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Green Project Management and Performance of its Projects in the Telecommunication Companies in Kenya

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ABSTRACT

Purpose: The general objective of this study is to examine the effect of green project management on performance of IT projects in the telecommunication companies in Kenya. This study was guided by the following theories; Resource-Based View (RBV) Theory and Theory of Planned Behavior (TPB).

Methodology: This study adopted a descriptive research design and focused on telecommunication companies in Kenya. According to the Communications Authority of Kenya (2024), there are 11 registered telecommunication companies. The target population comprised 352 respondents, including project managers, IT specialists, engineers, sustainability officers, procurement officers, and operations managers involved in green project management and project performance. Using the Krejcie and Morgan (1970) formula, a sample size of 187 employees was determined. Stratified random sampling was used to categorize respondents into strata, after which simple random sampling was applied to select participants. Primary data were collected using structured questionnaires, while a pilot study involving 28 respondents was conducted to test the instrument's validity and reliability. Data were analyzed using descriptive statistics and inferential statistics, including Pearson correlation and multiple regression analysis.

Findings: The study concludes that resource management and stakeholder engagement have a positive and significant effect on performance of IT projects in the telecommunication companies in Kenya.

Unique Contribution to Theory, Policy and Practice: Based on the findings, the study recommends that telecommunication companies in Kenya should institutionalize stakeholder engagement by involving key stakeholders throughout the IT project lifecycle. This can be achieved through regular consultations, timely communication, collaborative decision-making, and structured feedback mechanisms to ensure stakeholder needs and expectations are effectively addressed.

Keywords: *Green Project Management, Resource Management, Stakeholder Engagement, IT Projects, Telecommunication Companies*

Background of the Study

Telecommunication companies play a pivotal role in modern society by enabling seamless communication across vast distances. They provide the essential infrastructure and services that support voice calls, internet connectivity, and data transmission, which are fundamental to both personal and business interactions (Li *et al*., 2021). By offering mobile, fixed-line, and broadband services, these companies facilitate real-time communication, access to information, and digital services that drive productivity and innovation. In Kenya, telecommunication companies have been instrumental in expanding network coverage and internet accessibility, thus promoting social inclusion and bridging gaps between urban and rural areas (Pittayasoponkij, Kongsong & Pooworakulchai, 2021).

Beyond connectivity, telecommunication companies also serve as key drivers of economic growth and technological advancement. They enable businesses to operate efficiently by supporting digital platforms, e-commerce, and cloud computing, which are critical in today's knowledge-based economy (Sang *et al*., 2022). Furthermore, these companies contribute to job creation, investment in infrastructure, and the development of related industries such as software development and digital content creation. In the Kenyan context, telecommunication firms are central to the country's Vision 2030 development agenda, enhancing access to digital services that improve education, healthcare, and governance, thereby fostering sustainable socio-economic development (Abayomi, 2022).

Green project management refers to the integration of environmental sustainability principles into the planning, execution, and monitoring of projects to minimize their ecological footprint. It involves adopting practices that reduce waste, conserve resources, lower carbon emissions, and promote the use of renewable materials throughout the project lifecycle (Chinomona & Bikissa-Macongue, 2022). This approach not only aims to achieve traditional project objectives such as cost, time, and quality but also prioritizes environmental responsibility and social well-being. By embedding sustainability into project management, organizations can contribute to global efforts against climate change, improve regulatory compliance, enhance their corporate reputation, and achieve long-term economic benefits through more efficient resource use (Umutoni & Dushimimana, 2025).

Green project management significantly influences the performance of IT projects in telecommunication companies in Kenya by promoting sustainable project design and efficient resource management (Sisay, 2024). In terms of resource management, green project management encourages the prudent use of materials, energy, and human resources, which helps avoid waste and cost overruns. By efficiently allocating resources and adopting renewable energy solutions, telecommunication firms can improve project timelines and quality while supporting Kenya's broader environmental goals (Agyeman-Boakye, Kissi & Abu, 2025). Additionally, stakeholder engagement and carbon management play crucial roles in enhancing IT

project performance under green project management. Active engagement of stakeholders—including employees, customers, regulators, and local communities—ensures that sustainability objectives are clearly communicated and supported, fostering collaboration and reducing resistance to green initiatives. This inclusive approach helps align project goals with social and environmental expectations, thereby increasing the likelihood of successful project delivery (Miruka & Omwenga, 2025). This study sought to examine the effect of green project management on performance of IT projects in the telecommunication companies in Kenya.

