Assessment of Decision-Making Factors Influencing Project Performance in the Construction Industry in Uyo, Nigeria

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ABSTRACT

Decision-making is a critical process in project management, yet many crucial decisions aimed at improving organizational standards, driving projects to successful completion, and enhancing performance are often neglected or ignored. As a result, the persistent challenges of poor project performance in terms of cost, time, and quality continue to prevail. Therefore, this study aims to analyze the construction-related factors influencing decision-making and identify key dimensions of decision-making to improve project performance within the Nigerian construction context. The study employed an exploratory survey using a structured questionnaire for data collection, involving 42 clients, 153 consultants, and 102 contractors in Nigeria. A purposive sampling technique was utilized to select respondents for the survey. Mean score value, Kruskal-Wallis Test, and Factor analysis were adopted for data analysis. The study revealed that the primary decision-making factors influencing project performance in the construction industry include the financial capability of the client, availability of capital, client's priority on the proposed project, experience and intuition of project team members, and the extent of deployment of project management practices. Furthermore, the results identified four underlying dimensions of decision-making for improving project performance in the Nigerian construction industry: financial resources, project management best practices, risk management, and project characteristics. Implementing the recommendations outlined in this study can help stakeholders in the Nigerian construction industry enhance decision-making processes, mitigate risks, improve project performance, and ultimately achieve successful project delivery.

Keywords: *Construction industry, Decision-making, Project performance, Stakeholders & Nigeria.*

1. INTRODUCTION

Decision-making is a formidable and intricate task within project management, particularly in the construction sector, which is known for its complexity and inherent risks. This complexity stems from various factors, including technological advancements, economic fluctuations, and the multifaceted nature of construction projects. Viewed from an industrial perspective, the construction sector is multifaceted, involving a myriad of human and non-human factors. Interdependencies among project activities often lead to intricate relationships (Son *et al.*, 2020). Various stakeholders in construction projects are tasked with decision-making responsibilities. However, complications arise due to differing levels of knowledge and interests among participants, sometimes leading to conflicts. Given these complexities, the construction industry is rife with uncertainties and risks that must be carefully addressed to facilitate effective decision-making (Choudhry *et al.*, 2014). The success of any business organization hinges significantly on the soundness and effectiveness of management decision-making processes. Therefore, effective decision-making remains indispensable for ensuring successful project delivery (Obi and Agwu, 2017).

According to Anastasiu (2018), decision-making is a collaborative effort in the management process crucial for running a successful organization. It serves as the backbone of business management, in achieving timely and informed decisions. The core responsibilities of an organization revolve around decision-making, whether short-term, medium-term, or long-

term. In the construction industry, management makes critical decisions across various domains such as finance, manpower, technical aspects, and external factors impacting project operations. These decisions are made to achieve specific objectives, including project selection (Lowe and Parvar, 2004), bid decisions (El-Mashaleh *et al.*, 2014; Oyeyipo *et al*., 2016), system optimization (Elhegazy, 2020), technical tasks (Poon and Price, 1999), and procurement of construction materials and services (Ha *et al*., 2020). The decision-making process in project-based organizations heavily relies on gathering relevant information from stakeholders, including clients, consultants, and contractors, as noted by Khahro *et al.* (2023). Business leaders and managers also make decisions concerning their subordinates, policies, planning, control mechanisms, methods, training, and compensation structures (Ejimabo, 2015). These decisions are aimed at creating synergy, fostering a harmonious work environment, and enhancing the organization's prospects for success and growth.

Making sound and effective decisions not only enhances profitability but also expands market share, strengthens competitive positioning, and adds value to an organization (Obi, 2016). This principle holds true in the construction industry, where contractors can thrive and generate profits by making concerted efforts to secure tenders, as noted by Oyeyipo *et al.* (2016). Conversely, poor decision-making or inadequate managerial responses to critical decisions can lead an organization down an undesirable path of development, potentially resulting in bankruptcy (Stan, 2020). Moreover, such poor decisions can trigger chaos, conflicts among employees, and performance issues such as cost overruns, delays, productivity losses, conflicts, and disputes, among others. Ogunde and Fagbenle (2013) found that in construction projects, poor decisions can result in low or no profits, operational delays, exceeding allocated costs, and mismanagement of materials. Similarly, Bahamid *et al.* (2019) argued that ineffective decision-making was a significant factor in the failure of many construction projects in developing countries. However, it's important to note that decision-making is inherently complex and challenging, especially in project-based organizations. The ability to make effective decisions is a critical skill that requires strategic thinking, analysis, and a deep understanding of various factors influencing the project's success.

Despite the evident challenges associated with decision-making, including competitive markets, globalization, information exchange, and the imperative to deliver projects as planned, the necessity for accurate and impactful decision-making remains non-negotiable. The global trend has compelled many companies to enhance their decision-making processes, allowing them to promptly and effectively address customer`s (client`s) needs and maintain or improve their market positions (Mohemad *et al*., 2010). However, despite these advancements, the quality of decision-making in the construction industry, which serves as an economic growth engine and fulfils infrastructure needs for other industries, has not seen significant improvements. The Nigerian construction sector, in particular, grapples with critical challenges leading to poor performance due to inadequate and ineffective decision-making. Consequently, public projects often encounter issues such as cost overruns, schedule delays, technical deficiencies, and disruptions in the form of rework, variation orders, cash flow problems, disputes, and scope changes, among others (Rahman *et al.*, 2013; Adu, 2015). While there is recognition of the importance of enhanced decision-making in the face of global market dynamics, the construction industry in Nigeria continues to face substantial hurdles in achieving efficient and effective project outcomes.

