Risk Identification Techniques and Project Success: Evidence from Building Construction Companies in Lagos State, Nigeria

O. I. Olateju[1], *S. S. Ajemunigbohun[2], I. I. Oshin[3]& R. O. Pelumi[4]
[1, 3,4]Department of Management Technology, Lagos State University, Lagos, Nigeria
[2]Department of Insurance, Lagos State University, Lagos, Nigeria

*Corresponding Email Address: sunday.ajemnuigbohun@lasu.edu.ng

Abstract
Boosting project risk identification, as evidence for productive instrument, can assist the sustenance of project success to cushion builders' income, and ensure adequate property safety in Lagos State Nigeria. This study examined the relationship between risk identification techniques and project success, with empirical evidence drawn from building construction companies in Lagos State. The study employed a cross-sectional survey design cum double sampling technique; comprising judgmental and convenience. The study employed a structured questionnaire to gather data from a sample of 147 participants. Descriptive statistic, Friedman's rank test and simple regression techniques were adopted in the data analysis. The study revealed the rank-order analysis of risk identification techniques and project success criteria. Further results also displayed the positive relationship between risk identification techniques and project success criteria of selected building construction companies in Lagos State, Nigeria. The study recommended that government agency, saddled with building control in Lagos State, should ensure physical inspection is carried out on public buildings (either completely or under construction) in order to compel builders for proper risk identification. Having carried out physical inspection, it is important for builders to be enlightened on builders 'liability insurance (being a compulsory insurance product) and thus, ensure that buildings under construction are covered by contractors' all-risk insurance policy.

Keywords: ***Risk Identification Techniques, Project Success, Building Construction Firms, Builder's Liability Insurance***

1.0 Introduction

The construction sector of any country in the globe serves as core component facet of such country's economic, social and infrastructural development. Previous studies (Aina, 2023; National Bureau of Statistics (NBS), 2023; Samson & Olaolu, 2023) noted that construction industry in Nigeria contributed 11.79 percent to nominal Gross domestic Product (GDP) in 2023 and this represents an improvement over what was recorded in 2022. This shows that construction sector in Nigeria plays a crucial role in the economic and social advancement of the nation. However, the sector encounters numerous problems and hazards that jeopardise the effective completion of construction projects in terms of time, cost, quality, scope, and stakeholder satisfaction; which probably could be imparted by poor risk management capabilities (Ajayi et al., 2022; Alameri et al., 2021; Ishaq et al., 2021; Tessema et al., 2022). Risk management evolves methodically by identifying, analysing, and controlling the uncertainties and opportunities that could impact the accomplishment of project objectives (Jarrah et al., 2022).

By and large, identification of risk is a pertinent component of risk management, which serving as the foundation for project risk assessment, response, decision-making, and successes (Gachie, 2017; George, 2020). The success of projects is well-described both by internal and external stakeholders and can vary from project to another contingent on the milieu, the individuals and project objectives. Project success is the primary objective of every construction project, as it signifies the worth and advantages that the project provides to the project owners, users, and society (Dwivedi & Dwivedi, 2021; Gebczynska & Piwowarczyk, 2022). Project success is determined by the extent to which the project fulfils or surpasses

the expectations and needs of the project stakeholders. Project success therefore is a complex and subjective idea that may be evaluated using different criteria and indicators, including time, cost, quality, scope, stakeholder satisfaction, safety, environmental effect, and innovation (Ahmad et al., 2022; Irfan et al., 2021).

The nexus between risk identification techniques and project success in construction projects is important hence there exist no rank order analysis of the risk identification techniques cum project success criteria in previous studies. The devoid of theoretical and empirical gap is also evident. Therefore, the study specific objectives are to examine the rank order analysis of risk identification techniques among selected building construction companies in Lagos State; evaluate the rank order analysis of project success criteria among selected building construction companies in Lagos State; and ascertain the effect of risk identification techniques on project success among selected building construction companies in Lagos State.