Statement of the Problem

In recent years, the demand for environmentally sustainable business practices has significantly increased, prompting organizations to rethink their project management approaches. The telecommunication sector in Kenya, while playing a central role in digital transformation, has yet to fully embrace green project management (GPM) as a strategic tool for enhancing both environmental sustainability and IT project performance (Owino & Omwenga, 2023). Green project management integrates eco-friendly principles into the project lifecycle—covering planning, execution, and monitoring—with the aim of reducing ecological footprints, optimizing resource use, and ensuring long-term project sustainability. However, the extent to which GPM influences the performance of IT projects within Kenya's telecommunication industry remains insufficiently explored, despite the sector's growing carbon footprint and reliance on technology-intensive infrastructure (Lamin & Ndeto, 2021).

Globally, ICT contributes approximately 2% to 4% of global CO_2 emissions, a figure expected to rise with the proliferation of data centers, networks, and devices (IEA, 2022). In Kenya, the telecommunication sector grew by 12.8% in 2023, driven by increased mobile subscriptions, internet use, and digital services (Communications Authority of Kenya [CAK], 2023). However, this rapid expansion has intensified concerns about electronic waste, high energy consumption, and inefficient project practices. According to the Green Project Management Global Survey (2021), only 32% of organizations in Africa had formally adopted GPM practices, compared to over 60% in Europe. In Kenya specifically, a 2022 survey by the Project Management Institute-Kenya Chapter found that less than 25% of IT project managers considered environmental sustainability a core part of their project success criteria. As a result, many IT projects in the telecommunication sector continue to face challenges such as cost overruns, missed deadlines, and stakeholder dissatisfaction—partly due to unsustainable practices and lack of green performance indicators.

Various studies have been conducted in different parts of the world on green project management and project performance. For instance, Miruka and Omwenga (2024) in Kenya investigated on green project management practices and environment performance of housing construction projects in Nairobi City County. In Kenya, Mpidaki and Omwenga (2022) examined on green project management and performance of water project in Narok County and Owino and

Omwenga (2023) in Kenya conducted a study on green project management practices and performance of non-governmental organizations in Migori County. However, none of these studies focused on resource management and stakeholder engagement on performance of it projects in the telecommunication companies in Kenya. To fill the highlighted gaps, the current study seeks to examine the effect of green project management (resource management and stakeholder engagement) on performance of IT projects in the telecommunication companies in Kenya.

Objectives of the Study

General Objective

The general objective of this study is to examine the effect of green project management on performance of IT projects in the telecommunication companies in Kenya

Specific Objectives

i. To analyze the impact of resource management on performance of IT projects in the telecommunication companies in Kenya
ii. To evaluate the role of stakeholder engagement on performance of IT projects in the telecommunication companies in Kenya

Theoretical Framework

Resource-Based View (RBV) Theory

The Resource-Based View (RBV) theory, developed by Jay Barney (1984), asserts that an organization's sustainable competitive advantage arises from its unique resources and capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN) (Hasan, Hassan & Ali, 2020). RBV focuses on internal strengths rather than external market conditions, suggesting that firms must effectively acquire, develop, and manage resources to outperform competitors (Ajayi & Oguntade, 2020). This theory is widely used to analyze how resource management impacts project and organizational performance.

In the setting of IT projects within Kenya's telecommunication companies, RBV stresses the importance of managing critical resources such as skilled IT personnel, advanced technology infrastructure, and financial capital (Kabubo-Mariara, 2020). Efficient resource allocation ensures that projects can meet technical requirements and timelines without unnecessary delays or cost overruns. Since the telecom industry is highly competitive and technologically driven, leveraging unique resources effectively can differentiate companies and enhance project success rates (Alande, 2020).

Furthermore, RBV encourages continuous development of capabilities to adapt to fast-changing environments (Mutahi & Busienei, 2020). Telecommunication companies in Kenya face evolving market demands, regulatory pressures, and technological innovations. By nurturing

valuable internal resources and combining them with effective project management practices, firms can improve IT project performance, foster innovation, and sustain long-term growth. RBV thus provides a strategic lens for understanding how resource management contributes to superior project outcomes (Hasan, Hassan & Ali, 2020). The theory was used to analyze the impact of resource management on performance of IT projects in the telecommunication companies in Kenya.

Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB), formulated by Icek Ajzen (1985), explains how human behavior is guided by behavioral intentions, which are influenced by attitudes toward the behavior, subjective norms, and perceived behavioral control (Ullah *et al*, 2020). TPB suggests that individuals are more likely to perform a behavior if they have a positive attitude towards it, believe that important others expect them to engage in it, and feel capable of executing it. This theory is widely applied in understanding behaviors related to organizational change and stakeholder engagement (Mbelwa, 2020).

Applying TPB to stakeholder engagement in IT projects of Kenyan telecommunication companies helps explain how and why stakeholders choose to participate in or resist project activities (Wangombe, 2020). For example, a stakeholder's positive attitude toward sustainable project practices, social pressure from peers or regulators, and confidence in their ability to contribute effectively influence their engagement level. Understanding these factors enables project managers to tailor communication and involvement strategies that increase stakeholder commitment and cooperation (Nyandika & Ngugi, 2021).

Moreover, TPB can guide interventions aimed at overcoming barriers to engagement (Kilonzi, Atikiya & Atambo, 2023). By addressing negative attitudes, enhancing social support, and building stakeholders' capacities, telecommunication companies can foster stronger collaboration. This improved stakeholder participation can lead to better decision-making, smoother project implementation, and enhanced performance outcomes. Thus, TPB offers a valuable behavioral framework for managing the human dimensions of IT projects (Ullah *et al*, 2020). This theory was used to evaluate the role of stakeholder engagement on performance of IT projects in the telecommunication companies in Kenya.

Conceptual Framework

A conceptual framework shows the relationship between the independent variables and the dependent variable below (Orodho, 2019). The independent variables of the study are resource management and stakeholder engagement. The dependent variable of the study is performance of IT projects in the telecommunication companies in Kenya. A conceptualization of the relationship between the independent variables and the dependent variable is illustrated in figure 1

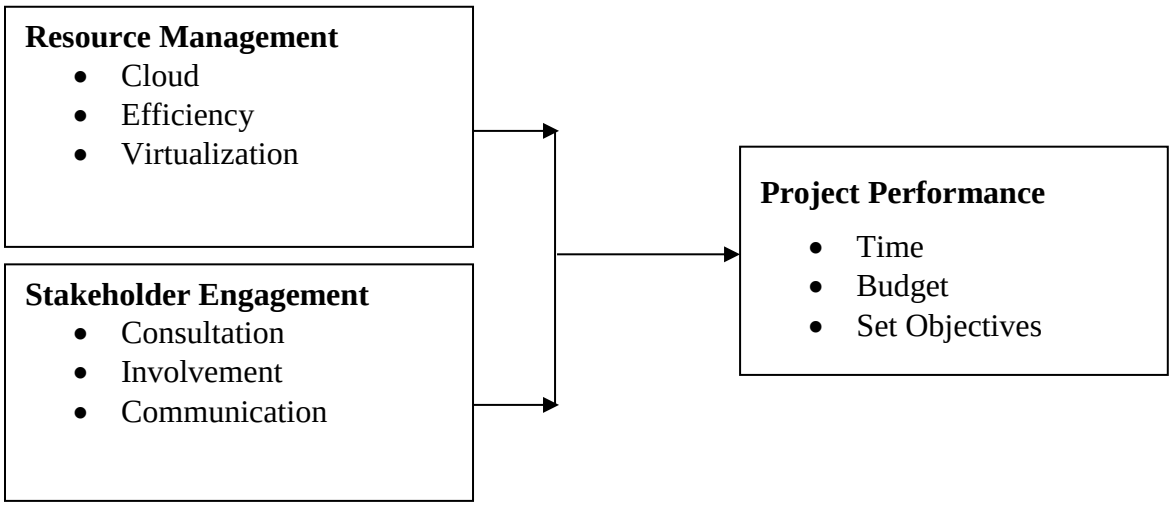


Figure 1: Conceptual Framework

Resource Management

Resource management refers to the systematic planning, allocation, utilization, and monitoring of available resources to ensure their optimal use in achieving project objectives. It encompasses the coordination of human resources, financial assets, materials, time, and technological inputs in a manner that maximizes efficiency while minimizing waste and unnecessary costs (Hussein, 2025). Effective resource management involves forecasting resource needs, scheduling their use appropriately, and continuously evaluating their performance to ensure alignment with project goals. It also emphasizes sustainability by promoting the responsible use and conservation of resources, ensuring that current demands are met without compromising future availability (Umuhirewimana, Amolo & Juma, 2021). Cloud refers to a computing paradigm that enables the delivery of computing resources such as storage, processing power, and software applications over network-based platforms, allowing for flexible and on-demand access (Ajao, Olayinka & Oyewale, 2024). It supports centralized resource utilization, reducing the need for extensive physical infrastructure and promoting more efficient use of computing capacity. Through dynamic allocation and scalability, cloud systems enhance operational flexibility and enable better management of workloads, thereby optimizing resource consumption.

