

**EVALUATION OF DIGITAL HEALTH SOLUTIONS
INITIATIVES FOR IMPROVING FINANCIAL RESOURCES
MANAGEMENT IN PUBLIC HEALTH FACILITIES IN RUKWA
REGION**

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INITIATIVES FOR IMPROVING FINANCIAL RESOURCES
MANAGEMENT IN PUBLIC HEALTH FACILITIES IN RUKWA
REGION**

BY

LEONS MALIYAHEZE

**A Dissertation Submitted to the School of Public Administration and
Management for the Partial Fulfillment of the Requirements for the Award of
Master of Science in Health Monitoring and Evaluation (MSc. HME) of
Mzumbe University**

2025

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled “Evaluation of Digital Health Solutions Initiatives for Improving Financial Resource Management in Public Health Facilities in Rukwa Region”, in partial fulfillment of the requirements for award of the degree of Master of Science in Health Monitoring and Evaluation of Mzumbe University.

Major Supervisor

Internal Examiner

DECLARATION AND COPYRIGHT

I, Leons Maliyaheze, declare that this thesis is my original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

Signature _____

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DEDICATION

I enthusiastically dedicate this work to my late parents, Maliyaheze Ndayabonye Bona and Potonia Mpambanyi Katuvya, whose enduring love, values, and memory continue to guide and inspire me.

LIST OF ABBREVIATIONS

CHMT	Council Health Management Team
CSV	Comma Separated Values
FFARS	Facility Financial Accounting and Reporting System
GePG	Government e-Payment Gateway
GoTHoMIS	Government of Tanzania Hospital Management Information Government
ICT	Information and Communication Technology
LAN	Local Area Network
MoCIT	Ministry of Communications and Information Technology
MoFP	Ministry of Finance and Planning
MoH	Ministry of Health
NHIF	National Health Insurance Fund
PHC	Primary Health Care
PlanRep	Planning and Reporting System
PO-RALG	President's Office – Regional Administration and Local
RHMT	Regional Health Management Team
SDG	Sustainable Development Goals
STATA	Statistics and Data Analysis Software System
UHC	Universal Health Coverage
VIF	Variance Inflation Factor
WHO	World Health Organization

OPERATIONAL DEFINITIONS

Digital health implementation refers to the extent of which digital platforms such as PlanRep, GePG, and NHIF Online Service Portal are deployed, configured, and actively employed in health facility activities. This includes system configuration, user credential provision, availability of supporting infrastructure, and routine use for planning, service delivery, and financial transactions (MoHCDGEC, 2019; WHO, 2020a)

Financial resource management refers to the systematic planning, tracing, and control of financial resources in healthcare facilities. Digital platforms improve this procedure. PlanRep helps with budgeting and planning; GePG handles electronic payments and revenue collection; and NHIF systems make it easier to file insurance claims and receive reimbursement (Anasel et al., 2023a; Karia et al., 2024a)

Planning and Reporting System (PlanRep) is a digital platform used for planning, budgeting, and reporting in Local Government Authorities (LGAs). It helps manage strategic plans, revenue projections, budgets, and tracks expenditure and physical implementation. PlanRep is crucial for ensuring compliance with government regulations and promoting effective financial resource management (MoFP, 2018b)

System account ownership This refers to the possession and accessibility of user credentials to utilise the system. Facilities possessing their own accounts can autonomously handle budgeting, revenue collection, and claims submission, guaranteeing independence and effectiveness. Conversely, depending on upper-level departments for account access leads to delays, restricts decision-making, and obstructs effective system use (MoFP, 2018b).

Government Electronic Payment Gateway (GePG) is a national public digital payment platform of which enhances security and transparent in revenue collections. It generates control numbers, enables fee collection, and transmits financial data directly to the national treasury. GePG enhances accountability, reduces revenue leakage, and can integrate with other systems such as GoTHoMIS to streamline financial operations in public institutions (MoFP, 2018a).

National Health Insurance Fund (NHIF) Online Services Portal serves as digital platform which allows medical care facilities to verify member eligibility, check benefit coverage, manage claims, and view real-time payment and reimbursement information. It promotes effective health insurance administration, eliminates fraud, and enhances service delivery to insured patients (NHIF, 2019a)

Staff capacity and motivation refer to the technical skills, confidence, and willingness of healthcare personnel to use digital technologies on a consistent basis. Capacity is built by training and experience in tasks such as budgeting, data entry, and claims processing, but motivation is influenced by perceived benefits, workload, technological support, and available incentives (URT, 2010).

Reliable internet connectivity is the consistent and stable internet service connection, with minimal disruptions and a seamless online performance, extremely more than just speed; but also, its consistency, dependability and the capacity to rebound swiftly from problems. It is required for effective digital health system utilisation, as it allows real-time access to online platforms. Poor connectivity or a lack of routers impedes system access, slows data entry, and lowers system efficiency (URT, 2023b)

Digital health solutions it includes and comprises utilisation of data and communication technologies (ICT) and electronic platforms to enhance the provision, management, and oversight of health services. These consist of platforms for telemedicine, mobile health apps, electronic health records, and government platforms such as Plan Rep, GePG, Go THo MIS, and the NHIF Online Service Portal. These solutions seek to improve efficiency, transparency, accountability, and accessibility in healthcare by optimising data management, tracking financial resources, and integrating services (MoHCDGEC, 2019).

ABSTRACT

Introduction: Financial management in public organisations remains an ongoing challenge despite applications of new digital devices with the main objective of improving transparency, efficiency, and accountability. These challenges remain due to a lack of institutional commitment, ineffective law enforcement, and insufficient policy execution. The government of Tanzania has implemented digital platforms such as the Planning and Reporting System (PlanRep), the National Health Insurance Fund (NHIF) Online Service Portal, and the Government e-Payment Gateway (GePG) to improve planning, budgeting, and financial management. Nevertheless, their implementation and virtue are uneven between health facilities.

Methods: This study assessed the factors facilitating the implementation and utilisation of these systems in 158 public health facilities across Kalambo, Sumbawanga, and Nkasi districts in Rukwa region. The quantitative data was analysed using (STATA version 15), bivariable and multivariable logistic regression.

Results: Significant associations were found between PlanRep use and internet reliability (OR = 8.66, $p < 0.001$), router availability (OR = 9.76, $p < 0.001$), staff capacity (OR = 28.15, $p < 0.001$), PlanRep account ownership (OR = 14.12, $p < 0.001$), staff motivation (OR = 23.30, $p < 0.001$), and community involvement (OR = 5.53, $p < 0.001$). Multivariate analysis revealed seven predictors: staff motivation, PlanRep account ownership, router availability, internet dependability, staff capacity, computer availability, and facility type, with staff motivation (AOR = 106.14, $p = 0.001$) being the most significant.

Conclusion: Public financial resource management benefited from the introduction of digital health technologies. Health facilities may consider strong efforts on sustainability of provision of PlanRep system user accounts, availability of facility reliable internet, availability of computers, availability of routers for internet connectivity, continuous staff capacity building on using digital health solutions and motivations to staffs such as incentives, recognitions, technical and leadership support.

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CHAPTER ONE

INTRODUCTION AND PROBLEM SETTING

1.1 Introduction

This part provides an overview of the evaluation by beginning with background and the statement of the problem. It highlights the specific issues the study aims to address, in addition to the general and specific goals. The chapter also gives the assessment inquiries, which are directly derived from the declared goals. Finally, it outlines the significance of the investigation, emphasizing the potential value and consequences of the results.

1.2 Background

The viability and functionality of healthcare systems around the world depend heavily on the efficient management of financial resources. The capacity of healthcare systems to deliver superior, equitable care is supported by the appropriate distribution and use of financial resources (WHO, 2010). Important facets of healthcare, such as medication availability, healthcare worker employment, and the execution of preventive and health promotion initiatives, are at risk in the absence of proper financial management (WHO, 2010). Globally, attaining universal health coverage (UHC) and prompting the Sustainable Development Goals (SDGs) depend heavily on the effective use of financial resources (Odoch et al., 2021; WHO, 2024).

Effective financial management guarantees that resources are distributed fairly, reaching the most disadvantaged groups and minimizing health result inequalities. Transparency, accountability, and a reduction in waste and corruption are all made possible by effective financial governance (Frumence et al., 2015; Hanson et al., 2022). According to WHO, (2010) health funding systems are conceptually separated into three interconnected functions: service purchase, fund pooling, and revenue collecting. Sources of health financing vary across countries and may include government tax revenues, social security contributions, out-of-pocket payments by individuals, and charitable donations (WHO, 1978).

Financial resource management remains a global concern, as corruption, poor planning, and resource misallocation impede effective health expenditure and fuel service inequities (Cerf, 2023; Kitole et al., 2025; UHC Forum, 2017). Limited resources and inadequate governance are prevalent in low and middle-income countries resulting in financial mismanagement, medicine shortages, and low staff morale, all of which worsen health outcomes. Poor communities suffer the most, exacerbating disparities (WHO, 2010). Reforms that improve accountability and monitoring are critical (Kesale et al., 2022). Digital solutions like GePG improve transparency by automating procedures and allowing for real-time revenue tracking, hence reducing leakages (Ruhago et al., 2022b).

Recently, digital health solutions have become effective instruments for improving health systems' financial resource management (WHO, 2018). They increase revenue collection, foster transparency, and reduce corruption. For instance, integrated digital payment systems provide quicker revenue collection and real-time tracking, guaranteeing effective and responsible use of funds (WHO, 2020b). However, inadequate infrastructure, a lack of training, and fragmented systems make implementation difficult in environments with limited resources. Coordination of ICT infrastructure investments, employee capacity building, and the incorporation of digital devices towards beyond financial governance frameworks are necessary to overcome these obstacles (Ibeneme et al., 2022a; Ruhago et al., 2022a).

Significant financial management issues, such as absence of transparency, corruption, insufficient monitoring, and a lack of internal controls, plague public primary health facilities in Sub-Saharan Africa (SSA)(Musiega et al., 2024). The performance and sustainability of the healthcare system are undermined by these inefficiencies, which result in resource waste, unfair distribution, and impaired service delivery (Hanson et al., 2022; Karia et al., 2024a). To meet the demands of population growth and a rising number of non-communicable diseases in SSA, effective financial management is extremely important. Financial efficiency, which may be attained through both digital innovations and improved institutional

governance, has a significant impact for sustainable, equitable health systems (WHO, 2020a).

Public health facilities in Tanzania are essential to the delivery of healthcare services but they confront persistent financial management issues such as insufficient internal controls, poor monitoring, corruption, and limited transparency. These issues cause resource misallocation, revenue losses, and poor delivery of services, especially in underserved and rural regions with weak governance (Hanson et al., 2022; N. A. Kapologwe et al., 2019; Ruhago et al., 2022b). To address this, the government introduced digital solutions like Planning and Reporting System (PlanRep), Government Electronic Payment Gateway (GePG), Facility Financing Accounting and Reporting System (FFARS), National Health Insurance (NHIF) Online Service Portal, and Government of Tanzania Hospital Management Information System (GoTHOMIS) to increase accountability, efficiency, transparency and service delivery (MoHCDGEC, 2019).

However, the deployment of these digital systems is hampered by poor ICT infrastructure, unpredictable electricity, limited funding, the shortage of ICT personnel, low proficiency with digital technologies among medical professionals, and aversion to new technology (Ibeneme et al., 2022b; Ogundaini & Mlitwa, 2024; Otorkpa et al., 2025). The presence of several, non-interoperable digital systems contribute to system fragmentation, lowering the overall efficiency of financial management instruments (MoHCDGEC, 2019). Ruhago et al., 2022b), found that FFARS improved fund reporting and accounting at the primary healthcare. Although, there is still a effects literature void about the implementation and impact of systems such as PlanRep System, GePG, GoTHoMIS and the NHIF Online Service Portal.

Despite the reported success of some digital solutions, there is no indication of how widely these technologies are being used to improve financial resource management in Tanzania's government facilities, especially in remote areas like Rukwa region. Understanding the current implementation status, obstacles, and successes of these digital technologies initiatives is a fundamental for facilitating future policy,

investment, and execution strategies, thus the aim of this evaluation research was to investigate the implementation of digital health solutions initiatives for improving financial resource management in government owned facilities in Rukwa region.

1.3 Program descriptions

1.3.1 Background

Digital health technology makes it easier to share, secure, and uniquely identify patients at all health care facilities throughout health systems (MoHCDGEC, 2019b). The government ensures that client information is shared according in accordance with recognized digital health standards, guaranteeing client privacy, confidentiality, data security, and safety (MoHCDGEC, 2019; Otokpa et al., 2025). The Strategy's objective is to enhance the performance of the health system, which will lead to better population health outcomes, sustainable health service delivery, and quality, as well as expedite the attainment of UHC and health-related SDGs of the UN, ultimately resulting in a healthier country. Health systems depend on effective financial resource management as a fundamental tool to achieve UHC (GDI, 2019).

However, without proper management of financial resources, other critical components such as health information systems, health-related workforce, essential medicines, health service delivery, health systems financing, leadership and good governance can be compromised totally, impacting the quality and accessibility of care (WHO, 2010). Thus, digital health technologies provide an innovative approach to inscription these challenges by enabling efficient and transparent financial practices across all levels of health systems, resulting in faster attainment of UHC and other health-related goals, better population health outcomes, and sustainable, high-quality health service delivery SDGs eventually leading to a healthier nation (MoHCDGEC, 2019).

1.3.2 Strategic goals and priority areas

There are 10 priorities and five strategic goals in the strategy.

1.3.3 Objectives

1. Enhanced leadership and governance in digital health.
2. Enhanced customer satisfaction via effective service delivery
3. Enabled management and healthcare professionals to act based on evidence.
4. Constant accessibility to medical resources.

1.3.4 Priorities for strategy

1. To enable improved coordination and execution of digital health projects, fortify leadership and governance in the field.
2. Efficiency, accessibility (including telemedicine), patient safety, quality, and continuity of treatment can all be enhanced by the comprehensive digitalization of health service delivery.
3. Enhance the technological proficiency and capacity of the health workforce to deliver specialized care to underprivileged facilities.
4. Encourage healthy behavior by providing communication, education, and access to pertinent health information.
5. Improve the safe and easy flow of information.
6. Enhance the use of data for evidence-based decisions at all health system levels.
7. Enhance health commodity supply chain management throughout the board.
8. At every stage of the health system, enhance human resource management.
9. Make financial resource management better.
10. Boost disease control, response, detection, reporting, surveillance, and prevention at every level of the healthcare system.

1.3.5 Strategic priority 9: Enhanced financial resource management

Improving infrastructure, health human resources, health commodities, and the provision of health services at all levels of the health system depend on efficient financial resource management (WHO, 2010). There have been benefits to the adoption and usage of digital financial management solutions in the health sector, including better planning and budgeting as well as increased revenue collection at healthcare facilities and institutions (MoHCDGEC, 2019a). However, inadequate

coverage, weak transaction controls, and fragmented digital financial management systems are the problems of financial resources management (Hepworth, 2024). Hence, this strategy priority 9 intends to ensure the improvement of financial resources management at all health system levels.

1.3.6 Strategic initiatives for priority 9

1. Enhance digital solutions at all stages of planning, budgeting, revenue collection, accounting, auditing, and reporting.
2. Integrate the Government e-Payment Gateway (GePG) with electronic revenue collection systems in all public health facilities and institutions.
3. Boost online tools for managing health insurance

1.3.7 Unleashing capabilities for priority 9

1. Planning, collecting, and controlling costs can all be improved in the health sector.
2. The management of insurance programs can be made more efficient by the health sector.

1.3.8 Planned indicators

1. The percentage of healthcare facilities utilizing the PlanRep system, which is an enhanced planning and reporting system
2. How many public health facilities use revenue collecting systems that are GePG-integrated.
3. The percentage of medical facilities that manage health insurance through digital health solutions.

1.3.9 Strategic targets

1. By June 2023, all healthcare facilities will be using upgraded PlanRep software.
2. By June 2022, all public health facilities will have a revenue collection system that is connected with GePG.

3. By June 2021, all healthcare facilities will be using digital technologies for managing health insurance.

1.3.10 Logical framework for implementing digital health solutions initiatives

As defined by WHO, (2016) logical framework as the management and measurement tool that enumerates the main assumptions, the intended tasks and methods, and the methods for tracking and assessing results. A program theory, usually consists of the following: (i) inputs, like organizational support and resources; (ii) activities, which explain the process of implementation; (iii) outputs or intermediate outcomes, which show the sequence of changes brought about by the activities; and (iv) the final intended results (WHO, 2016b). The World Health Organization's (WHO) model for tracking and assessing health information technologies is in line with this strategy. In order to facilitate evaluation, the WHO stresses the significance of defining and connecting resources, activities, outputs, outcomes, and impacts within a logical model. The following table provides a logical framework for implementing digital health solutions for monetary resources administration in public basic healthcare units. It is based on the (WHO, 2016b) guidelines to conduct research and assessment.

Table 1.1: Program logical framework

Inputs	Activities	Outputs	Outcome	Impact
• Healthcare providers	Operating digital devices	Number of healthcare operating digital devices	Proportion of healthcare providers operating digital devices	Improved financial resources collections
• Digital devices (Computers, Tablets, Smartphones)	• Buying of digital devices and system installations	Number of departments/units with digital devices	Proportion of digital devices operating in a health care facility.	Improved efficiency in financial processes
• Systems/Software (PlanRep, GePG, GOTHOMIS, NHIF portals)	• Automates procedures such as financial reporting, revenue collection, and budgeting. • Claiming • Integration of digital solutions for operations	Number of systems operating in a health care facility	Proportion of systems operating in a health care facility	Improved financial transparency and accountability
• Internet	• Real-time data transmissions	Number of digital devices with internet connectivity	Proportion of digital devices with internet connectivity	Improved real-time financial data

Table 1.1 Program logical framework (Continued)

• Electricity	• Enabling digital systems operations	Number of department/units with electricity	Proportion of departments/units with electricity	Improved operations of digital devices
• Training	• Capacity building on digital literacy	Number of health care providers trained on digital solutions operations	Proportion of health care providers trained on digital solutions	Improved skills on digital solutions operations for financial management
• Financial Resources	• Budgeting and planning	Total amount budgeted and planned for digital health solutions and staff training	Proportion of budget planned for digital health solutions and staff training in each department/unit	Improved financial transparency and accountability

Source: Evaluator Own Construct, 2025

1.3.11 Stakeholder analysis

According to Bryson et al. (2011), stakeholders are people, organizations, or groups that have a stake in the evaluation process or its results. He classifies stakeholders as people who are very interested in the program, like program workers, funders, or beneficiaries who are directly affected by the evaluation outcomes, those who will use the evaluation findings, like decision-makers and policymakers relying on results for planning and improvement; and those involved in implementing the program, whose insights can inform the evaluation design.

In this evaluation context of implementing digital health solutions initiatives for improving financial resources management in frontline healthcare units, stakeholders who were involved are government health departments, health facility in-charges, administrators, ICT specialists, donors, department of planning, monitoring and evaluation. These stakeholders each have a distinct role in the program, evaluation, interests, communication channels, and significance of the assessment.

The strategy is implemented in coordination between the MOH and PO-RALG with essential significant systems like PlanRep, GePG, and the NHIF Online Service Portal. System installation, employee training, and user account creation are all part of the implementation procedure at the level of the medical facility. Monitoring and evaluation are conducted by Ministry of Health, PO-RALG, RHMT, CHMT and Health Management Team (HMT) through supervisions, system generated reports and compliance reviews of the system performance at the health facility level (MoHCDEGEC, 2019).

