

Project Management Information Systems and Performance of Community-Based Peace Projects in Kisumu County.

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ABSTRACT

The role of technology in applying project management practices has become increasingly important in improving the performance of community-based projects. In Kenya, technology integration in community-based projects faces unique challenges, such as limited internet connectivity, inadequate technical training, uneven adoption of technology, and limited infrastructure in rural and other marginalized areas. This study investigated the influence of project management information systems on the performance of community-based peace projects in Kisumu County, informed by the factual, geographical, political, and economic data. The study was guided by the Diffusion of Innovation Theory, Resource-Based View Theory and Sustainability Theory. A descriptive research design was adopted with a population of 365 project stakeholders. Stratified sampling techniques were adopted to give a sample size of 191. Questionnaires were used for data collection. A pilot study was conducted with 10% (19 respondents) of the sample size. Thematic analysis was used to analyze qualitative data and the presentation of results in prose form. SPSS Version 23 was utilized for quantitative data analysis. Pearson correlation analysis and multiple regression modeling were used as inferential statistics. The results were presented using tables and images. The study found that PMIS for communication and collaboration, and the performance of community-based peace projects in Kisumu County are positively and significantly related. The study concluded that PMIS for risk management and the performance of community-based peace projects in Kisumu County are positively and significantly related. Finally, the study found that PMIS for data management and the performance of community-based peace projects in Kisumu County are positively and significantly related. The study thus recommends that community-based peace projects in Kisumu County should effectively adopt integrated PMIS to facilitate communication, collaboration, risk management and data management on such projects. This should be done with ethical consideration of data handling and with the government providing needed infrastructure.

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I. INTRODUCTION

1.1. Background

Community-based programs are some of the most implemented programs targeting the last mile of the people in orchestrating developments and meeting specific needs. In most cases, community-based projects are performed by the members of the community, especially in providing labor to show inclusion, but most often the members of the community do not participate in the initiation and planning of such projects. The planning and initiation of these projects are done either by the government, the NGOs, or the sponsors of such projects, at times with representatives from the community, which in most cases do not represent the full face of the community and what the larger community wants (World Health Organization [WHO], 2021). These projects range from peace, social welfare, education, governance, gender championing, infrastructure development, policy enhancement, etc.

Proper, well-community-consulted, and efficient implementation of community-based projects can lead to higher success rates and impacts on the communities. Since these projects are community-specific according to the unique challenges affecting such communities, the success of these projects would bring a lot of direct impact to the communities, and the outcomes would be easily visible and appreciated.

PMIS in community-based peace projects has evolved over the years, with early technology use involving the use of radios and TVs to create awareness (Unwin, 2017). Later, with the revolution of digitalization, the introduction of the internet, computers, and mobile phones enabled more widespread access to information, enhanced data collection, and facilitated collaboration on such projects (Heeks, 2009). Improved new technologies like artificial intelligence and data analytics have been a turning point in the sector of project management and implementation by providing informed data and analysis. Drivers of PMIS on the performance of community-

based peace projects include global connectivity, access to resources, and empowerment through participation, but still, there are challenges with the sustainability of such integrations, illiteracy, especially in the marginalized regions, and the digital divide since access to the required technology is not universal.

1.1.1. Global Perspective of PMIS and Performance of Community-Based Peace Projects

Globally, PMIS integration in community-based peace projects has become vital in enhancing transparency, efficiency, and the impacts of such projects. According to World Bank data (2020), more than 80% of community-based peace projects that are financed by international donors use some digital technology, one way or another. On the other hand, according to the UNDP Report (2021), currently, 75% of United Nations Development Program projects at the community level use digital tools for their planning, monitoring, and implementation. An example of the Balkans Early Warning Systems used PMIS tools in 2016 to monitor the potential conflicts and ethnic tensions in Europe by integrating community reports, law enforcements guidelines and satellite data to generate early warning alerts. This was proven to be very effecting in prevention of war and maintenance of peace in the countries (Gandhi et al., 2017).

Applying PMIS has brought about change that can transform communities' peace projects and promoting social and economic inclusion bringing about sustainability in the community within Europe. Through PMIS technology the United Nations Peacebuilding Fund monitors peace projects that operate in areas emerging from conflict. The Peace InSight platform gives stakeholders access to up-to-date project data through its platform which ensures both transparency and accountability (Lennert, 2017).

PMIS initiatives that use artificial intelligence, big data, and the Internet of Things to enhance public services and for efficient management of resources have enhanced community peace projects in Hungary (Cohen, 2015). The technology hubs serve as a means for rural residents to connect to online education, healthcare, and business (Lennert, 2017) thus bringing equality and in turn shrinking the gap for violent extremism and spreading the peace gospel. These centers help to overcome the problem of the absence of appropriate access to modern ICT facilities in the defined areas for social and economic development.

These cases and many more describe the usage of technology to drive community-based peace projects globally. PMIS functions as an effective instrument to boost both efficiency and performance of worldwide community-based peace projects. The deployment of these systems generates sustainable peace by enabling data-driven decisions and real-time tracking and fostering connection between stakeholders.

1.1.2. Regional Perspective of PMIS and Performance of Community-Based Peace Projects

Project Management Information Systems (PMIS) serve as fundamental tools which enhance performance outcomes of community-based peace projects throughout Africa. These systems enable organizations to track both their resources and project development as they improve collaborative efforts among key project participants (Olaniyi, 2020). Adoption of PMIS in community-based peace projects across Africa has reinvented the conventional method of peace projects management hence contributing to more sustainable and visible development in community peace initiatives. The level of PMIS integration remains a little low but differs from one country to another, the main factors being infrastructure, digitization, and stakeholders' acceptance rate. Africa, at the same time, is experiencing a surge in technology adoption in community-based peace projects, with mobile penetration reaching 46% in 2023 (Global System for Mobile Communications Association [GSMA], 2023). Access to the Internet is crucial for human communication, training, and data collection, 40% of Africa's population had access to the Internet by the end of 2022 (International Telecommunication Union [ITU], 2023) with 60% of UNDP-backed projects using mobile-based training or e-learning for capacity development.

ECOWAS Early Warning and Response Network (ECOWARN) and CEWS (warning system operated by the African Union) operates through a PMIS architecture which serves as an early warning system for conflicts (Jack & Suri, 2011). Through the platforms, States obtains information from community monitors and analysts so they can prevent the escalation of violence. This system collects regional reports in real time so policy leaders can obtain up-to-date analysis for their decision processes.

The Situation Room (Nigeria) implemented PMIS to monitor electoral violence together with human rights violations in Nigeria's election period. The information from the data provided vital information which civil society groups and security agencies and journalists used to prevent threats and establish peace (Olaniyi, 2020). Across the region of Africa and particularly East Africa, there is at least one application of PMIS in the improvement of performance of community-based peace projects sponsored and managed by either the different levels of government or NGOs.

1.1.3. Local Perspective of Technology Integration and Performance of Community-Based Peace Projects

Kenya's advanced ICT infrastructure and high mobile penetration have enabled successful technology integration in community-based peace projects. Kenya is considered one of the most technologically advanced states in Africa, with major innovations across the region and globally. With 55% internet access by 2022, digital

communication and project management tools are essential. Over 70% of adults use M-Pesa for mobile money services, which is integral to many community-based peace projects for financial transactions and resource distribution (World Bank, Global Findex Database, 2021). This has provided opportunities to the rural communities to obtain banking services in the absence of commercial banks and therefore supports the formation and strengthening of microfinance and other developmental schemes in rural areas (Jack & Suri, 2011). Additionally, 50% of peace projects use digital M&E tools for project tracking (ITU, 2023).

Another major example in Kenya is Ushahidi, a crowdsourcing platform invented in Kenya where communities report incidences like natural calamities, election violence, and service delivery gaps through SMS and web tools. Having given a voice to the communities and having provided a transparent means of ensuring accountability, the platform has been useful in enhancing democracy and governance, hence enhancing citizenship (Okolloh, 2009).

The above and additional examples put Kenya as a good consumer of technology in bettering the performance of community-based peace projects by facilitating communication, collaboration, risk management, and data management. Kenya, on the other hand, has areas and populations with no access to electricity or with low penetration of technology and enablers of technology. The said areas are mostly marginalized areas with lower literacy rates, and hence they are the most to be targeted with peace and security problems, such community needs integration of PMIS into their peace the management of the same especially in time where physical access to such areas is a mystery.

Periodic conflicts emerge in Kisumu County because of its geographical, political and economic placement. Kisumu County is one of the regions with the city containing a digital population that at the same time has a good population considered marginalized and poor with slow penetration of the digitization features, but at the least they can afford the cheapest non-Android phones for communication (Njeru, 2022). Several community-based community peace projects within Kisumu County utilize PMIS such as project management software, mobile applications, GIS mapping etc., to facilitate stakeholder engagement, enhancing efficiency and project outcomes (Mwaura, 2024). The Uwiano Platform for Peace derives its power from PMIS to track potential conflicts by monitoring real-time reports through SMS social media and local community members. The system has delivered peace by allowing immediate interventions to stop election-related violence (Lennert, 2017). Through Sauti Yetu (Our Voice) initiative, a Kisumu-based mobile PMIS, the local community can use the platform to report conflict incidents alongside peace violation occurrences. Analyzing these data enables peace committees at local levels to action swift dispute settlement.

1.2. Statement of the Problem

Many community-based peace projects struggle to incorporate technology successfully due to factors like lack of infrastructure, inadequate training, and financial constraints. In Kenya, PMIS in community-based peace projects faces unique challenges, such as limited internet connectivity, inadequate technical training, uneven adoption of technology, and limited infrastructure in rural and other underserved areas of Kenya (Njeru, 2022). The PMIS in community-based peace projects is crucial for the developmental progress of Kisumu County and Kenya as a whole. Failing to address this integration of PMIS issues could result in significant losses in peace building developmental gains, leading to inefficiencies in such project implementation and a diminished capacity to meet local community peace needs. Moreover, this may hinder Kenya's progress towards achieving its development goals and the Sustainable Development Goals (SDGs).

According to Oino et al. (2015), technology adoption plays a big role in the successful implementation of projects. The Kenya Institute of Management report in 2022 states that only 30% of projects in Kisumu County are successful in integrating digital tools due to insufficient technical support and infrastructure. Additionally, as per the County Government of Kisumu Integrated Development Plan (CIDP) 2023-2027, the lack of ICT infrastructure and low technical capabilities have hindered the pace of efficient service delivery and development implementation in the county, where peacebuilding is considered the most significant motivator, and service delivery and project success would have greatly benefited from PMIS. Moreover, the Kisumu County Annual Development Plan 2022/2023 emphasized ICT capability enhancement as one of the critical pillars for ensuring continuity, accountability, and efficiency in county initiatives. However, the studies have been limited to general project management and/or performed by the national government, county government, or big NGOs and have not focused on the community-based peace projects performed by CBOs or the other grass-root organizations that have a direct influence on the beneficiaries. It is against this background that this study sought to fill the existing research knowledge gap by investigating the influence of project management information systems on the performance of community-based peace projects in Kisumu County performed by a community-based organizations. Investigations and recommendations to these PMIS integration issues in the performance of community-based peace projects in Kisumu County could see substantial improvement, ultimately enhancing peacebuilding initiatives for the affected communities. The study also aimed to inform future technology

implementation in community-based projects for success and sustainability, especially in Kisumu County, where scarce resources are crucial.

1.3. Research Objectives

1.3.1. General Objectives of the Study

The general objective of this study was to investigate the influence of project management information systems on the performance of community-based peace projects in Kisumu County, Kenya.

1.3.2. Specific Objectives of the Study

The specific objectives of the study were:

- i. Assess how the use of project communication systems influences the performance of community-based projects in Kisumu County.
- ii. Investigate how the use of project collaboration systems influences the performance of community-based projects in Kisumu County.
- iii. Examine how the application of risk management systems influences the performance of community-based projects in Kisumu County.
- iv. Establish how the use of data management systems influences the performance of community-based projects in Kisumu County.

1.4. Research Questions

Below are the research questions to guide the study.

- i. In what ways does embracing communication systems affect the performance of community-based peace projects in Kisumu County?
- ii. To what extent does the implementation of collaboration systems affect the performance of community-based peace projects in Kisumu County?
- iii. In which manner does the application of risk management systems affect the performance of community-based peace projects in Kisumu County?
- iv. In what way does the application of data management systems affect the performance of community-based peace projects in Kisumu County?

1.5. Significance of Study

1.5.1 Significance to Practice

The study was important in identifying and understanding the role of PMIS integration in the planning, execution, management, and delivery of community-based peace projects in Kisumu County. The key areas of PMIS include communication, collaboration, risk management, and data management. By defining and understanding the key influence these technologies have in the phases of project implementation, their effects would be felt, and their further adoption and integration would improve the outcomes of community-based peace projects in the county.

1.5.2 Significance to Policy

The findings are useful to different policymakers, such as the national government, county governments, NGOs, CBOs, and individual policy influencers, in considering the need to integrate various aspects of PMIS in their design of all levels of projects. This would then result in the review of existing policies at various levels to incorporate effective PMIS adoption and integration. The study will also further support development agencies in designing programs that enhance digital systems towards project implementation.

1.5.3 Significance to Research

The study is significant to academics and researchers in the future because it improves the existing literature review on PMIS by examining their application of community-based projects. It also contributes empirical knowledge of PMIS integration in the performance of community-based peace projects in Kisumu County relating to communication, collaboration, risk management and data management. Finally, the study contributes to practical knowledge by providing results and recommendations that can improve PMIS implementation on community-based peace projects as well as acting as a valuable resource for academics and scholars in the future.

1.6. Scope of the Study

The study focused on undertaking community-based peace projects within Kisumu County to ensure a comprehensive understanding of the influence of PMIS integration on the performance of community-based peace projects. The study considered the community-based peace projects currently being performed by the organizations to capture modern and contemporary PMIS integration practices. In the community-based peace projects, the project participants provided insights into the study's wide perspective. The study was held between Nov 2025 and Jan 2026, covering a population of 365 individuals and a sample size of 191 individuals.

1.7. Limitations of the Study

The selected personnel had tight schedules and laxity in filling the research questionnaires. The researcher used his network in persuading the respondents who had not filled in the questionnaires to fill and return them.

Some of the respondents were reluctant to fill in the questionnaires on the fear of their data protection and the use of the information they were to provide. To deal with this, the researcher provided a letter of introduction from

the university and research permit from NACOSTI and assured them of confidentiality and that the information was solely for academic reasons.

II. LITERATURE REVIEW

2.1. Introduction

The chapter examined several theories about the adoption and integration of PMIS in community-based peace projects. The conceptual framework and a review of the study's concepts, including project management information systems for project communication, collaboration, risk management, and data management, are also presented in this chapter. To identify knowledge gaps, an empirical literature assessment and critique are also conducted critically.

