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ABSTRACT

The overall aim of the study was to investigate barriers to project visibility and its effects on the performance of road infrastructure projects in Kenya. It specifically examined the challenges related to project change management, communication, reporting, and resource allocation, and how these factors impacted project outcomes such as timeliness, budget adherence, and quality. The study was guided by the Project Management Maturity Model (PMMM), the Transparency Theory, the Stakeholder Theory, and the Resource-Based View (RBV). The study adopted the descriptive survey method and targeted 89 road infrastructure projects in Kenya, with the accessible population comprising 89 project managers from the projects, selected through simple random sampling. Data was collected through questionnaires and data sheets. Both descriptive and inferential statistical methods were used to analyze the data, which was then presented in tables and discussed. The expected output was to be of significance to project managers and other stakeholders in the road construction sector. The study found that clarity in project change management was a strategic driver of road infrastructure project performance in Kenya. The study also established that project communication plays a significant and positive role in enhancing the performance of road infrastructure projects in Kenya. The study further highlights the critical role of project reporting in the performance of road infrastructure projects in Kenya. Finally, the study highlights the critical role of shared resource channels in the performance of road infrastructure projects in Kenya. It is recommended that project implementers institutionalize robust change management frameworks, placing greater focus on proactive risk identification. It is recommended that project teams institutionalize structured communication protocols, including scheduled status updates, standardized reporting formats, and dynamic risk communication tools. It is recommended that project managers and policymakers prioritize the development of standardized, transparent, and frequent reporting systems. It is recommended that stakeholders in road infrastructure projects invest in strengthening coordination frameworks and organizational planning systems.

Key Words: Project Communication, Road Infrastructure, Kenya

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INTRODUCTION

In the United States, poor communication contributes to cost overruns and delays in around 30% of public infrastructure projects (PMI, 2020). With growing project complexity, effective communication supported by digital tools like Building Information Modeling (BIM), helps track progress, manage resources, and assess risks (Hickson, 2022). However, challenges persist, inconsistent communication, hindering project success. This gap leads to misalignment in project goals and delays in delivery. Despite advancements, the U.S. infrastructure sector must adopt more collaborative, data-driven approaches to improve project visibility and performance (McKinsey & Company, 2021)

In South Africa, communication plays a pivotal role in improving infrastructure performance, especially with large-scale projects like the Gautrain and the revitalization of port and rail infrastructure. According to reports, visibility tools, such as project dashboards and real-time reporting systems, are being increasingly adopted to mitigate risks like cost overruns and schedule delays (Mahlangu et al., 2021). However, challenges persist due to inconsistent data sharing between government bodies and contractors, which leads to inefficiencies and delays in meeting deadlines. In Nigeria, communication is crucial in addressing the challenges of infrastructure development, where corruption and lack of transparency have often hindered project success (Akinlolu et al., 2020). For instance, the Lagos-Ibadan expressway project faced significant delays and cost escalations due to poor project tracking and oversight mechanisms (Nigerian National Petroleum Corporation, 2023)

Communication plays a crucial role in the performance of infrastructure projects in Kenya, yet many projects struggle due to insufficient transparency and unclear communication. Statistics indicate that over 79% of infrastructure projects in Kenya face delays, cost overruns, or quality issues (Nyika, 2012). Inadequate communication between stakeholders, leading to misalignment in goals and

resource allocation. The Kenya National Highways Authority (KeNHA) has also reported delays in road projects, with many failing to meet their deadlines or budgets due to poor communication and limited access to real-time project data (KeNHA, 2021). These challenges are further exacerbated by factors such as poor project change management and an insufficient reporting system that prevents stakeholders from having a clear view of project progress. For instance, the failure to document and share critical project updates causes confusion and affects decision-making, hindering the overall performance of the projects (Ike, Diallo, & Thuillier, 2012).

Statement of the Problem

Kenya's road infrastructure is a critical component of its economic development, playing an essential role in facilitating the transportation of goods and people. As of 2020, Kenya's road network spanned approximately 160,000 kilometers, with only 12% of it being paved (World Bank, 2020). While the Kenyan government has heavily invested in expanding and modernizing the road infrastructure, the country continues to face persistent challenges in the delivery of road infrastructure projects. According to the Kenya National Highways Authority (KeNHA), only 56% of road projects were completed on time and within budget between 2014 and 2019 (KeNHA, 2022). Despite significant investments, many road projects still face issues with poor construction, inadequate maintenance, and the deterioration of roads faster than expected. These challenges undermine the long-term sustainability and cost-efficiency of infrastructure projects, highlighting a critical need for improved project management practices to ensure the successful delivery of road infrastructure in Kenya. One of the key challenges facing Kenya's road infrastructure projects is communication which often attributed to poor project management practices, misalignment of goals among stakeholders, and a lack of clear project visibility. Studies indicate that 75% of road infrastructure projects in Kenya suffer delays due to

poor communication and the absence of proper progress tracking mechanisms (Ombui & Irungu, 2021).

Despite the clear need for improved project management practices, there is a notable gap in research focused on the internal factors that affect the success of road infrastructure projects in Kenya. Specifically, the role of communication in enhancing project performance has not been sufficiently explored. While external factors like funding shortages and political interference have been well-documented, the barriers of project visibility remains an understudied area. Studies, such as those by Kariuki (2023), Ombui and Irungu (2021), and World Bank. (2020), have highlighted that barriers to project visibility, such as inadequate reporting systems, unclear project goals, and poor coordination among stakeholders, remain major challenges in Kenya's road infrastructure sector. Addressing these research gaps could lead to the development of more effective strategies for managing road infrastructure projects and ensuring their success, ultimately contributing to Kenya's socio-economic development.

Objectives of the Study

The overall aim of this study was to investigate barriers to project visibility and its effects on performance on road infrastructure projects in Kenya. The study's specific objective was to examine how project communication influences performance of road infrastructure projects in Kenya.

LITERATURE REVIEW

Theoretical Review

Transparency Theory

Transparency Theory emphasizes the importance of openness, clarity, and the availability of information to foster trust and accountability in decision-making processes. It originated from the need to understand how clear and accessible communication within organizations or projects affects stakeholder relationships. Key proponents

include scholars like Heald (2006), who defined transparency as the openness with which decision-making and operations are conducted, allowing stakeholders to make informed judgments. It asserts that transparency reduces uncertainty and enhances stakeholders' confidence, especially in complex or public projects. Transparency also links to accountability, suggesting that organizations or project teams must not only be open but also be held responsible for their actions (Fox, 2007). The theory, while applicable in various fields, has found significant use in project management, particularly in infrastructure projects, where multiple stakeholders often interact.