2.0 Literature Review

2.1 Conceptual review

Risk is defined as the uncertainty of outcome, whether positive opportunity or negative threat, of actions and events (Luckmann, 2015). Risk management is the process of systematically identifying, analysing, and responding to the uncertainties and opportunities that may affect the achievement of project goals (George, 2020). Risk management is essential for enhancing the efficiency, effectiveness, and reliability of construction projects, as well as reducing the negative impacts and maximizing the positive outcomes of project activities (Masengesho et al., 2021). The risk management process consists of four main phases: risk identification, risk assessment, risk response, and risk monitoring (Aven, 2016). Risk identification, as one of the core aspects of risk management, helps to provide the foundation for risk assessment and response, as well as improving the project planning and decision-making. It is the process of determining the sources, causes, and characteristics of the risks that may influence the project performance (Alsaadi & Norhayatizakuan, 2020). Risk identification should be performed throughout the project life cycle, as the risks may change or emerge over time. Risk identification should also involve the participation of the project stakeholders, as they may have different perspectives and insights on the potential risks (Gachie, 2017; Vliet et al., 2020). Studies (Hernadewita & Saleh, 2020; Project Management Institute (PMI), 2019; Sharma & Gupta, 2019) highlighted the various risk identification tools and techniques to include brainstorming, flowchart, expert opinion, risk survey, cause &effect diagram, documentation review, industry-knowledge based experience, historical information, root cause analysis, and checklists. These numerous techniques can aid project success in the construction sector.

Project success is the extent to which the project meets or exceeds the expectations and requirements of the project stakeholders (Pinto et al., 2022). Project success is the ultimate goal of every construction project, as it reflects the value and benefits that the project delivers to the project owners, users, and society (Ika & Pinto, 2022). Project success is a multidimensional and subjective concept that can be measured by various criteria and indicators, such as time, cost, quality, scope, stakeholder satisfaction, safety, environmental impact, and innovation (Albtoush et al., 2022; Oko-Osi et al., 2023). However, Zekavat and Momenian (2019) stated that non-compliance to these criteria might cause possible project failure.

2.2 Theoretical review

The contingency theory is a general theory that proposes that the effectiveness of an organization or a system depends on the fit or alignment between its various elements and the external environment (Shala et al., 2021). The contingency theory suggests that there is no one best way to design or manage an organization or a system, but rather the optimal way depends on the specific context and situation. The contingency theory can be applied to the risk identification process and the project success, as it implies that the suitability and effectiveness of the risk identification techniques and the project success criteria may vary depending on the project characteristics, project team, project environment, and project

management practices (Mahmud et al., 2021). Therefore, the contingency theory supports the hypothesis that there is a positive and significant relationship between risk identification techniques and project success, as well as the hypothesis that this relationship is influenced or moderated by various factors.

2.3 Empirical review

George (2020) evaluated the essence of risk identification in project risk management, with an overview on selected project managers. This study took an analysis of issues relating to techniques adopted for gathering risk information; significance of project risks registers, and its various categories; and project risk response and monitoring. The study examined motivation behind effective risk management plan, waste prevention of project resources, aversion of project failure, speedy delivery of project, and meeting clients' requirements.

Masengesho et al. (2021) reviewed the role of risk management (RM) and value engineering (VE) tools for project successful delivery in construction industry in both developing and developed countries. This study looked at the commonalties of risk management and value engineering for project completion to enhancing project quality, achieving the project deadline, and culminating total project costs. The study pointed out prevalent characteristics and differences that subsist between the folds in relations to construction project delivery. The study was exploratory in nature. It concluded that risk management tool cannot only address project implementation due to the fact that it produces adverse effects and minimises project success. The study thus projected that the nexus between RM and VE in such research would avert duplication of work and deliver an improved value for money hence it leads to an enhanced project result.

Rasheed et al. (2022) did a systematic review on the nexus between risk identification, assessment, and allocation in Public-Private Partnership (PPP) projects adopting Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) flowchart. In doing this greatly, 87 article papers were peer-reviewed. The results of the study established that PPPs focus had shifted from an overall risk identification and assessment technique to individual risk analysis. The study reviewed further that in developed countries, PPPs are much popular due to adverse public opinions, concerns for transparency, and concerns for value for money not being realised. The study recommended Designed-Build-Finance-Maintain (DBFM) as option to be observed in achieving the required shift for future PPPs.