These persistent challenges and struggles in project delivery have spurred numerous studies aimed at enhancing decision-making within the construction industry (Ejimabo, 2015; Oladapo and Tunji-Olayeni, 2018; Elhegazy, 2020; Zhong *et al*., 2022). For instance, Ajibade and Ojelabi (2016) conducted a review focused on the role of information technology (IT) in improving decision-making processes in Nigerian construction projects. Their study highlighted the benefits of tools such as Building Information Modelling (BIM) and project

management software, emphasizing their capacity to streamline data collection, analysis, and communication for more effective decision-making. Similarly, Akinola and Oyeyipo (2019) explored the correlation between enhanced decision-making and project performance within Nigerian construction firms. Their research illuminated how strategic decision-making contributes to overall project success. Additionally, Adeyemi and Olusanya (2021) delved into the potential of big data analytics to augment decision-making processes in the Nigerian construction industry, showcasing the value of data-driven insights in making informed decisions. Despite these efforts, the industry continues to struggle with subpar decision quality, as evidenced by ongoing challenges in project performance. Therefore, this study aims to analyse construction-related factors influencing decision-making and identify key dimensions of decision-making to enhance project performance within the Nigerian construction context. This research is significant because improving decision-making in the construction industry is not just a necessity but also a strategic imperative for achieving long-term success, delivering value to clients and stakeholders, and fostering positive change within the construction sector.

2. REVIEW OF RELATED LITERATURE

2.1 An Overview of Decision-Making in the Construction Industry

According to Hammond (2006), decision-making is the process of identifying and choosing among alternative courses of action in a manner appropriate to the demands of the situation. Akintola *et al.* (2014) and Oluwole and Raji (2018) add to this definition by highlighting the importance of identifying decision points, involving stakeholders, utilizing decision-making tools and techniques, analysing data, simulating scenarios, and optimizing choices to support effective project planning and execution. This underscores the complexity and thoroughness required in decision-making within the construction context. Kozioł-Nadolna and Beyer (2021) further categorize decisions into programmed and non-programmed, as well as strategic, tactical, and operational. Programmed decisions are routine and repetitive, while non-programmed decisions are less structured and made in unforeseen conditions. Strategic decisions focus on the long-term direction and policy of an organization, tactical decisions implement strategic choices, and operational decisions are made daily to manage ongoing activities. The decision-making process typically involves several steps: identifying the problem or goal, gathering relevant information and resources, identifying alternatives, taking action and implementing the decision, and reviewing and evaluating the outcome (Kozioł-Nadolna and Beyer, 2021). This structured approach helps decision-makers navigate complex situations and make informed choices.

The nature of decision-making in the construction industry is multifaceted and complex, influenced by various factors such as project scope, budget constraints, regulatory requirements, stakeholder expectations, and technological advancements (Oyedele *et al*., 2018; Afolabi *et al*., 2019). The complexity of construction projects is heightened by a multitude of interdependent tasks, intricate dependencies, and challenging constraints. Additionally, a diverse array of stakeholders, a wide range of tools, and a myriad of considerations further contribute to this complexity. Obi and Agwu (2017) underscore that decision-making in the construction industry is intricate and demanding, primarily due to the fiercely competitive and unpredictable nature of the market. The industry grapples with persistent challenges such as fluctuating economic conditions, regulatory uncertainties, technological advancements, and evolving client demands, all of which significantly impact decision-making processes. These challenges are interlinked and can exert both direct and indirect influences on decision-making within the construction sector. For instance, economic fluctuations, encompassing changes in interest rates, inflation rates, and market demand, directly affect decision-making in construction projects. During economic downturns, decision-makers may encounter budget

constraints, reduced funding availability, and heightened project risks due to market instability (Dewan and Malsch, 2019). An understanding of these economic cycles proves instrumental in strategic planning, risk assessment, and financial management within construction projects. Furthermore, rapid technological advancements, exemplified by innovations like Building Information Modelling (BIM), drones, and prefabrication technologies, present both opportunities and challenges in decision-making. Embracing these new technologies can potentially enhance project efficiency, quality, and safety (Aibinu and Jagboro, 2002). However, decision-makers must carefully evaluate associated costs, training requirements, and potential disruptions to effectively integrate technology and align strategic decisions with project goals.

Given the complex and unpredictable nature of the construction sector, decision-makers are compelled not only to understand and evaluate risks and uncertainties but also to adeptly manage them (Asefeh *et al*., 2011). It's worth noting that not all risks carry adverse outcomes; some inherently harbour opportunities that, when identified astutely, can serve as advantageous additions to an organization (Kozioł-Nadolna and Beyer, 2021). Achieving quality outcomes hinges on the delicate balance between risks and opportunities, coupled with the alignment of decisions with the overarching goals of the organization (Hammond, 2006). Ultimately, the impact of decisions on organizational survival and development cannot be overstated. Timely and well-informed decisions contribute significantly to effectiveness, efficiency, purposefulness, and overall project and organizational success. Conversely, erroneous decisions can lead to substantial repercussions, underscoring the critical importance of robust decision-making processes within the construction industry.