The core argument of Transparency Theory is that information should flow freely and be readily available to all relevant stakeholders to facilitate accountability. This transparency, it is argued, improves decision-making, fosters public trust, and mitigates corruption or misconduct (Heald, 2006). A key assumption of the theory is that transparency results in better project outcomes by ensuring that all participants have access to the same information, reducing asymmetries that could lead to poor decisions or inefficiencies. Moreover, the theory assumes that transparency promotes stakeholder engagement, as individuals or groups are more likely to participate if they feel informed and aware of ongoing processes. Additionally, it assumes that increased transparency leads to more ethical behaviors, with stakeholders feeling an obligation to adhere to shared expectations due to the visible scrutiny of their actions (Fox, 2007).

In the context of project communication, Transparency Theory has been widely applied to explore how open and clear communication channels contribute to project success. For example, studies have shown that when stakeholders in construction projects have easy access to project timelines, budgets, and decision-making processes, their involvement and commitment to the project increase. Transparency reduces the risks of miscommunication and project delays, ensuring that every participant, from

contractors to local communities, understands their roles and responsibilities. One study by Williams (2008) applied the theory to large infrastructure projects, highlighting that transparent communication is a significant factor in maintaining stakeholder trust and ensuring project goals are met. The use of transparent reporting systems in these projects fosters a shared understanding of progress and challenges, essential for effective problem-solving.

Despite its widespread application, Transparency Theory has faced criticism, particularly regarding its overemphasis on information availability. Critics argue that merely providing access to information does not necessarily lead to improved decision-making or project outcomes. According to some scholars, transparency can lead to information overload, where too much information becomes counterproductive and difficult to process (Florini, 2007). Furthermore, transparency does not always guarantee trust or accountability, as stakeholders may still manipulate or misinterpret the available information to suit their interests. Another criticism relates to the idea that transparency can sometimes be used as a superficial tool to create the appearance of openness without meaningful action behind it. Additionally, concerns have been raised about the security and privacy risks involved in making certain sensitive project details public (Kovacs, 2012).

Transparency Theory underlines the importance of open and honest communication in decision-

making processes. It explains how visibility contributes to trust and accountability, particularly in complex or change-driven projects. Transparency Theory supports the argument that clear communication of risks and milestones ensures stakeholders have a shared understanding of project progress and potential challenges, facilitating proactive solutions (Anderson & Lewis, 2021). In Kenya, Transparency Theory has been applied to examine communication in infrastructure projects, particularly those funded or overseen by the government. The theory is crucial in addressing challenges related to corruption, mismanagement, and inefficiencies in such projects. For instance, transparency in procurement processes, project monitoring, and financial reporting can significantly reduce the potential for corrupt practices. A study by Mwangi and Bichanga (2014) focused on the construction of roads and bridges in rural Kenya, where transparent communication between contractors, local governments, and the communities affected by the project led to improved stakeholder trust and minimized disruptions. Transparent communication ensures that the public is informed about timelines, funding, and potential disruptions, leading to smoother project execution. While some projects still face challenges related to the application of transparency, the theory continues to offer valuable insights into improving project communication and outcomes in Kenya's infrastructure sector.

Conceptual Framework

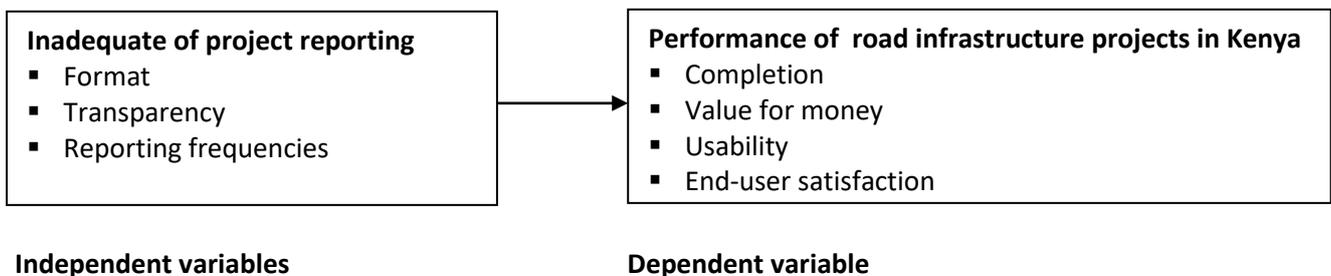


Figure 1: Conceptual Framework

Empirical Literature Review

Project Communication and Performance of Projects

Rahimian et al. (2022) employed a fully connected deep neural network approach to predict communication quality in construction projects. The study demonstrated that effective communication significantly influenced project performance by reducing delays and improving coordination among stakeholders. By analyzing large datasets, the researchers identified patterns that linked high-quality communication to enhanced decision-making and streamlined workflows. However, the study faced challenges such as limited interpretability of the deep learning model, which made it difficult to explain how specific communication factors influenced project outcomes. A significant research gap lay in the lack of qualitative data to complement the quantitative findings, potentially overlooking the nuanced interpersonal dynamics of communication in construction projects.

Malik et al. (2023) explored the impact of communication factors and stakeholder engagement on renewable energy projects in Pakistan. The findings highlighted that transparent and frequent communication was crucial in fostering trust and collaboration among stakeholders, which, in turn, improved project outcomes. Nonetheless, the study encountered challenges in accounting for cultural differences and varying stakeholder priorities, which complicated the generalization of its findings. A notable research gap was the limited focus on technological tools that could enhance communication efficiency and stakeholder coordination in renewable energy projects, leaving opportunities for future research.

Malik et al. (2021) investigated the relationship between communication and construction project success, emphasizing the mediating role of conflict. The study revealed that effective communication mitigated conflicts and enhanced project performance by aligning stakeholder expectations.

Despite these findings, the study struggled with capturing the dynamic nature of conflicts and their resolution over the project lifecycle. Additionally, it lacked a comprehensive exploration of how different communication channels and technologies influenced conflict resolution, pointing to a research gap that future studies could address.

Gamage (2022) examined the role of effective communication in minimizing disputes in construction projects. The study underscored that clear and timely communication was pivotal in resolving misunderstandings and avoiding costly disputes, ultimately boosting project performance. However, challenges arose in measuring the effectiveness of communication strategies across diverse project settings. Moreover, the research primarily relied on case studies, limiting its generalizability. A key research gap was the absence of a robust framework for evaluating communication effectiveness, which could guide project managers in diverse contexts.

Kwofie et al. (2019) analyzed communication performance challenges in public-private partnership (PPP) projects in Ghana and South Africa. They found that inadequate communication led to misaligned objectives and project delays. The study highlighted cultural and institutional barriers as significant challenges to effective communication. However, the research did not sufficiently explore the role of digital communication tools in mitigating these challenges, leaving a gap in understanding how technology could enhance communication performance in PPP projects. Ssenyange et al. (2017) assessed the role of project communication in improving project performance in selected public university projects. The study established that structured communication processes significantly enhanced project performance by facilitating timely information exchange. Challenges included resistance to adopting standardized communication frameworks among project teams. Additionally, the research lacked an examination of the role of modern communication technologies, representing

a gap in addressing contemporary communication needs in academic projects.