Table 1.2: Stakeholder analysis

SN	Stakeholder	Role for the Program	Interest on Evaluation	Role on Evaluation	Means of Communication	Level of Importance
1	Ministry of Health	Strategy formulation, Funding	Ensuring strategy is followed	Supervision Strategy recommendations	Emails, Reports, Virtual and Physical Meetings	High
2	President's Office-Regional Administration and Local Government (PO-RALG)	Monitoring of services delivery	Supporting governance and Strategy implementation	Supervisions on health care services delivery	Emails, Reports, Virtual and Physical Meetings	High
3	Regional Health Management Team (RHMT)	Monitoring of digital health solutions implementation	Evaluation of regional system effectiveness	Supportive supervisions	Reports, Emails, Meetings	High
4	LGA	Coordinates digital health solutions implementation in council level	Ensuring facilities use digital solutions for service delivery	Supervision on digital health solutions implementation	Reports, Emails, Meetings	High
5	Council Health Management Team (CHMT)	Provision of technical supports	Supervise resources allocations	Supervise on functioning of the systems	Reports, Emails, Meetings	High
6	ICT Officer	Technical support and system implementation	Optimization of digital systems	Technical analysis and reporting	Reports, Meetings	High
7	Donor Agencies/Development Partners	Funding and resource provision	Return on investment and sustainability	Evaluation funding and guidance	Emails, Reports, Virtual and Physical Meetings	High

Table 1.3: Stakeholder analysis (Continued)

SN	Stakeholder	Role for the Program	Interest on Evaluation	Role on Evaluation	Means of Communication	Level of Importance
8	Health Facility Governing Committees (HFGCs)	Responsible for effective implementation	Accountability and efficient fund use	Provision of feedback	Reports, Meetings	High
9	Health Facility Management Team (HMT)	Implements digital solutions operations	Efficient financial management systems	Internal supervision on system functioning	Reports, Meetings	High
10	Health Care Providers	Service delivery	Use of digital solutions	Easy way of execution of tasks	Meetings, Meetings	High
11	Community Members	End-users and beneficiaries	Improved transparency and services	Offering user feedback	Reports, Meetings	Medium

Source: Evaluator Own Construct, 2025

1.4 Problem statement

A substantial worldwide commitment has been made to deploy digital health technology in order to achieve Universal Health Coverage (UHC) and fortify health systems (WHO, 2020). The World Health Organization's (WHO) Global Strategy on Digital Health (WHO, 2020a) and other programs call for countries to embrace digital technologies in order to improve healthcare delivery, governance, and financial management. Tanzania has embraced these worldwide statements by establishing frameworks to include digital health technologies, like financial management systems, within the country's healthcare system through its National Digital Health Strategy (2019–2024).

According to the National Digital Health Strategy 2019–2024 (MoHCDGEC, 2019), the Government Electronic Payment Gateway (GePG), the Government of Tanzania Hospital Management System (GOTHOMIS), the National Health Insurance Fund (NHIF) Online Services Portal, and the Facility Financial Accounting and Reporting System (FFARS) are important initiatives to improve financial transparency and efficiency in public primary healthcare facilities (PHC). But according to recent evaluations of FFARS's deployment in Tanzania, it has a lot of potential to enhance

facility financial management, including the capacity to monitor PHC facilities' income and expenses (Ruhago et al., 2022). shortfalls in staff. The implementation of FFARS and its full influence on Tanzania's pursuit of UHC may be hampered by ICT infrastructure and limited capacity building opportunities (MoHCDGEC, 2019a; WHO, 2016).

Furthermore, a study on the cost-efficiency analysis of the Tanzanian council-level Improved Web-Based Planning, Budgeting, and Reporting System (PlanRep) found that it had cut preparation time from 87 days to 8 days and planning and budgeting costs by 53% (Ruhago et al., 2021), but the implementation status on public healthcare facility level was still unknown for both PlanRep, GePG and NHIF Online Service Portal (MoHCDGEC, 2019a). It is easier to pinpoint particular obstacles to successful deployment or to create plans optimise their effects with a thorough grasp of how well these systems operate.

The findings revealed that GePG had not been implemented across all facilities, while the PlanRep System was operational in only a few facilities, thus falling short of the national health technologies platforms target mandating its execution at all levels of health facilities. In addition, facilities that had deployed digital health solutions, such as the NHIF Online Service Portal, continued to experience challenges, underscoring the need for further system strengthening and improvement.

A solid grasp of how these systems work makes it easier to identify particular obstacles to their implementation and strategies that maximise their impact. Without such insight, digital initiatives risk being underutilised, misaligned with existing workflows, or unsustainable in the long run especially in resource-constrained environments. Evaluating system performance and implementation issues allows stakeholders to make evidence-based decisions, better allocate resources, and devise context-specific interventions. This is especially important in places like Rukwa, where staffing shortages, poor digital literacy, and inadequate infrastructure can all significantly affect how well digital health systems work (MoH, 2023).

As one of the projects under the National Digital Health Strategy 2019–2024, the evaluation was conducted to address and close this gap. e-Payment Gateway (GePG), the PlanRep System, and the NHIF Online Service Portal were all implemented at selected public healthcare facilities in the Rukwa Region. As one of Tanzania's poorest areas (UNDP, 2023). Rukwa faces considerable resource constraints, making good financial resource management is critical for increasing income generation and improving service delivery. As a result, the study examined at how these three systems were implemented in public health facilities.

1.5 Objectives and evaluation questions

1.5.1 Main objective

To assess how digital health solutions initiatives are being used for financial resource management in public health facilities in the Rukwa Region.

1.5.2 Specific objectives

- i. To determine the proportion of health facilities implementing planning and reporting systems (PlanRep) software in the Rukwa region.
- ii. To determine the proportion of public health facilities in the Rukwa region that implement revenue collection systems integrated with GePG.
To determine the proportion of health facilities utilising digital solutions for health insurance management in the Rukwa region.
- iii. To examine the factors facilitating the implementation PlanRep digital health solutions for the management of financial resources in public health facilities in the Rukwa region

1.5.3 Main evaluation question

To what extent are the digital health solutions initiatives implemented to manage financial resources in public health facilities in the Rukwa region?

1.5.4 Specific evaluation questions

- i. What are the proportions of health facilities implementing planning and reporting systems (PlanRep) software in the Rukwa region?
- ii. What are the proportions of public health facilities in the Rukwa region that are implementing revenue collection systems integrated with GePG?
- iii. What are the proportions of health facilities utilising digital solutions for health insurance management in the Rukwa region?
- iv. What are the factors facilitating with implementing PlanRep digital health solution to manage financial resources in public health facilities in the Rukwa region?

1.5.5 Significance of the evaluation

This assessment examined how digital health technologies such as PlanRep, GePG, and the NHIF Online Service Portal improved financial responsibility, revenue collection, and budgeting in public health facilities. The findings suggest that better resource allocation, reduced financial mismanagement, and improved governance can be achieved through transparency and accountability. The insights gathered assist policymakers in identifying implementation gaps, particularly in resource-limited locations such as Rukwa, and informing changes to the National Digital Health Strategy. Better financial management can boost financing for critical services, infrastructure, and staffing. The study also focuses on the return on investment (ROI), which will guide future digital health investments and national initiatives to improve healthcare system performance.

1.5.6 Scope of the study

This study examined the implementation of three digital health systems in selected public healthcare facilities in Region: PlanRep, the Government e-Payment Gateway (GePG), and the NHIF Online Service Portal. It evaluated at how these tools were utilised to improve financial responsibility, revenue collection, and budgeting in public healthcare facilities. The study specifically examined the extent to which these digital systems were implemented, the significant elements impacting their

utilisation, obstacles and possibilities encountered during their deployment under the National Digital Health Strategy 2019-2024.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter includes other relevant material that is currently available in addition to a synthesis of insights gathered from a variety of sources. Along with establishing theoretical and empirical foundations based on existing literature that influence the study's goals, it identifies important terms and concepts used throughout the investigation. Three main goals were set for the evaluation, given the size and focus of the study: evaluating public health facilities that use the planning and reporting system (PlanRep) software, revenue collection systems integrated with the Government e-Payment Gateway (GePG), and digital solutions for health insurance management (NHIF Online Portal).

2.2 Definitions of key terms

2.2.1 Primary health care (PHC)

In order to guarantee the highest level of health and well-being and their equitable distribution, PHC is a whole-of-society approach to health that priorities people's needs as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation, and palliative care (WHO, 1978). The evaluation focus was primary health care (PHC), which is responsible for meeting people's needs throughout the spectrum of medical services, including palliative care, rehabilitation, disease prevention, treatment, and health promotion.

2.2.2 Digital health solutions

Digital health solutions are specific electronic products or services (or a set of several products or services) designed to meet a particular goal of the health system. It often involves a range of ICT infrastructure and services necessary to increase the health system's efficiency (MoHCDGEC, 2019). In this evaluation digital solutions targeted are PlanRep, GePG and NHIF Online Service Portal and includes all financial

operations using electronic devices, such as computers, smartphones or tablets (Aldaas, 2021).

2.2.3 System integration

System integration is the process of combining a system's or subsystems' constituent parts into a single system so that the latter can provide the main functionality (MoHCDGEC, 2019). In this study revenue collection systems should be integrated to provide efficiency and effectiveness.

2.2.4 Health system

Health System consists of all organisations, people, and actions whose primary intention is to promote, restore, or maintain health. This also encompasses the people, institutions, resources, and policies that governments put in place to improve public health (MoHCDGEC, 2019). In this study health system comprised all organisational departments/units, people and processes conducted at the health facility.

2.2.5 Financial resource management

Systematically keeping an eye on, managing, safeguarding, and disclosing an organization's financial assets is known as financial resource management (Karia et al., 2024b). It avoids waste, encourages openness, and guarantees effective financial allocation and utilization. Effective management facilitates the accomplishment of strategic objectives while upholding accountability and financial responsibility, which promotes organizational growth and long-term sustainability. According to N. Kapologwe et al. (2022) and N. A. Kapologwe et al. (2019), the study's funding resources included User Fees, Cost Sharing, Improved Community Health Fund, Drug Revolving Fund, Health Sector Basket Fund, National Health Insurance Fund, and Results-Based Financing.

2.2.6 Government Electronic Gateway (GePG)

The Government electronic Payment Gateway (GePG) is a digital platform which enables electronic money transfers between the Tanzania government and the general people (URT, 2018). The system has two main features which are Online payment;

which enables the general population to pay the government online and the Billing verification; allows the public to verify their billing through the GEPG website or mobile app (URT, 2018).

The government has benefited from GePG technology in overcoming obstacles related to revenue collection, including limited payment alternatives, High costs for revenue collection agents, convoluted processes for funding government services, corruption, and a lack of real-time revenue visibility. GePG is integrated into 28 commercial banks, 6 mobile money providers, and 660 public institutions (M & S, 2021; William et al., 2022a).

2.2.7 PlanRep System

PlanRep System is web-based system designed for planning, budgeting and reporting for Local Government Authority (LGA). It was created in an attempt to improve resource management and service delivery's efficiency, accountability, and transparency. In the context of this study, the researcher intends to know how public primary healthcare facilities use PlanRep system for prepare their planning, budgeting, and reporting within health care systems (URT, 2023a).

2.2.8 National Health Insurance Fund (NHIF) Online Service Portal

The NHIF web-based system is a digital health solution designed to give members and healthcare facilities convenient access to insurance services. It speeds up health-related financial transactions and improves service delivery through digital (NHIF, 2019a). In primary healthcare, it reduces administrative burdens, ensures timely reimbursements to address resource gaps, and promotes system interoperability, particularly through platforms such as PlanRep and GOTHOMIS, resulting in more coordinated and efficient health service planning and management (Ruhago et al., 2021).

2.2.9 Revenue collection systems (RCS)

These are systems, procedures, and tools that an organisation or institution uses to collect, keep track of, and manage its financial resources. These systems make guarantee that money from government grants, insurance payouts, and patient

payments is collected correctly in the setting of healthcare facilities. Examples are manual procedures like handling cash or digital systems that automate financial reporting and payments (Kessy, 2019).

2.2.10 Government of Tanzania Hospital Management System (GOTHOMIS)

The Government of Tanzania Hospital Management Information System (GOTHOMIS) is a digital health system designed to facilitate the way healthcare professionals improve service delivery through effective hospital data management (URT, 2017a). It delivers fast and trustworthy information to help with decision-making in critical operational areas such as financial transactions, medical records, appointment scheduling, inventory management, and patient registration. It is a critical component of digital health infrastructure, used in primary healthcare institutions to streamline revenue collection, monitor healthcare resources, improve service delivery, and effectively manage health data (MoHCDGEC, 2019).

2.3. Theoretical Literature Review

2.3.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), which describes how individuals act when they embrace and utilize a particular technology, was used in the research project (Davis, 1989). Davis created this model in 1986, and it is thought to be the most widely used model to explain how people implement technology (Lee et al., 2003). The social psychology theory, in particular, provided the basis for the development of this theory, which was modified from the Theory of Reasoned Action (TRA) (Fishbein & Azjen, 1975). TRA holds that attitudes are shaped by beliefs, which in turn influence intentions and, eventually, actions (Davis, 1989). Similar to this, he asserts that attitudes regarding the system's use are influenced by its perceived utility and ease of use, which in turn affect behavior intentions to use the system, and finally, actual system implementation can be accomplished (Alqudah et al., 2021). The most important component is "value," or a man's belief that utilising the new technology will boost his or her output (Venkatesh et al., 2008). According to Lee et al. (2003), the second component is the extent to which a person

thinks the new idea will be easy to implement. While "value" refers to the user's evaluation of the experienced results, "usability" refers to their assessments of the process that produces the final product (Fred Davis, 1987).

2.3.2. The theory's pertinence to this evaluation

The Technology Acceptance Model (TAM) was relevant to this study because it described how views and intentions toward perceived utility and usability, as well as embracing digital systems. In this study, TAM contributed in determining how healthcare providers' attitudes influenced their acceptance of digital health technologies for financial resource management. When users found the system difficult to use, it resulted in negative views and low utilisation. As a result, providing user-friendly interfaces, adequate training, and support was critical to encouraging system use and improving financial management in public health facilities (Garavand et al., 2016).

2.3.3 Digital Health Solutions and Technology Acceptance Model (TAM)

Perceived utility and perceived ease of use are the two elements that decide whether a new technological system will be accepted by its potential users, according to Davis' 1989 Technology Acceptance Model (TAM). The primary characteristic of the model is its emphasis on the perceptions of the potential user. In other words, potential users will not accept a technology product until they agree with it, even if the inventor believes it is valuable and easy to use.

2.3.4 Perceived utility (PU)

To what degree customers believed which digital health solutions would enhance their ability to effectively manage their financial resources, including advantages such as greater accountability, transparency, and responsibility, as well as fewer errors and faster processing of financial transactions. To promote favorable thoughts and feelings, it is necessary to demonstrate the value of these solutions.

2.3.5 Perceived ease of use (PEOU)

In this study Perceived Ease of Use (PEOU) described how users would be effortless to use and accept digital health solutions for financial resource management. Improved PEOU, training and usability issues would be addressed. Systems are more likely to be accepted users if they are simple and easy to use.

2.3.6 Attitude toward use (ATU)

The entire emotional response of a user to the technology. Acceptance may be encouraged if people believe that digital health solutions are practical and simple to use.

2.3.7 Behavioral intention to use (BI)

The possibility that consumers would embrace digital health solutions. Actual use behavior is determined by BI, which is directly impacted by favorable opinions of PEOU and PU.

2.3.8 External variables

External factors in this study included, system design, organizational support, and training, all of which are crucial in impacting PEOU and PU in digital health solutions for revenue resource regulation in government-owned primary healthcare facilities.

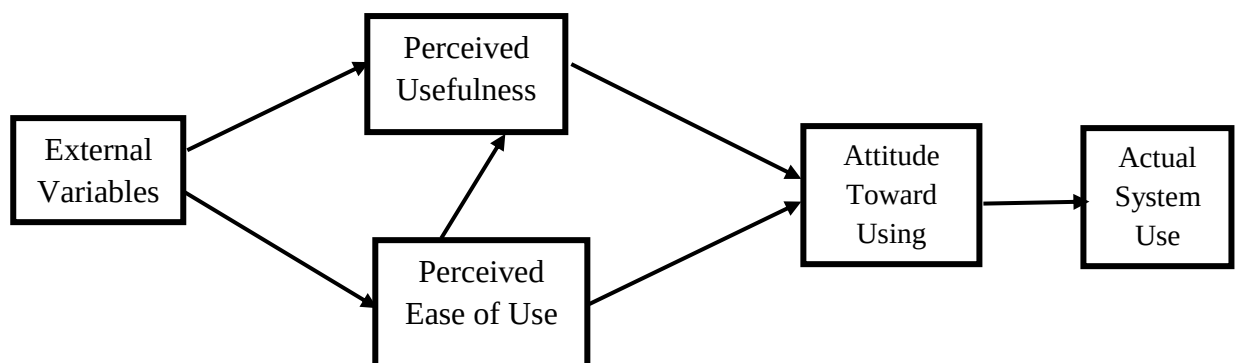


Figure 2.1: Modified Technological Acceptance Model (Venkatesh & Davis, 1996)

Source: (Venkatesh & Davis, 1996)

2.4 Empirical review

2.4.1 Health facilities implementing Planning, Budgeting and Reporting using PlanRep Software

The achievements of sustainable development goals (SDGs) and universal health coverage (UHC) both United Nations and WHO recommends the use Digital Technologies to achieve these goals (UN, 2019; WHO, 2020a). Financial resource management at primary health facilities will continue to be challenging without a well-designed and operational systems (WHO, 2010). Tanzania like any other developing countries cannot be left behind without implementing digital technologies in health care facilities so that to increase accountability, transparency and efficiency in service delivery (Ruhago et al., 2021). Planning, budgeting and reporting is one of the principles of financial resource management in health care facilities (Anasel et al., 2023b).

A study by (Ruhago et al., 2021) on cost-effective analysis of web-based PlanRep system in Tanzania, had shown significant evidence that the web-based PlanRep system has greatly enhanced the planning, reporting, and budgeting procedures in terms of time savings and improved workflows, both at LGAs and at national-level PORALG/MOFP where they can see both monetary and non-monetary efficiency improvements.

However, as the system evolved and IT infrastructure was expanded to schools and health facilities with limited technological capabilities, there was the possibility of additional time and cost savings as these institutions began to create their own plans and budgets using the digital solutions (Ruhago et al., 2021).

A study conducted by Ngwega, (2023) on financial mechanisms used to manage public funds in LGAs, (PlanRep) system improved resource allocations by automating time-consuming procedures, reducing waste, and matching budgets with priorities. Through the consolidation of real-time data and the facilitation of performance monitoring to efficiently track progress, it enables evidence-based decision-making. Systematic record-keeping, audit preparedness, and transparent

reporting support accountability and transparency while fostering trust among stakeholders, including the public, governments, and donors. Nonetheless the study did not show how facilities (services providers) such health care facilities are utilising the system.

The importance of digital techniques in financing health care in LMIS was examined in a study by Meessen (2018). He talked about the three tasks of health finance in LMIS: collecting funds, pooling funds, and purchasing services. Additionally, in numerous LMIS, he suggests the impact of digital health initiatives on the administration of financial resources in healthcare facilities. A significant issue is the availability of financial resources. Consequently, primary health care financial resource management becomes inefficient and inequitable, especially in resource-constrained. Due to the absence of a robust health financing structure capable of mobilising, pooling, and effectively allocating resources.