Efficiency refers to the ability to achieve maximum output or performance with minimal input of resources such as time, energy, and cost. It involves optimizing processes, systems, and resource utilization to eliminate waste and enhance productivity (Ngugi, Gichuhi & Nderitu, 2025). In project environments, efficiency is achieved through streamlined workflows, effective coordination, and the use of technologies that enhance performance while reducing unnecessary

consumption (Hussein, 2025). It also encompasses energy efficiency, where systems are designed to consume less power while maintaining high levels of functionality. Virtualization refers to the creation of virtual versions of physical resources, such as servers, storage devices, and networks, allowing multiple systems or applications to operate on a single physical platform. This approach enhances resource utilization by enabling the sharing and consolidation of computing resources, thereby reducing the need for additional hardware (Ajao, Olayinka & Oyewale, 2024). Virtualization improves flexibility and scalability, as resources can be allocated or adjusted based on demand without requiring significant physical changes.

Stakeholder Engagement

Stakeholder engagement refers to the structured process of identifying, involving, and communicating with individuals, groups, or organizations that have an interest or influence in a project (Bobae, 2024). It entails understanding stakeholder expectations, needs, and concerns, and integrating them into project planning and decision-making to enhance support and minimize resistance. Effective stakeholder engagement involves continuous interaction, transparency, and feedback mechanisms to ensure that stakeholders remain informed and actively participate throughout the project lifecycle (Mambwe, *et al*, 2020). It also promotes collaboration, trust, and accountability, which are essential for achieving project objectives and ensuring long-term success and sustainability. Consultation refers to a structured process of seeking input, opinions, and feedback from stakeholders to inform decision-making and enhance the quality of project outcomes (Nsengiyumva & Ogbe, 2022). It involves creating opportunities for stakeholders to express their views, concerns, and expectations, which are then carefully considered in project planning and implementation. Effective consultation promotes inclusivity and ensures that diverse perspectives are acknowledged, leading to more balanced and well-informed decisions (Cheruiyot & Shale, 2024).

Involvement refers to the active participation of stakeholders in project activities, processes, and decision-making. It goes beyond merely providing input by enabling stakeholders to contribute directly to the development, execution, and evaluation of project initiatives (Bobae, 2024). This active engagement enhances ownership and commitment, as stakeholders feel a sense of responsibility toward project success. Involvement also facilitates the sharing of knowledge, skills, and experiences, which can improve problem-solving and innovation (Mambwe, *et al*, 2020). Communication refers to the continuous exchange of information between project teams and stakeholders to ensure clarity, understanding, and alignment throughout the project lifecycle (Nsengiyumva & Ogbe, 2022). It involves the use of appropriate channels, messages, and feedback mechanisms to keep stakeholders informed about project progress, changes, and outcomes. Effective communication promotes transparency, reduces misunderstandings, and enhances coordination among all parties involved (Cheruiyot & Shale, 2024).

Empirical Review

Resource Management and Project Performance

Hussein (2025) assessed on the impact of resource management on organizational performance: a case study of NGOs in Jordan. The study used a quantitative approach cross-sectional design. The target population is of NGOs registered and operating across Jordan. A sample of 350 non-governmental organizations was selected by way of a purposive sampling. The study found that resource management had statistically significant effects on performance. The study concluded that resource management significantly and positively affects organizational performance.

Umuhirewimana, Amolo and Juma (2021) researched on the impact of resource management on agricultural project performance. The study used descriptive survey and correlational research designs. A census of 92 participants, including project beneficiaries and other stakeholders from Burera District, were selected. Data was gathered through interviews and questionnaire. The study found that there is a significant effect of financial resource management, human resource management and material resource management on performance of Agricultural projects. The study concluded that project resource management significantly influences the performance of Agricultural projects.

Ajao, Olayinka and Oyewale (2024) investigated on resources management practices and performance of construction firms in southwest, Nigeria. The study was a descriptive research. The study population includes the construction firms in the Southwest Nigeria. Sample frame were the managers in each firm who are responsible for the managerial activities in their respective firms. The sample size 292 was used. The study found that there are both internal and external factors influencing resources management practices. The resources management practices are positively significant except for cost management which was negative. The study concluded that, the management of cost is not efficient due to the fact that the project cost is allocated to other resources but not spent directly.

