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Communication Effectiveness and Construction Project Performance in Lagos State, Nigeria

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ABSTRACT

Communication remains a pivotal determinant of success within fragmented construction environments. This empirical study evaluated the impact of communication effectiveness on construction project performance in Lagos State, Nigeria. Utilizing a quantitative cross-sectional survey design, primary data were gathered from 125 validated construction professionals across consulting, contracting, and client entities. Descriptive statistical tools (Mean Scores) and inferential techniques (Pearson correlation and simple linear regression) were applied to analyze interaction patterns and assess specific research objectives. Findings revealed that rapid informal channels, particularly instant messaging (Mean = 4.57) and face-to-face interactions (Mean = 4.55), dominate site communication, whereas advanced Building Information Modelling platforms (Mean = 2.77) remain severely underutilized. Professional discipline divergence (Mean = 4.58), lack of trust (Mean = 4.47), and complex organizational structures (Mean = 4.43) were identified as the major operational barriers. Inferential analysis confirmed a significant positive relationship between communication effectiveness and project performance (r=0.491), establishing that communication quality directly predicts 24.1% of the variance in project performance (R2 =0.241, B=0.451, F=74.568). The study concludes that structured communication planning is vital for optimizing project delivery.

Keywords: Communication Channels, Effectiveness, Project Performance, Lagos State, Analysis, Linear Regression

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1. INTRODUCTION

The construction industry serves as a foundational driver of economic expansion, infrastructure development, and urban transformation globally. Unlike traditional manufacturing sectors characterized by controlled environments and standardized operational routines, construction projects are intrinsically dynamic, temporary, and highly fragmented. Every construction endeavour brings together a diverse array of stakeholders—Including Clients, Architects, Structural Engineers, Quantity Surveyors, Main Contractors, Subcontractors, Suppliers, And Regulatory Authorities with each operating with distinct organizational cultures, professional jargon, and strategic priorities (Ejohwomu et al., 2017).

Within this multidisciplinary matrix, communication functions as the essential connective tissue that aligns technical specifications with physical site execution (Okereke et al., 2022). Effective communication encompasses the timely, accurate, and unambiguous exchange of data, design revisions, progress reports, contractual variations, and field directives among all project participants (Olaniran, 2015). When communication channels operate efficiently, they facilitate real-time decision-making, promote interdisciplinary collaboration, streamline resource allocation, and foster mutual trust among project teams (Ejohwomu et al., 2017). In rapidly expanding urban centers such as Lagos State, Nigeria, where construction projects face intense pressures from rapid urbanization, tight delivery timelines, and complex supply chain logistics, the demand for structured and reliable communication protocols becomes even more critical to ensuring operational success (Yakubu, 2019).

2. LITERATURE REVIEW

2.1 Construction Project Performance

Project performance in the construction domain has historically been evaluated using the "Iron Triangle" parameters of time, cost, and quality (Atkinson, 1999). Within modern project environments, performance extends beyond these basic indicators to encompass safety management, client satisfaction, stakeholder alignment, and environmental sustainability (Hussain et al., 2022). In high-density, rapidly growing urban settings like Lagos State, project performance is routinely threatened by structural delays, supply chain disruptions, and budget variance, making operational metrics dependent on real-time organizational coordination and decision-making capabilities (Unegbu, 2023).

2.2 Communication Effectiveness

Communication effectiveness refers to the accurate, timely, and complete transfer of project information from sender to receiver, ensuring that the intended operational meaning is understood without distortion (Dainty et al., 2006). In multidisciplinary project environments, communication functions as an integrative mechanism connecting disparate architectural, engineering, and contractual stakeholders (Olaniran, 2015). Effective communication utilizes both formal channels (such as written reports, site instructions, and contractual notices) and informal channels (such as instant messaging and face-to-face dialogues) to maintain operational alignment across all project phases (Malik et al., 2021).

2.3 Theoretical Framework

2.3.1 Uncertainty Reduction Theory (URT)

Originally formulated by Berger and Calabrese (1975), Uncertainty Reduction Theory posits that human agents seek to reduce information asymmetry and ambiguity during interpersonal and organizational exchanges. In construction project management, complex site environments create high levels of technical and environmental uncertainty. Clear, structured information exchange enables site teams, contractors, and consultants to minimize ambiguities regarding project scopes, change orders, and execution standards, thereby reducing costly site rework and operational errors (Berger & Calabrese, 1975).

