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PROJECT COMMUNICATION AND PERFORMANCE OF ROAD CONSTRUCTION PROJECTS IN KENYA

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ABSTRACT

This study sought to investigate the influence of project communication on the performance of road construction projects in Kenya and to find out the moderating effect of organizational culture on the relationship between project communication and the performance of road construction projects in Kenya. This study adopted a cross-sectional research design and used a positivist research paradigm. The unit of analysis was the road construction projects implemented by National Government Road agencies (KURA, KeRRA, and KeNHA) in Kenya, while the unit of observation was management employees involved in the implementation of these road construction projects. Therefore, the target population for the research was 695 respondents, comprising director generals, directors, project engineers, resident engineers, site engineers, and surveyors involved in the implementation of these projects. The overall sample size for this study was determined using a formula by Krejcie and Morgan, which obtained 248 respondents. This study employed stratified random sampling to select the study sample. Primary data was used and was collected using a semi-structured questionnaire. Samples of the questionnaire were pilot tested with 24 respondents to test for reliability and validity. The data was analyzed using the Statistical Package for Social Sciences (SPSS) version 25 software. The qualitative data collected was analyzed using thematic analysis and presented in prose form. Quantitative data was analyzed using descriptive statistics and presented in tables and figures. The study also computed correlation and regression analyses to test the relationship between study variables and the research hypothesis. The study found that project communication has a positive and significant relationship with the performance of road construction projects in Kenya. In addition, organizational culture was found to have a significant positive moderating effect on the relationship between project communication and the performance of road construction projects in Kenya.

Key Words: Project communication, performance of road construction projects, organizational culture

Background of the Study

The construction industry is a vital sector of any nation's economy, serving as a significant driver of economic growth, infrastructure development, and job creation (Oluwoye, 2018). In Kenya, like many other developing countries, the construction of roads plays a pivotal role in enhancing transportation networks, fostering regional integration, and facilitating trade and economic development (Oketch & Osongo, 2017).

Kenya, a country known for its diverse landscapes and rapidly growing urban centers, has continually invested in the construction and maintenance of its road infrastructure to support economic development and improve the living standards of its citizens (Government of Kenya, 2017). The country's extensive road network connects major cities, towns, and remote regions, making transportation a vital aspect of daily life. Furthermore, the Kenyan government has prioritized infrastructure development as part of its Vision 2030 blueprint, reinforcing the importance of road construction as a means of achieving sustainable economic growth and prosperity (GoK, 2007).

Despite the strategic importance of road construction projects in Kenya, these initiatives have often faced challenges that hinder their timely completion and overall success. These challenges include budgetary constraints, inadequate project management, technical complexities, and environmental considerations (KIPPRA, 2016). Among these challenges, communication issues have emerged as a significant bottleneck that the successful completion of road construction projects in multiple ways (Kibwage et al., 2018; Ngumbau et al., 2020).

Effective project communication is widely recognized as a critical success factor in construction projects worldwide (El-Asmar & Kartam, 2018). In Kenya, where diverse stakeholders are involved in the planning, design, financing, and execution of road construction projects, the importance of clear, timely, and efficient communication cannot be overstated. Stakeholders include government agencies, contractors, subcontractors, suppliers, local communities, and regulatory bodies. Any breakdown or inefficiency in communication can lead to misunderstandings, disputes, delays, cost overruns, and compromised project quality (Mwangi et al., 2019). This paper therefore sought to explore the influence of project communication on the performance of road construction projects in Kenya.

Statement of the Problem

The performance of road construction projects in Kenya has been faced with numerous challenges. A closer examination of the Kenya Roads Board's (KRB) end-of-year review audit for FY 2020/21 reveals disparities in performance among road authorities (KRB, 2022). KeNHA, for instance, achieved a commendable accountability rating of 82.52%, whereas the Kenya Urban Roads Authority (KURA) and the Kenya Rural Roads Authority (KeRRA) obtained ratings of 79.85% and 67.36%, respectively. These accountability index ratings gauge the effectiveness of road authorities in implementing roadwork programs financed by KRB. The significant variations in these ratings imply potential governance-related challenges within different road authorities, which can have profound implications for project performance and service delivery.

Amid the intricate landscape of road construction projects, effective project communication emerges as a critical factor that can exert a transformative influence on project performance and outcomes. Project communication encompasses the processes, tools, and strategies employed to facilitate the exchange of information and coordination among project stakeholders (PMI, 2017).

It transcends mere information dissemination, encompassing the establishment of clear channels for collaboration, decision-making, and conflict resolution (Holtzhausen & Fourie, 2012).

Effective project communication is vital for timely and accurate information dissemination for effective project coordination and decision-making (Tayeh et al., 2019). Engaging diverse stakeholders, including government agencies, contractors, local communities, and regulatory bodies, is essential for addressing concerns and garnering support (Shenhar et al., 2016). Also, communication strategies can facilitate the swift resolution of conflicts and disputes, preventing project delays and cost overruns (Lan et al., 2016).

Project related activities in corporate governance are areas of concern for project governance (APM,2011). While the significance of project communication is well-established in project management literature, its specific impact in project based organizations and the performance of road construction projects within the Kenyan context remains an underexplored area. Therefore, this study sought to bridge this research gap by providing an in-depth analysis of the relationship between project communication and the performance of road construction projects in Kenya.

Objectives of the Study

1. To explore the influence of project communication on the performance of road construction projects in Kenya.
2. To examine the moderating effect of organization culture on the relationship between project communication and performance of road construction projects in Kenya.

Research Hypothesis

Ho1: There is no significant influence of project communication on performance of road construction projects in Kenya.

Ho2: There is no significant moderating effect of organizational culture on the relationship between project communication and performance of road construction projects in Kenya.

