



# Usage, Benefits, and Barriers of EMRs in Tanzanian Public PHC Facilities: Insights from Sociotechnical Systems Theory

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## Abstract

This study explores the usage, perceived benefits, and implementation barriers of electronic medical record (EMR) systems in Tanzanian public primary healthcare (PHC) facilities, drawing on sociotechnical systems theory to examine the interplay between technical functionalities and the social and organisational contexts of system use. A qualitative multi-case study design was employed, involving semi-structured interviews with 41 healthcare workers across six PHC facilities in Iringa and Manyoni districts. Participants were purposively selected based on their direct engagement with the national EMR system, the government of Tanzania health operation management information system. The data was thematically analysed using inductive coding in Microsoft Excel. The EMR system is widely used for clinical and administrative functions, including patient registration, billing, inventory control, diagnostics, nursing care, and radiology services. Participants reported improvements in record accuracy, workflow efficiency, revenue tracking, and service accountability. However, persistent sociotechnical barriers were identified: technical difficulties, organisational constraints, and individual-level challenges that collectively hinder optimal system use and sustainability. Sustainable EMR integration in resource-constrained environments requires a sociotechnical approach that prioritises user-centred design, ongoing capacity-building, and investments in supportive infrastructure and governance.

## 1. Introduction

Electronic Medical Record (EMR) systems are digital tools designed to improve the storage, retrieval, and use of patient information in healthcare delivery [12]. Worldwide, EMRs have shown significant potential in enhancing healthcare outcomes by reducing medication errors, improving documentation, streamlining billing processes, and helping with regulatory compliance [16]. While adoption has increased in high-income countries (HICs) due to strong infrastructure and supportive legislation, low- and middle-income countries (LMICs) face specific challenges that limit the uptake and sustainability of EMRs [6, 8].

The factors are not just technical; they stem from the complex relationships between social and technical systems in healthcare settings. The Sociotechnical Systems (STS) Theory offers an important framework for understanding how EMRs are implemented and used in these environments. STS theory claims successful technology integration depends on the combination of technical factors, such as software, hardware, and data systems, with social factors, including people, workflows, and organisational norms [3, 20]. In LMICs, EMR systems often do not meet their goals because of mismatches between the systems involved. For instance, this can occur when a system's usability fails to align with local workflows, or when infrastructure issues impede the technology's functionality.

The Government of Tanzania Health Operations Management Information System (GoT-HoMIS) demonstrates the importance of considering both social and technical factors in Tanzania. Primary healthcare facilities, including dispensaries, health centres, and district hospitals, play a vital role in Tanzania's decentralised healthcare system. However, these facilities often face several problems, including inadequate staff and heavy workloads. GoT-HoMIS was introduced

to digitise key clinical and administrative tasks, improve service delivery, and support data-driven decisions. However, previous studies [14] and implementation reports point out ongoing challenges, such as irregular use of the system, lack of training, hardware issues, poor compatibility, and continued dependence on paper systems.

These challenges show a lack of fit between technology and the needs of healthcare professionals. The technological tools may not support their daily practices, and organisational structures may not facilitate the effective use of the systems. Additionally, there are few studies investigating the performance of GoT-HoMIS, including exploring its features and benefits. Therefore, it is important to examine these factors through STS. This approach helps identify not only technical problems, but also institutional, behavioural, and workflow-related challenges that affect how EMRs function.

This study uses the sociotechnical systems theory to explore the use of GoT-HoMIS in primary healthcare institutions in Tanzania. It explores how this system affects healthcare service delivery and identifies the social and technical challenges that limit its effective use. By examining both the technology and the social context, the research offers valuable insights for redesigning the system, adjusting policies, and creating user-focused implementation strategies in low- and middle-income countries. Three research questions guide this study:

1. What interactions do healthcare workers in Tanzanian PHC facilities have with GoT-HoMIS features and which functionalities do they most frequently use in routine service delivery?
2. In what ways has the integration of GoT-HoMIS influenced healthcare delivery processes,

coordination, and efficiency within PHC facilities?

3. What sociotechnical barriers spanning technical design, organisational infrastructure, and human factors do PHC workers encounter when using GoT-HoMIS?

