

**MANAGING VIRTUAL TEAM AND PROJECT PERFORMANCE: A STUDY OF NON-
GOVERNMENTAL ORGANIZATIONS IN WEST NILE REGION-UGANDA.**

BY

JIMMY LATIGO

07/U/1901/MBA

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DECLARATION

I LATIGO JIMMY declare that this thesis entitled “Managing Virtual Teams and Project Performance: A Study of Non-Governmental Organizations in West Nile Region-Uganda” is my original work and has not been presented for a degree or any academic award in any institution or University to the best of my Knowledge.

Signature  Date 12/04/2026

LATIGO Jimmy

07/U/1901/MBA

APPROVAL

This is to certify that this thesis entitled “Managing Virtual Team and Project Performance: A Study of Non-Governmental Organizations in West Nile region-Uganda”, was written under our guidance and supervision and we approve it for Assessment.

Signature.....Date 12/04/2026.....

Supervisor 1. DR. OLANYA D. ROSS

Signature.....Date 12-04-2026.....

Supervisor 2. MR. CANWAT VINCENT

DEDICATION

To the guiding light of my life, my beloved grandmother Mrs. Dorothy Acayo Obonyo, whose unwavering love, wisdom, and encouragement have been the cornerstone of my journey. Your strength and resilience inspire me to reach for the stars and never give up.

To my precious children, Ethan, Leonard, Xavier, Gabriel and Jordan whose laughter brings joy to my soul and whose innocence reminds me of the true purpose behind every endeavor. You are my motivation to strive for excellence and leave a legacy worth remembering.

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ABBREVIATIONS

COVID19	Corona Virus Disease 2019
CVI	Content Validity Index
EVM	Earned Value Management
HR	Human Resource
ICT	Information and Communication Technology
IPO	Input-Process-Output
IT	Information Technology
KM	Knowledge management
M&E	Monitoring & Evaluation
NGO	Non-governmental Organization
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
UN	United Nations
VTs	Virtual teams
R ²	Coefficient of Determination
PMO	Project Management Office
KPMS	Key Performance Management System
PRINCE2	Projects IN Controlled Environments2

ABSTRACT

Effective management of virtual teams plays a significant role in improving project performance in contemporary organizational environments. Accordingly, this study investigated the effect of virtual team management on project performance among selected non-governmental organizations (NGOs) in the West Nile Region of Uganda. Specifically, the study examined virtual team management practices among NGOs, assessed the level of project performance, established the relationship between virtual team management and project performance, and examined the mediating effect of ICT infrastructure on the relationship between virtual team management and project performance. To achieve these objectives, the study adopted a descriptive-correlational research design employing both quantitative and qualitative approaches. Data were collected from a sample of 126 respondents using structured questionnaires and interview guides, and subsequently analyzed using descriptive and inferential statistics, particularly correlation and regression analyses, to determine the relationships and effects among the study variables. The findings revealed that the level of project performance among NGOs in the West Nile Region was high and that virtual team management practices were strongly implemented. Furthermore, the study established that components of virtual team management, particularly knowledge management and team building, had a statistically significant effect on project performance. In addition, ICT infrastructure was found to mediate the relationship between virtual team management and project performance, thereby indicating that effective technological support enhances the contribution of virtual team practices to project outcomes. Consequently, the study concluded that virtual team management is a critical factor in enhancing project performance in non-governmental organizations. Therefore, the study recommends that NGOs strengthen virtual team management practices, particularly knowledge management and team building, while also investing in reliable ICT infrastructure to sustain and further improve project performance outcomes.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Project management is a structured discipline that guides how organizations achieve their objectives through well-planned and executed projects. Traditionally, project performance has been assessed based on the “iron triangle” of time, cost, and quality, although recent perspectives also emphasize stakeholder satisfaction and long-term value. Over time, project management approaches have evolved from rigid, sequential models such as Waterfall to more flexible and adaptive frameworks like PRINCE2 and Agile. PRINCE2 is a process-based project management framework that defines how to initiate, plan, execute, monitor, and close a project using clearly defined roles, responsibilities, and controls. It focuses on governance, accountability, and control through structured processes, while Agile emphasizes flexibility, collaboration, and responsiveness to change. These approaches have shaped how organizations, including non-governmental organizations (NGOs), manage and evaluate project performance in increasingly complex environments (Pavez, Gómez, Liu & González, 2022; Project Management Institute, 2021).

In the NGO context, project performance is multifaceted, as organizations must balance efficiency with accountability, sustainability, and alignment with their mission. Historically, NGOs relied on co-located teams and face-to-face interactions to plan and implement projects. While this approach strengthened community engagement and supervision, it limited access to diverse expertise and reduced flexibility in responding to disruptions. The emergence of virtual teams, particularly during

the COVID-19 pandemic, transformed how NGOs operate. Digital technologies enabled geographically dispersed teams to collaborate, share knowledge, and coordinate activities effectively.

However, virtual team management also presents challenges, including communication barriers, trust-building difficulties, and coordination complexities. These factors significantly influence project outcomes, especially in dynamic and resource-constrained environments. This study therefore examines how virtual team management affects project performance in NGOs in Uganda's West Nile region, and the role of information and communication technology (ICT) in enhancing project success.

1.1 Background to the Study

The landscape of work and organizational collaboration has undergone significant transformation over recent decades, largely driven by rapid advancements in technology. One of the most notable developments has been the emergence of virtual teams, where individuals who are geographically dispersed collaborate to achieve shared objectives through digital communication platforms (Morrison-Smith & Ruiz, 2020). This shift has fundamentally altered how organizations structure their operations, particularly in project-based environments where coordination, communication, and performance are critical.

Project management remains central to organizational success across sectors. Traditionally, emphasis was placed on completing projects within predefined constraints of time, cost, and quality. However, contemporary perspectives have shifted toward optimizing overall project performance, incorporating broader considerations such as stakeholder satisfaction, sustainability, and long-term

impact (Kerzner, 2017). As a result, project performance is now viewed as a multidimensional construct that goes beyond efficiency to include effectiveness, adaptability, and value creation.

At the same time, the advancement of Information and Communication Technology (ICT) has revolutionized how teams collaborate. ICT has enabled organizations to transcend geographical boundaries, allowing individuals to work together virtually in real time. Tools such as email, video conferencing, cloud computing, and collaborative platforms have become essential in facilitating communication, coordination, and knowledge sharing among dispersed teams (Garro-Abarca et al., 2021). Consequently, many organizations have adopted virtual teams as a strategic approach to enhance flexibility, access diverse talent, and improve operational efficiency (Davidavičienė et al., 2020).

The COVID-19 pandemic further accelerated the adoption of virtual teams across the globe. With restrictions on physical interaction and movement, organizations were compelled to transition to remote working arrangements. This sudden shift led to increased reliance on digital communication tools and platforms, significantly transforming traditional work practices (Afridi et al., 2023). Reports indicate a substantial rise in internet usage and digital communication activities during this period, including virtual meetings, online training, and remote project coordination (Kemp, 2020). While virtual collaboration enabled continuity of operations, it also introduced new challenges related to communication effectiveness, coordination, trust-building, and technological limitations.

Historically, the concept of virtual teams can be traced back to early communication technologies such as the telegraph and telephone, which enabled long-distance interaction. However, the true emergence of virtual teams occurred with the widespread adoption of the internet in the late 20th

century (Morrison-Smith & Ruiz, 2020). Globalization further intensified the need for virtual collaboration as organizations sought to access diverse skills and expertise from different regions. Over time, advancements in digital technologies have made virtual teams increasingly viable and effective, allowing organizations to improve innovation, responsiveness, and competitiveness.

Similarly, the evolution of project performance is closely linked to the development of project management as a discipline. Early project management practices were largely informal and characterized by trial-and-error approaches. However, the introduction of systematic methodologies such as Critical Path Method (CPM) and Project Evaluation and Review Technique (PERT) in the mid-20th century marked a significant advancement in project planning and control (Meredith et al., 2017). As projects became more complex, the need for comprehensive performance measurement frameworks became evident, leading to the development of modern project management approaches that emphasize both efficiency and effectiveness.

The development of ICT infrastructure has played a crucial role in enabling virtual team operations. Early milestones such as the introduction of email in the 1970s laid the foundation for remote communication, while subsequent innovations including video conferencing, cloud computing, and collaborative software have significantly enhanced virtual interactions (Folaron, 2012). Modern ICT infrastructure supports both synchronous and asynchronous communication, enabling teams to share information, coordinate tasks, and manage projects effectively regardless of physical location (Alavi et al., 2018). Key components of effective ICT infrastructure include reliable internet connectivity, secure data systems, and user-friendly collaboration tools.

Despite these advancements, managing virtual teams presents unique challenges. Unlike traditional co-located teams, virtual teams face issues such as communication barriers, cultural differences, lack of face-to-face interaction, and difficulties in building trust and cohesion (Scott & Wildman, 2015). These challenges require managers to adopt specialized strategies that combine traditional management principles with approaches tailored to the virtual environment. Theoretical frameworks such as Tuckman's stages of group development and the Input-Process-Output (IPO) model provide valuable insights into how virtual teams evolve and function. Concepts such as leadership, trust, and collaboration take on new dimensions in virtual settings, requiring deliberate effort to ensure team effectiveness (Kurz, 2021).

Effective virtual team management is therefore a complex process that involves balancing multiple factors, including communication, coordination, trust-building, and technological support. The interplay between scope, time, and cost further adds to the complexity of managing project performance in virtual environments (Cobb, 2023). Organizations must ensure that their ICT infrastructure is robust enough to support virtual collaboration while also addressing the human and organizational aspects of team management.

The contextual relevance of virtual team management is particularly important in developing countries such as Uganda. Factors such as technological infrastructure, policy environment, and cultural dynamics significantly influence the effectiveness of virtual teams (Ojo, 2016). In Uganda, challenges such as unreliable electricity supply, limited internet connectivity, and high costs of digital access can hinder effective virtual collaboration. However, the widespread use of mobile phones and

increasing digital adoption provide opportunities for organizations to leverage virtual teams in their operations (Baguma & Wolters, 2021).

The COVID-19 pandemic played a pivotal role in accelerating the adoption of virtual teams in Uganda. Organizations, including NGOs, were forced to shift from traditional face-to-face operations to remote working arrangements. This transition highlighted both the potential and limitations of virtual team management within the local context. While virtual teams enabled continuity of operations, challenges such as communication breakdowns, technological constraints, and limited digital skills affected project performance.

From a theoretical perspective, this study is grounded in Kurt Lewin's Theory of Planned Change, which provides a framework for understanding organizational change processes. The theory outlines three stages of change: unfreezing, changing, and refreezing (Schein, 1996; Burnes, 2004). In the context of virtual team management, this theory helps explain how organizations transition from traditional work practices to virtual collaboration. The unfreezing stage involves recognizing the need for change, the changing stage involves adopting new practices such as virtual communication, and the refreezing stage involves stabilizing these practices to ensure long-term effectiveness. This framework is particularly relevant in understanding how organizations adapt to virtual team management and its impact on project performance.

Conceptually, project performance is defined as the extent to which a project achieves its objectives within the constraints of time, cost, and quality while meeting stakeholder expectations (Project Management Institute, 2021). In NGOs, project performance is more complex due to the need to balance efficiency with social impact, accountability, and sustainability. Factors such as stakeholder

engagement, resource management, monitoring and evaluation, and transparency play a critical role in determining project success.

Virtual teams, defined as groups of individuals working across geographical boundaries and connected through digital communication, have become an essential component of modern project management (Alsharo et al., 2017). These teams rely on various communication tools to coordinate activities, share information, and achieve project goals. Effective communication within virtual teams is crucial for enhancing coordination, monitoring, and overall team performance (Hill & Bartol, 2018).

In Uganda, the adoption of virtual teams has been influenced by both global trends and local contextual factors. The shift toward virtual collaboration has created new opportunities for organizations to improve efficiency and access diverse expertise. However, it has also introduced challenges related to infrastructure, communication, and management practices. Understanding these dynamics is essential for developing strategies that enhance project performance in virtual environments.

In summary, the increasing adoption of virtual teams, driven by technological advancements and external factors such as the COVID-19 pandemic, has transformed project management practices globally and locally. While virtual teams offer significant benefits, their effectiveness depends on the ability of organizations to manage communication, coordination, and technological challenges. This study therefore examined the relationship between virtual team management and project performance within the Ugandan context, with a focus on identifying strategies that can enhance effectiveness in NGO projects.

1.2 Problem Statement

In the contemporary globalized work environment, organizations increasingly rely on virtual teams to execute projects across geographical boundaries. While this model enhances flexibility and access to diverse expertise, it introduces challenges related to communication, coordination, trust, and team cohesion, which can negatively affect project performance (Sospeter, Rwelamila, & Mtanga, 2022; Handke et al., 2024). The COVID-19 pandemic accelerated the adoption of virtual work, with platforms such as Zoom experiencing a rise from 10 million daily users in 2019 to over 300 million in 2020 (Evans, 2020). This shift has persisted, with projections indicating that a significant proportion of meetings remain virtual (Standaert et al., 2021). However, many organizations, particularly in developing contexts, transitioned without adequate preparation in terms of ICT infrastructure, policies, and team management strategies.

In Uganda, especially within NGOs in the West Nile region, the transition to virtual teams was largely abrupt and unstructured. This has resulted in persistent challenges such as unreliable internet connectivity, limited digital skills, cultural differences, and reduced interpersonal interaction, all of which may undermine effective project execution (Muzee, Kizza, & Mugabe, 2021; Afridi et al., 2023). These challenges can directly impact measurable project performance outcomes, including timely project completion, adherence to budget, quality of deliverables, stakeholder satisfaction, and achievement of project objectives (Project Management Institute, 2021; Pavez et al., 2022).