Mobile insurance platforms, health finance dashboards, and electronic payment systems were among the digital solutions that helped to streamline revenue collection, improve money allocation, and promote expenditure responsibility. These tools assisted in addressing difficulties in resource-constrained locations while also supporting primary healthcare delivery. PlanRep provided real-time data tracking, linked resources with health priorities, and improved financial oversight transparency (Meessen, 2018).

2.4.2 Health facilities implementing revenue collection systems integrated with GePG

The global business environment is undergoing a dynamic shift due to the advent of ICT and digital advancements, with cash-based transactions continuously giving way to electronic-based ones (Mohamad, 2009). As part of a national effort to improve collection of revenues in public health facilities, Tanzania has largely embraced the GePG (MoHCDGEC, 2019). The application of the GePG system in Tanzanian public institutions was examined by (Sausi & Mtebe, 2021) and emphasized that the system contributed to increased efficiency and transparency. According to their

assessment, the integration of GePG reduced administrative costs by 27.10% and raised revenue collection by 44.28% during the fiscal years 2015–2016 and 2019–2020.

They ascribed these results to decreased chances of revenue leakage and enhanced financial accountability. As reported by Sausi et al., (2021) concentrated on how satisfied users were with the GePG system in public health institutions. Their investigation revealed that perceived utility, System and information quality were crucial components of the successful deployment. It was discovered that these elements were essential to guaranteeing the successful deployment of GePG and were closely related to user satisfaction.

Research conducted by Nyambi & Assey, (2022) in Tanzania has additionally glanced at how the Government Electronic Payment Gateway (GePG) can be integrated with other healthcare administration platforms for instance, noted that the Government of Tanzania Hospital Management Information System (GoTHOMIS) and GePG have greatly simplified the administration of patient registration and billing procedures. Even with these developments, obstacles to the best possible system performance still exist, such as inadequate personnel training and inadequate infrastructure (Chambega et al., 2024)

2.4.3 Health facilities utilising Insurance Management Systems (NHIF Online Service Portal)

The expanding worldwide commitment to Universal Health Coverage (UHC) during the past 10 years has sparked reforms and investments to expand health services in several LMICs (WHO, 2021). Regardless of their living circumstances or financial ability, UHC guarantees that everyone has access to essential, high-quality healthcare without suffering from extreme financial hardship as a result of doing so (WHO, 2022). Everyone can receive all the high-quality medical treatment they need at the time and place they need it without experiencing financial hardship if they have access to universal health coverage (UHC) (UHC Forum, 2017).

It includes all essential health services, including prevention, treatment, rehabilitation, palliative care throughout life, and health promotion. Health care professionals at all levels of the health system would be equitably distributed, have access to high-quality products, be decent with their duties, and possess the widest variety of skills necessary to provide these services (WHO, 2016b). According to Baubacar, (2021) achieving UHC is largely dependent on the structure of the healthcare financing system, which is the sale and purchase of revenue from patients to healthcare providers in return for healthcare services.

In a healthy healthcare system, all residents may get high-quality services whenever and wherever they need them. Countries must, however, establish a strong and reliable financial resources management system linked to skilled, well-paid, and driven healthcare workers in order to finance their healthcare systems and reach UHC by deploying variety of strategies, including digital health solutions (Meessen, 2018; MoHCDGEC, 2019; Okuzu et al., 2022; WHO, 2010).

According to an analysis of Ghana's National Health Insurance Scheme (NHIS), switching from paper-based to electronic billing claims processing significantly reduced reimbursement delays and operational costs. The manual approach frequently caused claim processing delays, which hampered cash flow and delayed healthcare providers' service delivery. In contrast, the computerised system increased processing speed, decreased administrative errors, and reduced paperwork. It also improved transparency and accountability, which helped to strengthen financial management and provide more efficient, dependable service delivery within the national health insurance framework (GDI, 2019).

Similar studies on the using block chain technology to implement an electronic health record and health insurance management system had shown a positive result that smooth handling of reimbursements is facilitated by automated claim management system. Additionally, it lowers the general operating expenses of offices or healthcare facilities. Automating clinical documentation and administrative procedures reduces costs and increases efficiency. Implementing innovative systems

invariably disrupts workflow, which causes a brief drop in production. These losses will ultimately only be short-term, and revenues will increase as a result of higher productivity and quicker claim payments (Global Delivery Initiative, 2019; Nonvignon et al., 2022, Golda, 2022).

Furthermore, a study by Saputra & Prima, (2022) in Indonesia on the Social Security and health insurance e-Claim systems they pinpointed that officers in-charge entering charges deal with issues related to accuracy, timing, and human entry errors. This would impede the health facility's revenue generation and cause delays and pending. Generally speaking, healthcare facilities use digital technology for three main reasons: to increase effectiveness, efficiency, and service quality. Several functional applications, including pharmacies, billing systems, medical record information systems, and other functional modules, can be implemented to accomplish this purpose.

This system can conserve infrastructure and human resources, capture health service data, expedite the claim submission procedure, enhance participant administration services, and pay service incentives based on workload (Saputra & Prima, 2022; URT, 2010). Wambua& Mutua, (2024), conducted a study on Biometric Strategies and the Performance of Electronic Claim Processing at the National Hospital Insurance Fund in Kenya, NHIF has been able to enhance its services in terms of their dependability in paying claims, reduce fraud involving claims made by service providers, and increase revenue through the payment of NHIF premiums over time.

Furthermore, on study by Echulet et al., (2023a) which examined the impact of Total Quality Management on e-Claims System performance in Kenyan medical insurance companies; an example of NHIF, Kenya had shown that a well-functioning e-Claims System makes it possible to pay claims and compensate healthcare providers (HCPs) on time, which guarantees that National Health Insurance Fund (NHIF) members are satisfied with the time it takes for claims to be approved. Also, by switching from manual to computerized processes, the fund has generated more revenue, improved production and efficiency, and decreased fraud instances because the automated

approach eliminates administrative overhead and streamlines operations, this change has also shown a significant return on investment (Golda Careline, 2022; Nonvignon et al., 2022)

2.5 Conceptual model

The conceptual framework for evaluating the implementation of digital health solutions initiatives aimed to enhance financial resource management by evaluating the processes involved in putting these technologies into practice and operationalising them in public primary healthcare facilities in three councils chosen from the Rukwa region. Understanding the implementation and maintenance of digital systems like PlanRep, the Government e-Payment Gateway (GePG), and the NHIF Online Service Portal was a key component of this process evaluation in order to achieve the intended functionality and system objectives (MoHCDGEC, 2019).

PlanRep ensured that facility-level planning, budgeting, and reporting are in line with national health priorities. This process evaluation assessed the effectiveness and timeliness of financial planning activities as well as how well PlanRep System were being implemented (Ruhago et al., 2021). Similarly, to this, GePG makes digital revenue collection easier by lowering the hazards associated with handling cash. The evaluation relied on how well revenue transactions are handled and how well the system can manage high transaction volumes without making mistakes (Sausi & Mtebe, 2021). Insurance claims administration is made easier using the NHIF Online Service Portal. This evaluation process assessed the operation of the system at the facility level to handle claims quickly, how easy it is to use, and how consistently reimbursement schedules are adhered to (Saputra & Prima, 2022).

Critical enablers of the processes were identified by this framework as an important input (independent variables). These included facility characteristics such as (health facility type, facility location, health facility units/departments and health facility staffs). Furthermore, having staffs with digital health literacy to run and maintain the systems, training, having digital infrastructure (hardware, software, internet access, routers, computers, tablets, printers), reliable power source supply, maintenance of

digital health solutions, regular meetings on revenue collections, budget allocations for digital health solutions, technical supports, utilisation of GOTHOMIS, staff motivation on using digital health solutions, governance support frameworks that offer operational and regulatory rules for system use, system usability and Community involvement (MoHCDGEC, 2019; Ruhago et al., 2021).

The evaluation assessed whether the necessary inputs were available and effectively implemented across all selected public primary health facilities at various levels of the health service system, as specified in the national strategy. These constituents formed a cohesive framework with the goal of improving financial resource management. The evaluation also influenced the creation of a conceptual framework that depicted the interrelationships between system inputs, implementation processes, and anticipated outcomes. This approach functioned as a guide for determining how digital initiatives increased efficiency, accountability, and financial sustainability in public primary healthcare delivery.

INDEPENDENT VARIABLES

INDEPENDENT VARIABLES

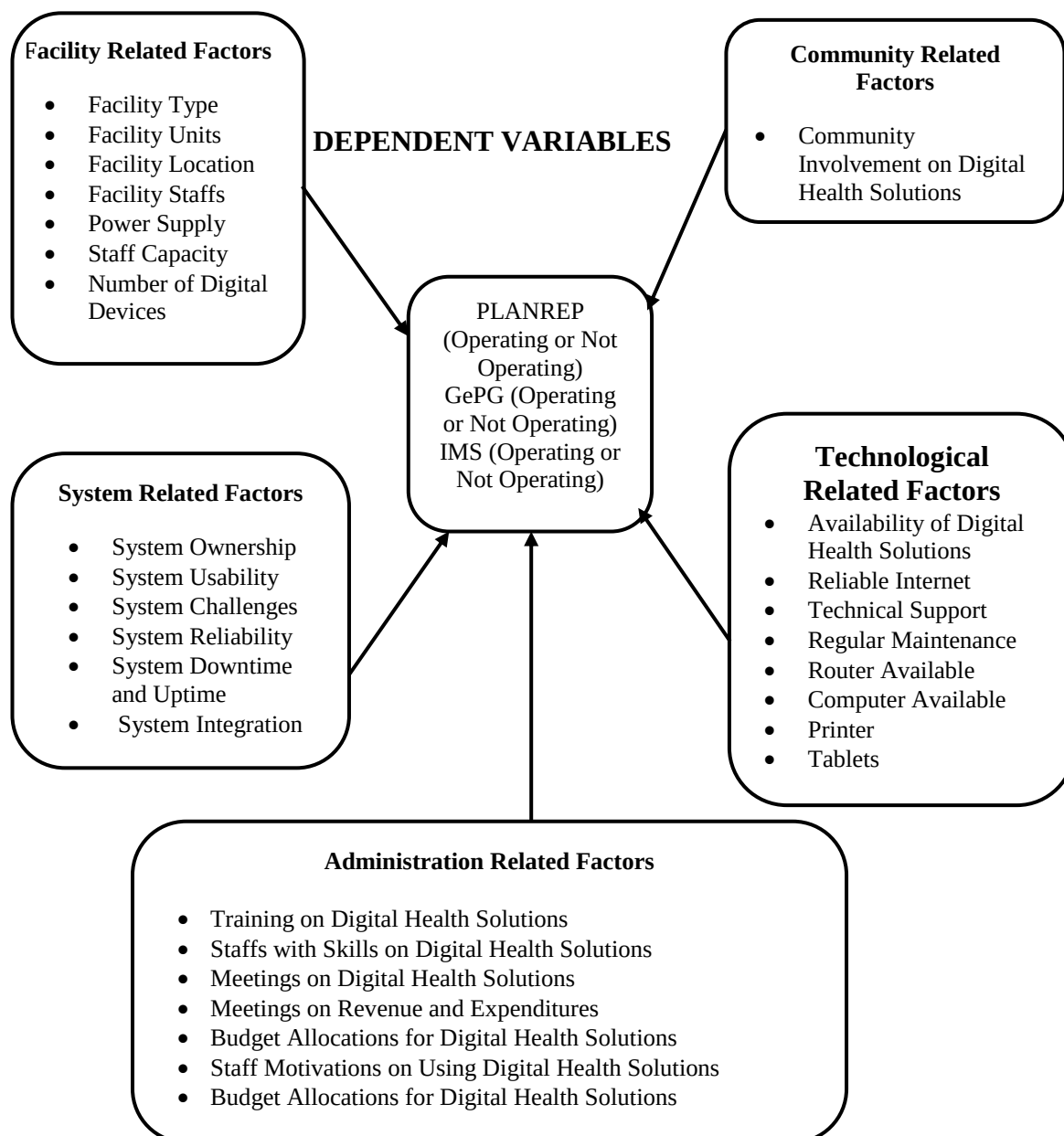


Figure 2.2: Conceptual model for evaluation of digital health solutions initiatives for improving financial resource management at public health facilities

Source: Evaluator Own Construct, 2025

CHAPTER THREE

EVALUATION METHODOLOGY

3.1 Introduction

This section concentrated on how the assessment was conducted and the evaluation procedure. It addressed the target population, unit of analysis, design, assessment duration, focus areas, evaluation approach, and key indicators for assessing implementation and utilisation. It also covered sample procedures, criteria for inclusion and exclusion, data sources, and data collection methods such as questionnaires. Also describe how data was analysed and managed, as well as ethical issues including confidentiality, informed consent, and adherence to research ethics and procedures.

3.2 Study area

The evaluation study was conducted in Rukwa region among of the 26 regions of Tanzania with four councils which are Sumbawanga Municipal Council, Nkasi District Council, Kalambo District Council and Sumbawanga District Council with 330,023 households, total population 1,540,519, whereby males are 743,119, and females are 797,400, total health care facilities were 276 which are distributed as 228 are dispensaries, 37 health centres and 11 (URT, 2022b). The evaluation was conducted in 3 district councils namely Kalambo, Sumbawanga and Nkasi.

A study conducted on evaluating the responsiveness of Tanzania's basic healthcare institutions, Kapologwe et al. (2020), Rukwa was one of the regions that performed poorly in an assessment of response of basic healthcare facilities to the health system. This low performance can be linked mostly to economic and social development challenges, together with the healthcare system capabilities in critical responsiveness categories such as financial resource availability and management. Moreover, Rukwa is among of the top four regions with the most impacted areas, where the prevalence of stunting is higher than 40%, are Ruvuma (41.0%), Iringa (47.1%), Rukwa (47.9%), and Kigoma (42.3%).

Furthermore, a survey conducted on Malaria Indicator Survey and Tanzania Demographic and Health Survey (URT, 2022a), still had shown that Rukwa region is one of the top three regions with stunting rate above 30% and low vaccination coverage counting 9% in Tanzania despite that, Rukwa was included in the regions that produce agricultural products in abundance in Tanzania (URT, 2020). Therefore, Rukwa region still needs more effective efforts to strengthen health care systems not only health services delivery, but also on financial resources management for planning, budgeting, proper utilization, procurement of health care commodities, and incentives for frontline healthcare providers.

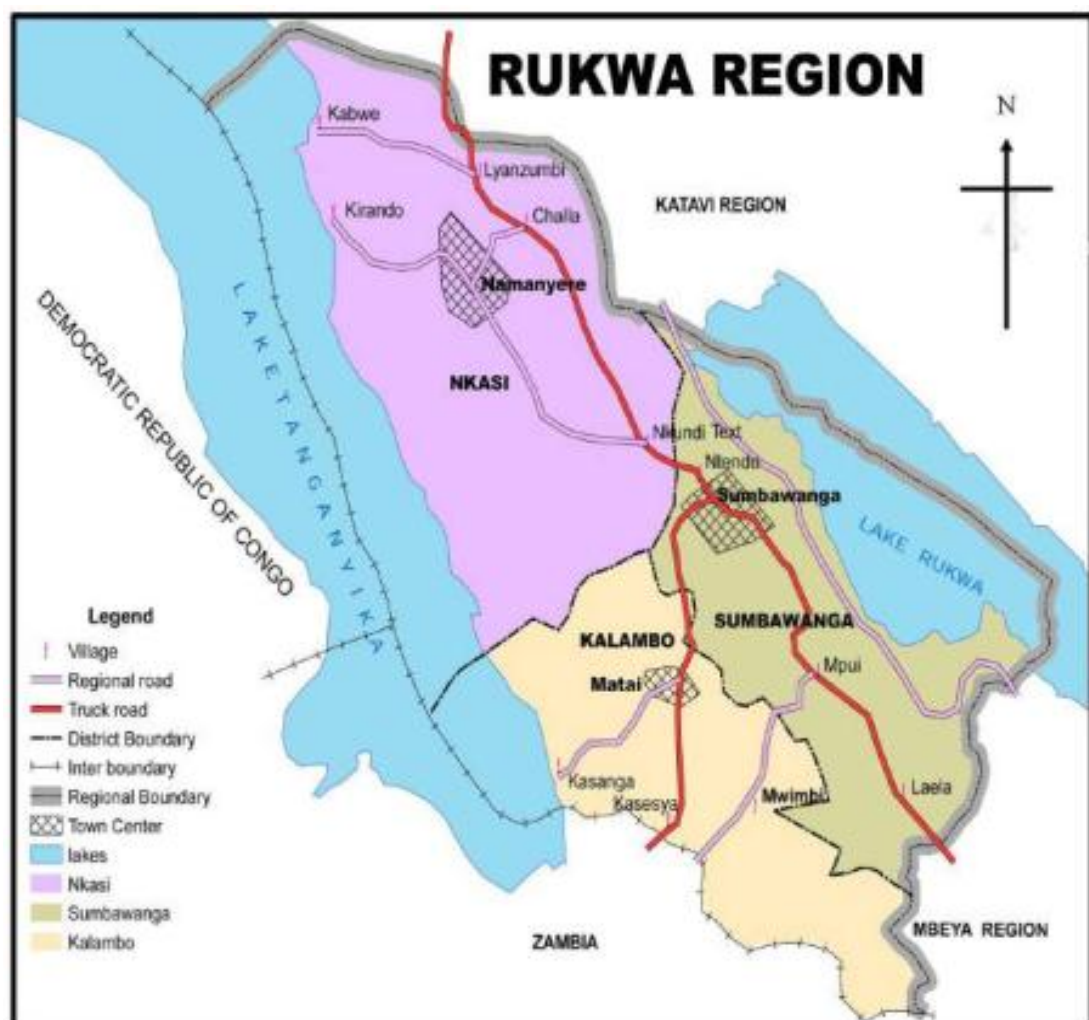


Figure 3.1 Rukwa region map

Source: Rukwa Region Map (URT, 2014)

3.3 Evaluation period

The evaluation began in October 2024, with the formulation of a study proposal. Field data collection took place from April to June 2025, followed by data analysis, report writing, and findings presentation from July to August 2025. The entire evaluation period provided ample time for thorough investigation, allowing meaningful insights to be generated. The chosen timeline was consistent with the academic requirements for partial fulfillment of master's degree completion and was deemed appropriate for collecting, analysing, and presenting the study's results.

3.4 Evaluation design

A cross-sectional study methodology was used in this assessment, which was appropriate for a process evaluation due to its capacity to enable both descriptive and analytical examination of results (WHO, 2016a). The process evaluation assessed how digital health solutions were implemented to support accurate budgeting, revenue collection, expense tracking, and resource allocation. It also examined how these systems facilitated timely, efficient and transparent financial management, enhanced financial reporting, and reduced the likelihood of errors or financial mismanagement.

3.5 Evaluation approach

The evaluation strategy utilised a quantitative methodology to analyse the World Health Organization's (WHO, 2016a) recommendations for the implementation of digital health solutions projects in order to effectively assess the systems for resource management in healthcare facilities. This strategy entailed gathering quantitative data, which were then analysed independently using statistical methods. The findings were analysed to give a thorough overview of how well digital health technology is being used and implemented for financial resource management.