2.3.2 Information Processing Theory (IPT)

Information Processing Theory asserts that organizations must structure their information channels to match the complexity and uncertainty of their operational environments (Galbraith, 1974). Construction site management requires continuous processing of design drawings, material specifications, and field directives. When the capacity of information channels falls short of the project's processing requirements, communication bottlenecks emerge. IPT provides a foundation for evaluating how structured communication systems prevent information overload, streamline reporting procedures, and support decision-making during execution (Galbraith, 1974).

2.4 Communication Channels in Construction Projects

The channels selected for transmitting information directly influence message clarity, response speed, and record maintenance. Academic literature categorizes communication channels into formal and informal mediums (Malik et al., 2021). Formal tools such as site instructions, official progress reports, and contractual emails provide legally defensible audit trails necessary for resolving site claims and variations (Olaniran, 2015). Conversely, informal channels such as instant messaging platforms and verbal discussions which enable rapid feedback and real-time operational troubleshooting on active project sites (Malik et al., 2021). However, over-reliance on unverified informal channels without documented follow-up can introduce misinterpretations regarding complex technical specifications (Gamil & Abdul Rahman, 2017).

2.5 Barriers to Effective Communication

Communication breakdowns on construction sites stem from multi-dimensional factors across human, organizational, technological, and stakeholder domains:

- Human and Cultural Barriers: Professional discipline divergence, technical jargon misuse, language differences, and a systemic lack of inter-organizational trust represent major human impediments to clear interaction (Ejohwomu et al., 2017). Personal tensions and conflicting professional agendas frequently distort message decoding between consultants and field personnel (Anton, 2021).
- Organizational Barriers: Multi-layered managerial hierarchies, convoluted reporting structures, unclear lines of site authority, and absence of standardized feedback mechanisms create severe information delays (Ejohwomu et al., 2017).
- Technological and Operational Barriers: Financial constraints, high implementation costs for advanced digital tools (such as Building Information Modeling), and inadequate communication infrastructure impede seamless information flow across project tiers (Yakubu, 2019).
- Stakeholder Alignment Barriers: Divergent goals among clients, contractors, and regulatory agencies frequently cause conflicting site directives, leading to contractual friction and operational stagnation (Cheung et al., 2013).

2.6 Impact of Communication Effectiveness on Project Performance

Empirical studies consistently demonstrate a direct relationship between communication efficiency and project performance indicators. Clear and prompt interaction prevents construction errors, eliminates redundant tasks, minimizes material wastage, and maintains project schedules (Dainty et al., 2006). Conversely, ineffective communication practices lead to budget overruns, extended completion deadlines, increased site safety incidents, and adversarial disputes among project participants (Gamil & Abdul Rahman, 2017; Yap et al., 2017).

Improving communication protocols provides a direct mechanism for mitigating operational risks and improving overall delivery success in complex urban construction markets (Ejohwomu et al., 2017).

3. METHODOLOGY

This study adopted a quantitative research design utilizing a cross-sectional survey strategy to evaluate the impact of communication effectiveness on construction project performance in Lagos State, Nigeria. The quantitative approach was chosen because it allows for the systematic collection, statistical measurement, and objective empirical testing of hypotheses across a standardized sample of construction professionals. The cross-sectional design enabled the collection of primary data from multiple stakeholder groups at a single point in time, providing a clear snapshot of communication practices, existing operational barriers, and performance metrics across ongoing construction projects.

The target population for this study comprised key professionals and project entities actively engaged in the execution of building construction projects within Lagos State. The study targeted a diverse array of core project actors, including Subcontractors, Builders, Project Managers, Civil Engineers, Architects, Site Supervisors, and Quantity Surveyors representing consulting firms, contracting companies, and client organizations. To ensure adequate representation across these distinct professional categories, a stratified random sampling technique was employed. A total of 154 questionnaires were distributed to qualified construction professionals across registered construction sites and professional consultancy firms in Lagos State. Out of the distributed questionnaires, 125 completed and valid responses were retrieved and retained for analysis, representing an overall response rate of 81.2%. The detailed composition of the analyzed sample is summarized below.