Despite the growing reliance on virtual teams, there remains limited empirical evidence on how virtual team management practices affect these specific performance indicators in the Ugandan NGO

context. Therefore, this study examined the effect of virtual team management on project performance.

1.3 General Objective

To establish the effect of virtual team management on project performance with focus on selected NGOs in West Nile Region-Uganda.

1.4 Specific Objectives

1. To examine virtual team management practices among NGOs in West Nile Region-Uganda.
2. To assess the level of project performance of NGOs in West Nile Region-Uganda.
3. To establish the relationship between virtual team management and project performance in NGOs in West Nile Region-Uganda.
4. To examine the moderating effects of ICT infrastructure on the relationship between Virtual team management and Project performance in non-governmental organizations in West Nile region-Uganda.

1.5 Research Questions

1. What is the relationship between virtual team building and project performance of NGOs in West Nile Region-Uganda?
2. What is the relationship between virtual team management and project performance of NGOs in West Nile Region-Uganda?

3. What is the relationship between knowledge management in virtual teams and project performance of NGOs in West Nile Region-Uganda?
4. How does ICT infrastructure influence the effectiveness of virtual team management and in non-governmental organizations (NGOs) operating in the West Nile region of Uganda?

1.6 Significance of the study

The study may help funders, NGO managers. Findings may be used for organizational learning and improve projects planning, implementation, and management. It might enable the project managers and other staff to understand and appreciate the ever-changing virtual working environment. The result of this study may be adopted by NGOs to realistically plan and formulate its projects policies that are geared to improving the overall project performance.

This study may be necessary to understand and analyze the dynamics of virtual team management from the perspective of evolving ICT frameworks involving institutions, knowledge management and teams' communication.

The study may also benefit MBA and project management students involved in project planning. Although, it will be conducted in a local context, it is also relevant to other areas involved with virtual team management and project performance. In addition, this study may also provide insights that help build additional knowledge in this study area by filling knowledge gap that currently exists.

1.7 Scope of the Study

The scope of this study was defined in terms of content, geographical, and time parameters.

1.7.1 Content Scope

The study specifically examined the impact of virtual team management on project performance in non-governmental organizations (NGOs) with focuses on; project purpose, outputs and milestones.

1.7.2 Geographical Scope

The study focused on selected non-governmental organizations (NGOs) operating within the West Nile region of Uganda, specifically targeting the districts of Arua, Yumbe, and Adjumani. These districts host a diverse range of NGOs implementing both short-term and long-term projects, offering a rich source of data and multiple perspectives essential for comprehensive analysis.

1.7.3 Time Scope

The study covered the period from 2020 to 2024, a time frame marked by the aftermath of the COVID-19 pandemic. During this period, effective virtual team management among NGOs became paramount, addressing evolving needs and IT challenges and shifting from traditional work practices.

1.8 Conceptual Framework

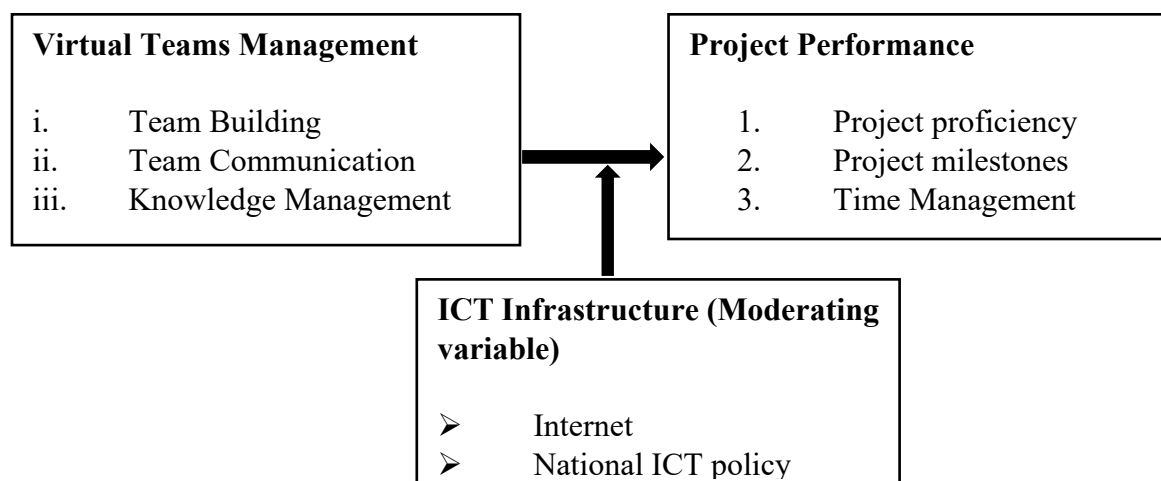


Figure 1: Conceptual framework showing the relationship between virtual team management and the project performance in NGOs.

Source: Adapted from (Pavez, Gómez, Liu & González, 2022; Project Management Institute, 2021) and Modified by the researcher.

The conceptual framework above, the researcher conceives that virtual team management in the form of team building, virtual team communication and knowledge management in virtual teams, would lead to improved or project performance. The framework also includes the indicators of the dependent variables that would be used to measure the levels of knowledge management in virtual teams (Completed /delivered on time; delivered to or within budget; delivered to funders (donors) satisfaction and Satisfied stakeholders)

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Literature reviews are critical to academic research as they consolidate previous findings, highlight areas of consensus, reveal contradictions, and identify research gaps that merit further inquiry (Smela et al., 2023). In business and management, the exponential growth of ICTs has fueled a dramatic expansion of scholarly publications. This proliferation, while evidence of intellectual vibrancy, has created challenges for researchers in maintaining awareness of the latest contributions (Brainard, 2020). The resulting saturation often leads to redundancy, contradictory findings, or the proliferation of studies with limited novelty, thereby diluting disciplinary advancement (Kraus, Mahto, & Walsh, 2023). Against this backdrop, systematic reviews play a crucial role by synthesizing knowledge, assessing methodological approaches, and charting pathways for future research (Snyder, 2019).

The current review focuses on three interrelated domains; virtual teams, project performance, and ICT infrastructure to provide a coherent framework for understanding how organizational change, technology, and management practices intersect. By integrating theoretical insights and empirical findings, the review positions virtual team management as a key determinant of project outcomes, particularly in contexts where ICT capabilities shape collaboration.

2.1 Theoretical Review

2.1.1 Theory of planned change Kurt Lewin' approach

The study is anchored on the Theory of Planned Change developed by Kurt Lewin in 1951, which provides a foundational framework for understanding how organizational change occurs and how it can be effectively managed. Lewin conceptualized change as a dynamic and systematic process involving three sequential stages: unfreezing, changing (or moving), and refreezing (Lewin, 1951). Contemporary scholars affirm that this model remains highly relevant in explaining organizational transformation, particularly in contexts driven by technological change and digital transformation (Burnes, 2020; Cummings, Bridgman, & Brown, 2016). In the context of this study, the theory is applicable in explaining how organizations transition from traditional face-to-face work arrangements to virtual team structures, especially in response to disruptions such as the COVID-19 pandemic and increasing reliance on ICT. The theory further assumes that organizational behavior is influenced by a balance between driving forces that promote change and restraining forces that resist it, and successful change occurs when the driving forces outweigh the restraining forces.

The key constructs of Lewin's theory of unfreezing, changing, and refreezing provide a strong conceptual lens for understanding virtual team management. The unfreezing stage involves creating awareness about the limitations of conventional work systems and the need for digital transformation. In NGO contexts, this may involve recognizing inefficiencies in physical coordination, high operational costs, and limited geographical reach. The changing stage reflects the transition to virtual teams through the adoption of digital tools such as video conferencing, collaborative platforms, and cloud-based systems, alongside restructuring communication processes and redefining team roles (Gilson et al., 2015; Handke et al., 2024). The refreezing stage focuses on institutionalizing these

practices by embedding virtual collaboration into organizational culture, policies, and standard operating procedures. Recent studies emphasize that successful virtual team management requires continuous reinforcement of digital practices and capacity building to ensure sustainability (Contreras, Baykal, & Abid, 2020).

Lewin's theory also provides a valuable framework for explaining project performance in virtual environments. Effective progression through the three stages enhances key performance indicators such as project timeliness, cost efficiency, quality of deliverables, team coordination, and stakeholder satisfaction (Project Management Institute, 2021; Serrador & Turner, 2015). For instance, the unfreezing stage helps reduce resistance to virtual systems, thereby improving acceptance and readiness for change. The changing stage enhances communication, knowledge sharing, and coordination through digital platforms, which are critical for meeting project deadlines and maintaining quality standards. The refreezing stage ensures that improved practices are sustained, leading to consistent performance and long-term project success. Empirical studies indicate that organizations that effectively manage digital transitions tend to achieve higher levels of project efficiency and effectiveness (Marnewick & Marnewick, 2020).

One of the major strengths of Lewin's theory lies in its simplicity, clarity, and wide applicability across different organizational contexts. It provides a structured and practical approach to managing change, making it particularly useful for guiding transitions such as the adoption of virtual teams. The model also emphasizes the role of leadership in facilitating change, especially in addressing resistance and fostering commitment among team members (Burnes, 2020). Furthermore, its focus on the interaction between driving and restraining forces offers valuable insights into managing

behavioral and technological resistance, which is common in virtual team environments. Recent literature supports the continued relevance of Lewin's model in digital transformation initiatives due to its adaptability and strong conceptual foundation (Cummings et al., 2016).

However, the theory is not without limitations. Critics argue that it oversimplifies the change process by presenting it as linear and static, whereas modern organizations operate in complex, dynamic, and continuously evolving environments (By, 2005; Stouten, Rousseau, & De Cremer, 2018). Additionally, the model does not sufficiently account for external environmental factors such as rapid technological advancements, globalization, and cultural diversity, which significantly influence virtual team dynamics. Some scholars also argue that in digital contexts, change is often continuous rather than episodic, making the concept of "refreezing" less realistic (Burnes, 2020). Despite these criticisms, Lewin's Theory of Planned Change remains a robust and widely used framework, and it provides a strong theoretical foundation for this study by explaining how organizations can effectively transition to and sustain virtual team management practices while enhancing project performance outcomes.

2.2 Virtual team

Virtual teams (VTs) are defined as geographically dispersed groups working interdependently through digital technologies to achieve organizational goals (Handke et al., 2021). Their rise is driven by globalization, cost pressures, and technological advancements that enable collaboration across borders (Kilcullen et al., 2021). Benefits include reduced travel costs, flexibility, and access to a global talent pool. However, challenges abound, particularly in building trust, managing cultural diversity, and mitigating the lack of non-verbal communication cues (Glikson & Erez, 2020).

2.2.1 Team building

Team building in virtual contexts requires intentional strategies. Trust, often fragile in digital interactions, can be fostered through reputation, demonstrated competence, and transparent communication (Cheng et al., 2021). Positive feedback enhances cohesion (Jaakson et al., 2019), while systems to keep all members updated on roles and progress promote accountability (Guinalíu & Jordán, 2016). Systems thinking is essential, i.e. viewing the team as an interconnected whole rather than isolated parts has also been identified as critical to effective problem solving (Arnold & Wade, 2015; Shaked & Schechter, 2020). Leaders who adopt holistic perspectives encourage sustainable solutions rather than short-term fixes (Galli, 2020).

Moreover, interpersonal compassion and mindfulness have been shown to predict engagement in virtual work environments. A study in Uganda and Rwanda demonstrated that kindness from supervisors and employee mindfulness enhanced vigor among staff working remotely during COVID-19 lockdowns (Muzee, Kizza, & Mugabe, 2021). This highlights the continuing relevance of human-centric approaches even in highly digital workspaces.

2.2.2 Team Communication

Communication is the backbone of virtual collaboration. Effective communication fosters cohesion, minimizes conflict, and enhances team outcomes (Garro-Abarca et al., 2021). Yet, mediated communication technologies present challenges. Misunderstandings arise more easily without tone and body language, leading to conflicts and reduced trust (Maduka et al., 2018). Rich communication channels, such as video conferencing, mitigate this by reintroducing visual and emotional cues

(Olaisen & Revang, 2017). Informal communication, such as casual check-ins, also plays a vital role in building empathy and strengthening bonds (Shaik & Makhecha, 2019).

Studies consistently highlight the importance of structured communication norms. When teams align on protocols such as expected response times and channel use, performance improves (Henderson et al., 2016). At the same time, over-reliance on digital tools can cause information overload and communication anxiety, discouraging participation (Fuller, Vician, & Brown, 2016). Hence, balancing formal structures with relational communication is key.

2.2.3 Knowledge Management

Knowledge management refers to a range of practices and techniques used by organizations to identify, represent and distribute knowledge, know-how, expertise, intellectual capital and other forms of knowledge for leverage, reuse and transfer of knowledge and learning across the organization. It suffices crucial issues on organizational adaptation, survival and competence threatened by unpredictable environmental change (Sunil, 2013). Tarekegn (2017) defined Knowledge management as the set of proactive activities to support an organization in creating, assimilating, disseminating, and applying its knowledge. KM is a continuous process to understand the organization's knowledge needs, the location of the knowledge, and how to improve the knowledge. Knowledge management involves a strategic commitment to improving the organization's effectiveness, as well as to improving its opportunity enhancement.