2.2. Theoretical review

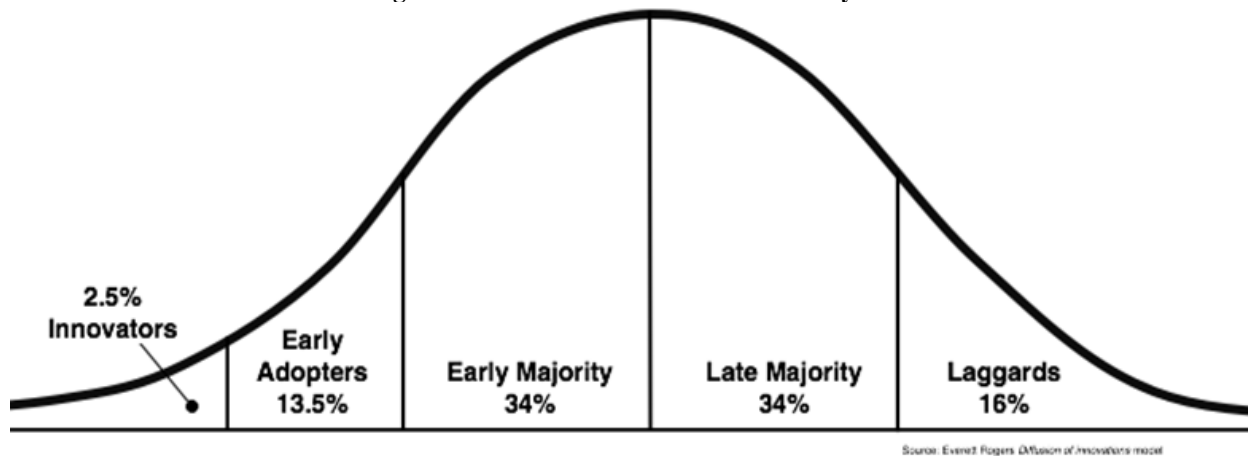
A theoretical review is the exploration and analysis of the existing theories self-developed about the research topic. This theoretical literature review aimed to develop a model to explain factors in PMIS use for improving the effectiveness of community-based peace projects in Kisumu County, supported by three theories that are Diffusion of Innovation (DOI) theory, Resource Based View (RBV) theory, and Sustainability Theory.

2.2.1. Diffusion of Innovation Theory

E.M. Rogers created the Diffusion of Innovation (DOI) Theory in 1962, making it one of the earliest social science theories. It was first used in communication to describe how, throughout time, a concept or item gathers traction and diffuses or spreads through a particular community or social structure (Rogers, 2003). People eventually adopt new ideas, behaviors, or products as a part of a social system because of this dissemination (Katz, 1957). When someone adopts something new, it indicates that they are doing something different from what they were doing before (e.g., buying or using a new product, acquiring and performing a new behavior, etc.) (Kaminski, 2011). Adoption hinges on the individual perceiving the concept, action, or item as novel or inventive. This allows for the possibility of dissemination (Toews, 2003).

In a social system, the adoption of a novel concept, action, or product (referred to as "innovation") is a process in which certain individuals are more likely than others to accept the innovation (Green et al., 1989). It has been discovered by researchers that early adopters of innovations exhibit distinct traits from later adopters. It's critical to comprehend the traits of the target audience when pushing an invention to them because these traits might either facilitate or impede the innovation's adoption (Toews, 2003). The public tends to fall into the middle of the five defined adopter categories, but it is still important to understand the characteristics of the target demographic (Green et al., 1989). Various tactics are employed to promote innovations to the different categories of adoptions. The five adopter categories include Innovators: these are venturesome people who need little, nothing, or too little to be able to try new solutions. They are risk-takers and are often the ones to come up with and develop new ideas (Kaminski, 2011). Early adopters—these are opinion leaders. They welcome chances for change and take pleasure in leadership jobs. Since they already understand that change is necessary, they have little trouble embracing novel concepts. User manual guides and implementation information sheets are among the tactics used to appeal to this demographic (Rogers, 2003). Early majority, these people don't often take the lead; some individuals do accept new ideas before the public does. Before they are willing to embrace an innovation, they usually require proof that it is effective. Proof and success stories of innovation's efficacy are two tactics to appeal to this demographic (Von, 2006). Late majority: these people are resistant to change and won't accept an invention until the majority has given it a go. Information on the number of other individuals who have successfully tested and embraced the innovation is one tactic to appeal to this demographic (Kaminski, 2011). Finally, Laggards are the people who are extremely conservative and constrained by tradition. They are the hardest group to convince to accept change since they are highly resistant to it. Statistics, fear appeals, and pressure from members of other adoptive groups are some of the tactics used to appeal to this population (Von, 2006).

Figure 2.1: Diffusion of Innovation Theory



Note. From "All sizes | Everett Rogers Diffusion of Innovations graph | Flickr - Photo Sharing!" Flickr (<http://www.flickr.com/photos/wfryer/2564440831/sizes/o/in/photostream/>). CC BY-SA.

These stages of adoption of innovation are influenced by the relative advantage of the new idea, its compatibility with the values, needs, and experiences of the target audience, the ease of use of the innovation, trialability, and the extent to which the innovation provides tangible results (Green et al., 1989). It assumes that information would influence the adoption decisions; while this could be true, for consequential interventions that affect changes in user routines and behaviors, direct influence is often required (Rogers, 2003).

This theory contributed to this study's effort on how new technologies are adopted to improve community-based peace projects, especially within Kisumu County, how quickly the new technologies are disseminated in the communities and their consequential adoption. It therefore supported the main objective of looking at the influence of PMIS in community-based peace projects in improving their performance. In this study, information resources were paired with social influence in an overall dissemination strategy as an improvement to the Diffusion of Innovation theory to take care of consequential interventions.

2.2.2. Resourced-Based View Theory

Resource-Based Theory (RBT) focuses on effective management, diversification, and productive opportunities of firms (Penrose, 2009). RBT views a firm as a coordinated package of resources to achieve its goals. Emerging in the 1980s, RBT evolved from the theory of the growth of the firm, influenced by Jay Barney in the 1980s and dominant in strategic management by the 1990s (Penrose, 2009).

There are two fundamental suspicions of the RBT related to the clarification of how firm-based assets produce supported competitive advantage and why a few associations may ceaselessly outflank others by picking up higher competitiveness (Helfat & Peteraf, 2003). One of the foundations of RBT is the heterogeneity of assets and capabilities in a populace of firms, which separates the competitive advantage of each firm. The heterogeneity of assets accepts that a firm has one-of-a-kind assets in a particular circumstance and can be more talented at performing specific exercises and make a competitive advantage (Barney, 1991). Be that as it may, the conventional RBT does not expound on why and how a few firms pick up a competitive advantage in circumstances of unusual and quick alter (Adner & Helfat, 2003). The improvement of a broader RBT viewpoint recommends that firms can accomplish competitive advantage not only by using basic resources but also by building unused potential capabilities through learning, ability procurement, and the amassing of substantial and intangible resources over time (Penrose, 2009). The resource-based view proposes that if valuable resources (resources that are costly and difficult to imitate) are held by some firms, firms that can manage these resources with the view of possibly attaining enduring competitive advantage, then these firms can gain an advantage through the dynamic bundling and re-bundling of different kinds of resources and through the development of new configurations to answer market needs (Adner & Helfat, 2003).

According to the resource-based view theory, competitive advantage is realized if the organization efficiently deploys its resources, of which technology is one. In community-based peace projects, PMIS can be a valuable resource if it improves the degree of achievement in the project and/or offers features that other projects find challenging to achieve and accomplish. Introducing integrated PMIS can improve resource utilization and increase performance when technology is well identified as a strategic resource (Irwin et al., 1998).

This theory spoke to the realization of PMIS as a strategic resource in the efficiency, reliability, and management of community-based peace projects. It contributed to the main objective of PMIS influence to improve community-based projects.

2.2.3. Sustainability Theory

The concept of sustainability gained attention after the 1972 "Limits to Growth" report by the Club of Rome. The term "sustainable development" became well known in the 1987 "Brundtland Report," defining it as meeting present needs without compromising future generations (Hajian & Kashani, 2021).

Early uses of the concept aimed to integrate responses to environmental and social issues, emphasizing the need to balance human needs with Earth's resources. In general, sustainability can be defined as a type of stewardship in which present persons' environmental and economic behavior does not consume resources and precludes similar valuable resource consumption by future persons (Al-Emran, 2023).

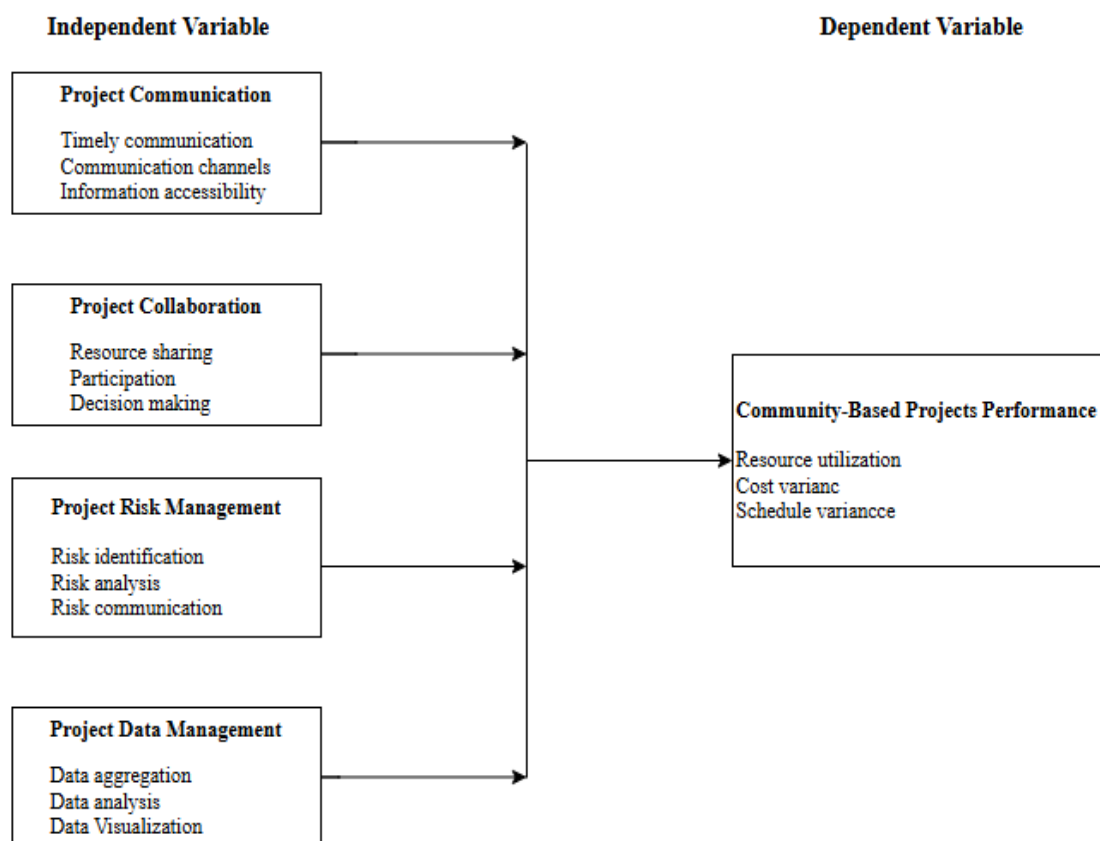
While some criticize the focus on human needs, sustainability has sparked debate and influenced concepts like sustainable development, communities, resource management, livelihoods, and societies. Sustainability integrates responses to social and ecological issues, recognizing limits to human and biophysical systems. It harmonizes human and environmental goals, considering future generations' needs (Al-Emran, 2023). Moral challenges arise in prioritizing needs such as capital or community for the future. Sustainability balances present and future obligations, addressing global problems while considering the Earth community's well-being generations (Hajian & Kashani, 2021).

In community-based peace projects, sustainability theory claims that PMIS technology should be created with permanent utilization, especially in conditions of a scarcity of resources. Sustainable PMIS leads to improved performance when it lowers costs in the long run; it increases capacity and flexibility appropriate for meeting community demographics and needs, converting effective environmental, social, and economic value (Vacchi et al., 2021).

2.3. Conceptual Framework

A conceptual framework is a diagram that illustrates the relationships between the study's variables (Bryman, 2016). The framework makes it easier for the reader to quickly and visually understand the suggested connections between the study's variables. The dependent variable and independent variables of the study are shown in Figure 2.3.

Figure 2.2: Conceptual Framework



Note. Developed research conceptual framework.

Independent variables of the study are project communication, collaboration, project risk management, and project data management. The dependent variable is community-based project performance.

It is hypothesized that project communication, collaboration, risk management, and data management will have a significant influence on the performance of community-based peace projects in Kisumu County.

2.4. Review of Variables

2.4.1. Project communication

Project communication is the processes, methods, and tools used to exchange information among the stakeholders of a project. Project communication is vital in all the phases of the project as it ensures that all the stakeholders align with the objectives, roles, and responsibilities and management of potential risks (Hwang et al., 2013). Communication, when done properly, would ensure all stakeholders are engaged and their views considered; it would also ensure proper coordination.

Project communication involves two levels of communication, that is, internal communication and external communication. Internal communication involves the members of the project implementation team, like project managers, implementation officers, and other internal stakeholders. External communication involves passing the information to the external stakeholders outside the project team, like suppliers, vendors, regulators, clients, etc. Communication in these senses could also be formal or informal, formal through reports, presentations, contracts, project plans, etc., and informal through casual conversations, impromptu meetings, etc.

Communication can also be done verbally through video conferences, meetings, phone calls, etc.; other times it can be written in reports, emails, memos, etc. Sometimes, communication is visually done through dashboards, Gantt charts, infographics, etc., or at times, digitally communicated through digital tools such as Teams, Trello, Slack, etc.

2.4.2. Project collaboration

Project collaboration can be defined as the process through which different people and teams in a project form collective synergy to achieve certain project objectives. Effective collaboration ensures that all the efforts, knowledge, and resources are well utilized to accomplish the set goals of any project at the specified time, cost, and scope. The current collaboration works done through projects mostly require the adoption of tools and platforms that can support cross-location and cross-time zone operations (Freeman, 2010).

Collaboration brings diverse perspectives, knowledge, and skills from the different members of the team, thus improving problem-solving and decision-making. Collaboration also yields improved efficiency by distributing tasks according to individual strengths, hence faster task completion. Effective collaboration ensures stronger team relationships by developing trust and mutual respect among the team members. Collaboration also improves resource optimization by pooling ideas and skills as well as increasing adaptability and flexibility.

Collaboration is supported by clear communication, effective collaboration tools, defined roles and responsibilities, shared goals, and mutual trust and respect among the members.

Major tools used include file-sharing tools like Google Drive, One Drive, etc. Project management software like Trello, Jira, etc. Communication platforms like Microsoft Teams, Slack, etc. Time management tools like Clockify to manage the time and set reminders.

2.4.3. Project risk management

Project risk management involves the identification, assessment, and mitigation of the current risks that can be capable of affecting the achievement of the project's goals, scope, cost, and time. These risks could include environmental, technological, financial, and operational risks.

Risk identification involves the discovery of potential risks that can affect the projects; different technological tools can be applied in identifying risks (Breslin & Greschner, 2013). Risk assessment is the evaluation of the identified risks to find out the likelihood and impact of such risks in the event they occur to prioritize response.

Risk mitigation is to formulate strategies to avoid, reduce, and manage the risk, control the risk, or transfer the risk. This may include technology contingency strategies, staff training, or other protective procedures. Risk monitoring involves continuous tracking of the risks throughout the project's life cycle to ensure the response approaches are effectively implemented to mitigate any risks observed. Risk response is a contingency plan to manage any emanating risk.

2.4.4. Project data management

Project data management can be described as activities on how data is collected, stored, structured, protected, and processed to analyze the results within the lifecycle of a project. Data management is very important for organizational projects as it assists in decision-making, helps to measure performance, and increases accountability (Mefalopulos, 2008).

Data collection is the gathering of project-relevant data, including timelines, budgets, scope documentation, etc. Data comes from various sources, and several techniques can be used to collect data, like spreadsheets, project

management platforms, and automated capture systems. Data storage is to ensure that the data is stored securely and in a manner that every stakeholder can get access to the appropriate data they need. This should also be done by the necessary regulations. Data protection involves shielding critical project data from theft, loss, corruption, or unauthorized access by implementing backups, access control matrices, etc. Data analysis is the derivation of a meaningful presentation of all the collected data. Data should also be retained or archived to provide future references and access whenever needed.

Proper data management ensures efficient decision-making, regulatory compliance, proper tracking and reporting, adequate risk management, and retention of historical data for future project reference.