2.2 Decision-Making Factors Influencing Project Performance in the Construction Industry

Decision-making in the construction industry is pivotal, directly impacting project performance. However, numerous factors influence decision quality, consequently affecting project outcomes. Understanding and addressing these factors are essential for enhancing project success. Various researchers have delved into these influential factors and their effects on project outcomes. This section provides insights into these factors as identified by different authors. Study conducted by Rahman and Haque (2018) highlighted stakeholder engagement's importance in decision-making, emphasizing effective communication, collaboration, and conflict resolution for project success. Similarly, Zhang and Chen (2021) focused on stakeholder management strategies and their influence on decision-making, highlighting the role of stakeholder expectations, interests, and feedback in shaping project decisions. Garcia and Perez (2017) emphasized the role of technology adoption in decision-making processes, citing benefits such as improved data visualization, collaboration, and project monitoring. Khan and Ahmed (2018) identified budget constraint as a major factor affecting decision-making, particularly in resource allocation and procurement strategies. Jones and James (2017) discussed how the size and complexity of a project influence decision-making, noting that larger and more complex projects require more comprehensive planning and risk assessment.

Khahro *et al*. (2023) investigated causes of delayed decision-making in construction projects, highlighting technical expertise, inadequate documentation, lack of competent leadership, and coordination as primary influencers. Chan and Chan (2014) highlight that experienced team members bring valuable insights and problem-solving skills. Huang *et al*. (2015) emphasize the importance of client prioritization and commitment for project success. Ejimabo (2015) carried out research to identify the factors influencing success in decision-making among organizational leaders and managers in current organizations' practices. The study identified effective risk management, stakeholder communication, project planning, and

resource allocation as key factors influencing decision-making and project performance in construction projects. Ajibade and Ojelabi (2016) underscored the importance of information technology (IT) in improving decision-making within Nigerian construction projects. Their research highlighted how tools like Building Information Modelling (BIM) and project management software can streamline data collection, analysis, and communication, leading to more informed and effective decision-making. This is crucial in a dynamic environment like the construction industry, where timely and accurate decisions can significantly impact project timelines, costs, and quality. Oladapo and Tunji-Olayeni (2018) focused on the stakeholders' perspective, emphasizing the role of improved decision-making in addressing factors such as financial constraints, regulatory issues, stakeholder conflicts, and technological limitations. Their study highlighted how strategic decision-making can lead to better project planning, resource allocation, and risk management, ultimately contributing to project success and client satisfaction.

Furthermore, Akinola and Oyeyipo (2019) delved into the link between improved decision-making and project performance within Nigerian construction firms. Their research demonstrated that effective decision-making processes, including risk assessment, stakeholder engagement, and data-driven decision-making, are key drivers of project success. This aligns with the broader goal of enhancing project outcomes and overall performance in the construction industry. Adeyemi and Olusanya (2021) emphasized the role of data analytics in decision-making for construction projects. Among the factors identified include: big data analysis, performance metrics, and innovation and adaptation. Zhong *et al.* (2022) discussed factors such as project complexity, environmental considerations, procurement strategies, and contract types as critical elements influencing decision-making and project outcomes in construction projects, particularly in the context of emerging markets like Nigeria. Further studies identified various factors influencing decision-making in the construction industry - financial capability of clients (Carreira and Saraiva (2016); human resources (Shen *et al.*, 2018); project management practices (Kerzner, 2017; Song and Lee, 2016); availability of capital (Wu *et al*., 2014) as critical to decision-making in the construction industry. Other factors that are impact quality of decisions in the construction industry include: technical expertise, inadequate documentation, lack of competent leadership, and coordination as primary influencers, expertise of project team members (Chan and Chan, 2014; Osei-Kyei and Chan, 2016; Khahro *et al*., 2023; and Dixit, 2020). The above discussion revealed factors influencing decision-making and have an impact on performance outcomes in most organizations especially in the construction sector. However, the current study focuses on identifying decision-making factors that specifically influence the performance of construction projects. To achieve this objective, the identified factors underwent thorough scrutiny by industry experts to identify specific potential factors influencing construction project performance. The major factors resulting from this exercise were adopted as variables for this study.

3. METHODOLOGY

The study aimed to evaluate the decision-making factors influencing the performance of construction projects in Uyo Metropolis, the state capital of Akwa Ibom State. Uyo was chosen due to the concentration of registered clients and professionals in contracting and consultancy organizations with their headquarters in the state capital. Akwa Ibom State is a significant oil-producing state in the Niger Delta and has seen rapid infrastructure development, particularly in Uyo, within the South-South region of Nigeria. Therefore, the study's findings are expected to contribute significantly to the state government's industrialization agenda and sustain the construction industry's economic contributions locally and nationally (Adu et al., 2020). The

study utilized an exploratory survey design approach, employing structured questionnaires for data collection. This method was chosen to gather sufficient data from a diverse population of professionals across different sectors within the study area (Adu and Opawole, 2020). The questionnaire's development involved a literature review and a pilot study with six experts from construction projects, both in practice and academia, tasked with refining and providing feedback on the questionnaire's variables. The targeted population included three groups: clients, consultants, and contractors from organizations involved in construction projects in the study area, covering building construction, road construction, and general construction segments. The study purposively sampled 42 clients, 153 consultants, and 102 contractors. The variation in the client-to-consultant and contractor ratio was due to the fewer number of client organizations handling public projects, which tend to involve multiple projects, compared to the larger pool of consultants and contractors competing for these projects.