Table 1: Professional Profile of Sampled Respondents

Professional Role	Frequency (n)	Percentage (%)
Subcontractors	23	18.50%
Builders	19	14.80%
Project Managers	16	13.00%
Civil Engineers	14	11.10%
Architects	12	9.30%
Site Supervisors	12	9.30%
Other Construction Stakeholders	29	24.00%
Total	125	100%

4. RESULTS AND DISCUSSION

4.1 Response Rate and Demographic Profile of Respondents

A total of 154 questionnaires were distributed to construction professionals across Lagos State, from which 125 valid questionnaires were completed and retrieved, representing an 81.2% response rate. The demographic distribution of respondents reflects broad representation across key project roles:

Subcontractors constituted 18.5% (n=23), Builders 14.8% (n=19), Project Managers 13.0% (n=16), Civil Engineers 11.1% (n=14), Architects 9.3% (n=12), Site Supervisors 9.3% (n=12), and other technical stakeholders 24.0% (n=29). The internal consistency of the measurement instrument across all sections yielded a Cronbach's Alpha coefficient of α=0.972, confirming high data reliability.

4.2 Analysis of Communication Channels Used Among Construction Stakeholders

Analysis was based on responses obtained from Section B of the questionnaire, which examined the frequency and perceived effectiveness of various communication channels used during construction project delivery. The dataset contained responses from 125 construction stakeholders as represented in Figure below. Each communication channel was ranked based on its calculated mean score, where a higher mean value indicates stronger agreement among respondents regarding the usage and relevance of the communication channel within construction projects.

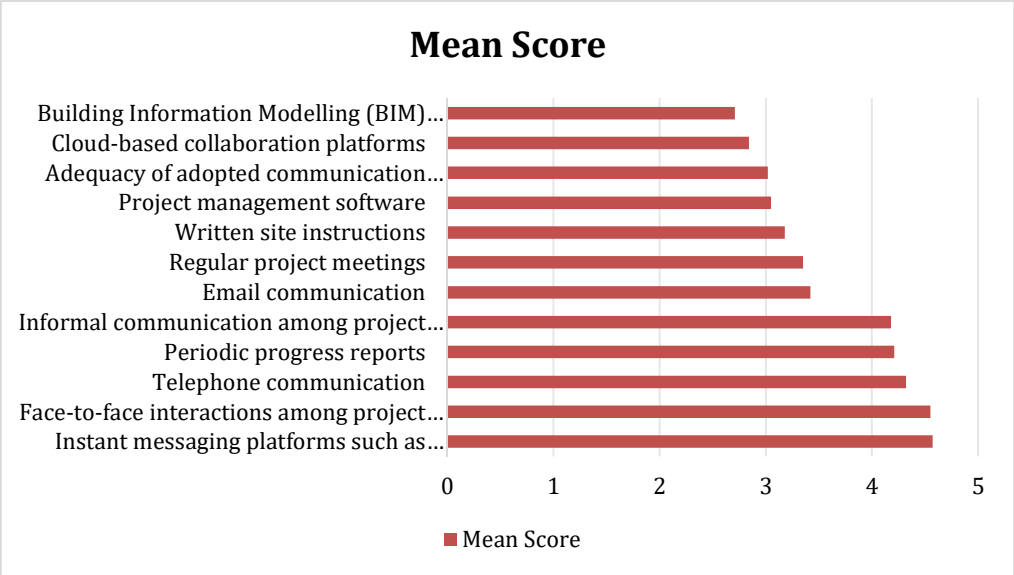


Fig 1: Mean Score Ranking of Communication Channels

As detailed in Figure 4.1, Instant Messaging platforms (WhatsApp) ranked highest among communication channels (MS=4.57, Rank 1), followed closely by Face-to-Face interactions (MS=4.55, Rank 2) and Telephone calls (MS=4.32, Rank 3). Conversely, specialized digital platforms such as Building Information Modelling (BIM) recorded the lowest utilization (MS=2.77, Rank 12).

4.3 Factors Affecting Communication Effectiveness Among Construction Stakeholders

The analysis was based on responses obtained from the questionnaire section relating to communication barriers and challenges experienced during construction project delivery. The identified factors were grouped according to the conceptual framework. The groups include:

- Organisational factors.
- Human factors.
- Technological factors.
- Stakeholder-related factors.

