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Regis University
Regis College
Master of Development Practice

Advisor/Final Project Faculty Approval Form

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Capstone Title: **Enhancing Patient Experience through EHR Implementation in Rwandan Rural Health Posts: A Comprehensive Learning Program for improving the EHR adoption**

Presented in the MDP Community Forum on: **May 7, 2024**

I approve this capstone as partial fulfillment of the requirements for the Master of Development Practice.

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**Enhancing Patient Experience through EHR Implementation in Rwandan
Rural Health Posts: A Comprehensive Learning Program for improving the
EHR adoption.**

By

Samantha Mugeni Niyoyita

Master of Development Practice

Cohort 2021

Regis University

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List of Abbreviations:

CBHI	Community-Based Health Insurance
DHO	Digital Health Officer
EHR	Electronic Health Records
FGHPs	First Generation Health Posts
HCW	Healthcare Worker
HPs	Health Posts
MoH	Ministry of Health
P4P	Pay for Performance
PHC	Primary Healthcare
PPPs	Public-Private Partnerships
RHOS	Rural Health Operating System
RSSB	Rwanda Social Security Board
SFH	Society for Family Health
SGHPs	Second Generation Health Posts
UHC	Universal Health Coverage
WHA	World Health Assembly
WHO	World Health Organization
PL	Provincial Lead

Personal statement

As an industrial engineer with hands-on experience optimizing operations in a food processing company, I am eager to transition my knowledge and skills to the subject of community development. My profession has established in me a strong desire to use engineering expertise to effect real change. I've seen how well-designed systems and processes can have a significant impact on people's lives, and I believe technology can be a powerful instrument when used with compassion and accountability.

Rwanda, a country known for its accomplishments in healthcare and community development, provides an appropriate setting for my journey. Rural health posts play an important role in providing primary healthcare to remote and vulnerable regions, and there is potential for improvement in healthcare provision and outcome through the use of Electronic Health Records (EHR) systems. My work is entitled: 'Enhancing Patient Experience through EHR Implementation in Rwandan Rural Health Posts: A Comprehensive Learning Program for improving EHR adoption'.

Through a process of data collection, I plan to collaborate closely with healthcare professionals with experience in rural areas, the EHR implementation team and other stakeholders to better understand the EHR users' needs, attitudes and learning preferences to develop a user-centric program.

I look forward to embarking on this transformative thesis journey dedicated to transforming rural healthcare operations in Rwanda and beyond through technology and empathy.

Executive summary

This research project aims to develop a tailored learning program for staff at rural health posts (HPs) to ensure the smooth adoption of an Electronic Health Records (EHR). It supports Rwanda's effort to expand Universal Health Coverage (UHC) and aligns with the Ministry of Health's Digitization Directorate General (DDG) program, which focuses on secure data access, continuity of care, and evidence-based decision-making.

Using a design thinking approach, the learning program is centered on the needs of healthcare workers, gathered through interviews and surveys with both the HP staff and the EHR designers. Research identified different levels of digital literacy and education among users, highlighting the necessity to equip them with the skills required to transition effectively from paper-based systems to EHR.

The program will enable healthcare workers to fully utilize the EHR system, thereby enhancing patient outcomes through improved service delivery.

Background

Rwanda is a landlocked country in East-Central Africa that is bordered to the north by Uganda, to the east by Tanzania, to the east and south by Burundi, and to the west by the Democratic Republic of the Congo. Rwanda's total area is 26,338 Km² (About Rwanda, 2023) with a population of 13.2 million people as of 2022, according to the National Institute of Statistics of Rwanda (NISR). The country's healthcare system has undergone remarkable transformations after the 1994 Genocide.

The Rwandan healthcare system is decentralized and well-functioning, with various levels of care available to citizens as shown in

Figure 1 (RDB, 2023). The Health Sector Strategic Plan (HSSP), published by the Ministry of Health, outlines the strategic objectives for the sector, including its commitment to decentralization. **At the community level**, Community Health Workers (CHWs) provide basic healthcare services such as vaccinations, malaria prevention, and health education. Health Centers and Health Posts (HPs) serve as primary healthcare facilities, but they differ in their scope of services and staffing. Health Posts are smaller, community-based facilities, offering basic preventive and primary care services. Health Centers are larger facilities with a broader scope of services, including consultations with medical professionals and more extensive diagnostics and treatments. Health posts are run by nurses and act as a link between health centers and CHWs; and can refer patients to higher-level care when needed. **At the district level**, District Hospitals offer a wider range of services including consultations with general practitioners, specialists, maternity services, and basic surgical procedures. **The referral level** includes Provincial Referral Hospitals, which offer more specialized care such as advanced diagnostics and complex surgeries. Finally, National Referral Hospitals like the University

Teaching Hospital of Kigali (CHUK) provide the highest level of care, with specialized departments, advanced equipment, and highly trained medical professionals.

In rural areas of Rwanda, where 72% of the population resides (as of the 2022 NISR report), accessing healthcare has historically been challenging due to long travel distances to the nearest health facility. This difficulty sometimes resulted in instances of home childbirth. However, the introduction of Health Posts (HPs) aimed to address this issue by targeting a reduction in patients' travel time to healthcare facilities. The objective is to achieve less than 25 minutes by 2024, compared to the previous durations of 47 minutes in 2020 and 95 minutes in 2010 (WHO, 2022a). This reduction in travel time has notably enhanced the accessibility of healthcare services to the rural population. Subsequently, there has been a notable 260% increase in visits to HPs from July 2019 to August 2020, serving as evidence of the positive impact of improved accessibility, particularly in the utilization of maternal and child health services (Sanders, 2022). The section titled "Health posts (HPs): Reaching the " provides details on the implementation of HPs.

In addition to increasing access points through HPs, another of the five MoH programs is focused on digital health solutions. The program known as "Digitization Directorate General (DDG)" focuses on enhancing healthcare services through digital health solutions by providing secure access to data, fostering continuity of care, and facilitating evidence-based decision-making (MoH, 2023). One such solution within this framework is the Electronic Health Record (EHR). In resource-constrained settings like Rwanda, the implementation of EHR systems holds the potential to significantly enhance healthcare. EHR systems contribute to improved diagnosis (Friedman, 2009) and their role in data management can elevate the performance of healthcare workers by delivering accurate and timely information about their patients. Studies have demonstrated that the

utilization of EHR leads to enhanced accuracy and completeness of patient information (Ibyimana et al., 2016), empowering healthcare professionals to make well-informed patient care decisions.

SAND Technologies¹ and the Society for Family Health Rwanda (SFH)² have joined forces in an HP digitization project: the "Rural Health Operating System (RHOS)". The project aims to establish connectivity among a network of rural health posts by implementing an innovative and locally designed EHR platform called "eFiche". The latter is developed by eFiche Limited, a technology company based in Rwanda. The envisioned platform is designed to facilitate improved diagnosis, effective patient triage, remote consultations, improved clinical documentation and streamlined data management processes.

However, it is crucial to recognize that EHR implementation in Primary Healthcare (PHC) in Rwanda is still in its early stage as highlighted by the latest Atlas of eHealth country profiles, which reported that it had not been implemented in 2015 (Global Observatory for eHealth, 2015). Achieving widespread adoption across HPs in Rwanda requires a strategic approach that addresses potential implementation barriers while capitalizing on facilitators.

This literature review below summarizes what is known about Rwanda's Primary Healthcare (PHC) approach in relation to the global pursuit of Universal Health Coverage (UHC), delving into existing evidence on the processes involved in introducing EHR systems in developing countries and examining factors influencing their adoption. A significant gap in the existing literature is related to evidence-based best practices for successful EHR implementation in rural

¹ SAND Technologies is a company committed to solving challenges through advanced AI and data-driven solutions.

² SFH is a national health organization dedicated to improving the health of people in Rwanda

clinics in Sub-Saharan Africa. Much of the existing research focuses on EHRs designed to manage specific diseases such as HIV (Benjamin Muhoza, 2018) (Tom Oluoch, 2014).

Literature review

Universal Health Coverage

Universal Health Coverage (UHC) is a global initiative aimed at ensuring everyone has fair and affordable access to quality health services they need. Significant progress has been made towards achieving this goal, with the UHC service coverage index (as indicated by SDG indication 3.8.1) rising worldwide from 45 in 2000 to 68 in 2019 (WHO, 2023). This expansion has yielded numerous benefits, including improved health outcomes: for instance the 2015 report from the Lancet Commissions states that the provision of timely, safe, and affordable surgical and anesthesia care in low- and middle-income countries (LMICs), not only reduces premature death and disability but also boosts welfare (John G Meara, 2015).