3.6 Central focus of the assessment

The assessment analysed the implementation of digital health solution initiatives aiming at improving financial resource management among basic healthcare institutions that are public in the Rukwa region. It concentrated on looking at how

these digital devices increased accountability, transparency, and efficiency in financial operations like revenue collecting, budgeting, and reporting (N. Kapologwe et al., 2022; MoHCDGEC, 2019; Ruhago et al., 2021, 2022a; WHO, 2020a). Furthermore, the evaluation identified key related factors to implementation and provided evidence-based recommendations to strengthen the efficiency, scalability, and continuity of the aforementioned initiatives.

3.7 Quantitative method

In this evaluation study, the quantitative data collection approach governed the entire strategy for data collection. This strategy included the use of standardised questionnaires with closed-ended questions, such as, "Did you use the digital health application for revenue collection?" (WHO, 2016a). The study focus was an objectively measuring the implementation and outcomes of electronic health devices, which aligns and influenced the decision to use a quantitative approach. Because the evaluation aimed to assess patterns, trends, and relationships through statistical analysis rather than investigating subjective experiences, the quantitative method was deemed most appropriate and effective for this evaluation study.

3.8 Target population

The public primary healthcare facilities were included in the study, which are currently functioning in 3 selected councils (Kalambo, Sumbawanga and Nkasi) health facilities in Rukwa region. As defined by the WHO, (2008) a health care provider is a person or an organisation licensed to offer patients/client health care services such as medical diagnosis and treatment, including prescriptions of medicines, surgery, and medical equipment. In this context service providers were the representative of the health facility and included either doctors, nurses, midwives, pharmacists, clinical officers, laboratory technicians, health administrators, health assistants or non-health professionals just to mention few (WHO, 2008)

3.9 Unit of analysis

Selected public health facilities in the 3 district councils served as the unit of analysis in this evaluation study. Each facility was represented by a member of the health management team or a frontline health care provider with direct experience in implementing or utilising digital health technologies. This method enhanced the evaluation to secure facility level comprehension into the use of technologies including PlanRep, GoTHoMIS, GePG, and the NHIF Online Service Portal.

3.10 Sample size

The sample size utilised to address the evaluation's specific objectives from objective one to four was mathematically derived using Yamane's formula (Singh & Masuku, 2014), a well-known approach for estimating sample size in cross-sectional studies with a specified population this formula assumed a simple random sampling method, ensuring that every number of the population had an equal chance being chosen (Sathyanarayana S T. Mohanasundaram, 2024). Its use in this study ensured statistical representativeness and sufficient power reached significant conclusion on the implementation and use of digital health solutions in public primary health care facilities (Kesse-Tachi et al., 2019).

Where:

n: Required sample size

N: Population size

e: Margin of error (in decimal form, e.g., 0.05 for ±5%)

From this formula above:

$$N = \frac{N}{1 + N.e^2}$$

n= Required sample size to be evaluated

$$N = \frac{276}{e = 0.05}$$

From the formula above n= 220

$$n = \frac{1 + 220 \cdot 90.05^2}{141.935} \approx 142$$

Thus, the sample size calculated for this evaluation study was 142, however during data collection we managed to reach a total number of 158 public health facilities

3.11 Sampling technique

The evaluation research deployed a multi-stage selection technique to assess the implementation of health technology devices for monetary resource supervision in public health facilities in Rukwa Region. Multi-stage sampling was recognized for its efficiency in geographically dispersed populations, as it provides evaluators to systematically narrow down larger clusters into smaller, controllable sections while retaining representativeness (Lohr et al., 1999; William G. Cochran, 1953).

From the four councils in Rukwa Region, three councils were selected using simple random sampling (SRS). The technique ensured that every council were having an equal probability of being selected by reducing bias in the initial selection stage. Random selection as an essential method in cluster sampling was enhances for drawing generalizability of findings (Kumar & Ranjit, 2019). A total of 158 public health facilities under the jurisdiction of the selected councils were classified based on their levels of service delivery.

The second stage involved comprehensive compilation of the chosen medical facilities among the three councils. To guarantee representation across several tiers of healthcare facilities, such as hospitals, health centres, and dispensaries, stratified simple random sampling was employed (Kagoma et al., 2025). The method also divided the population (facilities) into subgroups (strata) before random selection within each stratum, the inclusivity was promoted for all types of facilities so that to be engaged in the evaluation project (Florida & Bhattacharjee, 2012).

The total sample size (158 facilities) was then distributed proportionally across the selected councils and facility types based on their size and capacity. The probability proportional to size (PPS) approach ensures that larger facilities, which handle more patients or resources, have a higher likelihood of inclusion in the study. This method

is generally recognized for its capacity to improve the representativeness of samples in stratified or cluster sampling designs (N. Kapologwe et al., 2022). For this evaluation research, the strata were defined as council district hospitals, health centres, and dispensaries. Due to their direct involvement in the usage and administration of digital health systems, study participants (facility representatives) such as facility in-charges, health secretaries/administrators, and facility accountants were specifically chosen.

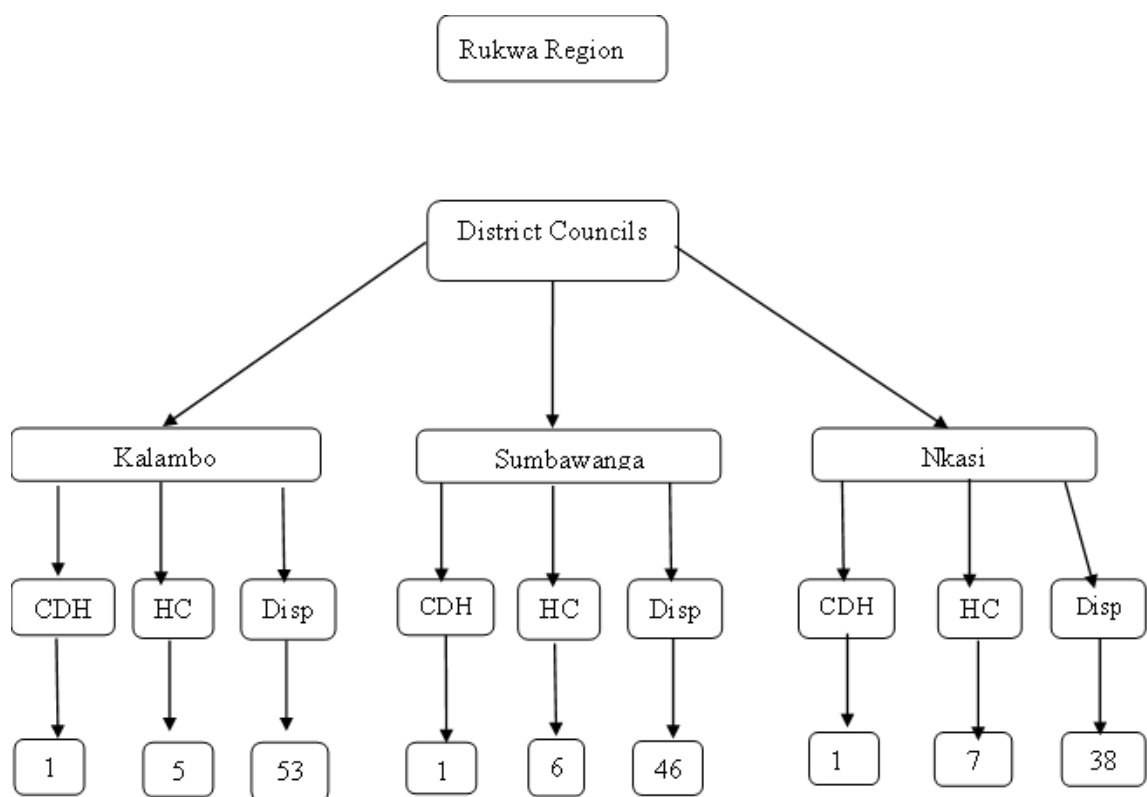


Figure 3.2 Sample Selection

Source: Evaluator Field Data, April 2025.

Key:

CDH – Council District Hospital

HC – Health Centre,

Disp – Dispensary

3.12 Eligibility criteria

3.12.1 Participants inclusion requirements

Medical facilities that have been in operation for a minimum of one year within the three selected district councils.

3.12.2 Exclusion criteria

Public health facilities which had been operating for less than a year in three selected councils.

3.13 Key variables and indicators

A table of variables is shown below, along with the measurements that were used during evaluation process.

Table 3.1: Evaluation variables and measurements

SN	Category	Variables	Measurement
1	Facility characteristics	Health Facility Type	Dispensary, Health Centre, Hospital
		Health Facility Location	Urban or Rural
		Health Facility Units/Departments	Number of Units/ Departments
2	Objective 1: Asses health facilities using planning and reporting (PlanRep) in Rukwa region.	Health Facility Staffs	Number of Staffs
3	Objective 2: Assess health facilities using revenue collection systems integrated with GePG in Rukwa region	Facility using collection systems integrated with GePG in Rukwa region.	Number of health facilities using revenue collections systems integrated with GePG/Total number of health facilities
4	Assess health facilities utilising digital solutions for health insurance management in Rukwa region	Facility utilising health insurance management system	Number of health facilities utilising health insurance management/ Total number of health facilities
5	Examining factors facilitating with the implementation of digital health solutions for management of financial resources in public health facilities in Rukwa region	Availability of digital health solutions	Digital health solutions are available or not available
		Reliable internet	Reliable internet or not reliable internet
		Reliable electricity	Reliable electricity or not reliable electricity
		Regular maintenance of digital solutions	There is regular maintenance or there is no regular maintenance of
		System performance and reliability	The system is stable and reliable or the system is not stable and reliable
		Training on digital health solutions	Training on digital health solutions is provided/conducted or not provided/conducted
		Budget allocations for digital solutions	Budget allocated; Not allocated
		Technical support	Technical support is provided, not provided
		System usability	User-friendliness or not friendly, speed on executing a task; very speed, low or moderate.
		Staff motivations	Incentives are provided to staffs or not provided
		HFGC and Clients/Patient Participation	HFGC and Clients/Patient are involved in digital health solutions or not involved
		Guidelines for digital health solutions	Guidelines for digital health solutions are available or not available

Source: Evaluator Field Data, April 2025.

3.14 Data collection tools

Data collection tool for this evaluation study was designed to capture all factors that were relevant to the study objectives (WHO, 2008). The tool was a structured questionnaire, researcher-administered questionnaire administered to 158 public primary health care facilities (PHC) in Rukwa region to assess the implementation and utilisation of three critical digital health solutions which are PlanRep, GePG, and the NHIF Online Service Portal. The tool also evaluated staff capacity and competence in using the systems, ease of use of digital platforms, and challenges encountered during implementation. Financial issues such as budget allocations for digital health solutions and motivational factors influencing employee engagement were investigated. Evidence on the frequency of digital equipment maintenance and community participation in digital health initiatives were collected as well. It collected detailed information about the availability of digital gadgets such as personal computers, printers, and tablets, along with whether the facility had its own PlanRep account. Essential infrastructure factors such as power supply, internet access, and router availability were also indicated.

3.15 Tool pre-testing

To affirm the accuracy, clarity, and dependability of the information obtained tools used to evaluate digital health solutions for financial resource management a thorough pretesting process was carried out. The pilot study comprised a small number of health facilities with similar characteristics to those included in the main study. During the pretesting phase, the questionnaire was evaluated for relevance, completeness, and clarity. During probing meetings, feedback from facility representatives assisted in identifying ambiguities, redundancies, and inconsistencies with the tools.

Based on these findings, necessary changes were made to improve contents clarity and technical accuracy. This systematic validation process ensured that the final instruments were well-aligned with the study objectives and robust enough to capture reliable and meaningful data on the introduction and functioning of digital health

systems specifically PlanRep, GePG, and the NHIF Online Service Portal across public health facilities.

3.16 Data collection technique

The data gathering process utilised systematic quantitative procedure, including face-to-face interviews and questionnaires installed in the KoboCollect application. Trained data collectors used android devices to visit all 158 public primary health facilities in the three selected councils. Before beginning fieldwork, data collectors underwent two days of extensive training in study objectives, ethics, informed consent, and KoboCollect utilisation. Questionnaires were administered to key informants in charge of planning, finance, and digital system operations at each facility. The face-to-face approach allowed for clarification of questions, accuracy, and the collection of complete replies from service providers directly engaged in system operationalisation.

Additionally, during administering of questionnaires, the process for collecting data includes an organised observation of the availability and performance of ICT equipment such as computers, routers, internet connectivity, and power supply. This approach increased both the information correctness, completeness, and reliability, providing a thorough picture of digital health system implementation at the facility level.

3.17 Data management

3.17.1 Data entry

At each health facility, the data collector began collecting the information by launching the Kobo Collect app on a smartphone. Well-designed digital questionnaire was employed together responses to the evaluation variables. Following each interview or data extraction session, the data collector thoroughly checked the replies in the form to ensure completeness, correctness, and internal consistency. If any discrepancies were discovered, they were immediately corrected before the form was saved as a draft. Before leaving the facility for the next facility,

the data collector re-checked the saved draft to confirm that all information was accurate and in line with the desired responses.

Only after this validation proved the form was complete and ready for submission to the Kobo Collect server. This standardized approach was followed consistently in all selected health facilities. After data collection was completed in all facilities, the saved forms were uploaded to the Kobo Collect server. The obtained data was then downloaded in the Comma Separated Values (CSV) format. The CSV file was compared to the original questionnaire to ensure that all essential variables were correctly captured and that the dataset structure matched the desired design (Nagy, 2023).

3.17.2 Data cleaning

After collecting field data and downloading the raw dataset from the Kobo Collect server in CSV format, a rigorous data cleaning process was performed to assure correctness, reliability, and preparation for analysis. The technique involved an organised approach to identifying and solving discrepancies, missing values, and formatting issues were performed without altering the original responses. All string variables were transformed into a STATA readable machine format (STATA version 15) (Hesketh & Everitt, 2007). In order to accomplish this, new numerical variables were created for every string category. To guarantee accuracy and consistency, the newly generated variables were given the proper numeric codes, labeled appropriately, and technically cross-checked against the original string variables. Throughout this procedure, STATA commands were used to control labeling, verification, and variable transformation. This step was essential to ensure compliance with STATA analytical procedures and preparing the dataset for reliable statistical analysis (Hesketh & Everitt, 2007)

The dataset was initially checked to ensure that all variables were consistent with the digital questionnaire used for data collection. Each variable name, label, and response value were checked for conformity with the desired questionnaire format. Key areas of focus included facility type, PlanRep usage, GePG integration, NHIF

Online Service Portal, internet connectivity, and staff training indicators (Otorkpa et al., 2025)

Whenever necessary, these cases were evaluated for clarification using field notes. To ensure data integrity, records with permanently damaged gaps were excluded from the analysis. Categorical responses that were previously recorded as string variables (e.g., "Yes", "No", "Hospital", "Dispensary") were rigorously recoded as numerical values. Each recoded variable was given a distinct code (e.g., 1 = Yes, 0 = No) and correctly labeled to guarantee clarity throughout analysis. A separate "codebook" was created to document each variable and its values.

To prepare for tabulation, variables such as facility type were standardised into three categories: dispensary, health centre, and hospital. Binary responses were uniformly coded, and multi-response variables were harmonised to ensure consistent interpretation across the dataset. After cleaning all variables, A final assessment was undertaken to guarantee that the dataset satisfied the evaluation analytical requirements. This included generating frequency tables to ensure completeness, examining the balance across facility types, and validating the inclusion of all variables required for analysis.

The useful dataset was finally saved into STATA file format (.dta) with a separate backup copy. All changes made during the data cleaning process were documented in a separate data cleaning file (do-file), ensuring complete transparency and replication. The clean dataset and do-file were then shared to supervisors and utilised to generate descriptive statistics, cross-tabulations, and inferential analysis that were consistent with the objectives of the study (Hesketh & Everitt, 2007)

3.17.3 Data analysis

Microsoft Excel and STATA version 15 were employed to clean, recode, and analyse quantitative data from structured questionnaires. For verification and quality control, the cleaned dataset (.dta) and corresponding STATA do-file (.do) were securely saved and shared to academic supervisors. In order to answer objectives such as facility characteristics Microsoft Excel was utilised to create preliminary descriptive

summaries and visual outputs, such as tables, and bar charts, that depict system utilization across health facility types (district hospitals, health centres, and dispensaries).

Frequencies and proportions for categorical variables pertaining to ICT infrastructure, internet accessibility, employee training, login credentials, employee motivation, and digital devices availability were executed using descriptive statistics in STATA (Tajul et al., 2022). Chi-square tests (χ^2) were employed to determine whether there were statistically significant associations existed between key categorical variables related to the implementation and utilisation of digital health solutions across public primary health care facilities and proportion of system implementation and utilisation across these factors in order to fulfill evaluation objectives one, two and three (Franke et al., 2012; Nihan, 2020; StataCorp, 2017). However, since no statistically significant relationships were found and no health facilities reported using GePG, the results for GePG and the NHIF Online Service Portal were simply provided descriptively (Hesketh & Everitt, 2007).

Bivariable and multivariable logistic regression analysis were performed on PlanRep System implementation in order to determine the factors that facilitating the utilisation of the system. At the bivariable level, 17 variables were first evaluated. Stepwise backward elimination method was employed, in which non-significant factors were removed until there were only seven statistically significant factors left (Liu et al., 2022; Mittal et al., 2024). Based on contextual relevance and statistical significance, seven factors were selected to remain in the final multivariable logistic regression. These included facility type, computer availability, internet connectivity, router availability, employee motivation, internet availability, and ownership of a PlanRep System account. Because of its operational significance, the model also maintained the capacity of the workforce to use PlanRep (Ogundaini & Mlitwa, 2024).

Multicollinearity diagnostics were carried out to guarantee model reliability and effect estimate accuracy before multivariable logistic regression was conducted. Strong correlations between independent variables can lead to multicollinearity, which may influence regression coefficients and enhance standard errors, making the model difficult to interpret. The Variance Inflation Factor (VIF) was used to identify this problem, identifying variables with possible collinearity issues at a threshold of 10. The variables "number of digital devices" and "availability of computers" were found to be conceptually associated in this evaluation since facilities with additional digital devices were also more likely to report possessing computers

Several diagnostics tests were used to assess the model fit, a non-significant p-value ($p > 0.05$) from the Hosmer-Lemeshow Goodness-of-Fit Test indicated that the model correctly described the data (Nattino et al., 2020; Surjanovic et al., 2024). With a Nagelkerke Pseudo R² value of 0.6612, the predictors were responsible for 66.1% of the variation in PlanRep implementation. The inclusion of the chosen variables in the final model was supported by the statistical significance of the Likelihood Ratio (LR) Test ($p < 0.001$). Regression results were displayed in tables and figures that were consistent with the assessment objectives of the study and were provided as Adjusted Odds Ratios (AORs) with 95% Confidence Intervals (CIs) (Hesketh & Everitt, 2007).