Oko-Osi et al. (2023) examined the nexus between risk financing options and project success, with empirical evidence among building construction companies in Lagos State, Nigeria. The study adopted a cross-sectional survey design cum double sampling techniques comprised of judgmental and convenience. The study population employed were sixty-nine registered building construction companies with the assistance of a structured questionnaire. A simple regression technique was used, which established the nexus between risk financing options (risk retention and risk transfer) and project success, with both options producing positive relationships. The study recommended that government oversight on compulsory purchase of builders' liability insurance by building construction companies. It thus suggested that building under construction should be placed forward for contractor's all-risk insurance policy.

3.0 Research Method

This study employed a cross-sectional survey research design dependent upon a quantitative method to provide an improved perception of judgments associated the nexus between risk control techniques and project success among building construction companies. This research design supported the planning and execution of the study in a way to attain expected outcomes and thus, generated an association with the real-life world situation (Creswell & Creswell, 2018; Gray, 2017). Data gathering was conducted through a field survey among selected building construction companies with the support of a structured questionnaire. The substance of choosing the participants were due to their role in economic and social sustainability of Lagos State. The adoption of this data gathering instrument was because of its appropriateness to the study design with respect to being cost effective, attract wider coverage and sample representation, sufficiency of

time for participants to assign well thought out responses and simplicity in the administration the research instrument (Ghauri et al., 2020; Hesse-Biber & Johnson, 2015).

According to Obialo (2023), the registered building construction companies in Lagos State are 69 in number. Out of this, 37 building construction firms were selected for the distribution and collection of required data. Each of this selected companies got at least five (5) copies of questionnaire, which made its sample population to be 185 questionnaires. Out of this, 147 copies of this questionnaire were useful and appropriate for the data analysis, making up 79 percent response rate. The sampling techniques adopted were both judgmental and convenience. For judgmental, it required the opinions of the building contractors on the bases of their expertise. For convenience sampling, the readiness and availability of the participant justified it.

The study carried out tests of validity comprised of congruent, content, and criterion-related in nature. While the congruent validity was structured in accordance to preceding literature, content validity took cognisance of the measures on the survey instrument, and the criterion-relation validity took a probe of the outcomes from other related participants (Booth et al., 2016). Also, the reliability test was conducted with a Cronbach alpha estimated for risk avoidance, risk reduction, risk retention options, risk transfer options, and project success. These outcomes from this study were in line with statistical computations of the soundness of the scale, and the safety of the internal consistency.

4.0 Results and Discussion

4.1. Descriptive Analysis of Participants Responses

This section delves into the analysis of demographic variables and the hypothesis testing conducted. This phase summarizes the demographic variables and rigorously tests formulated hypotheses, aiming to either validate or refute the proposed conjectures.

Table 1: Demographic Information of Participants

Variable	Category	Frequency (%)
Gender	Male	121 (82.3%)
	Female	26 (17.7%)
Age	18 but less than 30	50 (34.0%)
	30 but less than 40	77 (52.4%)
	40 but less than 50	13 (8.8%)
	50 but less than 60	07 (4.8%)
	60 & above	00 (0.0%)
Income	Less than 1,000,000	21 (14.3%)
	1,000,000 but less than 3,000,000	48 (32.6%)
	3,000,000 but less than 5,000,000	58 (39.5%)

	5,000,000 but less than 10,000,000	12 (8.2%)
	10,000,000 & above	08 (5.4%)
Educational Qualification	BSc/HND	70 (47.6%)
	Master's Degree	28 (19.1%)
	Doctorate Degree	02 (1.4%)
	Professional Certificate	23 (15.4%)
	Others	24 (16.5%)