This study contributes substantially to the empirical literature by presenting context-specific findings relating to the use, benefits, and barriers of EMR in Tanzanian public primary healthcare facilities, an area still understudied in digital health research. It moves beyond theoretical postulations to provide empirical findings relating to the operationalisation of EMR by several healthcare professionals, and how the various characteristics of EMR influence the results of service delivery. By examining obstacles at the technical, organisational, and individual levels, the study benefits from understanding EMR deployment dynamics in a resource-constrained setting.

## 2. Methodology

### 2.1 Study Design

This study utilised a qualitative, interpretative research methodology to investigate the lived experiences and attitudes of healthcare providers working with EMR systems within Tanzanian public PHC facilities. The study aimed to understand the context-based realities of EMR implementation by analysing the descriptions provided by users from an interpretive perspective. A multi-case study was adapted to facilitate in-depth investigation of EMR systems in PHC facilities of different operational and infrastructural environments.

### 2.2 Study Setting

We conducted a study in six public PHC facilities in the Iringa urban and Manyoni districts. The districts were chosen to represent two varying primary healthcare settings: Iringa as an urban setting and Manyoni as semi-urban; both had

functional EMR systems. We included various facility types; dispensaries, health centres, and district hospitals to allow broad exploration of the study.

The majority of Tanzanians receive basic diagnostic, maternity, and outpatient care from PHC facilities, which are entry points for healthcare. However, they normally work under constrained conditions, including few staff, poor infrastructure, and inadequate access to digital technologies [10]. It is therefore necessary to understand how EMRs are used under these conditions to inform scalable and contextually appropriate digital health interventions.

### *Study Participants and Sampling*

The target population included healthcare workers who directly interact with the EMR system. These were physicians, nurses, laboratory and pharmacy technicians, accountants, radiologists, and health information clerks. A multi-phase sampling method was used. First, convenience sampling was used to select the study sites based on their availability and presence of an operational EMR system. Then at every site, the key informants were purposely selected based on their experience of use, planning, or implementation of the EMR system. All selected personnel had experience of more than six months in EMR use.

A total of 41 key informants were interviewed. The sample was designed to ensure diversity among departments and cadres, aiming to capture differences in EMR usage patterns, experiences, and perceptions. Maximum variation in purposive sampling for informants enhances contextual validity and richness in data, while convenience sampling elevates selection bias.

### *Data Collection*

A nine-item interview guide was used in data collection using semi-structured interviews. To

facilitate clarity and ease of understanding for participants with varying education levels, the questionnaire was first written in English and then translated into Swahili. To ensure open-ended discussion, interviews were held in secrecy in an office or other enclosed space and lasted 20 to 30 minutes. Data saturation was reached when new themes were no longer emerging during the interviews.

### ***Ethical Considerations***

Ethical clearance was given by the University of Dodoma Research Ethics Committee (reference number MA.84/261/66/6) and approvals by the respective local government authorities and health facilities. All participants obtained informed consent prior to their participation in the study. Audio recordings were anonymised during transcriptions and kept in a secure location to ensure confidentiality.

### ***Data Analysis***

Thematic analysis was used to analyse the data. Microsoft Excel 365 was applied in verbatim transcription, English translation, and inductive coding of the interviews. Excel was applied due to its ease of use and applicability to the management of small- to medium-sized qualitative datasets. Open coding was applied line by line to analyse the data. Similar codes were grouped into developing categories and emergent themes. Two coders independently coded 30% of the transcripts and achieved an inter-coder reliability of 0.85 via Cohen's Kappa, which is excellent. Differences were discussed in consensus.

The study used secured theme finalisations, version-controlled coding files, and constant cross-checks of raw data and codes to improve analytical rigour. For validation of interpretations, emergent themes were shared with some participants in the member checking process. This cyclical process

ensured that the final themes adequately and deeply reflected the opinions of the participants.

To ensure the accuracy of the findings and interpretations, the researcher adhered to the principles of trustworthiness, which encompassed four key components, namely credibility, dependability, transferability, and confirmability.

## **3. Findings**

This section provides a thorough examination of the use, benefits, and obstacles of EMR systems in Tanzanian public PHC facilities, which differ depending on the type of facility and the roles of its users. The results are divided into four main sections: (1) respondent demographics; (2) EMR system usage trends in public PHC settings; (3) EMR system usage-related operational and clinical improvements; and (4) obstacles to EMR system adoption and use. Each subsection provides a detailed explanation of the study's findings.