Table 3.2: Data management and data analysis plan

SN	Objective	Data Sources	Sample Size	Data Collection Method	Data Collection Tool	Data Analysis
1	Objective 1: Assess whether health facilities are using planning and reporting (PlanRep) System for budgeting and planning	Primary data collected from facilities	158	Structured Questionnaire, Interviewer administered	Questionnaire	Descriptive statistics presented with cross-tabulation, with Chi-Square (χ^2) test to measure significance in difference between health facilities
2	Objective 2: Assess whether health facilities are using revenue collection systems integrated with GePG	Primary data collected from facilities	158	Structured Questionnaire, Interviewer administered	Questionnaire	Descriptive statistics presented with cross-tabulation, with Chi-Square (χ^2) test to measure significance in difference between health facilities
3	Assess whether health facilities are utilising digital solutions for Health Insurance Management System	Primary data collected from facilities	158	Structured Questionnaire, Interviewer administered	Questionnaire	Descriptive statistics presented with cross-tabulation, with Chi-Square (χ^2) test to measure significance in difference
4	Examining factors facilitating the implementation of digital health solutions for management of financial resources in public health facilities in Rukwa region	Primary data collected from facilities	158	Structured Questionnaire, Interviewer administered	Questionnaire	Inferential statistics: Bivariate and Multivariate Logistic Regression Analysis was performed for significance differences

Source: Evaluator Field Data, April 2025.

3.18 Validity and reliability of findings

3.18.1 Validity

In order to ensure the validity of the study, questionnaire was deliberately developed in accordance with the objectives of the evaluation study, which centred on assessing the deployment and utilisation of digital health solutions for financial resource management systems in primary health care settings. Academic supervisors from Mzumbe University conducted an expert review of the instrument to guarantee its design and content validity. The questionnaire sufficient representation of the constructs under reviewing, including ICT infrastructure, staff capacity, motivation, internet access, and system operation, was confirmed by this expert assessment.

Furthermore, pilot testing was carried out in a healthcare facility that was not sampled in order to evaluate the items for coherence, relevance, and clarity. The effectiveness of the instrument in collecting precise and pertinent data under actual field conditions was improved by the necessary modifications to the questions language and structure based on feedback from the pilot study as how evaluations of digital health solutions had conducted (Karamagi et al., 2022)

3.18.2 Reliability

The evaluation study reliability was ensured by rigorous methodological procedures, standardized instruments, and uniform procedures throughout the whole research process. A thorough research proposal that covered everything from data collection to analysis was developed reviewed by supervisors, presented and authorized by Mzumbe University Postgraduate Research Panel, and provided the framework for reliable implementation. In order to reduce bias and improve consistency, research assistants received extensive training on the goals of the study, ethical standards, and standardized methods for distributing the questionnaire among dispensaries, health centers, and district hospitals. To ensure clarity and reproducibility, it contained structured, closed-ended questions. Using STATA version 15, quantitative data were processed, and string variables were converted to numeric representation. All coding

and analysis stages were documented in a STATA do-file, which was approved by peers and sent to supervisors for recommendations.

3.19 Ethical considerations

Mzumbe University, under the Directorate of Postgraduate Studies, Research and Publications (DPRS), granted formal introductory letter for this evaluation study in accordance with its institutional research standards and protocols. This letter of introduction served as the basis for an official request correspondence that was sent to the Rukwa Regional Administrative Secretary (RAS), who granted regional authorization to carry out the assessment. The District Executive Directors (DEDs) of the Kalambo, Sumbawanga, and Nkasi District Councils were subsequently notified of the introduction by the RAS. Between 24th of March to 30th of June 2025, the researcher was officially authorised by these councils to collect data in selected public primary healthcare facilities.

Correspondence from Mzumbe University (DPRS) to RAS Rukwa, then to the corresponding District Councils, and lastly to the student researcher, followed an organised procedure. In order to ensure transparency as well as collaboration at the facility level, official introduction and permission letters were sent to health facility in-charges during courtesy visits after obtaining these clearances. Formal correspondence with reference numbers were channeled at each step of the jurisdictions procedure in order to ensure accountability and transparency.

RAS Rukwa received the first introductory letter from Mzumbe University with Ref. No.M/DPGS/INT/38/Vol.IV/594, in response, the RAS confirmed regional introduction with Ref. No. CA.190/227/01B/104. RAS Rukwa then sent a letter with Ref. No.CA.190/227/01B/104 to the three selected district councils executive directors of the Kalambo, Sumbawanga, and Nkasi councils. At last, the student received letters of approval from the District Councils under their respective references: Kalambo (KDC/F.40/02/180), Sumbawanga. No. SDC/T.60/31/139 and Nkasi NKSC/DC/R.20/6/VOL.1V/115.

The evaluation was carried out in accordance with Mzumbe University, national ethical research norms and the public service code of ethics and conduct, with the full knowledge and assistance of all relevant legal and government authorities, according to this organised administrative approval process. Official courtesy visits were used to formally present introduction and permission letters to facility in-charges, which made it easier to gain access to the study sites and promoted collaboration at the health facility level.

3.20 Dissemination plan

The findings of this evaluation were presented to Mzumbe University and disseminated to stakeholders, including the Ministry of Health (MOH), the President's Office – Regional Administration and Local Government (PO-RALG), the Regional Health Management Team (RHMT), Council Health Management Teams (CHMTs), and at the public primary health facilities. This dissemination aimed to promote evidence-based decision-making and strengthen digital health implementation at various administrative levels. Evaluator is on the process of preparing the manuscript and will be submitted to a reputable peer-reviewed academic journal.

3.21 Study limitations

This evaluation was done at public health facilities specifically in Rukwa region, and may not fully represent the diversity of digital health system implementation across Tanzania. Differences in infrastructure, human resource capacity, and administrative priorities may cause varying levels of system implementation and performance elsewhere. Furthermore, the study relied mainly on structured interview-guide questionnaire as the primary data collection tool. While this method aided structured data collection, it is nevertheless prone to response bias. Participants may have overstated positive outcomes or understated operational challenges, particularly in areas such as system functionality, infrastructure availability, and staff performance, which could have influenced on the findings of the objectivities.

The study employed cross-sectional design, which makes it difficult to evaluate long-term trends, causality, or the long-term impact of digital system implementation on financial management and service delivery. The quantitative technique allowed for generalisation and the detection of statistical relationships, but it lacked the in-depth required to investigate user experiences, behavioural factors, and contextual difficulties. Lack of qualitative data limited insight into how healthcare providers interact with technologies such as PlanRep, GOTHOMIS, and the NHIF Online Service Portal. These limitations highlight the need for future longitudinal and mixed-method studies to gain a more complete picture of digital health systems implementation and integration in public health sector.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter presents a structured synthesis of the study empirical findings, guided by the research objectives and derived from systematically collected quantitative data. The presentation is organized into four analytical segments: an overview of the key institutional characteristics of the surveyed health facilities, the extent of implementation of three essential digital health solutions, namely, Planning and Reporting System (PlanRep), Government Electronic Payment Gateway (GePG) integrated with the Government of Tanzania Hospital Management Information System (GOTHOMIS) and the National Health Insurance Fund (NHIF) Online Service Portal. Moreover, this chapter highlights key facilitating factors that influence the successful implementation of PlanRep digital health solution for improving financial resource management in public primary health facilities in Rukwa region. Collectively, these findings establish a robust evidence base for the interpretations, strategic insights, and policy implications explored in subsequent chapters.

4.2 Health facility characteristics

This study engaged 158 public primary health facilities across three district councils, namely Kalambo (59), Sumbawanga (53), and Nkasi (46). The majority of the facilities involved were dispensaries ($n = 136$, 86.1%), and most were located in rural areas ($n = 147$, 93.0%). A significant percent of the facilities had two or more digital devices ($n = 66$, 43.7%), while others reported having only one device ($n = 53$, 35.1%). More than half of the health facilities owned computers ($n = 89$, 53.3%). However, a significant majority ($n = 122$, 77.2%) of facilities had no printers and in terms of tablets were present in a substantial number of facilities ($n = 112$, 71%). With regard to internet infrastructure, internet connection devices (routers) availability was more than half ($n = 106$, 67.1%) of the facilities, and reliable internet access was reported by majority ($n = 103$, 65.2%). Most of the health facilities were

connected with TANESCO as their main source of electrical power supply (n = 149, 94.3%). The implementation GOTHOMIS was more than half (n = 82, 51.9%) of the health facilities involved in the study (Table 4.2).

Table 4.1: Key characteristics of 158 health facilities engaged in the study

Variable	Categories	Frequency	Percent
Type of health facility	Dispensary	136	86.1
	Health Centre	19	12.0
	District Hospital	3	1.9
District council	Kalambo	59	37.3
	Sumbawanga	53	33.5
	Nkasi	46	29.1
Health facility location	Rural	147	93.0
	Urban	11	7.0
Number of digital devices available at health facility	One Devices	53	35.1
	Two or Three Devices	66	43.7
	Four or More Devices	32	21.2
Availability of Computer at health facility	Has computer	89	56.3
	Has no computer	69	43.7
Availability of Printer at health facility	Has no Printer	122	77.2
	Has Printer	36	22.8
Availability of Tablets at health facility	Has Tablets	112	71
	Has no Tablets	46	32.9
Availability of Router at health facility	Has Router	106	67.1
	Has no Router	52	67.1
Internet Reliability	Reliable	103	65.2
	Not Reliable	55	34.8
Main Source of Electricity	TANESCO	149	94.3
	Generator or Solar	9	5.7
Utilisation of GOTHOMIS	Using GOTHOMIS	82	51.9
	Not Using GOTHOMIS	76	48.1

Source: Evaluator Field Data, April 2025.

4.3 Implementation of Planning and Reporting System (PlanRep) System among health facilities involved in the study in Rukwa, April 2025 (N=158)

The majority of health facilities (n = 120, 88.2%) did not have their own PlanRep System accounts. A statistically significant difference in account ownership was observed across facility types, with dispensaries more likely to lack accounts compared to hospitals and health centres (88.2% compared to 54.6%, $p < 0.001$). With regard to implementation, (n = 99, 62.7%) of facilities were not using the PlanRep System for planning, budgeting, and reporting. Additionally, (n = 122, 72.2%) of healthcare facilities were reported to lack the capacity to use the PlanRep System. This difference was statistically significant across facility types, dispensaries

lacking capacity compared to those in hospitals and health centres (80.1% Vs 59.1%, $p = 0.029$).

The majority of facilities ($n = 68$, 82.9%) reported that the PlanRep System was easy to use. No statistically significant difference was found in perceived ease of use between facility types ($p = 0.761$). Among facilities that had implemented the system, ($n = 147$, 93.0%) reported experiencing no challenges in its use. A statistically significant difference was observed in the distribution of reported challenges between hospitals and health centres, and dispensaries ($p = 0.002$). The majority of facilities ($n = 152$, 96.2%) reported not conducting regular training on the use of the PlanRep System. A statistically significant difference was also found in training practices across facility types, with 97.8% of dispensaries lacking regular training compared to 86.4% of hospitals and health centres ($p = 0.009$) (Table 4.3).

Table 4.2: Implementation of Planning and Reporting System (PlanRep) System among health facilities involved in the study in Rukwa, April 2025 (N=158)

Variable	Categories	Type of health facility						P
		Total		Hosp/HC		Dispensary		
		N	%	N	%	N	%	
Facility has PlanRep Account	Has account	26	16.5	10	45.5	16	11.8	< 0.001
	Has no account	132	83.5	12	54.6	120	88.2	
Health Facility Using PlanRep	Use PlanRep	59	37.3	12	54.6	47	34.6	0.072
	Not use PlanRep	99	62.7	10	45.5	89	65.4	
Healthcare workers has capacity to use PlanRep	Have capacity	36	22.8	9	40.9	27	19.9	0.029
	Have no capacity	122	72.2	13	59.1	109	80.1	
Easy use of PlanRep	Easy to use	68	82.9	12	85.7	56	82.4	0.761
	Not easy to use	14	17.1	2	14.3	12	17.6	
Challenges on using PlanRep	Experience challenges	11	7	5	22.7	6	4.4	0.002
	No challenges	147	93	17	77.3	130	96.6	
Facility conducting regular training on PlanRep use	Conduct training	6	3.8	3	13.6	3	2.2	0.009
	Not conducting training	152	96.2	19	86.4	133	97.8	

Source: Evaluator Field Data, April 2025.

4.4 Implementation of Revenue Collecting System integrated with Government Electronic Payment Gateway (GePG)

A majority of health facilities (n = 82, 51.9%) reported using the centralized Government of Tanzania Hospital Management Information System (GOTHOMIS) for health service provision and revenue collection. However, none of the facilities had integrated GOTHOMIS with the Government Electronic Payment Gateway (GePG) System (0.0%) (Table 4.4).

Table 4.3: Implementation of Revenue Collection System integrated with Government Electronic Payment Gateway (GePG) among health facilities involved in the study in Rukwa, April 2025 (N=158)

Variable	Categories	Frequency	Percent
GOTHOMIS Implementation	Implementing GOTHOMIS	82	51.9
	Not implementing GOTHOMIS	76	48.1
GePG Integration	GePG Integrated	0	0.0%
	GePG not integrated	158	158

Source: Evaluator Field Data, April 2025.

4.5 Utilisation of digital health solutions for Health Insurance Management, National Health Insurance Fund (NHIF) Online Service Portal)

The majority of health facilities (n = 152, 96.2%) reported utilising the National Health Insurance Fund (NHIF) Online Service Portal. In terms of system access, (n = 85, 53.8%) of the facilities had at least one healthcare worker accessing the system, while (n = 73, 46.2%) had two or more staff involved. The system was primarily used in a single department, with (n = 111, 70.2%) of the facilities reporting usage specifically in the Outpatient Department (OPD). Most facilities (n = 146, 92.4%) indicated that the NHIF Online Service Portal was easy to use. However, a significant number (n = 90, 57.0%) reported experiencing challenges in using the system. Additionally, a large proportion of facilities (n = 116, 73.4%) indicated that they do not conduct regular training sessions for staff on the use of the NHIF Online Service Portal (Table 4.5).

Table 4.4: Utilisation of digital health solutions for health insurance management (NHIF Online Service Portal) among health facilities involved in the study in Rukwa, April2025 (N=158)

Variable	Categories	Type of health facility					
		Total		Hosp/HC		Dispensary	
		N	%	N	%	N	%
Facility Utilising NHIF Online Service Portal	Utilising	152	96.2	21	95.5	131	96.3
	Not utilising	6	3.8	1	5.5	5	3.7
Number of healthcare workers who access NHIF System	One staff	85	53.8	6	27.3	79	58.1
	Two or more staff	73	46.2	16	72.7	57	41.9
Number of departments using NHIF System	One department	111	70.2	9	40.9	102	75.0
	Two or more	47	29.8	13	59.1	34	25.0
NHIF System easy to use	Easy to use	146	92.4	21	95.5	125	91.9
	Not easy to use	12	7.6	1	4.5	11	8.1
Healthcare workers experiencing challenges when using NHIF System	Experience challenges	90	57.0	10	45.5	80	58.8
	No challenges	68	43.0	12	54.5	56	41.2
Health Facility conducting on NHIF System	Conducting training	42	26.6	8	36.4	34	25.0
	Not conducting training	116	73.4	14	63.6	102	75.0

Source: Evaluator Field Data, April 2025.

4.5.1 Challenges affecting the implementation of the Insurance Management System (NHIF Online Service Portal)

The implementation of the Insurance Management System (IMS) in public primary health facilities across Rukwa Region faced several operational challenges as reported by participants. The most frequently cited barrier was poor internet connectivity, highlighted by 34% of respondents. This was followed by system failures (20%), non-functional or faulty devices (11.5%), and software bugs or system errors (3.2%) (Figure 4.1).

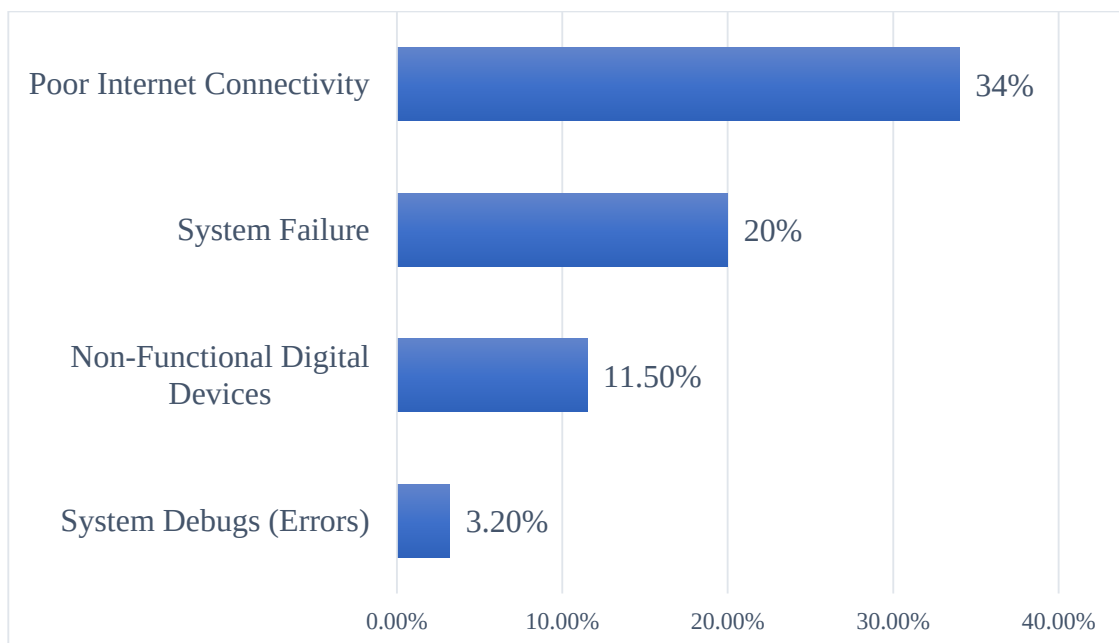


Figure 4.1 NHIF Online System Challenges

Source: Evaluator Field Data, April 2025.

4.6 Factors facilitating the implementation of PlanRep digital health solutions for the management of financial resources in public health facilities in the Rukwa region (N=158)

Table 4.6 provides the bivariate logistic regression of factors associated with the implementation of PlanRep. Several factors were associated with the implementation of the PlanRep System. These factors included health facility type, district council, availability of digital devices, facility with computers, availability of printers, availability of tablets, PlanRep own account, source of electricity, availability of health facility internet, availability of router for internet services provision, staff capacity of using PlanRep System PlanRep easy to use, challenges of implementing PlanRep System, having budget for digital health solutions, motivation for staff on using digital health solutions, regular maintenance of digital health solutions, and community involvement on digital health solutions.

The dispensaries were less likely to use the PlanRep System compared to district hospitals and health centres (OR = 0.44, 95% CI: 0.18–1.09, $p = 0.077$). Similarly, facilities located in Nkasi (OR = 0.53, 95% CI: 0.02–0.16, $p < 0.001$) and Sumbawanga (OR = 0.14, 95% CI: 0.62–0.32, $p < 0.001$) were less likely to implement the system compared to those in Kalambo district. Each unit increased in digital device availability was associated with a 9.4% increase in the likelihood of using PlanRep System (OR = 1.094, 95% CI: 1.01–1.18, $p = 0.023$). Facilities with computers (OR = 1.50, 95% CI: 1.26–1.97, $p = 0.040$), printers (OR = 1.63, 95% CI: 1.10–2.41, $p = 0.014$), and tablets (OR = 1.51, 95% CI: 1.10–2.41, $p = 0.014$) were more likely to implement the system than those without. Ownership of a PlanRep account by a health facility had shown a strong positive association with the implementation of the PlanRep (OR = 14.12, 95% CI: 4.56–43.76, $p = 0.001$). While facilities connected by TANESCO as the main electrical power supply were more likely to implement the system, the association was not statistically significant (OR = 2.17, 95% CI: 0.44–10.80, $p = 0.345$).