Knowledge management in VTs and presumed conflicts came to the scholars' attention due to the complex settings of geographically distributed teams. The implied challenges are explained as

difficulties in sharing comprehensive knowledge with no face-to-face communication potentially creating sub-groups (Boh *et al.*, 2007) and reducing the attention of team members under virtual circumstances (Ortiz De Guinea *et al.*, 2012).

The emergence of the COVID-19 pandemic led to a widespread transition to telework, knowledge sharing and management and thus organizations suddenly were having massive numbers of VT (Chamakiotis *et al.*, 2021; Ferreira & Rodrigues, 2023).

Knowledge management also entails learning and cooperation. Miller *et al.* (2010) highlighted the importance of learning and cooperation within virtual teams, emphasizing the role of collaborative networks in fostering organizational growth. Leaders have been noted to play an instrumental role in facilitating team building, team cohesion, knowledge sharing, and motivational dynamics within teams (Eseryel, Crowston & Heckman, 2021).

Other knowledge management variables that refer to performance and that have other designations are the following: creative project performance of VTs (Grözinger *et al.*, 2020), the effectiveness of VTs in creating knowledge (Mangla, 2021), team effectiveness (perceptions of location and the use of knowledge) (Jackowska & Luring, 2021), project management (Kanagarajoo *et al.*, 2019), interaction and performance of VTs (Richter *et al.*, 2021) quantity and quality of work and the volume of work (Mell *et al.*, 2021).]

Applying knowledge is often considered a basic asset to gain a competitive advantage in the branch or industry (Byström & Jäger, 2021) and consequently, knowledge sharing in virtual teams plays a crucial role in the knowledge management processes of organizations. Among the world's most

successful companies are the knowledge-based ones (Bolisani & Bratianu, 2018). In order to reach an optimal level of knowledge sharing, highly efficient teams are an absolute necessity. Other studies (Davidavičienė et al., 2020) focused on barriers in virtual teams. They concluded that trust is a main component. Other researchers (Curado & Vieira, 2019; Rutten et al., 2016) came to the same conclusion. However, the lacking possibility for face-to-face interactions while working in virtual teams could have a negative impact on the development of trust (Davidavičienė et al., 2020).

2.3 Project Performance

Project performance is a critical measure of how effectively project objectives are achieved within the constraints of time, cost, scope, and quality (Iriarte & Bayona, 2020; Larson & Gray, 2011). In today's dynamic and technology driven environment, assessing performance goes beyond traditional indicators to include the adaptability of teams, the efficiency of processes, and the ability to leverage digital tools for collaboration (Gilson et al., 2021; Sudhakar, 2022). For virtual teams in particular, performance is shaped not only by technical proficiency but also by the alignment of skills, leadership, cooperation, and organizational support (Haerani, 2019; Brewer, Estes, & Pam, 2015). As globalization and technological innovation continue to redefine project environments, understanding the drivers of performance in both traditional and virtual contexts become essential for ensuring project success (Dumitrașcu, Iulia, & Dumitrașcu, 2015; Graham & Daniel, 2017).

2.3.1 Project Proficiency

Project proficiency involves applying project management knowledge, skills, and tools effectively (Larson & Gray, 2011). In virtual environments, proficiency extends to digital collaboration, cross-cultural competence, and ICT literacy. Research shows mixed results: while project management

skills enhance outcomes, technical proficiency with virtual tools alone does not guarantee quality (Graham & Daniel, 2017). Instead, proficiency must align with commitment, cooperation, and leadership support to be effective (Haerani, 2019).

When looking at project proficiency in virtual teams, project managers need to appreciate that these teams carry out most of their work remotely through technology, rather than in the traditional face-to-face setting (Brewer, Estes, & Pam, 2015). Despite the distance, members still share a common scope, objectives, and expected outputs, whether products or services, which makes it especially important to identify and strengthen the skills needed to manage and support such teams effectively (Lee, 2014).

Project proficiency has also been linked to globalization in recent decades. Scholars have noted that there has been an increase in the complexity of international projects with the appearance of the Internet, which has favored the emergence of a new working environment i.e. the virtual environment, with a direct impact on dispersed project teams. Thus, international projects now include new features and dimensions, and the “virtual team” becomes the most representative segment of the “dispersion degree of project teams” dimension (Dumitraşcu, Iulia, Dumitraşcu, 2015), due to technological innovation, which has offered the necessary means to overcome spatial and temporal barriers of communication and to access talent across borders or continents.

Graham and Daniel (2017)’s study attempted to address two hypotheses: that increased proficiency in projects skills contribute to greater project quality and that increased proficiency within the virtual environment will contribute to greater project quality. Findings suggest that technical proficiencies in projects skills do contribute to greater project quality however the technical proficiency in the use

of virtual environments does not. The relationship between proficiency in project skills and the quality of project outcomes was found to be weak; suggesting that other variables not investigated in the study may exert a more powerful influence on project outcomes.

Haerani (2019)'s research findings show that the variables of job proficiency, commitment, and cooperative relationship simultaneously significantly affect the performance of the project with the coefficient of determination R^2 of 0.565. While Mahabir and Pun (2022) did a study on the revitalising project management office operations in an engineering-service contractor organisation: a key performance indicator-based performance management approach. Findings showed that existing PMO process lacked significant value-drivers of its PM practice. The company also overlooked strategic PMO roles and trial implementation of the modified PMO process achieved improved project performance, which stakeholders attributed to the value-driven processes and guidance provided by the KPMS. One gap is that limited publications investigate the project management office's (PMO) proficiency in facilitating proper PM practice.

2.3.2 Project milestones

Milestones are tangible indicators of progress, providing checkpoints against which performance can be assessed (Pollack et al., 2018). In VTs, challenges such as time-zone differences and technological disruptions make milestone achievement difficult (Shonhiwa, 2008). Frameworks emphasizing clarity, inclusion, and trust enhance milestone attainment (Derven, 2016).

Derven (2016) provides a practical, concise framework for organizations that are using or considering global virtual teams focusing on how global VTs can use diversity, inclusion, structure and processes

to promote desired outcomes. His findings indicated that with globalization and skill shortages, global VTs are required to meet critical organizational objectives. Often these teams fall short of their promise, due to the complexity and lack trust and formal processes. Thus, virtual teams can use the proposed framework can promote high project performance and project milestones

Shonhiwa (2008) in an African journal study warned that simply establishing virtual project teams does not guarantee success and realizing project milestones and that VTs teams are often less effective than face-to-face teams on many outcome measures. Virtual project teams can experience difficulties at every stage of their development. Improved understanding of how virtual project teams develop and mature will provide managers with important insights that might increase a team's contributions to firm performance. In realizing project milestones, virtual teams face a number of unique challenges that often prevent them from obtaining successful outcomes such as: (1) logistical problems, such as communicating and coordinating work across time and space, (2) interpersonal concerns, such as establishing effective working relationships with team members in the absence of frequent face-to-face communication, and (3) technology issues, such as identifying, learning, and using technologies most appropriate for certain tasks (Gheni et al, 2016).

Other authors imply that both temporal orientations can exist comfortably side-by-side within projects. The suggestion is that strict project milestones are set by managers, and team members are allowed the flexibility to act within these defined project timings (Ellwood, Grimshaw & Pandza, 2017).

2.3.3 Time Management

Project performance in relation to time management is defined as organizational impact and on time and on/under budget project completion (Iriarte & Bayona, 2020). Other authors (Curcio, et al, 2016) keep definitions linked to the iron triangle present some variant for the vertices; for the time vertex: time, schedule, adherence to schedule, within time, duration. Other studies have examined the perception of time in organizational and project contexts and the experience of time pressure among VTs in projects (Major et al., 2002; Raharjo & Purwandari, 2020). Another facet of project success that is important to establish is time management frame. Pinto & Slevin (1987) give fourteen critical success factors and analyzes the most relevant for each stage of the project but prioritized time management.

Sudhakar (2022) collects eighty factors and presents a model explaining interaction among groups of them. To avoid problems associated with time management in any project that give rise to the criticisms, they grouped them into components of the formal system model used as a framing device to deliver the benefits of taking account of time management.

2.4 ICT Infrastructure

2.4.1 Internet

An ICT infrastructure supports these improvements by making it easier for organizations to communicate, share information, streamline business processes and respond to change. It underpins effective collaboration inside and outside your organization (Linton, 2016; Zhang et al, 2016). Linton

(2016) further notes that teams working on projects such as new product development can work together easily, even when team members are in different locations. Using collaboration tools such as video conferencing, email, instant messaging and web conferencing, your teams can make decisions and get new products to market quickly, helping you to meet your strategic marketing goals. Other authors have noted that teams can also collaborate with suppliers and other external groups, such as research laboratories or universities, providing access to expertise and skills that can improve your ability to innovate (Swart, Bond-Barnard & Chugh, 2022).

The role of information and communication technology as an enabler is essential for communication and building relationships in VTs (Verburg et al 2013). Furthermore, the use of internet enables VTs to carry out basic team functions such as collaborating, managing knowledge, communication and decision-making (Pinjani & Palvia, 2013).

Lee-Kelley and Sankey (2008) segmented collaboration technology into three incremental generations, depending on the level of interaction and effectiveness. First-generation collaboration technology includes platforms such as emails and conference calls, where human-based emotions are limited, and the primary means of communication are vocal or written. Visual illustrations of information through PowerPoint presentations, videos and online meeting tools are classified as second-generation collaboration tools and are proven to improve human engagement. Third-generation collaboration technology is web-enabled shared workspaces via the internet and cloud-based platforms (Lee-Kelley & Sankey, 2008).

There are also new online communication technologies such as online file-sharing systems, global systems for mobile communications, electronic data interchange, web 4.0 applications and cloud

computing services (Aceto, Persico & Pescapé, 2019). Researchers have recommended the extensive use of fourth and fifth-generation technologies for global VT collaboration, with first generation used primarily for brief information-sharing interactions (Velez-Calle et al, 2020; Liang, 2021). Thus, a collaborative technological environment in geographically distributed teams provides avenues for interactivity, knowledge sharing and coordination in VTs.

Thus, the rapid development of internet technologies since the 1990s led to propose the concept of a “network society” (Castells, 2009). The theoretical core still focuses on the issue of labour. Subsequently, researchers who respond to Castells’ theory also focus on the labour issue of a network society from views of structural inequality and labor production (Wang 2011 cited in Liang, 2021).

As such, internet technology differs from traditional technology in terms of form and ideology, which acquires significant characteristics of a culture of technology or tech culture. First, the internet tech culture exists prior to and is embedded in technology, and the rules and structure of technology are a reflection of technology. Second, the internet tech culture influences not only work but also the world (as in the vision that “*technology changes the world*” (Liang, 2021). From this perspective, it is not enough to focus only on the technology itself when we discuss internet technology in reference to VTs and their functioning in project performance.

Other studies show that the proliferation of globalization, the internet, and ICT has been linked with the evolution of virtual teams (Abarca et al, 2020; Tadesse & Ayenew, 2023). They also highlight that these global teams harness ICT and are influenced by myriad technological, social, and psychological dynamics. Advances in IT such as expansion of internet usage have revolutionised the working environment (Chaudhary et al, 2022). Their meta-analysis shows significant effect of

cohesion on virtual team performance ($r = 0.40, p < 0.000$). Study outcomes indicate a positive relationship between team cohesion and virtual team performance and High heterogeneity was found and moderator analysis was performed to examine the heterogeneity (Chaudhary et al, 2022).

Finally, the introduction of Cloud applications is a new communication technology permits virtual team members to operate software and applications from an online environment. Virtual team members can store data related to virtual team projects on remote location and is accessible from any Internet-connected device (Kannan, 2014). VTs can store all project data in one shared location. Chance of document redundancy on different computers is reduced. Single location ensures the document's most current version is utilized.

2.4.2 National ICT policy

The internet forms the backbone of VT collaboration. Early tools like email and teleconferencing have evolved into cloud-based, interactive platforms that support simultaneous collaboration (Lee-Kelley & Sankey, 2008). Advanced ICTs, such as AI and cloud systems, further enable cohesion and knowledge sharing (Caputo et al., 2016; Kannan, 2014). Cloud applications reduce duplication, ensure access to updated information, and centralize project data for dispersed teams.

Many governments and organisations around the world are using the Information and Communication Technologies (ICT) to build a more transparent, efficient and inclusive relationship with citizens. This new paradigm of open government, which is interrelated with e-government, differs among countries due to technological and socioeconomic conditions (Alderete, 2018). Rapid advancements in ICT have been found to dynamically alter organizational operational landscapes (Abarca, Palos-

Sanchez & Rus-Arias, 2020). Rapid technological advances supported the emergence of virtual teams (Batarseh et al., 2017). Such evolutions have led to increasingly globalized and competitive business spheres. Global virtual teams, as identified in the literature, predominantly rely on ICT for communication and collaboration (Clark, Marnewick & Marnewick, 2019).

Organizations globally have adopted ICT policies and acquired tools to make their employees' work more accessible and quicker to deliver the projects and products to the clienteles to gain profit and achieve reputation (Ratheeswari, 2018). Moreover, to achieve stability in the market and gain more reputation among customers, companies adopt new technologies and e-services. However, it could be observed that many companies and organizations fail to achieve success and thus change their product development plans or operational plans accordingly since ICT is considered a "catalysts for change" (Ratheeswari, 2018).

Researchers point out that the effectiveness of ICT policies often depends on strong management support. Unlike traditional teams, virtual teams (VTs) can be more affected by gaps in training and the absence of hands-on technical support, especially when dealing with software-related issues (Siddiquah et al., 2017). Providing the right hardware and equipping teams with proper training is therefore critical to maintaining project performance. While earlier studies have examined ICT and team effectiveness (Govender & Govender, 2014; Harerimana & Mtshali, 2017; Lee et al., 2018), more recent work that directly connects ICT policy with VT effectiveness and project outcomes is still limited (Gao, 2014; Palacios et al., 2014). This makes the present study particularly valuable, as it offers timely insights into how ICT infrastructure can better support virtual teams and enhance project success.