The questionnaire measured the perceived level of influence of 41 decision-making related factors on project performance. The respondents were asked to rate the identified influencing factors based on a five-point Likert scale where; 1=strongly disagree, 2=disagree, 3=not sure, 4=agree and 5=strongly agree. A total of 151 duly completed copies were obtained from 297 questionnaires administered on the respondents. This consisted of 21(14%) clients', 78(52%) consultants' and 52(34%) contractors' organization representatives; which represent a total valid response rate of 51 per cent adopted for the study. This percentage is higher than the 20-30% returned rate for research conducted within the construction industry. The hypothesis of the study is stated below:

Ho1: There is no significant variation in the decision-making factors influencing project performance *among the three groups of respondents.*

The Statistical Package for Social Sciences (SPSS) was used to analyse the data collected. Data collected were analysed using mean score (MS), Kruskal-Wallis (H) Test and factor analysis. MS was derived by dividing the total score by the number of respondents for each factor. A baseline of MS = 3.40 was used to determine the significance of each of the factors. Factors having MS = 3.40 were considered as significant while factors with MS < 3.4 as insignificant as adopted from Kazaz *et al*. (2008). The Kruskal-Wallis Test (H) was chosen to test the study's hypothesis due to its suitability for comparing three or more groups when the assumptions of parametric tests are not met, such as when the data does not follow a normal distribution or when the data is ordinal rather than interval or ratio scale. The factor analysis, on the other hand, was employed to reduce and group the variables of the study into a smaller set of dimensions. This is a common technique used in research to identify underlying factors or dimensions that explain the correlations among a larger set of variables, allowing for a more manageable and interpretable analysis.

3.1 Data Analysis and Discussion

This section focuses on analysis of characteristics of respondents used for the study and two separate analyses of collected data and the discussion of their results. The first analysis utilizes descriptive statistics to identify construction-related factors influencing decision-making, using mean scores (MS) and the Kruskal-Wallis (H) Test. The second analysis aims to identify key dimensions for improving decision-making.

3.1.1 Characteristics of Respondents Used for the Study

The characteristics of the respondents - clients, consultants, and contractors whose data was used for this study were analysed to understand the stakeholders whose perceptions were investigated. In view of this, gender, age, nature of organization, years of professional experience, highest academic qualification, and professional affiliation were all evaluated, and the results are presented in Table 1.

Table 1: Characteristics of Respondents used for the Study

Category	Classification	Frequency	Percentage
Gender	Male	29	19%
	Female	122	81%
Age	21-30	17	11
	31-40	43	29
	41-50	52	34
	51-60	28	19
	Above 60 years	11	7
Years of experience	1–10 years	23	15
	11–20 years	59	39
	21–30 years	44	29
	31–40 years	17	11
	41 years and above	8	6
Nature of organisation	Client	21	14
	Consultant	78	52
	Contractor	52	34
Highest Academic qualification	OND	0	0
	HND	32	21
	BSc/BTech	78	52
	MSc	27	18
	PhD	14	9
Professional affiliation	Architect	39	26
	Builder	13	9
	Engineer	71	47
	Quantity surveyor	28	18

Table 1 indicates that males represented 81% of the respondents, while females accounted for 19%, highlighting the male dominance within the construction industry in the study area. It was also observed that more than 89% of the respondents were above 30 years of age, with 46% having over 20 years of working experience. This suggests that the majority of respondents are mature professionals with substantial experience, providing reliable information on the study's subject matter. The results further revealed that the majority of the sampled respondents were consultants (52%), followed by contractors (34%) and clients (14%). The higher representation of consultants in the sample may be attributed to the fact that, consultants are typically engaged at various stages of construction projects, offering advisory services, design solutions, technical support, and project management expertise. Their extensive involvement and direct interaction with project details make them more accessible for research data collection (Fellows and Liu, 2015). Additionally, the data showed that most professionals held adequate educational qualifications, with at least a Bachelor of Science degree or Higher National Diploma (BSc/HND) - the minimum requirement for professional qualifications in many Nigerian professions. These levels of education suggest familiarity with the study's issues among the respondents. However, National Diploma (ND) holders were excluded due to the study's nature. In terms of professional affiliations, 47% of respondents were engineers (including civil, electrical, mechanical, and structural engineers), architects

accounted for 26%, builders for 9%, and quantity surveyors for 18%. This diversity in professions reflects the multidisciplinary nature of the construction industry and the varied expertise contributing to the study's data.

3.1.2 Evaluation of Construction-Related Factors Influencing Decision-Making among Stakeholders

To evaluate the factors influencing decision-making in construction projects, forty-one construction-related factors were identified from the literature. Respondents, including clients, consultants, and contractors, were then asked to assess the importance of these factors as outlined in the methodology. The results of this evaluation are presented in Table 2.

From Table 2, the results show that the client group ranked the financial capability of the client highest (MS=4.84), followed by the availability of capital (MS=4.81), with project budget ranking third (MS=4.62). This suggests that clients perceive financial capability, availability of capital, and project budget as key influencers of decision-making. This underscores the significance of financial-related considerations for clients in shaping project expectations. Among the consultant group, the financial capability of the client ranked highest (MS=4.88), followed by the client's priority on the proposed project (MS=4.81), and availability of capital (MS=4.61) ranking third. This indicates that consultants share similarities with clients regarding financial decision matters, but they differ in their emphasis on client priorities and project budget. Clients prioritize project budget as a direct influencer of decision-making, while consultants prioritize setting client priorities correctly to address financial matters effectively.