The analysis used the Mean Score Ranking Technique to determine the relative severity of each factor based on respondents' perceptions.

4.4 Organisational Factors Affecting Communication Effectiveness

Organisational structures and management systems influence how information moves among construction stakeholders. Issues such as unclear communication procedures, poor coordination systems, and inadequate managerial support may affect the speed and accuracy.

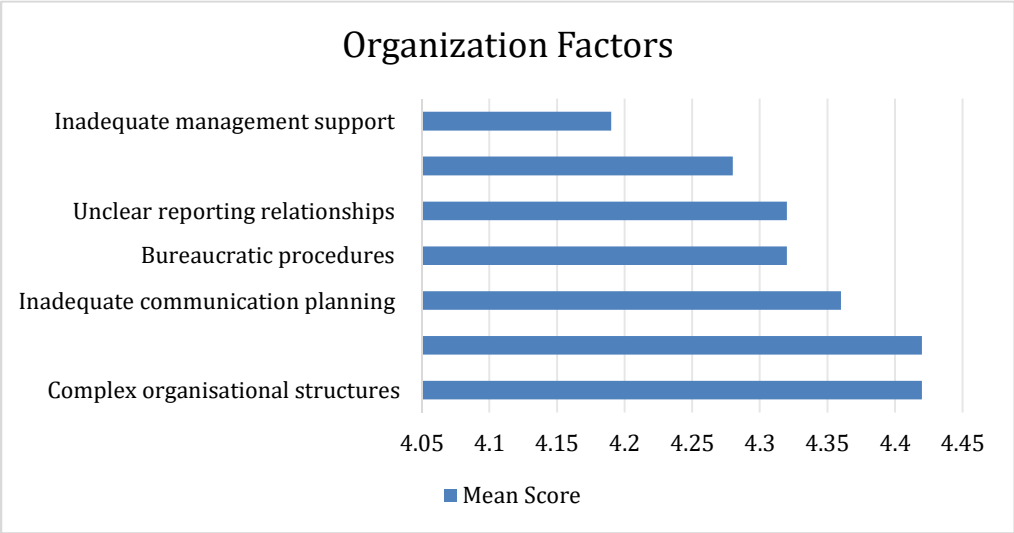


Fig 2: Mean Ranking of Organisational Factors Affecting Communication Effectiveness

Figure below indicates that complex organisational structures and weak coordination mechanisms were the most significant organisational factors, both recording a mean score of 4.42. This suggests that communication challenges within Lagos construction projects are partly associated with how project teams are structured and coordinated. Although inadequate management support ranked lowest within this category, the mean score of 4.19 still indicates a high influence. This suggests that management commitment remains important in establishing communication systems, although respondents perceived structural and coordination issues as more dominant challenges.

4.5 Human Factors Affecting Communication Effectiveness

Human-related issues represent behavioural and interpersonal challenges among project participants. Construction projects depend on cooperation among professionals with different technical backgrounds, communication styles, and organisational interests.