2.4.5. Performance of Community-Based Peace Projects

Performance of Community-Based Peace Projects refers to how well peace projects, which have been developed, delivered, and maintained within the communities, meet the set social, economic, or environmental requirements of the given community. Such initiatives are usually based on the engagement of stakeholders who are representative of communities and work towards finding practical and contextually relevant solutions (Mwangi & Njihia, 2013). It is vital in arguably measuring the performance of these projects and their viability for scaling up and sustaining successfully. The key aspects of community-based peace projects performance include stakeholder engagement and participation, relevance to community needs, sustainability and long-term impact, capacity building and empowerment, equity and inclusiveness, efficiency resource utilization, monitoring and evaluation (M&E), cultural sensitivity, and environmental impact. All these projects should be done within scope, cost, and schedule.

2.5. Empirical Review of Variables

2.5.1. Project communication system and performance of community-based peace projects

Empirical studies have confirmed the direct correlation between quality communication and project performance, particularly when dealing with multiple stakeholders with varying power and interests. Kumar et al. (2014) found that good communication reduces conflicts between project teams and stakeholders, improving project performance.

A cardinal success factor in project communication, especially for the development of community-based peace projects, is timeliness. Timely communication in a project ensures timely decision-making, coordination, stakeholder management, trust, and momentum. Updates delivered at the right times give stakeholders all the information they need to make the right decisions and know what tasks are upcoming and the timelines involved (Ngubane et al., 2022). Timely and consistent communication keeps the stakeholder engaged and informed about the project, hence increasing commitment levels. Response time is also effective in the quick addressing and consequently handling of the issue so that risks are mitigated well in advance (Kumar et al., 2014). Regular appraisal of the status of projects, challenges, and alterations is encouraged by transparency and accountability. Doing so keeps progress on track and does not get stuck in communication gaps. Timely updates also optimize resource utilization, which cuts down on delay and confusion (Kalu & Igwe, 2016). Thus, timely communication remains an important sub-variable that affects decision-making, stakeholders' confidence, working on issues, disclosure, and people's satisfaction. This makes them focused on meeting the laid-down project goals and objectives and increases responsibility and utilization of resources acquired.

Communication channels play a critical role in the process of communication within a project, with implications on the degree of involvement of all stakeholders as well as the timeliness and comprehensibility of delivered information (Mwangi & Njihia, 2013). Among the theoretical reviews of community-based peace projects, choosing the right channels guarantees openness, participation, and wider involvement. While all the identified communication channels are viable, the following factors are of paramount importance: Accessibility and inclusiveness of target stakeholders: The target stakeholders' communication preferences and ease and availability of the communication technology. The effectiveness of the delivery of information hastens messages that get to the recipients fast and with precision to keep the project going. Communication channels also influence the level of stakeholder engagement and their feedback since the more interactive channels highly encourage the same (Diallo & Thuillier, 2005). This process is done frequently and openly keeping everyone informed to ensure that they develop trust in the system. It is very important that those channels are flexible to cater to changing needs since flexibility allows the project team to change when informing stakeholders (Nyandoro & Mapira, 2014). Cultural relevance and acceptability are also essential since stakeholders within a given culture accept what is relevant in their culture. Diallo and Thuillier (2005) highlighted communication barriers due to cultural practices, language, and low literacy levels. Carefully and selectively identifying and implementing the channels of communication used within project teams can help project managers improve stakeholders' satisfaction, minimize potential issues that can take place within a project's functioning, and, finally, increase a project's performance.

Information accessibility is essential for project communications because it makes it possible to disseminate data, updates, and project decisions to everyone in need. As with any other community-based projects,

accessibility has always been a crucial factor given the variation of needs and resources available to people. Past studies highlight that information access enhances two-way communication, increases stakeholder participation, enhances efficiency in decision-making, enhances transparency, facilitates trust development, and empowers the stakeholders. Pinto and Slevin's 1988 research identified communication accessibility as a key success factor in project management, as it helps eliminate confusion and ensures all participants understand the project's objectives. Decision-making is also affected by accessibility, meaning that organizations with relatively easier access to channels of communication are more likely to respond to emergent issues quickly (Nyandoro & Mapira, 2014). Transparency and trust building are also made possible by increased accessibility of information, as the stakeholders view the project as more transparent, hence developing trust. Restrictions to information access can cause misunderstandings between some of the stakeholders, delays, and frustration. Accessible information can minimize the probability of misunderstanding or confusion because various channels are available for stakeholders to confirm information (Pinto & Slevin, 1988). However, there are barriers to accessing information, including that the project updates may not be easily accessed by those with low access to necessary devices or infrastructure. Mwangi and Njihia (2013) noted the lack of communication infrastructure in rural areas, causing delays in project implementation and feedback cycles.

2.5.2. Project collaboration systems and performance of community-based peace projects

Collaboration brings diverse perspectives, knowledge, and skills from the different members of the team, thus improving problem-solving and decision-making.

Resource sharing is widespread mostly in community-based collaborations since people working together would like to ensure that they offer the best results with as few resources as possible. Hence, effective resource sharing has an influence in determining project success by enhancing relations with stakeholders, encouraging fair distribution of resources, and identifying and mobilizing the strengths of all the stakeholders (Swart et al., 2022). Resource sharing enhances the effectiveness of resource utilization of financial and human resources and enables organizations to pursue common objectives at a lower expense. It also comprises the transfer of knowledge and enhancing organizational capability, where project teams have the opportunity of developing local capacities that will enhance project delivery (Khatib, 2022). Fair allocation of resources increases community participation since it ensures that communities that were hitherto disadvantaged would get an opportunity to access the resource; hence, socio-economically disadvantaged groups get elevated access to resources for use in community-based projects in which they may not afford the resource (Vidgor, 2021). But on the other hand, resource sharing also has some problems, for example, conflict in the distribution of resources, unclear boundaries are likely to lead to conflicts (Mansuri & Rao, 2013).

Participation is a process of involving the noble, community members, local administrators, non-government organizations, and government agencies in decision-making processes and planning and implementation processes (Woolcock & Narayan, 2000). Participation leads to enhanced ownership, meaning that initiatives underpinning a project are more likely to meet the priorities of the community they seek to address. It also checks on the general trust and cooperation between entities, as it assures more respect and understanding between them (Swart et al., 2022). Participation results in stakeholders being empowered and their capacities improving because one learns throughout the engagement process. This empowers the stakeholders to have control of activities, to act on their own, and in the process facilitates knowledge sharing (Mansuri & Rao, 2013). Besides, participation leads to keeping the stakeholders accountable since they are involved in every stage of the project. This shared responsibility increases the level of transparency of the projects and promotes ethical behavior. Participation affects the quality of projects and their time because of the long steps of decision-making (Swart et al., 2022). However, based on empirical evidence, the study reveals that even though participation slows down projects and delays its early outcomes, which may be perfectly positive once achieved, it is effective in offering a better product that is sustainable with the project ecosystems (Khatib, 2022).

Mansuri and Rao (2013) found that collaboration is crucial for successful development projects, as collaborative decision-making increases acceptance and sustainability. Decision-making processes should be informed, culturally sensitive, and client-oriented (Swart et al., 2022). Studies indicate that top-down, participative decision-making leads to projects that are more sensitive to the local realities and which the stakeholders are likely to support and take personal interest in. Kumar et al. (2014) found that projects with local communities involved in decision-making were more successful, as they felt ownership and responsibility towards the project. Woolcock and Narayan (2000) noted that communities were more likely to ensure the project's goals were achieved. Decision-making that involves everyone strengthens credibility since people value the role after the decisions are made because their contribution impacts the results. This creates mutual understanding, and there is good trust between organizations, which is important for long-term partnerships (Woolcock & Narayan, 2000). However, shared decision-making also brings about its own issues, most notably the issues of power and decision-making imbalance. Decision-making involving people of all diversity can sometimes be a disadvantage because it takes time to consult, negotiate, and schedule meetings (Khatib, 2022). Therefore, community-based peace projects may

be managed by trained people to prevent the overpowering of some individuals over others, hence leading to better decisions.

2.5.3. Project risk management systems and performance of community-based projects

Project risk management involves the identification, assessment, and mitigation of the current risks that can be capable of affecting the achievement of the project's goals, scope, cost, and time (Matheka & Mungai, 2024).

Risk identification involves the discovery of potential risks that can affect the projects; different technological tools can be applied in identifying risks (Breslin & Greschner, 2013). This practice helps in project planning since early recognition of risks allows the teams to make proper estimations. It is especially helpful in projects that are large or multilayered, and that implies cooperation with different communities (Matheka & Mungai, 2024). Engaging stakeholders in risk identification activities enhances their awareness of potential areas of project risks and enhances unity. Risk identification also enhances flexibility for the implementation of projects (Breslin & Greschner, 2013). It means that the teams can always be ready to confront the changes, which makes the project more robust. Risk identification is acceptable at an early stage as it promotes risk prevention strategies to ensure that risks do not snowball (Maige, 2023). But prejudices as well as other possible factors can influence risk identification. Forecasting can also work to the detriment of a project when its team falls victim to cognitive biases such as optimism bias or anchoring, which cause teams to underestimate risks. These biases can, however, be minimized by employing a variety of risk identification processes and engaging all stakeholders (Ochieng & Price, 2010). It is crucial to perform subsequent risk identification because project risks change during the project, and it is necessary to detect new risks on an ongoing basis (Pretty, 2012). Preventive measures enabled by technology help avoid interruptions and improve project performance. Pretty highlighted the need for technology to aid in recognizing and managing risks, especially in community-based projects (Pretty, 2012).

Risk analysis is the evaluation of the identified risks to find out the likelihood and impact of such risks in the event they occur to prioritize response (Pretty, 2012). Risk analysis enhances the decision-making process because, in a project context, risk management helps project teams to isolate the most significant risks that may affect the project, hence helping the project team to prioritize their efforts and avoid unnecessary expenses (Ahmed & Anwar, 2022). It also results in increased project success probabilities and performance results. Risk analysis can be useful when it comes to risk prioritization; this is because, in most cases, a certain set of risks is critical in any given project, a fact that means that more attention needs to be given to those risks during those times (Brown & Grey, 2022). Risk analysis combines both using both quantitative and qualitative techniques, where the former provides probability of risk occurrence while the latter gives clues about risks whose probability cannot easily be put into figures (Pretty, 2012). Risk analysis approaches should be integrated since, while quantitative gives an exact measurement of the risk, qualitative gives more accurate information that may have nothing to do with the model but may be very significant to the project (Zwikaël & Ahn, 2011). Risk analysis adds value and wins stakeholders trust by showing that organizations actively manage risks within the business environment. A clear advantage of risk analysis is that it makes a project more flexible and capable of responding to a variety of circumstances. While using the decision trees or risk matrices in structuring the risk analysis processes helps to reduce the biases that may influence decision-making regarding risk management, the method may also bring out important risks that would otherwise be omitted. Response approaches are effectively implemented to mitigate any risks observed. PMIS enhances data collection, analysis, and decisions in risk management (Zwikaël & Ahn, 2011) in improving project performance.

The act of communicating risks identified in the project is referred to as risk communication. It refers to providing people with information on the kinds, seriousness, and relevance of risks together with methods of managing or mitigating them (Maige, 2023). The primary purpose of risk management is to ensure that various people and other stakeholders understand the risks the project is exposed to, make reasonable decisions, and take appropriate actions that avoid those risks (Chen et al., 2021). Risk management communication is important in managing project risks, especially in complex or community-based projects. It helps deepen stakeholders' knowledge and participation; improves stakeholder trust and accountability; helps to combat and prepare for risks; improves managerial, investor, employee, and other stakeholders' risk perception and perception of the organization; minimizes cognitive distortions and misunderstandings; aids decision-making and negotiation; addresses issues around languages, cultures, structural hierarchy, and more (Brown & Grey, 2022). There is evidence that various sources of information should be consistent in communicating risks to all stakeholders and ensuring they realize the importance and possible effects of the noted risks. Open risk discussion with the local stakeholders in community-based projects assists them to understand the project risks and engage them in the risk management strategies (Ahmed & Anwar, 2022). Improved disclosures of risk enhance the stakeholders' confidence in the project team if they are told the opportunities and threats of the project. Risk communication also aids info-bias and attitude tendencies that may require one to have a wrong impression of risk. These biases are cut by clear and factual communication, which provides stakeholders with the most appropriate risk judgment from the information presented to them (Mefalopulos, 2008).

Risk communication is all about the choice of media and the frequency of the message relayed. Face-to-face meetings, emails, and reports guarantee the delivery of information to all stakeholders; constant updates on such risks as project risks also maintain stakeholders' awareness of changes and new risks. Communication must occur throughout the project phases to keep stakeholders interested and ready to respond to changes within the environment (Mefalopulos, 2008). Ochieng and Price (2010) highlights how technology aids risk assessment and communication in construction projects, particularly in remote areas. Hwang et al. (2013) emphasizes the use of RMIS and project management software for capturing and disseminating risk information in real-time. Mefalopulos (2008) notes the efficiency of mobile-based platforms in community-based projects for real-time communication and rapid response to new risks, especially in rural East Africa.

2.5.4. Project Data Management systems and performance of community-based projects

Project data management can be described as activities on how data is collected, stored, structured, protected, and processed to analyze the results within the lifecycle of a project. Data management is very important for organizational projects as it assists in decision-making, helps to measure performance, and increases accountability (Mwangi & Muchelule, 2023).

Data aggregation of project information improves decision-making and strategic planning for projects since all essential information is compiled. It aids in project evaluation and tracking as it removes the complex process of monitoring the performance and parameters of a project (Wang et al., 2021). It increases the accountability of the stakeholders by presenting all project information that can be viewed by all the project team members. Data aggregation also leads to another efficiency gain in that it minimizes data redundancy and overly burdensome data collection responsibilities for project teams (Zhang & Liu, 2023). Large data volumes become critical for analytics to predict trends in the future to make informed decisions on subsequent projects, but dealing with large data presents issues on data quality, consistency, and integration. It is therefore very crucial to guarantee that data sources are standardized, clean, and accurate so that the value of aggregated data is more significant. Applications such as dashboards and data integration applications enhance the availability of data for project teams to access and make informed decisions using the aggregated data.

Data collection is the gathering of project-relevant data, including timelines, budgets, scope documentation, etc. Data comes from various sources, and several techniques can be used to collect data, like spreadsheets, project management platforms, and automated capture systems (Zhang & Liu, 2023). Conducting efficient data collection also adds to risk and issue management as well as shaping an understanding of new threats and risks. It is also about project justification of what has been done and what results were achieved for everybody to see (Wang et al., 2021). Practical and routine data help to provide greater transparency and promote high levels of responsibility for the stakeholders interacting with the project teams. Collection of data leads to improvement of ongoing projects through comparison with current project management practice and for setting goals and objectives for future projects. There are many methods in which data collection tools and technology can help enhance the areas of accuracy, accessibility, and efficiency in gathering data. This is done using technologies such as mobile applications or even cloud-based applications, where data collection is also eased and prevented from being influenced by individuals (Mwangi & Muchelule, 2023). Data collection provides the basis for project assessment and review, helping the teams to compile figures in the assessment of results, which include the financial position of the project, or the milestones achieved in the project. Incorporating technology into community health projects enhances data collection and tracking progress in real-time (Breslin & Greschner, 2013).

Data storage is to ensure that the data is stored securely and in a manner that every stakeholder can get access to the appropriate data they need (Mwangi & Muchelule, 2023). Data protection involves shielding critical project data from theft, loss, corruption, or unauthorized access by implementing backups, access control matrices, etc. (Breslin & Greschner, 2013). Archiving is an important part of the management of the data collected during a project to make it easy to search for, retrieve, and analyze (Freeman, 2010). Data storage has a rather large importance within a long-term perspective of a project due to its contribution to access, protection, as well as data archive or privileged data because it guards information against breaches, hacks, or even losses. Structured data storage serves to store data compliant with the regulations of certain countries, or regions, restricted storage areas, such as HIPAA in the United States or GDPR in the European Union (Ahmed & Anwar, 2022). This means that information technology policies for the storage of information must centralize the storage process, which makes data easily accessible in case of risks or any other emergencies. Credible data of excellent quality and data integrity are preconditions for correct analytics and reporting. Efficient storage of data prepares the alloying use of machine learning or even predictive analytics; they are used to predict the performance of a project depending on past trends (Zhang & Liu, 2023). Hedrick et al. (2013) mentioned mobile data collection systems, cloud storage, and GIS as tools for tracking project performance. Mefalopulos (2008) noted mobile platforms provided real-time information for agricultural development projects, allowing for risk forecasting and timely interventions.