Ntinyari and Nyang'au (2024) conducted a study on project resource management practices and performance of donor funded health projects in Nairobi City County, Kenya. The study adopted a descriptive research design. The unit of observation was 379 project managers of the health projects implemented by the NGOs. Yamane sampling formula was used to get a sample of 194 project managers that were sampled using stratified random sampling. Data was collected using questionnaires. The study found strong positive correlations between performance and resource allocation and task management. The study concluded that effective resource management practices significantly enhance the performance of donor-funded health projects in Nairobi City County.

Ngugi, Gichuhi and Nderitu (2025) examined on project resource management and performance of development projects by Kiambu County Government, Kenya. An explanatory research

design was adopted. The study was conducted at Kiambu County Government offices in Kiambu town focusing on 36 projects implemented by the Departments of Roads, Transport, Public Works and Utilities. A total of 60 employees directly involved in project implementation were surveyed. The study found that project resource management significantly and positively influenced the performance of development projects. The study concluded that project resource management has a substantial and positive effect on project performance.

Stakeholder Engagement and Project Performance

Bobae (2024) investigated on the role of stakeholder engagement in enhancing project outcomes in construction projects in Korea. This study adopted a desk methodology. The study found that effective stakeholder engagement fosters a collaborative environment where all parties involved, including clients, contractors, suppliers, and community members, actively participate in decision-making processes. The study concluded that this collaboration leads to improved project understanding, reduced misunderstandings, and increased alignment of goals and expectations among stakeholders.

Mambwe, *et al* (2020) assessed on the impact of stakeholder engagement on performance of construction projects in Lusaka District. The research approach that was adopted was a quantitative with descriptive research design. Both primary and secondary data were collected using a semi structured questionnaire. The study found a strong linear relationship between stakeholders' engagement in project costing stages and performance on project cost. The study concluded that stakeholder engagement was related to performance in roads construction projects.

Nsengiyumva and Ogbe (2022) examined on assessment of stakeholder engagement practices and the project performance of prime cement ltd, Musanze District, Rwanda. The research methods that adopted in this study were quantitative and qualitative with descriptive research design. The target population for this study includes employees of Prime Cement Ltd and its stakeholders including employees, contractors, customers, suppliers, government officials. Stratified random sampling technique was employed in order to determine the sample size. The study found that there is a strong positive correlation between stakeholder engagement practices and project performance of prime cement ltd, Musanze District, Rwanda. The study concluded that stakeholder engagement practices were essential and crucial to Prime Cement Ltd.

Cheruiyot and Shale (2024) researched on stakeholder engagement process and performance of real estate projects in Nairobi City County, Kenya. The study adopted a descriptive research design. A sample of 162 respondents was determined using Yamane 1967 formula. The study found a strong significant relationship between plan stakeholder engagement and project performance and a strong significant relationship between monitor and evaluate stakeholder engagement and project performance. The study concluded that stakeholder engagement affect project performance.

Nyangenya and Miroga (2025) conducted a study on project stakeholder engagement and performance of affordable housing projects in Trans Nzoia County, Kenya. A descriptive research design was used in the study. The study targeted 72 respondents comprising of project managers, physical planners, building inspectors and project architects. From the targeted population, the study sampled 72 respondents using census sampling techniques. The study found that there exist a significant relationship between stakeholders' engagement in project conceptualization, project implementation, monitoring and evaluation, project risk management and completion of housing construction projects. The study concluded that stakeholder engagement has significant influence on completion of housing construction projects in Kisumu County.

RESEARCH METHODOLOGY

Research Design

Kothari (2018) defines research design as an outline of the actual measures, adopted by an investigator for testing the correlation involving dependent variables as well as independent variables. This study used descriptive research design which involves gathering of data that describes events then organizing, tabulating depicting and describing the data. The choice of this research design was influenced by the fact that it enables the researcher to assess the situation in the study area at the time of study. This design is pertinent in "developing the profile of a situation and a community of people by getting complete and accurate information through an interaction between the researcher and the respondent via data collection tools" (Kothari & Garg, 2019).