### **1) Respondents' Demographics**

Table 1 lists the 19 male and 22 female health professionals who participated in the study. Their levels of experience with electronic medical records ranged from 1 to 8 years, with an average of 3 years. Like other EMR systems, GoT-HoMIS serves a diverse group of healthcare professionals.

The GoT-HoMIS platform was used to support administrative and clinical operations in public PHC facilities. While administrative staff used the system to manage inventory levels, sort through patients according to insurance status, produce revenue reports, and handle day-to-day operational procedures, clinicians utilized to view patient histories, document clinical encounters, and request tests and treatment plans. Patient registration, documentation of consultation, diagnostic and laboratory services. Likewise, documenting prescription, inventory management, and billing

Table 1. List of study participants (Source: Authors' work).

Occupation	No. of Respondents	Gender (M/F)	Average Years of Experience
Medical Doctors	8	5 / 3	6.8
Nurses	10	4 / 6	9.2
Laboratory Technicians	5	3 / 2	5.4
Accountants	3	2 / 1	4.7
Pharmacy Technicians	8	6 / 2	7.3
Health Information Clerks	5	2 / 3	3.9
Radiologists	2	2 / 0	8.0
<b>Total</b>	<b>41</b>	<b>24 / 17</b>	—

## Key Activities Supported by the EMR in the Public PHC Facilities

processes were some of the many critical functionalities included in its application.

**a) Patient Registration**

To create a standard identifier that reinforced accurate patient identification, reduced the risk of duplication, and allowed consistency between clinical and administrative records, medical record personnel employed the system to generate unique medical record numbers (MRNs) for every patient. This process allowed longitudinal follow-up of care, improved coordination among providers, provided easy retrieval of patient health data during follow-up encounters, and ensured continuity and integrity of patient data within the facility. One physician reiterated the foundation role of this process by claiming, "*Registration of the patient is a prerequisite for examination, testing, and documentation by caregivers.*"

**b) Billing and Revenue Collection**

By classifying patients according to their insurance coverage or exemption status, the system

streamlined billing procedures and minimised potential revenue losses. GoT-HoMIS made it easier for frontline staff to distinguish between insured, exempt, and fee-paying patients during registration by automating the categorisation process. This feature ensures adherence to national health finance policies during billing procedures, reduces manual errors, and expedites service delivery. Additionally, by linking patient categories to the appropriate billing rules in the system, it increased transparency and accountability. Through the categorization of patients against insurance or exempted, the system made billing easier and reduced the likelihood of revenue loss. GoT-HoMIS made it easy for frontline staff to distinguish between fee-paying patients, insured, and exempt patients upon registration through automated classification. This feature improves compliance with national health finance regulations during billing, reduces human errors, and accelerates delivery of services. In addition, by linking patient types with relevant billing policies in the system, it increased transparency and

accountability in fund management., As noted by an Iringa receptionist: *"When they come, we register them and settle their bills."*

### ***c) Inventory Management***

Pharmacy employees employed GoT-HoMIS to monitor the quantities of inventories, document the dispensed items, and check the expiration dates of medicines. The stock levels of pharmaceuticals became visible in real time through the inventory module of the system, minimising the risk of stockouts and enabling timely restocking. Through monitoring all transactions, from supplying items to departments to dispensing medication to patients, the system guaranteed adequate documentation and traceability of drug movement in the facility. Furthermore, with the ability to monitor expiration dates, it was easier to remove expired drugs from inventory in advance, increasing patient safety, minimizing waste, and maintaining adherence to legislation and regulations. An Iringa pharmacist testified, *"We use the stock balance verification interface on a routine basis."*

### ***d) Clinical Activities***

The system was used across a range of clinical activities by a wide spectrum of professionals, including doctors, nurses, laboratory technicians, and radiologists, like reviewing patient histories, retrieving lab results, writing prescriptions, and triggering diagnostic procedures. Through constant information sharing between departments and enhanced clinical decision-making, this widespread collaboration with GoT-HoMIS enabled an integrative response to patient care. At the point of care delivery, clinicians can get the latest diagnosis and treatment histories, so that intervention is made easy and redundant services are delivered. By maintaining a historical record of patient visits, the technology made consistency of care easier by allowing medical professionals to trace the path of

illnesses, assess the effectiveness of treatments, and plan follow-up services more effectively.