Data sharing and real-time tracking enhance transparency, accountability, and stakeholder synergy in project management processes. Kimaro and Sahay (2007) found ICTs improved data management in rural Tanzania, saving time and improving the quality of reports. Ika et al. (2010) found that using data management systems in cross-national projects led to increased effectiveness and quicker decision-making. Overall, technology in community-based peace projects improves efficiency, accuracy, and real-time monitoring, allowing for better decision-making and enhanced project outcomes (Ochieng & Price, 2010).

2.5.5. Performance of Community-Based Peace Projects

The performance of Community-Based Projects refers to how well projects, which have been developed, delivered, and maintained within the communities, meet the set social, economic, or environmental requirements of a given community (Maige, 2023).

It is vital to arguably measure the performance of these projects and their viability for scaling up and sustaining successfully. As seen in the paper, resource management is a critical component of community-based peace projects, and this will determine their effectiveness (Ochieng & Price, 2010). Project management as a strategic plan focuses on the effective management of resources, particularly funds, hardware and software, time, and manpower. Financial management means proper utilization of funds; in another way, it would mean directing funds to where they are needed most, other than being wasted or used beyond the planned budget. Effective utilization of the materials and equipment guarantees that the work progresses without interruption most of the time. Effective assignments and application of people resources, tapping into the community and people knowledgeable of the area. Project scheduling plays a significant role with references to project progress and stakeholder trust. Technological resources that could greatly enhance the use of resources include technology such as project management technology and the use of mobile devices. Resource efficiency with an emphasis on sustainability, recycling, or using renewable materials and energy should be applied for the sake of longer-term benefits of the community (Zwikaël & Ahn, 2011). Holding and disclosure of resources improves their credibility in the public and among the stakeholders, consequently maintaining the community's support for the project.

Cost variance is another sub-variable in community-based projects that points to the difference between the amount spent and that which was planned. It has information telling whether a project is on its rightful financial status or overspending or even underspending (Maige, 2023). Cost variance affects the sustainability of projects, stakeholder confidence, and the likelihood of success of stated goals or objectives. They point to the possibility of developing financial control, effective resource distribution, project scale and quality, project sustainability, stakeholders' trust, decision-making, and risk management possibilities. A favorable cost variance means that the project managers are using the financial resources that have been set aside in the budget wisely, while an unfavorable cost variance means that more resources have probably been used than originally planned. Monitoring keeps costs constant with the project financial plan, which makes it easy for projects to run, enabling them to meet the targeted costs (Mwangi & Muchelule, 2023). Resource allocation and control of variances may help to improve the results of the project. Effective monitoring and controlling of cost and variance are crucial aspects of project sustainability, viability, stakeholders, decision-making, and risk management. Keeping track of costs helps those undertaking community-based projects to realize their objectives as well as sustain stakeholders' confidence and responsibility.

Schedule variance defines the difference between a project schedule and its timeline. This is essential to judge the performance level of the project against set goals and timelines, which influences allocation of resources, costs of the project, level of satisfaction with the stakeholders, and level of impact with the project. Schedule variance that is positive indicates that the project is making progress faster, while negative schedule variance may slow the accomplishment of results (Matheka & Mungai, 2024). Managing schedules promotes usage of resources and reduces wastage; this helps with cost control. Control of cost is inextricably connected with schedule variance because any prolongation of schedule reverberates directly in cost. Satisfaction and trust of stakeholders are important, and the trust of stakeholders is well preserved if projects are followed to the timelines. Possible consequences of delays can therefore harm the project scope and effectiveness to meet the needs of the community (Hwang et al., 2013).

Schedule variance is also used as an indicator of risks to a project so that corrective actions may be taken by the project teams. Another important aspect is also flexibility and being able to introduce changes quickly as schedule variance tracking data allows us to remain reactive to various difficulties. Being on schedule is helpful regarding community trust and participation, bagging a positive community relationship and resulting in easier implementation and support (Hwang et al., 2013).

2.6. Critique of Existing Literature Relevant to the Study

The technological determinism approach, which views technology as a tool for improving project outcomes, often overlooks other social, political, and economic factors that contribute to successful implementation. This approach overlooks leadership, stakeholder engagement, governance structures, and

community participation (Hwang et al., 2013). Good community-based peace projects are not only a function of smart PIMS but also deeply influenced by power dynamics, trust-building processes, local governance arrangements, and the extent to which communities are actively involved in decision-making and implementation processes.

The existing research looked at the PIMS application successes in project management, while very little information is given on the failures and difficulties of such systems. Diallo and Thuillier (2005) discussed the difficult question of the scant availability of infrastructure, high costs, low technical competencies, and maintenance costs particularly in rural and resource-constrained settings. However, these studies are still the exception rather than the rule. As a result, there is an incomplete understanding of the conditions under which PIMS may be ineffective or counterproductive. Further research should examine experience with PMIS both when it is successful and when it is not.

Not many studies are done to understand the way in which PMIS agree with the existing community governance systems, which include elderly councils, peace committees or local administration systems. Most of the time, PMIS are not integrated but simply imposed resulting in parallel systems that cause confusion, duplication of effort and governance fragmentation.

Finally, lack of information regarding the sustainable implementation of PMIS technologies. While the first implementation of PMIS use in community-based peace projects is well explained, sustainability is rarely discussed. This issue is especially important when carrying out community-based peace projects in developing countries (Hwang et al., 2013).

2.7. Research Gaps

Methodological, contextual, and theoretical concerns with PMIS in community-based projects and their performance are revealed by an examination of the literature. There are many studies on this topic; nevertheless, some of them overstate the benefits of implementing PIMS while ignoring important factors like sustainability, capacity building, and endogenous knowledge. Furthermore, the other aspects that are not related to PMIS are overlooked in the mechanistic approach that holds that technology alone can improve project performance. This research used better research designs, including experimental techniques, to find a more tangible relationship between PMIS and project performance.

Furthermore, this study broadened the scope of research to include a focus on challenges and setbacks encountered when utilizing PIMS. This helped to paint a realistic image of how technologies are applied in community-based peace projects.

2.8. Summary

The chapter has reviewed the various theories related to PIMS and performance of community-based peace projects in Kisumu County, Kenya. The conceptual framework presented how variables in the study relate. A review of the literature and earlier studies done to identify research gaps, acknowledge the efforts, and assess the contributions of other experts in the field.

III. RESEARCH METHODOLOGY

3.1. Introduction

This chapter presents the research approach used in the study. It outlines the study population, sample size and sampling procedures, data collection strategies, data analysis, and the way the findings were communicated and understood. Methodology was used as a roadmap for the conduct of research study, it made the study reasonable, dependable, and accurate. It also assisted in the ability to conduct the research ethically and properly.

3.2. Research Design

Research design is the framework that guides the study, ensuring that the research question is addressed systematically and efficiently (Jayathilaka, 2021). It describes methods for data collection, analysis, and interpretation. This study used descriptive research to describe the population accurately and systematically, answering the questions of what, when, where, and how the population relates to the topic.

3.3. Study Population

The target population is the group of individuals whom the study intends to conduct research and draw conclusions from, selected depending on the objectives of the study and the contextual information needed (Chaudhuri & Mukerjee, 2020). The population of this study consisted of 365 individuals involved in community-based peace projects implementation in the county as indicated in non-governmental organization (NGO) reports and Policy documents on peace initiatives in Kisumu County. The individuals included boda boda groups' representatives, chiefs, assistant chiefs, religious leaders, media representatives and university students' representatives with the aim of them spreading the gospel of peace to reach even more people. The table below gives the population breakdown.

Table 3.1: Target Population

Project sector group	Directly targeted population
Boda Boda Representatives	100
Chiefs	10
Assistant Chiefs	25
Religious Leaders	80
Media Representatives	50
University Student's Representatives	100
Total	365

Note. Adapted from <https://www.cop-k.org/index.php/projects>. Copyright 2024 by Champions of Peace.

3.4. Sampling Techniques

A sample is a subset of participants drawn from the target population that has a representation of the characteristics of the population (Jayathilaka, 2021). The sampling technique is the process of identifying the sample needed from the entire target population. This study employed the stratified sampling technique, which involved random selection within predefined groups (Chaudhuri & Mukerjee, 2020). The stratified sampling method was useful in ensuring representatives from all the sector groups in the project were involved in the study.

3.5. Sampling Size

The sample size, typically represented by n , is the number of participants in a study, influencing the precision of estimates and the study's ability to draw conclusions (Chaudhuri & Mukerjee, 2020). Using Yamane's formula with a margin of error of 5% and a confidence level of 95%, the sample size was calculated as follows:

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

where;

n = the sample size,

N = the population of the study,

e = the margin of error in the calculation.

Therefore, the sample size is:

$$n = \frac{365}{1+365(0.05)^2} = 190.85 \approx 191$$

The study therefore used a sample size of 191 individuals, which is 52.3% of the targeted population.

Table 3.2: Sample Size

Project sector group	Targeted population	Sample size
Boda Boda Representatives	100	52
Chiefs	10	5
Assistant Chiefs	25	13
Religious Leaders	80	43
Media Representatives	50	26
University Student's Representatives	100	52
Total	365	191

Note. Data collected by researcher (2024).

3.6. Data Collection Instruments

Data collection instruments are the tools used to collect data and record information for research or study. Primary data refers to firsthand data gathered by a researcher (Bhattacharyya Dipak, 2013). This study was performed by permission from JKUAT and NACOSTI to collect data from the targeted individuals. The consent of the respondents was also taken into consideration.

3.6.1. Instruments

This study used primary data to draw the necessary conclusions. The study therefore used online-based questionnaires to fetch primary data. The questions were divided into five parts covering the demographic data of the respondents and each of the specific objectives covered in every other section.

3.6.2. Measurement of variables

The process of quantification, which involves placing values or tags on different components of a variable by some specific set of rules, is known as the measurement of variables. In research, variables are fixed or stated characteristics, properties, or factors that are to be studied, changed, or measured in a study. Whenever researchers are concerned with investigating relationships between variables, then these must have been quantified in some way (Chaudhuri & Mukerjee, 2020). The ordinal scale was adopted in this study, which involved ranking or

ordering variables that are considered as discrete categories, but the distance between them does not have to be equal (e.g., education level: high school, bachelor's, master's). Community-based peace projects were the units of analysis, while the units of observation were the individuals like boda boda operators, chief, assistant chiefs, university students' representatives, religious leaders and media representatives.

3.7. Pilot Testing

A pilot study is a type of small-scale research activity designed to gather data from participants that will be utilized in the larger survey. A pilot test was conducted to find any potential flaws in the design and data gathering process (Kennedy et al., 2011). The pilot test performed on randomly picked individuals amounting to 10% of the total sample size according to Hennink and Hutter, 2011. Therefore, the pilot study was done by 19 individuals from a different geographical area to ensure adequate testing of the research methods and to uncover potential problems before application to the primary study area.

3.7.1. Reliability of the Research Instrument

Reliability is the consistency, accuracy, and factuality of the presentation of the total population under study (Ovan & Saputra, 2020). The acceptable value of 7.0 of Cronbach's alpha was used to test the reliability of the measures in the questionnaire.

3.7.2. Validity of the Research Instrument

The validity of an instrument is indicated by the ability to measure what it was intended to measure. To ensure that the validity of the questionnaire was tested and improved, nineteen questionnaires were administered and reviewed to ensure the proper validity of the data that was collected (Kothari, 2004).

This study employed construct validity as well as content validity. Construct validity is an assessment of the degree to which a variable measures the characteristic that, in the view of the measure, is supposed to measure (Strauss & Smith, 2009). Content validity is the extent to which an instrument measures content in a manner that it's intended to (Yaghmaie, 2003). To test construct validity, KMO tests were used. The questionnaire was presented to the supervisor for review for content validity. According to the assessment, necessary amendments were made to the instrument to undertake the final data collection exercise. Review comments made by them were utilized to make certain that content validity is realized.

3.8. Data Analysis and Presentation

3.8.1. Diagnostic Tests

From the study, assumptions of normality, multicollinearity, linearity, autocorrelation, and heteroscedasticity tests should be satisfied for the relationship between independent and dependent variables (Henwood, 2014).

3.8.2. Normality Tests

To determine whether the data distribution is consistent, normality tests were performed (Yazici & Yolacan, 2007). The Kolmogorov-Smirnov test was used in this study to verify normality tests. P-value of less than 0.05, indicated that the data is not normally distributed; and that greater than 0.05, indicated that the data is normally distributed.

3.8.3. Test of Linearity

The assumption of linearity states that the predictor and criterion variables have a straight-line connection. To evaluate if there is a straight-line relationship, a scatter plot of all the independent factors versus the dependent variable were examined. For linear relationship between the dependent and independent variables, regression analysis was utilized to produce reliable results (Osborne & Waters, 2002).

3.8.4. Autocorrelation Tests

The autocorrelation test was done by Durbin-Watson test. The Durbin-Watson test has a 0–4 range of findings. According to Solutions (2018), numbers close to 2 indicate less autocorrelation, values near 0 indicate a higher positive correlation, and values close to 4 indicate a negative correlation.

3.8.5. Variable Definitions and Measurement

Table 3.3: Operational Variables

Variable	Variable Type	Measurement	Scale
Project communication	Independent variable	• Timely communication • Communication channels • Information accessibility	Ordinal Scale
Project collaboration	Independent variable	• Resource sharing • Participation • Decision making	Ordinal Scale
Project risk management	Independent variable	• Risk identification • Risk analysis • Risk communication	Ordinal Scale
Project data management	Independent variable	• Data aggregation • Data analysis	Ordinal Scale

Community-based peace projects performance	Dependent variable	• Data visualization • Resource utilization • Cost variance • Schedule variance	Ordinal Scale
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Note. Developed research operational variables.

3.8.6. Aggregated Analyses

Data analysis is crucial in various industries for better decision-making. Research data analysis connects research data with knowledge to answer questions, making it essential for organizations to effectively manage and analyze data (Bhattacharyya Dipak, 2013).

The analysis of the data obtained for this study involved the systematic application of statistical techniques to describe, illustrate, and present the data. Thematic data analysis and statistical methods were then used to analyze the collected data and derive meaningful insights. This included the use of Microsoft Excel, SPSS, and R tools. The study used ANOVA to identify significant technology integration variables influencing the performance of community-based project implementation in Kisumu County, with a critical p-value of 0.05 used to determine whether the individual variables were significant or not, which were then incorporated into a regression analysis to identify their contribution (Mutai, 2021). Person correlation was used to make conclusions on the nature of the relationship between the independent variables and the dependent variable, ranging from -1 to 1. Where $r = +0.5$ and above, was used as signifying a very strong relationship, while $r = +0.5$ to below 0 were weak relationships. Positive correlation where $r = 7$ was a sign of a strong relation; $r = 0.3-0.49$ a moderate relationship, while $r = 0$, suggested that the variables in question do not correlate. The multiple regression model was estimated as.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Y = performance of community-based projects in Kisumu County

$\beta_1, \dots, \beta_4$ are regression coefficients to be estimated.

X_1 = project communication

X_2 = project collaboration

X_3 = project risk management

X_4 = project data management

e = error term

IV. RESEARCH FINDINGS AND DISCUSSION

4.1. Introduction

This chapter focused on the analysis of data, the interpretation and presentation of the findings as well as discussion of the findings in relation to the objective of this study. The general objective of the study was to determine the project information management systems integration and performance of community-based peace projects in Kisumu County. The different sections of this chapter touched on the pilot study, response rate of the study questionnaire, the reliability and validity tests, and the information about the respondents. The chapter presents the descriptive results of the variables and finally the inferential statistics on the diagnostic tests, regression analysis and correlation analysis.