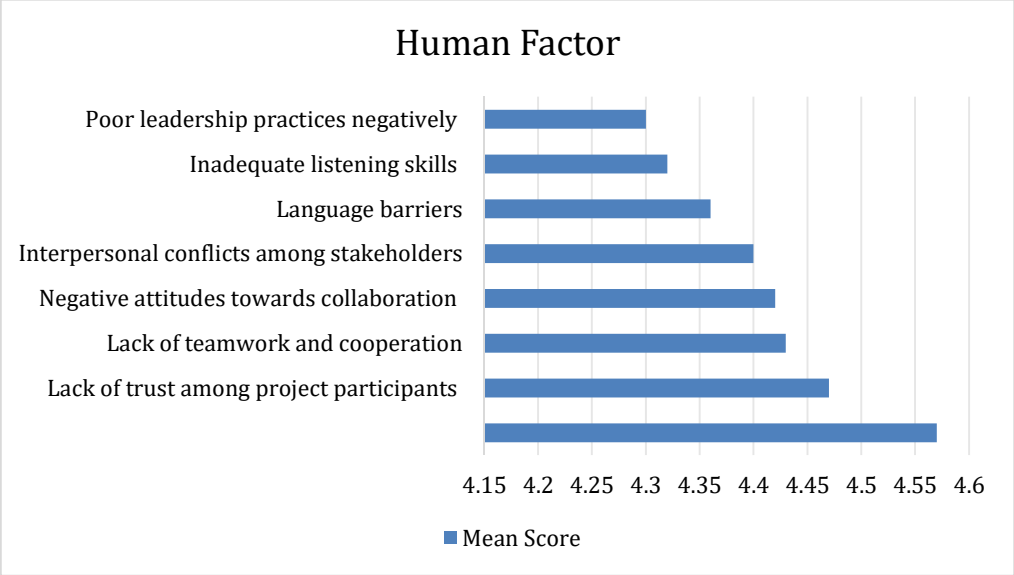


Fig 3: Mean Ranking of Human Factors Affecting Communication Effectiveness

As shown in Figure above, differences in professional backgrounds recorded the highest mean score of 4.57, indicating that professional diversity represents a major communication challenge among construction stakeholders. Construction projects require interaction between architects, engineers, quantity surveyors, contractors, and other specialists. Each professional group operates with different technical terminology, priorities, and decision-making approaches, which may create misunderstanding during information exchange. Poor leadership recorded the lowest value within the category, with a mean score of 4.30. Although ranked lowest, the value still represents a significant influence. This indicates that leadership practices remain important in establishing communication culture and encouraging stakeholder participation.

4.6 Technological Factors Affecting Communication Effectiveness

Technology has become increasingly relevant in construction communication through digital platforms, information management systems, and collaborative tools. However, technological limitations may affect the efficiency of communication systems.

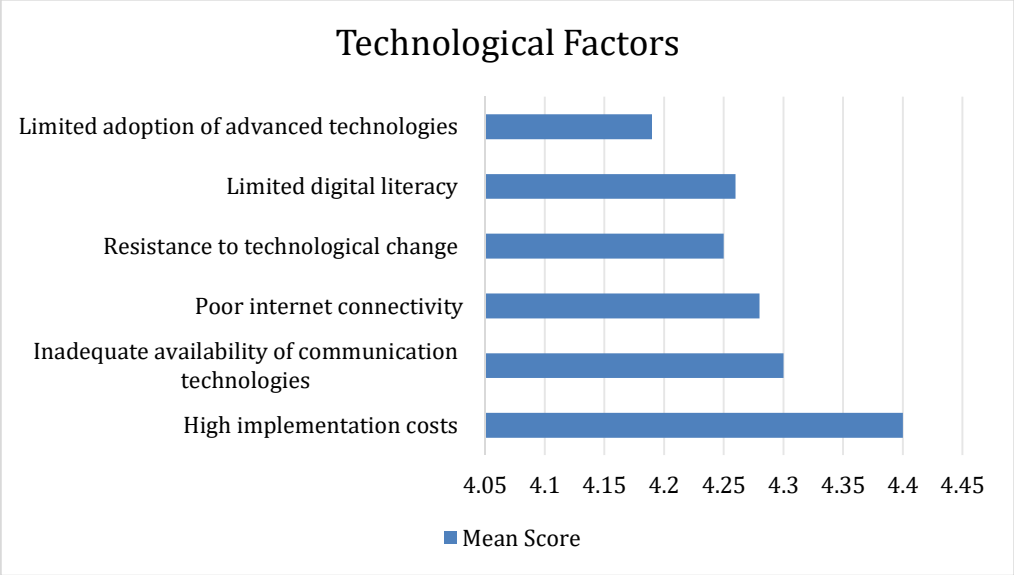


Fig 4: Mean Ranking of Technological Factors Affecting Communication Effectiveness

The results as illustrated in Figure above shows that implementation cost was the highest technological challenge with a mean score of 4.40. This suggests that financial limitations may restrict adoption of advanced communication systems among construction organisations. Although digital communication platforms such as BIM and project management software provide opportunities for improved coordination, their adoption requires investment in software, training, and organisational restructuring. Limited adoption of advanced technologies recorded the lowest score within the category at 4.19, indicating that respondents recognised technology-related challenges but considered cost and infrastructure limitations as more significant barriers.

4.7 Stakeholder-Related Factors Affecting Communication Effectiveness

Stakeholder relationships influence communication because construction projects involve participants with different objectives, responsibilities, and expectations.