Odhiambo et al. (2020) investigated how communication drives project performance in Kenyan commercial banks. The study found that effective communication enhanced project performance by fostering clarity and reducing ambiguities in task execution. Challenges involved resistance to change and inadequate training on effective communication practices. Furthermore, the study did not address the integration of communication planning with technological advancements, creating a gap in understanding how technology could further optimize project performance. Rotich et al. (2022) examined the impact of communication planning and technology integration on the implementation of water construction projects in Bomet County, Kenya. The findings indicated that strategic communication planning coupled with technology adoption significantly improved project performance by enhancing coordination and reducing miscommunication. However, the study faced challenges in isolating the specific contributions of communication planning versus technology integration. A research gap was the lack of a longitudinal perspective to assess the sustained impact of these factors over time.

METHODOLOGY

The research design that was adopted in this study is the descriptive survey research design. The design was appropriate because it was used to assess the opinions and attitudes on events, people and procedures (Kothari, 2004). The researcher can then use statistical techniques to make conclusions about the population based on the sample. The

Table 1: Response Rate

Target No. of respondents	No. of questionnaires Returned	Response Rate (%)
88	84	95.5

The high questionnaire response rate (95.5%) shown in Table 1 resulted from the method of administration of the instrument, which was in this

study was both qualitative and quantitative in nature.

The target population refers to the entire group of individuals with observable characteristics from which inferences can be drawn (Mugenda & Mugenda, 2003). The study targeted road projects 800 road projects worth Sh763 billion are currently on slow implementation while others have completely stopped due to the inability of the government to avail adequate budget over the years (Ministry of Roads and Transport, 2023). From these the accessible population was the project managers in the roads projects targeted.

Since the target number of road infrastructure construction projects in Kenya since 2018 is 800, this population was high enough to warrant the use of probability sampling methods.

The study used structured questionnaire for data collection. These are briefly discussed below. The data collected was derived from both primary and secondary sources. The questionnaire is a collection of items to which an interviewee is expected to respond in writing. The researcher piloted the instruments by distributing nine (9) questionnaires to other road infrastructure projects in the country, which were not part of the projects to be sampled. The results of the piloted questionnaires enabled the researcher to determine the consistency of responses to be made by respondents and adjust the items accordingly by revising the document.

DATA ANALYSIS, RESULTS AND DISCUSSIONS

Response Rate

Table 1 shows the response rate of the questionnaires.

case self-administered. This was acceptable according to Denzin (2017). This method also ensured that the respondents' queries concerning

clarity were addressed at the point of data collection; however, caution was exercised so as not to introduce researcher bias in the process. The other questionnaires were either not returned or were found to be unusable for the study; hence, their results were not included in the findings.

Descriptive Statistical Analysis

The study carried out descriptive statistical analysis in order to establish the basic trends of the data and, consequently, form the basis for which other inferential statistical analyses could be carried out. This sub-section describes the results arising from the descriptive statistical analysis.

Clarity in project change management and performance of road infrastructure projects in Kenya

The first objective of the study was to assess how clarity in project change management influences performance of road infrastructure projects in Kenya. The project change management variable was measured using three constructs, Good definition, Milestones, and Risk identification. A five-point Likert scale was used to establish the levels of agreement of the respondents with these constructs and this formed the basis of quantitative data. The results are presented in Table 2.

Table 2: Clarity in project change management and performance of road projects

Statement	SA F(%)	A F(%)	N F(%)	D F(%)	SD F(%)	Mean	Std. Dev
The project's goals and objectives are clearly defined at the beginning of the road infrastructure project.	15(18)	43(51)	21(25)	4(5)	2(2)	3.81	0.51
The scope of changes within the project is clearly communicated to all stakeholders throughout the project's lifecycle.	26(31)	29(35)	12(14)	9(11)	8(9)	3.68	0.679
Key project milestones are established early on and regularly communicated to all project team members.	17(20)	39(47)	14(17)	8(9)	7(8)	3.65	0.799
Progress toward achieving project milestones is consistently tracked and made visible to all relevant stakeholders.	26(31)	41(49)	14(17)	1(1)	0	4.04	0.831
Potential risks are identified and communicated early in the project, providing adequate time to develop mitigation strategies	12(14)	31(37)	12(14)	19(23)	10(12)	3.18	0.748
There is a visible, centralized system in place for tracking and managing project risks throughout its execution	16(19)	38(45)	17(20)	8(10)	5(6)	3.61	0.712
Aggregate						3.662	0.713

Table 2 presents findings on the influence of clarity in project change management on the performance of road infrastructure projects in Kenya. This variable was measured through three key constructs: Good Definition, Milestones, and Risk Identification. Respondents rated their agreement on a five-point Likert scale, and the results are analyzed based on the mean and standard deviation for each statement.

Under the Good Definition construct, responses indicated a high level of clarity regarding project initiation and scope communication. The statement "The project's goals and objectives are clearly defined at the beginning of the road infrastructure project" received a strong rating (mean = 3.81; SD = 0.51), indicating consensus on clear goal setting. Similarly, "The scope of changes within the project is clearly communicated to all stakeholders

throughout the project's lifecycle" also scored positively (mean = 3.68; SD = 0.679), suggesting that change-related communication is generally effective.

For the Milestones construct, responses reflected positive perceptions. The statement "Key project milestones are established early on and regularly communicated to all project team members" yielded a favorable mean (mean = 3.65; SD = 0.799). This is reinforced by the even higher score for "Progress toward achieving project milestones is consistently tracked and made visible to all relevant stakeholders" (mean = 4.04; SD = 0.831), indicating strong practices in milestone tracking and reporting.

However, in the Risk Identification construct, the scores were slightly lower, reflecting moderate concerns. The item "Potential risks are identified and communicated early in the project" had a lower rating (mean = 3.18; SD = 0.748), suggesting delays or limitations in initial risk identification. In contrast, the presence of a formal tracking system was viewed more positively, with "There is a visible, centralized system in place for tracking and managing project risks" scoring higher (mean = 3.61; SD = 0.712), indicating some structured

mechanisms are in place for risk management during execution.

Implications of the findings suggest that project change management practices in Kenyan road infrastructure projects are generally strong in terms of initial goal clarity and milestone management. These strengths support effective tracking and coordination throughout the project lifecycle. However, the relatively lower ratings related to early risk identification highlight a potential area for improvement. Strengthening risk anticipation and mitigation strategies at the outset would enhance adaptability and overall project resilience, further boosting performance outcomes.