Despite advancements, challenges persist. Approximately 2 billion people globally continue to face significant out-of-pocket healthcare expenses (as indicated by SDG indicator 3.8.2) (WHO, 2023), underscoring the need for continued investment in health systems and innovative solutions where resources are collected and managed collectively in advance. This approach aims to provide fair access to healthcare and reduce financial barriers for individuals seeking medical services.

Healthcare issues were also made worse by the COVID-19 pandemic, which caused widespread service disruptions in 84% and 92% of nations, respectively, in 2021 and 2022 (WHO, 2023).

To address these challenges and "build back better", the World Health Organization (WHO) advocates for a Primary Health Care (PHC) approach. PHC serves as the first point of contact between individuals and the healthcare system and places a priority on prevention, early intervention, and community involvement (WHO, 2021). Notably, PHC can deliver 90% of

essential UHC interventions, potentially saving 60 million lives and raising the global life expectancy by 3.7 years by 2030 (WHO, 2023).

Achieving these ambitious PHC targets requires significant investment. The WHO estimates that an additional \$200 to \$370 billion per year is needed to expand health services (WHO, 2021). Recognizing this need, nations pledged to strengthen PHC at the UN High-Level UHC meeting in 2019. The WHO recommends that countries dedicate an additional 1% of GDP to PHC (WHO, 2021), with money coming from both domestic and external sources.

Primary Health Care (PHC) in Rwanda

The life expectancy at birth is one of the indicators that has increased from 41.2 years to 60.2 years between 2000 and 2019 against a global average of 63.7 years (WHO, 2022b). This progress can be attributed to various initiatives and strategies, with Primary Health Care (PHC) playing a pivotal role.

These initiatives prioritize enhancing the **presence of healthcare personnel**, **expanding the geographic reach** of healthcare services, and **enhancing the affordability** of healthcare services (Government of Rwanda, 2005).

Human resources in decentralized PHC

The density of skilled health workers (physicians, nurses, and midwives) in Rwanda stands at 1.1 per 1000 population, falling far below the WHO's recommended minimum health workforce density of 4.45 per 1000 to meet the SDGs by 2030 (MoH, 2020-2021).

Investing in human resources is essential for the success of PHC. Rwanda recognizes this and has taken steps to enhance the skills and capabilities of its healthcare workforce. This includes

implementing training programs aimed at equipping healthcare workers with expertise not only in delivering healthcare services but also in data management and analysis (Ibyimana et al., 2016). However, to ensure optimal effectiveness, it is imperative to tailor these educational programs to address specific health needs and incorporate technology training accordingly (Alexander, 2010).

In addition to education, Rwanda has employed innovative strategies like Pay for Performance (P4P) and Mentorship programs to motivate and enhance the performance of healthcare workers (Das et al., 2016). P4P programs offer financial rewards for achieving specific performance goals, promoting higher quality care. Likewise, mentorship programs provide guidance, feedback, and support, leading to improved skills and knowledge (Ngabonzima et al., 2021).

The Rwandan government acknowledges the need for additional measures to improve HRH performance, prompting the MoH to introduce the "4x4" initiative in early 2023. This initiative aims to multiply the current healthcare workforce by four within the next four years (2024 to 2028) (MoH, 2024) in order to align with WHO healthcare workforce requirement. To achieve this goal, the initiative will implement further efforts to enhance education and training through measures like collaborations with regional and international universities, as well as initiatives to enhance healthcare worker retention and motivation.

Financial access to healthcare

Community-based health insurance (CBHI)

In 2004, the Ministry of Health (MoH) implemented a community-based health insurance (CBHI) system also known as "Mutuelle de Santé", a subsidized health insurance scheme. This solidarity health insurance scheme aims to provide affordable health coverage to low-income and vulnerable

populations, empowering them to access essential healthcare services. Since 2015, the management of CBHI is done by Rwanda Social Security Board (RSSB).

The CBHI Scheme operates on a yearly cycle, running from the 1st of July to the 30th of June the following year. Individual contribution amounts for each year are determined based on household income classifications, referred to as "Ubudehe" categories (RSSB, 2024). These categories comprise five levels:

- Category I members contribute 3,000 Frw (approximately 2.4 USD) per person and is usually supported by the Government and other donors.
- Both Category II and III members contribute 3,000 Frw (approximately 2.4 USD) per person.
- Category IV members contribute 7,000 Frw (approximately 5.5 USD) per person.

Data from the 2021/2022 period indicates that the national reach of CBHI is recorded at 86.6% (RSSB, 2024).

Membership in the scheme provides coverage for drugs and medical services offered at any health facility at the community and district level nationwide. Additionally, with a transfer note, patients can seek treatment at higher-level health facilities (RSSB, 2024).

Public-private partnerships (PPPs) initiative

Rwanda has also adopted Public-Private Partnerships (PPPs) as a key strategy to finance and enhance PHC. This collaborative approach involves the government working with private entities to improve service quality, resource access, and infrastructure development.

A study conducted in 2021 explores the landscape of PPPs in Health Supply Chain Management (HSCM) within the country. Through a descriptive, cross-sectional, and quantitative approach using a questionnaire, various aspects of PPPs in HSCM were examined. Results reveal that PPP interventions in HSCM predominantly revolve around provision of commodities (99%), delivery of health Information Technology (IT) supplies and equipment for operation (53%), finance (52%), and maintenance (40%) (Evariste Byomuhangi, 2021).

This commitment is also evident in the partnership between Abbott and the Rwandan Ministry of Health (MoH) and the Society for Family Health (SFH) Rwanda to expand access to primary care and testing in rural areas of the country (Sanders, 2022). Abbott is a global healthcare company committed to providing access to quality healthcare for all and SFH is a national health organization dedicated to improving the health of people in Rwanda. In 2019, Abbott partnered with the Rwandan MoH and SFH Rwanda to establish 10 second-generation health posts in rural communities in eight locations of Bugesera district in the Eastern Province. These small clinics offer a variety of essential services (Abbott, 2020). Additionally, their minimal infrastructure and personnel requirements make them a cost-effective way to deliver essential services. The health posts are staffed by local community health workers which builds trust with residents. Through the Public-Private Community Partnerships (PPPs) approach, some HPs are run by public health centers, some by non-governmental organizations and others by nurses from the private sector (MoH, 2022).

Health posts (HPs): Reaching the underserved.

HPs evolved through two distinct generations, each offering a unique set of services. Introduced in the late 1990s, First Generation Health Posts (FGHPs) were the pioneers of this healthcare revolution primarily focusing on immunization, family planning, treatment of common diseases and use basic laboratory or rapid testing. While FGHPs faced limitations in terms of services offered, Second Generation Health Posts (SGHPs) were introduced in 2019, offering a broader range of essential services including outpatient consultations, prenatal and postnatal care, dental and ophthalmic care, and microscopic laboratory testing (MoH, 2022). SGHPs are staffed by nurses and midwives who receive more comprehensive training compared to Community Healthcare Workers (CHWs) in FGHPs who were trained to provide basic healthcare services. SGHPs staff can provide a higher level of care and manage a wider range of health conditions and offer services 24 hours, 7 days.

In an analysis of clinical data between October 2019 and January 2021, 10 SGHPs had an average of 1070 patient visits per SGHP per month. OPD (Outpatient Department) new cases recorded in the year 2018 – 2019 at HPs increased from 1,445,119 cases to 3,824,343 cases in the years 2019 – 2022, highlighting an increase of 260% compared to 15% decrease in Health centers (Y2018-2019: 13,268,067 cases versus Y2019-2020: 11,302,357 cases) (MoH, 2022). These numbers underline the significant unmet need for healthcare at the community level.

Health posts stakeholders include government entities (MoH, District Health management Health (DHMT), etc.), health insurance providers both public and private, community representatives, and private entities like NGOs and pharmaceutical companies (MoH, 2022). Each plays a critical role in supporting health post operations, with the MoH facilitating collaboration and ensuring everyone contributes to improved health outcomes via comprehensive regulations.