LITERATURE REVIEW

Theoretical Review

Communication Theory

The communication theory explains how communication processes might lead to discourse with others. According to Wiley et al. (2012), having a common language between sender and recipient improves communication. According to Miller (2005), the communication process consists of seven steps: message, encoding, transmitting, receiving, decoding, understanding, and feedback. As a result, according to Shannon, the first source, the information source, generates messages that are sent to the receiving terminal. It is necessary to update employees on new policies and developments in order for them to be aware of and engage effectively in issues that affect them. Any information should have a clear source. The second step is encoding, when the sender manipulates the message to create a signal that can be sent over the channel (Affare, 2016).

The third factor is the medium through which the signal is transmitted from the transmitter to the receiver. The communication channel should be suitable and free of impediments. The message can be sent via memo, phone call, or face-to-face communication. The fourth component is the receiver, which reverses the transmitter's action by recreating the signal's message. The fifth element is the destination, or the person (or thing) for whom the communication is intended. The

sixth thing for efficient communication is the message from the receiver confirming reception, which indicates information or communication. The seventh item is feedback, which is strategic in terms of actualizing what has been communicated. Information reaches its desired outcomes through feedback (Mugo & Moronge, 2018).

Organizational communication can be roughly defined as communication among employees inside a company (Naqvi, Aziz, & Rehman, 2017). According to Afroze and Khan (2017), effective communication occurs when the listener understands the message intended and responds appropriately. As a result, managers must effectively communicate and interact to accomplish the project's goals (Naqvi, Aziz, & Rehman, 2017). According to the theory, communication significantly impacts workgroups since organizational communication serves as a conduit for the flow of information, resources, and even policies. The theory emphasizes that communication is an integral part of any performance enhancement strategy (Afroze & Khan, 2017). As a result, the theory was deemed perfect for anchoring the project communication independent variable in the study to the performance of road construction projects in Kenya.

Schein's Theory of Organizational Culture

Schein (1985) developed a highly influential theory of organizational culture, consisting of three interrelated levels: artifacts, espoused values, and shared basic assumptions. Artifacts are the surface level of an organizational culture, tangible, easily seen, and felt manifestations such as products, physical environment, language, technology, clothing, myths and stories, published values, rituals, and ceremonies (Nguyen, Hai &Watanabe, 2017). Iqbal *et al.* (2018) clearly state that the artifacts that exist in the organization's environment are the climate of the organization and are ambiguous. Observers must gain evidence about why they exist before the artifacts become more clearly understood by them. Once an observer lives in the organization long enough and a greater understanding of artifacts becomes apparent, then and only then can an attempt be made to analyze the espoused values and beliefs, which is the next level of organizational culture.

Espoused beliefs and values include strategies, goals, shared perceptions, shared assumptions, norms, beliefs, and values instilled by founders and leaders. Indiya *et al.* (2021) explain that the espoused beliefs and values of an organization are what predict the behaviors that can be observed at the artifact level. The strategies, goals, and philosophies are the espoused values or justifications for actions that take place in the organization. The overt behaviors illustrate the espoused values to observers, but there can be inconsistencies between some of the espoused values and the visible behaviors. The reason for the inconsistencies is a deeper level of thought and perception driving the overt behaviors. In order to truly gain a more thorough understanding of the organizational culture, one must decipher what is going on at the deeper level of underlying assumptions.

Critics have said the dynamic culture model is ambiguous because it does not clearly describe the processes that occur within and among individuals and does not define whether the processes are cognitive or social. The cultural dynamics framework presupposes that cultural dynamics are both cognitive and social, that cultures define people, and that social processes have an impact on cognition. A key contribution of the cultural dynamics framework is that it bridges the mutually exclusive objectivist and subjectivist perspectives to provide a more complete picture of culture than either perspective offers on its own (Iqbal *et al.* 2018).

The theory was related to the study because a supportive organizational culture motivates employees to be the best they can and thus has a positive effect on performance. Organizational culture offers a shared system, which forms the basis of communication and mutual understanding.

In addition, organizational culture plays a major role in influencing behavior by using reasonable managerial tools, such as strategic direction, goals, tasks, technology, structure, communication, decision-making, cooperation, interpersonal relationships, and so forth, which are all designed to do things (Nguyen, Hai & Watanabe, 2017).

Conceptual Framework

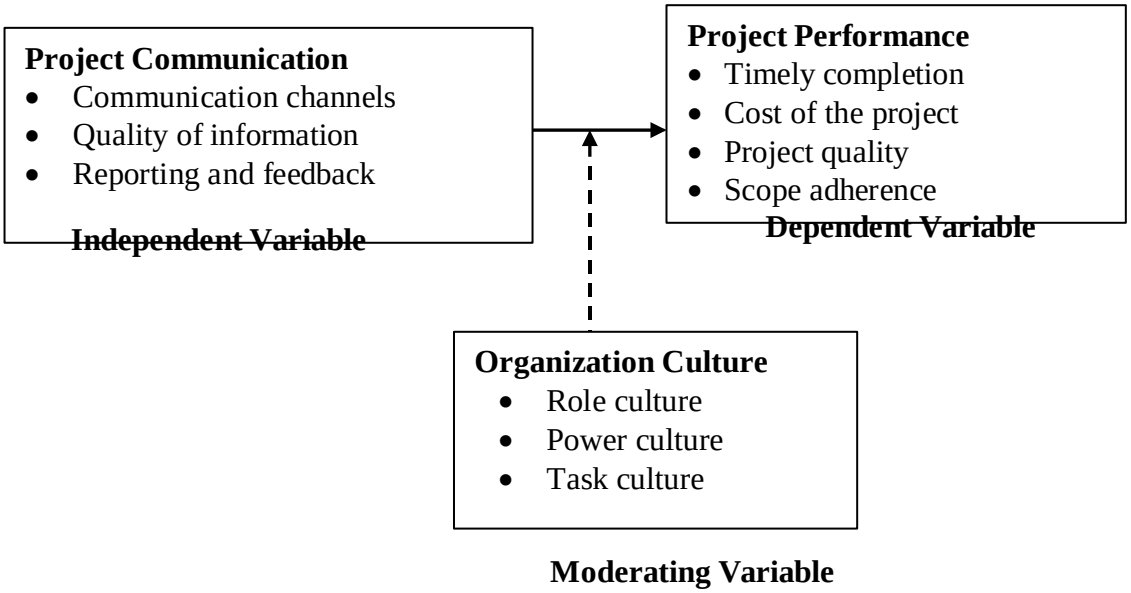

Figure 2.1: Conceptual Framework

Project Communication

Project communication is the formal and structured management of communication processes within an organization (Affare 2016). Project communication involves the establishment of policies, procedures, guidelines, and controls that govern how communication is conducted to ensure alignment with the organization's objectives, values, and legal requirements (Muchinsky, 2017). Effective project communication is characterized by clear communication channels, quality information, and effective reporting and feedback (Muchinsky, 2017). Project communication must be done in such a way that information can be simply received and processed by both the recipient and the sender, allowing them to make decisions and act accordingly (Harris & Sherblom, 2018). Project communication entails communication channels, quality of information, reporting, and feedback (Oyier *et al.,* 2018).