Despite varying applications across professional positions, the system's Regardless of differential utilisation by professional role, the widespread implementation of the system improved continuity of care across several sites of service provision, fostered interprofessional collaboration, and facilitated integration by department. To reduce information silos and facilitate real-time collaboration between providers, GoT-HoMIS was created as an integrated electronic platform accessible to all pertinent staff. This interoperability promoted integration between administrative and clinical activities by providing patient data like referral notes, treatment plans, and diagnostic results to all authorized professionals. Clinical procedures were therefore better coordinated, patient transfer between departments was facilitated, and the quality and timeliness of healthcare services was improved.

### ***Improvements Made by GoT-HoMIS in PHC Facilities***

As summarised in Table 2, there are overarching themes in how GoT-HoMIS improves resource management, fosters data integrity, and enhances service delivery, even though each cadre uses the system differently depending on their role.

#### ***a) Streamlined Patient Management and Continuity of Care***

To guarantee accurate record maintenance and patient monitoring, the medical records staff emphasised the significance of patient registration through GoT-HoMIS, which assigns a unique Medical Record Number (MRN). Clinicians pointed out that registration is crucial for fostering continuity of care. To link care episodes across departments and access patient histories, registration is crucial. This widespread reliance on

Table 2. Enhancement made by GoT-HoMIS in PHC facilities.

Key Area		Description of Improvements	Primary Actors
Streamlined Management and Continuity of Care	Patient and	Unique MRN assignment enables accurate patient tracking and retrieval of records across departments. This ensures consistency and continuity in patient care, reduces duplication, and improves equity in service provision.	Medical Records Officers, Clinicians
Improved Accountability and Billing	Financial	Patient categorisation by payment modality (insurance, cash, exemption) improves billing accuracy and transparency. Automated billing reduces errors and enhances auditability, ensuring proper application of exemptions.	Medical Records Officers, Accountants
Inventory and Chain Efficiency	Supply	Real-time monitoring of drug stocks, automated ordering, and tracking of dispensed items optimise inventory management. Prescriptions can be cross-verified against available stock, reducing errors and waste.	Pharmacists, Administrative Staff
Clinical Integration	Workflow	Integration of multiple clinical functions (e.g., test ordering, diagnosis, discharge, imaging, and vital tracking) promotes seamless communication and timely decision-making. It also improves the coordination of operations among various departments.	Clinicians, Nurses, Laboratory & Radiology Staff
Enhanced Accountability and Quality Monitoring		The system tracks service delivery at the individual health worker level, allowing supervisors to monitor productivity and adherence to documentation. The system facilitates data-driven performance appraisal and service improvement.	Supervisors, Facility Manager

a digital identity demonstrates how EMRs reduce duplication and advance fair treatment. To guarantee effective record keeping and patient tracking, the medical records staff emphasized patient registration through GoT-HoMIS, which provides a unique Medical Record Number (MRN). Clinicians noted that registration is critical in ensuring continuity of care. To link care episodes across departments and access patient histories, registration is critical. Such general application of a digital identity shows how EMRs minimise

duplication and ensure equal treatment by consistently viewing patient data at all levels.

#### ***b) Improved Financial Accountability and Billing***

Pharmacy and administrative staff indicate that GoT-HoMIS enhances management of stocks by automating procurement, continuous monitoring of stock in real-time, and proper tracking of dispensed products. Ability to reject prescriptions for drugs not in stock and produce electronic reports reduces

drug errors and wastage by aligning supply and clinical demands. In high-volume primary healthcare (PHC) facilities, this feature enhances service responsiveness.

#### ***c) Inventory and Supply Chain Efficiency***

Pharmacy and administrative staff claim GoT-HoMIS has enhanced inventory management by facilitating automated procurement, real-time stock surveillance, and precise tracking of dispensed goods. The ability to refuse prescriptions for unavailable medications and produce digital reports reduces medication errors and waste by balancing supply and clinical demand. Particularly in primary healthcare (PHC) settings with a high patient volume, this feature enhances service responsiveness.