Target Population

Target population is the entire set of individuals (or objects) having the same characteristics as pointed out in the sampling criteria used for the study (Quinlan, 2019). This study focused on the telecommunication companies in Kenya. According to the communication authority report (2024), in Kenya there are 11 registered telecommunication companies and they include; Airtel Networks Kenya Limited, Commcarrier Satellite Services Limited, Dimension Data Solutions East Africa Limited, Geo-Net Communications Limited, Iristel Kenya Limited, Jamii Telecommunications Limited, Liquid Telecommunications Kenya Limited, Mobile Telephone Networks Business (K) Limited, Safaricom Plc, Telkom Kenya Limited And Wananchi Telecom Limited. In this study, the target population comprised employees involved in the planning, implementation, and management of IT projects within telecommunication companies in Kenya. The total target population was 352 respondents comprising of project managers, IT specialists, engineers, sustainability officers, procurement officers, and operations managers, as they play a critical role in green project management practices and project performance.

Table 1: Target Population

Category	Target Population
Project Managers	22
IT Specialists	44
Engineers	88
Sustainability Officers	66
Procurement Officers	22
Operations Managers	110
Total	**352**

Sample Size and Sampling Technique

A sampling frame is a list used to define a study population of interest. The sampling frame defines a set of elements from which a study can select a sample of the target population (Kothari, 2019). The sampling frame for this study was the list of management level employees at telecommunication companies in Kenya. It is from this list that the study sample was selected from.

Sampling as described by Geteria, (2019) is the process of choosing the units of the target population which are to be included in the study in such a way that the sample of selected elements represent the population. The study used Krejcie and Morgan (1970) formula to arrive at the sample size. The selection formula was as follows:

$$n=\frac{N}{1+(N-1)e^2}$$

Where n= the required sample size

N = is the Target Population (187)

e = accuracy level required. Standard error = 5%

Sample calculation

$$n=\frac{352}{1+(352)0.05^2}$$

n=187

n=187 respondents

Table 2: Sample Size

Category	Target Population	Sample Size
Project Managers	22	12
IT Specialists	44	23
Engineers	88	47
Sustainability Officers	66	35
Procurement Officers	22	12
Operations Managers	110	58
Total	**352**	**187**

Data Collection Instruments

This research used a questionnaire to collect primary data. According to Patton *et. al (*2019), a questionnaire is appropriate in gathering data and measuring it against a particular point of view. It provides a standardized tool for data collection. Structured questions were used to collect primary data from the field. Questionnaires were preferred because they are effective data collection instruments that allow respondents to give much of their opinions pertaining to the research problem (Dempsey, 2019). According to Kothari (2018), the information obtained from questionnaires is free from bias and researchers' influence and thus accurate and valid data was gathered. The preference for the questionnaire is based on the premise that it gives respondents freedom to express their views or opinions more objectively.

Pilot Study

Pilot study was conducted to pretest and validate the questionnaire. Cronbach's alpha methodology, which measures internal consistency, was used. The main aim of the pilot test is testing how reliable the data collection tool is. The study used a total of nineteen individuals in the pilot test which represent 10% of target population. The pilot sample was not included in the final study.

Data Analysis and Presentation

Descriptive statistics such as frequency distribution, mean (measure of dispersion), standard deviation, and percentages were used. Descriptive statistics therefore enables researchers to present the data in a more meaningful way, which allows simpler and easier interpretation (Singpurwalla, 2019). Inferential data analysis was conducted by use of Pearson correlation coefficient, and multiple regression analysis. Inferential statistic is used to make judgments about the probability that an observation is dependable or one that happened by chance in the study.

The relationship between the study variables was tested using multivariate regression models.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Whereby;

Y = performance of IT projects in the telecommunication companies in Kenya

β_0 = Constant

$\beta_1, \beta_2,$ = Coefficients of determination

X_1 = resource management

X_2 = stakeholder engagement

ε = Error term

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

Descriptive Statistics Analysis

Resource Management and Project Performance

The first specific objective of the study was to analyze the impact of resource management on performance of IT projects in the telecommunication companies in Kenya. The respondents were requested to indicate their level of agreement on the statements relating to resource management and performance of IT projects in the telecommunication companies in Kenya. The results were as shown in Table 3

From the results, the respondents agreed that cloud services are integrated to enhance project scalability and accessibility (M=3.826, SD= 0.879). In addition, the respondents agreed that cloud-based solutions are leveraged to reduce physical infrastructure costs (M=3.811, SD=0.627). Further, the respondents agreed that project activities are managed efficiently to maximize output with minimal input (M=3.788, SD= 0.782).

From the results, the respondents agreed that resource utilization is regularly monitored to improve IT project performance (M=3.767, SD=0.616). In addition, the respondents agreed that virtualization technologies are applied to optimize server and storage usage (M=3.751, SD=0.889). Further, the respondents agreed that the organization uses virtualization to reduce hardware dependency and energy consumption (M=3.744, SD=0.778).