Source: *Field Survey, 2024*

The analysis of demographic variables reveals significant thoughts into the configuration of the studied population. The gender distribution indicates a wide gap representation, with 82.3 percent identified as male and 17.7 percent as female. This gap in gender ratio within the sample population proposes a degree of gender disparity within the building construction sector. Regarding age distribution, the data reflects a diverse age variety within the sample. The mainstream of participants falls within the age brackets of 30 to less than 40 years and 18 to less than 30 years, responsible for 52.4 percent and 34 percent, respectively. Comparatively smaller proportions are recorded in the older age groups, with 8.8 percent falling between 40 to less than 50 years, and 4.8 percent each for the 50 to less than 60 years; while nothing was recorded for 60year & above categories. This distribution indicates a relatively younger unit ruling the sample. The income presents a stimulating surface of the demographic profile. The majorities, constituting 39.5 percent and 32.6 percent, are identified as those participants who earned three million but less than five million and those who earned one million but less than three million, while 14.3 percent, 8.2 percent, and 5.4 percent were recorded for those who earned less than one million, five million but less than ten million, and ten million and above. This is evidence of 72.1 percent earning reasonable sum of income. Educational qualifications within the sample population display changing heights of attainment. A considerable portion, accounting for 47.6 percent holds a BSc/HND qualification, followed by 19.1 percent holding a Master's degree; followed 16.5 percent recorded for others; while 15.4 percent recorded for those possessing professional certificate. Only 1.4 percent was recorded for those with doctorate degree.

4.2. Descriptive Analysis of Research Variables

Table 2: Risk Identification Techniques

Variables	Scale Level					Mean	Std Dev.
	SD	D	U	A	SA		
	1	2	3	4	5		
Group approach is frequently adopted strategy among Units heads in properly identifying risk spots in my organization	2.0	2.7	1.4	38.1	55.8	4.43	0.828
My organisation uses diagrammatical lay down structure (flow chart) in risk identification	1.4	9.5	5.4	35.4	48.3	4.20	1.004
Interview sections are usually granted among experts in identifying risk	0.0	3.4	7.5	40.8	48.3	4.34	0.763

Risk survey/questionnaire is often designed in our quest for identifying risk elements within my organisation	0.7	6.1	15.0	38.8	39.4	4.10	0.920
There is an existing diagrammatical structure for identifying causes and possible effects of risks in my organisation	2.7	4.8	6.8	46.9	38.8	4.14	0.936
My organisation often engaged in documentation review of possible identified risk	0.7	4.1	12.2	40.8	42.2	4.20	0.857
Industry-knowledge based experience is always among techniques which informs our decision to properly identifying possible risk areas in my organisation	0.0	6.8	9.5	44.9	38.8	4.16	0.858
My organisation takes historical information of possible identified risks in the line of our operational activities	0.0	4.8	10.2	39.5	45.5	4.26	0.828
Root cause analysis is often carried out in respect of possible risk occurrence in the course of our organisation activities	0.7	3.4	9.4	48.3	38.2	4.20	0.799
My organisation has an existing risk checklist to possibly identify any risk occurrence relating to our operational activities	0.7	6.1	8.2	34.0	51.0	4.29	0.907

Source: Researchers' Computations, 2024

In Table 2 (Fig. 1), the risk identification survey items for which data were gathered from the entire participants were brainstorming, flowchart, expert judgment, risk survey, cause & effect diagram, documentation review, industry-knowledge based experience, historical information, root cause analysis, and checklist. The participants reacted to the numerous items, wherein 4.7 percent expressed their disagreement in terms of brainstorming, 1.4 percent indifferent, and 93.9 percent indicated their agreement. For flowchart, while participants expressed 10.9 percent in not supporting this item, 5.4 percent were undecided with it. Then, 83.7 percent supported. As for expert judgment, 3.4 percent of the entire participants exhibited their disagreement, 7.5 percent were indecisive, and 89.1 percent agreed. For risk survey, 6.8 percent disagreed, 15.0 percent undecided, and 78.2 percent expressed their agreement. For cause & effect diagram, while participants expressed 7.5 percent in not supporting this item, 6.8 percent were undecided with it. Then, 85.7 percent supported. As for documentation review, 4.8 percent of the entire participants exhibited their disagreement, 12.2 percent were indecisive, and 83.0 percent agreed. For industry-knowledge based experience, 6.8 percent disagreed, 9.5 percent undecided, and 83.7 percent expressed their agreement. For historical information, while participants expressed 4.8 percent in not supporting this item, 10.2 percent were undecided with it. Then, 85.0 percent supported. As for root cause analysis, 4.1 percent of the entire participants exhibited their disagreement, 9.4 percent were indecisive, and 86.5 percent agreed. For checklist, 6.8 percent disagreed, 8.2 percent undecided, and 85.0 percent expressed their agreement. The mean and standard deviation scores supported the outcomes for all the items surveyed. This is an indication that builders' judgments towards the survey items were normally distributed and centered around the mean. The result of the descriptive statistics on risk identification techniques obviously imply that all the metrics have similar judgments about all the subject matter in the distribution of the participants' judgments.

