THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT,
GENDER, ELDERLY AND CHILDREN

THE NATIONAL DIGITAL HEALTH STRATEGY 2019 – 2024

FINAL DRAFT

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List of Abbreviations

ADDO	Accredited Drug Dispensing Outlet
APHFTA	Association of Private Health Facilities in Tanzania
BAKWATA	Baraza Kuu la Waislamu Tanzania (National Muslim Council of Tanzania)
CBE	College of Business Education
CBO	community-based organisation
CHMT	Council Health Management Team
CMO	Chief Medical Officer
COSTECH	Commission for Science and Technology
CSSC	Christian Social Services Commission
CTC	Care and Treatment Clinic
DH	Digital Health
DHIS2	District Health Information System software version 2
DMO	District Medical Officer
DPG	Development Partners Group
DUP	Data Use Partnership
eGA	e-Government Agency
EGPAF	Elizabeth Glaser Pediatric AIDS Foundation
eIDSR	electronic Integrated Diseases Surveillance and Response System
eLMIS	electronic Logistics Management Information System
EMR	Electronic Medical Record
eTR	electronic TB Register
FBO	Faith-Based Organisation
FFARS	Facility Financial Accounting and Reporting System

GePG	Government Electronic Payment Gateway
GHSC TA-TZ	Global Health Supply Chain Technical Assistance – Tanzania
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HCMIS	Human Capital Management Information System
HDIF	Human Development Innovation Fund
HFR	Health Facility Registry
HIM	Health Information Management
HIS	Health Information Systems
HMIS	Health Management Information System
HPS	Health Promotion Section
HPSS	Health Promotion and System Strengthening
HRH	Human Resources for Health
HRHIS	Human Resources for Health Information System
HSS	Health Systems Strengthening
HSSP	Health Sector Strategic Plan
ICT	Information and Communications Technology
IEC	Information, Education, and Communication
iHFeMS	Integrated Health Facility Electronic Management System
IHI	Ifakara Health Institute
KOICA	Korea International Cooperation Agency
LGA	Local Government Authority
M&E	Monitoring and Evaluation
MCTIS	Medical Council of Tanzania Information System
MDA	Ministerial Delivery Agencies

MEL	Monitoring, Evaluation, and Learning
MESI	Monitoring and Evaluation Strengthening Initiative
mHealth	Mobile Health
MIS	Management Information System
MNH	Muhimbili National Hospital
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MSD	Medical Stores Department
MSH	Management Sciences For Health
MTUHAPRO	
MUHAS	Muhimbili University of Health and Allied Sciences
NDHS	National Digital Health Secretariat
NDHSC	National Digital Health Steering Committee
NeHSC	National eHealth Steering Committee
NGO	Nongovernmental Organisation
NHIF	National Health Insurance Fund
NICTBB	National Information And Communications Technology Backbone
NIDA	National Identification Authority
NSMIS	National Sanitation Management Information System
PlanRep	Planning and Reporting System
POPSM&GG	President’s Office, Public Service Management and Good Governance
PORALG	President's Office–Regional Administration and Local Government
PS3	Public Sector Systems Strengthening
RHMT	Regional Health Management Team
RITA	Registration Insolvency and Trusteeship Agency

RMO	Regional Medical Officer
SWOC	Strengths, Weaknesses, Opportunities, and Challenges
TC-SWAp	Technical Committee Sector-Wide Approach
TFDA	Tanzania Food & Drugs Authority
TIIS	Training Institution Information System
TImR	Tanzania Immunization Registry
TMDA	Tanzania Medicines & Medical Devices Authority
TTCIH	Tanzanian Training Centre for International Health
TTLC	Tanzania Telecommunications Corporation Limited
TWG	Technical Working Group
UDSM	University of Dar es Salaam
UHC	Universal Health Coverage
UNICEF	United Nations Children's Fund
VIMS	Vaccine Information Management System
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization

Definition of Terms

1. **Continuity of care** is a process of receiving health care or is a chain of a series of health care events experienced by people as coherent, interconnected over time, and consistent with their needs and preferences. Is a generic term for the uninterrupted management of a patient who passes from one health care provider to another

2. **Digital health and eHealth** (used interchangeably in this document) is an umbrella term to encompass all concepts and activities at the intersection of health and information and communications technologies (ICTs), including mobile health (mHealth), health information technology, electronic health records, and telehealth. It encompasses three main functions:
    - The delivery of health information to health professionals and health clients through the Internet and telecommunications media;
    - The use of ICTs to improve public health services (e.g., through the education and training of health workers);
    - The use of health information systems to capture, store, manage, or transmit information on patient health or health facility activities.
3. **Digital health solution** is an individual digital product or service (or a combination of multiple products or services) created to serve a specific health system objective. It often encompasses a set of ICT infrastructure and services required to improve effectiveness and efficiency of the health system.
4. **Digital health system** is the interrelated set of technologies, processes, and structures within a digital health ecosystem, typically encompassing numerous solutions and organisations.
5. **Electronic medical record** is an electronic record of medical information of an individual that can be created, gathered, managed, and consulted by authorised clinicians and staff within one health care organisation.
6. **Enterprise architecture** is a blueprint for organisational change defined in models that describe (in both business and technology terms) how the entity operates today and how it

intends to operate in the future. It also includes a plan for transitioning to this future state.[1]