Other studies show that national ICT policies and technological advances significantly shape virtual team (VT) performance by demanding flexibility and responsiveness from members (Zhu & Smith, 2019). ICT development also mediates the relationship between socioeconomic conditions and e-government, with stronger economies and innovation driving higher ICT adoption and improved project outcomes (Alderete, 2018). However, over-reliance on national IT policies may hinder multinational expansion in low-ICT regions (Kanike, 2023), while system performance and design remain critical to effective collaboration and project success (Kudyba & Cruz, 2023).

2.5 Virtual team management and project performance

Virtual team management integrates leadership, cultural intelligence, stakeholder engagement, and digital coordination. Leaders who adapt to cultural diversity and provide training enhance trust and performance (Pinjani & Palvia, 2013). The COVID-19 pandemic highlighted the centrality of digital collaboration and knowledge sharing in sustaining project performance (Swart, Bond-Barnard, & Chugh, 2022).

Effective leaders balance internal roles (team cohesion, communication management) with external roles (stakeholder engagement, resource mobilization). This duality has been shown to improve delivery and effectiveness in virtual projects (Kashive, Khanna, & Powale, 2022). Stakeholder engagement and KM also strengthen sustainability, with positive effects consistent across both virtual and traditional projects (Blak Bernat et al., 2023).

A research by Kashive, Khanna & Powale (2022) focuses on understanding the factors for better team performance in virtual teams. Based on the contingency perspective, both internal as well as external

roles were explored, which could facilitate better communication quality and role clarity to increase project performance through timely delivery, outputs and effectiveness in the COVID-19 crisis. They noted that VT management and their roles showed a significant effect on leadership effectiveness, which were further related to project performance

2.6 Summary of Literature

Lewin's three-step model; unfreezing, changing, and refreezing, remains foundational for planned change in organizations (Lewin, 1951; Schein, 1996). It explains how driving and restraining forces shape equilibrium and how managers can mobilize transitions through awareness, new behaviors, and stabilization (Burnes, 2004). While effective in guiding reforms, criticisms highlight its simplicity and inability to capture iterative change processes (By, 2005). Still, leadership and team commitment are central in applying Lewin's theory to virtual environments (Černe et al., 2013).

Virtual teams (VTs) are geographically dispersed groups working through technology (Handke et al., 2021). Benefits include cost reduction and global talent access (Kilcullen et al., 2021), but challenges involve trust and communication barriers (Glikson & Erez, 2020). Trust, reputation, and clear goals are vital (Cheng et al., 2021), as is systems thinking for sustainable solutions (Arnold & Wade, 2015). Compassion and mindfulness also improve engagement in virtual work (Muzee, Kizza, & Mugabe, 2021).

Effective communication underpins cohesion and performance (Garro-Abarca et al., 2021). While ICT tools enable coordination, poor communication increases conflict (Maduka et al., 2018). Richer channels like video calls reduce misinterpretation (Olaisen & Revang, 2017). Informal

communication builds trust (Shaik & Makhecha, 2019), while structured norms enhance performance (Henderson et al., 2016).

Knowledge management (KM) enables sharing and reuse of organizational expertise (Sunil, 2013). In VTs, distance complicates tacit knowledge sharing (Boh et al., 2007). Trust is a key enabler (Curado & Vieira, 2019). During COVID-19, strong KM systems supported rapid virtual transitions (Chamakiotis et al., 2021). Efficient KM drives innovation, competitive advantage, and project success (Bolisani & Bratianu, 2018).

Project proficiency reflects applying project management knowledge and tools (Larson & Gray, 2011). While skills improve outcomes, technical proficiency with virtual tools shows mixed impact (Graham & Daniel, 2017). Proficiency must align with commitment and cooperation for effectiveness (Haerani, 2019).

Milestones are key indicators of performance and progress (Pollack et al., 2018). VTs face challenges such as coordination across time zones and technological issues (Shonhiwa, 2008). Structured frameworks and trust-building improve milestone achievement (Derven, 2016).

On-time completion remains central to project success (Iriarte & Bayona, 2020). Virtual contexts complicate scheduling, but effective processes and monitoring mitigate delays (Sudhakar, 2022).

The internet underpins VT communication, collaboration, and decision-making (Pinjani & Palvia, 2013). Collaboration technologies have evolved from email to cloud-based platforms, enhancing interactivity (Lee-Kelley & Sankey, 2008). Advanced ICT tools like AI and cloud systems improve cohesion and knowledge sharing (Caputo et al., 2016; Kannan, 2014).

National ICT policies shape organizational readiness and project success. ICT development correlates with economic activity and innovation (Alderete, 2018). Effective adoption depends on management support and training (Siddiquah et al., 2017). Over-reliance on policies without local adaptation may hinder performance in low-ICT regions (Kanike, 2023).

Effective VT management including leadership, cultural intelligence, and stakeholder engagement is crucial to performance (Gilson et al., 2021; Pinjani & Palvia, 2013). The COVID-19 pandemic highlighted the need for strong digital communication and collaboration practices (Swart, Bond-Barnard, & Chugh, 2022). Leadership that balances internal and external roles enhances project delivery (Kashive, Khanna, & Powale, 2022). Knowledge management and stakeholder engagement also strengthen sustainability and outcomes, even in virtual contexts (Blak Bernat et al., 2023).

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the methodology adopted for the study. The methodology is designed to systematically address the research objectives and questions, facilitating a comprehensive understanding of the dynamics influencing project performance within virtual team settings in NGOs. It thus covers the research design, area of the study, target population, sample size and sampling techniques, data collection methods, validity and reliability, data processing and analysis method, and anticipated limitations for the study.

3.1 Research Design

Research design refers to the overall approach of a researcher (or research team) to bridge theory and concepts with the design of data-collection and analysis methods for a specific study; shaped by responding to realities and perspectives of participants and study contexts (Ravitch & Carl, 2020). This study employed a cross sectional survey design because it will help establish the state of the situation about the phenomenon under investigation at that particular time of research (Cresswell, 2014). It involved conducting a survey of the population elements at one point in time.

The study employed a descriptive-correlational design and will adopt a mixed-methods research approach. Quantitative component utilized a descriptive survey design, while qualitative approach will employ phenomenology due to its capability to provide an in-depth description of common characteristics of the phenomena under study (Creswell & Hirose, 2019). Both quantitative and

qualitative approaches were used to seek explanations and analyze opinions. The adoption of both approaches facilitated triangulation, enhancing the validity and reliability of the research findings

3.2 Study Population

The study population included employees and managers involved in project implementation within selected NGOs in the West Nile Region of Uganda. Administratively, West Nile region is composed of 11 district local governments: Pakwach, Nebbi, Zombo, Madi Okollo, Arua, Koboko, Maracha, Yumbe, Moyo, Obongi, and Adjumani projected total population of 3.2 million (AFARD, 2024).

This population was instrumental in providing insights into the practical aspects of managing VTs, the utilization of ICT infrastructure, and its effects on the performance of projects. The total population was 75 and consisted of 30 employees and stakeholders obtained from the Personnel of NGOs in West Nile in four purposively selected districts. These included other employee or staffs of NGOs working closely at the grass roots of implementation in community projects. Therefore, the population consisted of all characteristics required in the study. It was from this population that the required sample to be used in this study will be determined.

3.3 Sampling Procedure

Stratified random sampling and purposive sampling were used to select respondents from key departments directly concerned with managing virtual teams and project performance. The study participants were selected based on their willingness and availability. To execute the process the names of these persons were listed, located and contacted in person in seek of their responses. However, the researcher randomly selected staff members in NGOs totaling 111 respondents. Stratified random sampling was used to ensure that different categories of NGOs (based on size, focus

area, and geographic location within the region) were adequately represented. This technique enhanced the representativeness of the sample, allowing for generalizations of the findings to the broader population of NGOs in the region. The strategy also aimed at enhancing credibility (Komakech, Orach & Atuyambe, 2023). Respondents included: M&E Officers; Finance Managers; community development officers, area focal persons and other project staff.

On the other hand, purposive sampling was used to identify participants with relevant information for the study. This approach enabled the researcher to select individuals with knowledge and experience related to managing Virtual Teams and project performance, in line with the study's objectives. The participants were selected based on their expertise and practical insights into the subject matter. Focus group discussions were conducted with 12 purposefully chosen participants in each of the four selected districts, including administrators, IT personnel, and other key staff involved in virtual team operations and project management.

3.4 Sample Size

According to the study population above, there was 2 focus group discussions and 84 employees in various departments of NGOs in West Nile region. Using Krejcie and Morgan Table (1971). Systematic random sampling was used to pick four out of 11 districts. These include: Arua, Adjumani, Pakwach and Nebbi. For each district, a proportionate sample of 20 respondents was selected among employees of NGOs, plus 2 focus group discussions (FGDs) who were purposively selected.

Table 3.1: Sample Size Determination

Department	Population	Sample size	Sampling method
Programme Managers/administrators	16	10	Purposive sampling
IT support managers	12	8	Purposive sampling
Technical staff (M&E Officers; Finance Officers/Managers; community development officers, area focal persons and other project staff of NGOs.	142	108	Stratified random sampling
Total	170	126	

Source: West Nile Region NGO Board 2023

The desired sample size was therefore 126 respondents to correspond with Krejcie and Morgan (1970)'s table which states that a population of 170 calls for 126 sample size.

The inclusion of UN agencies in this study was essential due to their central role in coordinating, funding, and setting performance standards for humanitarian operations in the West Nile region much as UN-Agencies were not among the targeted institution, their frameworks, policies, and partnership arrangements significantly influence NGOs and CBOs project design, implementation, and virtual team management practices. Engaging them in the research ensured a comprehensive understanding of both internal organizational and external institutional factors affecting project performance, while enhancing the study's credibility and relevance.

3.5 Data Collection Methods

Qualitative method employed was interview method whereas quantitative methods involved use of questionnaire survey method during data collection. A questionnaire survey method using a self-

administered questionnaire to help in gathering quantitative data from primary respondents. Interview method using semi-structured interviews are a common data collection method in qualitative research and the quality of the interview guide fundamentally influences the results of the study. Interviews of face-to-face nature were carried out with the key informants. Document review method Secondary data were obtained from: NGO annual reports, M&E reports, policies, ICT reports, Project performance records among others.

3.6 Data Collection Tools

A number of data collection tools were used to collect both primary and secondary data. Secondary data was collected through reviewing literature related to projects management and sustainability in donor-funded projects, which was later triangulated with primary data findings. On one hand primary data collection was done using questionnaires and interview guide administered in NGOs selected by this study. Therefore, this study employed both qualitative and quantitative data collection methods (Part, 2002). Both primary and secondary data was collected.

3.6.1 Self-administered Questionnaire

A close-ended self-administered questionnaire was used for data collection from 84 employees in various departments concerned with project performance in selected NGOs. Questionnaires was expected to enable the researcher obtain results within a considerably short time. Self-administered questionnaires are used in studies to explore the experiences, perceptions and expectations of respondents (Leon, Lapkin, Fields & Moroney, 2022). It was also possible to get information from all the respondents identified purposively. Choosing questionnaire also addressed cost and budget limitations in this study.

The questionnaires thus gathered mainly qualitative information. Self-administered questionnaires were distributed to selected respondents by the researcher. A self-administered questionnaire was the major instrument that was used in data collection administered to various categories of employees of selected NGOs. These questionnaires comprised of closed-ended questions formulated by the researcher to gather quantitative information regarding research questions. It was useful in generating reliable and valid data from a high proportion of the population within a reasonable time period at a minimum cost and was a relatively cheap and quick means of obtaining information. Likert scales was used because of their suitability in measuring attitudes towards a topic by asking respondents to indicate whether they strongly agreed, agreed, neutral, disagreed or strongly disagreed with each of series of statements about the topic (Appendix A).

3.6.2 Focused Group Discussion guide

Two Focus Group Discussions were conducted across the four study districts to collect in-depth qualitative data on virtual team management and project performance. Purposive sampling brought together diverse stakeholders from all districts, fostering balanced perspectives, cross-district dialogue, and the exchange of varied experiences. Consolidating into two sessions addressed logistical, geographical, and budget constraints while maintaining methodological rigor. Guided by a semi-structured framework, the FGDs enabled real-time clarification, probing, and spontaneous sharing, capturing both consensus and divergent views for a comprehensive understanding of the issues

3.7 Validity and Reliability

Validity is how well research instruments measure; a document may be enhanced if it measures what it's supposed to (Roberts & Priest, 2006). The instrument was checked for its goal, and 10% of participant's questionnaires were pretested in different area. After the expert validation of the instrument for the content validity index (CVI) it was determined that the instruments used are valid. Instruments was also discussed with colleagues and supervisor and later pre-tested using a reasonable sample of respondents.

In interviews the researcher used simple language and clear instructions appropriate to the respondents. Questions were re-phrased to ensure consistency in responses of the participants. Respondents who participated in the study were informed and knowledgeable and provided reliable answers.

Reliability is concerned with the question of whether the results of a study are repeatable. The reliability index will be used to determine the internal consistency of the instrument, and its predicted performance. It will be assessed using the Cronbach's Alpha (α). Reliability coefficient of the research instrument will be assessed by using (α) computed as follows:

$$\alpha = \frac{k}{k-1} \times [1 - \frac{\sum (S^2)}{\sum S^2 \text{ sum}}]$$

Where: α = Cronbach's alpha k = Number of responses. The reliability coefficient value should be above 0.7. It should be noted that alpha measures the extent to which item responses obtained at the same time correlate highly with each other (DeVellis, 2003). Cronbach alpha is a measure for the

internal consistencies of the items that together cover the specific factor. It measures internal consistency of items to the concept.