Digitization in the healthcare sector

WHO describes digital health as the cost-effective and secure application of information and communication technologies (ICTs) in health-related areas. It covers a range of services and systems, including health and medical informatics, telehealth, eLearning, and mHealth (WHO, 2023). Since 2005, the World Health Assembly (WHA) has encouraged Member States to develop digital health strategies for achieving Sustainable Development Goals (SDGs) and Universal Health Coverage (UHC). By the end of 2019, 33 Member States in the African regions had developed such strategies, but many still use digital health solutions in pilot stage (WHO Regional Committee for Africa, 2021). In 2020, WHO adopted the Global Digital Health Strategy, a strategy designed to provide flexible solutions for countries with varying level of digital infrastructure and resources (WHO, 2021). The global strategy has a vision to use digital health technologies for better health outcomes and towards achieving the SDG-3 vision of “health for all” and other health-related SDGs (WHO, 2021).

The Global Observatory for eHealth provides an overview of the various digital health components. These components include (WHO, ITU, 2012):

- *Electronic Medical Records* (EMRs), which capture, store, and share information within healthcare organizations.
- *Electronic Health Records* (EHRs), EMR designed for cross-organizational information sharing.
- *Personal Health Records* (PHRs), maintained by individuals for proactive health management.
- *Telemedicine*, involving remote healthcare services, encompasses store-and-forward, remote monitoring, and interactive services.

- *Mobile Health (mHealth)* leverages mobile technology for data collection, monitoring, treatment support, and health education. Decision support systems assist providers in diagnosis and treatment decisions.
- Electronic medication services, such as *e-prescribing*, enhance accuracy and convenience in medication management.
- Health knowledge resources provide trusted information for healthcare providers, and distance learning (*eLearning*) facilitates electronic education for health professionals.
- *Health information systems* gather and analyze data for reporting on health situations and trends, supporting decision-making and resource allocation.

The focus of this project is on Electronic Health Records (EHRs) because unlike Electronic Medical Records (EMRs), which are limited to individual organizations, EHRs facilitate seamless information sharing across different healthcare settings. Prioritizing EHRs enables improved patient outcomes, streamlined workflows, and enhanced interoperability across the healthcare ecosystem.

Electronic Health Records (EHRs)

Electronic Health Records (EHRs) provide a computerized platform to enter, store and access personal health information electronically by healthcare providers and over the person's lifetime (WHO, 2006). EHR and EMR are often used interchangeably to denote the same concept under the Health Information Technology (HIT) and have gained attention as a promising solution to enhance healthcare delivery over paper records (Miller, 2004). A systematic review of the literature done in 2006 has highlighted quality and efficiency benefits of EHRs: on the quality side, consistent improvements in adherence to preventive care recommendations, with increases ranging from 5% to 66%; EHR-based surveillance identified adverse drug events, leading to

decreased rates and associated cost savings (Chaudhry B, 2006). On the efficiency side, EHRs with decision support features, like reminders and pre-test probability calculations, led to a decrease in time spent on some services such as primarily lab and radiology tests. Reductions ranged from 8.5% to 24%, with some translating to potential cost savings (Chaudhry B, 2006).

While EHRs streamline documentation, they don't always free up nurses from non-data tasks. Studies in ICUs saw decreased charting (from 17% to 10%) and data gathering (from 7% to 4%) times with EHRs, but overall data manipulation remained constant (Pierpont GL, 1995). More importantly, no significant impact was found on nurses' time allocation for direct care or medication tasks after implementing an electronic medication management system (Westbrook JI, 2013).

Despite the significant benefits of EHR systems, adoption and utilization levels vary, with studies revealing varying user satisfaction rates. In China, health providers exhibited a high satisfaction rate of 70.7% (Abiy Tasew Dubale N. D., 2023), contrasting with Ethiopia, where overall satisfaction was moderate at 53.1% (Abiy Tasew Dubale N. D., 2023), and in a Saudi Arabia government hospital, only 40% (SA, 2020) of users reported satisfaction. Key drivers of user satisfaction across these regions included good computer literacy, positive perceptions of the EHR's information quality, and effective training.

The relationship between EHR adoption and performance has strengthened over the years, suggesting technological maturity and a shift in focus towards EHR functionalities with more consistent benefits such as improvements in process adherence and patient satisfaction. (Adler-Milstein J, 2015).

EHR Initiatives in Developing Countries

In aiding healthcare professionals in the effective implementation of EHR systems, WHO has developed the "Electronic Health Records Manual for Developing Countries". Chapter 3 of the manual recognizes challenges associated with implementing EHR systems in low- and middle-income countries (LMICs). The main challenges identified include limited infrastructure and resources, such as access to reliable electricity and internet connectivity, shortage of trained IT personnel, and insufficient funding (WHO, 2006). Organizational and policy issues revolve around weak data governance, fragmented healthcare systems, and a lack of clear government policies. Human resources and workflow challenges include limited digital literacy among healthcare workers and potential resistance to change (WHO, 2006) which correlate with factors affecting EHR adoption as mentioned above. As a solution, the manual encourages tailored EHR platforms starting from the terminology used to fit the local settings and needs.

Open Medical Record System (OpenMRS) (OpenMRS, 2023), Baobab Health Trust (operates in Malawi), and Last Mile Health (founded in Liberia) are among organizations implementing EHR solutions in developing countries. These organizations specifically target underserved populations, showcasing unique strategies, reliable technologies, and community involvement models to bridge healthcare gaps in resource-constrained settings. OpenMRS' open-source nature promotes global collaboration and local customization (Neha Verma, 2021), while Baobab's focus on the use of low cost technologies and community health workers rigorous capacity building programs which improve effectiveness in remote areas (Devex, 2023). Last Mile Health collaborated with the Liberian government bodies to co-design an EHR that they named "electronic Community-Based Information System (eCBIS)". The platform allows users to collect and transfer data without

internet via Bluetooth instead (Last Mile Health, 2023). These diverse strategies highlight the importance of context-specific approaches in bridging healthcare gaps with EHRs.

EHR/EMR Implementation in Rwanda

OpenClinic

The introduction of OpenClinic in Rwandan hospitals faced challenges but was generally well-received by users. A study in four district hospitals revealed that 64% of surveyed workers expressed a favorable attitude towards OpenClinic, with 91% preferring it over paper-based systems (Mutabazi, 2016). Challenges included insufficient training, technological limitations, workflow disruptions, and concerns about data quality. Positive observations noted the ease of data entry on the system, indicating potential for improved productivity with enhanced functionalities and efficient training.

OpenMRS and Data use for HIV research

Current HIV prevalence among adults in Rwanda is 3% (Nsanzimana S, 2022). Despite extensive prevention and treatment efforts, ongoing challenges remain in managing the existing HIV population and preventing new infections. Rwanda's Ministry of Health implemented OpenMRS in 10 HIV clinics to manage patient records and information. This system's potential extends beyond use for clinical care, offering valuable resources for global HIV epidemiology research highlighting its application in observational and experimental studies (Muhoza B, 2019), showcasing its potential for maximizing data use.

Addressing Data Challenges and Decentralization

The absence of a centralized medical record system that allows for interoperability among existing health information systems hinders the progress of health digitization in Rwanda (Crichton R, 2013). Researchers proposed solutions include storing patient records on portable devices like smartphones, flash drives, or RFID cards (Wannous, 2018).

As an inclusive and more sustainable solution, in 2019, the Rwandan Ministry of Health has initiated the Rwandan Health Information Exchange Systems (RHIES) to address challenges associated with paper-based records and fragmented data systems, such as data silos, inefficiencies in resource allocation, data entry and reporting synchronization (Digital Health Atlas, 2022). RHIES tackles these issues by standardizing data formats, establishing integration among health information systems across the country and facilitating exchange of patient demographic information held by the National Identification Agency (NIDA) (OpenHIE, 2023). Although still in its early stages, RHIES could serve as a transformative model for healthcare systems in other developing countries.

Exploring learning initiatives in relation to EHR adoption

The successful implementation of EHRs relies heavily on a skilled and knowledgeable workforce. Education and training are crucial components of any EHR implementation strategy, ensuring that healthcare professionals possess the expertise to effectively utilize these systems and optimize their benefits. There are several learning initiatives to meet gaps in knowledge and skills described below.