7. **Health system** consists of all organisations, people, and actions whose primary intent is to promote, restore, or maintain health. This also encompasses the people, institutions, resources, and policies that governments put in place to improve public health.
8. **System integration** is the process of aggregating the components of a system or subsystems into one, so that the resulting system can deliver the overarching functionality.
9. **System interoperability** is the ability of different information technology systems to communicate with one another and exchange data.
10. **mHealth** is the delivery of health care services through the use of mobile networks and devices.
11. **Telehealth** refers to the use of telecommunications and virtual technology to deliver health care within and outside of traditional health care facilities. It also includes use of teleconferencing and eLearning systems for remote nonclinical services, such as provider training, administrative meetings, and continuing medical education, in addition to clinical services.
12. **Telemedicine** is a subset of telehealth that refers solely to the provision of health care services and education over a distance using telecommunication technologies.

[1] Hite RC. *Enterprise Architecture: Leadership Remains Key to Establishing and Leveraging Architectures for Organizational Transformation*. Technical Report GAO-06-831, United States Government Accountability Office; 2006 Aug. https://www.gao.gov/new.items/d06831.pdf.. Accessed 8th April 2019.

Acknowledgments

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I would like to recognise and appreciate the important contributions of the Ministries, Departments and Agencies; regional administrative secretaries; Regional Health Management Teams; regional information and communications technology (ICT) officers; municipal/town/district executive directors; Council Health Management Teams; district ICT officers; Hospital Management Teams of public and private hospitals; training institutions; professional councils; regulatory bodies; vertical programmes; and development and implementing partners.

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Finally, I wish to acknowledge the support of all individuals and institutions not explicitly mentioned here that have contributed to the accomplishment of this work. Your invaluable contributions and efforts are highly appreciated.

Dr. Zainab Chaula

Permanent Secretary

Ministry of Health, Community Development, Gender, Elderly and Children

Foreword

The development of any nation depends largely on the health status of its population. Tanzania strives to become a middle-income economy, with the health sector providing high-quality health care for all through universal health coverage (UHC). Digital technologies potentially play a fundamental role in facilitating timely availability of high-quality health information for provision of better-quality health care services, and thus digital health solutions should respond to clients' needs through user-centred design to ensure responsive, resilient, and inclusive health system.

The Government of Tanzania is committed to improving the application of digital health technologies in order to facilitate attainment of her overall objective of delivering high-quality health services to all citizens. This is evidenced by implementation of the National eHealth Strategy 2013–2018 to accelerate the health system transformation by enabling timely information access and supporting health care administrative, financial, and clinical operations to enhance decision-making.

The outcomes of the National eHealth Strategy 2013–2018 implementation include improvements in quality of health services delivery, revenue collection and management, human resource management, supply chain management of health commodities, health information management, and planning and decision making at different levels of the health system.

The National Digital Health Strategy 2019–2024 is in line with the Tanzania Development Vision 2025 and the Health Sector Strategic Plan 2015–2020, emphasising provision of high-quality health care to all households. It facilitates realisation of the Health Policy 2019 priorities to achieve UHC in Tanzania. The current situational analysis indicates existence of multiple digital health systems across the health sector operating in silos. The government will build on ongoing efforts to ensure that digital health systems are implemented in a well-coordinated and interoperable manner. Moreover, this Strategy seeks to address challenges affecting utilisation of digital health for better health outcomes.

The digital health technologies facilitate sharing and protection of information and unique identification of clients at all points-of-service in the health system. Furthermore, sharing of clients' health information is critical to ensuring continuity of high-quality health care. The government will make sure clients' information is shared in accordance with acceptable digital health standards that ensure client safety and data security, confidentiality, and privacy.

Thus, the Digital Health Strategy will greatly improve the health system performance, which will result in improved-quality, sustainable health service delivery and population health outcomes, as well as fast-track achievement of UHC and health-related United Nations Sustainable Development Goals—eventually leading to a healthier nation.

I, therefore, would like to call upon all public and private stakeholders to tirelessly contribute towards a successful implementation of the National Digital Health Strategy 2019–2024.

Hon. Ummy Ally Mwalimu (MP)

Minister, Ministry of Health, Community Development, Gender, Elderly and Children

Executive Summary

The application of digital health technologies has great potential for making a health system more responsive to health needs of the population. Thus, the Government of Tanzania, through the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC), is committed to the effective application of the digital technologies to improve population and individual health outcomes by facilitating evidence-based actions at all levels of the health system. The National Digital Health Strategy 2019–2024 outlines how Tanzania intends to leverage digital health technologies, build on the achievements, and experience from the implementation of the National eHealth Strategy 2013–2018.

