comp. Cost	0.927	0.941	0.943	0.708
Project Comp. Time	0.828	0.853	0.873	0.504
Risk Assesst. Factors	0.857	0.888	0.881	0.606
Risk Ident. Factors	0.862	0.888	0.888	0.575
Risk Response	0.727	0.772	0.851	0.661

Source: SMART PLS Output, 2023

Reliability refers to the degree to which an instrument yields consistent results and to achieve this the study adopted the internal consistency method using Cronbach's Alpha and composite reliability. Cronbach's Alpha was introduced by Lee Cronbach in 1951. The choice of internal consistency is because it helps to provide an indicator of how well the different items measure the same variable.

Internal consistency is measured by calculating a statistic known as Cronbach's coefficient alpha, and composite reliability (CR) as suggested by Hair, et al. (2019) as a requirement for the structural equation model. Generally, Cronbach's Alpha and composite reliability have a range between 0 to 1 and the closer it is to 1 the greater the internal consistency of the items in the scale. However, greater than 0.6 is acceptable while below 0.6 is unacceptable (Isaacs, 2019). From Table 1 above, the Cronbach alpha and composite reliability of the constructs exceeded the 0.700 threshold. Therefore, the construct reliability is said to have been met.

3.5 Model Specification:

With the two key performance indicators (project cost and time), three independent variables (risk identification, risk assessment and risk response) and one mediating variable (knowledge management), the structural equation modeling assumes the following model equations adapted from Javaid et al., (2021):

$$Y_{cost} = \beta_0 + \beta_I X_{RI} + \beta_2 X_{RA} + \beta_3 X_{RR} + \beta_4 X_{KM} + \varepsilon \quad \ldots\ldots 3.1$$

where Y_{cost} is the dependent variable (project cost), $\beta_0$is the intercept or constant or regression coefficient, β_1 is the coefficient of the first independent variable, $X_{RA}$is the first independent variable (risk identification),$\beta_2$is the coefficient of the second independent variable, X_{RA} is the second independent variable (risk assessment), β_3 is the coefficient of the third independent variable, X_{RR} is the third independent variable (risk response), $\beta_4$is the coefficient of the mediating variable, X_{KM} is the mediating variable (knowledge management) and ε is the error term.

$$Y_{time} = \beta_0 + \beta_I X_{RI} + \beta_2 X_{RA} + \beta_3 X_{RR} + \beta_4 X_{KM} + \varepsilon \quad \ldots\ldots 3.2$$

where Y_{time} is the dependent variable (project time), $\beta_0$is the intercept or constant or regression coefficient, β_1 is the coefficient of the first independent variable, $X_{RA}$is the first independent variable (risk identification),$\beta_2$is the coefficient of the second independent variable, X_{RA} is the second independent variable (risk assessment), β_3 is the coefficient of the third independent variable, X_{RR} is the third independent variable (risk response), $\beta_4$is the coefficient of the mediating variable, X_{KM} is the mediating variable (knowledge management) and $\varepsilon$is the error term.

3.6 Method of Data Analysis:

Following the example of Kissi et al. (2019), this study adopts partial least square–structural equation modeling (PLS-SEM) as its primary technique of data analysis and thus the Smart-PLSM was used to generate both descriptive and inferential statistics from the quantitative data. It is a suitable method for investigating the impact of Project risk management on the performance of public buildings in North Central Nigeriawith knowledge management as the mediating variable because it allows for the examination of multiple variables simultaneously,

considering the interrelationships between them (Guenther et al., 2023). The hypotheses of the study weretested at a significance value of 5%.

4.0Discussion of Major Findings:

The discussions were divided into two parts in line with the models (project completion cost and project completion time which are the measures of project performance). The outputsof the analysis from the Smart-PLSM which aids the discussions are displayed in the tables below:

Outputs on Project Completion Cost

able 2 Path Coefficient of the Model for Project Completion Cost

	Std. Dev	**T-Stat**	**P-Value**	**Relationship**	**Decision**
KGM >PCC	0.39	28.49	0.000	Direct	Rejected
RAF >KGM	0.078	3.14	0.002	Direct	Rejected
RAF > PCC	0.081	5.77	0.000	Direct	Rejected
RIF > KGM	0.029	5.47	0.000	Direct	Rejected
RIF > PCC	0.051	11.39	0.000	Direct	Rejected
RR > KGM	0.072	13.9	0.000	Direct	Rejected
RR > PCC	0.699	5.47	0.000	Direct	Rejected

Source: SMART-PLS Output, 2023

Table 2above shows that risk identification has a positive and significant effect on project completion cost of public building projects in North Central Nigeria as seen in the p-value of 0.000, which is less than 0.05 and the t-statistics value of 11.39 which is more than 1.96. The hypothesis is therefore rejected.Similarly, Table 2shows that risk assessment has a positive and significant effect on project completion cost of public building projects in North Central Nigeria as seen in the p-value of 0.000, which is less than 0.05 and the t-statistics value of 5.77 which is more than 1.96. It is concluded that risk identification has a significant effect on the project cost completion and the hypothesis is therefore rejected. Furthermore, Table 2 shows that risk response has a positive and significant effect on project completion cost of public building projects in North Central Nigeria as seen in the p-value of 0.000, which is less than 0.05 and the t-statistics value of 5.47 which is more than 1.96. It is concluded that risk response has a significant effect on the project cost completion and the hypothesis is therefore rejected.