#### ***d) Clinical Workflow Integration***

Physicians, nurses, and lab staff indicated that the GoT-HoMIS system integrates various clinical activities, including ordering tests, recording diagnoses, and discharging patients. The system shortens diagnosis delays, facilitates communication, and allows departments to share data in real time. The radiology staff highlighted better imaging records as a method of accelerating clinical decision-making. With patient admission management, monitoring of vital signs, and bed allocation using GoT-HoMIS, nurses were capable of providing safer and more structured care.

#### ***e) Enhanced Accountability and Quality Monitoring***

The majority of respondents stressed that GoT-HoMIS improved the monitoring of performance by tracking the delivery of care at the level of individual healthcare providers. Supervisors can track patient volumes and service categories, increasing accountability and enforcing compliance with documentation needs. This improvement has more implications for workforce management,

quality of care, and service categories, enhancing accountability and encouraging compliance with documentation standards. This improvement has more consequences for workforce management and care quality.

#### ***Barriers to GoT-HoMIS Use***

Notwithstanding those benefits, a number of organisational, individual, and technical obstacles prevent GoT-HoMIS from being used effectively.

##### ***a) Technical barriers***

Clinical workflows are disrupted, and user confidence is lost through recurring system failures (e.g., "Error 500"), unresponsive login screens, and usability problems like a lack of a cancel feature. Dissatisfaction of staff members and data inaccuracy due to rigid billing workflows, and restricting patient record revision privileges on pharmacy and medical records personnel.

##### ***b) Organizational barriers***

PHC facilities were plagued by frequent power outages, erratic internet connectivity, inadequate IT personnel, and limited computers, particularly in units such as maternity and reproductive health. As they depend on easy access to shared devices to finish care documentation, nurses and clinicians are disproportionately hindered by these infrastructure limitations.

##### ***c) Individual-level barriers***

Individual-level issues are knowledge loss due to shift work schedules, digital illiteracy among older workers, and uneven training. Nurses and clinicians were severely affected by the lack of refresher courses and on-demand technical support. Furthermore, the requirement for dual documentation, keeping paper and electronic copies due to reporting requirements or system downtime, causes duplication of effort, decreases data quality, and decreases system trust.

The complete integration of services is also weakened by inadequate data exchange and interoperability between modules and departments. To improve system usability and sustainability, these issues underscore the importance of iterative, user-driven designs, significant infrastructural outlays, as well as a co-ordinated policy approach connecting digital and paper flows.

#### 4. Discussion

The Sociotechnical Systems (STS) Theory, which is concerned with the interaction between social and technical subsystems in creating, implementing, and using digital technologies, is used in this section to analyze the study findings. This sociotechnical analysis of the GoT-HOMIS system in Tanzania's organisational, physical, and human contexts determines the sociotechnical misalignments that derail the effective use of the system, as well as the system's effects on service delivery. The system has improved patient tracking, billing accuracy, inventory management, and workflow efficiency, but persistent issues like poor design, lack of infrastructure, and user competency shortfalls demonstrate a misfit between GoT-HoMIS's technical features and the socio-organizational context in which it operates.

These findings point to the urgent need for an overall implementation plan that takes into account the institutional, cultural, and human dimensions of healthcare delivery, while simultaneously increasing technical capacity. In settings in which digital literacy is weak or common uses are not supported at random, the technical capacity of the system to automate tasks and generate helpful data is not optimized. In the absence of local adaptation mechanisms, centralised design decisions diminish facility-level usability and ownership. These sociotechnical tensions illustrate that maintaining application of EMRs in resource-limited settings requires constant compromise and coordination between evolving user needs, institutional norms, and system capabilities. The findings of Section 3 are elaborated in the following section by using the lens of the Sociotechnical Systems (STS) Theory.

#### Sociotechnical Integration of EMR Features in PHC Workflows

How technological components (e.g., electronic medical record modules) relate to social actors (e.g., healthcare professionals) can be appreciated through the GoT-HoMIS implementation in Tanzanian primary healthcare facilities. Different professionals, such as radiologists, nurses, laboratory technologists, chemists, and medical records staff, have interactions with different functionalities specific to their workflow tasks. According to Trist et al. [20], such integration constitutes an exemplary case of the co-adaptive relationship between human behavior and technological systems. For Sirili et al. [17] and Alanazi et al. [1], continuity of care and record-keeping are guaranteed through enabling tracking by unique identifiers (MRNs).