The implementation of the National eHealth Strategy 2013–2018 has contributed to improved quality of health services delivery, revenue collection and management, human resource management, supply chain management of health commodities, health information management, and planning and decision making at different levels of the health system. These achievements are results of several initiatives, including installation of local area networks and national information and communications technology (ICT) backbone network in national, zonal, and regional hospitals. The eHealth governance and leadership at the national level was also established. The government strengthened and scaled up the District Health Information Software version 2 and implemented the planning and reporting system in all councils. It implemented the Facility Financial Accounting and Reporting System at health facilities, an electronic Logistics Management Information System countrywide, and Epicor 9 at the Medical Stores Department. The government also successfully rolled out an electronic Integrated Diseases Surveillance and Response System countrywide and implemented an electronic Health Facility Registry, as well as the National Sanitation Management Information System.

Despite these achievements, several challenges affected successful implementation of the Strategy. These includes: inadequate ICT infrastructure; unreliable electric power supply; limited financial resources; inadequate skilled ICT personnel; limited eHealth skills amongst users and decision makers; and resistance to the adoption of eHealth solutions. Others include existence of multiple, fragmented electronic health information systems that were not interoperable and/or not well aligned with the workflow in the health sector, which contributed to added workload to health workers.

This Strategy outlines what needs to be done in the next five years, from 2019 to 2024, to fast-track progress towards attainment of universal health coverage and the health-specific Sustainable Development Goals. The Strategy will also address challenges encountered in the digitalisation of the health sector in Tanzania.

Vision: Better health outcomes through a digitally enabled health system.

Mission: To accelerate the transformation of the Tanzanian health care system through innovative, data-driven, client-centric, efficient, effective, and integrated digital health solutions.

This Strategy consists of five strategic goals and ten priorities. as indicated in Table 1 below.

Table 1. Strategic goals and priorities of the National Digital Health Strategy 2019–2024.

Strategic Goals	**Strategic Priorities**
1. Strengthened digital health governance and leadership 2. Improved client experience through efficient provision of high-quality health services 3. Empowered health care providers and managers to take evidence-based actions 4. Sustained availability of health resources 5. Standardised information exchange	1. Strengthen digital health governance and leadership to facilitate better coordination and implementation of digital health initiatives 2. Improve efficiency, accessibility (including use of telehealth) patient safety, and quality and continuity of care through digitalisation of health service delivery in a holistic manner 3. Improve health workforce competency and use of technology to provide specialized care to under – served facilities 4. Promote healthy behaviour through access to relevant health information, education, and communication 5. Enhance seamless and secure information exchange 6. Improve data use for evidence-based actions at all levels of the health system 7. Improve supply chain management of health commodities at all levels of the health system 8. Improve management of human resources at all levels of the health system 9. Improve management of financial resources 10. Strengthen disease prevention, surveillance, detection, reporting, response, and control at all levels of the health system

The implementation of the Digital Health Strategy will be managed by a National Digital Health Steering Committee, which shall be chaired by the permanent secretary at the

MoHCDGEC and co-chaired by the Permanent Secretary, at the President's Office–Regional Administration and Local Government. A costed action plan will be developed to guide the implementation of the Strategy. The Digital Health Secretariat will be responsible for day-to-day implementation and supervision of digital health initiatives through the Digital Health Strategy annual action plans. Various digital health committees will be responsible for implementation and supervision of digital health initiatives at health facility and institutional levels.

1. Introduction

1.1 Background

The application of digital technologies aims to increase the efficiency and quality of health care delivery to improve the health outcomes of all Tanzanians.[1] Digital health technologies have potential to accelerate transformation of the health system, thus leading to *improved population health, enhanced responsiveness of the health system, and fair financing and financial-risk protection for households.*[2] In addition, the use of digital technologies will support the efforts of the Government of Tanzania and stakeholders to achieve universal health coverage (UHC) and the Sustainable Development Goals, particularly Goal 3 on good health and well-being.[3] The National Digital Health Strategy 2019–2024 will also contribute to the achievement of the Tanzania Development Vision 2025.[4]

The government—through the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC)—is promoting the effective use of digital technologies to improve provision of high-quality health services, client experience, health systems strengthening, and health outcomes by facilitating evidence-based actions at all levels of the health system.

The overarching goal of the National Digital Health Strategy 2019–2024 is to accelerate increased access to and improved quality of effective and efficient health care to all Tanzanians through digitally enabled transformation of the health system.

1.2 The Need for the Digital Health Strategy

The National Digital Health Strategy emerges from the broader national health and development goals. The Tanzania Development Vision 2025 and Health Policy 2019 strive to attain improved-quality livelihood for Tanzanians by ensuring access to high-quality primary health care for all, access to quality reproductive health services for all age-appropriate individuals, and reduction in maternal and infant mortality rates.

The strategy seeks to use digital technologies to strengthen health systems in areas of governance and leadership, management of resources (human, financials and materials), Health Information systems, Supply chain of health commodities, and delivery of quality health services. Therefore, this Strategy provides guidance for designing, planning,

implementing and coordinating digital health initiatives aiming at improving health outcomes and achieve UHC.

1.3 Alignment of the Digital Health Strategy with National Policies and Strategies

This Digital Health Strategy aligns with key national policies and strategies. The National Health Policy 2019 aims to ensure that preventive, promotive, curative, and rehabilitative high-quality health services are accessible to all individuals. The Policy also aims to strengthen the health system to be more resilient and responsive to the needs of the population through evidence-based interventions.[5] Furthermore, it recognises digital health as an important enabler in transforming health care delivery by supporting health care processes and providing access to information, as well as facilitating management and decision making in the health sector.