Communication channels play a crucial role in project communication as they determine how information is shared, exchanged, and disseminated among project team members and stakeholders (Naqvi, Aziz, & Rehman, 2017). Effective communication channels ensure that everyone involved in the project stays informed, aligned, and engaged (Muchinsky, 2017). According to Gouder (2019), direct, in-person communication allows for immediate feedback, clarification, and the building of rapport. It can take place in team meetings, one-on-one discussions, or informal gatherings. Muchinsky (2017) holds that email is a widely used channel for written communication. It allows for detailed explanations, documentation, and record-keeping. It is suitable for formal communication, sharing attachments, and reaching out to multiple recipients simultaneously. Presentations are useful for sharing project plans, progress updates, or delivering training sessions (Mugo & Moronge, 2018). Presentation slides or supporting

documents are often shared before or after the session. When choosing communication channels, it's essential to consider factors such as the nature of the project, team composition, stakeholders' preferences, geographical distribution, and the urgency or sensitivity of the information being shared. A combination of channels is often employed to cater to various communication needs throughout the project lifecycle (Affare, 2016).

Quality of information refers to the accuracy, relevance, clarity, and completeness of the information being shared (Kim & Lee, 2019). Inaccurate information can lead to misunderstandings, wrong decisions, and wasted efforts (Naqvi, Aziz, & Rehman, 2017). Project team members and stakeholders rely on accurate information to make informed choices and take appropriate actions (Ondari-Okemwa and Oduor, 2016). According to Afroze and Khan (2017), clear and concise communication is crucial for effective project communication. Ambiguous or vague information leads to confusion and misunderstandings among team members and stakeholders. The timeliness of information is crucial in project communication. It should be shared in a timely manner to ensure that stakeholders have access to the information when they need it. Delayed or outdated information can hinder progress, result in missed opportunities, and impact decision-making (Oyier *et al.* (2018)).

Reporting involves the systematic collection, analysis, and dissemination of project information to relevant stakeholders (Mugo & Moronge, 2018). It provides a structured mechanism for sharing project progress, status, risks, and other relevant information (Mugo & Moronge, 2018). Regular reporting ensures that stakeholders are aware of the project's progress, accomplishments, and challenges. It allows project managers to communicate milestones achieved, tasks completed, and any deviations from the plan (Affare, 2016). Reporting can include information about resource allocation and utilization, including budget, manpower, equipment, and materials. This helps stakeholders monitor resource efficiency and make informed decisions regarding resource allocation. Afroze and Khan (2017) argue that feedback is the exchange of information, opinions, and suggestions among project team members, stakeholders, and other relevant parties. Feedback enables continuous improvement by identifying areas of improvement, process bottlenecks, and lessons learned. It allows team members to share insights, suggestions, and best practices to enhance project performance. Feedback makes sure that the recipients of the information understand it correctly during project communication. It allows stakeholders to ask questions, seek clarification, and verify their understanding of project requirements, objectives, and expectations (Naqvi, Aziz, & Rehman, 2017).

Organizational Culture

The influence of different organizational cultures is usually reflected in numerous factors, including style, structure, competence, shared values, norms, and beliefs, policies and procedures, the view of relationships with authority, and work ethics, to mention but a few (Mugo & Moronge, 2018). In addition, organizational culture influences organizational performance by shaping the behavior of organization members (Zheng, Yang & McLean, 2019). Sawner (2020) points out that an organization’s culture is considered to be an important factor affecting organizational success or failure. Priyono and Djojopranoto (2020) argue that organizational culture has a strong association with the organization’s sense of uniqueness, its values, mission, aims, goals, and ways of building shared values. Therefore, ignoring organizational culture in plans for any changes within the organization would yield unforeseen and negative consequences (Agboola, Motilewa & Adeniji, 2015). This study focuses on role culture, power culture, and task culture.

Role culture, also known as a bureaucratic or functional culture, is an organizational culture that places a strong emphasis on hierarchical structures, clearly defined roles and responsibilities, and adherence to established rules and procedures (Nguyen, Hai & Watanabe, 2017). In a role culture, individuals are assigned specific roles based on their expertise, and decision-making authority is typically concentrated at the top levels of the organization. Role culture emphasizes specialization and a clear division of labor. Employees are assigned specific roles and responsibilities based on their skills and expertise. Each role has well-defined tasks and functions, which helps create a sense of order and clarity within the organization (Indiya *et al.,* 2021). Role culture is characterized by a hierarchical structure where authority and decision-making power are concentrated at the top levels of the organization. The reporting relationships are clearly defined, and individuals are expected to follow the chain of command (Iqbal *et al.* 2018).

Power culture, also known as a centralization culture, is an organizational culture where power and decision-making authority are concentrated in a few individuals or a central figure within the organization. Iqbal *et al. (2018)* In a power culture, key decisions and control are held by a select few who wield significant influence and have the ability to shape the organization's direction (Nguyen, Hai & Watanabe, 2017). Power culture is characterized by a centralized decision-making process. A small group or an individual at the top of the hierarchy holds the authority to make key decisions without significant input or consultation from others (Aibinu & Jagboro 2018). Power culture often revolves around a dominant leader or a small group of influential individuals who exert a significant influence on the organization. The leader's personality, vision, and preferences play a crucial role in shaping the organization's culture and direction (Olanipekun, Abiola, & Aje, 2019).