Table 3: Resource Management and Project Performance

	Mean	Std. Dev
Cloud services are integrated to enhance project scalability and accessibility.	3.826	0.879
Cloud-based solutions are leveraged to reduce physical infrastructure costs.	3.811	0.627
Project activities are managed efficiently to maximize output with minimal input.	3.788	0.782
Resource utilization is regularly monitored to improve IT project performance.	3.767	0.616
Virtualization technologies are applied to optimize server and storage usage.	3.751	0.889
The organization uses virtualization to reduce hardware dependency and energy consumption.	3.744	0.778
Aggregate	**3.781**	**0.762**

Stakeholder Engagement and Project Performance

The second specific objective of the study was to evaluate the role of stakeholder engagement on performance of IT projects in the telecommunication companies in Kenya. The respondents were requested to indicate their level of agreement on various statements relating to stakeholder engagement and performance of IT projects in the telecommunication companies in Kenya. The results were as presented in Table 4.

From the results, the respondents agreed that the organization seeks stakeholder opinions before making key project decisions (M=3.854, SD= 0.789). In addition, the respondents agreed that feedback from stakeholders is actively considered in project design and implementation (M=3.836, SD=0.545). Further, the respondents agreed that stakeholders participate in setting project goals and priorities (M=3.822, SD=0.820).

From the results, the respondents agreed that stakeholder involvement contributes to better project outcomes (M=3.818, SD= 0.563). In addition, the respondents agreed that the organization maintains regular and transparent communication with stakeholders (M=3.799, SD=0.667). Further, the respondents agreed that project updates are communicated promptly to all relevant stakeholders (M=3.781, SD= 0.714).

Table 4: Stakeholder Engagement and Project Performance

	Mean	Std. Dev
The organization seeks stakeholder opinions before making key project decisions.	3.854	0.789
Feedback from stakeholders is actively considered in project design and implementation.	3.836	0.545
Stakeholders participate in setting project goals and priorities.	3.822	0.820
Stakeholder involvement contributes to better project outcomes.	3.818	0.563
The organization maintains regular and transparent communication with stakeholders.	3.799	0.667
Project updates are communicated promptly to all relevant stakeholders.	3.781	0.714
Aggregate	**3.818**	**0.683**

Project Performance

The respondents were requested to indicate their level of agreement on various statements relating to performance of IT projects in the telecommunication companies in Kenya. The results were as presented in Table 5.

From the results, the respondents agreed that The IT projects are completed within the planned project schedule (M=3.801, SD= 0.567). In addition, the respondents agreed that project milestones are achieved within the specified timelines (M=3.774, SD=0.607). Further, the respondents agreed that cost overruns in IT projects are rare and effectively controlled (M=3.723, SD= 0.775).

From the results, the respondents agreed that financial resources allocated to IT projects are utilized efficiently (M=3.706, SD=0.693). In addition, the respondents agreed that IT projects achieve their defined goals and intended outcomes (M=3.684, SD=0.507). Further, the respondents agreed that the deliverables of IT projects meet the initial project specifications (M=3.649, SD=0.790).

Table 5: Project Performance

	Mean	Std. Dev
The IT projects are completed within the planned project schedule.	3.801	0.567
Project milestones are achieved within the specified timelines.	3.774	0.607
Cost overruns in IT projects are rare and effectively controlled.	3.723	0.775
Financial resources allocated to IT projects are utilized efficiently.	3.706	0.693
IT projects achieve their defined goals and intended outcomes.	3.684	0.507
The deliverables of IT projects meet the initial project specifications.	3.649	0.790
Aggregate	**3.723**	**0.657**

Inferential Statistics

Inferential statistics in the current study focused on correlation and regression analysis. Correlation analysis was used to determine the strength of the relationship while regression analysis was used to determine the relationship between dependent variable (performance of IT projects in the telecommunication companies in Kenya) and independent variables (resource management and stakeholder engagement).

Correlation Analysis

The present study used Pearson correlation analysis to determine the strength of association between independent variables (resource management and stakeholder engagement) and the dependent variable (performance of IT projects in the telecommunication companies in Kenya) dependent variable. Pearson correlation coefficient range between zero and one, where by the strength of association increase with increase in the value of the correlation coefficients.