Similarly, the National Health Sector Strategic Plan IV 2015–2020 emphasises the importance of investing in the development of information and communications technology (ICT) infrastructure and systems in order to improve administrative processes, patient/client recording, and communication. The MoHCDGEC strives to ensure by 2020 all hospitals and at least 25 per cent of primary health care facilities utilise ICT applications for administrative, financial, and clinical operations, as well as ensure interoperability amongst the digital health systems.[6]

The Tanzania Development Vision 2025 and the National ICT Policy 2016 recognise the application of ICT as a central pillar to a competitive social and economic transformation due to the fact that ICT is one of the major driving forces for the realisation of the Vision 2025. Specifically, the National ICT Policy 2016 focuses on the application of ICT to enhance delivery of social services, including health services.

1.4 The Approach Used in Developing the Digital Health Strategy

The National Digital Health Strategy 2019–2024 was developed using analytical and participatory approaches. A critical analysis was conducted to assess the current situation of the use of digital health technologies in local and global contexts. It was guided by the World Health Organization and the International Telecommunication Union National eHealth Strategy Toolkit, the assessment report of the National eHealth Strategy 2013–2018 implementation and the National Health Policy 2019, and related documents. Several

consultative workshops and key informant interviews were conducted involving multidisciplinary stakeholders at national, zonal, regional, and district levels, as well as training institutions. In addition, Ministries, Departments, and Agencies (MDA) and development and implementing partners were also consulted. This comprehensive approach provided a unique opportunity to solicit views, inputs and recommendations from key stakeholders for development of this Strategy.

2. Situational Analysis

The situational analysis of digital technology potential in the health sector focused on three main areas: existing gaps in the health system building blocks as identified in the national health policy (Table 2); appropriate remedial measure(s) which can better be delivered through ICT; and Strengths, Weaknesses, Opportunities, and Challenges (SWOC) analysis (Table 2) for the implementation of the National Digital Health Strategy 2019–2024.

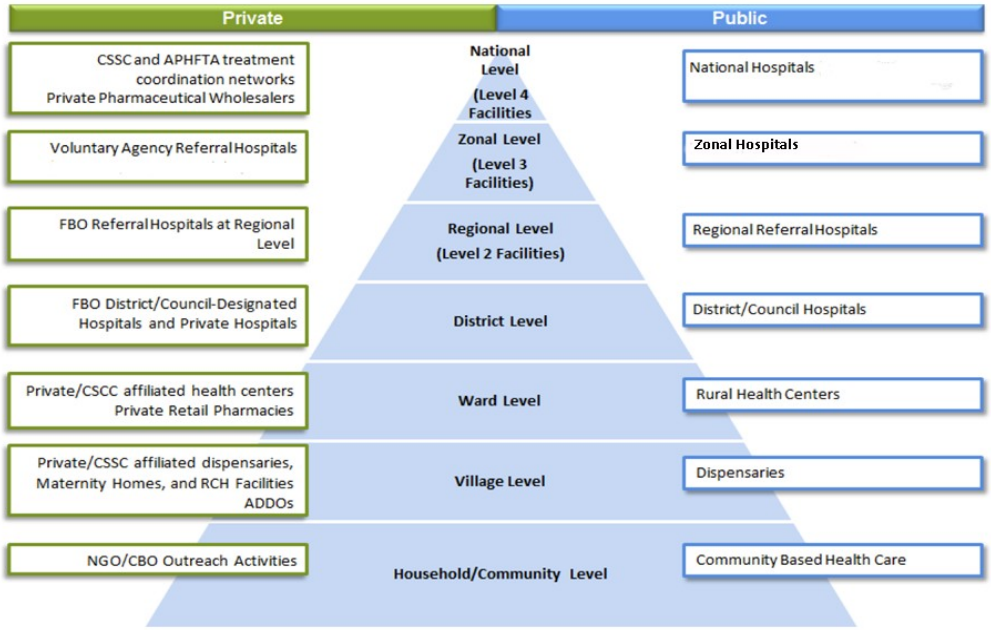
2.1 Overview of the Health System in Tanzania

The health system in Tanzania is well organised in pyramidal structure from the community to the national levels (Figure 1). The foundation of this pyramidal structure is primary health care services comprising community-based health services, dispensaries, health centres, and district hospitals. Community-based health services focus on health promotion and prevention. Dispensaries provide basic preventive and curative outpatient services and labour and delivery services, while health centres provide outpatient and inpatient health services. At the district level, hospitals provide medical and surgical services to patients referred from health centres. Specialised health care services are provided by the regional referral hospitals. Zonal and national hospitals provide advanced health care and also serve as teaching hospitals.

The MoHCDGEC has the overall responsibility for provision of health and social welfare services. It sets the policy and guidelines; provides technical guidance to organisations involved in service delivery; defines priorities; mobilises resources; and promotes standards for health and social welfare services.