Task culture, also known as project culture or team culture, is an organizational culture that prioritizes the completion of specific tasks or projects (Indiya *et al*., 2021). In a task culture, the focus is on forming dynamic and flexible teams that come together to achieve specific objectives. It emphasizes collaboration, innovation, and expertise to accomplish project goals. Task culture emphasizes the formation of teams or project groups based on specific tasks or projects (Iqbal *et al.*, 2018). Individuals who have the necessary knowledge and skills to successfully complete the assigned tasks make up these teams. The task culture is project-oriented, with teams created to accomplish specific objectives within a defined timeframe. The organization's structure is often dynamic and adaptable, allowing teams to be formed and dissolved as projects begin and end (Belassi, Kondra & Tukel, 2017).

Project Performance

Project management is both an art and a science: a science because it requires the skills, tact, and finesse to manage people, and a science because it demands an in-depth knowledge of an assortment of technical tools for managing relatively short-term efforts, having finite beginning and ending points, usually with a specific budget, and meeting or exceeding customers' needs and expectations (Simona, Adela-Eliza, & Badea, 2017). According to Alade, Lawal, Omonori, and Olowokere (2016), timely delivery of projects within budget and to the level of quality standard specified by the client is an index of successful project delivery. This involves balancing competing demands among: scope, time, cost, and quality; stakeholders with different needs and expectations; and identified requirements and expectations (Dumitrascu & Nedelcu, 2016). Citing the Project Management Body of Knowledge [PMBOK] (2011), Muthoka (2018) argued that a project is considered underperforming when it has not delivered what was required in line with expectations of cost, quality, and time. Consistent with this argument, Stojčetović *et al*. (2018) submit that one of the biggest problems for project managers is harmonizing project cost, time,

and quality. However, it is difficult to achieve this because cost, time, and quality are related in the way that a change in one influences the other two. In this study, project performance is measured in terms of timely completion, cost of the project, project quality, and scope adherence.

Muthoka (2018) argues that timely completion is an important measure of project performance that assesses whether a project is finished within the planned schedule or the agreed-upon timeframe. Meeting project deadlines is crucial, as it impacts various aspects of the project's success and overall organizational objectives. Meeting deadlines demonstrates reliability and professionalism, and it enhances the client's trust in the project team's ability to deliver on time. Timely completion instills confidence among project stakeholders, including investors, sponsors, and senior management. It shows that the project is well managed, and it increases trust in the project team's capabilities. Delays in project completion can lead to additional costs, such as extended labor hours, penalties, or increased overhead expenses. Completing projects on schedule helps avoid these cost overruns (Stojčetović *et al*., 2018).

Project cost focuses on evaluating whether the project is completed within the approved budget and managing costs effectively throughout the project lifecycle (Indiya *et al.*, 2021). Effective cost management ensures optimal allocation of resources. By controlling project costs, resources such as funds, personnel, equipment, and materials can be efficiently allocated to meet project requirements and priorities (Muthoka, 2018). Cost management mitigates the financial risks associated with the project. It involves identifying potential cost risks, such as budget overruns, and implementing strategies to mitigate those risks before they impact the project's financial health. To effectively manage project costs, project managers should develop accurate and comprehensive cost estimates, establish a robust cost tracking and reporting system, monitor costs regularly, and proactively address cost deviations. Collaboration between project managers, finance teams, and stakeholders is crucial for successful cost management throughout the project lifecycle (Stojčetović *et al*., 2018).

Project quality refers to the degree to which a project meets the requirements, specifications, and expectations of its stakeholders (Simona, Adela-Eliza, & Badea, 2017). Project quality focuses on delivering outcomes and deliverables that meet predefined quality standards and are fit for their intended purpose. Quality management ensures that the project meets the defined requirements and specifications. It involves understanding stakeholder needs, documenting requirements, and implementing processes to verify and validate that the project outputs satisfy those requirements (Anuar & Ng, 2017). Quality management emphasizes proactive measures to prevent defects and errors rather than relying solely on detection and correction (Alade *et al.* 2016). It involves implementing quality assurance activities, such as process reviews, quality planning, and risk management, to identify and mitigate potential quality issues before they occur (Elanga, Louzolo-Kimbembe, & Pettang, 2018).

Scope adherence refers to the degree to which a project stays within the defined scope boundaries throughout its lifecycle (Kim & Lee, 2019). Scope adherence measures the project team's ability to deliver the agreed-upon scope of work without unnecessary additions, changes, or omissions. Adhering to the project scope helps manage stakeholder expectations. When the project team delivers within the agreed-upon scope, it minimizes the risk of stakeholders expecting additional work or deliverables that were not initially planned (Ali & Kamaruzzaman, 2019). Scope adherence contributes to effective time and cost management. When the project team sticks to the defined scope, it minimizes the likelihood of scope creep, which can result in schedule delays, cost overruns, and resource inefficiencies (Anuar & Ng, 2017).

Empirical Review

Affare (2016) conducted an assessment of project communication management on construction projects in Ghana. The research established that within the Ghanaian construction industry, there is a strong appreciation of the importance of project communication and its importance within the industry. Specifically, the study established that the hindrances to effective communication on construction projects in Ghana are poor listeners, poor leadership, unclear communication objectives, unclear channels of communication, an ineffective reporting system, ineffective communication between the parties on the project, stereotyping, and language difficulties. Finally, the research established that poor project communication had resulted in project delays, project cost overruns, and project abandonment. Project communication was also shown to strongly affect the performance of professionals within the construction industry.

Mugo and Moronge (2018) undertook a study to establish the influence of organizational communication on the implementation of building projects within Nairobi County. A total of 80 ongoing building projects within Nairobi City County were considered. The study revealed that clear roles in the project organization aim at building effective organizational communication, and a well-documented communication plan is essential to enhance project implementation and the availability of information and transparency to all participants in the project to increase the level of synergy. The study further revealed that appropriate communication channels ensured that information was relayed to the right audience, improved team coordination, and increased synergy and trust. The level of skill among personnel ensured accurate interpretation of information relayed, and the use of modern and compatible IT software ensured clear and timely interpretation of information.