3.8 Data processing and analysis

Data analysis is the process of bringing order, structure and meaning to the mass of information gathered. The instruments that were used to collect information that yielded both qualitative and quantitative data (Mugenda & Mugenda, 2003).

3.8.1 Quantitative data

The raw data was cleaned, sorted and condensed into systematically comparable data. Data analysis was done using the Statistical Package for Social Sciences (SPSS), which helped to summarize the coded data and this facilitated quick interpretation of the results. Descriptive statistics included: frequency tables for sample size, percentages, means, standard deviation, maximum and minimum values, averages and measures of variation of the data about the average.

Once the data was collected and exported to SPSS, the data was transformed from strings to numeric, and the analysis process was initiated with confirmatory factor analysis, followed by reliability, descriptive, correlation analysis. Correlation analysis is a statistical evaluation method useful in studying the strength of relationship between two numerically measured variables (Schober, Boer, & Schwarte, 2018). In this study, correlation analysis will be used to establish if there were possible relations between SP implementation and health service delivery. A further 2-tailed test will be conducted to determine the level of significance at 0.01 and 0.05. Additionally, regression analysis

was conducted to determine the predictive power of the different dimensions of virtual team management on project performance.

Quantitative data results have been presented in form of tables and graphs to enhance proper understanding of data while qualitative results were presented in a narrative form.

3.8.2 Qualitative data

The study utilized thematic analysis to examine qualitative data obtained from interviews with key informants involved in virtual team operations. This method was selected due to its flexibility and effectiveness in identifying and interpreting patterns within qualitative data, enabling a deeper understanding of how virtual team management influences project performance (Braun & Clarke, 2021). The analysis began with data familiarization, where interview recordings were transcribed and reviewed multiple times to gain a comprehensive understanding of the content. This process helped identify key ideas related to communication, coordination, trust, ICT usage, and project outcomes.

Next, initial coding was conducted by labeling meaningful segments of the data. Codes were assigned to recurring issues. This step organized the data into manageable units and highlighted relevant patterns. The coding process combined both deductive and inductive approaches to ensure comprehensive analysis.

The codes were then grouped into broader themes reflecting key aspects of virtual team management. Finally, the themes were refined and presented narratively, supported by participant quotations. This approach provided in-depth insights and enhanced the validity of the study through triangulation.

3.9 Limitations and Delimitations

The first and most significant limitation was convincing respondents that the information collected from them is not going to be used in illegal and unethical activities as well as assurance for confidentiality of private information. However, the introductory letter from the university confirmed that the information collected is only for academic purposes and promise confidentiality.

In terms of methodology, that this study relied on managers, heads of departments and all employees of NGOs to fill the questionnaires, and now in the absence of the researcher

The study may have certain limitations and therefore was confined to NGOs due to lack of time and adequate financial resources. However, in spite of these constraints; all effort was made to come out with thorough research.

Furthermore, there may be lack of awareness and willingness of some employees regarding, filling questionnaires with care and being unable to return the questionnaire on time basis.

Approval was granted by all participants after the relevant consent forms are signed so that the researcher can include them in the study. The researcher made sure that participants understand that they are not obliged to participate in the study. They were assured of confidentiality of the information provided and that the study findings would be used for academic purposes only. The researcher also sought consent of respondents to ensure that they willingly participate in the research to assure them that their participation in the study was purely voluntary.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter provides background information about the study's respondents and outlines the independent and dependent variables, focusing on virtual team management and project performance. The key objectives of the chapter are to examine virtual team management practices, assess the level of project performance, to establish relationship between virtual team management and project performance and to examine the moderating effect of ICT infrastructure on virtual team's management and project performance of NGOs in the study area.

4.1. Types of organization

Table 4.1 below; presents the distribution of participating organizations in the study, categorized into Community-Based Organizations (CBOs), National Organizations, and International Non-Governmental Organizations (INGOs).

Table 4.1: Types of organization

Organization type	Frequency	Percent
CBO	17	15.3
National Organization	34	30.6
INGO	60	54.0
Total	111	100.0

Source: Primary data 2024.

The results indicate that a total of 34 respondents (30.6%) are affiliated with National Organizations, reflecting a strong presence of professionals working within domestically focused institutions that emphasize national priorities, policies, and programs. Additionally, 54% of the participants were from INGO Agencies, indicating the involvement of global governance institutions in the sample, likely contributing to humanitarian, peacekeeping, and development efforts. Community-Based Organizations (CBOs) have the smallest representation, with 17 respondents (15.3%), suggesting a less localized, grassroots level of organizational engagement, typically centered on community-driven initiatives and smaller-scale projects.

4.2 Virtual Teams Management Practices

In this research's section, virtual team management practices are examined around three key areas: team building, communication, and knowledge management. These elements play a crucial role in how well virtual teams' function, especially in development and humanitarian settings where remote work is becoming the norm.

4.2.1 Team Building

Table 4.2 below; presents the analysis of team-building effectiveness within Virtual Teams (VTs) across five dimensions: team development, trust, cooperation, responsiveness, and collaboration.

Table 4.2: Team Building

Team Building	SD (%)	D (%)	N (%)	A (%)	SA (%)
Team development is done in Virtual Teams	5.4	7.2	18.9	45.0	23.4
Virtual Team members trust each other	2.7	19.8	19.8	37.8	19.8
There is significant cooperation among Virtual Teams	2.7	10.8	18.9	43.2	24.3
Virtual Teams are responsive to co-workers' needs	1.8	10.8	22.5	48.6	16.2
Virtual Teams collaborate with each other to attain common organizational goals	1.8	1.8	12.6	53.2	30.6
Average	2.9	10.0	18.5	45.6	22.9

Source: Primary data 2024.

Overall, the findings show a predominantly positive perception, with an average of 68.5% of respondents agreeing or strongly agreeing across all indicators, while only 12.9% expressed disagreement and 18.5% remained neutral. Collaboration toward organizational goals emerged as the strongest area, with 83.8% affirming its presence, reflecting a solid culture of collective goal achievement in virtual environments. Team development was similarly viewed positively by 68.4%, though 18.9% were neutral and 12.6% disagreed, indicating that although team formation practices are effective for many, there remains room for improvement. Trust among team members received support from 57.6% of respondents, but a significant 22.5% expressed disagreement and 19.8% remained neutral, revealing that interpersonal trust is a challenge in some teams. Likewise, cooperation was endorsed by 67.5%, while 13.5% disagreed and 18.9% were neutral, suggesting that while collaboration is generally strong, a portion of teams face relational or operational barriers. Responsiveness to co-worker's needs was positively rated by 64.8%, but again, 22.5% neutral responses and 12.6% disagreement indicate inconsistency in mutual support across teams.

Insights from the FGD reinforced these results, revealing that *knowledge and resource availability emerged as foundational to virtual team performance*. Participants emphasized that teams equipped with adequate technical knowledge and necessary equipment demonstrated greater operational efficiency. Moreover, the retention of key staff was identified as critical for preserving institutional memory and ensuring continuity in project delivery.

4.2.2 Team Communication

Table 4.3 below presents the effectiveness of communication within Virtual Teams (VTs) across key dimensions, including the use of available communication infrastructure, direct knowledge-sharing practices, integration of computer-mediated technologies, support for remote project coordination, and maintaining focus on performance targets.

Table 4.3: Team Communications

Team Communications	SD (%)	D (%)	N (%)	A (%)	SA (%)
Virtual Teams use the available communication infrastructure	2.7	3.6	9.0	59.5	25.2
Direct communication processes are used to share knowledge among Virtual Teams	3.6	1.8	9.0	58.6	27.0
Computer-mediated technologies are tools used for VT communication	1.8	2.7	5.4	55.0	35.1
Virtual communication enables remote project coordination	1.8	0.9	6.3	45.0	45.9
Virtual communication reminds Virtual Teams about their performance targets	2.7	4.5	12.6	50.5	29.7
Average	2.5	2.7	8.5	53.7	32.6

Source: Primary data 2024.

The findings reveal strong confidence in the effectiveness of communication within Virtual Teams (VTs). A combined 84.7% of respondents agreed or strongly agreed that their teams effectively utilize available communication infrastructure, with only 2.7% expressing strong disagreement. Similarly, 85.6% positively rated knowledge-sharing through direct communication, underscoring the trust in interpersonal exchanges within VTs. The integration of computer-mediated technologies, such as messaging platforms and video conferencing, was affirmed by 90.1% of respondents, highlighting their central role in enabling seamless collaboration. Virtual communication was also widely acknowledged as essential for coordinating remote projects, with 91% agreement, and only 1.8% dissent. Additionally, 80.2% of participants agreed that virtual communication helps keep teams focused on performance targets, reinforcing its importance in maintaining alignment with organizational goals. Overall, the data illustrates that virtual communication tools are not only widely adopted but are also viewed as critical enablers of effective teamwork and productivity in virtual environments.

From the FGD discussions, *training and communication practices were found to significantly affect team effectiveness*. Respondents noted that concise, precise, and well-targeted training sessions yielded better outcomes, whereas poorly scheduled virtual meetings, particularly those not adapted to field realities disrupted ongoing activities and undermined performance.

4.2.3 Knowledge Management

Table 4.4 below presents the effectiveness of Knowledge Management (KM) within Virtual Teams (VTs) across dimensions such as fostering a knowledge-sharing culture, creating a conducive learning

environment, supporting strategic planning, guiding capacity-building efforts, and the role of top management in KM practices.

Table 4.4: Knowledge Management

Knowledge Management	SD (%)	D (%)	N (%)	A (%)	SA (%)
Knowledge management creates a conducive learning environment for Virtual Teams	1.8	0.0	10.8	62.2	25.2
Our organization has a knowledge-sharing culture	2.7	0.0	6.3	59.5	31.5
Top management controls KM practices in the NGO	1.8	5.4	21.6	48.6	22.5
Knowledge management helps in strategy formulation for our NGO	2.7	3.6	6.3	59.5	27.9
Knowledge management enables identification of gaps in capacity building for virtual teams	2.7	0.9	7.2	51.4	37.8
Average	2.3	2.0	10.0	56.2	28.9

Source: Primary data 2024.

The survey findings underscore the critical role of Knowledge Management (KM) in enhancing organizational learning, strategic development, and capacity building within Virtual Teams (VTs). With over 85% of respondents agreeing or strongly agreeing across all measured statements, the data reflects high confidence in the effectiveness of KM practices. Notably, 91% affirmed that their organizations promote a strong knowledge-sharing culture, fostering collaboration and innovation. Additionally, 87.4% recognized KM's role in cultivating a learning environment for VTs, while an equal percentage acknowledged its contribution to strategic planning. KM's importance in guiding capacity-building efforts was also evident, with 89.2% agreement on its effectiveness in identifying training needs. While overall support for KM is strong, perceptions of top management's control over

KM practices were slightly less favorable, 71.1% agreed, but 21.6% remained neutral, suggesting room for more inclusive or decentralized KM governance. With disagreement levels averaging below 5% across all areas, the findings confirm that KM is not only well-established but also widely valued as a driver of virtual team performance and strategic agility.

4.3 Project Performance

This section presents a detailed analysis of project performance as a key variable in the study. Specifically, it examines three critical dimensions; project proficiency, the achievement of project milestones, and time management. These elements are essential indicators of how well projects are executed, monitored, and completed within the organizational and virtual team contexts.

4.3.1 Project Proficiency

Table 4.5 below; presents Virtual Teams' (VTs) proficiency across five indicators; productivity, continuous improvement, self-motivation, timely target achievement, and progress reporting, offering a snapshot of their overall effectiveness and operational transparency.

Table 4.5: Project Proficiency

Project Proficiency	SD (%)	D (%)	N (%)	A (%)	SA (%)
Virtual Teams have performance effectiveness in terms of productivity	2.7	6.3	17.1	55.0	18.9
Our Virtual Teams show zeal for continuous improvement	0.9	0.9	18.9	60.4	18.9
Virtual Teams are self-motivated to achieve goals	1.8	8.1	17.1	55.0	18.0
Virtual Teams attain their targets in time	1.8	18.9	20.7	40.5	18.0
The Virtual Teams provide constant updates on the progress towards tasks	0.9	1.8	9.0	51.4	36.9
Average	1.6	7.2	16.6	52.5	22.1

Source: Primary data 2024.

The analysis of Table 4.7 shows that Virtual Teams (VTs) are generally viewed as performing well across key areas such as productivity, continuous improvement, self-motivation, meeting targets on time, and progress reporting. Most respondents felt their teams were productive (73.9%), committed to improving (79.3%), and self-motivated (73%), though some noted there is still room to build consistency and maintain drive across all members. Meeting deadlines was seen as a moderate strength (58.5%), pointing to the need for better time management and realistic planning. On a positive note, the strongest feedback came in progress reporting, with 88.3% confirming that their teams regularly share updates reflecting a strong culture of coordination, openness, and accountability.

4.3.2: Project Milestones

Table 4.6 below; presents the analysis of project milestones in guiding the performance and evaluation of Virtual Teams (VTs).