The President's Office–Regional Administration and Local Government (PORALG) coordinates and monitors the provision of health and social welfare services at regional and council levels. Regional Health Management Teams (RHMTs) supervise, monitor, and build the capacity of local government authorities in health and social welfare services. These authorities are responsible for planning, delivering, and supervising services. The Council Health Management Teams (CHMTs) provide supportive supervision and capacity building for delivering preventive, rehabilitative and curative health services in a district.

Figure 1. The health care pyramid in Tanzania (public and private equivalent).[6]



Abbreviations: ADDO, Accredited Drug Dispensing Outlet; APHFTA, Association of Private Health Facilities in Tanzania; CBO, community-based organisation; CSSC, Christian Social Services Commission; FBO, faith-based organisation; NGO, nongovernmental organisation.

The Tanzania Health Policy 2019 outlines several issues and challenges in the health system. The Policy has prioritised the challenges affecting provision of health services and management of the health system performance and indicated policy statements and strategies for addressing these challenges. Some of the challenges and respective potential digital health interventions are presented in Table 2.

Table 2. The digital health potential in addressing health system issues.

Issues	**Response through digital health**
Service delivery	
Prioritised Health services in the Health Policy 2019: Health promotion; community-based health services; nutrition; immunisation; reproductive, maternal, newborn, child, and adolescent health; communicable diseases (e.g., HIV/AIDS, tuberculosis, malaria); noncommunicable diseases; neglected tropical diseases; oral health; eye health; and super-specialised health care	Improve the use of digital health solutions, including telehealth and mobile health (mHealth), to enhance access to high-quality health services. Use mHealth and social media to improve provision of high-quality health information, education, and communication to enable the community to adapt healthier behaviours and

services. Issues that affect efficiency, quality, access, equity, awareness, and coverage of above health services: • Limited public awareness on health promotion, prevention and curative services, geriatric services, and rehabilitative and palliative care services • Low level of awareness amongst communities on promoting healthy behaviour, prevention, self-management, access to health care. • Increase in burden of communicable and non-communicable diseases. • Limited access to specialised health services.	increase health literacy in communities. Improve the use of digital solutions to engage community health workers for improved provision of community-based health services and promote community engagement. Improve use of digital health solutions for surveillance, detection, reporting, response, and control. Implement eReferral system to facilitate management of patient referrals and feedback.
Health workforce	
Existence of multiple, disconnected human resources for health systems, staffing shortages, and skills-mix imbalance; uneven distribution of human resources for health; lack of up-to-date comprehensive workforce registry.	Use digital solutions for human resource information management to effectively address staffing shortages and skills-mix imbalance; use eLearning system and other digital solutions for provision of pre-service and in-service education, including continuing professional development.
Medicines and health commodities	
Inadequate health commodities; inefficient supply chain management.	Implement digital solutions for tracing and tracking of health commodities and strengthen logistics management information systems.
Health care financing	

Ineffective health care–service financial-management information systems; limited financial resources; insufficient and fragmented health care financing strategies.	Use digital solutions to improve health financial-management systems.
Health information systems	
Fragmented and interoperable health information systems; limited data-use culture; low data quality; limited ICT infrastructure.	Integrate various Health Management Information Systems for improved data availability and use at all levels; build capacity on digital health systems and data use; improve ICT infrastructure.
Governance and leadership	
Inability to easily track performance of the health system and health care providers, weak governance and leadership, inefficient allocation of resources, inefficiencies in health services delivery, inadequate transparency, and failure to adhere to professionalism.	Use digital solutions to avail quality information for monitoring the performance of the health system and improve evidence-based decision making.