4.2. Response Rate

The study targeted a sample size of 191 individuals from different categories. Table 4.1 indicates that out of the 191 questionnaires administered, 150 responded, which gave a response rate of 79%. According to Mugenda and Mugenda (2003), for a study to be statistically significant, its response rate should be at least 50% with over 70% as excellent. Thus, the response rate sufficiently describes the study population. According to Babbie (2004), return rates of above 50% are acceptable to analyze and publish, 60% is good and 70% is very good. Based on these assertions 79% response rate is very good for the study.

Table 4.1: Response Rate

Response Rate	Sample Size	Percentage (%)
Filled and returned questionnaires	150	79
Un-returned questionnaires	41	21
Total	191	100

4.3. Pilot testing

The primary function of a pilot study was to undertake a minimal preliminary investigation which evaluates the operational methods and uncertainties for future execution in a larger study. This procedure helped in developing a more effective research design for the main investigation (Kothari, 2019). The pilot study represented 10% of the selected sample. The pilot test was done in Nairobi County, which has similar

characteristics as Kisumu County, thus crucial in refinement of the methods and data instruments before deployment to the real study area. The pilot test helped to ensure that the items raised under the instruments were in line with what is expected of the study.

4.3.1. Reliability of Research Instruments

Reliability described the extent to which research instruments provided consistent results in repeated tests. The research used 0.7 Cronbach Alpha as the acceptable threshold for reliability analysis (Ovan & Saputra, 2020). The accepted standard indicates excellent reliability when $\alpha > 0.9$ whereas good reliability stands at $\alpha > 0.8$ and acceptable reliability is achieved when $\alpha > 0.7$. Any value of α equals 0.6 becomes questionable whereas poor and unacceptable reliability exists when α falls lower than 0.6.

Table 4.2: Overall Reliability Results

Variable	Cronbach's Alpha	Number of items	Remarks
Communication Systems	0.721	6	Reliable
Collaboration Systems	0.799	6	Reliable
Risk Management Systems	0.851	6	Highly Reliable
Data Management Systems	0.814	6	Highly Reliable
Performance of Community-Based Peace Projects	0.902	6	Excellently Reliable

Table 4.2 showed that all the variables had 6 items considered with all their values meeting the required Cronbach alpha threshold of 0.7, making all the variables sufficiently reliable, highly reliable and another excellently reliable. Communication systems had a value of 0.721 deemed as reliable, collaboration systems had a value of 0.799 making it also reliable. Risk management systems, data management systems and the dependent variable, performance of community-based peace projects had values of 0.851, 0.814 and 0.902 respectively, making them all highly reliable.

4.3.2. Validity of Research Instruments

Sekaran and Bougie (2016) explain that statistical instrument accuracy stems from its ability to measure intended constructs which comprise of validity.

There are two key validity types i.e. content validity and construct validity. The evaluation of content validity depends on how well the research variables match the corresponding proposed measures used in the study. This method lacks sufficient proof since it depends on personal interpretations. Expert evaluation by supervisors served to determine content validity for the study. Supervisors helped in defining the questionnaire structure and questions wording within the setting of the main research areas.

The research employed the Content Value Index (CVI) from Polit and Beck (2006) to validate content in the instrument. According to Yaghmal (2003), CVI represents the 'degree to which an instrument includes suitable items representing specific constructs its measures'. The mean expert proportion score obtained for this instrument reached 0.808 (See Table 4.3). The achieved consensus between respondents demonstrates the scale's robust content validity.

Table 4.3: Content Validity Test

Variables	Experts' opinion	No. indicating "essential"	CVR
Communication systems	19	17	0.79
Collaboration systems	19	16	0.68
Risk management systems	19	18	0.89
Data management systems	19	17	0.79
Performance of community-based peace projects in Kisumu County	19	18	0.89
Mean CVI			0.808

Testing of construct validity involved substantiation by Bartlett's test of Sphericity and the Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy followed by Exploratory Factor Analysis (EFA), where a validity index of 0.5 and above was accepted according to Leech et al. 2014. The analysis of KMO values should meet or

exceed 0.5 while values under 0.5 indicate inadequate results according to Yaghmaie (2003). All the values met the required thresholds as indicated in table 4.4 below.

Table 4.4: KMO and Bartlett's Summary

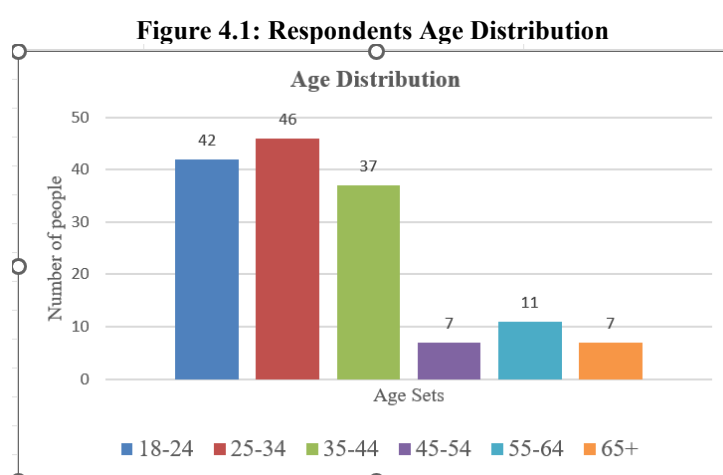
Item	KMO	Bartlett's test of Sphericity
Communication systems	0.615	0.001
Collaboration systems	0.582	0.020
Risk management systems	0.558	0.000
Data management systems	0.537	0.011
Performance of community-based peace projects in Kisumu County	0.766	0.001

4.4. General and Demographic Information

This section covered the general demographic information about the respondents. Respondents were asked about their gender, age, highest level of education, whether in Kisumu County or not, how long they have been involved in the community peace-based project in the county and what group of the target population do they represent.

4.4.1. Age

The study sought to identify the respondents according to their age groups as presented in Figure 4.1 below.

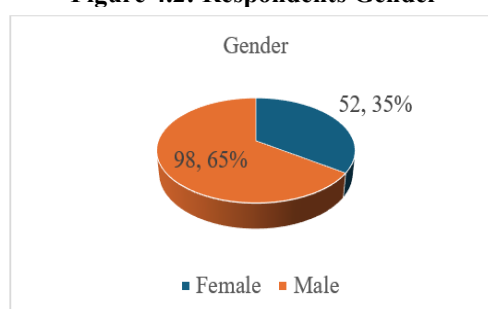


Majority of respondents were 25-34 years who were 46 in number representing 31%, followed by 18-24 years who were 42 in number representing 28%. 35-44 years were 37 in number representing 25%, 55-64 years were 11 in number representing 7%. Both 45-54 years and those above 65 years were 7 in number accounting for 4.5% each. This indicates a fare age distribution for inclusiveness in the study thus dependable result outcomes.

4.4.2. Gender

The study sought to establish the gender of the respondents. The findings were as indicated in Figure 4.2 below.

Figure 4.2: Respondents Gender

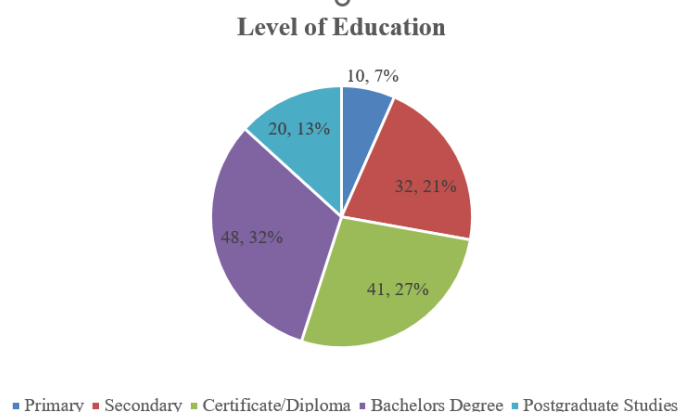


The study revealed that all genders were represented with majority being males at 65% and females being 35%.

4.4.3. Level of Education.

The respondents were asked to indicate the highest level of education; the findings are as indicated in figure 4.3 below

Figure 4.3: Respondents Level of Education



The findings indicated that majority of the respondents, 32%, had bachelor's degree in different courses, 27% of the respondents had Certificate or Diploma qualifications, 21% of the respondents had Secondary Education and 13% had Postgraduate Studies. The findings highlighted that respondents were knowledgeable as per their educational background as only 7% had KCPE qualifications and therefore were able to respond to questions addressed in the study. They equally had the capacity to enhance the performance of the projects according to Feldman (2018) that found that higher levels of education are positively related to job performance.

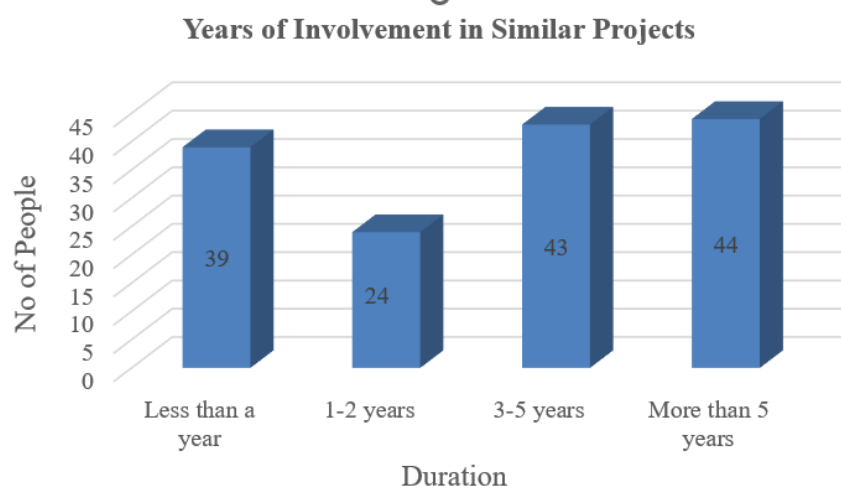
4.4.4. Respondents involved in community-based projects in Kisumu

All the respondents, 100% agreed that they had previously or are currently involved in community-based projects in Kisumu County. This gave complete confidence in the target sample being able to provide the necessary information for the study.

4.4.5. Respondents Years of Involvement in Community-based Peace Projects

The study sought to know how long the participants have been engaged in the community-based peace projects, and the findings are as indicated in figure 4.4 below.

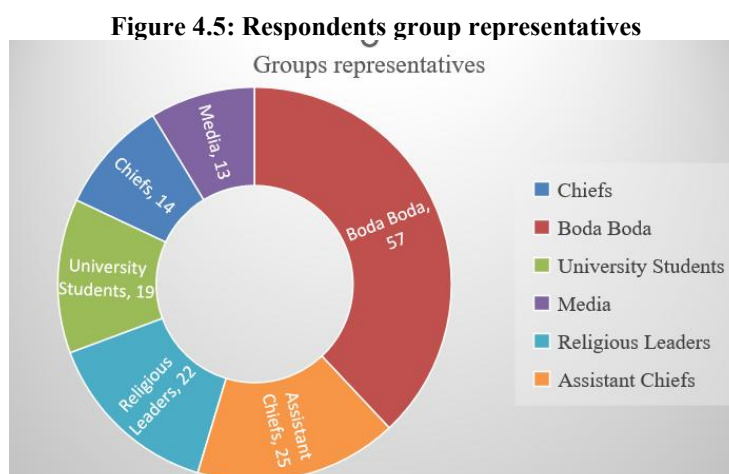
Figure 4.4: Respondents Years of Involvement in Similar Projects



The findings indicated 39 respondents, 26%, have been engaged in such projects for less than a year, 24 of them, 16% being engaged in such projects for a period of 1-2 years. 29%, which is 43 respondents have 3-5 years of experience in such projects with additional 44 respondents representing 29%, indicated to have more than 5 years engaging in the community-based peace projects. These results indicate balanced experience levels of participation in community-based peace projects which can be dependable in providing a holistic view of the outcomes concurring Börsch-Supan et al., (2017) findings that stated that individuals with vast experience have undergone continuous learning and development, which can contribute to their knowledge of the subject matter.

4.4.6. Respondents' group representation.

The study sought to understand which participation groups the respondents represented in the study, and the findings are as indicated in figure 4.5 below.



The results showed a distributed representation of the different participant groups to give wide and divergent responses to the study. The Boda Boda group were the most represented with 57 adding to 38%, the Assistant Chiefs were 25 people, that is 16.67%, Religious leaders were 22, 14.67%, the University students were 19, 12.67%. The Chiefs numbered 14, adding 9.3% and finally the media representatives numbered 13 making 8.67%. The full representation confirmed the validity, reliability and fairness of the study according to Shadish et.al, (2002) in explaining validity and generalizability.

4.5. Descriptive Analysis of the Study variables

4.5.1. Project Management Information System in Project Communication

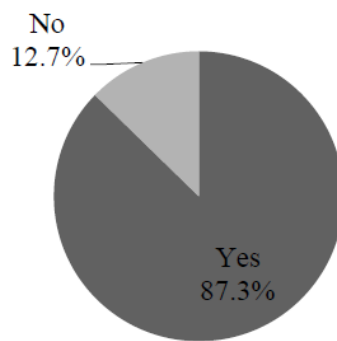
The objective of the study was to determine how project management information systems for communication influence the performance of community-based peace projects in Kisumu County. First the study sought to understand which communication systems are commonly used within the projects and the results were as per table 4.5 below. The results indicated a wide spread of all the different communication capabilities with a combination of different tools at any one point of the project to facilitate proper communication.

Table 4.5: Commonly used Communication Systems

Item	No of Respondents
Email	123
Social Media Platforms	30
Messaging Apps (e.g., WhatsApp, Telegram)	141
Video Conferencing (e.g., Zoom, Google Meet)	114
Project Management Tools (e.g., Slack, Trello)	59

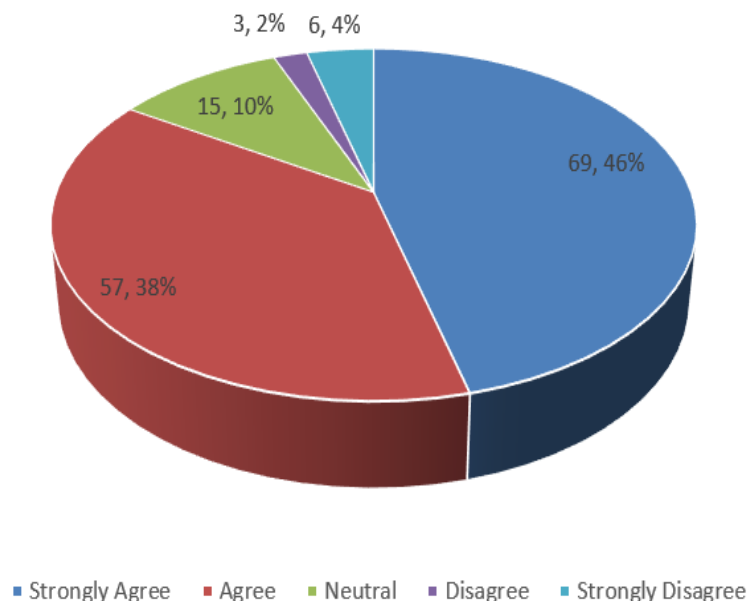
The study also sought to understand whether the communication channels provide feedback and communication tracking mechanism and the results were as displayed in figure 4.6 below. Based on the findings, 87.3% of the respondents agreed that the communication channels provided feedback and communication tracking mechanism while only 12.7% disagreed. This is an indication that majority of the stakeholders were aware of feedback and communication tracking. However, not all the stakeholders were aware of this kind of feedback and communication tracking systems. This could explain the low performance rate in project implementation as Lestler (2007) observed that communication is the driving force of organizations and therefore, strategies for communication systems must be identified to achieve the intended results.