Figure 1: The Graphical Model explains the Risk Identification techniques among Building Construction Companies in Lagos State, Nigeria

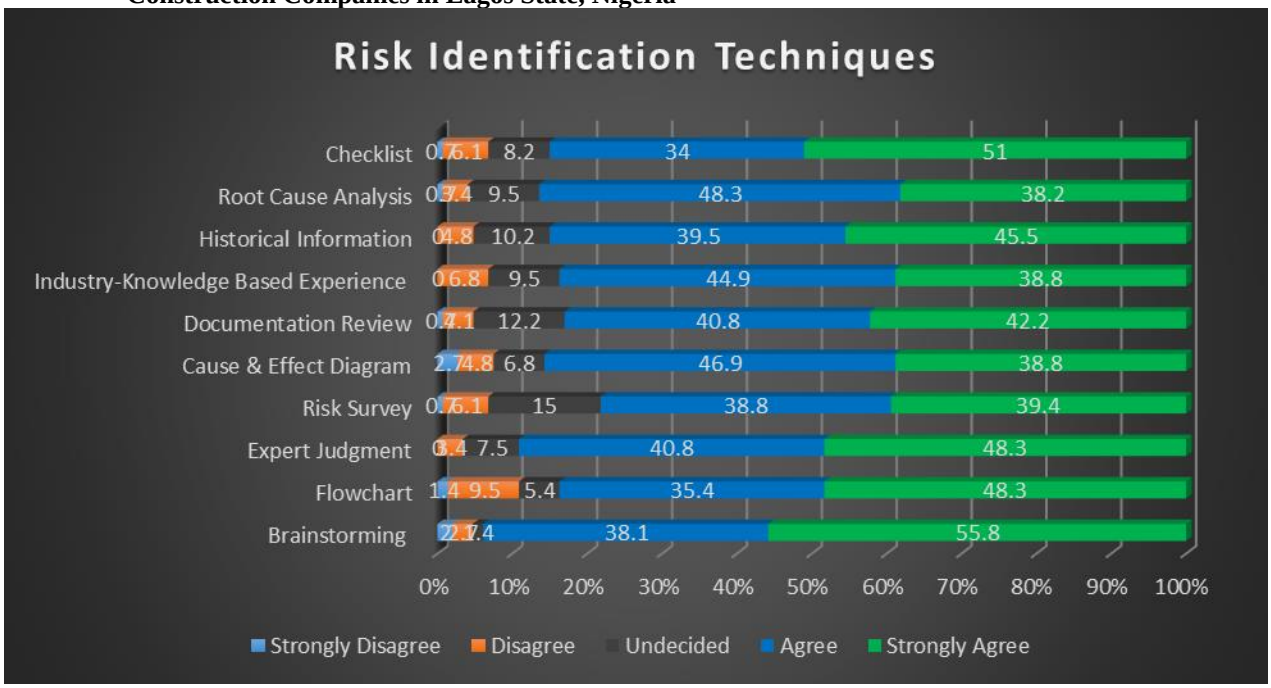


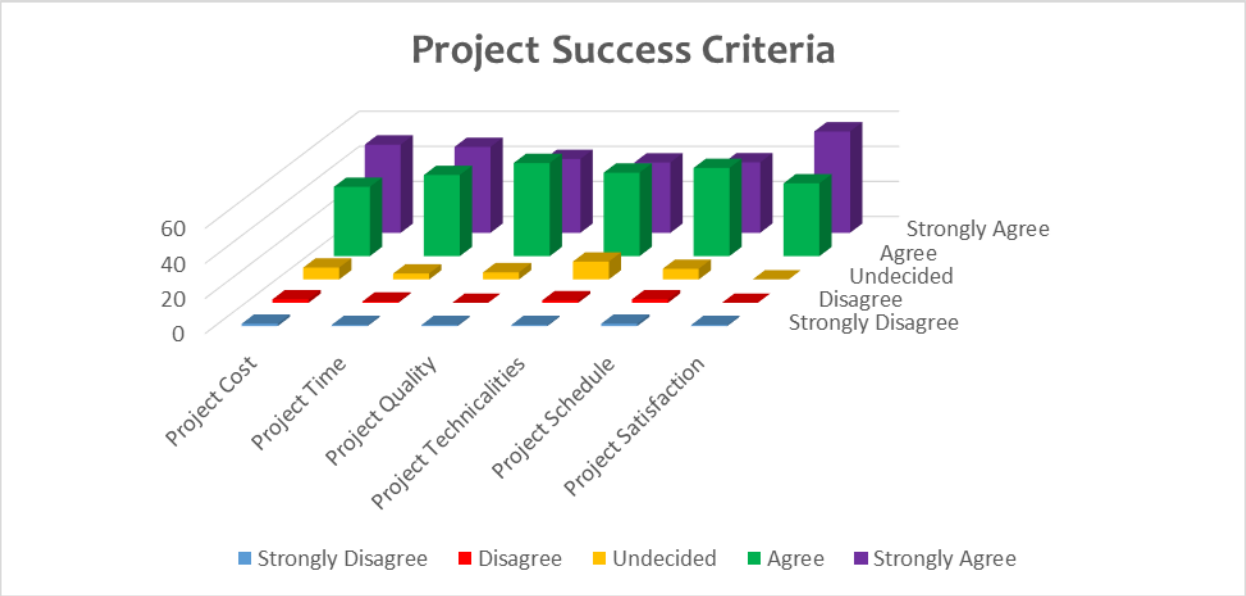
Table 3: Project Success Criteria

Variables	Scale Level					Mean	Std Dev.
	SD	D	U	A	SA		
	1	2	3	4	5		
My company always manage monetary budget to enable its completion	1.4	2.0	6.8	39.5	50.3	4.35	0.809
My company ensures it meets up with project completion deadline oftentimes	0.7	0.7	3.4	46.2	49.0	4.42	0.661
My company often effect quality project deliverables in a bid to meet required expectations	0.7	0.0	4.1	53.1	42.1	4.36	0.630
My company ensures application of necessary technicalities on project execution	0.7	1.4	10.2	47.6	40.1	4.25	0.748
My company ensures compliance with project outlines that often endear time-bound completion	1.4	2.0	6.1	50.3	40.2	4.26	0.777
My company ensures compliance with any project embarked upon to produce required output	0.7	0.0	0.0	41.5	57.8	4.56	0.575

Source: Researchers' Computations, 2024

In Table 3 (Fig. 2), the project success survey items for which data were gathered from the entire participants were project cost, project time, project quality, project technicalities, project schedule, and project satisfaction. The participants reacted to the numerous items, wherein 3.4 percent expressed their disagreement in terms of project cost, 6.8 percent indifferent, and 89.8 percent indicated their agreement. For project time, while participants expressed 1.4 percent in not supporting this item, 3.4 percent were undecided with it. Then, 95.2 percent supported. As for project quality, 0.7 