Naqvi, Aziz, and Rehman (2017) researched the impact of stakeholder communication on project outcomes from July 2007 to April 2014 in the IT industry in Islamabad, Pakistan. A stratified sample of 70 heterogeneous IT projects from 24 different software houses was selected. The data was analyzed using frequency distribution, Pearson correlation, and linear regression. The findings confirmed a strong correlation and dependency of project outcomes on stakeholder communication. It recommended good quality stakeholder communication as a primary tool for determining the project's scope, time, and cost.

Kwete and Maralise (2018) researched the impact of effective project communication practices and project complexity on performance of international development projects. The study aimed to explore and identify effective communication practices influencing performance of international development projects in Pakistan and also illustrates important project complexity elements which moderates the relationship between effective communication and project performance. Task complexity was taken as moderator between communication and performance relationship. A survey was conducted to find the impact of project communication practices and moderating impact of project complexity on project performance. Questionnaires were sent to 60 international organizations working on such projects.

The results of the study showed that these practices have significant and positive impact on project performance; project complexity has a minimal impact on the communication and performance relationship. After detailed literature review and conducting 9 expert interviews from project managers, project coordinators and communication coordinators working on international development projects, 4 key communication practices which should be adopted by project professionals working on such projects were identified. These practices involved quality of

communication, frequency of communication, communication formality and communication bi-directionality.

Research Methodology

Research philosophy is the foundation of knowledge, and the nature of that knowledge contains essential assumptions about how researchers view the world (Saunders, Lewis, & Thornhill, 2017). According to Cooper and Schindler (2018), the positivist research paradigm is founded on real facts, objectivity, impartiality, measurement, and the validity of results. The current study was therefore anchored on the positivism paradigm because it is highly structured in methodology, which enables the generalization of quantifiable observations and the evaluation of results with the help of statistical methods. The research problem of the current study was studied through the use of a cross-sectional survey research design. This design suits the scenario where the correlation of two variables is to be determined at an instant in time (Mugenda, 2008; Cooper & Schindler, 2011).

The unit of analysis was the road construction projects implemented by National Government Road Agencies (KURA, KeRRA, and KeNHA) in Kenya and the management staff involved in implementing these road construction projects served as the unit of observation. The management employees include top managers (director general and directors), middle managers (project engineers and resident engineers), and low-level managers (site engineers and surveyors). Therefore, the target population for the research was 695 respondents, comprising director generals, directors, project engineers, resident engineers, site engineers, and surveyors involved in the implementation of these projects. The participants were targeted in the research as they are well versed in the management of road projects in Kenya and, more particularly, in the three road agencies in Kenya.

The overall sample size for this study was determined using a formula by Krejcie and Morgan (1970). Therefore, using the Krejcie and Morgan formula, the sample size for the study was 248 respondents. Stratified random sampling was used in selecting the sample for this study. In our study, the population was grouped into three strata, that is, projects by KURA, KeRRA, and KeNHA. The study then used simple random sampling to select a sample from each stratum. This study made use of web-based questionnaires to collect data.

According to Lancaster, Dodd, and Williamson (2019), the sample size for high-precision pilot studies should be between 1% and 10%. Twenty-four respondents from the three road authorities were given questionnaire samples or pilot-tested. The Statistical Package for Social Sciences (SPSS) version 25 software was used to analyze the data. Quantitative data was analyzed using descriptive statistics such as frequency, percentages, and means and summary graphs, pie charts, and frequency distribution tables to depict the data's sets of categories. The Pearson correlation coefficient was used to test associations between the independent and dependent variables. A multiple regression model was used to test the significance of the influence of the independent variables on the dependent variable. The validity of multi-regression models was tested in this study using ANOVA and the F distribution.

Research Findings and Discussion

A total of 248 grade 1–6 employees working on road construction projects were selected as the sample for this study. The returned questionnaires were verified for accuracy and completeness, and 222 were found to be valid, reliable, and suitable for further analysis and reporting. The response rate for the study was 89.7%, which is considered excellent according to Sekaran and Bougie's (2016) criteria. They suggest that a response rate of 50% or above is adequate, 60% or

above is good, and 70% or above is excellent for analysis. Therefore, the response rate of 89.7% is excellent and provides a solid foundation for further analysis and reporting.

Descriptive Analysis

Project Communication

The first objective of the study was to explore the influence of project communication on the performance of road construction projects in Kenya. Table 1 presents a summary of the findings obtained. The study found on communication channels that respondents agreed that there is a top-down (leaders to subordinates) hierarchical structure and chain of command that is used in communication (M = 4.346, SD = 0.485); that formal and informal forms of communication are usually used during project implementation (M = 4.077, SD = 0.935); and that communication channels are usually identified so that the channel and information being passed are consistent (M = 4.039, SD = 0.916). The findings agree with those of Singh and Gupta (2018) that effective communication channels are essential for project success, particularly in the construction industry. They emphasize the importance of selecting appropriate communication channels, such as face-to-face communication, email, and project management software, to ensure that project stakeholders are well-informed and that communication barriers are minimized. It also agrees with Erez-Reinhold and Sagiv (2017) that effective communication channels also contribute to improved collaboration, increased productivity, and better project outcomes.

Regarding the quality of information, respondents agreed that proper communication strategies help enhance the effective flow of information throughout the project (M = 4.231, SD = 0.815); that top management possesses relevant expertise in managing communication (M = 3.923, SD = 0.796); and that there is effective and regular communication among the stakeholders (M = 3.769, SD = 0.863). The findings agree with Babatunde and Olaleye (2019), who found that regular communication between project team members contributed significantly to project success in the Nigerian construction industry. The authors suggest that project managers should prioritize regular and effective communication to ensure that project stakeholders are well-informed.