Table 4.6: Project Milestones

Project Milestones	SD (%)	D (%)	N (%)	A (%)	SA (%)
Virtual Teams finish projects on-time as budgeted	0.9	23.4	31.5	30.6	13.5
Our Virtual Teams use projects milestones when the project is evaluated	0.9	1.8	19.8	52.3	25.2
Using milestones enables Virtual Teams decide the project progress	0	9.9	13.5	53.2	23.4
Virtual Teams calculate total project duration taking account key milestones	0.9	3.6	19.8	57.7	18.0
Virtual Teams set realistic goals to achieve milestones	0.9	6.3	20.7	52.3	19.8
Average	0.72	9	21.06	49.22	19.98

Source: Primary data 2024.

The findings show that most respondents see milestones as a vital part of managing projects, with close to 70% agreement across all measures. However, finishing projects on time and within budget stood out as a challenge, with less than half (44.1%) agreeing and many expressing neutral or negative views, highlighting common difficulties virtual teams face in managing scope, time, and costs. On a more positive note, milestones were widely appreciated for their practical value: 77.5% said they are useful for project evaluation, 76.6% felt they help track progress, and 75.7% confirmed they are used to calculate total project duration. Setting realistic goals to meet these milestones was also seen as important by 72.1% of respondents, though some mixed feedback suggests this practice is not applied consistently across all teams.

4.3.3 Time Management

Table 4.7 below; summarizes respondents' perceptions regarding how effectively virtual teams manage time in various project aspects.

Table 4.7: Time Management

Time Management	SD (%)	D (%)	N (%)	A (%)	SA (%)
Virtual Teams use project completion score in terms of time dimension	0	6.3	23.4	53.2	17.1
Virtual Teams ensure timeliness of evaluations for all projects	0.9	5.4	18.9	51.4	23.4
Virtual Teams ensure that the necessary time extension that fits to the additional activities for Virtual Teams	0.9	12.6	26.1	42.3	18.0
To ensure that the project is on track, Virtual Teams share reports in a timely manner.	0.9	5.4	9.9	55.0	28.8
Average	0.675	7.425	19.58	50.48	21.83

Source: Primary data 2024.

The findings reveal that 70.3% of respondents agree or strongly agree that project completion scores are effectively used to track time performance, though 23.4% remain neutral, suggesting varied adoption across teams. For project evaluations, 74.8% confirm that these are conducted in a timely manner, indicating overall satisfaction, despite 18.9% being neutral. Regarding time extensions for additional tasks, 60.3% express satisfaction, though a notable 26.1% remain neutral and 12.6% disagree, pointing to potential inconsistencies in extension practices. Finally, 83.8% of respondents

agree or strongly agree that progress reports are shared promptly to keep projects on track, highlighting timely reporting as a key strength of virtual teams.

4.4 Relationship between virtual team management practices and project performance

4.4.1 Correlation analysis

A Pearson correlation analysis was conducted to examine the relationship between virtual team management practices (team building, team communication, and knowledge management) and project performance among NGOs operating in West Nile region of Uganda. The results indicated statistically significant positive correlations across all variables, suggesting that effective virtual team management is associated with improved project outcomes. Specifically, team building demonstrated a strong positive correlation with project performance, $r = 0.652, p < 0.001$ implying that NGOs that invest in virtual team-building strategies are more likely to report better project performance. Team communication also showed a moderate positive correlation with project performance, $r = 0.475, p < 0.001$, indicating that effective communication within virtual teams contributes meaningfully to the success of project implementation. Likewise, knowledge management had a strong positive correlation with project performance, $r = 0.576, p < 0.001$ suggesting that the ability to effectively manage and share knowledge within virtual teams enhances overall project delivery and effectiveness as shown in Table 4.8 below.

Table 4.8: Bivariate correlations

	Project Performance	Team Building	Team Communication	Knowledge management
Project Performance	1			
Team Building	0.652**	1		
Team Communication	0.475**	0.609**	1	
Knowledge management	0.576**	0.634**	0.692**	1

4.4.2 Regression analysis

To assess the predictive power of virtual team management dimensions (team building, team communication, and knowledge management) on project performance, a multiple linear regression analysis was conducted. The regression model was statistically significant, $F(3, 107) = 31.60, p < .001$, indicating that the model reliably predicts project performance.

The model summary reveals that the three predictors together explain approximately 45.5% of the variance in project performance ($R^2 = 0.470$, Adjusted $R^2 = 0.455$). This suggests that nearly half of the variability in project performance among the NGOs studied can be attributed to differences in virtual team building, communication, and knowledge management practices.

Examining the regression coefficients, the analysis shows that team building has a significant and positive influence on project performance ($\beta = 0.483, t = 5.05, p < 0.001$). This implies that enhancing team building activities within virtual teams such as fostering trust, collaboration, and cohesion is associated with improved project outcomes.

Similarly, knowledge management emerged as a significant predictor ($\beta = 0.278, t = 2.65, p = 0.009$), indicating that effective sharing, organization, and use of knowledge resources within virtual teams

positively impact project performance. The practical implication here is that NGOs that establish systems for managing knowledge in virtual settings can expect better delivery of project goals.

In contrast, team communication was not a statistically significant predictor of project performance ($\beta = -0.012$, $t = -0.117$, $p = 0.907$). This suggests that, within this particular sample, the frequency or clarity of communication in virtual teams does not independently predict project success when team building and knowledge management are accounted for. It may imply that communication's effect is already captured through its influence on other variables or that its standalone contribution is minimal.

Table 4.9: Coefficients

		Unstandardized		Standardized				
		Coefficients		Coefficients		95.0% CI for B		
Model		B	Std. Error	Beta	T	Sig.	Lower	Upper
1	(Constant)	1.545	0.295		5.233	0.000	0.959	2.130
	Team Building	0.337	0.067	0.483	5.053	0.000	0.205	0.470
	Team Communication	-0.011	0.094	-0.012	-0.117	0.907	-0.196	0.174
	Knowledge management	0.265	0.100	0.278	2.651	0.009	0.067	0.462
	R	0.685						
	R ²	0.470						
	Adjusted R ²	0.455						
	F	31.596						
	Sig. F	<0.001						

a. Dependent Variable: Project Performance

4.5 Moderating effect of ICT infrastructure on Virtual team management

To examine whether ICT infrastructure moderates the relationship between virtual team management and project performance, a moderation analysis was conducted using PROCESS macro version 4.0 (Model 4) developed by Dr. Frances Hayes. A sample of 111 observations was analyzed.

The first model assessed the predictive effect of virtual team management on the proposed moderator, ICT infrastructure. Results revealed a statistically significant relationship, $R^2 = 0.3705$, $F(1, 109) = 64.16$, $p < 0.001$. Virtual team management significantly predicted ICT infrastructure ($b = 0.612$, $SE = 0.076$, $t = 8.01$, $p < 0.001$, 95% in Table 4.12. This indicates that improvements in virtual team management are associated with enhanced ICT infrastructure capacity within the organizations studied.

The second model evaluated the combined effects of virtual team management and ICT infrastructure on project performance. The overall model was significant, $R^2 = 0.4723$, $F(2, 108) = 48.33$, $p < 0.001$, indicating that the predictors jointly explained approximately 47.2% of the variance in project performance. Specifically, virtual team management significantly predicted project performance ($b = 0.489$, $SE = 0.085$, $t = 5.78$, $p < 0.001$, 95% as did ICT infrastructure ($b = 0.235$, $SE = 0.084$, $t = 2.79$, $p = 0.006$, 95% as shown in Table 4.13.

Additionally, the indirect effect of virtual team management on project performance through ICT infrastructure was significant, with a bootstrapped point estimate of 0.144 and a 95% confidence interval that did not include zero (BootLLCI = 0.026, BootULCI = 0.253) as shown in Table 4.15.

This confirms the presence of a partial mediation effect, whereby ICT infrastructure partially explains how virtual team management impacts project performance.

Taken together, these findings suggest that ICT infrastructure plays both a mediating and enhancing role in the effectiveness of virtual team management practices on project performance. Organizations that strengthen their ICT systems may not only improve communication and collaboration in virtual teams but also see a tangible boost in project outcomes.

Model: 4

Y: Project Performance

X: Virtual Team management

M: ICT Infrastructure

Sample Size: 111

Table 4.10: Outcome variable I, ICT Infrastructure

	Coefficient	SE	T	p	LLCI	ULCI
Constant	1.6502	0.3072	5.3722	0.0000	1.0414	2.2590
Virtual team management	0.6119	0.0764	8.0098	0.0000	0.4605	0.7634
R	0.6087					
R ²	0.3705					
F	64.156					
P	0.0000					

Table 4.11: Outcome variable II, Project Performance

	Coefficient	SE	T	p	LLCI	ULCI
Constant	0.9390	0.3034	3.0944	0.0025	0.3375	1.5404
Virtual team management	0.4892	0.0846	5.7835	0.0000	0.3215	0.6569
ICT Infrastructure	0.2346	0.0841	2.7879	0.0063	0.0678	0.4013
R	0.6872					
R ²	0.4723					
F	48.33					
P	0.0000					

The indirect effect (0.1435) means that part of Virtual Team Management's impact on Project Performance works through ICT Infrastructure. For every 1-unit increase in Virtual Team Management, Project Performance increases by about 0.14 units indirectly via ICT Infrastructure, in addition to the direct effect of 0.49 (see Table 10 & 11)

Table 4.12: Direct effect(s) of Virtual Team Management (X) on Project Performance (Y)

Effect	SE	T	P	LLCI	ULCI
0.4892	0.0846	5.7835	0.0000	0.3215	0.6569

Table 4.13: Indirect effect(s) of Virtual Team Management (X) on Project Performance (Y)

	Effect	BootSE	BootLLCI	BootULCI
ICT Infrastructure	0.1435	0.0583	0.0258	0.2532

CHAPTER FIVE

DISCUSSIONS

5.0 Introduction

This chapter presents a critical interpretation and discussion of the findings presented in Chapter Four, drawing connections between the empirical results, the research objectives, and the existing literature. The purpose of this chapter is to explore the practical and theoretical implications of the results, assess their alignment or divergence from prior studies, and provide actionable recommendations for improving virtual team management and project performance in NGOs operating in Uganda.

5.1 Virtual team management practices

The results demonstrated that team members generally perceive their virtual teams as cohesive, motivated, and well-structured. High levels of agreement were observed regarding members' willingness to collaborate, mutual trust, and a shared sense of purpose. These findings align with the work of Ford, Piccolo, and Ford (2017) who emphasized that effective team building in virtual settings requires deliberate efforts to foster trust, clarify team roles, and ensure social bonding despite geographical separation.

However, a modest proportion of respondents expressed neutrality or disagreement concerning team self-motivation and timely achievement of targets, suggesting that not all teams experience the same level of cohesion or drive. This inconsistency resonates with the observations of Gibson and Grushina (2021), who argued that while virtual teams can be highly effective, disparities in engagement levels often arise due to limited face-to-face interaction and challenges in sustaining accountability across dispersed members.

Communication emerged as a relative strength among virtual teams. Most respondents confirmed that their teams maintain regular updates on task progress and share information openly. This supports the findings of Wen and Gheisari (2020), who found that frequent and structured communication enhances trust and mitigates misunderstandings in virtual environments. Moreover, Kiely, Butler, and Finnegan (2022) highlight that clear, consistent communication is crucial for virtual team success, particularly when managing complex tasks under tight timelines.

Nonetheless, the results also indicated variability in communication effectiveness, especially where team members failed to meet timelines despite consistent updates. This contrast suggests that while communication may be present, its quality and strategic use in decision-making and problem-solving may vary. As Fristedt (2021) note, virtual teams often fall short not due to a lack of communication, but rather due to insufficient depth, timeliness, or responsiveness in the communication that occurs. The findings also show that knowledge sharing is perceived as active and collaborative among most virtual teams. Teams reportedly utilize digital platforms to store, access, and update information regularly, aligning with the knowledge management practices outlined by Natu and Aparicio (2022). The authors underscore the critical role of ICT in enabling virtual teams to codify and disseminate both explicit and tacit knowledge across organizational units.

However, the study also identified that some virtual teams struggle with real-time access to critical documents and updates, often due to infrastructural limitations. This observation is consistent with the research of Vinson (2024), who emphasized that even well-intentioned virtual teams may

experience knowledge gaps and redundancies when there is inadequate investment in supporting technologies or when digital literacy among team members is uneven.

Taken together, these findings affirm the theoretical argument that virtual team management significantly influences project performance, particularly when built upon strong foundations of trust, effective communication, and knowledge sharing (Davidavičienė, Al Majzoub, and Meidute-Kavaliauskiene 2020; Hodzic, Efendic, and Kapo 2025). In the context of Ugandan NGOs, these dimensions appear especially vital given the resource constraints and dependency on donor-driven timelines.

Yet, the data also suggests that virtual team effectiveness is not uniform across organizations, hinting at the moderating role of contextual factors such as organizational culture, ICT access, and managerial commitment. This reinforces the position of Wen and Gheisari (2020), who notes that virtual team dynamics are shaped not only by internal processes but also by the broader technological and institutional environment.

5.2 Project performance

Project proficiency, referring to the ability of project teams to apply technical knowledge, manage resources, and deliver quality outputs, was rated highly by respondents. This suggests that NGOs have developed internal capabilities to maintain effectiveness despite operating in virtual or hybrid work arrangements. These findings align with Kathio and Paul (2025), who reported that project teams using digital project management tools and virtual collaboration platforms showed improved skill application and decision-making accuracy in Kenyan NGOs. However, the study also found that proficiency levels were lower in organizations with weak internal coordination mechanisms. This

reflects Alghail, Yao, and Abbas (2024) argument that proficiency in virtual project environments is strongly influenced by both the availability of ICT infrastructure and the maturity of project management systems.