percent of the entire participants exhibited their disagreement, 4.1 percent were indecisive, and 95.2 percent agreed. For project technicalities, 2.1 percent disagreed, 10.2 percent undecided, and 87.7 percent expressed their agreement. As for project schedule, 3.4 percent of the entire participants exhibited their disagreement, 6.1 percent were indecisive, and 90.5 percent agreed. For project satisfaction, 0.7 percent disagreed, and 99.3 percent expressed their agreement. The mean and standard deviation scores supported the outcomes for all the items surveyed. This implies that builders' judgments towards the survey items were normally distributed and centered around the mean. The result of the descriptive statistics on project success plainly indicate that all the measures have identical decisions about all the subject matter in the distribution of the participants' opinions.

Figure 2: The Graphical Model explains the Project Success Criteria among Building Construction Companies in Lagos State, Nigeria



4.3. Hypotheses Testing

4.3.1. Friedman's Rank Test

Friedman's symbiotic analysis test, denoted by K, assesses a population that is repeatedly sampled and has the same median. Friedman's test assumes, in a hypothetical scenario where there is no effect, that the

dependent variable follows a consistent distribution, necessitating at least ordinal measurement (Eisinga et al., 2017). Data under Friedman's rank test is organised in a tabular model with 'n' rows and 'k' columns. Friedman's test determines if the aggregate rank effects for each condition significantly differ from the predicted estimations (St. Laurent & Turk, 2013).