On reporting and feedback, respondents agreed that top management effectively communicated with the stakeholders to enhance organizational efficiency (M = 3.962, SD = 0.871); that there is frequent reporting on project progress (M = 3.962, SD = 1.113); and that top management continuously communicated and discussed the implications of the project with various groups of stakeholders (M = 3.731, SD = 1.079). These findings show that reporting and feedback are essential components of project management that contribute significantly to project success. This agrees with Cho and Pucik (2015) that regular reporting and feedback help project managers identify and address issues in a timely manner, which can improve project outcomes. Similarly, a study by Molenaar and Songer (2015) found that regular reporting and feedback helped project managers manage project risks more effectively.

Table 1: Descriptive Statistics on Project Communication

	Mean	Std.Dev.
Communication Channels		
Formal and informal forms of communications are usually used during project implementation	4.077	0.935
There is top-down (leaders to subordinates) hierarchical structure and chain of command that is used in communication	4.346	0.485
We usually identify communication channels soon so that the channel and information being passed are consistent	4.039	0.916
Quality of Information		
There is effective and regular communication among the stakeholders	3.769	0.863
Top management possesses relevant expertise in managing communication	3.923	0.796
Proper communication strategies helps enhance effective flow of information throughout the project	4.231	0.815
Reporting and Feedback		
Top management effectively communicated with the stakeholders to enhance organizational efficiency	3.962	0.871
Top management continuously communicated and discussed implications of the project with various groups of stakeholders	3.731	1.079
There is frequent reporting on project progress	3.962	1.113
Aggregate Score	**4.004**	**0.875**

Organizational Culture

The second objective of the study was to examine the moderating effect of organizational culture on the relationship between project communication and the performance of road construction projects in Kenya. Respondents gave their level of agreement on statements on organizational culture and the performance of road construction projects. Table 2 presents a summary of the findings obtained. From the findings on role culture, the study found that respondents agreed that individuals have authority in positions they occupy (M = 3.885, SD = 0.909); that in their organization, roles are delegated according to individual education qualification and specialization (M = 3.846, SD = 1.008); and that when assigning tasks, individual educational qualification and interests are considered (M = 3.500, SD = 1.030). The findings agree with those of Gopalakrishnan and Sundaravadivelu (2015), who found that assigning tasks based on individual education qualifications and interests was critical for project success in the construction industry. It also agrees with Huang (2018) that giving individuals authority in the positions they occupy is important for job satisfaction and employee performance. Also, Odeyinka and Yusif (2017) emphasized the importance of assessing individual educational qualifications and specializations when delegating tasks in construction project management. The authors suggest that project managers should prioritize assessing individual skills and expertise to ensure that the right person is assigned to the right task, which can improve project outcomes and reduce the risk of errors and delays.

On power culture, respondents agreed that subordinates in their organization have to strictly follow their superior's instructions (M = 3.769, SD = 0.765). This is consistent with Weber's (2017) concept of authority, which argues that legitimate power is based on a belief in the legitimacy of the rules and the individuals who enforce them. In this view, power is not inherently negative or oppressive, but rather a necessary aspect of organizational functioning. Therefore, subordinates may agree that they have to strictly follow their superiors' instructions because they believe in the legitimacy of their superiors' authority. The findings further showed that the respondents were neutral on the statement that in their organization, power remains in the hands of few individuals (M = 3.308, SD = 1.258) and that decision-making in their organization is made by few individuals who have power (M = 3.231, SD = 1.177). This is consistent with March and Olsen (2017)

observations on organizational power and decision-making, which suggest that power can be both centralized and decentralized in organizations.

Further, the study found on task culture that respondents were in agreement that in their organization, teams are formed to achieve set targets (M = 3.923, SD = 0.796) and that critical problems are solved in teams (M = 3.731, SD = 0.874). Findings also showed that respondents also agreed that their organization depends on teamwork to produce results (M = 3.615, SD = 0.983). This agrees with Iqbal *et al.* (2018) on the importance of teamwork and collaboration, where they submit that a task-oriented culture can enhance organizational effectiveness and performance. Respondents were, however, neutral on the idea that team members in their organization have to contribute equally to accomplish tasks (M = 2.923, SD = 1.129). This could suggest that there may be some uneven distribution of work or contributions within the team. This is consistent with Karau and Williams (2017), who suggested that issues such as free-riding, social loafing, and unequal contributions can be detrimental to team effectiveness.

Table 2: Descriptive Statistics on Organizational Culture

	Mean	Std. Dev.
Role culture		
In my organization, roles are delegated according to individual education qualification and specialization	3.846	1.008
When assigning tasks, individual educational qualification and interests are considered	3.500	1.030
Individuals have authority in positions they occupy	3.885	0.909
Power culture		
In my organization, power remains in the hands of few individuals	3.308	1.258
Decision making in my organization is made by few individuals who have power	3.231	1.177
Subordinates in my organization have to strictly follow their superior's instructions	3.769	0.765
Task culture		
In my organization, teams are formed to achieve set targets	3.923	0.796
In my organization, critical problems are solved in teams	3.731	0.874
Team members in my organization have to contribute equally to accomplish tasks	2.923	1.129
My organization depends on teamwork to produce results	3.615	0.983
Aggregate Score	**3.573**	**0.993**

Performance of Road Projects

The main objective of the study was to examine the influence of project communication on the performance of road construction projects in Kenya. Respondents were therefore requested to indicate their level of agreement with statements on the performance of road construction projects. Table 3 presents a summary of the findings obtained.

The findings show the mean values and standard deviations for various aspects of project performance, including timely completion, cost of the project, project quality, and scope adherence. The mean values for most of the performance aspects were below the neutral range of 2.5–3.4, indicating a negative perception of project performance by the respondents. The standard deviations were within an acceptable range, indicating a moderate level of agreement among the respondents.