Achievement of project milestones defined as the timely completion of planned deliverables was also reported at a generally high level across the NGOs that participated in this study. Most NGOs in the sample indicated that they had met critical deliverables within project cycles. This supports Kudyba and DCruz (2023), who observed that consistent milestone achievement in development projects is often a result of agile planning, digital documentation, and iterative monitoring, all of which are features common in virtual team settings. Yet, a minority of respondents noted that milestone delays sometimes occurred, especially in projects involving rural outreach or multi-partner coordination. These findings are consistent with Otundo Richard (2024), who found that external dependencies such as delays in donor approvals or logistical constraints can negatively affect milestone adherence, even in digitally enabled environments.

The findings indicate that time management within NGO project teams is moderately strong, particularly where task delegation, digital calendars, and online monitoring systems were in use. Respondents highlighted the use of virtual check-ins, project tracking tools (e.g., Trello, Asana), and mobile reporting platforms as enablers of better time discipline. These results are supported by Nguar and Appolloni (2025), who found that time efficiency is significantly enhanced in NGOs that invest in staff capacity building on digital productivity tools. Nevertheless, some NGOs particularly those operating in bandwidth-limited regions reported inefficiencies due to internet outages, power cuts, and a lack of real-time access to reporting platforms. These constraints echo Galindo-Domínguez and

Bezanilla (2021) findings, which showed that the success of virtual time management practices is highly dependent on contextual ICT conditions and digital fluency among staff.

Overall, the study demonstrates that NGOs using virtual team management approaches can maintain satisfactory levels of project performance, especially when supported by robust planning and digital coordination. The positive ratings on proficiency, milestone achievement, and time use suggest that virtual teams, when effectively structured, can deliver high-impact results. This supports the view of Lee (2021), who argue that performance in virtual project teams depends not only on tools and systems but also on leadership clarity, accountability mechanisms, and continuous team engagement. However, this study also highlights the risks of uneven performance, especially among organizations with low ICT readiness or high dependency on external actors. As such, improving virtual team effectiveness must be accompanied by targeted investments in infrastructure, training, and adaptive planning.

5.3 Relationship between virtual team management and project performance

The results confirmed that effective team building plays a critical role in enhancing project performance. NGOs that engaged in intentional team development activities such as assigning clear roles, creating space for team bonding, and establishing shared goals exhibited higher proficiency in meeting targets and deadlines. This aligns with findings by Zhang, Zhao, and Yu (2022), who emphasized that strong interpersonal relationships, psychological safety, and mutual trust within virtual teams lead to enhanced team performance and goal alignment. Zamani and Pouloudi (2022) similarly argued that effective team building in geographically dispersed teams leads to a shared mental model, which is crucial for coordinating complex project activities. These findings affirm the

importance of investing in structured onboarding, virtual retreats, and clarity in team norms to strengthen cohesion and performance outcomes in the NGO sector.

Contrary to theoretical expectations, team communication was not found to have a significant relationship with project performance in this study. This result contrasts with several prior studies (e.g., Antonio 2023; Karolina 2015) which established communication as a cornerstone of successful virtual collaboration.

This divergence could be attributed to contextual challenges within Ugandan NGOs, such as inconsistent internet connectivity, reliance on asynchronous communication tools, and limited digital communication training. These barriers may reduce the quality and timeliness of information exchange, thereby diluting the effectiveness of communication in improving performance. Sivhada et al. (2024) similarly observed that in low-resource settings, even frequent communication may not yield performance gains if it lacks clarity, timeliness, or strategic alignment with project goals.

These findings suggest that communication alone is insufficient unless accompanied by robust digital infrastructure and communication competence within virtual teams. The results echo the caution by Kornei (2020) that unstructured or ineffective communication in virtual teams can become noise, rather than a facilitator of coordination.

Knowledge management emerged as a significant positive predictor of project performance. NGOs that implemented systems for knowledge sharing, documentation, and learning were better positioned to meet milestones and deliver on project objectives. These findings support the work of (Kenny 2019), who argue that effective knowledge flows within virtual teams facilitate learning, innovation,

and adaptive responses which are key factors for project success. Ellenberger (2024) also demonstrated that knowledge-sharing practices such as shared document platforms, routine debriefs, and mentoring significantly increase project performance by reducing redundancy and promoting continuity, especially in multi-stakeholder environments such as NGOs. The findings underline the importance of institutionalizing knowledge processes in virtual teams to prevent knowledge loss and ensure consistent decision-making across dispersed members.

The overall findings suggest that while virtual team management is a relevant framework for enhancing project performance in NGOs, its impact varies across components. Team building and knowledge management are particularly critical, contributing directly to milestone completion and efficient project execution. On the other hand, communication while necessary is not inherently enhanced unless it is reliable, structured, and aligned with team needs.

The results emphasize the need for NGOs to go beyond basic communication tools and instead invest in team capacity-building, structured collaboration practices, and knowledge management systems tailored to low-resource, high-stakes environments.

5.4 Moderating effect of ICT infrastructure on virtual team's management

Findings from the moderation analysis using Hayes' PROCESS macro (Model 4) demonstrated that ICT infrastructure significantly enhances the positive relationship between virtual team management and project performance. The model explained 47.2% of the variance in project performance with both virtual team management and ICT infrastructure emerging as significant predictors.

The results suggest that virtual team management is not only directly linked to higher project performance but also indirectly affects performance through improved ICT infrastructure. The

mediation effect was supported by a significant indirect effect, indicating that ICT infrastructure partially mediates the relationship. This supports the argument that robust ICT systems are instrumental in facilitating effective virtual collaboration, which ultimately enhances project delivery. These findings are consistent with several studies who found that strong ICT infrastructure enhances the effectiveness of virtual teams by improving information flow, reducing communication delays, and supporting real-time collaboration (Ford et al. 2017; Lee 2021). Similarly, Abarca, Palos-Sanchez, and Rus-Arias (2020) highlighted that virtual teams equipped with advanced ICT tools demonstrate higher cohesion, decision-making speed, and adaptability, particularly in complex project environments.

Furthermore, Davidavičienė et al. (2020) emphasized that in NGO contexts where resource constraints are prevalent, investment in scalable ICT solutions enables better coordination and monitoring of project activities. The current findings reinforce this position by demonstrating a tangible statistical link between ICT capacity and project outcomes in non-profit settings.

Interestingly, this study aligns with the hybrid model highlighted in Goodhue and Thompson (1995), which posits that while virtual team leadership and structure are essential, their impact is amplified when supported by enabling technologies. This suggests that virtual team management practices cannot operate in isolation but require a strong digital backbone to reach their full potential.

However, the results diverge from earlier studies that downplayed the moderating role of ICT in non-profit contexts due to assumed low technology adoption (e.g., Mao 2024). This discrepancy may reflect changing trends in the NGO sector, particularly in Sub-Saharan Africa, where increasing donor

emphasis on digital monitoring and adaptive management is pushing organizations toward ICT-enabled solutions.

In conclusion, the study provides strong empirical support for the dual role of ICT infrastructures as both a mediator and moderator in the relationship between virtual team management and project performance. These findings underline the importance for NGOs to not only invest in building virtual team capacity but also to strengthen ICT systems as a strategic enabler of performance.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMENDATIONS

6.0 Introduction

This chapter presents a summary of the key findings from the study, draws conclusions based on the research objectives, and provides actionable recommendations for improving project performance through effective virtual team management in NGOs.

6.1 Summary

6.1.1 Virtual team management practices

The study revealed a relatively high level of virtual team management among NGOs, with a strong emphasis on knowledge management and team building. However, team communication scored the lowest among the three dimensions. While knowledge management and team building were positively associated with project performance, team communication was found to be statistically insignificant. This suggests that although virtual teams are making progress in some areas, communication remains a potential weakness.

6.1.2 Project performance

Project performance was assessed through three parameters: project proficiency, milestone achievement, and time management. Results indicated that NGOs generally performed well across all three dimensions, with project milestone achievement ranking highest. However, time management was identified as a comparatively weaker area. This finding points to the need for improved planning and scheduling practices within virtual project environments.

6.1.3 Relationship between virtual team management and project performance

The study found a statistically significant and positive relationship between virtual team management and project performance. Knowledge management and team building were strong predictors of project success. However, team communication did not significantly contribute to project performance, contrary to expectations and previous literature. This suggests that while communication is essential, its effectiveness may depend more on the quality and structure of communication systems rather than frequency alone.

6.1.4 Moderating effect of ICT infrastructure on virtual team's management

The moderation analysis showed that ICT infrastructure significantly enhanced the relationship between virtual team management and project performance. Moreover, the results demonstrated that ICT infrastructure partially mediated this relationship. Virtual team management significantly predicted ICT infrastructure capacity, which in turn positively influenced project performance. These findings underscore the critical role of reliable ICT systems in enabling effective virtual collaboration and improving project outcomes in NGO settings.

6.2 Conclusions

6.2.1 Virtual team management practices

The study concludes that virtual team management in NGOs operating in Uganda is generally well-established, particularly in areas of team building and knowledge management. These practices are positively contributing to effective collaboration and knowledge sharing among dispersed teams. However, team communication was found to be a weak link, with no statistically significant impact on project performance. This indicates that while communication exists, it may not be well-structured, timely, or effective enough to influence project outcomes meaningfully. There is a need for NGOs to rethink and improve the quality and channels of virtual communication.

6.2.2 Project performance

Project performance levels among NGOs were found to be moderate to high, with the achievement of project milestones as the strongest area. However, time management remains a challenge for many organizations, suggesting potential inefficiencies in scheduling, remote coordination, or resource allocation in virtual environments. Improving these aspects could significantly boost overall project effectiveness.

6.2.3 Relationship between virtual team management and project performance

There is a statistically significant relationship between virtual team management and project performance. In particular, knowledge management and team building emerged as important drivers of improved project outcomes. However, team communication did not significantly predict performance, indicating that simply having communication processes is not enough; quality, clarity, and structure matter more. This finding challenge conventional wisdom and emphasizes the need for strategic investments in communication planning within virtual teams.

6.2.4 Moderating effect of ICT infrastructure on virtual team's management and project performance

ICT infrastructure plays both a mediating and enhancing role in the relationship between virtual team management and project performance. Virtual team management positively influenced the state of ICT infrastructure, which in turn significantly improved project performance. The findings confirm that ICT infrastructure is not just a background enabler but a strategic asset that amplifies the benefits of strong virtual team practices. Therefore, NGOs that invest in robust, user-friendly ICT systems are more likely to achieve better outcomes in their projects.

6.3 Recommendations

Based on the findings of this study, the following key recommendations are proposed to enhance virtual team management practices and improve project performance among NGOs operating in the West Nile region of Uganda:

To enhance project outcomes, NGOs should institutionalize structured team building and knowledge-sharing practices. These components were found to significantly influence performance, indicating that regular capacity-building sessions and internal knowledge systems (e.g., wikis, digital repositories) can boost efficiency and team synergy.

Investment in ICT infrastructure must be treated as a strategic enabler, not just a support function. Since ICT infrastructure strengthens the effect of virtual team management on performance, NGOs and development partners should prioritize digital tools, reliable internet access, and user training to maximize team effectiveness and accountability.

Adoption of digital project management tools is essential for improving project proficiency, timely delivery, and milestone tracking. By using tools such as Trello, Asana, or Microsoft Teams, project managers can better organize tasks, assign responsibilities, and monitor progress, leading to more consistent achievement of project goals.

Communication strategies within virtual teams require rethinking. Despite its assumed importance, team communication did not have a significant impact on performance. Organizations should focus less on volume and frequency of communication, and more on clarity, relevance, and alignment with task execution, using analytics to monitor and refine practices over time.

6.4 Areas of further studies

While this research has provided valuable insights into virtual team management practices and their relationship with project performance among NGOs in the West Nile region, certain limitations such as the study's focus on a single region, resource constraints, and the scope of variables examined suggest opportunities for further exploration. Expanding future research beyond the current geographical and thematic boundaries could provide a more comprehensive understanding of the dynamics influencing virtual team effectiveness. The following areas are recommended for future studies to build on the findings of this research and address gaps that were beyond its scope.

- I. Explore how virtual team management practices and their impact on project performance differ between the West Nile region and other regions in Uganda or sub-Saharan Africa.
- II. Investigate the impact of gender dynamics within virtual team environments, including leadership roles, communication styles, and decision-making, on project performance.
- III. Research how ICT innovations influence the efficiency of virtual teams and improve project performance outcomes.