#### *Technical Subsystem Contributions to Operational and Clinical Efficiency*

Greater efficiency was mentioned by the stakeholders in important areas like communication between departments, stock control, and billing. Shortened time and precise delivery of services were allowed by features such as electronic check of prescriptions, real-time stock monitoring, and automatic patient classification (insured, cash-paying, or exempt). These efficiencies demonstrate the ability of highly integrated technical systems to reduce administrative burden and improve performance [3, 11]. In addition, laboratory and radiology modules reduce delay and paper reliance by offering electronic record keeping and accelerated diagnosis cycles [5].

#### *Organizational Impact and Enhanced Accountability Mechanisms*

Through enabling real-time monitoring of staff activity and service delivery performance, integration of GoT-HoMIS into management processes further enabled accountability and

monitoring. Revenue reconciliation, patient throughput monitoring, and daily performance monitoring were all enabled through system-generated reports. These affordances are in line with the STS view that, if aligned with organisational norms, sociotechnical systems can revolutionise organisational control mechanisms [21]. The system reduced the potential for abuse and increased responsible recording by incorporating traceability into activities in care.

### ***Sociotechnical Misalignments and Emergent Workarounds***

In spite of the benefits of the system, persistent technical issues like frequent system crashes ("Error 500"), lack of cancellation options, and inability to modify prices at the point of dispensing caused interruptions and forced staff to use unofficial workarounds. Such flaws prove that the system design and frontline operations workflow in action are not well-matched [13, 15]. Noncompliance, evasions, or even the development of parallel systems would, as per STS theory, typically be due to technology design not developed through consensus with the users [2].

### ***Infrastructural and Organizational Constraints as Barriers to EMR Functionality***

Implementation success was largely determined by the availability of hardware, electricity, and technical support. Ongoing EMR use was thwarted by participants' reports of frequent power outages, few available computers, and a lack of IT personnel. Infrastructure limitations have been documented in many low- and middle-income nations, where EMR systems collapse due to organisational readiness deficiencies, in addition to poor design [9, 18]. Several PHC facilities lacked the supportive environment needed for technological tools, according to the STS theory.

### ***Fragmentation Arises from Hybrid Documentation Practices.***

PHC workers explained the widespread use of both electronic and paper systems due to reporting needs, poor connectivity, and unreliable power supply. There were inconsistencies, inefficiencies, and redundant information in clinical documentation because of this dual-mode practice. Where electronic systems are poorly institutionalized, dual systems are an example of enduring sociotechnical tensions [4]. Performance by EMR is impaired by this fragmentation, and it also indicates that there is scope for improved policy coherence and infrastructure support.

### ***Human-System Interaction and Capacity Gaps***

Individual-level obstacles, specifically digital illiteracy and training, negatively impact system use. Turnover, night shifts, and emergency scheduling produced a distorted skills distribution. The identical problems have been noted in studies in Asia and Africa, where human resource constraints cause difficulties in the use of electronic medical records [7]. The discrepancy between system requirements and user competences mirrors inadequate co-development procedures and a need for continual capacity building.

### ***Implications for Sociotechnical Optimization***

This study showcases the key STS theory concept: digital health systems flourish when social and technological subsystems become accustomed to accommodate one another [3, 19]. GoT-HoMIS is capable of enhancing service delivery and organisational accountability, but sociotechnical mismatches like usability issues, infrastructure issues, and technical support issues have created barriers to slow down system performance. Effective integration of EMR with primary health care in the long term requires overcoming these limitations through user-focused design, expert training, robust infrastructure, and policy alignment.

## **5. Conclusion**

Using the Sociotechnical Systems Theory as an analytical framework, this study investigated the GoT-HoMIS electronic medical record system's use, operational benefits, and implementation challenges in Tanzanian public primary healthcare facilities. According to the findings, GoT-HoMIS has enhanced key service areas, including patient registration, billing, inventory management, diagnostics, and accountability. However, persistent inconsistencies between its technical design and the organisational and social contexts of PHC settings have limited its effectiveness. Usability issues, inadequate training, uncoordinated workflows, and inadequate digital infrastructure continuously jeopardize user experience and system sustainability. These challenges underscore the need for a sociotechnical approach that views the adoption of EMR as an organisational transformation that requires the integration of people, procedures, and systems, rather than just a technology intervention.