Project communication and performance of road infrastructure projects in Kenya

The second objective of the study was to assess how project communication influences performance of road infrastructure projects in Kenya. The project communication variable was measured using three constructs, Status updates, Information flow, Risk Documentation. A five-point Likert scale was used to establish the levels of agreement of the respondents with these constructs and this formed the basis of quantitative data. The results were presented in Table 3.

Table 3: Project communication and performance of road infrastructure projects in Kenya

Statement	SA F(%)	A F(%)	N F(%)	D F(%)	SD F(%)	Mean	Std. Dev
The status updates provided throughout the road infrastructure projects are clear and regularly communicated	8(10)	22(26)	8(10)	40(48)	6(7)	2.83	1.114
The frequency of status updates in the project is sufficient to keep all stakeholders informed about the progress	10(12)	20(24)	8(10)	44(52)	2(2)	2.92	1.084
There is effective flow of information between all project stakeholders (contractors, consultants, government agencies, etc.).	26(31)	39(46)	13(15)	7(8)	0	4.00	0.621
The information shared within the project team is always accurate and up-to-date	7(8)	40(48)	11(13)	24(29)	2(2)	3.31	0.995
Project risks are properly documented and communicated to all relevant stakeholders in a timely manner	23(27)	37(44)	11(13)	7(8)	7(8)	3.74	0.82
There is clear documentation of potential risks in the road infrastructure project, and these risks are continuously updated throughout the project lifecycle	9(11)	13(16)	6(7)	34(41)	22(26)	2.46	1.187
Aggregate						3.21	0.9702

Table 3 presents data on the influence of project communication on the performance of road infrastructure projects in Kenya. This variable was examined through three constructs: Status Updates, Information Flow, and Risk Documentation. Respondents rated their level of agreement on a five-point Likert scale, with results interpreted using the mean and standard deviation for each item.

Under the Status Updates construct, findings indicate moderate dissatisfaction with the clarity and frequency of updates. The statement "The status updates provided throughout the road infrastructure projects are clear and regularly communicated" had a relatively low score (mean = 2.83; SD = 1.114), as did "The frequency of status updates in the project is sufficient to keep all stakeholders informed about the progress" (mean = 2.92; SD = 1.084). These results suggest that communication gaps exist in how and how often project status is shared with stakeholders.

In terms of Information Flow, perceptions were more positive. Respondents strongly agreed that "There is effective flow of information between all project stakeholders" (mean = 4.00; SD = 0.621), showing that inter-agency and team-level communication is seen as generally effective. However, the belief that "The information shared within the project team is always accurate and up-to-date" received a more moderate rating (mean = 3.31; SD = 0.995), indicating some inconsistencies in the quality or timeliness of shared information.

For Risk Documentation, the results were mixed. The statement "Project risks are properly

documented and communicated to all relevant stakeholders in a timely manner" received a strong rating (mean = 3.74; SD = 0.820), reflecting good practices in risk communication. However, a much lower score was reported for the item "There is clear documentation of potential risks in the road infrastructure project, and these risks are continuously updated throughout the project lifecycle" (mean = 2.46; SD = 1.187), pointing to weaknesses in the ongoing management and updating of risk records.

Implications of the findings indicate that while communication across stakeholder groups is perceived to be effective, critical aspects such as the frequency of status updates and continuous risk documentation are lagging. These deficiencies can undermine transparency, delay issue resolution, and reduce responsiveness during project execution. Addressing these gaps by standardizing update intervals and strengthening the mechanisms for real-time risk tracking would likely enhance both performance and stakeholder trust in road infrastructure projects in Kenya.

Project reporting and performance of road infrastructure projects in Kenya

The third objective of the study was to assess how project reporting influences performance of road infrastructure projects in Kenya. The project reporting variable was measured using three constructs, Format, Transparency, and Reporting frequencies. A five-point Likert scale was used to establish the levels of agreement of the respondents with these constructs and this formed the basis of quantitative data. The results are presented in Table 4.

Table 4: Project reporting and performance of road infrastructure projects in Kenya

Statement	SA F(%)	A F(%)	N F(%)	D F(%)	SD F(%)	Mean	Std. Dev
The format of project reports in road infrastructure projects is often unclear and difficult to interpret.	5(6)	70(83)	4(5)	4(5)	1(1)	3.88	0.629
The project reporting format does not effectively communicate critical information to stakeholders	9(11)	45(54)	5(6)	17(20)	8(9)	3.60	0.576
The project reports for road infrastructure projects in Kenya lack transparency regarding budget allocation and resource utilization. Stakeholders are not provided with sufficient information on project progress through the reports, leading to a lack of transparency	8(23)	15(43)	5(14)	4(11)	3(9)	3.38	0.774
The frequency of project reporting in road infrastructure projects is inadequate to monitor progress effectively	4(5)	36(43)	36(43)	7(8)	1(1)	3.43	0.764
Project reports are submitted too infrequently, hindering timely decision-making in road infrastructure projects	17(20)	32(38)	28(33)	5(6)	3(3)	3.66	0.946
Aggregate	14(17)	48(57)	17(20)	3(4)	2(2)	3.83	0.838
						3.63	0.755

Table 4 presents findings on the influence of project reporting on the performance of road infrastructure projects in Kenya. The project reporting variable was examined using three constructs: Format, Transparency, and Reporting Frequencies. Respondents rated their agreement on a five-point Likert scale, and the analysis below is based on the reported mean scores and standard deviations for each item.

Within the Format construct, the perception that "The format of project reports is often unclear and difficult to interpret" received a high mean score (mean = 3.88; SD = 0.629), indicating strong agreement among respondents. Similarly, the view that "The reporting format does not effectively communicate critical information" was also rated highly (mean = 3.60; SD = 0.576), reinforcing concerns over the clarity and communicative effectiveness of current report structures.

Under the Transparency dimension, responses reflected moderate agreement with the assertion that project reports lack transparency regarding budget and resource use (mean = 3.38; SD = 0.774).

This aligns with the sentiment that stakeholders are not sufficiently informed about project progress (mean = 3.43; SD = 0.764), suggesting room for improvement in making reporting more open and informative.

For Reporting Frequencies, respondents showed relatively strong agreement that current reporting intervals are insufficient. The statement "The frequency of project reporting is inadequate to monitor progress effectively" scored (mean = 3.66; SD = 0.946), while "Project reports are submitted too infrequently, hindering timely decision-making" had an even higher mean (mean = 3.83; SD = 0.838). These findings indicate a widespread perception that infrequent reporting undermines both monitoring and responsiveness in project execution.