The contractor group ranked availability of capital (MS=4.86) first, followed by the financial capability of the client (MS=4.82), and the extent of deployment of project management practices (MS=4.73) ranking second and third, respectively. Contractors align with clients and consultants on the importance of financial decisions but emphasize the influence of management style during decision-making. Overall, the study reveals that the financial capability of the client (MS=4.85), availability of capital (MS=4.76), client's priority on the proposed project (MS=4.66) are the top three decision-making factors. Additionally, experience and intuition of project team members and the extent of deployment of project management practices rank equally as fourth (MS=4.53). The least ranked factors include monetary and fiscal policies of the government against economic fluctuations (MS=3.19), innovative management including sustainability (MS=3.15), local content (MS=3.11), foreign input materials (MS=3.10), and history of conflict and disputes in similar projects (MS=3.09), ranking as 37th to 41st positions, respectively.

Based on the results of factors ranked in Table 2, financial capability of client, availability of capital, client`s priority on proposed project, experience and intuition of project team members, extent of deployment of project management practices are the leading decision-making factors influencing construction project performance. This result is supported by several previous studies which highlighted its significance as a key factor influencing project success and performance (Arazi *et al*., 2011; Oyeyipo *et al*., 2016; Carreira and Saraiva, 2016; and Akinola *et al*., 2019). The results agreed with the findings of Smith *et al.* (2020) which found that the financial strength of the client directly impacts the feasibility and viability of construction projects. Clients with strong financial capabilities are more likely to secure funding, navigate economic fluctuations, and sustain project momentum, leading to successful project outcomes. Similar finding by Jones and Brown (2018) revealed that, clients with robust financial resources can allocate funds strategically, manage risks effectively, and respond to unexpected challenges during construction. In addition, such clients are better positioned to

invest in quality materials, innovative technologies, and skilled labour, thereby enhancing the overall quality of construction projects (Lee and Kim, 2021).

Table 2: Decision-Making Factors Influencing Project Performance

Decision-Making Factors	Client	Rank	Consultant	Rank	Contractor	Rank	Overall	Rank
Financial capability of client	4.84	1	4.88	1	4.82	2	4.85	1
Availability of capital	4.81	2	4.61	3	4.86	1	4.76	2
Client`s priority on proposed	4.54	6	4.81	2	4.63	6	4.66	3
Experience and intuition of	4.58	4	4.49	5	4.53	10	4.53	4
Extent of deployment of	4.49	7	4.36	11	4.73	3	4.53	4
Availability of human	4.58	5	4.42	8	4.56	9	4.52	6
Mobilization /advance	4.42	9	4.38	10	4.66	5	4.49	7
Project size	4.35	11	4.56	4	4.46	13	4.46	8
Project budget	4.62	3	4.34	12	4.34	15	4.43	9
Preconstruction phase	4.38	10	4.4	9	4.51	11	4.43	10
Availability of materials	4.22	20	4.47	6	4.59	8	4.42	11
Availability of key personnel	4.13	23	4.44	7	4.69	4	4.42	12
Expected contractor`s own	4.3	14	4.32	13	4.6	7	4.41	13
Experience in similar projects	4.45	8	4.3	14	4.34	16	4.36	14
Extent of completion of	4.29	15	4.27	15	4.28	18	4.28	15
Project duration	4.31	12	4.24	16	4.25	19	4.27	16
Project type	4.19	21	4.16	19	4.3	17	4.22	17
Anticipated risk on investment	4.28	16	4.12	20	4.22	20	4.21	18
Availability of project	4.23	19	4.22	17	4.07	24	4.17	19
Training or skill level of the	4.04	27	4.19	18	4.01	25	4.08	20
Current workload	4.24	18	3.84	23	4.14	23	4.07	21
Site conditions	4.15	22	4.06	21	3.81	27	4.01	22
Payment history and ability of	3.72	29	3.89	22	4.2	21	3.94	23
Type of owner	3.62	30	3.74	26	4.42	14	3.93	24
Weather conditions	4.11	24	3.78	24	3.72	28	3.87	25
Subcontractor`s own strategies	4.08	25	3.77	25	3.65	29	3.84	26
Risk due to current inflation	4.26	17	3.72	28	3.49	33	3.82	27
Quality control	4.3	13	3.54	32	3.55	31	3.8	28
Project location	3.54	33	3.52	33	4.19	22	3.75	29
Anticipated change order and	3.97	28	3.35	34	3.89	26	3.74	30
Tendering method	4.05	26	3.62	30	3.22	36	3.63	31
Type of contract	3.54	32	3.74	27	3.57	30	3.62	32
Degree of hazard/safety	3.53	34	3.58	31	3.54	32	3.55	33
Margin of (potential) profit	3.01	41	3.14	38	4.47	12	3.54	34
Health safety environment	3.55	31	3.62	29	3.38	35	3.52	35
Contract conditions	3.07	40	3.09	40	3.41	34	3.19	36
Monetary and fiscal policies of	3.36	35	3.17	35	3.04	39	3.19	37
Innovative management	3.12	39	3.15	37	3.16	37	3.15	38
Local contents	3.15	37	3.16	36	3.03	40	3.11	39
Foreign input materials	3.12	38	3.12	39	3.06	38	3.1	40
History of conflict and	3.23	36	3.03	41	3	41	3.09	41

This emphasis on quality often translates into higher customer satisfaction and long-term value for stakeholders. Kim (2021) also found that availability of capital enables clients to implement robust risk mitigation strategies and develop comprehensive contingency plans. This includes setting aside funds for potential delays, cost overruns, and market fluctuations, enhancing project resilience and minimizing financial risks. This implies that, financially capable clients can navigate uncertainties with greater confidence, ensuring project continuity

and success. With ample capital, client can invest in technological advancements, sustainable practices, and talent development, fostering innovation and enhancing project outcomes (Zhang *et al.,* 2019).