The results suggest that there is room for improvement in various aspects of project performance in road construction projects in Kenya. For instance, the mean values for timely completion (M =2.350, SD = 0.689) and cost of the project (M = 2.423, SD = 0.857) were below the neutral range, indicating that the projects are not being completed on time or within budget. This finding is consistent with those of Kithae et al. (2019), who identified time and cost overruns as major

challenges in road construction projects. On the other hand, project quality had means above 3.5, meaning the project quality was satisfactory (M = 3.539, SD = 1.029), and stakeholders were satisfied with completed projects (M = 3.654, SD = 0.797). This finding aligns with Wambua et al. (2018), who emphasized the importance of project quality and stakeholder satisfaction as key measures of project success. Also, scope adherence had means below 3.5, which means that some projects are finished according to the defined scope while others are not (M = 3.385, SD = 1.023); and project execution adheres to all of the project's key elements sometimes and not (M = 3.346, SD = 0.977). Muthoka (2018) argued that a project is considered underperforming when it has not delivered what was required in line with expectations of cost, scope adherence, quality, and time. Consistent with this argument, Stojčetović *et al*. (2018) submit that one of the biggest problems for project managers is harmonizing project cost, time, scope, and quality.

The findings suggest that there is a need to improve project performance in various aspects, particularly timely completion and cost management. These findings are consistent with previous research (Kithae *et al*., 2019; Nduta *et al.*, 2019) that has identified time and cost management as critical challenges in road construction projects. Therefore, efforts should be made to address these challenges to improve the overall performance of road construction projects in Kenya.

Table 3: Descriptive Statistics on Performance of Road Projects

	Mean	Std. Dev.
Timely completion		
Projects are finished on time.	2.350	0.689
Projects activities were carried out as scheduled.	2.423	0.857
Cost of project		
The projects are finished within budget.	2.423	0.758
There are no project cost overrun incurred	1.885	0.766
Project quality		
The project quality was satisfactory	3.539	1.029
Stakeholders are satisfied with completed projects	3.654	0.797
Scope adherence		
The projects was completed as per the defined scope	3.385	1.023
Project execution adheres to all of a project's key elements.	3.346	0.977
Aggregate Score	**2.875**	**0.862**

Inferential Analysis

Correlation Analysis

The study found a positive and significant correlation between project communication and the performance of road construction projects (r = 0.768, p =0.001). This finding implies that effective project communication can lead to improved project performance. This finding is consistent with those of Kim and Lee (2019), who argued that effective project communication can help project teams improve project performance. Therefore, organizations should adopt effective project communication strategies to improve their project performance.

Table 4: Correlation Analysis

		Performance	Project communication
Performance of road construction projects	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	222	
Project communication	Pearson Correlation	.768**	1
	Sig. (2-tailed)	.001	
	N	222	222

**Correlation is significant at the 0.05 level (two-tailed)

Test for Hypothesis One

The first objective of the study was to explore the influence of project communication on the performance of road construction projects in Kenya. The associated null hypothesis was that there is no significant influence of project communication on the performance of road construction projects in Kenya. A univariate analysis was conducted to test the null hypothesis.

R is the correlation coefficient, which indicates the strength and direction of the relationship between the predictor and outcome variables. In this case, R =.757 suggests a strong positive relationship between project communication and the outcome variable (the performance of road construction projects in Kenya). R Square is the coefficient of determination, which indicates the proportion of variance in the outcome variable that can be explained by the predictor variable. In this case, R Square =.573 suggests that 57.3% of the variation in the performance of road construction projects in Kenya can be explained by project communication.

The remaining 42.7% variation in performance of road construction projects suggests that there are other important factors that influence the outcome variable, and further research may be needed to identify these factors and improve the predictive accuracy of the model.

Table 5: Model Summary for Project Communication

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.757[a]	.573	.556	.43008

a. Predictors: (Constant), Project communication

The analysis of variance was used to determine whether the regression model was a good fit for the data. From the analysis of variance (ANOVA) findings in Table 6, the study found that Prob>F (1, 220) = 0.000 was less than the selected 0.05 level of significance. This suggests that the model as constituted was fit to predict the performance of road construction projects in Kenya. Further, the F-calculated value from the table (32.260) was greater than the F-critical value from the distribution tables (3.884), supporting the findings that project communication can be used to predict the performance of road construction projects in Kenya.

Table 6: Analysis of Variance for Project Communication

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.967	1	5.967	32.260	.000[b]
	Residual	40.7	220	.185		
	Total	46.667	221			

a. Dependent Variable: Performance of road construction projects

b. Predictors: (Constant), Project communication

From the results in Table 7, the following regression model was fitted.

$$Y = 1.081 + 0.738 X_1$$

(X_1 is Project communication)

The results showed that the constant had a coefficient of 1.081, suggesting that if project communication was held constant at zero, the performance of road construction projects in Kenya would be 1.081 units. In addition, results showed that the project communication coefficient was 0.738, indicating that a unit increase in project communication would result in a 73.8% improvement in the performance of road construction projects in Kenya. It was also noted that the

P-value for the project communication coefficient was 0.000, which is less than the set 0.05 significance level, indicating that project communication was significant.

Based on these results, the study rejected the null hypothesis and accepted the alternative that there is a significant positive influence of project communication on the performance of road construction projects in Kenya. The findings are supported by previous research. For example, a study by Mugo and Moronge (2018) investigated the factors influencing the performance of road construction projects in Kenya. The study found that effective project communication was a significant factor in determining project performance and that communication between project stakeholders, such as contractors, clients, and government agencies, was positively associated with project success. Similarly, a study by Naqvi, Aziz, and Rehman (2017) found that effective project communication led to enhanced project performance by facilitating coordination, collaboration, and timely decision-making.

Table 7: Beta Coefficients for Project Communication

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.081	0.127		8.512	.000
	Project communication	.738	.130	.757	5.680	.000

a. Dependent Variable: Performance of road construction projects

Test for Hypothesis Two

A hierarchical regression model was used to test for the moderating effect. This helped to test the second research hypothesis. The second objective of the study was to examine the moderating effect of organizational culture on the relationship between project communication and the performance of road construction projects in Kenya. The study therefore computed a moderating effect regression analysis.

Ho2: There is no significant moderating effect of organizational culture on the relationship between project communication and the performance of road construction projects in Kenya.