Some examples of learning initiatives

Taming the EHR Playbook

The "Taming the EHR Playbook," published by the American Medical Association (AMA), provides practical insights to address challenges associated with adoption of Electronic Health Records (EHRs). The approach used in developing this material is innovative and could be utilized as a reference to this research project.

The Playbook seeks to address challenges identified including work overload due to tasks generated by the EHR like inbox management and data entry, concerns about data quality, workflow disruptions during integration, and technological limitations. The playbook proposes strategies to tackle these issues, such as adopting team-based care principles, optimizing personal proficiency through training, and emphasizing the importance of data gathering for continuous improvement. Overall, the playbook serves as a valuable guide for healthcare professionals and organizations aiming to navigate EHR-related challenges effectively and enhance patient care and clinician satisfaction.

Human-centered approach (Grenha Teixeira J, 2019)

The study, titled "Bringing service design to the development of health information systems: The case of the Portuguese national electronic health record" (Grenha Teixeira J, 2019), demonstrated that adopting a human-centered approach, incorporating visual models and collaborative workshops, facilitated the effective development and implementation of an EHR system in Portugal. The use of visual models allowed healthcare professionals to visualize the EHR system and comprehend its advantages. Collaborative workshops ensured direct user involvement in the

system's design, aligning it with their needs and preferences. The outcome was characterized by high user satisfaction and acceptance, contributing to a seamless and successful implementation process.

Lessons from the diverse learning initiatives

The above literature explored various learning initiatives relevant to EHR adoption, setting the context for this research project on an EHR learning program for health post staff in rural Rwanda. Notable programs, such as the "Taming the EHR Playbook" by the American Medical Association, emphasize strategies to address challenges like work overload and data quality concerns. Additionally, a human-centered approach in Portugal's EHR system development underscores the importance of visual models and collaborative workshops in ensuring high user satisfaction and successful implementation. These insights collectively inform the need for a strategic EHR implementation with users at the core.

Introduction to community and context

In the Fiscal Year 2020-2021, Rwanda had 1,179 health posts, 510 health centers, 47 district and provincial hospitals, and 8 national referral hospitals. Among the 1,179 HPs, 1,021 are fully operational and 520 are managed under the PPP model (*MoH, 2020-2021*).

Health Posts Digitization Project

SFH Rwanda, in partnership with Government of Rwanda, SC Johnson, Abbott, UNICEF, Government of Japan, and UNFPA, manages 40 health posts (HPs) with 29 being Second Generation HPs (SGHPs). These HPs' operations are run by private nurse entrepreneurs.

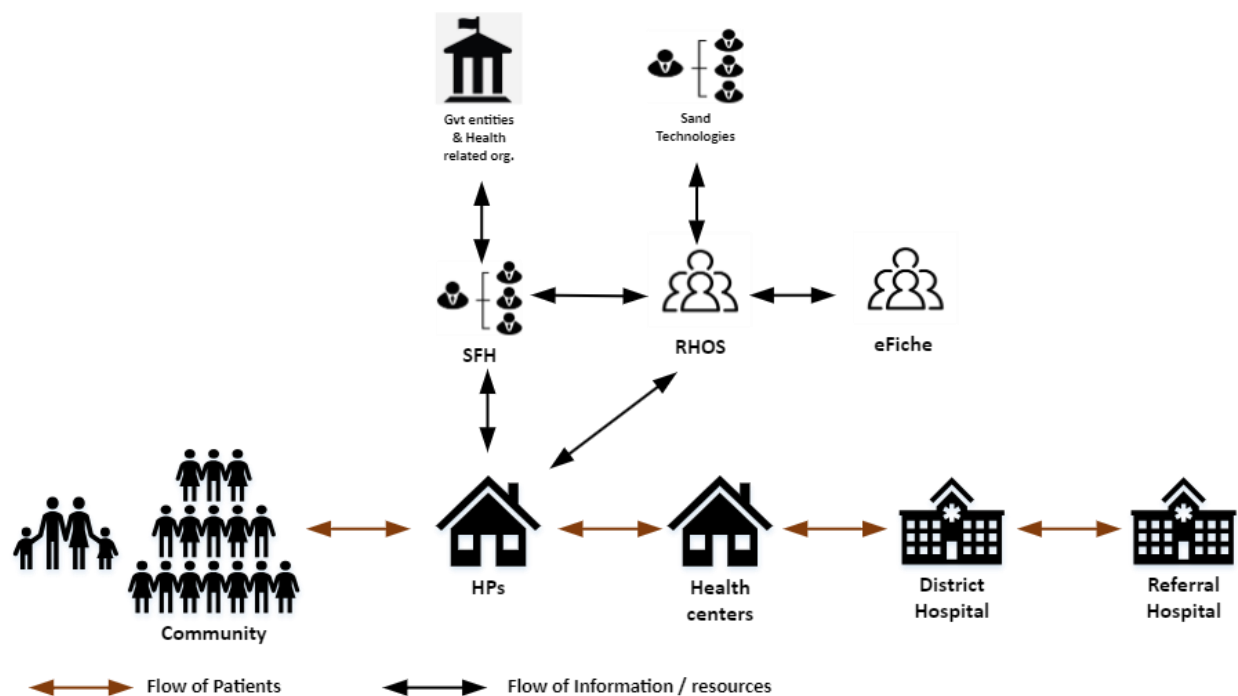
Private nurse entrepreneurs are registered nurses who establish and operate their own independent businesses providing healthcare services directly to clients on a private basis instead of working for a hospital. They typically manage all aspects of their business, including client acquisition, scheduling, billing, and administration. This entrepreneurial approach allows nurses to have more autonomy over their practice and to tailor their services to meet the specific needs of their clients.

SFH provides startup grants to the nurse entrepreneurs, engages communities to boost healthcare demand and provides them continuous technical support (SFH Rwanda, 2022). Furthermore, SFH establishes connections with microfinance institutions, ensuring access to medical loans and creating a revolving fund for sustained health post operations.

As of December 2023, SFH has successfully implemented a digitization initiative for 29 SGHPs across seven districts: Nyagatare, Kirehe, Bugesera, Gicumbi, Burera, Nyaruguru and Rusizi (SFH Rwanda, 2023). This effort, powered by eFiche (an EHR development company) and aided by the partnership with SAND Technologies, involves providing essential digital tools and internet connectivity to the health posts. Moreover, the establishment of a centralized data center hopefully

enhances the efficiency of data management. SFH Rwanda's comprehensive approach includes the recruitment and training of Digital Health Officers (DHOs) for each health post. The DHOs play a vital role in overseeing on ground implementation of the Electronic Health Record (EHR) system, by helping the HP staff with technical assistance during the process of transitioning to the digital solution.

Figure 1: Comprehensive Overview of the Organizational Structure for the Health Posts Digitization Project.



Rural Health Operating System (RHOS)

Run by SAND Technologies, the Rural Health Operating System (RHOS) project is responsible for implementing “eFiche” in rural Rwandan health posts. As the implementing organization, RHOS provides comprehensive support for the successful adoption of eFiche, including staff onboarding trainings (material on how to navigate and effectively use eFiche), the provision, monitoring and maintenance of essential hardware and software devices such as computers,

tablets, printers, internet connectivity, etc. and ensuring reliable technical support. The RHOS team is motivated by the opportunity to make a positive impact on healthcare outcomes and aspires to extend their work to more health posts within Rwanda and expand outside the country.

While navigating potential risks such as technical challenges and HP staff resistance, the RHOS team engages in weekly debrief sessions to assess progress, address challenges, and strategize the way forward in their mission to enhance healthcare delivery through the implementation of eFiche. This learning program comes as a support to improving the adoption rate.