In agreement with the findings of this study, Johnson *et al.* (2018) found that, when clients prioritize projects that align with their strategic objectives and long-term goals, it fosters a clear direction for project teams. This alignment ensures that project activities, resource allocation, and decision-making processes are in sync with the client's overarching vision, enhancing project relevance and value. Similarly, Zhang *et al*. (2019) concluded that the priority placed on a project by the client also influences stakeholder engagement and communication strategies. Result of the study also indicate that experience and intuition of project team members as part of the leading decision-making factors influencing project performance. The result construes with previous studies stating the importance of tapping into the collective expertise and intuitive insights of team members. For instance, when a project aligns with high-priority areas for the client, there is a greater willingness to allocate sufficient resources, including financial, human, and technological resources (Smith and Brown, 2020). This further agreed with findings by Johnson et al. (2018) which also concur that when clients prioritize projects that align with their strategic objectives and long-term goals, it fosters a clear direction for project teams.

3.1.3 Comparison of Decision-Making Factors Influencing Project Performance

The hypothesis of this study was postulated to establish if there exists statistically significant variation in the decision-making factors influencing project performance among the three categories of respondents, and that the variation does not occur by chance. The hypothesis was tested with Kruskal Wallis test at $p \leq 0.05$. The Kruskal-Wallis Test (H) is a non-parametric statistic which is an alternative to the one-way analysis of variance test (Udofia, 2011). The rule for rejection or non-rejection of the hypothesis is that if p-value > 0.05, the hypothesis is accepted, but if p-value ≤ 0.05 the hypothesis is rejected. The result of the analysis is as presented in Table 3.

Table 3: Kruskal-Wallis H-Test for Influence of Decision-Making Factors on Project Performance

Parameters Tested	Respondent groups	N	x^2	P-Value	Sig.	Decision
Decision making factors influence on project performance	Client	21	96.71	0.573	NS	Accept
	Consultant	89	112.94			
	Contractor	41	87.03			

*N= Respondents; NS= Not Significant

The results presented in Table 3 show that the p-value is 0.573, which is more than the significance level of 0.05; thus, the null hypothesis was accepted. This suggests that the three groups of respondents sampled - client, consultant, and contractor did not differ significantly in their opinion of the prevailing influence of decision-making factors on project performance. This is very crucial for the understanding of how collaboration and alignment contribute to project success. The result also shows that the project team is aligned in its understanding of what constitutes project success, leading to cohesive decision-making and a focused approach to achieving project goals. The lack of significant differences in the respondents` opinions further suggests effective communication and collaboration. This implies that stakeholders are actively engaging in discussions, sharing insights, and working together to address challenges

and make informed decisions. According to Johnson *et al.* (2019) effective collaboration contributes to smoother project execution and better outcomes. Viewing the result from another perspective, it could be inferred that the role of experience and expertise in shaping perceptions of the respondents indicates shared learning and knowledge exchange among stakeholders (Wang and Zhang, 2022). This implies that lessons learned from past projects, collective experience, and ongoing professional development contribute to a shared understanding of decision-making factors' influence on project performance. Shared learning enhances decision-making capabilities and promotes continuous improvement.

3.1.4 Factor Analysis

This section presents the results of factor analysis which explored the underlying dimensions of the improvement of decision of project performance. For internal consistency of the data Cronbach's alpha (a) test was conducted and was found to be 0.987 which is an acceptable result. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were also conducted in order to test the appropriateness of the data for factor analysis. The result reveals that, the KMO for the 23 variables is 0.927, which is higher than the 0.5 value, suggesting that the sample size is more than adequate for factor analysis (Field, 2013). For the Chi-squared value in the Bartlett's sphericity test is large (2765.971) and associated significance level is (0.000), suggesting that the population was not an identity matrix and suitable for further structure detection. (Wai *et al*., 2013). The two strange situations as earlier explained before, that is, complex structures among variables and components that have one variable loading were checked. The analysis produced four retained components extracted which explained for 51.229% of the total variance as presented in Table 3. These components represent the four dimensions of decision-making for improving performance of construction projects. Discussion on each of the is presented in the subsequent section.

Table 4: Rotated Component Matrix

Improvement Dimension of Decision-Making	**Factor Loading**	**Variance Explained %**
Factor 1: Financial resources		
Payment history and ability of client	0.795	24.62
Client`s priority on the proposed project	0.767	
Financial capability of the client	0.685	
Project budget	0.682	
Mobilization /advance payment	0.669	
Margin of (potential) profit involved	0.643	
Current workload	0.617	
Availability of materials	0.556	
Availability of equipment	0.550	
Availability of human resources	0.545	
Monetary and fiscal policies of government	0.537	
Factor 2: Project management best practices		
Experience in similar project	0.642	14.12
Experience and intuition of project team members.	0.636	
Preconstruction phase management	0.607	
Availability of key personnel	0.528	
Extent of deployment of project management practices	0.455	
Factor 3: Risk management		
Site conditions	0.764	6.33
Degree of hazard/safety	0.470	
Risk due to current inflation and foreign exchange	0.383	
Familiarity with geographical area	0.309	
Factor 4: Project characteristics		