REFERENCES

- Abarca, Victor M. Garro, Pedro R. Palos-Sanchez, and Enrique Rus-Arias. 2020. "Working in Virtual Teams: A Systematic Literature Review and a Bibliometric Analysis." *IEEE Access* 8:168923–40. doi: 10.1109/ACCESS.2020.3023546.
- Alghail, Adnan, Liu Yao, and Mohammed Abbas. 2024. "Will Knowledge Infrastructure Capabilities Elevate the Project Management Maturity? An Empirical Study." *VINE Journal of Information and Knowledge Management Systems* 54(4):782–803. doi: 10.1108/VJKMS-12-2021-0289.
- Antonio, Jose. 2023. "Effective Communication: A Cornerstone of Successful Management." *Journal Dimensie Management and Public Sector* 4(3):1–6.
- Davidavičienė, Vida, Khaled Al Majzoub, and Ieva Meidute-Kavaliauskiene. 2020. "Factors Affecting Knowledge Sharing in Virtual Teams." *Sustainability* 12(17):6917. doi: 10.3390/su12176917.
- Ellenberger, F. E. 2024. "Enhancing Knowledge Sharing Among Educational Consultants in Project-Based Organizations : Exploring Boundary Conditions for Effective Knowledge Sharing Tools with an Educational Design Research Approach."
- Ford, Robert C., Ronald F. Piccolo, and Loren R. Ford. 2017. "Strategies for Building Effective Virtual Teams: Trust Is Key." *Business Horizons* 60(1):25–34. doi: 10.1016/j.bushor.2016.08.009.
- Fristedt, Saga. 2021. "Communication , Collaboration and Belongingness in Virtual Teams." Malmö University, Faculty of Technology and Society (TS), Department of Computer Science and Media Technology (DVMT).
- Galindo-Domínguez, Héctor, and María-José Bezanilla. 2021. "Promoting Time Management and Self-Efficacy Through Digital Competence in University Students: A Mediatonal Model." *Contemporary Educational Technology* 13(2):ep294. doi: 10.30935/cedtech/9607.
- Gibson, Cristina B., and Svetlana V. Grushina. 2021. "A Tale of Two Teams." *Organizational Dynamics* 50(1):100823. doi: 10.1016/j.orgdyn.2020.100823.
- Goodhue, Dale L., and Ronald L. Thompson. 1995. "Task-Technology Fit and Individual Performance." *MIS Quarterly* 19(2):213. doi: 10.2307/249689.
- Hodzic, Naida, Amina Efendic, and Amra Kapo. 2025. "Team Effectiveness in a Virtual

- Environment: The Role of Trust and Knowledge Sharing.” *Strategic Management* (00):84–84. doi: 10.5937/StraMan2400017H.
- Karolina, Muszyńska. 2015. “Communication Management in Project Teams – Practices and Patterns.” *Proceedings of the MakeLearn and TIIM Joint International Conference 2015* 1359–66.
- Kathio, Rachael, and Machoka Paul. 2025. “Journal of Applied Social Sciences in Business and Management (JASSBM) Volume 4, Issue 1, 2025.” *Journal of Applied Social Sciences in Business and Management (JASSBM)* 4(1):182–98.
- Kenny, S. Victoria. 2019. “Employee Productivity And Organizational Performance: A Theoretical Perspective.” *Munich Personal RePEc Archive* (93294):1–11.
- Kiely, Gaye, Tom Butler, and Patrick Finnegan. 2022. “Global Virtual Teams Coordination Mechanisms: Building Theory from Research in Software Development.” *Behaviour & Information Technology* 41(9):1952–72. doi: 10.1080/0144929X.2021.1909141.
- Kornei, Katherine. 2020. “Opportunities and Challenges of Virtual Meetings.” *Eos* 101. doi: 10.1029/2020eo150227.
- Kudyba, Stephan, and Agnel D Cruz. 2023. “Understanding Project Success Involving Analytic-Based Decision Support in the Digital Era: A Focus on IC and Agile Project Management.” *Journal of Intellectual Capital* 24(6):1429–46. doi: 10.1108/JIC-03-2022-0054.
- Lee, Margaret R. 2021. *Leading Virtual Project Teams*. Auerbach Publications.
- Mao, Hanjin. 2024. “Beyond Overhead: Decoding Donor Attitudes toward Technology Adoption in Nonprofit Organizations.” *Journal of Chinese Governance* 9(4):511–36. doi: 10.1080/23812346.2024.2367281.
- Natu, Sveta, and Manuela Aparicio. 2022. “Analyzing Knowledge Sharing Behaviors in Virtual Teams: Practical Evidence from Digitalized Workplaces.” *Journal of Innovation & Knowledge* 7(4):100248. doi: 10.1016/j.jik.2022.100248.
- Nguar, Kot David Adhal, and Andrea Appolloni. 2025. “The Impact of Digital Learning and Capacity Building on Employees’ Performance in Humanitarian Organizations.” *Knowledge Management Research & Practice* 23(2):119–30. doi: 10.1080/14778238.2024.2328177.
- Otundo Richard, Martin. 2024. “Strategic Approaches to Turnaround and Performance Optimization of Mega Donor-Funded Projects in Mombasa, Kenya: A Sector-Specific Analysis&Nbsp;”

SSRN Electronic Journal. doi: 10.2139/ssrn.5015472.

Sivhada, Unarine, Philangezwi Zulu, Hillgate Sambo, and Bonginkosi Thango. 2024. “Performance Improvements from Virtual Collaboration and Communication Technologies in SMEs: A Systematic Review.” doi: 10.20944/preprints202410.1971.v1.

Vinson, Danna. 2024. “Leadership’S Role in Building Relationships a Study of Leadership’S Role in Building Relationships Among Virtual Team Members.” (May).

Wen, Jing, and Masoud Gheisari. 2020. “Using Virtual Reality to Facilitate Communication in the AEC Domain: A Systematic Review.” *Construction Innovation* 20(3):509–42. doi: 10.1108/CI-11-2019-0122.

Zamani, Efpraxia D., and Nancy Pouloudi. 2022. “Shared Mental Models and Perceived Proximity: A Comparative Case Study.” *Information Technology & People* 35(2):723–49. doi: 10.1108/ITP-02-2020-0072.

Zhang, Yinxuan, Ruonan Zhao, and Xuan Yu. 2022. “Enhancing Virtual Team Performance via High-Quality Interpersonal Relationships: Effects of Authentic Leadership.” *International Journal of Manpower* 43(4):982–1000. doi: 10.1108/IJM-08-2020-0378.

APPENDICES

Appendix A: Self-administered questionnaire

Introduction

Dear respondents; The purpose of this survey is to understand the relationship between virtual team management and project performance with focus on selected NGOs in West Nile Region-Uganda. The information collected will be used as a primary data in my study which I am conducting for the partial fulfilment of the requirements of my study for Master of Business Administration (MBA) Of Gulu University. This questionnaire is planned to acquire significant data to the research projected to come up with treasured recommendations for challenge areas (if any). Hence, your genuine, and quick response is a valuable input for the excellence and effective accomplishment of the study. Be confident that all information you provide will be kept quite confidential and it will be used only for research purpose. Thank you in advance for your kind cooperation.

Section I. Personal Information

1. Gender: Male ☐ Female ☐
2. Marital status: Single: ☐ Married ☐ Divorced ☐ Widow/Widower ☐
2. Age: Under 25 years ☐ 25- 35 years ☐ 36-45 years ☐ 46 years and above ☐
3. Educational Level: Certificate ☐ Diploma ☐ Degree Masters and above ☐
4. Occupation -----
5. Marital Status Single ☐ Married ☐ Divorced ☐ other -----
6. Position: Department head ☐ Section manager Supervisor Staff ☐
7. Years of experience: < 5 years ☐ 6– 10 years ☐ 11-15 years ☐ >15 years ☐

Section 2: Virtual Team

(SD= Strongly Disagree, D= Disagree, N= Neutral, A=Agree, SA=Strongly Agree)

Team Building.	SD	D	N	A	SA
Team development is done in VTs	1	2	3	4	5
Virtual Team members trust each other	1	2	3	4	5
There is significant cooperation among the VTs	1	2	3	4	5
VTs are responsive to co-worker's need	1	2	3	4	5
VTs collaborate with each other to attain common organisation goals	1	2	3	4	5
Team Communications					
VT use the available communication infrastructure	1	2	3	4	5
Direct communication processes are used to share knowledge among VTs	1	2	3	4	5
Computer-mediated technologies are tools used for VT communication	1	2	3	4	5
Virtual communication enables us to remotely coordinate projects	1	2	3	4	5
virtual communication reminds VTs about their performance targets	1	2	3	4	5
Knowledge management (KM)					
Knowledge management creates a conducive learning environment for VTs	1	2	3	4	5
Our organisation has a knowledge-sharing culture	5	4	3	2	1
Top management controls KM practices in the NGO	1	2	3	4	5

KM helps in the strategy formulation for our NGO	1	2	3	4	5
KM enables identification of gaps in capacity building for virtual teams	1	2	3	4	5

Section 2: Project Performance

Project proficiency	SD	D	N	A	SA
VTs have performance effectiveness in terms of productivity	1	2	3	4	5
Our VT show zeal for continuous improvement	1	2	3	4	5
VTs are self-motivated to achieve goals	1	2	3	4	5
VTs attain their targets in time	1	2	3	4	5
The VTs provided constant update on the progress towards tasks	1	2	3	4	5
VTs give their input when required in the decision-making process	1	2	3	4	5
Project Milestones					
VTs finish projects on-time as budgeted	1	2	3	4	5
Our VTs use projects milestones when the project is evaluated	1	2	3	4	5
Using milestones enables VTs decide the project progress	1	2	3	4	5
VTs calculate total project duration taking account key milestones	1	2	3	4	5
VTs set realistic goals to achieve milestones	1	2	3	4	5
Time management (KM)					
VTs use project completion score in terms of time dimension (in %)	1	2	3	4	5

VTs ensure timeliness of evaluations for all projects	1	2	3	4	5
VTs ensure that the necessary time extension that fits to the additional activities for VTs	1	2	3	4	5
to ensure that the project is on track, VTs share reports in a timely manner.	1	2	3	4	5

Section D: ICT infrastructure

D1. Internet.	SA	A	N	D	SD
VTs use internet to collect data needed for project performance	1	2	3	4	5
VTs use internet to speed up frequency of communication in the project	1	2	3	4	5
VTs used internet for networking with the communities they serve	1	2	3	4	5
VTs use the Internet to prevent project data loss in the organization	1	2	3	4	5
Internet assists VTs in project reporting activities during performance evaluation.	1	2	3	4	5
D2. ICT policy	SD	D	N	A	SA
ICT policy makes it easier for VTs to collaborate with each other	1	2	3	4	5
VTs use ICT policy for project automation thus leading to project performance	1	2	3	4	5
ICT policy helps VTs to bring project schedules up to speed with the changing project environment	1	2	3	4	5

Thank you for your participation

Appendix B: Focus Group Discussion (FGD) Guide

Introduction

- Welcome participants and explain the purpose of the discussion: to explore virtual team management practices and their impact on project performance among NGOs in the West Nile region (An Academic Research).
- Emphasize confidentiality and voluntary participation.
- Encourage open sharing of experiences and opinions.
- Clarify that there are no right or wrong answers, diverse perspectives are valuable.

Section 1: Background Information (*Ice-breaker*)

1. Please introduce yourself and briefly describe your role in your organization.
2. How long have you worked with your current organization?
3. Do you work mainly in a physical office, fully remotely, or in a hybrid arrangement?

Section 2: Managing Virtual Teams

A1: Team Building (Relates to Objective 1 & Research Question 1)

4. How is team building carried out in your organization, especially for virtual teams?
5. What barriers or challenges have you experienced in building effective virtual teams?
6. In your view, how does team-building affect project performance in your organization?

A2: Team Communication (Relates to Objective 1 & Research Question 2)

7. What communication tools and platforms are commonly used in your virtual teams?
8. How does communication (both formal and informal) influence virtual team effectiveness?
9. What challenges or barriers exist in team communication, and how do they impact performance?
10. In what ways has communication contributed to or hindered project success?

A3: Knowledge Management (Relates to Objective 1 & Research Question 3)

11. What types of knowledge are typically shared among virtual team members?
12. What challenges do you face in managing and sharing knowledge within virtual teams?
13. How has knowledge management influenced project performance in your organization?

Section 3: Project Performance (*Relates to Objective 2*)

14. How would you describe the overall performance of your organization's projects managed by virtual teams?
15. How are project milestones tracked and evaluated?
16. How effective is your team at meeting timelines and managing time in virtual settings?
17. What specific challenges have you experienced in achieving high project performance through virtual team management?

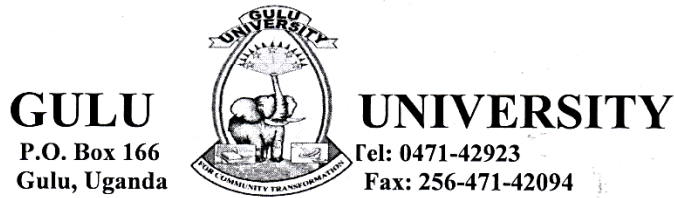
Section 4: ICT Infrastructure (*Relates to Objective 4 & Research Question 4*)

18. How does internet connectivity affect your virtual teams' performance?
19. How do your organization's ICT policies influence virtual team operations?
20. How would you assess the overall effectiveness of your ICT infrastructure in supporting virtual teams?
21. Are there dedicated staff for managing ICT systems for virtual team operations? If so, how does their work contribute to performance?
22. In your opinion, how does ICT infrastructure affect project outcomes in your NGO?

Section 5: Suggestions and Improvements (*Links to all Objectives*)

23. What changes or improvements could be made to better manage virtual teams?
24. What strategies could help virtual teams perform better and deliver stronger project results?
25. Are there other ways project performance could be improved in NGOs in the West Nile region?

Appendix C: Introductory Letter for Data Collection.



OFFICE OF THE DEAN FACULTY OF BUSINESS AND DEVELOPMENT STUDIES.

Date: 16th July 2024

TO WHOM IT MAY CONCERN

RE: LTIGO JIMMY

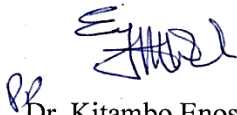
REG. NO. 07/U/1901/MBA

The above-named person is a final year student pursuing Master of Business Administration (MBA) Degree of Gulu University.

In partial fulfillment of the requirements for the award of the master's degree, he is carrying out research on the topic: **"Managing Virtual Team and Project Performance; A Case Study of Non-Governmental Organizations in West Nile Region- Uganda"**.

Due consideration accorded to him shall be highly appreciated.

Yours faithfully,



Dr. Kitambo Enos -Research Coordinator (Ph.D.)
Faculty of Business and Development Studies