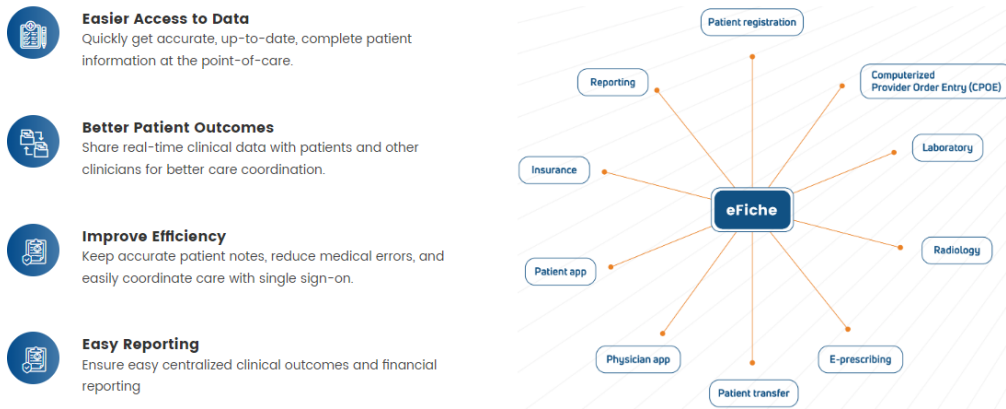
The RHOS team is composed of:

Role	Responsibility
Project Manager	Oversee the entire project implementation, including managing logistics and facilitating communication with internal and external stakeholders.
Operations Lead	Manages the progress of operations and leads Provincial leads
eFiche Support Specialist	Conduct on-boarding training sessions for HP staff and offers continuous technical assistance.
Provincial Leads (PLs)	Serve as a link between the RHOS team, SFH, and HP staff. They maintain regular communication with HP staff on the ground and ensure timely coordination between SFH and the RHOS team.
Technology Development Lead	Leads the development and oversees the monitoring of the data management platform

eFiche

“eFiche” is an Electronic Health Record developed by Rwandans under eFiche Limited, a local technology company. eFiche digitizes the healthcare processes from patient registration to billing and is hosted online. It is designed to uniquely align with existing paper format allowing for HP staff to easily transition from paper-based records.

Figure 2: <https://efiche.rw/>



HP workforce

The HP staff who are daily users of eFiche include nurses, a lab technician, a pharmacist and a receptionist and cashier.

Table 1 summarizes the HP staff roles and responsibilities:

Table 1: HP staff roles

Staff	Responsibilities
Head nurse	Manages all HP operations: including medication procurement, staff supervision, insurance billing, and serves as a liaison to SFH administration. Responsible for generating Ministry of Health reports, can when necessary, conducting patient consultations, and prescribing medications.
Receptionist / cashier	Greets patients, verifies insurance coverage, completes the visit form prior to consultation, handles patient billing for treatment and medications, generates receipts, and manages the collection and storage of payments from patients.
Nurse (midwife, dental nurse, ophthalmologist, generalist nurses)	Conducts patient consultations, identifies necessary medical tests, provides treatment, prescribes medications, and completes required paperwork/records.
Lab technician	Manages all laboratory operations, including maintaining records, conducting medical tests, analyzing test results, and delivering them to the nurse.

The country's nursing landscape has undergone significant transformation since the early 2000s, evolving into a dedicated workforce that serves as the backbone of the primary healthcare system.

Health post nurses are tasked with adjusting to dynamic clinical care demands, tending solely to community welfare, managing a significant patient volume, and meeting reporting deadlines, leading to a heavy workload.

Nursing educational programs levels starts at diploma level offered in upper secondary schools (also called A2), advanced diploma (also called A1: 3 years post-secondary school) offered at an institute of higher education and bachelor's degree (also called A0: 4 years post-secondary school) from universities like the University of Rwanda's School of Nursing and Midwifery. The curriculum emphasizes holistic patient care, community engagement, and public health skills. In 2007, the nation discontinued the training of nurses at the A2 standard and officially declared the A1 educational preparation as the minimum requirement for nursing practice (MoH, 2011). However, as of 2011, more than 90% of nurses staffing healthcare facilities are at the A2 level (Binagwaho A, 2013).

In 2012, the E-Learning Diploma Nursing program in Rwanda was initiated with the aim to elevate A2 nurses to an A1 nursing diploma level through face-to-face sessions and self-directed e-learning using various ICT tools and without the nurses leaving their jobs. Challenges like resource constraints, insufficient ICT training, inconsistent internet access, language proficiency issues, and resistance to change hindered the program (Glorieuse Uwizeye, 2017). Computer and digital literacy are country wide challenges with only 14.7% male and 9.6% female of the Rwandan population reporting as computer literate (National Institute of Statistics of Rwanda, 2021).

As discussed in the literature review, factors such as knowledge, computer literacy, and access to resources play crucial roles in facilitating the adoption of Electronic Health Records (EHR). This emphasizes the significance of the learning program under investigation in this research project.

Stakeholder analysis

The RHOS team, SFH, and HP staff are the primary stakeholders for the proposed learning program while the project implementation team (or RHOS team), will oversee the execution of the learning program.

Table 2 provides an overview of all stakeholders involved in the HP digitization project, categorized into users, partners, and government entities.

Table 2: Stakeholder analysis for the HP digitization project

Type of stakeholder	Name of person/org. and short description	Relationship to project	Incentives, motivations, risks	How to engage
Individuals (eFiche users)	HP Staffs Under the Government's health structure, health posts are operated by private operators who are selected by the Ministry to strengthen service delivery at the grass root level. Selected nurses are trained by the Society for Family Health (SFH) Rwanda who provides basic business skills training. The health posts have a minimum of 5 staff: a head nurse (HN) running all the operations including the financials and monthly reporting, a receptionist, a nurse, a lab technician, and a pharmacist. They do data entry and manipulation as they interact with the patients and provide care (on a daily basis).	Users of the eFiche Trainees of the learning program Beneficiaries of eFiche improvements.	Impact on their daily workflow / tasks They are provided with resources to use eFiche: easy to use and effective software, on-boarding training prior to use eFiche that includes basic computer literacy training, hardware (computers, tablets & internet connectivity), on demand technical support from the eFiche development team and RHOS. Motivated by the potential for improved data management and patient care: reduced penalties from insurance companies (e.g.: RSSB), operations improvement like pharmacy stock mgt, easy reporting, easy patient data retrieval... Risk: Their learning curve, fear of new systems/technology based on computer illiteracy, resistance to change especially because the workload will increase during transition time.	Regular visits to the field (at the different HPs) for impact assessment and support. WhatsApp group for online support (the group has eFiche & RHOS teams, DHOs and HP staffs). Jira: platform that HP staff use to submit issues and interact with the RHOS team for support 24/7. DHOs (Digital Health Officers): Newly introduced staff at the HPs that helps the staff with technical assistance during the transition to the digital solution. DHOs do not necessarily have healthcare background.
Private technical assistance partner	SFH Rwanda SFH Rwanda supports the MoH and Local Government to strengthen the functionality of health posts and improve quality of healthcare using Public Private Community Partnership (PPP) model. The move is part of the country's efforts to attain Universal Health Coverage (UHC). The organization oversees and supports the HP operations. They finance the	SFH act as a link between HNs and RHOS. Any intervention needs SFH's approval. SFH supports by facilitating communication with head nurses and provides access to available & existing	Motivations: Improving efficiency to tackle unclear reports on HP expenses from Head nurses. (HPs are not making profits so that they can be operational without financial support from SFH.) Risks: Disruptions of existing operations processes, HP staff resistance, no improvement in HP operations after the introduction of the EHR.	Always informed of the activities being implemented through the PLs (Provincial leads) and the project manager for HPs project at SFH.

	HP from constructing and equipping the health facilities, provide capacity building training of healthcare workers. The head nurses report to SFH.	information regarding HPs operations.		
Insurance companies	<p>RSSB Is an insurance company that runs the Community Based Health Insurance (mutuelle de santé) where most of the community members are insured.</p> <p>RSSB has recently released a billing software called Kwivuza. Clinics and hospitals are encouraged to use it to facilitate the reimbursement process.</p>	HNs send a monthly report/bill to RSSB for reimbursement. The report follows requirements from RSSB which should be considered in the EHR software (e.g.: service and meds pricing...)	<p>Motivation: Effective integration of insurance processes and data: Receive clear and correct report, real time access to data. Reduced reimbursement time and improved patient outcomes</p> <p>Risk: Missing information/data, data security and privacy, compliance with regulations. Resistance from RSSB to transition to eFiche.</p>	<p>Keep informed through RHOS project manager.</p> <p>eFiche can integrate Kwivuza (RSSB's new billing software) features: Increase buy-in and collaboration</p>
Direct Partner	<p>eFiche team EHR software developing company</p>	Develop eFiche software and conduct needed system updates and adjustments / modifications.	<p>Motivations: Provide innovative and user-friendly solutions.</p> <p>Expand the use of their software.</p> <p>Financial incentives / income</p> <p>Risk: user resistance</p>	<p>Always There is a team of developers that are full time dedicated to this project</p>
Partner / field workers	<p>Kapsule Data collection and analysis consulting firm</p>	Kapsule have experienced data collectors in the healthcare sector, they support in doing data collection at the HPs – HP staff and patients, data entry and reporting	<p>Need: Our collaboration and easy access to HPs for quality data collection</p> <p>Motivation: Sell their expertise Generating meaningful insights and contributing to the success of the project.</p> <p>Risk: data accuracy and privacy concerns</p>	<p>Contact person from Kapsule: Chief of Staff</p> <p>From RHOS: Samantha</p>
Government entities	<p>Ministry of Health MoH Governs all the health institutions and programs in the country / sets tariffs on all medical services / HP sends monthly report to MoH with HMIS reports.</p>	HNs send a monthly report to MoH following MoH requirements. This need to be considered in eFiche	<p>Risk: resistance to transition to a digital solution</p> <p>Motivation: easy and clearer view on the HP medical data, eFiche will facilitate informed decision making, real-time data access</p>	<p>Keep informed through RHOS MD</p> <p>Work to get their initial buy-in</p>

Needs assessment.