Implications of the findings suggest that shortcomings in report format, limited transparency, and inadequate reporting frequency are notable barriers to effective project management and oversight. Enhancing the clarity and standardization of reporting formats, improving

the openness of financial and progress information, and increasing the frequency of reporting could significantly boost stakeholder confidence and support more timely and informed decision-making in Kenya's road infrastructure sector.

Shared resource channel and performance of road infrastructure projects in Kenya

The fourth objective of the study was to assess how shared resource channel influences performance of

road infrastructure projects in Kenya. The shared resource channel variable was measured using three constructs, Framework, Organization planning, and Coordination. A five-point Likert scale was used to establish the levels of agreement of the respondents with these constructs and this formed the basis of quantitative data. The results are presented in Table 5.

Table 5 Shared resource channel and performance of road infrastructure projects

Statement	SA F(%)	A F(%)	N F(%)	D F(%)	SD F(%)	Mean	Std. Dev
The current framework in place for resource sharing in road infrastructure projects is insufficient to meet the project's needs	8(23)	15(43)	5(14)	4(11)	3(9)	3.38	0.774
There is a clear and established framework for resource allocation that is consistently followed across all road infrastructure projects	14(17)	52(62)	7(8)	9(11)	2(2)	3.81	0.835
Inadequate organizational planning contributes to the inefficient distribution of resources in road infrastructure projects in Kenya	12(14)	50(59)	18(21)	5(6)	0	3.81	0.752
The lack of coordinated organizational planning leads to delays and resource shortages in road infrastructure projects	12(14)	14(17)	16(19)	29(35)	13(15)	2.79	0.603
There is a lack of effective coordination between project teams, which leads to difficulties in sharing resources in road infrastructure projects	21(25)	35(42)	17(20)	8(10)	3(3)	3.76	0.830
Coordination among stakeholders is ineffective, resulting in resource mismanagement and inefficiencies in road infrastructure projects	19(23)	30(36)	9(11)	17(20)	8(10)	3.43	0.960
Aggregate						3.497	0.792

Table 5 presents findings on the influence of the shared resource channel on the performance of road infrastructure projects in Kenya. The shared resource channel was assessed using three key constructs: Framework, Organizational Planning, and Coordination. Under the Framework dimension, the statement "The current framework in place for resource sharing in road infrastructure projects is insufficient to meet the project's needs" received a moderate mean score (mean = 3.38; SD = 0.774), suggesting general agreement that

existing frameworks may not fully support project needs. However, the contrasting statement "There is a clear and established framework for resource allocation that is consistently followed across all road infrastructure projects" was rated higher (mean = 3.81; SD = 0.835), indicating that while there are concerns about framework sufficiency, many respondents still recognize structured resource allocation practices.

Regarding Organizational Planning, the statement "Inadequate organizational planning contributes to

the inefficient distribution of resources" also scored high (mean = 3.81; SD = 0.752), demonstrating strong agreement that planning shortfalls affect efficiency. However, the view that "Lack of coordinated organizational planning leads to delays and resource shortages" had a lower mean (mean = 2.79; SD = 0.603), implying some divergence in opinions or contextual variations in coordination experiences. Under the Coordination construct, perceptions were generally positive: "There is a lack of effective coordination between project teams..." scored (mean = 3.76; SD = 0.830), and "Coordination among stakeholders is ineffective..." scored (mean = 3.43; SD = 0.960), indicating broad agreement on coordination challenges, though with some variability in views.

Implications of the findings suggest that while frameworks and planning structures are partially in place and recognized, inconsistencies in coordination and the adequacy of planning

continue to hamper efficient resource sharing. These insights point to the need for strengthened inter-organizational collaboration, clearer communication protocols, and adaptive planning systems to align resource allocation with project demands. Addressing these gaps could significantly enhance the efficiency and performance of road infrastructure initiatives in Kenya.

Performance of road infrastructure projects in Kenya

The dependent variable of the study was to assess the performance status of road infrastructure projects in Kenya. The performance status was measured using the constructs, Completion, Value for money, Usability, and End-user satisfaction. A five-point Likert scale was used to establish the levels of agreement of the respondents with these constructs and this formed the basis of quantitative data. The results are presented in Table 6.

Table 6: Performance of road infrastructure projects in Kenya

Statement	SA F(%)	A F(%)	N F(%)	D F(%)	SD F(%)	Mean	Std. Dev
The road infrastructure projects in Kenya are typically completed on time.	5(6)	19(23)	17(20)	36(43)	7(8)	2.73	1.131
Road infrastructure projects in Kenya are generally completed within the allocated budget	14(17)	47(56)	19(23)	2(2)	2(2)	3.84	0.824
Road infrastructure projects in Kenya provide value for the money spent.	5(6)	23(27)	38(45)	13(15)	6(7)	3.28	0.934
The resources used in road infrastructure projects are efficiently managed and contribute to cost-effective results.	9(11)	46(55)	18(21)	9(11)	2(2)	3.62	0.859
The roads constructed in infrastructure projects meet the functional requirements of the intended users.	16(19)	16(19)	1(1)	41(49)	10(12)	2.66	1.098
The completed road infrastructure is accessible and meets the needs of the different regions it serves.	13(16)	18(21)	35(42)	4(5)	14(17)	2.51	1.052
The end users of road infrastructure in Kenya are generally satisfied with the quality and functionality of the roads.	9(11)	49(58)	11(13)	11(13)	4(5)	3.57	1.009
Road infrastructure projects have significantly improved the overall travel experience for road users in Kenya.	9(11)	45(54)	5(6)	17(20)	8(9)	3.60	0.576
Aggregate						3.226	0.935

Table 6 presents an analysis of the performance of road infrastructure projects in Kenya, measured through four key constructs: Completion, Value for Money, Usability, and End-User Satisfaction. The results, based on a five-point Likert scale, show varying levels of performance across these dimensions. Under the Completion construct, the statement "The road infrastructure projects in Kenya are typically completed on time" received a low score (mean = 2.73; SD = 1.131), indicating general disagreement and considerable variability in responses. In contrast, completion within budget was rated positively, with the statement "Projects are generally completed within the allocated budget" scoring high (mean = 3.84; SD = 0.824), reflecting strong agreement and low dispersion. Similarly, under Value for Money, responses were moderately favorable. The perception that projects offer value for money had a balanced rating (mean = 3.28; SD = 0.934), while the effective management of resources yielded a higher rating (mean = 3.62; SD = 0.859), suggesting confidence in cost-efficiency.