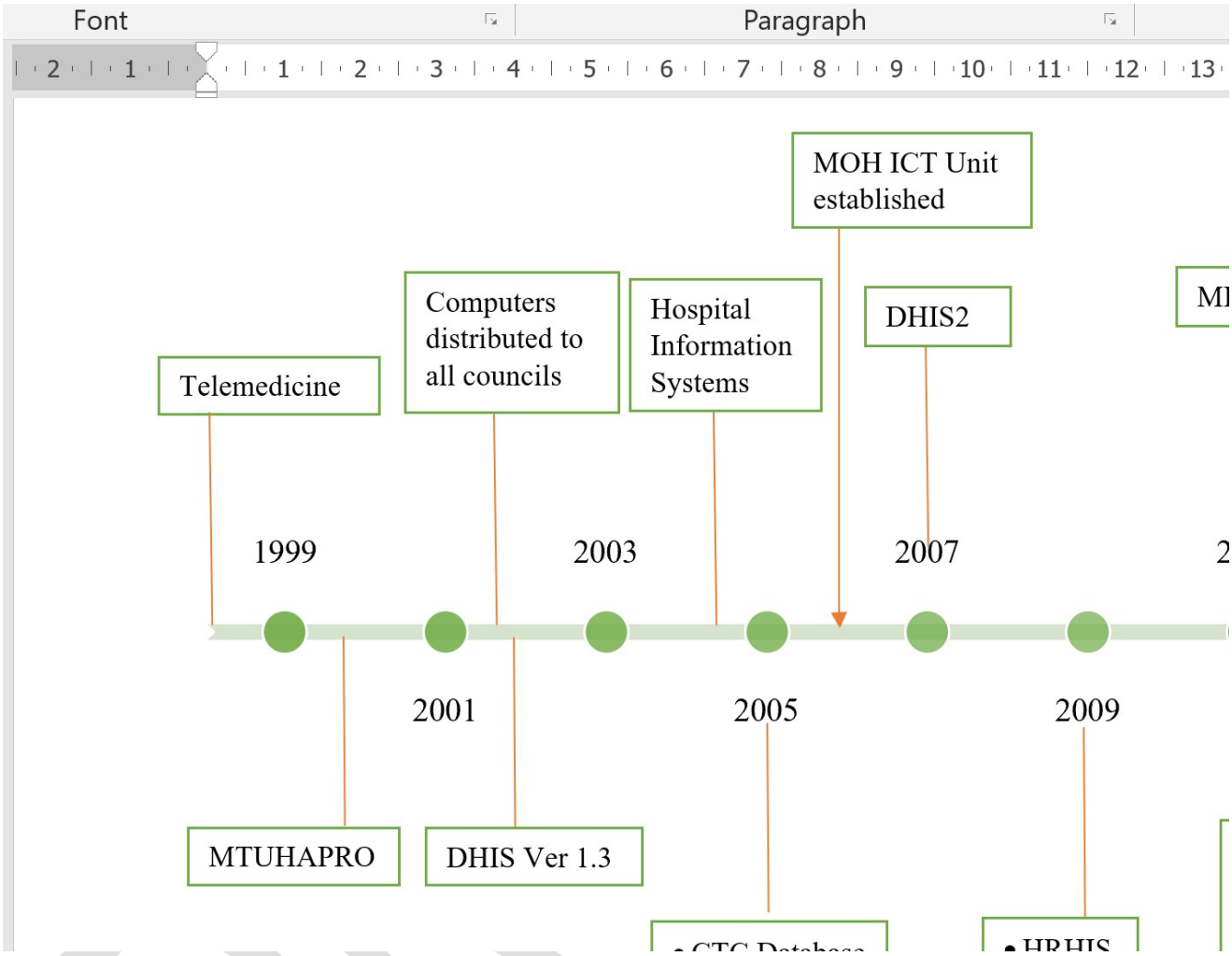
2.2 Digital Health Journey in Tanzania

Tanzania has made some remarkable progress on leveraging digital health in transforming the health system. This included initiatives aiming at establishing digital health governance and leadership and implementing digital health solutions. Initially, digital health solutions were primarily introduced to improve data collection and reporting of aggregate data, with an emphasis on availability and accuracy of data at the national level. The increase in the maturity level of digital technologies has shifted the focus of collecting and reporting from aggregate data to client-level data, as well as data use at all levels of the health system.

Currently, there are over 160 digital health or health-related systems. However, some of the systems have national coverage while other are institution-based. Some of them are at the piloting phase while others are at operational with limited interoperability. Therefore, this Digital Health Strategy seeks to provide a strategic direction in the development, adaptation, harmonization, integration and deployment of digital health solutions to ultimately improve

the effectiveness and efficiency of delivering health care services in Tanzania. Figure 2 summarises some of the major digital health milestones achieved in Tanzania. However, most of the digital health initiatives could not be depicted in the figure below.

Figure 2. The Tanzania digital health journey.



2.3 SWOC Analysis

This section presents the SWOC analysis for the development and implementation of the National Digital Health Strategy 2019–2024 (see Table 3).

Table 3. Strengths, Weaknesses, Opportunities, and Challenges analysis.

Strengths	**Weaknesses**
• Commitment of the Ministerial leadership on the use of digital technologies to transform the health system • Lessons learnt from the implementation of eHealth Strategy 2013–2018	• Inadequate implementation of digital health structures at all levels • Existence of multiple and fragmented digital health systems • Shortage of ICT personnel for implementation of digital health activities at all levels of the health

• Use of digital technologies by health workers at all levels of the health system • Availability of at least one ICT staff in each region • Use of task-sharing approach in addressing shortage of ICT staff • Increase in funding of digital health activities at all levels of the health system • Increase in penetration of Internet connectivity, including NICTBB and mobile network • Availability of telemedicine infrastructure in some facilities • Existence of digital health information systems, including integrated Health Facility Electronic Management Systems, in some facilities across different levels of the health system • Existence of computing infrastructure in some facilities • Existence of donor-funded projects that support digital health activities	systems • Limited digital health skills amongst ICT personnel • Inadequate skills to use digital solutions amongst health workers and managers • Insufficient funds to implement digital health activities • Limited coverage of digitalisation of health care services • Dependency on donors in funding digital health initiatives • Poor quality of data in the digital health systems • Reluctance to use digital health solutions • Limited data-use capacity • Limited national digital health legal and regulatory framework • Poor ICT infrastructure to support digital health solutions
Opportunities	**Challenges**
• Strong political will on the application of ICT for socioeconomic development • Existence of Tanzania Development Vision 2025 that recognises the use of ICT for development • Existence of the National ICT Policy 2016 • Existence of eGA standards and guidelines on ICT infrastructure and systems • Existence of local training institutions that produce health and ICT professionals • Existence of development and implementing partners who are	• Limited budget to meet the competing needs and priorities in the health sector • Limited data-use culture amongst health workers and managers for planning and decision making • Shortage of skilled health and eHealth workforce at all levels of the health system • Low digital literacy amongst health workers • Inadequate structured user-support and user-feedback mechanisms for many digital health systems • Lack of or unreliable electricity supply in some facilities

interested in supporting digital health ● Emerging digital health technologies	● Lack of or unreliable and slow Internet connectivity in some facilities ● The donor-driven priorities in funding in the health-sector activities, including digital health

2.4 Key Lessons from the Previous Strategy

The implementation of the first National eHealth Strategy 2013–2018 has established a strong foundation to accelerate sustainable adoption of digital technologies for transforming the health sector. The lessons learnt also provide avenues for improving existing and new digital health initiatives in the health sector.