Table 6: Correlation Coefficients

		Project Performance	Resource Management	Stakeholder Engagement
Project Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	163		
Resource Management	Sig. (2-tailed)	.003		
	N	163		
	Pearson Correlation	.826**	1	
	Sig. (2-tailed)	.001		
	N	163	163	
Stakeholder Engagement	Pearson Correlation	.854**	.256	1
	Sig. (2-tailed)	.000	.032	
	N	163	163	163
	Sig. (2-tailed)	.002	.020	.081
	N	163	163	163

**. Correlation is significant at the 0.01 level (2-tailed).

From the results, there was a very strong relationship between resource management and performance of IT projects in the telecommunication companies in Kenya (r = 0.826, p value =0.001). The relationship was significant since the p value 0.001 was less than 0.05 (significant level). The findings conform to the findings of Hussein (2025) that there is a very strong relationship between resource management and project performance.

Further, the results revealed that there is a very strong relationship between stakeholder engagement and performance of IT projects in the telecommunication companies in Kenya (r = 0.854, p value =0.000). The relationship was significant since the p value 0.000 was less than 0.05 (significant level). The findings are in line with the findings of Bobae (2024) that there is a very strong relationship between stakeholder engagement and project performance

Regression Analysis

Multivariate regression analysis was used to assess the relationship between independent variables (resource management and stakeholder engagement) and the dependent variable (performance of IT projects in the telecommunication companies in Kenya).

Table 7 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.798	.636	.635	.10129

a. Predictors: (Constant), resource management and stakeholder engagement

The model summary was used to explain the variation in the dependent variable that could be explained by the independent variables. The r-squared for the relationship between the independent variables and the dependent variable was 0.636. This implied that 63.6% of the variation in the dependent variable (performance of IT projects in the telecommunication companies in Kenya) could be explained by independent variables (resource management and stakeholder engagement).

Table 8: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.802	2	9.401	140.313	.000[b]
	Residual	10.748	160	.067		
	Total	29.550	162			

a. Dependent Variable: performance of IT projects in the telecommunication companies in Kenya

b. Predictors: (Constant), resource management and stakeholder engagement

The ANOVA was used to determine whether the model was a good fit for the data. F calculated was 140.313 while the F critical was 3.053. The p value was 0.000. Since the F-calculated was greater than the F-critical and the p value 0.000 was less than 0.05, the model was considered as a good fit for the data. Therefore, the model can be used to predict the influence of resource management and stakeholder engagement on performance of IT projects in the telecommunication companies in Kenya.

Table 9: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.258	0.068		3.794	0.000
	resource management	0.331	0.085	0.330	3.894	0.001
	stakeholder engagement	0.359	0.093	0.360	3.860	0.000

a Dependent Variable: performance of IT projects in the telecommunication companies in Kenya

The regression model was as follows:

$$\mathbf{Y = 0.258 + 0.331X_2 + 0.359X_2 + \varepsilon}$$

According to the results, resource management has significant effect on performance of IT projects in the telecommunication companies in Kenya, β1=0.331, p value= 0.001). The relationship was considered significant since the p value 0.001 was less than the significant level of 0.05. The findings conform to the findings of Hussein (2025) that there is a very strong relationship between resource management and project performance

Furthermore, the results revealed that stakeholder engagement has significant effect on performance of IT projects in the telecommunication companies in Kenya β1=0.359, p value= 0.000). The relationship was considered significant since the p value 0.000 was less than the significant level of 0.05. The findings are in line with the findings of Bobae (2024) that there is a very strong relationship between stakeholder engagement and project performance

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The study concludes that resource management has a positive and significant effect on performance of IT projects in the telecommunication companies in Kenya. Findings revealed that cloud, efficiency and virtualization influences performance of IT projects in the telecommunication companies in Kenya.

Further, the study concludes that stakeholder engagement has a positive and significant effect on performance of IT projects in the telecommunication companies in Kenya. Findings revealed that consultation, involvement and communication influences performance of IT projects in the telecommunication companies in Kenya.

Recommendations

The study recommends that telecommunication companies in Kenya should strengthen resource management by implementing comprehensive resource planning, allocation, and monitoring practices throughout the IT project lifecycle. This includes ensuring the timely availability of skilled personnel, financial resources, technological infrastructure, and project materials while using resource management tools to optimize utilization and minimize wastage.

Further, the study recommends that telecommunication companies in Kenya should institutionalize stakeholder engagement by involving key stakeholders throughout the IT project lifecycle. This can be achieved through regular consultations, timely communication, collaborative decision-making, and structured feedback mechanisms to ensure stakeholder needs and expectations are effectively addressed.

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