The Usability construct revealed less favorable outcomes. The view that constructed roads meet users' functional needs received a low score (mean = 2.66; SD = 1.098), and road accessibility across regions was rated even lower (mean = 2.51; SD = 1.052), both indicating dissatisfaction and a lack of consistency in respondent experiences. In contrast, the End-User Satisfaction construct recorded relatively positive perceptions. Respondents agreed that users are generally satisfied with road quality and functionality (mean = 3.57; SD = 1.009), and also that travel experiences have improved due to these projects (mean = 3.60; SD = 0.576), with the latter showing the least variability. Overall, the aggregate performance rating of road infrastructure projects stood at a moderate level (mean = 3.226; SD = 0.935), highlighting strengths in financial execution and user experience, but also underscoring the need for improvement in timeliness, usability, and equitable regional access.

The findings carry important implications for policy and project management. While budgetary discipline and improved travel experience indicate commendable progress, the consistently low ratings in timely completion and usability suggest gaps in project planning, monitoring, and user-centered design. The perception that roads often fail to meet functional needs and regional accessibility goals raises concerns about inclusivity and long-term impact. For policymakers, this calls for a shift toward integrated planning that prioritizes user engagement, needs assessment, and adaptive project delivery mechanisms. Furthermore, investing in monitoring systems and stakeholder feedback loops may help ensure that future infrastructure investments deliver not just cost efficiency, but also functional and socially equitable outcomes.

Inferential Statistical Analysis

The study carried out inferential statistical analysis to establish the relationships between the independent variables and the dependent variable and also to test the hypothesis postulated for the study. The section, therefore, presents the diagnostic tests which were used to estimate and validate the regression models. The section also contains the bivariate regressions, multivariate regressions and test of hypothesis. These are discussed as follows.

The study investigated the bivariate relations between the independent variables and dependent variable. Each independent variable was regressed against the dependent variable and the models assessed. Joint models based on the constructs of each independent variable were also assessed.

Correlation Analysis

In this subsection a summary of the correlation analyses is presented. It seeks to first determine the degree of interdependence of the independent variables and also show the degree and strength of their association with the dependent variable separately. The significance of the correlations was determined at $p \leq 0.05$. The results are summarized in Table 7.

Table 7: Summary of Correlations

		Project Change Management	Project Communication	Project Reporting	Shared Resource Channels	Performance of Road Projects
Project Change Management	Pearson Correlation Sig. (2-tailed)	1				
Project Communication	Pearson Correlation Sig. (2-tailed)	0.199 0.069	1			
Project Reporting	Pearson Correlation Sig. (2-tailed)	-0.001 0.994	0.184 0.094	1		
Shared Resource Channels	Pearson Correlation Sig. (2-tailed)	0.033 0.763	0.159 0.331	0.167 0.742	1	
Performance of Road Projects	Pearson Correlation Sig. (2-tailed)	.320* 0.002	.306* 0.003	.421** 0.000	.543** 0.000	1

An analysis of the relationships between four key visibility-related constructs, Project Change Management, Project Communication, Project Reporting, and Shared Resource Channels, and the performance of road infrastructure projects in Kenya shown in Table 7 revealed several important insights. Pearson correlation coefficients were used to determine the strength and direction of these associations, each of which was statistically significant and positively correlated with project performance, indicating that enhanced visibility mechanisms are linked to better project outcomes.

Project Change Management showed a moderate, statistically significant positive correlation with project performance ($r = 0.320$, $p = 0.002$). This suggests that when goals, milestones, and risk identification processes are clearly defined and consistently managed, infrastructure projects tend to perform better. Improvements in timeliness, cost control, functionality, and stakeholder satisfaction can be attributed to effective change management

practices that are structured and inclusive rather than reactive or improvised. The study's finding that Project Change Management has a moderate, statistically significant positive correlation with project performance aligns with several prior studies emphasizing the value of visibility in enhancing project outcomes. For instance, Zaman et al. (2019) found that visibility bolsters communication and milestone tracking, reinforcing this study's conclusion that clearly defined goals and change processes support timely and efficient project delivery. Similarly, Meyer (2023) linked visibility to improved risk identification and stakeholder coordination, echoing this study's observation that structured change practices enhance functionality and stakeholder satisfaction. Wanous and Reichers (2001) and Jayatilleke and Lai (2018) also support the idea that visibility increases engagement and reduces misalignment, reinforcing the proactive nature of effective change management. However, while Muthu (2014) and

Sihombing (2024) noted the benefits of visibility tools like agile methods and dashboards, they also identified technical and interpretive challenges not fully addressed in the current study. Moreover, Lopez-Torres et al. (2024) and Burgess et al. (2003) cautioned about drawbacks such as data overload and misinterpretation, which were not explicitly explored here. Nonetheless, overall, the findings are largely in agreement on visibility's value in structured change environments.

Similarly, Project Communication demonstrated a moderate positive and significant relationship with performance ($r = 0.306$, $p = 0.003$). This underscores the importance of maintaining clear, timely, and accurate information flow across project teams and stakeholders. When communication practices are robust, featuring frequent updates and transparent documentation, projects are more likely to stay aligned with goals and adapt efficiently to challenges as they arise. The study's finding that project communication demonstrated a moderate but significant positive relationship with project performance aligns well with existing literature that underscores the critical role of communication in enhancing coordination, minimizing delays, and improving stakeholder alignment. Rahimian et al. (2022) similarly showed that high-quality communication positively influenced construction project performance through better coordination, although their use of deep learning limited interpretability. Malik et al. (2023) also affirmed the value of transparent communication in renewable energy projects, echoing this study's emphasis on trust and collaboration, though cultural variability complicated generalization. Likewise, Malik et al. (2021) found that communication reduces conflict and improves performance, mirroring this study's conclusion on adaptive efficiency. Gamage (2022) supported the finding by linking clear communication with dispute reduction, while Ssenyange et al. (2017) and Odhiambo et al. (2020) reinforced the importance of structured communication processes in public and banking

projects respectively. However, several studies, including those by Kwofie et al. (2019) and Rotich et al. (2022), noted gaps in technology integration and cultural adaptation—areas this study also indirectly touches upon by highlighting the importance of timely and transparent documentation.

A stronger association was observed between Project Reporting and performance ($r = 0.421$, $p < 0.001$), indicating that regular and transparent reporting mechanisms are instrumental in achieving successful outcomes. Projects that implement structured reporting systems foster accountability and informed decision-making, while reducing ambiguity among stakeholders. Poor or infrequent reporting, on the other hand, can compromise trust and hinder project execution. The finding that project reporting has a strong positive correlation with performance aligns with multiple studies emphasizing structured reporting's role in enhancing project outcomes. Like Cacciamani et al. (2022), who found that standardized surgical reporting improved transparency and accountability, the current study supports the view that well-defined reporting frameworks foster better decision-making. Similarly, Czarnigowska et al. (2021) and Thompson et al. (2017) confirmed that predictive and comprehensive reporting respectively enhanced control and performance. This also mirrors Álvarez et al.'s (2021) finding that documented reports strengthen portfolio decisions. Furthermore, Kaufmann and Kock (2023) emphasized the dangers of biased reporting, which resonates with this study's caution against poor or infrequent reports. Morris et al. (2024) and Amin et al. (2023) further validate these conclusions, showing that reporting boosts collaboration and trust. While challenges such as technical limitations (Johnson, 2023) and cost (Lo et al., 2023) remain, the consensus across studies affirms that effective reporting—when accurate, timely, and participatory—remains a cornerstone of successful project delivery, reinforcing this study's emphasis on transparency and regular updates.