A needs assessment was conducted from January 12th to 23rd, 2024 with the objective of identifying needs and learning about any gaps in the utilization of eFiche. This involved evaluating users' current knowledge, skills, and attitudes toward eFiche, as well as determining their preferred learning styles. The outcomes of this assessment informed the development of a tailored learning program.

To ensure thorough insights, the assessment employed a multifaceted methodology:

- First, surveys were distributed to both HP staff and the RHOS team through Google Forms. This survey-based approach allowed for a structured and open-ended inputs from many participants with minimal to no cost. To maximise on data quality, the HP staff were taken through a training on the questionnaire and on how to fill a google form prior to completing the survey.
- Additionally, the needs assessment incorporates a document review component, delving into existing project documentation such as Bluelake used for data management, reporting & visualization and Jira used by eFiche users as a platform for issue reporting. This document review serves as a complementary qualitative method, providing insights into the historical context and the role of online support that is currently in place.
- Furthermore, to capture on-the-ground perspectives, the assessment includes interviews with 5 DHOs. These interviews aimed to gather qualitative data, offering a nuanced understanding of the challenges and opportunities faced by the staff directly involved in utilizing eFiche. This qualitative approach provides depth and context to the quantitative findings from the surveys.

Characteristics of Survey Respondents

The participants consisted of staff members from 10 distinct rural Health posts across the country's four provinces. These 10 Health posts have adopted eFiche, and their staff members collectively

underwent onboarding training between March and May 2023, equivalent to a minimum of 6 months experience utilizing the digital platform.

HP NAME	DISTRICT	PROVINCE	ON-BOARDING DATE
<i>Mbyo</i>	Bugesera	East	March 2023
<i>Ramiro</i>	Bugesera	East	March 2023
<i>Karambo</i>	Nyagatare	East	May 2023
<i>Kagarama</i>	Rusizi	West	May 2023
<i>Ruhinga</i>	Nyaruguru	South	May 2023
<i>Kabo</i>	Gicumbi	North	May 2023
<i>Gishambashayo</i>	Gicumbi	North	May 2023
<i>Nyarwambu</i>	Gicumbi	North	May 2023
<i>Bushenya</i>	Burera	North	May 2023
<i>Kamanyana</i>	Burera	North	May 2023

Respondents Demographics

Among 51 total respondents, 10 were DHOs (Digital Health Officers), 22 nurses (9 head-nurses and 13 nurses), 10 lab technicians and 9 receptionists and cashiers.

The gender distribution showed a majority of female respondents, accounting for 58%, while male respondents constituted 42%. The educational distribution across A2 (37%), A1 (37%), and A0 (25%) categories indicates a diverse educational background among the health post staff, highlighting the potential opportunity of tailoring training and educational materials to accommodate varying levels of education to enhance the effectiveness of training.

The age range of respondents spans from 20 to 25 years (20%), 26 to 30 years (22%), 31 to 35 years (35%), 35 to 40 years (6%), and those aged 40 and above (18%). This distribution reveals that a significant number of respondents fall within the 20 to 35 age range (76%), suggesting a relatively youthful group of participants. This trend may influence training approaches, as younger individuals can be more receptive to new educational methodologies and digital tools.

When asked about whether it is their first job, 78% of respondents have previous work experience before their current health post position. Regarding experience at the health post, 20% have less than 6 months of experience, 63% have 2 years or less, 16% have between 2 to 5 years, and only 2% have more than 5 years of experience. Understanding the diversity of experience levels is crucial for tailoring learning initiatives.

Findings

Findings from the survey

1. Effectiveness of the current on-boarding training

Typically, HP staff undergo a comprehensive two-day training session before commencing their utilization of eFiche in daily operations. Post-training, staff receive ongoing online support by submitting issues or requests through a dedicated platform, where eFiche support specialists address their needs promptly. According to survey data, 75% of respondents confirmed their completion of eFiche training. However, when asked whether the training content adequately prepared them to immediately integrate eFiche into their workflow, 76% expressed dissatisfaction, rating their preparedness below 3 on a 5-point Likert scale. This sentiment aligns with feedback from the trainers, who assessed the training content and duration as moderately sufficient, with a rating of 67%. Additionally, 92% of respondents expressed a need for further training. Despite this, users' comfort levels, measured by the number of support requests received over time from different HPs trained at various times, is satisfactory on average after five months.

2. User perspective on eFiche design

The design of eFiche was inspired by the familiar paper-based format commonly used in HPs, facilitating seamless navigation for staff due to similarities in terminology and functionality. Both users and trainers have rated eFiche as functional. When asked about difficulties in accessing

patient data or completing specific recording tasks, 67% of participants responded affirmatively, indicating they encountered no challenges. However, several factors hinder the widespread adoption of eFiche, including no or slow internet connectivity, unresponsive or missing features, and proficiency issues among users. For instance, staff noted that typing on computers is perceived as more time-consuming compared to filling out paper forms.

3. Digital and computer literacy of HP staff

The survey data reveal varying levels of digital literacy among HP staff, indicating both familiarity with basic mobile phone functions and a spectrum of proficiency in computer usage outside of work. While the majority demonstrate competence in tasks like text messaging (81% often) and accessing email, WhatsApp, or Facebook on mobile devices (65% often, 33% sometimes), there is room for improvement in more advanced computer skills, as evidenced by some respondents never (29%) and others sometimes (50%) using computers.

These insights are reinforced by the perspectives of the RHOS team. When asked about the importance of basic computer literacy for effectively using eFiche, all RHOS team members rated it 4 or above on a 5-point Likert scale.

Together, these findings underscore the need for targeted interventions to enhance digital literacy among HP staff bringing them at the same level, thereby maximizing the benefits of eFiche implementation.

4. Preferred Learning styles

When queried about their preferred learning styles, 79% of respondents favoured in-person lectures or instructor-led sessions, while 17% expressed a preference for visual and self-paced content, and 12% indicated a preference for written guides. This data underscores the predominant inclination toward traditional, interactive learning methods among the surveyed individuals.

Findings from the tools: Bluelake (data management and visualization) & Jira (issue reporting)

1. Users are the main drivers of eFiche utilization.

Based on the support tickets submitted through in Jira, the primary concerns can be categorized into three main areas: internet connectivity, user proficiency in hardware and software troubleshooting, and eFiche functionalities or updates.

Surprisingly, the volume of support requests does not necessarily correlate with a low adoption rate during the initial eFiche implementation phase. Instead, it suggests active usage of the platform, instead a gradual decrease in request numbers over time as staff members become more accustomed to the system reflect the adoption rate. This trend also aligns with an increase or stabilization in daily patient entries, indicating that patients' data is being consistently entered into the system as they visit the Health Posts, potentially in real-time.

Interestingly, certain Health Posts, such as Kabo and Mbyo trained in May and March respectively, demonstrate high adoption rates, while others like Ramiro, trained in March, and Ruhinga and Kamanyana, both trained in May show lower rates. Given that the training setup and the provided technological infrastructure and support are common for all users, this discrepancy underscores the importance of user willingness and proficiency in driving adoption, emphasizing the necessity of empowering users and fostering their engagement to enhance system utilization.