Figure 4.6: Whether communication feedback is achieved



Therefore, respondents were asked whether they agree that implementation of communication PMIS influences the performance of community-based peace projects and the results are as illustrated in figure 4.7 below,

Figure 4.7: Whether Communication PMIS Systems Influence the Projects



From the findings, 46% of the respondents showed that they strongly agree that communication PMIS influences the performance of community-based peace projects in Kisumu County, 38% of the respondents also agreed with the sentiments, with 10% being neutral of the sentiments. A few respondents disagreed and strongly disagreed that it is 2% and 4% respectively making the number of respondents who disagreed too small and affirming the fact that communication systems are greatly influencing the performance of such projects. These findings therefore showed that despite there being utilization of communication systems, the level is still moderate and therefore there is need for improvement so that the subject projects can be successful. This agrees with Buechler, (2009) who stated that communication is critical to community-based projects since it facilitates timely dissemination of information, accurate relaying of such information and aids quick informed decision making where need be. He also stated that communication should be done in the simplest methods and through the simplest channels that can be accessed by all the stakeholders within the project.

Table 4.6: Descriptive Statistics on Communication Systems

Statement	Mean	Std. Dev.
PMIS effectively facilitates communication within your project team.	4.200	0.983
The different PMIS communication platforms are easily accessible to you.	4.160	0.997
The PMIS communication system guarantees that all community members, including marginalized groups, have equal access to information.	4.087	1.061

The use of PMIS communication technologies enhances transparency and accountability in community-based projects.	4.193	1.103
The PMIS communication tools used in your organization are timely, reliable and provide satisfactory project updates.	4.153	1.098
PMIS communication channels offer ample opportunities for community members to share feedback, ask questions, and express concerns.	4.007	1.108
Aggregate Score	4.133	1.058

Respondents indicated their level of agreement with various statements that related to project management communication systems aspects. The findings obtained were as presented in Table 4.6. The aggregate mean of 4.133 and standard deviation of 1.058 suggest that, averagely, the respondents agreed with the statements about Project management communication systems. The findings showed that the respondents particularly agreed that project management communications systems effectively facilitate communication within the project management team (M= 4.200, SD= 0.983); that the different PMIS communication platforms are easily accessible to project stakeholders (M= 4.160, SD= 0.997); and that the PMIS communication system guarantees that all community members, including marginalized groups, have equal access to project information (M= 4.087, SD= 1.061). Respondents further agreed that use of PMIS communication technologies enhances transparency and accountability in community-based projects (M= 4.193, SD= 1.103); that the PMIS communication tools used in their organizations are timely, reliable and provide satisfactory project updates (M= 4.153, SD= 1.098); and that PMIS communication channels offer ample opportunities for community members to share feedback, ask questions, and express concerns (M= 4.007, SD= 1.108).

The findings of the study concur with Diallo & Thuillier (2005), that effectiveness of the delivery of information hastens messages that get to the recipients fast and with precision to keep the project going. Communication channels also influence the level of stakeholder engagement and their feedback since the more interactive channels highly encourage the same. Carefully and selectively identifying and implementing the channels of communication used within project teams can help project managers improve stakeholders' satisfaction, minimize potential issues that can take place within a project's functioning, and, finally, increase a project's performance (Nyandoro & Mapira, 2014). Pinto and Slevin's 1988 research identified communication accessibility as a key success factor in project management, as it helps eliminate confusion and ensures all participants understand the project's objectives.

4.5.2. Project Management Information System in Project Collaboration

The objective of the study was to determine how project management information systems for collaboration influence the performance of community-based peace projects in Kisumu County. First the study sought to understand which collaboration systems are commonly used within the projects and how much the respondents were familiar with the systems. The respondents had the option of selecting more than one option of the systems based on which they have used through the project phases. The results were as per table 4.7 below.

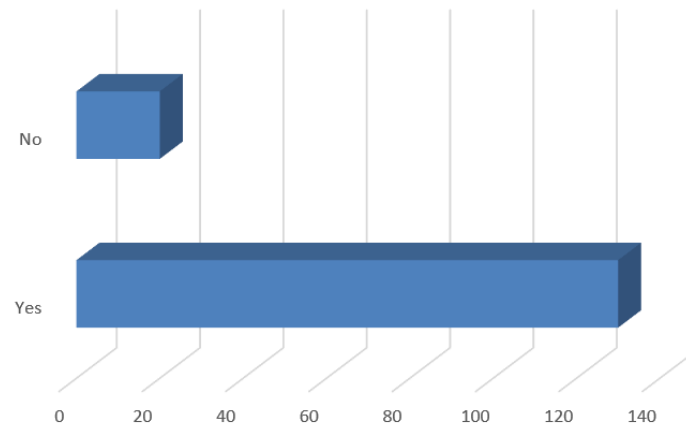
Table 4.7: Commonly used Collaboration Systems

Item	No of Respondents
Cloud Storage (e.g., Google Drive, Dropbox)	85
Collaborative Platforms (e.g., Microsoft Teams, Slack)	98
Project Management Software (e.g., Asana, Monday.com)	45
File Sharing Apps	132
Others	67

The results indicated a wide spread of all the different collaboration capabilities with a combination of different tools at any one point of the project to facilitate proper collaboration.

The respondents were then asked whether they thought collaboration systems have increased your level of participation and decision making in the project management process and the results were displayed as per figure 4.8 below.

Figure 4.8: Whether Collaboration PMIS Systems increased Participation



Based on the findings, 130 respondents, that is, 86.67% agreed that the collaboration systems created room for their participation and decision making on the project while only 20 respondents, that is 13.33% disagreed. This indicated that majority of the stakeholders were aware of collaboration systems and that the systems were important aspect of project participation and resource sharing. The results concurred with Mansuri and Rao (2013) who found that collaboration is crucial for successful development projects, as it fosters collaborative decision-making thus increasing acceptance and sustainability.

Table 2.8: Descriptive Statistics on Collaboration Systems

Statement	Mean	Std. Dev.
PMIS greatly enhances team collaboration.	4.033	1.228
PMIS enables seamless sharing of resources among team members.	4.053	1.163
All relevant stakeholders (e.g., community members, leaders, organizations) actively participate in the planning and implementation of the project through PMIS.	4.093	1.166
PMIS collaboration tools simplify project management and progress tracking in your organization.	4.166	1.032
The PMIS collaboration system effectively resolves conflicts or disagreements among stakeholders.	4.047	1.155
The PMIS tools effectively enhance decision making on the project.	3.993	1.196
Aggregate Score	4.064	1.157

The results showed the respondents' agreement with various statements that are related to project management collaboration systems aspects. The findings obtained were as presented in Table 4.8. The aggregate mean of 4.064 and standard deviation of 1.157 suggest that, averagely, the respondents agreed with the statements about Project management collaboration systems. The findings showed that the respondents particularly agreed that project management collaboration systems greatly enhances team collaboration ($M=4.033$, $SD=1.228$); that the different PMIS collaboration enables seamless sharing of resources among the project stakeholders ($M=4.053$, $SD=1.163$); and that the PMIS collaboration system guarantees all stakeholders' participation in project planning and implementation ($M=4.093$, $SD=1.166$). Respondents further agreed that use of PMIS collaboration technologies simplified project management and progress tracking ($M=4.166$, $SD=1.032$); that the PMIS collaboration tools help in conflict resolution among the stakeholders ($M=4.047$, $SD=1.155$); and that PMIS collaboration systems enhances decision making on the projects ($M=3.993$, $SD=1.196$).

These results agreed with Swart et al. (2022), that collaboration brings diverse perspectives, knowledge, and skills from the different members of the team, thus improving problem-solving and decision-making. Collaboration systems also improve resource sharing in community-based collaborations since people working together would like to ensure that they offer the best results with as few resources as possible. It also concurs with Hotch, (2006) that stated that poor scope collaboration could lead to dispute that might also require spending time and money on arbitration and litigation during the project phase. Concluding that strategic collaboration leads to smooth running of projects and better performance results.

4.5.3. Project Management Information System in Project Risk Management

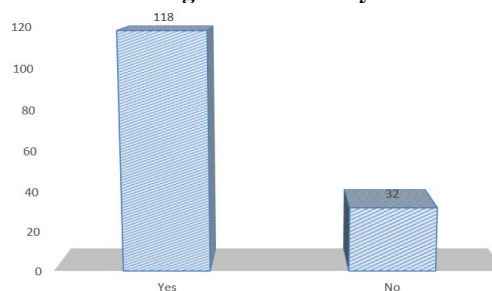
The objective of the study was to determine how project management information systems for risk management influence the performance of community-based peace projects in Kisumu County. The respondents were asked whether they are aware of the types of risks that affect such projects and they all responded with different types of risks.

Table 4.9: Types of known Risks

Item	No of Respondents
Financial	140
Operational	98
Stakeholder involvement	78
External factors such as political or environmental	132
Others	67

From the results the respondents were aware of the different categories of risks that exist in the projects. They were then questioned on whether they were aware of any PMIS for risk management used to identify, analyze and categorize the risks to action and subsequent closure and their responses were as captured in figure 4.9 below.

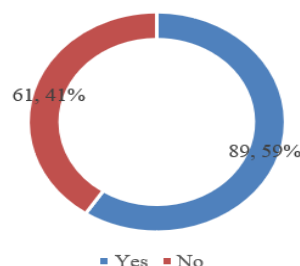
Figure 4.9: Whether Risk Management PMIS Systems are used in the Projects



Majority of the people at 181 (79%) agreed to the fact that there is integration of risk management systems and tools in project management. Only 32 (21%) indicated not being aware of application of risk management systems in such projects.

They were then asked whether the risk management systems analyzed and categorized risks according to likelihood and impact and the results we as in figure 4.10 below.

Figure 4.10: Whether Risk Management PMIS Systems performed Risk Management



Majority of the people at 59% agreed that the different risk systems identified, and categorized the risks as expected while 41% did not agree with the sentiments.

The findings concur with Ferris (2016), who found that risk management is to ensure that implementation is moving according to plans and if not, the project manager takes corrective action. The fact that the respondents were aware of project risks and that they even knew they are already application of PMIS risk management systems signified the importance of the systems to their actualization of the project objectives without hurdles. It also concurs with Freeman and Evan (2014) that risk management enhances project management decision making during the implementation hence increasing the chances of successful project implementation

Table 4.10: Descriptive Statistics on Risk Management Systems

Statement	Mean	Std. Dev.
PMIS risk management tools effectively identify risks.	4.140	1.062
The PMIS tools have a structured process to manage potential risks that could impact project success.	4.273	0.911

PMIS risk management tools enhance collaboration and communication among team members when addressing project risks.	4.200	0.934
PMIS risk management tools provide accurate forecasts for potential project risks.	4.040	1.134
PMIS risk management tools help organizations maintain project continuity during unexpected events.	4.287	0.985
Risk management strategies are communicated clearly and transparently to all stakeholders through the PMIS.	4.193	0.925
Aggregate Score	4.189	0.992

The results showed the respondents' agreement with various statements that are related to project management risk management systems aspects. The findings obtained were as presented in Table 4.10. The aggregate mean of 4.189 and standard deviation of 0.992 suggest that, averagely, the respondents agreed with the statements about Project management risk management systems. The findings showed that the respondents particularly agreed that project management risk management systems effectively identify project risks ($M=4.140$, $SD=1.062$); that the tools have a structured process to manage potential risks that could impact project success ($M=4.273$, $SD=0.911$); and that the PMIS risk management system tools enhance collaboration and communication among team members when addressing project risks ($M=4.200$, $SD=0.934$). Respondents further agreed that use of PMIS risk management provide accurate forecasts for potential project risks ($M=4.040$, $SD=1.134$); that the PMIS risk management tools help organizations maintain project continuity during unexpected events ($M=4.287$, $SD=0.985$); and that PMIS risk management systems communicates risk strategies clearly and transparently to all stakeholders ($M=4.193$, $SD=0.925$).

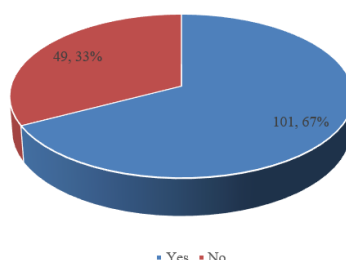
The results above confirm the findings of Matheka & Mungai (2024) that project risk management involves the identification, assessment, and mitigation of the current risks that can be capable of affecting the achievement of the project's goals, scope, cost, and time. It also concurred with the ultimate findings of Hwang et al. (2013) which emphasized the use of RMIS and project management software for capturing and disseminating risk information in real-time. Mefalopulos (2008) noted that it is efficient to use mobile-based platforms in community-based projects for real-time communication and rapid response to new risks, especially in rural East Africa.

4.5.4. Project Management Information System in Project Data Management

The objective of the study was to determine how project management information systems for data management influence the performance of community-based peace projects in Kisumu County.

The respondents were asked whether the projects they participated in used technology systems to store, organize, and manage project data and the results were as shown in figure 4.11 below.

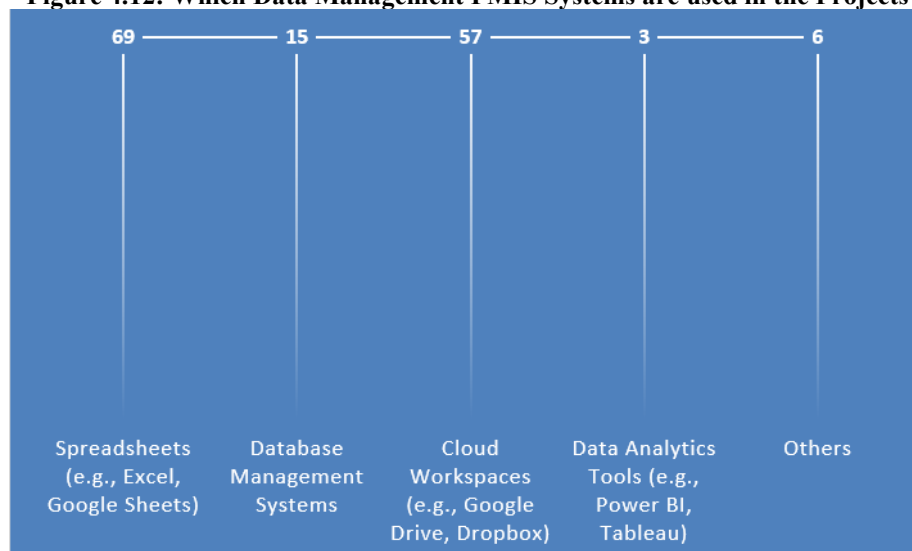
Figure 4.11: Whether Data Management PMIS Systems are used in the Projects



Majority of the people, 67%, agreed to have used at least one of the data management systems in their projects with only 33% denying it.

The respondents were then asked whether they were aware of any application of data management systems in their projects and if that is the case which of these systems were they familiar with, their responses were as captured in figure 4.12 below.

Figure 4.12: Which Data Management PMIS Systems are used in the Projects



Majority of the respondents at 69 (46%) indicated to have used spreadsheets to manage data during the implementations of the community-based peace projects in Kisumu County; 57 (38%) indicated to have used Cloud workspaces of such data management and access, with 15 (10%) having used different database management systems. Only 3 (2%) have utilized the advanced data analytics tools such as Tableau, Power Bi and the rest 6 (4%) mentioned having used other tools not stated above.

This showed a relatively widespread usage of data management systems but evidently shows the utilization of the native data tools that do not provide advanced data analytics limiting the way the data could be interpreted and presented to achieve maximum influence on such projects. This indicated a moderately low application of modern data management systems in the community-based peace projects in Kisumu County.