### Future Research

Future studies must evaluate the scalability and sustainability of EMR systems, particularly in Tanzania's rural and underserved areas, and look at the long-term effects of EMR use on patient health outcomes, to fully utilise EMRs, like GoT-HoMIS, in low-resource settings. The information collected will be crucial for directing national digital health programs and guaranteeing that EMRs contribute significantly to the overall goals of universal health coverage and health system improvement.

### Study Limitations

When assessing the findings, we must take into account the study's numerous limitations. The study only included Tanzanian public primary healthcare facilities using the government-approved EMR system (GoT-HoMIS). The findings might not apply to private healthcare organisations or settings that use various EMR platforms, due to wide variations in operating conditions, digital infrastructure, and governance structures. Second, the study only used self-reported data from medical professionals, which raises the possibility of social desirability bias, because participants might have given answers they thought were expected or favourable. The comprehensiveness of usability and implementation insights is limited when important stakeholder groups, including patients, IT staff, and system developers, are left out. While omitting patient viewpoints limits the evaluation of user experience from the perspective of the service recipient, the absence of developer and IT insights may have limited a thorough grasp of system design constraints, troubleshooting capabilities, and support infrastructure. The limitations underscore the need for cautious interpretation of the findings, and the significance of further research that involves a wider range of stakeholders. They employ complementary data collection methods, including direct observation, system log analysis, and patient feedback, to enhance validity, triangulation, and generalizability.

### CONTRIBUTIONS OF CO-AUTHORS

Joseph Makaranga	[ORCID: <a href="https://orcid.org/0000-0002-8877-2923">0000-0002-8877-2923</a> ]	Conceived the idea, conducted Data Collection and wrote the paper
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**APPENDIX: Interview Guide Questions**

i) Region: \_\_\_\_\_ ii) District: \_\_\_\_\_ iii) Facility: \_\_\_\_\_

iv) Age \_\_\_\_\_ v) Sex \_\_\_\_\_ vi) Role \_\_\_\_\_ vii) Experience \_\_\_\_\_

1. How do you use the EMR systems in your work?
2. Present a few (e.g., four) examples of how EMR systems have improved your day-to-day work or how they have improved your decision-making activities.
3. Which specific features of the EMR system are most useful to you?
4. Can you describe your experiences with the support you receive from IT officers?
5. Could you please explain how the training you receive has affected you?
6. How do these factors (support and training) influence your ease and expertise with the system?
7. How do you inform the health facility management about system improvements?
8. How do you obtain information regarding EMR system updates?
9. What challenges or obstacles have you encountered while using EMR systems in your day-to-day work?