Fig 5: Mean Ranking of Stakeholder - Related Factors Affecting Communication Effectiveness

As shown in Figure above, conflicting stakeholder interests ranked highest with a mean score of 4.38 as shown in Figure 4.12. This indicates that differences in project objectives and expectations remain a significant communication challenge within construction projects in Lagos State.
Poor collaboration between consultants and contractors recorded the lowest score of 4.17, although it remains a high influencing factor. This suggests that while professional relationships create communication challenges, respondents considered conflicting interests and delayed responses as more significant issues.

4.8 Inferential Analysis: Impact of Communication Effectiveness on Project Performance

Definition of Variables

The relationship between communication effectiveness and project performance was examined using two composite variables.

- **Independent Variable:** Communication Effectiveness
- **Dependent Variable:** Construction Project Performance
- **Hypothesis Testing**

The following hypotheses were developed:

Null Hypothesis (H_0)

There is no significant relationship between communication effectiveness and construction project performance among construction stakeholders in Lagos State.

Alternative Hypothesis (H_1)

There is a significant relationship between communication effectiveness and construction project performance among construction stakeholders in Lagos State.

The decision criterion was based on a 5% significance level.
Decision rule:
If p-value < 0.05, reject H_0.
If p-value > 0.05, accept H_0.

Pearson Correlation Analysis

Pearson Product Moment Correlation analysis was conducted using SPSS as shown in Table below to determine the strength and direction of the relationship between communication effectiveness and project performance.

Table 2: Pearson Correlation Between Communication Effectiveness and Project Performance

Variables	Communication Effectiveness	Project Performance
Communication Effectiveness	1	
Project Performance	0.491**	1

Significant at 0.01 level (2-tailed).

The Pearson correlation coefficient of r = 0.491 indicates a moderate positive relationship between communication effectiveness and construction project performance.

This means that improvement in communication effectiveness is associated with improvement in project performance. However, the relationship is not extremely strong, indicating that communication represents one of several factors influencing project outcomes.
The significance value obtained from SPSS was p = 0.000, since: p < 0.05, the null hypothesis is rejected. Therefore, there is a statistically significant relationship between communication effectiveness and construction project performance among construction stakeholders in Lagos State.

Regression Analysis

A simple linear regression analysis was conducted to determine the predictive influence of communication effectiveness on construction project performance.

The regression model is expressed as:
PP = a + b (CE)

Where:
PP = Construction project performance
CE = Communication effectiveness
a = Constant
b = Regression coefficient

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error
1	0.491	0.241	0.226	0.414

The regression model produced an R value of 0.491, confirming a moderate positive relationship between communication effectiveness and project performance.

The R^2 value of 0.241 indicates that communication effectiveness explains 24.1% of the variation in construction project performance among respondents in Lagos State. This implies that communication effectiveness contributes significantly to project outcomes, but its influence operates alongside several other factors. The remaining (100% − 24.1%) 75.9% of variation in project performance is explained by factors outside the model.

The relatively moderate R^2 value reflects the complex nature of construction project delivery. Unlike controlled environments where outcomes may depend on limited variables, construction projects involve multiple interacting technical, economic, and human factors.Therefore, the result should not be interpreted as communication having limited importance. Instead, it indicates that communication effectiveness is an important supporting factor within a broader project management system.

ANOVA Test of Regression Model

The ANOVA result from analysis shown in Table below produced an F-value of 74.568 with a significance level of 0.000. Since $p < 0.05$, the regression model is statistically significant. This confirms that communication effectiveness significantly predicts construction project performance

ANOVA Results

Model	Sum of Squares	df	Mean Square	F-value	Sig.
Regression	18.642	1	18.642	74.568	0.000
Residual	30.746	123	0.250		
Total	49.388	124			

Regression Coefficients

The regression equation is: PP = 2.352 + 0.451CE

Table below presents the analysis of the Regression Equation, where the coefficient value of 0.451 indicates that a one-unit increase in communication effectiveness is associated with a 0.451 increase in project performance score. The beta value of 0.491 indicates that communication effectiveness contributes moderately to explaining project performance. The significance value of 0.000 confirms that communication effectiveness is a statistically significant predictor of project performance.