Findings from Interviews

Throughout the interviews with 5 DHOs, respondents highlighted points similar to the above findings, with one particularly notable comment emphasizing the need to enhance system buy-in among head nurses who sometimes block its utilization. Additionally, they suggested for further training to empower them (DHOs) to undertake advanced support tasks for fellow HP staff.

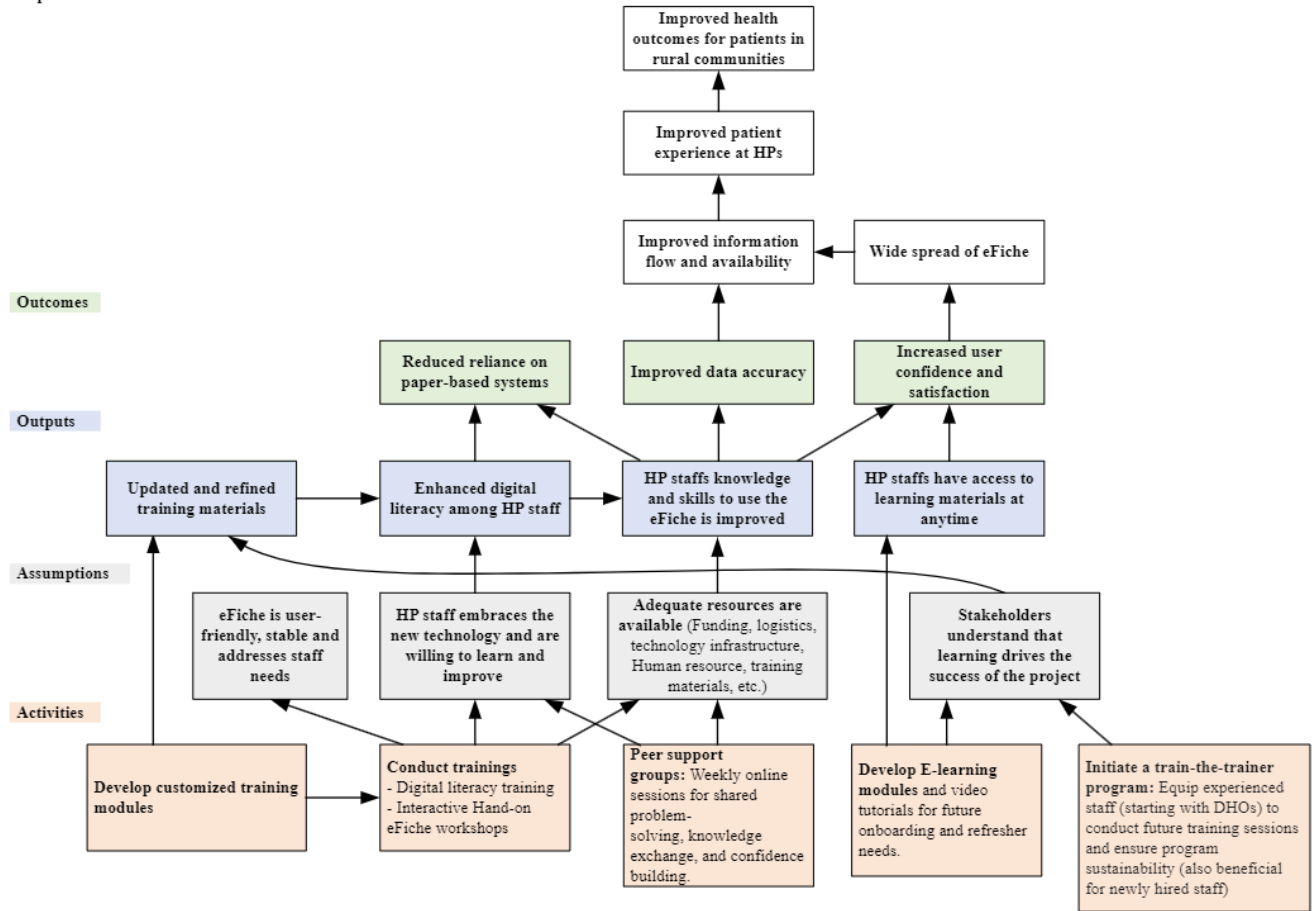
Theory of change

Our findings have shed light on the diverse landscape of HP staff demographics, digital literacy levels and eFiche proficiency. The successful integration of eFiche into their workflow depends not only on technological infrastructure already provided to the HPs but also on the readiness of the HP staff.

The below theory of change outlines a strategic pathway to enhance healthcare delivery through the effective adoption of eFiche and capitalizing on the benefits of the EHR. Through targeted activities such as customized training sessions and continuous support, we aim to empower the staff with the necessary skills and confidence to proficiently utilize eFiche in their daily operations. Our assumption is that by providing these resources, health post workers will embrace eFiche, have clarity on how best to take advantage of its benefits, leading to improved data management and healthcare outcomes. We also assume that the proposed solutions will be positively received by the key stakeholders.

The outputs of our efforts will be evident by the number of training sessions conducted, the level of support provided, and the active participation of the staff. These outputs will translate into outcomes such as increased proficiency and comfort with eFiche, leading to the impactful outcome of enhanced healthcare delivery and information management in rural communities, thereby contributing to better health outcomes for the rural population.

Impact



Program Description

Goals and Objectives

The success of digitizing Health Posts depends on the widespread user adoption and effective training. Consequently, the learning program adopts a human-centered approach informed by human design thinking principles, placing a strong emphasis on understanding the diverse needs and experiences of HP staff who are the only beneficiaries of this program. Through this approach, the goal is to create an inclusive and supportive learning environment conducive to skill development.

The learning program will be tailored to accommodate different literacy levels, ensuring that all participants can fully engage with the training materials. Interactive workshops will be integrated into the program to provide hands-on learning experiences and foster a deeper understanding of eFiche functionalities. Additionally, peer support groups will be established to facilitate knowledge sharing and provide ongoing assistance to participants, encouraging a collaborative learning ecosystem.

With a focus on **enhancing digital literacy, building eFiche proficiency, and fostering user confidence**, the program will be implemented across 3 HPs in the first phase. The program will span a longer duration compared to the current 2-days on-boarding period, allowing staff to grow at a similar pace and reach a similar level of proficiency. This approach also takes advantage of the concept of learning while working, or learning by doing, enabling participants to apply newly acquired skills in their daily tasks and reinforcing their learning in real-world scenarios. By combining in-person and online training modalities, and extending the training period, we aim to

maximize accessibility, effectiveness, and long-term sustainability, ultimately driving successful adoption of eFiche across all participating HPs.

Activities

The activities are designed based on expected learning outcomes and following a proficiency-based approach.

After analysing the findings of the needs assessment, four primary learning objectives were identified, forming the basis for module development:

1. Increase digital literacy and eFiche competency.
2. Enhance eFiche proficiency.
3. Promote learning program sustainability and continuous improvement.
4. Boost user confidence and satisfaction.

Following individualized assessments, the program will progress through color-coded certification:

- **Yellow** certification signifies the completion of modules 1, 2, and 3, establishing foundational knowledge in basic computer skills and familiarity with the eFiche interface.
- **Green** certification follows the successful participation in interactive workshops 1 to 3, delving into essential eFiche functionalities such as data entry, record management, clinical workflows, and reporting.
- **Black** certification denotes an elevated proficiency level, encompassing advanced features, error management, troubleshooting techniques, and the ability to train others. Achievement of the Black certification requires completion of workshop 4 and the train-the-trainer module.

The activities are:

Outcome #1: Increase digital literacy and eFiche competency:

- Trainee assessment: Conduct 30-minute computer skills evaluations at the beginning of the session.
- On-boarding modules conducted in-person: Develop and deliver three 3-hour modules across two days with an evaluation at the end:
 - Module 1: Basic computer navigation, keyboarding, and file management (Yellow proficiency).
 - Module 2: Internet usage, email, and communication tools (Yellow proficiency).
 - Module 3: Introduction to eFiche interface and basic navigation of the different roles (Yellow proficiency).

Each session starts with a 30-minute Q&A session on the previous session.