The strongest relationship in the analysis emerged between Shared Resource Channels and project performance ($r = 0.543$, $p < 0.001$). This strong, highly significant correlation highlights the critical role of coordinated resource planning and allocation across departments and teams. Projects with clear resource-sharing frameworks, covering labor, equipment, and budget, tend to avoid duplication, minimize delays, and operate more efficiently. As such, resource coordination stands out as the most influential visibility-related factor in determining project success. The strong positive relationship identified between shared resource channels and project performance in this study aligns closely with existing literature, affirming the critical role of coordinated resource planning. Palmié et al. (2021) similarly emphasized that well-orchestrated shared resource frameworks enhance cost efficiency and innovation, though they cautioned against complexity and stakeholder misalignment, issues echoed in the current study's implication of implementation variability. Qayyum et al. (2021) and Lakshmi and Jayakumari (2023) also affirmed efficiency gains through multi-level or technological resource sharing, but highlighted technical and integration barriers. The emphasis on collaboration by Turi et al. (2024) and Adebayo et al. (2024) supports this study's finding that shared channels enhance adaptability and stakeholder satisfaction, though both noted resistance and cohesion challenges. Likewise, Wang et al. (2021) confirmed that social capital and knowledge-sharing improve performance, reflecting this study's assertion that clear frameworks reduce redundancy and delays. In sum, while literature corroborates the positive influence of shared resources, it also consistently highlights the challenges of coordination, communication, and implementation—areas requiring systemic improvements to optimize performance.

Although low to moderate correlations were also observed among the visibility constructs themselves (e.g., between Change Management and Communication: $r = 0.199$, $p = 0.069$), none of these relationships were statistically significant. This indicates that each construct independently contributes to project performance without substantial overlap. Therefore, improvements in one area do not compensate for weaknesses in another, emphasizing the need for a comprehensive, multi-dimensional visibility strategy.

In summary, all four constructs significantly influence project performance, affirming the broader premise that visibility barriers, whether in planning, communication, reporting, or resource coordination, directly impact infrastructure outcomes. Of these, shared resource channels exert the greatest influence, pointing to the need for cross-organizational planning tools and governance mechanisms. Ultimately, the findings advocate for an integrated approach to visibility in project management, where each dimension is strengthened in parallel. For policymakers and project leaders, institutionalizing such practices through policy frameworks, capacity-building, and technological systems will not only enhance project delivery but also improve public accountability in the infrastructure sector.

Regression Analysis

Multiple regression analysis was used to determine the significance of the relationship between the dependent variable and all the independent variables pooled together. This analysis was used to examine how the independent variables influence the dependent variable in such a collective set-up. It was also used to determine the extent to which each independent variable affected the dependent variable and also rank them in order of their importance. The results are given in the model summary in Table 8

Table 8: Multivariate linear regression analysis model summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.735a	0.54	0.515	1.4836

a Dependent Variable: Performance of Road Infrastructure Projects in Kenya

b Predictors: (Constant), Clarity in Project Change Management, Project Communication, Project Reporting, Shared Resource Channel

A multivariate linear regression analysis was conducted to examine the combined effect of four visibility-related constructs, Project Change Management, Project Communication, Project Reporting, and Shared Resource Channels, on the performance of road infrastructure projects in Kenya. The results revealed a strong positive relationship, with a multiple correlation coefficient (R) of 0.735. The model explained 54% of the variance in project performance ($R^2 = 0.540$), and after adjusting for the number of predictors, the adjusted R^2 stood at 0.515. This indicates that more than half of the variability in performance can be attributed to the combined influence of the four constructs. The standard error of the estimate was 1.4836, suggesting a moderate level of prediction accuracy.

These findings underscore the critical role of project visibility in driving performance outcomes. Specifically, the integration of clear change

management processes, effective communication, structured reporting, and coordinated resource-sharing mechanisms significantly enhances project success. The strength of this model highlights the need for comprehensive, system-wide strategies rather than isolated interventions. In practical terms, project managers and policymakers should prioritize transparency, accountability, and collaboration as central pillars of infrastructure delivery to improve efficiency, stakeholder satisfaction, and overall project impact.

Sen and Srivastava (2012) state that the appropriateness of the multiple regression model as a whole can be tested using F test. The F-test of overall significance indicates whether linear regression model provides a better fit to the data than a model that contains no independent variables. The results of the ANOVA performed on the independent and dependent variables are summarized in Table 9.

Table 9: ANOVA Summary

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	87.856	4	21.964	9.97824	.000 ^b
Residual	173.894	79	2.20119		
Total	261.75	83			

a Dependent Variable: Performance of Road Infrastructure Projects in Kenya

b Predictors: (Constant), Clarity in Project Change Management, Project Communication, Project Reporting, Shared Resource Channel

The results of Table 9 indicate that there was a significant difference between means of the independent variables and supply chain performance of agrochemicals production firms in Kenya. The observed F-statistic for the model $F_o = 8.447$ being greater than the table value $F_c = 2.53$ at 5% significance level ($\alpha < 0.05$) and the degrees of freedom being $df = 4, 79$. Overall, the ANOVA is significant at p-value, $p \leq 0.05$. The F-test shows

that the model in Table 4.24 was indeed significant and fitted the variables before moderation and could, therefore, be used to make further inferences.

In order to determine which of the independent variables was more important when it came to supply chain performance of agrochemicals production firms in Kenya, the beta value was used.

The results are given in Table 10 which also provides a summary of the multiple linear

regression analysis coefficients.

Table 10: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.954	0.972		5.097	0.000
Project Change Management	0.418	0.183	0.389	2.284	0.024
Project Communication	0.242	0.108	0.204	2.241	0.026
Project Reporting	0.489	0.159	0.451	3.075	0.002
Shared Resource Channel	0.151	0.069	0.139	2.188	0.030

a Dependent Variable: Performance of Road Infrastructure Projects in Kenya

It can be deduced from the findings in Table 10 that the most influential optimization strategies in supply chain performance of agrochemicals production firms in Kenya was **Project Reporting ($\beta = 0.451, p = 0.002$)** emerged as the most influential predictor of performance. This indicates that improvements in transparent, structured, and regular reporting practices have the greatest impact on project outcomes. Its strong statistical significance and relatively high beta coefficient suggest that project stakeholders rely heavily on reporting to guide decision-making and monitor accountability.