According to the assessment results of the implementation of the eHealth Strategy, a number of improvements were recorded in the following areas: quality of health services delivery, patient experience, health promotion, disease surveillance, revenue collection and management, human resource management, supply chain management of health commodities, health information management, and planning and decision making at different levels of the health system.

These achievements resulted from execution of several initiatives, including installation of a local area network and national ICT backbone network in health facilities and institutions; existence of eHealth governance and leadership at the national level; strengthening and scaling up of the District Health Information System software version 2; implementation of planning and reporting system in all councils; implementation of the electronic Logistics Management Information System countrywide; national rollout of an electronic Integrated Diseases Surveillance and Response System (eIDSR); implementation of an electronic Health Facility Registry; and implementation of the National Sanitation Management Information System.

Other eHealth initiatives include the following: Hospital Management Information Systems; disease-specific information systems, such as Care and Treatment Clinic databases versions 2 and 3 for HIV and AIDS, a management information system (MIS) for neglected tropical diseases, electronic Tuberculosis and Leprosy registers, and malaria MISs; telemedicine infrastructure and services; a vaccine information management system; the Tanzania

Immunization Registry; a mobile health (mHealth) platform for enhancing health education, information, and communication (e.g., reporting and client feedback); and National Health Insurance Fund e-solutions.

Despite these achievements, a number of challenges affected implementation of the Strategy. These include inadequate ICT infrastructure; unreliable electric power supply; limited financial resources; inadequate ICT personnel; inadequate digital literacy amongst health workers and managers; and resistance to the adoption of eHealth solutions, as well as the existence of multiple fragmented electronic HISs that were not interoperable and/or not well aligned with the workflow in the health sector. Furthermore, there is an unclear governance structure and weak coordination and engagement of stakeholders in the eHealth Strategy implementation at different levels of the health system.

In conclusion, the assessment report of the National eHealth Strategy 2013–2018 implementation recommended the need for strengthening digital health governance and leadership, establishing a digital health legal and regulatory framework, improving coordination and mobilisation of resources for digital health implementation, building capacity of the health workforce in digital health systems and data use, developing health enterprise architecture, improving and enforcing compliance with standards and interoperability amongst digital health systems, and strengthening ICT infrastructure.

3. Strategic Direction

3.1 Vision

Better health outcomes through a digitally enabled health system.

3.2 Mission

To accelerate the transformation of the Tanzanian health system through innovative, data-driven, client-centric, efficient, effective, and integrated digital health solutions.

3.3 Guiding Principles

The implementation of this Strategy will be guided by the following principles, which are also recommended in the Principles of Digital Development:

- **Client-centric design:** Respond to clients' needs through user-centred design to ensure a responsive, resilient, and inclusive health system.
- **Data-driven initiatives:** Focus on ensuring quality information is available to the right people when they need it.
- **Interoperability:** Promote seamless and secure information exchange through open standards and interoperable digital solutions.
- **Open standards and open source:** Promote data preservation and greater freedom from technology and vendor lock-in through use of open standards, open source, and open innovation.
- **Data security:** Ensure data security, privacy, and confidentiality.
- **Stakeholder engagement and coordination:** Actively engage stakeholders in the planning, development, and implementation of digital health solutions.

3.4 Strategic Goals

Implementation will be guided by the following strategic goals:

1. Strengthened digital health governance and leadership
2. Improved client experience through efficient provision of high-quality health services
3. Empowered health care providers and managers to take evidence-based actions
4. Sustained availability of health resources
5. Standardised information exchange

3.5 Strategic Priorities and Initiatives

The Digital Health Strategy defines strategic priority outcomes to be achieved by 2024. The strategic priorities were primarily derived from the National Health Policy 2019 and through a rigorous consultation process with key stakeholders in the health sector and from the desk research on the best practices in the area. Specifically, these strategic priorities articulate shared goals for the health-sector stakeholders and support existing investment in digital health initiatives. The implementation of the strategic initiatives will result in measurable benefits for clients, health care service providers, decision makers, and the broader health system.

Therefore, this Strategy focuses on the following vision, mission, strategic priorities, and strategic initiatives.

Table 4. National Digital Health Strategy's vision, mission, priorities, and initiatives.