In terms of connectivity, facilities with reliable internet (OR = 8.66, 95% CI: 3.41–21.98, $p < 0.001$) and internet routers (OR = 9.76, 95% CI: 3.60–26.47, $p < 0.001$) had significantly higher odds ratio of PlanRep System implementation. The capacity of healthcare providers to use the system was also a significant predictor (OR = 28.15, 95% CI: 9.15–86.61, $p < 0.001$), as was their perception of the system being easy to use (OR = 60.67, 95% CI: 7.23–509.16, $p < 0.001$). Facilities that did not face challenges during implementation were more likely to use PlanRep (OR = 8.73, 95% CI: 1.82–41.95, $p = 0.007$). Additionally, having a budget allocated for digital health solutions (OR = 12.75, 95% CI: 5.43–29.96, $p < 0.001$), motivated staff (OR = 23.30, 95% CI: 9.95–54.57, $p < 0.001$), and regular maintenance support (OR = 2.12, 95% CI: 1.10–4.10, $p = 0.025$) were all positively associated with system use. Community engagement was also a strong determinant, with facilities that involved community members being more likely to implement PlanRep (OR = 5.53, 95% CI: 2.38–12.86, $p < 0.001$).

Table 4.5: Bivariate logistic regression of factors associated with the implementation of PlanRep digital health solutions

Variable	Bivariate Logistic Regression		
	COR	95% CI (OR)	P
Health Facility Type			
<i>Hosp/HC</i>	1.0		
<i>Dispensary</i>	0.44	0.18 – 1.09	0.077
District Council			
<i>Kalambo</i>	1.0		
<i>Nkasi</i>	0.53	0.02 – 0.16	<0.001
<i>Sumbawanga</i>	0.14	0.62 – 0.32	<0.001
Availability of Digital Devices			
<i>Number of Digital Devices Available</i>	1.094	1.01 – 1.18	0.023
Computer Category			
<i>Has no computer</i>	1.0		
<i>Has computer</i>	1.50	1.26 – 1.97	0.040
Availability of Printers			
<i>Number of Printers available</i>	1.63	1.10 – 2.41	0.014

Table 4.6: Bivariate logistic regression of factors associated with the implementation of PlanRep digital health solutions (Continued)

Tablets			
<i>Number of Tablets available</i>	1.51	1.23 – 1.85	<0.001
PlanRep Own Account			
<i>Facility with no account</i>	1.0		
<i>Facility with account</i>	14.12	4.56 – 43.76	<0.001
Source of Electricity			
<i>Other source</i>	1.0		
<i>TANESCO</i>	2.17	0.44 – 10.80	0.345
Availability of Health Facility Internet			
<i>Unreliable internet</i>	1.0		
<i>Reliable internet</i>	8.66	3.41 – 21.98	<0.001
Availability of Router for Internet Services Provision			
<i>Not available</i>	1.0		
<i>Router available</i>	9.76	3.60 – 26.47	<0.001
Staff Capacity of Using PlanRep System			
<i>Has no capacity</i>	1.0		
<i>Has capacity</i>	28.15	9.15 – 86.61	<0.001
PlanRep Easy to Use			
<i>Not easy to use</i>	1.0		
<i>Easy to use</i>	60.67	7.23 – 509-16	<0.001
Challenges of Implementing PlanRep System			
<i>Has challenges</i>	1.0		
<i>No challenges</i>	8.73	1.82 – 41.95	0.007
Having Budget for Digital Health Solutions			
<i>No budget</i>	1.0		

Table 4.7: Bivariate logistic regression of factors associated with the implementation of PlanRep digital health solutions (Continued)

<i>Has budget</i>	12.75	5.43 – 29.96	<0.001
Motivation for Staff on Using Digital Health Solutions			
<i>No motivation</i>	1.0		
<i>Has motivation</i>	23.30	9.95 – 54.57	<0.001
Regular Maintenance of Digital Health Solutions			
<i>No maintenance</i>	1.0		
<i>Has maintenance</i>	2.12	1.10 – 4.10	0.025
Community Involvement on Digital Health Solutions			
<i>No Involvement</i>	1.0		
<i>Has Involvement</i>	5.53	2.38 – 12.86	<0.001

Source: Evaluator Field Data, April 2025.

The findings from the multivariate logistic regression analysis identified seven independent factors significantly associated with the implementation of the PlanRep system in public primary health care facilities in Rukwa Region. Dispensaries were significantly less likely to implement the system compared to health centres and district hospitals (AOR = 0.18, 95% CI: 0.15–2.10, $p = 0.016$). Facilities equipped with computers showed higher odds of implementing PlanRep system than those without (AOR = 1.13, 95% CI: 0.20–6.00, $p = 0.019$). Ownership of a PlanRep account was a strong predictor of system use, with facilities that had an account being substantially more likely to implement the system (AOR = 64.55, 95% CI: 5.14–810.52, $p = 0.001$).

Facilities with reliable internet access demonstrated greater likelihood of PlanRep implementation (AOR = 4.56, 95% CI: 0.86 – 242.28, $p = 0.046$), and those with internet routers also showed higher odds of use (AOR = 8.23, 95% CI: 0.13 – 529.63, $p = 0.011$). Staff capacity to operate the PlanRep System was significantly linked to implementation of the system (AOR = 5.56, 95% CI: 1.36 – 67.43, $p = 0.023$). Staff motivation emerged as the strongest influencing factor, with facilities reporting motivated staff being over 100 times more likely to implement the system than those without (AOR = 106.14, 95% CI: 15.49 – 727.53, $p = 0.001$).

Table 4.8 Multivariate logistic regression of factors facilitating the implantation of PlanRep digital health solutions for the management of financial resource in public primary health facilities in Rukwa region, April 2025 (N=158)

Variable	Multiple Logistic Regression		
	AOR	95% CI (AOR)	P
Health Facility Type			
<i>Hosp/HC</i>	1.0		
<i>Dispensary</i>	0.18	0.15 – 2.10	0.016
Computer Category			
<i>Has no computer</i>	1.0		
<i>Has computer</i>	1.13	0.20 – 6.00	0.019
PlanRep Own Account			
<i>Facility with no account</i>	1.0		
<i>Facility with account</i>	64.55	5.14 – 810.52	0.001
Availability of Health Facility Internet			
<i>Unreliable internet</i>	1.0		
<i>Reliable internet</i>	4.56	0.86 – 242.28	0.046
Router Available			
<i>Not available</i>	1.0		
<i>Router available</i>	8.23	0.13 – 529.63	0.011
Staff Capacity of Using PlanRep System			
<i>Has no capacity</i>	1.0		
<i>Has capacity</i>	5.56	1.36 – 67.43	0.023
<i>Has budget</i>			
Motivation for Staff on Using Digital Health Solutions			
<i>No motivation</i>	1.0		
<i>Has motivation</i>	106.14	15.49 – 727.53	0.001

Source: Evaluator Field Data, April 2025.

CHAPTER FIVE

DISCUSSION OF THE EVALUATION FINDINGS

5.1 Introduction

This chapter presents a comprehensive analysis of the study findings in relation to the stated evaluation objectives and relevant to other previous studies. The discussion aims to provide clear and concise interpretations, underscores the significance of the results, and assess the extent to which they align with or diverge from previous studies. Specifically, the implementation of digital health solutions PlanRep, GePG, and the NHIF Online Service Portal which are intended to strengthen financial resource management in public health facilities in Rukwa region. This discussion is organized into four sub-sections corresponding to the specific evaluation objectives that guided the study: (1) the proportion of health facilities implementing Planning and Reporting System (PlanRep); (2) the proportion of facilities using revenue collection systems integrated with GePG; (3) the proportion of facilities utilising digital health insurance management systems; and (4) the factors facilitating the implementation of the PlanRep System for financial resource management in public health facilities.

5.2 The implementation of planning, budgeting and reporting (PlanRep) software in public health Facilities

Planning, Budgeting, and Reporting (PlanRep) System is a digital health solution designed to support decentralized planning in public sector in Tanzania, including health care (MOHCDGEC, 2019). It facilitates transparent, efficient, accountability and harmonized budgeting and reporting at the local level by enabling facility staff to plan according to their priorities and align with district and national health strategies (Ruhago et al., 2021). Planning and Reporting Systems enhances financial resource management by streamlining data entry, reducing paperwork, improving budget traceability, and allowing real-time performance and monitoring (Ruhago et al., 2022a).

This objective assessed the proportion of public health facilities using Planning and Reporting (PlanRep) System, for Planning, Budgeting and Reporting their activities at each facility in all three councils where the evaluation was conducted, Kalambo, Sumbawanga and Nkasi, and the results found 37.3% of the health facilities were using the system. These findings are below the intended target of the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC, 2019), which requires all district councils and health facilities to use improved PlanRep System by June, 2023.

In contrast with a study by (Ruhago et al., 2021) on Cost-Efficient Analysis of the Improved Web-Based Planning, Budgeting and Reporting System in 185 councils, and found all councils were using the system, contrary to these findings where by only 37.3% in Rukwa region are using the system, this pulls for the ministry of health, PO-RALG, LGA and the facilities to increase efforts for initiatives to implement the PlanRep System for Planning, Budgeting and Reporting to reach the target of all public health facilities using Improved Web-Based PlanRep System by June, 2023.

A study by (Mutale et al., 2013) in Ghana revealed that the District Health Planning and Reporting Toolkit (DiHPART), though designed for comprehensive health sector planning and reporting, was mainly used at the district level, with limited application at primary health care (PHC) facilities. This lack of decentralization hindered bottom-up planning, limiting PHC providers' involvement in developing and adjusting health plans. As a result, resource allocation and service delivery efficiency were compromised. Thus, excluding PHC levels from planning systems reduces responsiveness to local needs and weakens the overall effectiveness of health system performance, resource allocations, efficiency and accountability

Health facilities which are not using the system might be because of lack of training on the system use, lack of user profiles as recommended by PlanRep Documentation user manual (MoFP, 2018b) each level of the facility must have its user profiles (user credentials), as the requirement for the ownership of the system like other currently

operating systems on health facilities such FFARS, e-LMIS, DHIS2 and GOTHOMIS. Other reasons could be lack of staffs assigned duties and responsibilities for Planning, Budgeting and Reporting especially in dispensaries and health centres where there are low numbers of health workers, lack of adequate ICT infrastructures such as computers, internet, and printers.

5.3 Implementation of the revenue collecting system integrated with Government electronic Payment Gateway (GePG) in public health facilities

The Government Electronic Payment Gateway (GePG), was launched in 2017 by Ministry of Finance and Planning (MoFP), aims to enhance transparency, accountability, and efficiency in public revenue collection (URT, 2017b). GePG offers a centralized platform for real-time monitoring and reconciliation of payments across Ministries, Departments, Agencies (MDAs), and Local Government Authorities (LGAs). It integrates multiple payment channels banks and mobile money by improving accessibility and reducing revenue leakage and fraud. (MoFP, 2018a). Legally mandated for all public collections since 2018/2019, GePG supports the national digital transformation agenda through integration with key systems such as IFMIS, FFARS, and GOTHOMIS (Lawson et al., 2022). This integration strengthens financial oversight and improves revenue tracking in the health sector, especially in public primary health care facilities. Tanzania stands out among developing countries for effectively implementing this system as a core tool in controlling public financial management.

In this evaluation, one of the objectives was to evaluate the proportion of health facilities, implementing revenue collecting system integrated with GePG, the findings identified a significant gap in the integration of the Government Electronic Payment Gateway (GePG) with existing digital health systems, particularly Government of Tanzania Hospital Management Information System (GOTHOMIS). Though, 51.9% of the surveyed facilities were reported using GOTHOMIS for service delivery, none of the public primary health facilities had not yet already integrated GePG with GOTHOMIS. This underscores the integration process and poses a major barrier to achieve financial accountability, transparency, and

operational efficiency in resource utilisation. Facilities were not already integrated with GePG might be because of some of the facilities werenot operating GOTHOMIS, lack of ICT infrastructure such computers, internet, printers and trained personnel to operate the system.

Despite that there was no health facility which was using GePG integrated with revenue collecting system, does not mean that GePG has no important for financial management, if utilised effectively for public payments it enhances financial resources management in an institution, these findings are supported with a study conducted by (Mihangwa et al., 2024) on their study of evaluating the impact of GePG on revenue enhancement in Higher Education Institutions where they revealed that GePG has been a driving force for improving academic institutions financial operations. It has made financial transparency more effectively, improved reporting and analysis easier, and helped with better planning and budgeting. A useful tool for bolstering financial management in the education industry, GePG reduces expenses while increasing accountability.

Other supporting findings which are in line with our findings for GePG integration with other systems is the study conducted by (Nyambi & Assey, 2022) on evaluating the Effectiveness of Digitising Government Payment Systems on Service Delivery in Public Institutions the findings revealed that the Government Electronic Payment Gateway (GePG) efficiently aggregates government income gathered via various operating systems. Through centralising payments from several different sources for collection, GePG improves financial monitoring, accountability, and transparency especially in the health sector. When it is integrated well with other digital health systems, including the Government of Tanzania Hospital Management Information System (GOTHOMIS), it becomes a principal factor for success. For public health facilities, this integration is crucial because it enables an automated connection between the clinical services rendered and the associated financial transactions. The GePG with GOTHOMIS interface increases revenue tracking efficiency, lowers manual mistakes, and guarantees accurate invoicing by linking service delivery

information with financial records. This enhances facility-level financial management and promotes sustainable health service delivery.

Another study highlighting was conducted by (Chambega et al., 2024) on Contribution of Control Numbers System on Monitoring Revenue Collection at Kilimanjaro Christian Medical Centre, and revealed that the health facility propensity to improve revenue collection is among the ways that the control number system influences revenue collection control. Furthermore, it was discovered that the control number system might offer an extra edge over rivals in terms of tracking income streams and enhancing the standards of financial reporting.

Additionally, the importance of discouraging cash payments in all government transactions was also reported in the study conducted by (William et al., 2022b) the results of the study show that the Government Electronic Payment Gateway (GePG) system is essential for improving the efficacy and efficiency of revenue collecting operations. It promotes accountability and transparency by removing the need for cash in government payments by facilitating smooth financial transactions. Furthermore, GePG guarantees adherence to financial standards, facilitates the transfer of government money, and helps to improve budget compliance. These advantages highlight how crucial it is to enhance the deployment and use of the electronic payment gateway system in order to significantly streamline public institutions revenue collection procedures.

5.4 Utilisation of digital health solutions for health insurance management (NHIF Online Service Portal)

In order to improve the effectiveness and accountability of health financing, the National Health Insurance Fund (NHIF) had designated digital transformation of paramount importance (MoHCDGEC, 2019). NHIF Online Service Portal is integrated with Hospital Management Information Systems (GOTHOMIS) for claims submissions and member verification. The system was introduced in 2019 with the objective of automating claim processing, claim reimbursements, reducing claim delays, control of fraud among health care providers, improving efficient,

transparency and accountability in health care service provisions for NHIF beneficiaries. The system at facility-level has a functional module for e-claims processing, out of stock modules (Form 2C & 2E), payment notes, invoices, and member verification just to mention few (NHIF, 2019b). To comprehend with the implementation fidelity at primary health care level, it is very crucial to evaluate the proportion of public health facilities which are utilising the system.

These findings are consistent with a study conducted by (Echulet et al., 2023b) in Kenya, which explored digital transformation in healthcare, with a specific focus on the influence of Total Quality Management (TQM) on the performance of electronic claims systems in medical insurance firms. The Kenyan study revealed a strong acceptance and increasing adoption of digital technologies for claims processing findings that mirror the situation in the Rukwa region, where 96.2% of health facilities reported active use of the NHIF Online Service Portal. This high utilisation rate in Rukwa may be attributed to strategic NHIF initiatives aimed at enhancing operational efficiency, promoting transparency, curbing fraud, and improving access to digital tools, including internet connectivity and ICT infrastructure. However, despite the widespread adoption, both studies highlight those systemic challenges such as limited staff training, infrastructure gaps, and inadequate system support continue to impede the full realization of digital health system benefits. These results underscore that utilisation alone is not a sufficient indicator of success; it must be supported by sustained capacity building, reliable infrastructure, and comprehensive system integration to achieve meaningful and sustainable performance improvements in e-claims processing.

These findings are consistent with a study conducted by (Echulet et al., 2023b) in Kenya, which explored digital transformation in healthcare, with a specific focus on the influence of Total Quality Management (TQM) on the performance of electronic claims systems in medical insurance firms. The study revealed a strong acceptance and increasing adoption of digital technologies for claims processing findings that mirrors the situation in the Rukwa Region, where 96.2% of health facilities reported active use of the NHIF Online Service Portal. This high utilisation rate in Rukwa

may be attributed to strategic NHIF initiatives aimed at enhancing operational efficiency, promoting transparency, curbing fraud, and improving access to digital tools, including internet connectivity and ICT infrastructure. However, despite the widespread adoption, both studies highlight those systemic challenges such as limited staff training, infrastructure gaps, and inadequate system support continue to impede the full realization of digital health system benefits. These underscores that utilisation alone does not ensure success; it must be supported by capacity building, infrastructure, and system integration to achieve sustainable e-claims performance improvements.

The distribution of health facilities employing digital applications for NHIF Online Service Portal in Rukwa demonstrates strong adoption; however, experiences from other contexts offer valuable lessons for system enhancement. In a study conducted by (Wambua & Mutua, 2024) on Biometric Strategies and Performance of Electronic Claim Processing in Kenya, 51.4% of participants agreed that the integration of fingerprint biometric verification significantly reduced fraud in NHIF claims processing. This strategy strengthened the integrity and performance of the Kenyan NHIF Online Claiming System by ensuring that only verified beneficiaries could access services, thereby enhancing accountability and system credibility. While biometric verification is not yet implemented in Tanzania, integrating such a feature into the NHIF Online Service Portal could provide additional safeguards against fraudulent claims, impersonation, and data manipulation. This would not only improve service delivery integrity but also enhance financial resource management under Tanzania digital health financing framework, reinforcing transparency and trust across the health system.

Further supporting the findings of this study is a related investigation by (Saputra & Prima, 2022), which examined the effectiveness of the INA-CBG's e-Claim System in Indonesian hospitals operating under the National Health Insurance (JKN) program. Their study revealed a high level of acceptance and utilisation of web-based digital claim systems, particularly where the e-Claim application, was fully

integrated with the Hospital Management Information System (SIMRS). This integration contributed to improved claims processing, enhanced data accuracy, and greater operational efficiency. However, challenges were reported in both contexts. In Rukwa region, 57.0% of health facilities experienced operational difficulties, while the Indonesian study highlighted issues such as staff workload burdens, manual data entry errors, and delays in claim verification. These parallel challenges underscore the critical importance of sufficient infrastructure, continuous staff training, and effective system interoperability.

5.5 Factors facilitating the implementation of the PlanRep System for financial resource management in public health facilities

This evaluation examined the factors facilitating the execution of the PlanRep System in government owned facilities. The results indicated that the type of health facilities was associated with the implementation and utilisation of PlanRep System. Hospitals and health centres were more likely to be consistent in the use of PlanRep System compared to dispensaries. This might be because of structural disparities in infrastructures, administrative support, and technical readiness. Dispensaries, particularly those in remote rural areas, face significant challenges in utilising digital systems due to minimal staffing, poor internet connectivity, and limited ICT infrastructure often they rely on manual reporting processes (Kaboré et al., 2022; Krahe et al., 2025; Schuetze et al., 2023).