Table 3 Specific Indirect Effect of the Project Completion Cost

	Std. Dev	**T-Stat**	**P-value**	**Relationship**	**Decision**
RAF > KGM > PCC	0.088	3.039	0.002	Indirect	Partial
RIF > KGM > PCC	0.035	5.029	0.000	Indirect	Partial
RR > KGM > PCC	0.087	12.69	0.000	Indirect	Partial

Source: SMART-PLS Output, 2023

Table 3 above also shows that the mediation effect of knowledge management on the relationship between risk identification and project completion cost is statistically significant. The mediation made the risk identification have an indirect effect on project completion cost. Therefore, since both direct and indirect effects of risk identification on project completion cost are significant, the mediating effect of knowledge management is partial. In addition, Table 3shows that risk assessment has a positive and significant effect on project completion cost of public building projects in North Central Nigeria as seen in the p-value of 0.000, which is less than 0.05 and t-statistics value of 5.77 which is more than 1.96. It is concluded that risk identification has a significant effect on the project cost completion and the hypothesis is therefore rejected. Finally, Table 3 also shows that the mediation effect of knowledge management on the relationship between risk response and project completion cost is statistically significant. Therefore, since both direct and indirect effects of risk identification on project completion cost are significant, the mediating effect of knowledge management is partial. This means that the impact of risk response on project completion cost cannot be only through knowledge management, there are other factors under the risk identification that also impact the project completion cost directly.

Outputs on Project Completion Time

Table 4 Path Coefficient of the Model for the Project Completion Time

	Std. Dev	**T-Stat**	**P-value**	**Relationship**	**Decision**
KGM > PCT	0.039	25.815	0.000	Direct	Rejected
RAF > KGM	0.065	1.833	0.065	Direct	Accepted
RAF > PCT	0.033	8.501	0.000	Direct	Rejected
RIF > KGM	0.032	8.365	0.000	Direct	Rejected
RIF > PCT	0.037	9.006	0.000	Direct	Rejected
RR > KGM	0.053	15.201	0.000	Direct	Rejected
RR > PCT	0.051	10.051	0.000	Direct	Rejected

Source: SMART-PLS Output, 2023

Table 4 above shows that risk identification has a positive and significant effect on the project completion time of public building projects in North Central Nigeria as seen in the p-value of 0.000, which is less than 0.05 and the t-statistics value of 9.006 which is more than 1.96. It is concluded that risk identification has a significant effect on the project completion time and the hypothesis is therefore rejected. In the same vein, Table 4 shows that risk assessment has a positive and significant effect on the project completion time of public building projects in North Central Nigeria as seen in the p-value of 0.000, which is less than 0.05 and the t-statistics value of 8.501 which is more than 1.96. It is concluded that risk assessment has a significant effect on the project completion time and the hypothesis is therefore rejected.Equally, Table 4 shows that risk response has a

positive and significant effect on the project completion time of public building projects in North Central Nigeria as seen in the p-value of 0.000, which is less than 0.05 and the t-statistics value of 10.051 which is more than 1.96. It is concluded that risk identification has a significant effect on the project completion time and the hypothesis is therefore rejected.

Table 5 Specific Indirect Effect for the Project Completion Time

	Std. Dev	**T-Stat**	**P-value**	**Relationship**	**Decision**
RAF > KGM > PCT	0.088	3.039	0.002	Indirect	Partial
RIF > KGM > PCT	0.035	5.029	0.000	Indirect	Partial
RR > KGM > PCT	0.087	12.69	0.000	Indirect	Partial

Source: SMART-PLS Output, 2023

Table 5 above shows that the mediation effect of knowledge management on the relationship between risk identification and project completion time is statistically significant. The mediation made the risk identification to have an indirect effect on project completion time. Therefore, since both the direct and indirect effects of risk identification on project completion time are significant, the mediating effect of knowledge management is partial.Likewise, Table 5 shows that the mediation effect of knowledge management on the relationship between risk assessment and project completion time is not statistically significant with a p-value of 0.073. The mediation made the risk assessment not to have an indirect effect on project completion time. Therefore, since it is only a direct effect of risk assessment on project completion time that is significant, the mediating effect of knowledge management is insignificant. Finally, Table 5 also shows that the mediation effect of knowledge management on the relationship between risk identification and project completion time is statistically significant. The mediation made the risk identification have an indirect effect on project completion time. Therefore, since both the direct and indirect effects of risk identification on project completion time are significant, the mediating effect of knowledge management is partial.

5.0 Conclusion:

In conclusion, the study revealed that project risk management has a significant and positive impact on theperformance of public building projects in North Central Nigeria. Additionally, the mediation effect of knowledge management in the relationship between project risk management and project performance is also significant and positive. This concludes that project risk managementand knowledge management are highly required for the successful execution of public building projects in North Central Nigeria.

6.0 Recommendation:

Government agencies such as the Bureau of Public Procurement and Ministry of Works & Housing should fully imbibe project risk management processes and practices saddled with the responsibility of awarding and supervising Government projects (public buildings) in North Central Nigeria, the Contractors to execute the projects and the Consultants to supervise the Contractors.

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