Outcome #2: Enhance eFiche proficiency:

- Interactive online workshops: Conduct four 3-hour workshops (afternoon sessions only across 4 days) with each session starting with a 30 minute Q&A session:
 - Workshop 1: eFiche data entry, patient registration, and record management (Green proficiency).
 - Workshop 2: Clinical workflows, case recording, and data validation (Green proficiency).
 - Workshop 3: Advanced features, reporting, and data analysis basics (Green proficiency).
 - Workshop 4: Troubleshooting and error handling (black proficiency).

Outcome #3: Promote program sustainability and continuous improvement (Continuous):

- Train-the-trainer program: Identify and train the top 3 DHOs as future trainers within a period of 4 months as detailed in the section entitled “Timeline” (Black proficiency)
- Visual learning aids: Develop e-learning modules and video tutorials for future training by month 2 of the program implementation schedule (“TimelineTimeline”).
- Feedback-driven updates: Regularly revise training materials and incorporate user feedback into program enhancements.

Outcome #4: Boost user confidence and satisfaction (Continuous):

- Peer-to-peer support groups: Establish weekly 1-hour peer support sessions for shared problem-solving and knowledge exchange. These sessions are led by rotating HP staff members.
- Positive reinforcement and feedback: Implement frequent recognition of staff progress and achievements by clearly communicating the achievement. Recognition through awards, certificates, staff of the month programs, and employee development plans.
- Surveys and feedback sessions: Conduct quarterly surveys and individual feedback interviews to collect user experiences and suggestions.

Partners

The RHOS team takes the lead as our primary partner in rolling out the learning program for HP staff. With their integral role in introducing HPs to the eFiche system, the learning program will align with their ongoing initiatives and training channels. This collaboration involves close coordination with eFiche support specialists (as indicated under “Rural Health Operating System

(RHOS))” who are the current trainers to craft and deliver a comprehensive training package tailored to the specific needs of the users.

Sustainability

To ensure the success of the learning program, several key strategies will be implemented.

First, a train-the-trainer initiative will kick off after Month 4 of the program (reference to program implementation timeline: “Timeline”). The initiative aims to equip designated staff members with the necessary skills and knowledge to effectively train their colleagues. By empowering internal trainers, the program can achieve scalability and sustainability.

Simultaneously, efforts will focus on developing comprehensive online learning resources. e-learning modules and video tutorials will be created, accessible through dedicated platforms like TalentLMS. These resources will provide HP staff with flexible and on-demand learning opportunities, enhancing their proficiency with the eFiche system. Additionally, feedback mechanisms will be integrated into the program's framework, ensuring continuous improvement. Quarterly surveys and individual feedback interviews will be conducted, with user suggestions implemented to address evolving needs and challenges.

Evaluation

To gauge the effectiveness of the learning program, a multifaceted evaluation approach will be implemented. Firstly, pre-training computer skills evaluations will be conducted to establish a baseline of participants' digital literacy levels. These assessments will be repeated at the conclusion of the 3 modules covered under outcome #1, to measure improvements resulting from the program's interventions. Additionally, eFiche usage data will be closely monitored monthly to

track system utilization patterns, data entry accuracy, and completion rates. This data will provide insights into areas of strength and areas requiring further attention or refinement.

Moreover, user feedback will be integral to evaluating and refining the program. With the assistance of Provincial Leads who are consistently in the field and a newly hired Monitoring and Evaluation (M&E) officer, they will gather feedback from users to evaluate the program's effectiveness and user satisfaction. By directly gathering input from participants, the program can identify areas for improvement and make necessary adjustments to better align with user needs and preferences.

	PROJECT SUMMARY	INDICATORS	MEANS OF VERIFICATION
GOAL	Wide eFiche Adoption Technological Empowerment of staff	Number of HPs using eFiche Number and type of support issues submitted by HP staff	User activity logs (logins, data entries, patients entries vs patient footfall, etc.) with the eFiche for the different onboarded HPs Analysis Jira tickets volume & the average resolution time
OUTCOMES	Improved EHR Utilization	100% of patient data are recorded using eFiche. 50% reduction in time spent retrieving patient information	Usage analytics: User activity logs with the eFiche Observations during regular field visits.
	Enhanced data accuracy	Achieve a 95% accuracy rate in patient records (reduced discrepancies and missing data).	Regular audits comparing manual records with eFiche data. Conduct interviews with RSSB employees to confirm the number of report errors (before & after)
OUTPUTS	Staff's knowledge and skills to use the eFiche is improved.	Min 90% success rate on training evaluation.	Post-training evaluations for trainees. On job performance evaluations.
	Staff have access to e-learning mechanisms (on demand content).	50% of the trainees have requested for	Talent LMS traffic report: number of downloaded contents, completed modules.

		accessing to “learn on demand” modules	
	Updates the learning program following the M&E data	Number of program adaptations made based on feedback.	User feedback forms after the training sessions
ACTIVITIES	Develop a customized learning program	To start: At least 3 training modules are designed to respond to the identified needs	Pilot testing sessions (through focus groups) with a small group of representative learners.
	Conduct training.	100% health post staffs have fully completed the training modules / workshops. 90% (min) participation rate during workshops and training sessions.	Attendance records from training sessions. Observations during training sessions and post-training.
	Initiate a train-the-trainer program.	100% selected trainees have completed the training	Attendance records from training sessions. Training evaluation result
	Conduct quarterly interviews and surveys to track progress and impact.	100% of the trained HP staff have provided their feedback.	User feedback forms after the training sessions Follow-up interviews and surveys

Implementation

Timeline

Activity	Responsible	M-2						
		M-1	Day 1 & 2	Day 3 to 6	W-2, Onward	M-3	M-4	M-5
Engage the RHOS team and its members	PC							
Secure Funding: Obtain financial support for the program.	PC							
Create Tailored Content and Evaluation Materials	PC & Tr							
Conduct In-Person Modules 1 to 3	Tr & Te							
Conduct Interactive Online Workshops 1 to 4	Tr & Te							
Provide Online Support: Via the issue submission platform & regular field visits for hands-on guidance.	Tr & PL							
Develop Visual Learning Resources	Tr							
Launch Online Learning Platform: Develop and introduce an online platform for on-demand learning.	PC & Tr							
Administer Quarterly Surveys and Feedback Sessions	M&E Officer							
Implement Train-the-Trainer Program	Tr & Te							
Establish Weekly Peer-To-Peer Support Groups	PC, Tr & Te							

M: Month, PC: Project Coordinator, Tr: Trainer, Te: Trainee, PL: Provincial Lead

Capacity

We have established a training team consisting of two trainers and two provincial leads responsible for overseeing field visits. Currently, the trainers conduct two-day onboarding sessions and are accessible via Jira, the issue reporting platform.

To effectively implement this tailored learning program, we plan to expand the team by recruiting two additional trainers to enhance our capacity for delivering the modules and developing on-demand learning content. Additionally, we will hire a dedicated Monitoring and Evaluation (M&E) officer to support program evaluation efforts.

Funding

The implementation cost is estimated at 38'000\$.

The budget is comprised of salaries, training expenses, program development, travel and field expenses, M&E activities, and miscellaneous costs. A contingency fund of \$3,000 is allocated for miscellaneous expenses.

Overall, these budget allocations aim to ensure adequate resources for the program.

Category	Item	Qty	Unit \$	Total cost \$	
Salaries	Trainers (working as eFiche support specialist too)	2	500	1,000	Monthly salary
	M&E Officer	1	800	800	Monthly salary
Training expenses	Computers for the trainees, internet connection, etc.	15	500	7,500	Positivo laptops for 15 trainees (phase 1: 3 HPs)
	Learning & facilitation materials (notebooks, Flipcharts, markers, post-its, etc.)	2	200	400	Materials to covers the 2 days in-person sessions
	Trainees' facilitation fees	15	70	1,050	During in-person training
	Catering for trainers and trainees	17	20	340	During in-person training
Program development	e-learning modules infographics			1,000	Intervention of graphic designer/firm
	Video tutorials production			2,000	Intervention of graphic designer/firm
Travel and field expenses	Field visits by provincial leads (car rental, allowance and facilitation fees)	8	1,500	12,000	bi-weekly visits for a period of 4 months (phase 1)
M&E activity	Research firm contractor	1	1,000	1,000	Kapsule (research firm) monthly allowance
	Transportation and on-field facilitation expenses	5	1,500	7,500	Expenses for 3 data collectors, M&E officer, and driver
Miscellaneous	Contingency fund	1	3,000	3,000	

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