These findings align with previous research conducted in Cameroon, which demonstrates that facility type significantly influences the implementation and effective utilisation of digital health technologies. Agboryah et al., (2024) reported that higher-level facilities such as hospitals and health centre are more likely to adopt and consistently use digital systems than lower-tier facilities like dispensaries. This disparity is often due to better ICT infrastructure, a greater number of digitally skilled staff, and clearly defined roles in higher-level facilities. Conversely, dispensaries frequently experience staffing shortages, where one health worker may manage clinical, administrative, and digital tasks. These limitations constrain effective system implementation. Therefore, targeted investments in infrastructure,

staff training, and support at the primary care level are essential to ensure equitable adoption and utilisation of digital solutions such as the PlanRep System.

The evaluation reported a remarkable association between the presence of computers and the proper execution of the PlanRep System for Planning, Budgeting, and Reporting. Health facilities equipped with more computers were notably have a greater tendency to implement and utilise the system efficiently compared to those without such infrastructure. Hospitals and health centres, which generally have better access to ICT resources, were observed to be the primary implementers of the PlanRep System, whereas dispensaries lagged behind. This disparity highlights the critical role of basic ICT infrastructure in enabling the functionality of digital health systems. Health workers emphasized that computers are essential for logging into the PlanRep System, for planning, budgeting and reporting on time. Conversely, facilities without computers often resorted to manual recordkeeping or depended on support from council staff or neighboring health facilities, practices that contributed to delays and inconsistencies in data reporting especially in remote and under resourced rural area (Borges do Nascimento et al., 2023; Kaboré et al., 2022; Numair et al., 2021a)

In this evaluation, health facilities with a PlanRep System account were reported to be active use of the system, compared to those health facilities without PlanRep System account. Health facilities with PlanRep System credentials were essential for autonomous access and regular use of the system. Facilities without accounts had to rely on council health management teams for planning, budgeting and reporting resulting in delays and reduced engagement in planning activities (MoHCDGEC, 2019). These findings are also supported with a similar study conducted in Iran by (Bagherian & Sattari, 2022), health facilities with system accounts reported greater control over their planning process and increased staff involvement. Furthermore, these results are aligned with findings from (Ruhago et al., 2021) who found a strong association between system ownership and participation in budgeting.

Moreover, ownership of system accounts and credentials was observed by (Haule et al., 2023), he posits that as more resources are available to the ownership group, and they are more open to executing and embracing various Health Information Systems like PlanRep System based on their requirements. Additionally, a study by (Dakika & Saronga, 2024) reported findings consistent with this perspective, emphasizing that promoting system ownership among healthcare workers is essential for enhancing the utilisation of health information systems such as HMIS, PlanRep, and GePG. Their study highlighted those facilities where staff had a clear sense of system ownership demonstrated higher levels of engagement and system use. Strategy identified was the implementation of targeted focused training initiatives that considerably increased healthcare professionals' comprehension, and competency in using digital systems thereby increasing overall utilisation.

For the effective implementation of the PlanRep System, the PlanRep User Manual recommends that individual user profiles or credentials be created to enable access to the system (MoFP, 2018b). Each officer is assigned specific rights and responsibilities, which determine the screens, modules, and reports they can access within the system. The Council Information and Communication Technology Officer (CICTO) is tasked with managing the creation of user accounts within each Local Government Authority (LGA).

The results from this evaluation showed that successful deployment of the PlanRep System was substantially associated with the availability of reliable internet connectivity at healthcare facilities. Web-based PlanRep System, which offers multi-tiered approvals at the district, regional, and national levels, real-time budgeting, and planning submissions, was more likely to be used by facilities with reliable internet connectivity. Staff members in healthcare facilities without reliable internet frequently had to rely on offline workarounds, their own internet, or assistance from higher-level administrative offices, leading to delays and hampered system efficiency.

Supporting results are from a study conducted in Cameroon by Agboryah et al., (2024), they discovered a strong correlation between the utilisation of digital health systems and the availability of internet access in healthcare facilities. Health professionals can communicate with digital health systems by having access to the internet. For efficient system use, internet speed and reliability are just as important as having it. The effectiveness of digital health solutions can be undermined by poor connectivity, which can interfere with the entry of information, delay system synchronization, and make it more difficult to communicate with oversight authorities (Numair et al., 2021b)

Other supporting findings is from a study conducted by (Mwogosi & Kibusi, 2024) revealed that In Tanzania, having internet access is essential for the efficient deployment and utilisation of digital health systems. Without reliable internet connectivity, health facilities have trouble accessing up-to-date information, completing plans and reports on time, and getting fast response. System functionality is severely limited, operational efficiency is decreased; the urban-rural digital disparity among institutions is widened.

In this evaluation, the availability of routers at health facilities emerged as a key component promoting the efficient utilization of digital systems such as the PlanRep System. Routers provide reliable internet connectivity by ensuring consistent coverage across various departments, thereby allowing multiple staff members to access the system simultaneously. In contrast, facilities lacking routers often relied on unstable mobile networks or staff-purchased data bundles, which proved insufficient for reliable system use.

These findings are also demonstrated in a study by Mwogosi & Kibusi, (2024) which highlighted the importance of suitable hardware and software for efficient health information systems use in healthcare. Networking devices such as routers, switches, and other essential networking equipment are fundamental for successful operation of digital health systems. Stable internet access and multi-user access to systems such as PlanRep System and GOTHOMIS are supported by these solutions. Thus,

ensuring the consistent availability and functionality of networking equipment is essential for advancing digital transformation within the healthcare sector.

In this evaluation, staff capacity of using PlanRep System was reported to be one of the most important factors facilitating the successful deployment and regular use of the PlanRep System in healthcare facilities. These capacities of using PlanRep System were the ability of health care workers skills on digital literacy, system proficiency, and institutional support that enable healthcare personnel to use the platform effectively. Core competencies included was the ability to log in into the system, entering data into the system, submission of planned activities, and generation of accurate reports. Supporting these findings was also reported by Mwogosi & Kibusi, (2024) in their study they revealed that providing more comprehensive and continuous training is likely to enhance healthcare workers ‘acceptance of digital systems. Furthermore, Ongoing capacity building, particularly for IT support personnel, is essential to ensure the long-term sustainability of these systems (Mogwe & Balotlegi, 2020)

Additionally, other supporting study was a study conducted by (Kuzenza et al., 2024) the study emphasized the importance of staff knowledge and training in enhancing the effective use of ICT Systems in healthcare facilities, aligning closely with the findings of this study on PlanRep implementation. Structured training fosters continuous learning, strengthens staff competence, and builds confidence in using digital health solutions. A clear understanding of system functionalities and benefits promotes greater acceptance and more efficient utilization. Within the context of PlanRep System implementation, this underscores the importance of regular capacity-building efforts to improve digital literacy and operational proficiency.

Another supporting evaluation study was as study conducted by (Bagherian & Sattari, 2022), the study revealed that system acceptance and efficient use are severely hampered by a lack of technical expertise, inadequate training, low user readiness, and limited awareness. The evaluation emphasized that lack of structured training and insufficient digital literacy make it difficult for health personnel to

switch from manual to electronic systems. This underscores that improved HIS functionality was reported by facilities that made ongoing investments in mentorship, support systems, and capacity building. These findings are extremely pertinent to Tanzania, since the proficiency and readiness of health personnel working in public facilities with regard to digital technology are critical to the PlanRep System's successful deployment and regular use.

In this evaluation, staff motivation emerged as a strongest predictor of successful PlanRep implementation and utilisation in public health facilities. Motivation was assessed through financial incentives, recognition, certificates provision, professional development opportunities, and leadership promotion. These factors significantly influenced both initial adoption and sustained use of the system. Motivated staff were more likely to attend training, support peers, solve system-related issues, and ensure timely, accurate data submission. Financial incentives, team and individual recognition, and non-monetary incentives played a central role in maintaining engagement. Collectively, these factors fostered ownership, accountability, and commitment to PlanRep use, ultimately enhancing health system performance and service delivery.

Supporting this was a study by (Mboera et al., 2021) who revealed that low employee motivation is a significant obstacle to the efficient use of digital health systems in low- and middle-income countries, according to this study, lack of incentives and necessary equipment, poor technical abilities, understaffing, restricted training, and inadequate finances can all be an obstacle to system utilisation. Furthermore, they reported that employees who lacked motivation were significantly less likely to utilise the system efficiently. This reinforces number of measures to address this, including hiring enough and properly qualified personnel, offering frequent assistance monitoring, and implementing both monetary and non-monetary incentive motivation.

Supporting these findings, motivation for staffs in systems utilisation was also reported by (Dakika & Saronga, 2024), motivation as a critical factor influencing the effective use of Health Information Systems, when motivation is low, health workers often show limited commitment or interest in learning and consistently using such systems. Enhancing staff motivation through financial incentives, recognition, and the creation of a supportive work environment can significantly improve system performance and data quality. Moreover, a study by Wang et al., (2025), in particular, non-financial incentives such as opportunities for professional development, formal recognition, awards, and certifications play a pivotal role in increasing engagement and sustaining effective digital health solutions utilisation.

CHAPTER SIX

SUMMARY, CONCLUSION, AND POLICY IMPLICATIONS

6.1 Introduction

This chapter summarizes key findings, draws conclusions, offers recommendations, outlines policy implications, and identifies study limitations and areas for further research. Digital transformation is essential for improving service delivery, financial accountability, and transparency in the public health sector. This evaluation examined the implementation of PlanRep System, GePG, and the NHIF Online Service Portal across council hospitals, health centers, and dispensaries. It focused on ICT infrastructure, staffing capacity, internet connectivity, and staff motivation. Findings reveal both opportunities and challenges that influence the effective and sustainable use of digital systems in enhancing financial management in public health sector.

6.2 Summary

This process evaluation assessed how PlanRep, the Government e-Payment Gateway (GePG), and the NHIF Online Service Portal were implemented in Rukwa in public health facilities. The results revealed significant disparities across facility levels. PlanRep was more commonly utilised in hospitals and health centres due to improved ICT infrastructure as well as trained workers, whereas dispensaries confronted with inadequate digital devices, poor connectivity, and shortage of staffs. In contrast to higher-tier facilities with formal training, dispensaries depended heavily on peer learning and support from district level. GePG was not operational at the facility level, owing to poor GOTHOMIS integration and limited instruction. Despite 96.2% implementation of the NHIF Online Service Portal, health facilities encountered system access challenges, frequent claim rejections, and a restricted staff capacity. Motivation, credential access, and technical support are all factors that influence system usage. The study used a quantitative cross-sectional design, allowing for statistical analysis of key variables. The findings underscore the

importance of targeted investment and policy reforms in advancing National Digital Health Strategy (2019-2024).

6.2.1 Key findings from this evaluation study

- i. Facility type influences system utilisation; compared to dispensaries, hospitals and health centres implement and utilise the PlanRep System more consistently. This difference was mostly attributable to higher-tier institutions having better workforce, stronger ICT infrastructure, and greater digital readiness, which allowed for smoother implementation and routine system utilisation.
- ii. System access and ownership; facilities that have direct login credentials to digital platforms showed more autonomy, frequent updates, and consistent system utilisation. Dispensaries that used shared credentials or council-level access, on the other hand, experienced delays, decreased ownership, and a limited ability to run the systems autonomously.
- iii. ICT infrastructure availability; significant deficiencies in ICT infrastructure were found, particularly in rural and low-level facilities. These included a lack of functional computers, routers, and consistent internet connectivity, all of which directly impeded the full and effective use of digital systems such as PlanRep, NHIF, and GOTHOMIS.
- iv. Staff capacity and digital literacy; facilities with well-trained personnel or dedicated digital system users demonstrated more accurate and consistent use of platforms. However, facilities with inexperienced personnel struggled with system navigation, data entry, and fundamental operations, limiting the efficiency and impact of digital technologies.
- v. Staff Motivation; the lack of incentives, recognition, or career advancement linked to digital system duties resulted in sporadic and poor-quality system engagement, especially in lower-level facilities.

6.3 Conclusion

The implementation of digital health solutions had a positive impact on financial resource management in public health facilities across Rukwa region. This evaluation found that the implementation of key systems such as PlanRep, the Government Electronic Payment Gateway (GePG), and the NHIF Online Service Portal improved transparency, efficiency, and accountability in budgeting, reporting, and revenue tracking across hospitals, health centres, and dispensaries. These improvements were largely driven by enabling factors such as regional and council-level technical support, the availability of functional digital devices, reliable internet services, routers for internet connectivity, staff capacity to use digital devices and operating the system, and staff motivation to engage with digital health solutions.

However, the study found considerable differences between higher and lower-tier facilities. Dispensaries, in particular, experienced issues such as limited staffing, inadequate connectivity, and limited access to digital resources often relying on shared system credentials and outside assistance from district offices. The lack of GePG deployment at the facility level, poor integration with GOTHOMIS, and low digital literacy among frontline staff all hampered successful system utilisation. Furthermore, the absence of formal incentives and limited supervisory involvement contributed to low morale and uneven use of technological devices in these settings.

These findings highlight a persistent digital divide caused by facility type, access to basic digital enablers, and human resource capacity. To ensure equitable and sustainable gains from digital health investments, targeted interventions are needed especially for lower-tier and rural facilities which include the appointment of dedicated digital health personnel, sustained capacity building, strengthened supervision, and the inclusion of digital health priorities in annual planning and budgeting processes at all levels of the health systems.

6.4 Recommendations

a. At the regional level (RHMT)

- i. Regional Health Management Teams (RHMTs) should establish ICT Support Teams, have to set up specialized ICT support units with technically trained staff to offer continuous support, mentoring, and quick troubleshooting at the facility and council levels. The continuity and functionality of the operations of the digital health system will be heavily dependent on these teams.
- ii. Establishment of regular digital monitoring and supervision, during routine visits, RHMTs should make them a practice to utilize uniformly applied digital supervision tools and checklists. System utilization, performance issues, and protocol compliance can all be systematically tracked with the help of this systematic approach.
- iii. Organize initiatives for refresher training; RHMTs and Council Health Management Teams (CHMTs) should collaborate to plan recurring refresher training sessions. Regular capacity evaluations should guide them, and they should be specifically intended to address gaps in abilities in lower-level authorities with substantial staff turnover or little experience with digital health applications.

b. At the council level (CHMTs)

- i. Councils should allocate dedicated budget lines within their Comprehensive Council Health Plans (CCHPs) to address critical gaps in ICT infrastructure, internet connectivity, and the recruitment or designation of digital health personnel. These targeted investments are essential for the effective implementation, operation, and sustainability of digital health systems at the facility level.

- ii. Each council should also appoint a qualified and dedicated digital health focal person responsible for coordinating, supervising, and reporting on the use and performance of key digital platforms such as PlanRep, GoTHoMIS, GePG, and the NHIF Online Service Portal across all public health facilities. This focal person should work closely with the Digital Health Unit at the Ministry of Health to ensure alignment and support.
 - iii. Councils should priorities full implementation and routine use of GOTHOMIS and GePG in all public health facilities. This includes providing essential ICT infrastructure, reliable internet, and tailored staff training. Robust technical support should address real-time challenges. Effective rollout will improve service delivery efficiency, enhance financial accountability, and enable integration with national digital health platforms.
 - iv. Councils should establish structured peer learning mechanisms, including mentorship programs, learning exchanges, and inter-facility visits. These initiatives will enhance knowledge sharing, allow low-performing facilities to adopt best practices, and foster a collaborative culture that supports innovation and continuous improvement in digital system utilization.
- c. At the health facility level
- i. Each health facility should appoint a dedicated focal person to oversee the daily management of key digital health solutions, including PlanRep, GoTHoMIS, NHIF Online Service Portal, and GePG. This strategic assignment ensures consistent, accurate, and reliable financial data management, enhances operational efficiency, and reinforces institutional financial accountability at the facility level.
 - ii. Every facility should put in place organised motivational strategies, such as worker appreciation initiatives, performance-based rewards, and well-defined career advancement pathways. These programs are essential for improving

employee satisfaction, retention, and long-term involvement in the efficient use of digital health systems.

- iii. All clinical and administrative staff should receive basic training in digital literacy at each health facility. Developing fundamental digital skills will enable employees to manage financial and health information systems efficiently, improving system functioning, data accuracy, and service delivery quality.
- iv. Every facility should create and implement internal monitoring methods to regularly evaluate how well digital systems are being used. Through facilitating the early detection of operational difficulties and facilitating prompt technical or managerial solutions, these tools will promote a continuous improvement, accountability, and efficient system operation culture.
- v. Facilities should set aside particular funds for digital health initiatives in their annual plans. In order to ensure the long-term sustainability, scalability, and functionality of the digital health system, consistent financial investment is necessary. Critical needs like, internet access, ICT infrastructure improvements, and capacity-building initiatives should all be covered by these budget allocations.

6.5 Policy implications

This study advocates for the implementation of digital health solutions in healthcare facilities in order to improve financial resource management, service delivery, and accelerate progress towards achieving universal health coverage (UHC). Policymakers should prioritise infrastructure and staffing support for lower-tier facilities and remote areas, where restricted computer access, inadequate internet connectivity, and a shortage of routers have been reported. Many facilities were lacking PlanRep System credentials, decreasing autonomous and preventing consistent use. Monitoring and evaluation frameworks must be facility-specific, and digital health expenditures, including ICT tools, training, and technical support, must

be completely integrated into national and sub-national health budgets to ensure sustainability and long-term impact for digital health solutions implementation and utilization.

6.6 Areas for further evaluation

- i. Cost-effectiveness and sustainability analysis; comprehensive evaluations of digital systems like NHIF Online Service Portal, GePG, and GoTHoMIS are essential to assess return on investment, cost savings, and operational efficiency. Analyses should highlight improved processing speed, fewer errors and rejections, increased revenue, and reduced administrative workload.
- ii. Longitudinal impact assessment; future studies should use longitudinal designs to assess the long-term impact of digital health systems such as PlanRep, GoTHoMIS, and the NHIF Online Service Portal on health-care delivery, financial efficiency, and decision-making.
- iii. Comparative analysis across regions; comparative studies across geographic regions and facility levels (dispensaries, health centres, and hospitals) are required to uncover contextual, structural, and operational aspects influencing the implementation, functionality, and performance of digital health systems.

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APPENDICES

Appendix I: Informed Consent Form

Introduction

I am Leons Maliyaheze, a student pursuing a Master of Science in Health Monitoring and Evaluation at Mzumbe University (Morogoro Main Campus). In order to improve financial resource management in public primary health facilities in the Rukwa region, I am undertaking an evaluation study on the implementation of digital health solutions initiatives. This assessment aims to determine how the use of digital health solutions enhances the management of financial resources in public primary healthcare facilities. The main objective of this evaluation is to assess these initiatives like effectiveness, efficiency, challenges and contributions for improving financial accountability, transparency, and efficiency. The findings will be useful for establishing strategies to enhance financial management in public primary healthcare facilities in Rukwa region including this health facility.

This research remains entirely voluntarily, and you may withdraw at any time without confronting any negative consequences. Your contributions are valuable and will help improve the financial management procedures in public health facilities. The conversation is expected to last about an hour, and any information you provide will be kept strictly confidential and used only for research purposes. Facility information will not be shared or published outside of the research purposes.