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**REFERENCES**

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- [1]. Alanazi, B., Butler-Henderson, K., & Alanazi, M. (2020). Perceptions of healthcare professionals about the adoption and use of EHR in Gulf Cooperation Council countries: A systematic review. *BMJ Health & Care Informatics*, 27(1), e100099. <https://doi.org/10.1136/BMJHCI-2019-100099>
- [2]. Alter, S. (2014). *Theory of workarounds*. University of San Francisco. <https://repository.usfca.edu/at/40/>
- [3]. Baxter, G., & Sommerville, I. (2011). Socio-technical systems: From design methods to systems engineering. *Interacting with Computers*, 23(1), 4–17. <https://doi.org/10.1016/j.intcom.2010.07.003>
- [4]. Blaya, J. A., Fraser, H. S. F., & Holt, B. (2010). E-health technologies show promise in developing countries. *Health Affairs*, 29(2), 244–251. <https://doi.org/10.1377/HLTHAFF.2009.0894>
- [5]. Chowdhury, J., & Ravi, R. P. (2022). Healthcare accessibility in developing countries: A global healthcare challenge. *Journal of Clinical & Biomedical Research*, 2022 (November), 1–5. [https://doi.org/10.47363/jcbr/2022\(4\)152](https://doi.org/10.47363/jcbr/2022(4)152)
- [6]. Dhyani, V. S., Krishnan, J. B., Mathias, E. G., Hossain, M. M., Price, C., Gudi, N., ... Zodpey, S. (2023). Barriers and facilitators for the adoption of telemedicine services in low-income and middle-income countries: A rapid overview of reviews. *BMJ Innovations*, 9(4), bmjinnov-001062. <https://doi.org/10.1136/BMJINNOV-2022-001062>
- [7]. Ebarido, R. A., & Celis, N. J. (2019). Barriers to the adoption of electronic medical records in select Philippine hospitals: A case study approach. *ACM International Conference Proceeding Series*, 123–128. <https://doi.org/10.1145/3330482.3330503>
- [8]. Jones-Esan, L., Somasiri, N., & Lorne, K. (2024). Enhancing healthcare delivery through digital health interventions: A systematic review on telemedicine and mobile health applications in low and middle-income countries (LMICs). *Preprint*. <https://doi.org/10.21203/RS.3.RS-5189203/V1>
- [9]. Kanssiime, E. P., Ondulo, J. M., & Odoyo, C. O. (2024). Navigating the interoperability landscape of electronic medical record systems in developing countries: A narrative literature review. *Journal of Science, Innovation and Creativity*, 3(2), 18–25. <https://doi.org/10.58721/JSIC.V3I2.733>
- [10]. Kinyondo, A., & Pelizzo, R. (2018). Poor policy implementation in Tanzania: Is it a problem of resources or of management? *International Journal of Public Administration*, 41(10), 827–837. <https://doi.org/10.1080/01900692.2017.1303716>
- [11]. Kumari, R., & Chander, S. (2024). Improving healthcare quality by unifying the American electronic medical report system: Time for change. *The Egyptian Heart Journal*, 76(1), 32. <https://doi.org/10.1186/s43044-024-00463-9>
- [12]. Lee, M., Kim, K., Shin, Y., Lee, Y., & Kim, T. J. (2025). Advancements in electronic medical records for clinical trials: Enhancing data management and research efficiency. *Cancers*, 17(9), 1552. <https://doi.org/10.3390/CANCERS17091552>
- [13]. Mahboubi, H., Salibian, A. A., Wu, E. C., Patel, M. S., & Armstrong, W. B. (2013). The role and utilization of electronic medical records in ambulatory otolaryngology. *The Laryngoscope*, 123(10), 2418–2422. <https://doi.org/10.1002/LARY.24104>

- [14]. Mwogosi, A. (2024). Revolutionizing primary health care in Tanzania: Unravelling the contextual factors on electronic health record systems implementation for effective decision support. *Journal of Science and Technology Policy Management*. Advance online publication. <https://doi.org/10.1108/JSTPM-11-2023-0205/FULL/XML>
- [15]. Onuogu, P. (2023). Benefits and challenges of adopting electronic medical records in Nigerian Federal Capital Territory hospitals—Lessons learned. *International Journal of Science and Research Archive*, 10(1), 187–193. <https://doi.org/10.30574/IJSRA.2023.10.1.0734>
- [16]. Pereira, K. A. (2024). Rumo a uma maior eficiência na saúde: O impacto da digitalização de registros médicos. *Revista Sistemática*, 14(3), 709–714. <https://doi.org/10.56238/RCSV14N3-020>
- [17]. Sirili, N., Frumence, G., Kiwara, A., Mwangu, M., Goicolea, I., & Hurtig, A. K. (2019). Public private partnership in the training of doctors after the 1990s' health sector reforms: The case of Tanzania. *Human Resources for Health*, 17(1), 1–11. <https://doi.org/10.1186/S12960-019-0372-6/TABLES/3>
- [18]. Sun, J. H., de Vries, S., & Mould-Millman, N. K. (2024). Emergency medical services (EMS) infrastructure development and operations in low- and middle-income countries: Formal, professional-driven (Tier-2) systems. *Surgery*, 176(1), 217–219. <https://doi.org/10.1016/J.SURG.2024.02.024>
- [19]. Trist, E. (1980). The evolution of socio-technical systems: A conceptual framework and action research program. In *Conference on Organizational Design and Performance* (Vol. 2, pp. 1–67). <https://doi.org/0-7743-6286-3>
- [20]. Trist, E. L., & Bamforth, K. W. (1951). Some social and psychological consequences of the longwall method of coal-getting. *Human Relations*, 4(1), 3–38. <https://doi.org/10.1177/001872675100400101>
- [21]. Walker, R. M. (2008). An empirical evaluation of innovation types and organizational and environmental characteristics: Towards a configuration framework. *Journal of Public Administration Research and Theory*, 18(4), 591–615. <https://doi.org/10.1093/JOPART/MUM026>