Table 4.11: Descriptive Statistics on Data Management Systems

Statement	Mean	Std. Dev.
PMIS supports aggregation of data from different sources to enhance project outcomes.	4.140	1.093
The PMIS effective analysis of its data to achieve the project's goals.	4.060	1.238
The data collected though PMIS is consistently accurate, reliable, and free from significant errors or biases.	4.100	1.028
PMIS data is well-organized and visually presented for easy access by authorized stakeholders.	4.200	0.941
PMIS supports regular data analysis informs decision-making and enhances project outcomes.	4.127	1.119
PMIS enables members of the community members actively participate in data collection, analysis, and interpretation for the project.	4.080	1.184
Aggregate Score	4.118	1.100

The descriptive results in table 4.11 above showed that the respondents agreed with the various statements that are related to project management data management systems aspects. The aggregate mean of 4.118 and standard deviation of 1.100 suggest that, averagely, the respondents agreed with the statements about project management data management systems. The findings showed that the respondents specifically indicated that such systems support aggregation of data from different sources to enhance project outcomes (M= 4.140, SD= 1.093); that the PMIS tools effectively analyses project data to achieve the project's goals (M= 4.060, SD= 1.238); and that the data collected though PMIS is consistently accurate, reliable, and free from significant errors or biases (M= 4.100, SD= 1.028). Respondents further confirmed that PMIS data is well-organized and visually presented for easy access by authorized stakeholders (M= 4.200, SD= 0.941); that the PMIS data management tools supports regular data analysis informing decision-making and enhances project outcomes (M= 4.127, SD= 1.119); and that PMIS data management systems enables members of the community to actively participate in data collection, analysis, and interpretation for the project. (M= 4.080, SD= 1.184).

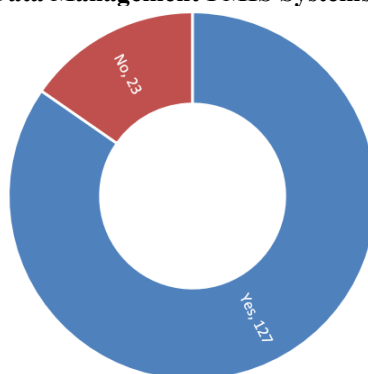
The results above indicated strong agreement that application of PMIS strongly influences the outcomes of community-based peace projects in Kisumu County thus influencing such projects to a greater degree. This conforms to the findings by Mwangi & Muchelule (2023) which stated that project data management involving data collection, storage, structuring, protection, and processing to analyze the results is very important for organizational projects as it assists in decision-making, helps to measure performance, and increases accountability thus ensuring better project performance.

4.5.5. Project Management Information Systems in Project Performance

The objective of the study was to determine how project management information systems influence the performance of community-based peace projects in Kisumu County.

The respondents were asked whether they have experienced improvements in the areas of Resource Utilization, Stakeholder Engagement, Cost Utilization and Schedules with the integration of PMIS and the responses were as captured in figure 4.13 below.

Figure 4.13: Whether Data Management PMIS Systems Influenced the Projects



Majority of the respondents 127(85%) confirmed that in one way or the other application of PMIS has greatly influenced the performance of community-based peace projects in Kisumu County, only 23 (15%) denied having seen any notable influence on such project with the application of the different PMIS.

The respondents were also asked about the notable areas of improvement experienced with the application of PMIS systems and the results were according to table 4.12 below.

Table 4.12: Notable areas of improvement with the application of PMIS systems

Item	No of Respondents
Improved Resource Utilization	113
Improved Stakeholder Engagement	134
Improved Cost Utilization	141
Improved Schedules	132
Others	34

The results showed a strong positive relationship between integration and application of PMIS and the influence on the performance of community-based peace projects. This agrees with Adan (2014) that most community-based projects were becoming sustainable with the application of proper project management information systems.

Table 4.13: Descriptive Statistics on Project Performance

Statement	Mean	Std. Dev.
PMIS utilization has enabled all key stakeholders to be involved in the decision-making processes of the projects, as this greatly contribute to its success	4.180	1.010
Utilization of PMIS optimizes usage of available resources (e.g., financial, human, and material) to achieve the goals of the community-based peace projects	4.160	1.165
PMIS utilization has helped the projects to stay within the planned budget, with the strategies implemented to minimize cost overruns	4.053	1.180
PMIS utilization has helped the projects to adhere to its planned timeline, and appropriate measures taken to address any delays	4.320	0.869

PMIS utilization has helped the projects enhance the efficient use of resources in achieving the project's objectives	4.327	0.952
PMIS utilization has helped the projects to balance cost control and timely delivery of activities	4.107	1.159
Aggregate Score	4.191	1.071

The descriptive results shown in table 4.13 above showed that the respondents' agreement with the different statements on utilization of PMIS influence on project management. The aggregate mean of 4.191 and standard deviation of 1.071 suggest that, averagely, the respondents agreed with the sentiments. The findings showed that the respondents specifically indicated that PMIS utilization has enabled all key stakeholders to be involved in the decision-making processes of the projects, as this greatly contribute to its success (M= 4.180, SD= 1.010); that the utilization of PMIS optimizes usage of available resources (e.g., financial, human, and material) to achieve the goals of the community-based peace projects (M= 4.160, SD= 1.165); and that PMIS utilization has helped the projects to stay within the planned budget, with the strategies implemented to minimize cost overruns (M= 4.053, SD= 1.180). Respondents further confirmed that PMIS utilization has helped the projects to adhere to its planned timeline, and appropriate measures taken to address any delays (M= 4.320, SD= 0.869); that the PMIS utilization has helped the projects enhance the efficient use of resources in achieving the project's objectives (M= 4.327, SD= 0.952); and that PMIS utilization has helped the projects to balance cost control and timely delivery of activities (M= 4.107, SD= 1.159).

The results above conforms with the study by Maige (2023), who indicated proper integration and application of Project Management of Information Systems in small and micro projects can greatly influence the performance of such projects in terms of how well they are developed, delivered, and sustained within the communities, meet the set social, economic, or environmental requirements of a given community. Magige indicated that application of PMIS held all factors in control thus improved resource utilization, stakeholder engagement, cost utilization and schedule control.

4.6. Diagnostic Tests

This section assumed that linear regression has a linear connection, homoscedasticity, little to no multicollinearity, normality, and no autocorrelation. Confidence intervals and other scientific insights obtained from the regression model may be viewed as deceptive, biased, or ineffective if the regression assumptions are broken, making the conclusions drawn from the model inapplicable to additional data.

4.6.1. Multicollinearity

Tolerance was used in this study to test multicollinearity. The effect that one independent variable has on other independent variables is measured by tolerance. If tolerance, $T = 1 - R^2$ is smaller than 0.01 then there is no doubt that there is multicollinearity. According to the results shown in Table 4.14, there is no multicollinearity between the research variables because the VIF values for each variable were less than 5. Multiple regression analysis can therefore be performed since it was discovered that the variables did not exhibit strong associations with one another.

Table 4.14: Multicollinearity Test Statistics

Model	Collinearity Statistics	
	Tolerance	VIF
Communication Systems	0.733	1.368
Collaboration Systems	0.450	1.083
Risk Management Systems	0.447	1.102
Data Management Systems	0.606	1.071

4.6.2. Autocorrelation Test

The Durbin-Watson test was used to check for autocorrelation. The residuals' nonlinear autocorrelation is the null hypothesis for Durbin-Watson's d tests. The d value is between 0 and 4, and if it is less than or equal to 2, it indicates that there isn't autocorrelation. The data is said to be autocorrelation-free if the d values are $1.5 < d < 2.5$. Only direct neighbors were considered as first-order effects when analyzing linear autocorrelation using the Durbin-Watson test. The d-value, as shown in Table 4.15, was 1.870. Since the number falls between 1.5 and 2.5, we may conclude that there is no autocorrelation in the data and that regression analysis can be performed.

Table 4.15: Durbin-Watson Autocorrelation Test

Model	Std. error of the Estimate	Durbin-Watson
1	1.25433	1.870

4.6.3. Heteroscedasticity

VIF was utilized in this work to determine heteroscedasticity. The variables' normality was investigated using skewness and kurtosis. The Cook-Weisberg/Breuch-Pagan test was employed to check for heteroscedasticity. According to Vinod (2008), the test's null hypothesis is that the error terms' variances are equal. According to Park (2018), the presence of homoscedasticity is suggested if $\text{Prob} > \text{Chi-squared}$ is more than 0.05. According to the results shown in Table 4.16, p-value P (0.3021) is greater than 0.05 for $\text{Chi}^2 = 1.3257$. Consequently, this implies insignificance, indicating the absence of heteroscedasticity.

Table 4.16: Breusch-Pagan / Cook-Weisberg Test for Heteroscedasticity

Ho: Constant variance

Statistics	Df	Stat value	p-value
Chi-squared	4	1.3257	0.3021

4.6.4. Normality Assumption

To ascertain if the variables in this investigation have a normal distribution, the Shapiro-Wilk test was employed (Cooper & Schindler, 2016). The null hypothesis for the Shapiro-Wilk test, the alpha level is 0.05 if it is a normal distribution. The null hypothesis, according to which the data are normally distributed, is rejected if the p-value is less than 0.05. The null hypothesis is data are normally distributed if the p-value is higher than 0.05. According to Table 4.17, the analysis's findings indicate that stakeholder communication systems had a p-value of $0.602 > 0.05$, collaboration systems had a p-value of $0.808 > 0.05$, risk management system had a p-value of $0.544 > 0.05$, and data management system had a p-value of $0.565 > 0.05$. This shows that all the variables were normally distributed and hence the data meets the regression analysis assumption of normality of data.

Table 4.17: Normality Tests

Model	Collinearity Statistics		
	Statistic	df	Sig
Communication Systems	0.533	95	.602
Collaboration Systems	0.950	95	.808
Risk Management Systems	0.947	95	.544
Data Management Systems	0.906	95	.565

4.7. Aggregated Statistics

Inferential analysis generated correlation results, variance analysis and regression coefficients.

4.7.1. Correlation Analysis

Table 4.18 below shows the correlation analysis.

Table 4.18: Data Correlation Analysis

	Communication	Collaboration	Risk Management	Data Management	Project Performance
Communication	1.000				
Collaboration	0.341	1.000			
Risk Management	0.540	0.339	1.000		
Data Management	0.339	0.352	0.509	1.000	
Project Performance	0.397	0.223	0.350	0.242	1.000

The analysis indicated significant positive relationship between the different dimensions of PMIS and performance of community-based peace projects in Kisumu County ($r = 0.223-0.408$, $p < 0.01$) with communication and collaboration systems exhibiting stronger correlations compared to risk and data management systems. Lack

of negative correlations suggested no contradictory effects of PMIS usage on community-based peace project outcomes.

Project management communication systems indicators showed positive correlations with project performance outcomes ($r=0.397$, $p=0.004$). The interpretation inferred that improved communication through PMIS enhanced the overall performance of community-based peace projects since it led to improved coordination and timely execution of tasks.

Correlation results indicated moderate positive relationships between collaboration PMIS and the performance of community-based peace projects ($r=0.223$, $p=0.004$) suggesting that collaboration tools were effective and helped in decision-making due to shared information, collective problem-solving, and inclusive participation of stakeholders.

The correlation between Risk management PMIS and the performance of community -based peace projects was also somehow positive ($r=0.350$, $p=0.004$). This indicated that risk management indicators such as risk identification, monitoring, and communication impact on the performance of such projects appeared less direct. This may have been due to more emphasis on the project operational factors vis a vis the strategic factors or limitation in capacity to fully utilize risk management tools.

PMIS Data Management variables (data aggregation, analysis, visualization) showed positive correlations with the overall performance of the community-based peace projects ($r=0.242$, $p=0.004$). This was because effective PMIS data management in such projects supported evidence-based decisions, which improved project tracking and accountability in peace initiatives.

4.7.2. Regression Analysis

The results presented in table 4.19 presented the fitness model used for the regression in explaining the study characteristics.

Table 4.19: Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.756a	0.634	0.615	0.398034

The correlation coefficient of 0.756 showed a strong relationship between PMIS aspects and performance of community-based peace projects. Further, the R square of 0.634 indicated that together the PMIS variables explain the variations in the community-based peace projects. Therefore, the model applied to link the relationship of the variables was satisfactory.

Statistically p-value indicated the level of relation of the independent variable to the dependent variable. The probability value (p) which is statistically set at 0.05, was used to measure the significance, where if the significant number was less than p then the model is significant in describing the phenomenon otherwise, insignificant.

Table 4.20: Analysis of Variance

	Sum of Squares	df	Mean Square	F	Sig.
Regression	24.345	4	6.035	38.610	.000b
Residual	8.443	54	0.145		
Total	32.788	58			

The results proved the overall model's significance. Further, the results pointed that PMIS utilization were good indicators of performance of community-based peace projects. This was proven by an F statistic of 38.811 and the reported p value (0.000), being less than the 0.05 conventional significance level. The study findings agreed with Maige (2003) who found that application of PMIS in project management of community-based peace projects greatly enhances the performance of such projects.

Table 4.21: Regression of Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-0.733	0.368		-1.84	0.053
Communication Systems	0.250	0.083	0.217	2.663	0.007
Collaboration Systems	0.347	0.102	0.314	3.330	0.001
Risk Management Systems	0.306	0.071	0.284	3.634	0.000
Data Management Systems	0.267	0.082	0.264	2.882	0.003

Regression of coefficients results showed positive and significant relationship, communication PMIS and performance of community-based peace projects ($\beta=0.217$, $p=0.007$). This inferred that integration of communication systems in community-based peace projects positively influenced the performance of such

projects, agreeing with the research by Mefalopulos (2008), which indicated that communication is the backbone to success of project management.

The results also showed that collaboration PMIS and the performance of community-based peace projects were positively and significantly related ($\beta=0.314$, $p=0.001$). This inferred collaboration tools adoption led to an improvement in performance of community-based peace projects in Kisumu County. The study findings agreed with El Khatib, et al. (2022), who found that collaboration effectively leads to smooth running of projects and to the end goal success for such projects.

The results showed that risk management systems and the performance of community-based peace projects were positively and significantly related ($\beta=0.284$, $p=0.000$). This inferred that integration of risk management systems on community-based projects positively influenced the performance of such projects. The study findings agreed with Zhu, et al., (2019) who indicated that risk management tracked and managed effectively using a system greatly improves the quality of risk handling translating to improved project results.

Further, the results showed that data management and performance of community-based peace projects were positively and significantly related ($\beta=0.264$, $p=0.003$). This means that application of data management led to an improvement in performance of community-based peace projects in Kisumu County.

$$Y = -0.733 + 0.217 X_1 + 0.314 X_2 + 0.284 X_3 + 0.264 X_4$$

Where:

Y= Performance of community-based peace projects (dependent variable)

X₁= Communication systems

X₂= Collaboration systems

X₃= Risk management systems

X₄= Data management systems

ε= Error term

V. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter presents the summary of the findings of the study, conclusions and recommendations of the study. The summary was based on the data analyzed in chapter four. The recommendations and conclusions were presented to shape policies and future research on the topic. The recommendations and conclusions were all based on the objectives and the findings of this study.

5.2. Summary of Findings

5.2.1. Communications systems and the performance of community-based peace projects.

The first objective was to assess how the use of project communication systems influences the performance of community-based projects in Kisumu County. Results showed that majority of the respondents agreed that integration of communication systems effectively facilitates communication within the project team thus leading to better performance of such projects. Further results showed that majority of the respondents agreed with the statement that the basic communication systems such as mobile phones are easily accessible to them and if that could be used effectively enhances performance of the projects.

The results also showed that the correspondents agreed that communication systems enhance transparency and accountability in projects management, ensuring timely reliable and satisfactory project updates, feedback and concerns which all improves the performance of community-based peace projects in Kisumu County.

Correlation results showed that communication systems had a very strong positive and significant correlation with performance community-based peace projects in Kisumu County. Further regression results showed that communication systems and performance of the projects are positively and significantly related.