Please bear witness to have read and comprehended this research's objective, confidentiality procedures, and participation obligations by signing below:

Questionnaire Number: _____

Name of Data Collector: _____

Signature: _____ Date: _____

Signature of Health Facility Representative/Informant _____

Date: _____

Appendix II: Questionnaire

Data Collection Tool

Questionnaire for the Evaluation of Digital Health Solutions Initiatives for Improving Management of Financial Resources in Public Primary Healthcare Facilities in Rukwa Region

A: Facility Characteristics (*Facility Related Factors*)

Please Circle the correct answer or write the response in the column provided

SN	Questions	Response
1	What is the name of this health facility?	
2	What is the type of this health facility?	a. Hospital
		b. Health Centre
		c. Dispensary
3	In which council is this health facility located?	a. Kalambo District
		b. Sumbawanga Municipal
		c. Nkasi District
		d. Sumbawanga District
4	In which ward is this health facility located?	
5	Where is this health facility located?	a. Urban
		b. Rural
6	How many departments/units are available? (Write number in response e.g., 1,2,3, 5)	
7	How many departments/units with digital health solutions? (Write number in response e.g., 1,2,3, 5)	
8	How many staffs are available at your health facility? (Write number in response e.g., 1, 2, 3, 5)	
9	How many average clients the facility serve per month (OPD/IPD) Clients? (Write number in response e.g., 1,2,3, 5)	
10	How many digital devices are available at this health facility? Write their numbers in response column	a. Computers_____
		b. Printers_____
		c. Tablets_____
		d. Smartphones_____
		e. Other, Specify_____

11	How many digital devices are functioning at this health facility? <i>Write their number in response column</i>	a. Computers_____
		b. Printers_____
		c. Tablets_____
		d. Smartphones_____
		e. Other, Specify_____
12	What is the main source of electrical power supply at this health facility? <i>(Select which is appropriate)</i>	a. TANESCO
		b. Generator
		c. Solar Panel
		d. Other, Specify_____
13	Is the facility having reliable internet connectivity?	a. Yes
		b. No
14	Which company is the main service provider of this internet services at this health facility?	a. TTCL
		b. Vodacom
		c. Airtel
		d. Halotel
		e. Tigo
		f. Other, Specify_____
15	How frequently does the health facility renew or recharge its internet service bundles? <i>Select which is appropriate</i>	a. Daily
		b. Weekly
		c. Monthly
		d. Quarterly
B: HEALTH FACILITIES IMPLEMENTING PLANNING, BUDGETING AND REPORTING USING PLANREP SOFTWARE <i>Please Circle the correct answer or write the response in the response column provided</i>		
SN	Questions	Response
1	Does this health facility have PlanRep System account/user credentials for Planning, Budgeting and Reporting?	a. Yes
		b. No
2	Why does this health facility not have user credentials for PlanRep System?	a. Not yet created
		b. Technical issues
		c. Security and access policies
		d. Limited facility awareness
		e. Other, Specify_____
3	Does this health facility use PlanRep for Planning, Budgeting and Reporting at each financial year?	a. Yes
		b. No
4	Does the staffs of this health facility having the ability to use PlanRep for planning, budgeting and reporting?	a. Yes
		b. No
5	How many staffs have an access to this software/system? <i>(Write number in response column)</i>	
6	How many departments/units use this system for planning, budgeting and reporting? <i>(Write number in response column)</i>	

7	How frequently the facility uses this system for planning and budgeting? <i>(Select the appropriate answer)</i>	a. Daily
		b. Weekly
		c. Monthly
		d. Quarterly
		e. Annually
8	How frequently the facility uses this system for reporting? <i>(Select the appropriate answer)</i>	a. Daily
		b. Weekly
		c. Monthly
		d. Quarterly
		e. Annually
9	Is the PlanRep System user friendly?	a. Yes
		b. No
10	How long this health facility has been using this system for planning, budgeting and reporting? <i>(Write number in response column)</i>	
11	Does the facility face any challenges when using the PlanRep System?	a. Yes
		b. No
12	If yes, which of the following challenges does the facility experience? <i>(Select all that apply)?</i>	a. Slow Performance
		b. System bugs/errors
		c. Poor Connectivity
		d. System downtime
		e. Other, Specify_____
13	Does this health facility having any instructions or guidelines on how to use PlanRep System?	a. Yes
		b. No
14	Does the health facility conduct or organize training about the use of PlanRep System?	a. Yes
		b. No
15	How often this training is being conducted? <i>(Select the appropriate answer)</i>	a. Daily
		b. Weekly
		c. Monthly
		d. Quarterly

C: HEALTH FACILITIES IMPLEMENTING REVENUE COLLECTION SYSTEMS INTEGRATED WITH GOVERNMENT ELECTRONIC PAYMENT SYSTEM (GePG)
Please Circle the correct answer or write the response in the response column provided

SN	Questions	Response
1	Does this health facility have a revenue collection system integrated with GePG systems?	a. Yes
		b. No
2	Which system does this health facility uses for revenue collection? <i>Select the appropriate answer</i>	a. GOTHOMIS
		b. Other, Specify_____
3	How many control numbers does the facility generate per day? <i>(Write number in response)</i>	
4	When does this health facility started using GePG system for revenue collections? <i>(Write number in response column)</i>	
5	Do the staffs of this health facility having the ability	a. Yes

	to use GePG System?	b. No
6	How many staffs have an access to this GePG System? <i>(Write number in response column)</i>	
7	How many departments/units use this system for revenue collections? <i>(Write number in response column)</i>	
8	How frequently the facility uses this system for revenue collection? <i>(Select the appropriate option)</i>	a. Daily
		b. Weekly
		c. Monthly
		d. Quarterly
9	Is the GePG System user friendly?	a. Yes
		b. No
10	How long this health facility has been using GePG for revenue collections? <i>(Write number in the response column)</i>	
11	Does the facility face any challenges when using the GePG System?	a. Yes
		b. No
12	If yes, which of the following challenges does the facility experience when using GePG System? <i>(Select all that apply)?</i>	a. Slow Performance
		b. System bugs/errors
		c. Poor Connectivity
		d. System downtime
		e. Other, Specify_____
13	Does this health facility having any instructions or guidelines on how to use GePG System?	a. Yes
		b. No
14	Does the health facility conduct or organize training about the use of GePG System?	a. Yes
		b. No
15	How often GePG System training is being conducted at this health facility?	a. Daily
		b. Weekly
		c. Monthly
		d. Quarterly
D: HEALTH FACILITIES UTILISING INSURANCE MANAGEMENT SYSTEMS (IMS) <i>Please Circle the correct answer or write the response in the response column provided</i>		
SN	Questions	Response
1	Does this facility have Insurance Management Systems?	a. Yes
		b. No
2	Which insurance management system does this facility use for e-claiming? <i>(Select the appropriate answer)</i>	a. NHIF Online Service Portal
		b. CHF
		c. Other, Specify_____
3	When does this health facility started using Insurance Management System for e-Claiming? <i>(Write number in response column)</i>	
4	Does the staffs of this health facility have the ability to use Insurance Management System for e-Claiming?	a. Yes
		b. No

5	How many health staffs of this facility have an access to Insurance Management System? <i>(Write numbers in response column)</i>	
6	How many departments/units use this Insurance Management System for e-Claiming? <i>(Write number in response column)</i>	
7	How often does this health facility use Insurance Management System for e-Claiming	a. Daily
		b. Weekly
		c. Monthly
8	Is the Insurance Management System user friendly?	a. Yes
		b. No
9	How long does this health facility has been using Insurance Management System for e-Claiming? <i>(Write duration in response column)</i>	
10	Does the facility face any challenges when using Insurance Management System?	a. Yes
		b. No
11	If yes, which of the following challenges does the facility experience when using Insurance Management System <i>(Select all that apply)</i>	c. Slow Performance
		d. System bugs/errors
		e. Poor Connectivity
		f. System downtime
		g. Other, Specify_____
12	Does this health facility having any instructions or guidelines on how to use Insurance Management System?	a. Yes
		b. No
13	Does the health facility conduct or organize training about the use of Insurance Management System?	a. Yes
		b. No
14	How often this training on Insurance Management System is being conducted at this health facility?	a. Daily
		b. Weekly
		c. Monthly
		d. Quarterly
E: FACTORS FACILITATING THE IMPLEMENTATION OF DIGITAL HEALTH SOLUTIONS INITIATIVES <i>Please Circle the correct answer or write the response in the response column provided</i>		
1	Did this health facility conduct meetings on revenues and expenditures?	a. Yes
		b. No
2	How many frequencies do you conduct these meetings on revenues and expenditures?	a. Daily
		b. Weekly
		c. Monthly
		d. Quarterly
3	Does the facility plan and allocates budgets for digital health solutions?	a. Yes
		b. No
4	Does the health facility provide motivation for the best champions on the use of digital health solutions?	a. Yes
		b. No

5	Which motivation does the facility provide to the best champions on the use of digital health solutions? <i>(Select all that apply)</i>	a. Recognition & Appreciation
		b. Financial Incentives
		c. Awards & Certifications
		d. Professional Development
		e. Leadership Promotion
6	Does this health facility receive any technical support regarding digital health solutions?	a. Yes
		b. No
7	If yes, where does this health facility receive technical support regarding digital health solutions?	a. MoH
		b. PO-RALG
		c. RHMT
		d. CHMT
		e. Both
8	Does this health facility conduct regular maintenance on available digital devices?	a. Yes
		b. No
9	Does the community be aware on the digital health solutions	a. Yes
		b. No
10	Does this health facility involve the community (HFGC) on planning and budgeting of digital health solutions?	a. Yes
		b. No
11	Does the facility receive any comments/suggestions/feedback from the community/clients regarding payments conducted electronically?	a. Yes
		b. No
12	What are the most common comments, suggestions, or feedback received from the community or clients regarding electronic payments at the facility? <i>(Select all that apply)</i>	a. Convenience and Efficiency of Payments
		b. Slow System Performance
		c. Unavailability of the System
		d. Transparency and Accountability
		e. System Accessibility



UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND
TECHNOLOGY



MZUMBE UNIVERSITY
OFFICE OF THE DEPUTY VICE CHANCELLOR
(ARC)

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Website: www.mzumbe.ac.tz

P.O. BOX 1
MZUMBE
MOROGORO, TANZANIA

In replying please quote:

Ref. No. MU/DPGS/INT/38/Vol. IV/594

14th March, 2025

Regional Administrative Secretary (RAS),
P.O. BOX 128 Sumbawanga
55180 RUKWA.

RE: INTRODUCTION OF MR. LEONS MALIYAHEZE

Refer to the heading captioned above

2. The bearer of this letter Mr. **Leons Maliyaheze** whose registration number is **1842251/T.23** is a postgraduate student at our University (Mzumbe University) pursuing **Master of Science in Health Monitoring and Evaluation (MSc.HM&E)**. As part of requirements for completion of his studies, he is collecting data on: **"Evaluation of the Implementation of the Digital Health Solutions Initiatives for Improving of Financial Resource Management in Public Primary Health Care Facilities in Rukwa Region"**. The activity is expected to start at 24th March up to 30th June, 2025
3. This letter serves to achieve three purposes. Firstly, to introduce him to you. Secondly, to request you to grant him permission to undertake data collection at your organizations, and thirdly to request you to facilitate any form of assistance he might need in order to successfully pursue this noble exercise at your organization. We can assure you that this activity is entirely for academic purpose and will never be used for any other purposes.
4. We trust that you will accord our student with necessary assistance.
5. Sincerely yours,

Dr. Juma Buhimila (PhD)

FOR DEPUTY VICE CHANCELLOR (Academic Research and Consultancy)

THE UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

RUKWA REGION
Telephone address: "REGCOM"
Phone: :025-/2802138/2802144
Fax No. (025) 2802217
E- mail: ras@rukwa.go.tz



Regional Commissioner's Office,
1 Regional Road,
P.O. BOX. 128,
SUMBAWANGA.
55180 Rukwa

ReNo.CA.190/227/01B/104

24 March, 2025

Rector,
Mzumbe University
P.O.BOX 1 Mzumbe
Morogoro, Tanzania.

Re: INTRODUCTION OF MR. LEONS MALIYAHEZE

Refer to the Captioned Subject matter with your letter with Ref. No. MU/DPCS/INT/38Vol/IV/594 dated 14th March, 2025 which introduce your student Leons Maliyaheze from Mzumbe University Pursuing Master of Science in Health Monitoring and Evaluation (MSc.Hm&E) who requested to collect data on "Evaluation of the implementation of the Digital Health Solutions Initiatives for improving of financial Resource Management in Public Primary Health Facilities in Rukwa Region.

3. I would like to inform you that your request has been accepted and your student can start activity from 24th March up to 30th June to all Primary Health facilities found in Rukwa Region.
4. Kindly be informed that our office will not be responsible for any cost including shelter, food and transport.

Hajayand C. Adon

Ag. REGIONAL ADMINISTRATIVE SECRETARY

Copy to:

Municipal Director,
Sumbawanga Municipal Council,
P.O. BOX 187
Sumbawanga.

District Executive Director,
Sumbawanga District Council,
P.O. BOX 229
Sumbawanga.

District Executive Director,
Nkasi District Council,
P.O. BOX 02,
Nkasi.

District Executive Director,
Kalambo District Council,
P.O.BOX 03
Kalambo.

Leons Maliyaheze,
Mzumbe University,
P.O.BOX 1
Morogoro- Tanzania.



JAMHURI YA MUUNGANO WA TANZANIA
OFISI YA RAIS TAWALA ZA MIKOA NA SERIKALI ZA MITAA
HALMASHAURI YA WILAYA YA KALAMBO
(Barua zote ziandikwe kwa Mkurugenzi Mtendaji)



Unapojibu tafadhali taja:

Kumb. Na. KDC/F.40/02/180

02 April, 2025

WAGANGA WAFWIDHI (Hospital-HQ, VITUO VYA AFYA NA ZAHANATI),
S.L.P 3,
MATAI-KALAMBO

YAH: KUMTAMBULISHA BW. LEONS MALIYAHEZE

Husika na somo tajwa hapo juu.

2. Ofisi ya Mkurugenzi Mtendaji imepokea barua kutoka Ofisi ya Katibu Tawala Mkoa yenye **Kumb.Na.CA.190/227/01B/104** ya Tarehe 24 Machi, 2025. Barua hiyo imemtambulisha Bw. **LEONS MALIYAHEZE** kwa ajili ya kukusanya Takwimu kuhusu "Evaluation of the implementation of the Digital Health Solutions Initiatives for improving of financial Resource Management in Public Primary Health Facilities" katika mkoa wa Rukwa.
3. Bw.**LEONS MALIYAHEZE** ataanza kukusanya Takwimu hizo kutoka vituo vya afya kuanzia tarehe 24th Machi, 2025 mpaka 30th Juni, 2025 kwa vituo vyote lengwa ndani ya mkoa wa Rukwa.
4. Ofisi ya Mkurugenzi Mtendaji haitahusika na gharama yoyote itayohusiana na zoezi hili ikiwa ni pamoja na Malazi, Chakula na Usafiri.
5. Kwa barua hii, nakuelekeza kutoa ushirikiano utakaohitajika ili kufanikisha zoezi hili.
6. Nakutakia utekelezaji mwema

Amandus L. Mtani

**Kny: MKURUGENZI MTENDAJI
DISTRICT EXECUTIVE DIRECTOR
KALAMBO**

Ofisi ya Mkurugenzi Mtendaji Halmashauri ya Wilaya S.L.P 03 Matai 13 Barabara ya Halmashauri 55482 Kalambo, Simu
025 2802429/0622858482 Nukushi 025 2802796 barua pepe ded.kalambo@rukwa.go.tz, Tovuti www.kalambodc.go.tz



JAMHURI YA JAMHURI YA MUUNGANO WA TANZANIA

OFISI YA RAIS

TAWALA ZA MIKOA NA SERIKALI ZA MITAA

HALMASHAURI YA WILAYA YA NKASI



Unapojibu tafadhali taja

Kumb.Na.NKSC/DC/R.20/6/VOL.IV/115

08 Aprili, 2025

Waganga Wafawidhi,
Hospitali ya Wilaya, Vituo vya Afya na Zahanati,
Halmashauri ya Wilaya,
S.L.P 20,
NKASI.

Yah: **KUMTAMBULISHA BW. LEONS MALIYAHEZE.**

Tafadhali rejeeni mada tajwa hapo juu.

2. Namtambulisha Mwanafunzi tajwa hapo juu kutoka Chuo Kikuu cha Mzumbe anayesoma Shahada ya Uzamili yaani "**Master of Science in Health Monitoring and Evaluation (MSc.HM&E)**" kwa ajili ya kufanya utafiti wa masuala ya tathmini ya utekelezaji wa mipango ya Digital Health Solutions kwa ajili ya kuboresha usimamizi wa rasilimali fedha katika vituo vya afya Mkoani Rukwa "**Evaluation of the implementation of the Digital Health Solutions initiatives for improving of financial resource management in public primary Health facilities in Rukwa Region**" kuanzia tarehe 24.03.2025 hadi tarehe 30.06.2025.

3. Kwa barua hii, Waganga Wafawidhi wa Hospitali Vituo vya Afya na Zahanati mnaelekezwa kutoa ushirikiano kwa Mwanafunzi tajwa atakayeanza kazi hiyo kwenye maeneo yenu.

4. Nawatakia utekelezaji mwema.

Afraha N. Hassan
MKURUGENZI MTENDAJI
HALMASHAURI YA WILAYA NKASI

NAKALA:

- Mganga Mkuu (W)
S.L.P 20.
NAMANYERE-NKASI

MKURUGENZI MTENDAJI
HALMASHAURI YA WILAYA
NKASI

Ofisi ya Mkurugenzi; 3 Barabara ya Ikulu; S.L.P. 02 Namanyere-Nkasi. Simu: +255 025 283 0006;
Nukushi: +255 025 283 0136; Email: ded@nkasidc.go.tz Tovuti: www.nkasidc.go.tz

SUMBAWANGA DISTRICT COUNCIL

(ALL CORRESPONDENCE SHOULD BE DIRECTED TO DISTRICT EXECUTIVE DIRECTOR)

RUKWA REGION P.O. Box 229,
TEL:025-2802133
FAX:025-2800301
Email: ded@sumbawangadc.go.tz



SUMBAWANGA,
TANZANIA.

Ref.No. SDC/T.60/31/139

04th April, 2025

MR. LEONS MALIYAHEZE
U.F.S
RECTOR,
MZUMBE UNIVERSITY
COLLEGE (JUCO),
P. O.Box 01 Mzumbe,
MOROGORO, TANZANIA

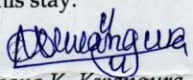
**REF: ACCEPTANCE TO CONDUCT DATA COLLECTION AND RESEARCH WORK
FORMS MR. LEONS MALIYAHEZE**

Reference is made to the letter dated **24th March, 2024** with Ref. No. CA.190/227/01B/104 in respect to the captioned subject above.

I am glad to inform you that the request you made for the above-mentioned Student pursuing Master of Science in Health Monitoring and Evaluation (MSc.Hm&E), has been accepted by this Office. He will conduct his Research from **24st March 2025, up to 30th June 2025.**

We are looking forward to receive him on time specified. The student is expected to adhere to all the rules, laws and regulations guiding the office and public service and work hard, showing high standard of professional integrity in order to be able to complete his research.

Also, the office and the District Council in general, will not incur any cost pertaining to the student's research during the time of his stay.


Missana K. Kwangura
**DISTRICT EXECUTIVE DIRECTOR
SUMBAWANGA**

**AKUNJENZI MTENDAJI CW
SUMBAWANGA**

Copy - District Medical Officer -For cooperation