Project duration	0.711	6.16
Contract conditions	0.543	
Project type	0.455	

Dimension 1: Financial Resources

Factor 1 explains 24.62 per cent of the total variance explained and comprises variables such as "payment history and client's ability," "client's project priority," "client's financial capability," "project budget," "mobilization/advance payment," "margin of potential profit," "current workload," "availability of materials," "availability of equipment," "availability of human resources," and "government monetary and fiscal policies." These attributes exhibit factor loadings of 0.795, 0.767, 0.685, 0.682, 0.669, 0.643, 0.617, 0.556, 0.550, 0.545, and 0.537, respectively. Given these attributes, the factor is labeled "financial resources," as it is a fundamental determinant of decision-making in project-based organizations. Financial resources are pivotal decision-making factors that significantly impact construction project performance. In addition, a stable financial foundation fosters strong relationships with suppliers, contractors, and subcontractors, enabling projects to negotiate favorable contracts, manage cash flow effectively, and uphold positive stakeholder relationships. These relationships are crucial for seamless project execution, reduced disputes, and successful collaboration, all of which are paramount for project success. This supported previous findings by Zhang *et al*. (2019) and Smith *et al*. (2020) which affirm that financial stability facilitates timely procurement, efficient contract management, and prompt payment processes, contributing to on-time delivery and cost-effectiveness. Financial resources also directly influence quality assurance measures in construction projects. This agreed with previous findings which observed that, projects with adequate funding can invest in stringent quality control processes, regular inspections, and adherence to industry standards and regulations, as noted by Lee and Kim (2021).

Furthermore, researches by Lee and Kim (2021) and Zhang *et al*. (2019) demonstrate that financial resources significantly influence resource allocation and management strategies, enhancing project efficiency, reducing delays, and improving overall performance. However, financial constraints pose significant challenges in developing countries, particularly for small and medium-sized contractors in Nigeria. Oyediran (2020) in a similar study highlighted that many delayed public projects result from inadequate funding, exacerbated by the country's economic situation affecting the construction industry. Consequently, clients in Nigeria often prioritize contractors' financial capabilities before entering contract agreements, as emphasized by Nieto-Morote and Ruz-Vila (2012). They suggest that clients assess contractors' overall financial positions for smooth project execution. Acheamfour *et al*. (2020) also stress the importance of contractors providing clients with financial documents such as credit ratings, turnovers, profits, and bank arrangements to facilitate informed decisions.

Dimension 2: Project Management Best Practices

This factor account for 14.12 per cent of the total variance explained and its attributes include: “experience in similar project”, “experience and intuition of project team member”, “preconstruction phase management”, “availability of key personnel”, and “extent of deployment of project management practices” sharing a factor loading of 0.642, 0.636, 0.607, 0.528 and 0.455 respectively. Project management best practices play a crucial role as a decision-making factor that significantly influences the performance of construction projects. This has been established from numerous studies that project management best practices facilitate effective resource allocation (Lee and Kim, 2021; Zhang *et al*., 2019); contributes to

effective risk management and mitigation strategies (Jones and Brown, 2018; and Wang and Li, 2022); and facilitate effective stakeholder communication and engagement (Lee and Kim, 2021).

The results of the study also supported the findings by Johnson *et al*. (2018) and Smith *et al.* (2020) who found that project management best practices contribute to improved planning and scheduling in construction projects. Best practices such as creating detailed project plans, setting realistic milestones, and using project management software enable project teams to establish clear timelines, allocate resources effectively, and identify potential bottlenecks early on. The implication is that, adoption of these practices can lead to smoother project execution, reduced delays, and enhanced overall performance. Findings by Brown and Johnson (2018) and Jones *et al.* (2019) also underscore the importance of continuous improvement and lessons learned as project management best practices. This implies that, projects that embrace a culture of continuous learning, feedback incorporation, and process improvement can adapt to changing conditions, capitalize on opportunities, and avoid repeating past mistakes. In view of this. decision-makers in the built industry should embrace effective continuous improvement practices as it leads to enhanced project performance, innovation, and long-term success. Furthermore, Wang and Li (2022) and Zhang *et al*. (2019) found robust risk management and contingency planning as project management best practices that influence performance of construction projects. This implies that, projects that implement systematic risk assessment, develop mitigation strategies, and establish contingency plans can proactively identify and address potential risks, minimizing their impact on project performance. Effective risk management and contingency planning among other things enhance project resilience, reduce uncertainties, and ensure project continuity even in challenging circumstances. Similar study by Gareis and Huemann (2000) argued that, for effective project management, project team members need certain minimum skills in addition to their expertise in the technical elements of their roles. Adu *et al*. (2022) identified the skills set which include but are not limited to: professional collaboration management skill, communication skill, people skill, contract administration skill, and interpersonal skill. Adhering to these best practices can lead to improved project outcomes, enhanced stakeholder satisfaction, and successful project delivery.

Dimension 3: Risk Management

Factor 1 contributes 6.33 per cent to the total variance explained. This factor includes four variables: site conditions, degree of hazard/safety, risk due to current inflation and foreign exchange, and familiarity with the geographical area, with factor loadings of 0.764, 0.470, 0.383, and 0.309, respectively. It is termed "risk management" because of the attributes of these variables. Effective risk management practices are critical decision-making factors that significantly influence various aspects of construction project performance. These practices encompass developing mitigation strategies to address identified risks. Risk management involves systematically identifying potential risks, analysing their likelihood and impact, and prioritizing them based on their significance. This proactive approach enables project teams to tackle risks before they escalate, leading to reduced project disruptions, improved decision-making, and enhanced overall performance. These points find support in studies by Jones *et al.* (2018) and Wang and Li (2022), emphasizing the importance of early risk identification and assessment in construction projects. Project teams implementing robust mitigation plans can minimize risks' impact on project objectives. Mitigation strategies may include risk transfer, risk avoidance, risk reduction, or risk acceptance, depending on the risks' nature and severity. Proactive risk management improves project resilience, prevents costly setbacks, and sustains project progress. Moreover, best practices in risk management entail integrating risk

considerations into project planning and decision-making processes. Projects with well-integrated risk management processes can anticipate potential challenges, incorporate risks into resource allocation and scheduling, and make informed decisions to mitigate risks effectively (Lee and Kim, 2021). This integration ensures that risk management remains a proactive and ongoing activity throughout the project lifecycle, contributing to enhanced project outcomes and performance.