Ho_1: There is no rank order analysis of risk identification techniques among selected building construction companies in Lagos State

Table 4: Results of Friedman's Rank Test on Risk Identification Techniques among Building Construction Companies in Lagos State

S/N	Survey Items	Mean Rank	Rank
1.	Brainstorming	6.23	1
2.	Flowchart	5.68	4
3.	Expert judgment	5.76	3
4.	Risk survey	5.08	10
5.	Cause & effect diagram	5.34	6
6.	Documentation review	5.33	7
7.	Industry-knowledge based experience	5.11	9
8.	Historical information	5.46	5
9.	Root cause analysis	5.21	8
10.	Checklist	5.80	2

Source: Researchers' Computations, 2024

Table 5: Chi-Square Results from the Friedman's Test

N	147
Chi-Square	28.720
Df	9
Asymp.sig.	.001

a. Friedman Test

The analytical outcomes of the Friedman's test signify the existence of a statistically significant variance in risk identification techniques [brainstorming, flowchart, expert judgment, risk survey, cause & effect diagram, documentation review, industry-knowledge based experience, historical information, root cause analysis, checklist, X^2 (9, n=147) = 28.720, $p < 0.05$]. Consequently, taking critical scrutiny of the mean calculations suggested a descending layer in risk identification techniques adopted in the selected building construction companies from brainstorming (6.23) to checklist (5.80), to expert judgment (5.76), to flowchart (5.68), to historical information (5.46), to cause & effects diagram (5.34), to documentation review (5.33), to root cause analysis (5.21), to industry-knowledge based experience (5.11), to risk survey (5.08). The significance of these techniques affecting risk identification in the selected building construction companies were plainly ranked to give grounds for the above clarifications.

Ho_2: There is no rank order analysis of project success among selected building construction companies in Lagos State.

Table 6: Results of Friedman's Rank Test on Metrics for Project Success among Building Construction Companies in Lagos State

S/N	Survey Items	Mean Rank	Rank
1.	Project cost	3.55	3

2.	Project time	3.63	2
3.	Project quality	3.43	4
4.	Project technicalities	3.22	6
5.	Project schedule	3.26	5
6.	Project satisfaction	3.91	1

Source: Researchers' Computations, 2024

Table 7: Chi-Square Results from the Friedman's Test

N	147
Chi-Square	23.794
Df	5
Asymp.sig.	.000

a. Friedman Test

The analytical outcomes of the Friedman's test signify the existence of a statistically significant variance in project success metrics [project cost, project time, project quality, project technicalities, project schedule, project satisfaction, X^2 (5, n=147) = 40.992, $p < 0.05$]. Consequently, taking critical scrutiny of the mean calculations suggested a descending layer in project success adopted in the selected building construction companies from project satisfaction (3.91) to project time (3.63), to project cost (3.55), to project quality (3.43), to project schedule (3.26), to project technicalities (3.22). The significance of these metrics affecting project success in the selected building construction companies were plainly ranked to give grounds for the above clarifications.

H_{o3}: Risk identification techniques have no effect on project success among selected building construction companies in Lagos State

Table 8: Simple Regression Results for Risk Identification Techniques vs Project Success

Table 6. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	. 422[a]	.178	.173	2.581	.178	31.477	1	145	.000

a. Predictors: (Constant), Risk Identification Techniques
b. Dependent Variable: Project Success

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	209.736	1	209.736	31.477	.000[b]
	Residual	966.142	145	6.663		
	Total	1175.878	146			

a. Dependent Variable: Project Success
c. Predictors: (Constant), Risk Identification Techniques

Coefficients[a]

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B

		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	14.941	2.019		7.401	.000	10.951	18.931
	Risk Identification Techniques	.266	.047	.422	5.610	.000	.172	.360
a. Dependent Variable: Project Success								
Source: *Researchers' Computations, 2024*								