5.2.2. Collaboration systems and the performance of community-based peace projects.

This objective was to establish how the use of project collaboration systems influences the performance of community-based projects in Kisumu County. Results showed that the correspondents agreed with the statement that PMIS collaboration systems greatly influence the performance of community-based peace projects in Kisumu County by improving resource sharing, simplifying project management and progress tracking.

The results further indicated that the correspondents agreed to the statement that collaboration systems make all relevant stakeholders to actively participate in the projects and assist in conflict resolution among the projects stakeholders. Collaboration systems also aid faster and coordinated decision making about the project. All these leads to an improved and better performance of such projects.

Correlation results showed that collaboration systems had a strong positive and significant correlation with performance community-based peace projects in Kisumu County. Further regression results showed that collaboration systems and performance of the projects are positively and significantly related.

5.2.3. Risk management systems and the performance of community-based peace projects.

This objective was to assess how the use of project risk management systems influences the performance of community-based projects in Kisumu County. Results showed that the correspondents agreed with the statement that the PMIS tools have a structured process to identify and manage potential risks that could impact project success. That the tools were able to forecast and plan for risks and to bring stakeholders together in handling project risks.

The correspondents further agreed that the risk management systems clearly and transparently communicated projects risks to all the relevant stakeholders. All these indications lead to improved risk planning, identification, quantification and mitigation and thus better performance of community-based peace projects.

Correlation results showed that risk management systems had a moderately positive and significant correlation with performance of community-based peace projects in Kisumu County. Further regression results showed that risk management systems and performance of the projects are positively and significantly related.

5.2.4. Data management systems and the performance of community-based peace projects.

This objective was to establish how the use of project data management systems influences the performance of community-based projects in Kisumu County. Results showed that the correspondents agreed with the statement that PMIS data management systems enhance project data aggregation and analysis with accuracy, reliability and free from bias thus better projects outcome.

The results further showed that the correspondents agreed to the data management systems visually presents data in a more palatable manner i.e. through dashboards that are easily interpreted by the stakeholders thus increasing stakeholders' participation in data review and improved informed decision making. These indicators lead to improved performance of community-based peace projects in Kisumu County.

Correlation results showed that data management systems had a moderately positive and significant correlation with performance community-based peace projects in Kisumu County. Further regression results showed that data management systems and performance of the projects are positively and significantly related.

5.3. Conclusion

The study concluded that PMIS for communication and performance of community-based peace projects in Kisumu County were positively and significantly related. To enhance such projects' performance, it is imperative for the project managers to invest heavily in communication systems and ensure the most available, reliable and easy to use systems are adopted for maximum and ease of use of such systems.

The study concluded that PMIS for collaboration and the performance of community-based peace projects in Kisumu County were significantly and positively related. Most reliable and available collaboration systems should be adopted to enhance team collaboration in seamless sharing of resources among team members, enhancing stakeholders' participation, aiding in project progress, assisting in conflict resolution and enhancing faster decision making on the project.

The study concluded that PMIS for risk management and the performance of community-based peace projects in Kisumu County were positively and significantly related. By fully implementing risk management systems it will result in proper risk identification, quantification and mitigation measures. The study therefore concluded that improved performance was attributed to PMIS risk management practices such as risk identification, risk processing, potential risk forecasting, risk communication and collaboration in resolving project risks.

The study concluded that PMIS for data management and the performance of community-based peace projects in Kisumu County are positively and significantly related. Therefore, efficient and effective data management in such projects led to better performance. Such improved performance was attributed to aggregation of data from different sources, effective data analysis, data accuracy, reliability, and free from significant errors or biases, data well visually presented for easy access by authorized stakeholders and informed decision making.

5.4. Recommendations

The community-based peace projects in Kisumu County ought to adopt the effective implementation of PMIS for communication. This is because the communication systems make it easier to relay information about the project and get the required feedback in time for faster and informed decision making.

It is also recommended to adopt integrated lightweight PMIS instead of such systems in Silos. Use simple, mobile and user-friendly tools and avoid complex systems that require complex infrastructure like constant internet so that the systems can be operated even to the less privileged and marginalized areas. The systems should also not require advanced skills for the adoption to be equal among all project stakeholders.

The county and national governments prioritize connectivity and improvement of digital infrastructure. Technology is here to stay and can only be improved, thus the coordination of governments should ensure all the parts of Kisumu County have got electricity and basic internet connection to ensure such adoption of PMIS can be uniform and operational.

The donors of such community-based projects and other projects should ensure funding of PMIS as the core project component, budgeting for necessary licenses, training, devices, system support and maintenance, this will ensure PMIS is not just an afterthought but a planned approach to such project management.

5.5. Areas for Further Research

The focus of the study was to investigate the influence of project management information systems on the performance of community-based peace projects in Kisumu County, Kenya, it should be noted that this study was limited in scope and methodology. The study focused on four PMIS practices, hence in future, similar studies should expand the scope to other PMIS practices that are relevant to management of such projects e.g. PMIS for schedule management and PMIS for cost management.

This study adopted quantitative methods for data processing and analysis. Other studies could consider qualitative or mixed methods of data analysis to compare to the results of the present study.

REFERENCES

- [1]. Aker, J. C., & Mbiti, I. M. (2010). Mobile phones and economic development in Africa. *Journal of Economic Perspectives*, 24(3), 207-232.
- [2]. Al-Emran, M. (2023). Beyond technology acceptance: Development and evaluation of technology-environmental, economic, and social sustainability theory. *Technology in Society*, 75, 102383.
- [3]. Araújo, T., & Casais, B. (2020). Customer acceptance of shopping assistant chatbots. In *Marketing and Smart Technologies: Proceedings of ICMarTech 2019* (pp. 278-287). Springer Singapore.
- [4]. Barney, J., Wright, M., & Ketchen Jr, D. J. (2001). The resource-based view of the firm: Ten years after 1991. *Journal of management*, 27(6), 625-641.
- [5]. Barrington, J., Wereko-Brobby, O., Ward, P., Mwafongo, W., & Kungulwe, S. (2010). SMS for life: A pilot project to improve anti-malarial drug supply management in rural Tanzania using standard technology. *Malaria Journal*, 9(298).
- [6]. Bhattacharyya Dipak, K. (2013). *Research Methodology* (3rd edition). Excel Books.
- [7]. Breslin, J., & Greschner, L. (2013). Using Digital Tools to Improve Health Outcomes in Community-Based Projects. *Journal of Health Informatics*, 15(2), 98-110.
- [8]. Bryman, A. (2016). *Social research methods*. Oxford university press.
- [9]. Chepkoech, L. (2019). The role of mobile money services in improving financial inclusion in Kenya. *International Journal of Social Sciences and Information Technology*, 5(1), 1-12.
- [10]. Chaudhuri, A., & Mukerjee, R. (2020). RR in a Finite Population Setting: A Unified Approach; Sampling with Varying Probabilities. In A. Chaudhuri & R. Mukerjee, *Randomized Response* (1st ed., pp. 108–137). Routledge. <https://doi.org/10.1201/9780203741290-7>
- [11]. Davis, F. D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International journal of man-machine studies*, 38(3), 475-487.
- [12]. Diallo, A., & Thuillier, D. (2005). The success of international development projects, trust and communication: An African perspective. *International Journal of Project Management*, 23(3), 237-252.
- [13]. El Khatib, M., Kherbash, A., Al Qassimi, A., & Al Mheiri, K. (2022). How can collaborative work and collaborative systems drive operational excellence in project management?. *Journal of Service Science and Management*, 15(3), 297-307.
- [14]. Freeman, R. E. (2010). Strategic Management: A Stakeholder Approach. *Cambridge University Press*.
- [15]. Gandhi, R., Veeraghavan, R., Toyama, K., & Ramprasad, V. (2017). *Digital Green: Participatory video and mediated instruction for agricultural extension*. Information Technologies & International Development, 5(1), 1-15.
- [16]. Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS quarterly*, 51-90.
- [17]. Green, L. W., Gottlieb, N. H., & Parcel, G. S. (1989). Diffusion theory extended and applied. *Advances in Health Education and Promotion*.
- [18]. Hajian, M., & Kashani, S. J. (2021). Evolution of the concept of sustainability. From Brundtland Report to sustainable development goals. In *Sustainable resource management* (pp. 1-24). Elsevier.
- [19]. Harlow, L. L. (2017, March). The making of Psychological Methods. In *European Congress of Methodology, VII, Jul, 2016, Palma de Mallorca, Spain; Portions of an earlier version of this paper were presented in Harlow, LL, "20 Years of Psychological Methods" at the aforementioned congress.* (Vol. 22, No. 1, p. 1). American Psychological Association.
- [20]. Heeks, R. (2009). "The ICT4D 2.0 Manifesto: Where Next for ICTs and International Development?" *Development Informatics Working Paper*, University of Manchester.
- [21]. Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. *Strategic management journal*, 24(10), 997-1010.
- [22]. Hwang, B.-G., Zhao, X., & Toh, L. P. (2013). Risk management in small construction projects in Singapore: Status, barriers, and impact. *International Journal of Project Management*, 32(1), 116-124.
- [23]. Jack, W., & Suri, T. (2011). Mobile money: The economics of M-Pesa. *National Bureau of Economic Research*, Working Paper No. 16721.
- [24]. Jayathilaka, A. (2021). Ethnography and Organizational Ethnography: Research Methodology. *Open Journal of Business and Management*, 09(01), 91–102. <https://doi.org/10.4236/ojbm.2021.91005>
- [25]. Kaminski, J. (Spring 2011). Diffusion of Innovation Theory Canadian Journal of Nursing Informatics, 6(2). Theory in Nursing Informatics Column. <https://cjni.net/journal/?p=1444>
- [26]. Kalu, I. U., & Igwe-Kalu, A. (2016). EFFECTS OF EXCHANGE RATE VOLATILITY ON COMMERCIAL PROPERTY RETURNS IN NIGERIA. *African Journal of Accounting, Economics, Finance & Banking Research*, 10(10).
- [27]. Katz, E. (1957). The Two-Step Flow of Communication: an Up-To Date Report on a Hypothesis. *The Public Opinion Quarterly*, 21 (1). pp. 61-78.
- [28]. Kimaro, H. C., & Sahay, S. (2007). An institutional perspective on the process of decentralization of health information systems: A case study from Tanzania. *Information Technology for Development*, 13(4), 363-390.
- [29]. Kothari, C. R. (2004). Research methodology: Methods and techniques. *New Age International*.
- [30]. Kumar, R., Singh, H., & Tiwari, P. (2014). Impact of communication on performance in water resource management projects. *Water Resources Management*, 28(11), 3735-3746.
- [31]. Lennert, M. (2017). Telecottages in Europe: A means of community regeneration. *Local Economy*, 16(3), 205-210.

- [32]. Maige, R. M. (2023). Factors Affecting Sustainability of Community-Based Projects in Rural Areas: A Case of Kilosa District in Morogoro (Doctoral dissertation, The Open University of Tanzania).
- [33]. Mansuri, G., & Rao, V. (2013). Localizing development: Does participation work?. *World Bank Policy Research Report*.
- [34]. Matheka, E. K., & Mungai, A. M. W. (2024). PROJECT INTEGRATION MANAGEMENT AND PERFORMANCE OF DIGITALIZED PROJECTS IN TELECOMUNICATIONS INDUSTRY IN NAIROBI CITY COUNTY, KENYA. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME)*, 8(2).
- [35]. *Measuring Digital Development - facts and figures 2023*. ITU. (2024, May 19). https://www.itu.int/hub/publication/d-ind-ict_mdd-2023-1/
- [36]. Mefalopulos, P. (2008). Development communication sourcebook: Broadening the boundaries of communication. *World Bank*.
- [37]. Mugenda, A. and O. Mugenda, 2013. Research methods: Quantitative and qualitative approaches. Nairobi: ACTS Press.
- [38]. Mutai, J. C. (2021). *Geospatial analysis of legume production constraints and opportunities in smallholder systems in Nandi County* (Doctoral dissertation, JKUAT-COHRED).
- [39]. Mwangi, W., & Muchelule, Y. (2023). Project Management Information System and Performance of Community-Based Organizations Projects in Nyeri County, Kenya. *World Journal of Innovative Research*, 14(3), 09-15.
- [40]. Mwangi, W. & Njihia, J. (2013). Influence of project communication on project performance in Kenyan rural development projects. *International Journal of Project Management*, 5(2), 21-29.
- [41]. Mwaura, J. (2024). Silicon Savannah or Digitising Marginalisation?: A Reflection of Kenya's Government Digitisation Policies, Strategies, and Projects. In *Communication Rights in Africa* (pp. 38-54). Routledge.
- [42]. Ngubane, N. A., Phiri, M. A., & Kunene, L. N. Causes and effects of delays in the implementation phase of infrastructure construction projects: Umgeni Water Case Study. In *Mbali Conference 2022 Proceedings* (p. 401).
- [43]. Ochieng, E., & Price, A. (2010). Managing cross-cultural communication in multicultural construction project teams: The case of Kenya and the UK. *International Journal of Project Management*, 28(5), 449-460.
- [44]. Okolloh, O. (2009). Ushahidi, or'testimony': Web 2.0 tools for crowdsourcing crisis information. *Participatory learning and action*, 59(1), 65-70.
- [45]. Olaniyi, T. (2020). From Uber to Uber-like platforms: The Hello Tractor model. *Harvard Business Review*.
- [46]. Osborne, J. W., & Waters, E. (2002). Multiple Regression Assumptions. ERIC Digest.
- [47]. Ovan, O., & Saputra, A. (2020). CAMI: Web-based application to test validity and reliability of research instruments. *Journal of Education, Teaching and Learning*, 5(2), 244-248.
- [48]. Payne, J. W., Bettman, J. R., & Johnson, E. J. (1988). Adaptive strategy selection in decision making. *Journal of experimental psychology: Learning, Memory, and Cognition*, 14(3), 534.
- [49]. Penrose, E. T. (2009). *The Theory of the Growth of the Firm*. Oxford university press.
- [50]. Pinto, J. K., & Slevin, D. P. (1988). Critical success factors in effective project implementation. *Project Management Journal*, 19(3), 67-75.
- [51]. Pretty, J. (Ed.). (2012). *The pesticide detox: towards a more sustainable agriculture*. Routledge.
- [52]. Robey, D. (1979). User attitudes and management information system use. *Academy of management Journal*, 22(3), 527-538.
- [53]. Rogers, E. (2003). *Diffusion of Innovations*. Fifth edition. Free Press: New York.
- [54]. Strauss, M. E., & Smith, G. T. (2009). Construct validity: Advances in theory and methodology. *Annual review of clinical psychology*, 5(1), 1-25.
- [55]. Swart, K., Bond-Barnard, T., & Chugh, R. (2022). Challenges and critical success factors of digital communication, collaboration and knowledge sharing in project management virtual teams: a review. *International Journal of Information Systems and Project Management*, 10(4), 84-103.
- [56]. *The mobile economy 2023*. (n.d.). <https://www.gsma.com/mobileeconomy/wp-content/uploads/2023/03/270223-The-Mobile-Economy-2023.pdf>
- [57]. Toews, D. (2003) *The New Tarde: Sociology after the End of the Social Theory Culture & Society* 20 (5), 81 -98.
- [58]. Unwin, T. (2017). *Reclaiming Information and Communication Technologies for Development (ICT4D)*. Oxford University Press.
- [59]. Vacchi, M., Siligardi, C., Demaria, F., Cedillo-González, E. I., González-Sánchez, R., & Settembre-Blundo, D. (2021). Technological sustainability or sustainable technology? A multidimensional vision of sustainability in manufacturing. *Sustainability*, 13(17), 9942.
- [60]. Vidergor, H. E. (2021). Effects of digital escape room on gameful experience, collaboration, and motivation of elementary school students. *Computers & Education*, 166, 104156.
- [61]. Von Hippel, E. (2006). Democratizing innovation (p. 216). the MIT Press.
- [62]. Woolcock, M. (2000). Social capital: The state of the notion. *Social Capital. Global and Local Perspectives*, 15-40.