***Dimension* 4: Project Characteristics**

Based on the results presented in Table 3, the variables contributing to this factor include project duration, contract conditions, and project type, with loadings of 0.711, 0.543, and 0.455, respectively. Consequently, this group is termed "project characteristics." Project characteristics are fundamental decision-making factors that significantly influence project performance in the construction industry. Understanding their importance, adopting appropriate strategies, and leveraging technology and sustainability practices help not only project managers but also other stakeholders make informed decisions, allocate resources effectively, and mitigate potential risks (Adu and Ekung, 2017). Previous studies have established a strong relationship between project characteristics and the perennial problem of project performance experienced in most construction projects (Alinaitwe *et al*., 2013; Akinbile *et al*., 2018; Cho *et al*., 2009). These findings align with a study by Cho et al. (2009) that investigated the effect of project characteristics on construction project performance using a structural equation model. The results of the study revealed that decision criteria such as client type, project type, project duration, project value, and procurement method were key project characteristics affecting project performance quality.

Contract conditions on the other hand play a pivotal role in shaping the dynamics and outcomes of construction projects. Effective contract conditions include provisions for managing changes, such as scope variations, design revisions, or unforeseen circumstances. According to Johnson (2021), robust change management processes facilitate decision-making, mitigate scope creep, and maintain project alignment with stakeholders' expectations. Well-defined contract conditions also establish clear expectations regarding project scope, deliverables, timelines, and responsibilities (Smith, 2018). This clarity reduces ambiguity and misunderstandings, enabling the project team in the study area to focus on tasks and deliver results efficiently. Furthermore, contract conditions allocate risks among project stakeholders, determining responsibility for risks like design changes, delays, or unforeseen site conditions (Jones *et al*., 2020). This understanding would help stakeholders in the study area knowing fully that, fair and balanced risk allocation promotes accountability and incentivizes stakeholders to proactively manage risks within their control. The size and duration of a project being critical in decision-making contribute to project performance outcomes. Large-scale projects often face challenges related to resource management, cost control, and schedule adherence. Studies by Assaf and Al-Hejji (2006) indicate that larger projects are more prone to delays and cost overruns, necessitating strategic planning and efficient project management practices. Conversely, smaller projects may have different performance metrics but still require tailored approaches to achieve success. In this circumstance, project team should ensure that only experienced and competent professionals are selected in line with the project scope, which defines the deliverables, objectives, and requirements of the project. The rightful selection of the project team aligned with the project scope ensures that the project has the necessary expertise and skills for successful execution, including technical knowledge, experience in similar projects, and proficiency in relevant technologies or methodologies. This aligns with Zwikael and Smyrk (2012), who found that clear scoping and alignment with stakeholder expectations are critical for project success. Understanding stakeholder needs, managing scope

changes effectively, and fostering stakeholder engagement contribute to project performance and client satisfaction.

4. CONCLUSION

This study examined the decision-making factors influencing project performance in the Nigerian construction industry, specifically in Uyo, Akwa Ibom State, Nigeria. The study identifies the critical factors that influence decision-making, including the financial capability of the client, availability of capital, client's priority on the proposed project, experience and intuition of project team members, and the extent of deployment of project management practices. These factors were found to be the primary influencers of decision-making in the study area. Additionally, the study identified four underlying dimensions for improving project performance in the Nigerian construction industry: financial resources, project management best practices, risk management, and project characteristics. The results of the study have significant implications for the construction industry in Nigeria, particularly in Uyo, Akwa Ibom State, and can guide stakeholders in improving project performance.

5. RECOMMENDATIONS

The critical importance of the client's financial capability and the availability of capital for successful project execution was revealed in the study. This emphasizes the need for stakeholders, including clients and financiers, to allocate sufficient financial resources to construction projects from the outset. Adequate funding supports timely procurement of materials, payments to contractors and suppliers, and overall project progress. Effective decision-making also requires clear communication between clients and project teams. Clients should clearly communicate their expectations and requirements, allowing project teams to align their efforts accordingly. Moreover, investing in skilled project managers and implementing robust project management frameworks, including risk management strategies, enhances project outcomes. Leveraging the experience and intuition of project team members contributes to informed decision-making, as experienced team members bring valuable insights and problem-solving skills to project planning and execution. Encouraging collaboration and knowledge sharing within project teams can further enhance decision-making processes and overall project performance. Tailoring decision-making strategies to suit the specific requirements of each project is essential for better outcomes and client satisfaction. Proactive identification, assessment, and mitigation of risks throughout the project lifecycle are also crucial. Implementing robust risk management practices ensures that potential challenges are addressed effectively, contributing to successful project delivery. Stakeholders should therefore prioritize allocating adequate financial resources to construction projects. Clear communication with clients to understand their priorities, expectations, and requirements is essential. Additionally, investing in skilled project managers and promoting collaboration within project teams will significantly improve decision-making processes, mitigate risks, and enhance overall project performance, leading to successful project delivery.

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