From the Table 8 results of the regression analysis presented above, it is clear that there is positive relationship between risk identification techniques and project success. The model also shows the variations experienced by the dependent variable that could be explained by the independent variable (R square) which shows that risk identification techniques are responsible for about 17.8 percent of variance in project success. This means that 82.2 percent of the project success enjoyed among building construction firms in Lagos State comes from other factors other than the predictor used in this model (risk identification techniques). The generalisation of the results (Adjusted R square) indicates that true 17.3 percent of the variation in project success is explained by risk identification techniques (brainstorming, flowchart, expert judgment, risk survey, cause & effect diagram, documentation review, industry-knowledge based experience, historical information, root cause analysis, checklist). This result is almost close to reality as the difference between R Square and Adjusted R Square is not high. The standard error fit, which is a measure of the precision of the model, shows how wrong the statistical outcomes could be at 3 percent if one uses this model to make real life predictions. The above result is statistically significant as seen in the ANOVA table (p-value = 0.000) as it is greater than the 0.05 confidence interval used in this study. A value greater than 1 show that F-ratio yield an efficient model but 31.477 F-ratio indicates that this model is not very efficient.

4.4. Discussion of Findings

This study confirms the nexus between risk identification techniques and project success among building construction companies in Lagos, Nigeria.

The results from hypothesis one indicated that 'brainstorming' was ranked first, followed by 'checklist', 'expert judgment', 'flowchart', 'historical information', cause & effect diagram', 'documentation review', 'root cause analysis', 'industry-knowledge based experience' and 'risk survey'. This result is corroborated with the recent studies (such as Hernadewita & Saleh, 2020; PMI, 2019; Sharma & Gupta, 2019) who noted the risk identification techniques as significant in the productive and efficient capacities of building construction firms.

The results for the second hypothesis indicated that 'project satisfaction' was ranked first; followed by 'project time', 'project cost', 'project quality', 'project schedule' and 'project technicalities'. This result aligned with recent studies (such as Albtoush et al., 2022; Oko-Osi et al., 2023; Zekavat and Momenian, 2019) who noted that regular push for quality project at low cost and prompt delivery time would possibly avoid project failure. They also noted well-designed project schedule, with high level technicalities to meet up project satisfaction for organizational attainment.

The result from hypothesis three revealed that risk identification techniques have positive and low relationship with project success among building construction companies in Lagos State, Nigeria, thereby invalidating the null hypothesis and validating the alternate hypothesis at (p = 0.000). This result is maintained by earlier studies (such as Alsaadi & Norhayatizakuan, 2020; Masengesho et al., 2021; Oko-Osi et al., 2023) that the positive and statistically significant nexus elucidated the link that subsist between the

various techniques of risk identification and project success of building construction companies in Lagos State, Nigeria.

5.0 Conclusion

Findings from the study have exhibited the significance of risk identification techniques on project success among selected building construction companies in Lagos State, Nigeria. Findings being drawn revealed the opinions of the selected participants where 'brainstorming', 'checklist', 'expert judgment', 'flowchart', 'historical information', cause & effect diagram',' documentation review', 'root cause analysis', 'industry-knowledge based experience' and 'risk survey' were all ranked according to their mean results. Results for hypothesis two showed that a ranked analysis for project success comprising 'project satisfaction',' project time', 'project cost', 'project quality', 'project schedule' and 'project technicalities' were evaluated. The hypothesis three proved the positive relationship between risk identification and project success criteria.

5.1 Recommendations

On recommendations, the building construction companies should ensure that well-designed risk identification techniques be entrenched in their policy document to address future risk emerging from the project site. Government agency, saddled with building control in Lagos State, should ensure physical inspection is carried out on public building (either completely or under construction) in order to compel builders for proper risk identification. Having carried out physical inspection, it is important for builders to be enlightened on builders 'liability insurance and thus, ensure that buildings under construction are covered by contractor's all-risk insurance policy. More risk retentive capacities should be built by building construction companies in a bid to handle small proportions of their risks possibly by creating a risk management unit/department.

5.2 Contribution to Knowledge and Future Directions

This study contributes to literature, knowledge, and theoretical gaps; hence it provided more conceptual clarifications, theoretical background and infusion of expert knowledge approach. As suggestions, future studies should delve strongly into the causal relationships between other risk management techniques and the various project success criteria and thus, evaluating the opinions of road construction companies and other construction sector; as this may provide insights.

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