Project Change Management ($\beta = 0.389, p = 0.024$) was the second most important factor. This implies that clearly defined change processes—especially those involving risk tracking and milestone management—substantially contribute to improved performance. The standardized beta value affirms that structured change control is integral to navigating the dynamic conditions of infrastructure projects.

Project Communication ($\beta = 0.204, p = 0.026$) showed a moderate yet significant effect. This finding supports the premise that consistent and accurate information sharing facilitates stakeholder alignment and project adaptability, although its influence is somewhat less pronounced than that of reporting or change management.

Shared Resource Channels ($\beta = 0.139, p = 0.030$), while statistically significant, had the lowest beta coefficient among the four constructs. This suggests that although resource coordination contributes to performance, its influence is relatively smaller when compared to other visibility dimensions, particularly reporting and change management. This result may reflect contextual limitations in how resource-sharing mechanisms are implemented or perceived within the Kenyan road infrastructure sector. The regression equation used to predict project performance can be expressed as:

$$\text{Performance} = 4.954 + 0.418(\text{Project Change Management}) + 0.242(\text{Project Communication}) + 0.489(\text{Project Reporting}) + 0.151(\text{Shared Resource Channel})$$

The constant ($B = 4.954, p < 0.001$) represents the expected baseline performance score when all predictor variables are held at zero. While this value has limited practical interpretation due to the standardized nature of the constructs, it provides a statistical anchor for the regression model.

Each of the four independent variables was found to have a statistically significant effect on performance at the 5% significance level, reinforcing the earlier correlation results. The standardized beta coefficients (β), which allow for direct comparison of the relative impact of each variable, offer a clearer picture of variable importance.

The results of this regression analysis provide several important implications for project governance and strategic planning in infrastructure development: **Prioritize Reporting Systems**- project reporting stood out as the most critical visibility-related factor influencing performance. This underlines the importance of institutionalizing robust reporting frameworks that promote accountability, real-time monitoring, and data-informed interventions. **Formalize Change Management Practices** - given its substantial influence, project change management should be treated as a strategic priority, involving stakeholder-inclusive processes, proactive risk management, and well-defined escalation pathways for scope or timeline adjustments. **Enhance Communication Mechanisms** - while less impactful than reporting or change management, project communication remains an essential component of visibility. Regular updates, clarity in messaging, and stakeholder feedback loops should be embedded throughout the project lifecycle. **Strengthen Resource Governance** - although it had the weakest relative effect in the regression model, shared resource coordination is still a statistically significant factor. Project managers should not neglect this dimension; instead, they should focus on strengthening inter-agency resource planning tools and reducing inefficiencies caused by siloed operations.

CONCLUSIONS AND RECOMMENDATIONS

The study established that project communication plays a significant and positive role in enhancing the performance of road infrastructure projects in Kenya. While stakeholders generally benefit from effective information flow, the findings revealed critical weaknesses in the clarity, frequency, and continuity of status updates and risk documentation. These gaps can impair transparency and delay timely responses to project challenges. Despite being moderately influential compared to other visibility constructs, communication remains foundational for stakeholder coordination, issue tracking, and

adaptive decision-making. The rejection of the null hypothesis underscores that strategic communication is not optional but essential for successful project execution, particularly in large, multi-stakeholder infrastructure environments.

In conclusion, this study highlights the critical role of project reporting in the performance of road infrastructure projects in Kenya. The findings reveal that clear, transparent, and frequent reporting mechanisms significantly enhance project oversight, accountability, and decision-making, leading to improved outcomes. By addressing the gaps identified in reporting formats, transparency, and frequency, stakeholders can foster stronger collaboration, reduce inefficiencies, and ensure timely project completion. As the most influential construct among visibility-related factors, project reporting serves as a cornerstone for optimizing the performance of infrastructure projects, emphasizing the need for systemic improvements across the sector.

In conclusion, the study highlights the critical role of shared resource channels in the performance of road infrastructure projects in Kenya. While there are challenges in the consistency of resource coordination and planning, the results demonstrate that effective frameworks and organizational planning are essential for minimizing delays and optimizing resource allocation. The strong correlation between shared resource channels and project performance emphasizes the importance of improving inter-organizational collaboration, communication, and adaptive planning systems to address current inefficiencies. Despite its relatively smaller influence compared to other constructs, resource coordination remains an integral factor for successful infrastructure delivery, underscoring its relevance in project management practices.

It was recommended that project teams institutionalize structured communication protocols, including scheduled status updates, standardized reporting formats, and dynamic risk communication tools. This will enhance transparency, ensure continuous stakeholder

engagement, and support adaptive project management.

It was recommended that project managers and policymakers prioritize the development of standardized, transparent, and frequent reporting systems. Investments in improving reporting mechanisms will ensure better monitoring, stakeholder engagement, and accountability, thereby enhancing the overall success and delivery of road infrastructure projects in Kenya.

It was recommended that stakeholders in road infrastructure projects invest in strengthening coordination frameworks and organizational planning systems. Enhancing inter-departmental communication, establishing clearer resource-sharing protocols, and ensuring continuous monitoring and adaptation can improve project efficiency, ultimately leading to more successful and timely project delivery across Kenya's road infrastructure sector.

Recommendations for Future Research

Based on the findings and insights from the current study, the following three future research topics are proposed to deepen and expand the understanding of visibility-related practices in road infrastructure project performance:

1. **"Evaluating the Mediating Role of Risk Management in the Relationship between Project Change Management and Infrastructure Project Performance in Kenya"**

While clarity in project change management was found to be influential, the moderate attention to early risk identification suggests

the need to explore how formal risk management practices may mediate or amplify this relationship. This study could uncover whether strengthening risk anticipation and response mechanisms enhances the performance outcomes attributed to change management.

2. **"The Impact of Digital Communication Tools on Stakeholder Coordination and Performance in Large-Scale Infrastructure Projects"**

Given the communication gaps identified in the current research, a focused study on the adoption, use, and effectiveness of digital platforms (e.g., project dashboards, collaborative apps, and real-time messaging tools) could yield insights into how technology can bridge communication inefficiencies and improve transparency and adaptability in complex infrastructure settings.

3. **"A Comparative Study of Centralized versus Decentralized Resource Coordination Models in Public Infrastructure Project Delivery"**

Although shared resource channels showed a strong relationship with performance, the implementation context may vary significantly across projects. This research would compare different coordination frameworks, centralized planning by government agencies versus decentralized, project-specific coordination, to determine which models offer superior efficiency, accountability, and resource optimization.

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