Regression Coefficients

Model	Unstandardised B	Std. Error	Beta	t-value	Sig.
Constant	2.352	0.510		4.612	0.000
Communication Effectiveness	0.451	0.114	0.491	3.961	0.000

5. DISCUSSION OF FINDINGS

The empirical findings confirm that communication channels in the Lagos State construction sector are heavily dominated by rapid, low-friction platforms like WhatsApp (MS=4.57) and direct face-to-face exchanges (MS=4.55), as illustrated in Figure 4.2. This aligns with prior observations by Malik et al. (2021), who noted that informal messaging tools are widely favored on active sites due to their immediate feedback capabilities. However, as highlighted by Gamil and Abdul Rahman (2017), reliance on informal tools without documentation can exacerbate misunderstandings regarding complex contractual or structural specifications. The low adoption rate of advanced BIM systems (MS=2.77) reinforces the findings of Yakubu (2019), who cited high software costs and digital skill gaps as primary barriers to digital transformation in the Nigerian construction industry.

The analysis of communication barriers underscores the impact of human and organizational constraints. Differences in professional backgrounds (MS=4.58) and systemic lack of trust (MS=4.47) emerged as critical points of friction, as illustrated in Figure 4.3. These findings align with Ejohwomu et al. (2017), who observed that professional silos and inter-organizational friction frequently cause information distortion among construction stakeholders in Nigeria. Furthermore, organizational complexity (MS=4.43) directly reflects Galbraith's (1974) Information Processing Theory, which posits that rigid, multi-layered hierarchies constrain information processing capacity, creating operational bottlenecks on site.

Crucially, the inferential results (r=0.491, R2 =0.241, B=0.451, F=74.568), visually represented in the trend line, demonstrate that communication quality is a strong determinant of project performance. The finding that communication accounts for 24.1% of performance variance corroborates Dainty et al. (2006) and Yap et al. (2017), who demonstrated that structured information exchange reduces rework, prevents delays, and lowers cost overruns. In accordance with Uncertainty Reduction Theory (Berger & Calabrese, 1975), effective communication serves as an essential mechanism for resolving operational ambiguity, aligning stakeholder expectations, and improving construction project delivery in complex urban environments like Lagos State.

6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study empirically evaluated the impact of communication effectiveness on construction project performance within Lagos State, Nigeria. The findings demonstrate that communication channels on active construction sites remain dominated by rapid, low-barrier informal platforms which was specifically instant messaging (WhatsApp) and direct face-to-face interactions, while advanced digital systems such as Building Information Modelling (BIM) experience significantly low adoption rates.

The empirical assessment further identified professional discipline divergence, systemic lack of trust, complex organizational hierarchies, high technology costs, and conflicting stakeholder interests as the primary barriers impairing effective interaction across project tiers. Inferential statistical analysis established a significant positive linear relationship between communication effectiveness and project performance (r=0.491). Regression modeling confirmed that communication effectiveness serves as a key predictor of project outcomes, accounting for 24.1% of the variance in construction project performance (R2 =0.241, B=0.451, F=74.568). The study concludes that optimizing communication protocols, establishing clear reporting lines, and bridging inter-disciplinary silos are vital strategic imperatives for mitigating delays, reducing cost overruns, and improving overall project delivery across the Lagos State construction sector.

6.2 Recommendations

Based on the empirical findings, the following actionable recommendations are proposed:

- Formalize Digital Informal Communication Channels: Given the widespread adoption of instant messaging tools like WhatsApp for daily coordination, project organizations should establish clear protocols that require formal documentation (e.g., written confirmation or site instruction entries) for all technical and contractual directives issued via informal channels.
- Implement Integrated Project Delivery (IPD) Frameworks: To overcome professional silos and the lack of trust among stakeholders, project managers should promote collaborative project management models that align stakeholder goals early in the project lifecycle and foster interdisciplinary transparency.
- Streamline Organizational Communication Structures: Construction firms operating in Lagos State should flatten complex hierarchical reporting structures and designate clear lines of authority to minimize information delays and prevent site operational bottlenecks.
- Subsidize and Incentive Digital Tool Adoption: To address the cost barriers associated with modern technologies, industry professional bodies and government agencies should provide training programs and financial incentives to lower the entry threshold for advanced communication tools like Building Information Modelling (BIM).
- Develop Standardized Communication Management Plans: Project teams must mandate the formulation of a comprehensive Communication Management Plan at the inception of every construction project, outlining exact reporting schedules, responsibilities, and dispute resolution channels.

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