The study used stepwise regression to establish the moderating effect of organizational culture (M) on the relationship between project communication (X) and the performance of road construction projects in Kenya (Y).

From the model summary findings in Table 8, the first model is the regression between project communication (X) without moderator and interaction; the value of R-squared was 0.693, which suggests that the 69.3% change in performance of road construction projects in Kenya can be explained by changes in project communication. The p-value for the first model (0.000) was less than the selected level of significance (0.05), suggesting that the model was significant.

The findings in the second model, which project communication, organization culture, and interaction term (X*M) as predictors, had an R-squared of 0.711. This implies that the introduction of organization culture in the second model led to a 0.100 increase in R-squared, showing that organization culture positively moderates the relationship between project communication and performance of road construction projects in Kenya.

Table 8: Model Summary for Moderation Effect

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.832[a]	.693	.634	.39019	.612	37.814	1	24	.000
2	.844[b]	.711	.672	.36941	.100	18.085	2	22	.038

a. Predictors: (Constant), project communication
b. Predictors: (Constant), project communication, organization culture , X*M

From the model summary findings in Table 9, the F-calculated value for the first model was 37.814 and for the second model it was 18.085. Since the F-calculated values for the two models were higher than the F-critical values of 3.884 (the first model) and 2.650 (the second model), the two models were a good fit for the data. Also, the p-values for both models were less than 0.05, an indication that they were significant. Therefore, the model could be used to predict the moderating effect of organizational culture on the relationship between project communication and the performance of road construction projects in Kenya.

Table 9: ANOVA for Moderation Effect

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6.366	1	6.366	37.814	.000[b]
	Residual	36.96	220	.168		
	Total	43.326	221			
2	Regression	7.404	3	2.468	18.085	.000[c]
	Residual	26.928	198	.136		
	Total	34.332	221			

a. Dependent Variable: Performance of road construction projects
b. Predictors: (Constant), project communication
c. Predictors: (Constant), project communication, organization culture , X*M

Further, by substituting the beta values as well as the constant term from the coefficient's findings in Table 10 for the first step of regression modeling, the following regression model was fitted:

$$Y = 1.435 + 0.884\ X$$

By substituting the beta values as well as the constant term from model 2 emanating from the second step in regression modeling, the following regression model was fitted:

$$Y = 1.861 + 3.986\ X + 3.209\ M + 0.868\ X*M$$

Where X is project communication M is organization culture, X*M is the interaction term between project communication and organization culture, and Y is the performance of road construction projects.

In Model 1, the results indicate that project communication has a significant positive influence on the performance of road construction projects (Beta =.884, p <.05). In Model 2, the results show that project communication (Beta = 3.989, p =.002) and organizational culture (Beta = 3.209, p =.012) have significant positive effects on the performance of road construction projects. Additionally, the interaction effect between project communication and organizational culture (X*M) is also significant and positive (Beta =.868, p =.012).

These findings suggest that effective project communication and a positive organizational culture are important factors in enhancing the performance of road construction projects in Kenya. The positive interaction effect between project communication and organizational culture indicates that a positive organizational culture can amplify the positive effects of effective project communication on project performance. These findings are consistent with previous research in project management (Priyono & Djojopranoto, 2020; Pinto & Slevin, 2017), which has emphasized the importance of effective project communication and a positive organizational culture in achieving project success.

Table 10: Beta Coefficients for Moderation Effect

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.435	.544		2.638	.002
	Project communication	.884	.144	.782	6.149	.000
2	(Constant)	1.861	.379		4.910	.010
	Project communication	3.989	1.139	3.530	3.502	.002
	Organization culture	3.209	1.168	2.066	2.746	.012
	X*M	.868	.315	3.878	2.752	.012

a. Dependent Variable: Performance of road construction projects

Conclusions

The null hypothesis for this variable was 'There is no significant influence of project communication on the performance of road construction projects in Kenya'. However, the study found that project communication is statistically significant in explaining the performance of road construction projects in Kenya. The influence was found to be positive, indicating that an increase in project communication would lead to an increase in project success. Therefore, the study concluded that project communication has a positive and significant relationship with the performance of road construction projects in Kenya.

The second research hypothesis tested was that 'There is no significant moderating effect of organizational culture on the relationship between project communication and performance of road construction projects in Kenya'. However, the study found that organizational culture is statistically significant in explaining project communication and project performance in road construction projects in Kenya. The influence was found to be positive, indicating that an organization culture that values innovation, risk-taking, and continuous improvement would lead to better project outcomes. Conversely, an organizational culture that is bureaucratic, hierarchical, and risk-averse would hinder innovation and limit project team creativity. Therefore, the study concluded that organizational culture has a significant positive moderating effect on the relationship between project communication and the performance of road construction projects in Kenya.

Recommendations for Policy and Practice

The study found that effective project communication is essential for the successful delivery of road construction projects in Kenya. Therefore, it is recommended that organizations establish clear communication channels and protocols for project teams and stakeholders. This would involve regular project status updates, clear and concise project documentation, and effective stakeholder engagement.

The study found that organizational culture can have a significant impact on the success of road construction projects in Kenya. Therefore, it is recommended that organizations introduce shared governance models where decisions are made collectively by representatives from different departments or units. This ensures that decisions are more representative of the organization as a whole and not limited to a select few. In addition, the organization should rotate leadership roles and decision-making responsibilities periodically among qualified individuals. This not only prevents power from being concentrated but also provides individuals with a broader perspective on the organization.

Recommendations for Further Studies

The study did not explore the mediating variables that could be influencing the relationship between the variables and project performance. Future studies could examine the mediating variables that affect project performance, such as team dynamics, motivation, and organizational structure. The study examined the moderating effect of organizational culture. Future studies could explore the moderating variables that affect project performance, such as project complexity, size, and scope.

The current study used a cross-sectional research approach to explore the impact of the variables on project performance. To learn more about how the variables affect project performance, future research could use mixed-methods research. This type of research includes qualitative data collection methods like case studies, interviews, and focus groups.

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