Vision	Better health outcomes through a digitally enabled health system
Mission	To accelerate the transformation of the Tanzanian health care system through innovative, data-driven, client-centric, efficient, effective, and integrated digital health solutions
Strategic Goals	1. Strengthened digital health governance and leadership 2. Standardised information exchange 3. Improved client experience through efficient provision of high-quality health services 4. Empowered health care providers and managers to take evidence-based actions 5. Sustained availability of health resources
Strategic Priorities	1. Strengthen digital health governance and leadership to facilitate better coordination and implementation of digital health initiatives 2. Improve accessibility, efficiency, patient safety, and quality and continuity of care through digitalisation of health service delivery in a holistic manner 3. Improve health workforce competency and use of technology to use of technology to provide specialized care to under – served facilities. 4. Promote healthy behaviour through access to relevant health information, education, and communication

	5. Enhance seamless and secure information exchange 6. Improve data use for evidence-based actions at all levels of the health system 7. Improve supply chain management of health commodities at all levels of the health system 8. Improve management of human resources at all levels of the health system 9. Improve management of financial resources 10. Strengthen disease prevention, surveillance, detection, reporting, response, and control at all levels of the health system

Strategic Priority 1: Strengthen digital health governance and leadership to facilitate better coordination and implementation of digital health initiatives

Successful implementation of digital health requires strong governance and leadership at all levels of the health system. The digital health governance facilitates better coordination and engagement of stakeholders, aligns digital health investments with national health priorities, provides guidance, and enforces compliance with digital health guidelines and standards.

This priority seeks to address issues related to strengthening digital health governance structures at all levels of the health system: engagement of stakeholders; involvement of health workers in digital transformation efforts; development of digital health implementation guidelines; establishment of digital health legal and regulatory framework; and awareness raising around the Digital Health Strategy.

Strategic Initiatives

1. Strengthen the governance structures to enable effective coordination, management oversight, and implementation of digital health initiatives across the health sector.
2. Develop a costed action plan for the implementation of the Digital Health Strategy.
3. Develop a resource mobilisation plan to ensure successful implementation of the Strategy.
4. Improve the legal and regulatory framework to ensure client safety, data security, confidentiality, and privacy.
5. Develop a change-management plan.
6. Implement a digital health–initiatives inventory and digital library.

Capabilities Unlocked

- Government can track and coordinate digital health initiatives in the health sector.
- Health sector can securely and safely use digital health technologies.
- Health sector can successfully plan and mobilise resources to implement the Digital Health Strategy.

Strategic Priority 2: Improve accessibility, efficiency, patient safety, and quality and continuity of care through digitalisation of health service delivery in a holistic manner

Digitalisation of health services involves implementing appropriate digital health technologies required to support high-quality health services delivery and health information management within and across health facilities. Furthermore, it delivers digital health solutions that enable clients, health care providers, health insurers, and health care managers to access, use, and share health information geared to improve population health outcomes.

The digitalisation should focus on supporting the following: high-quality care and adherence to guidelines and best practices; continuity of care over time and across different points of service; integrated services across vertical programmes; case detection, screening, triage, and referrals; health promotion and education; improvement in the efficiency of health services and efficient management of resources at the points of care.

This strategic priority intends to address the following issues: digitalisation of all health care processes in an integrated manner, leading to improved performance of health facilities and health workers; improved management of health insurance claims; enhanced management of prescriptions; improved management of referral and continuity of care as patients/clients move from one point of care to another. It will further improve the use of digital solutions for managing community-based health services and clients' feedback.

Strategic Initiatives

1. Digitalise health care services at health facility levels.
2. Implement standardised ePrescription.
3. Implement standardised insurance eClaim.
4. Implement integrated eReferral solutions.
5. Digitalise community-based health services.
6. Implement a digital platform for managing clients' feedback on the quality of services received at the health facilities.

Capabilities Unlocked

- Health workers at all levels can efficiently deliver high-quality health care for better client experience.

- Government can efficiently monitor the performance of the health system and quality of health services provision.
- Government can efficiently assess and improve quality of health services provision.
- Health facilities and insurance service providers can more efficiently process insurance claims, leading to increased financial resources for health facilities.
- Health sector can collect and respond to clients' feedback and needs.

Strategic Priority 3: Improve health workforce competency and use of technologies to provide specialized care to under-served facilities.

Telehealth services are increasingly becoming one of the critical approaches for delivering health care services and a panacea for achieving universal health care. Thus, telehealth has a great potential to significantly address some of the most pressing challenges of the health system, including access to health care, cost-effective health service delivery, and distribution of limited health care service providers in the country. Telemedicine services such as teleradiology, teleconsultation, teledermatology, and eLearning are amongst the most prevalent telehealth services. For instance, remote health facilities can provide specialised care services through telemedicine by consulting specialists at specialised facilities, while health workers in remote facilities can easily access continuing education through eLearning platforms.

This strategic priority aims to implement eLearning and telemedicine services to improve health workforce competencies and equitable access to health care services, respectively.

Strategic Initiatives

1. Develop guidelines to streamline implementation and operationalisation of telehealth services.
2. Improve ICT infrastructure to support delivery of telehealth services.
3. Implement telemedicine services.
4. Implement digital platforms for health professional peer networking.
5. Implement eLearning and knowledge management platforms for continuous professional development.

Capabilities Unlocked

- Health sector can provide equitable access to specialised health care services.
- Health care workers can provide specialised care services to under - served facilities
- Health workforce can access continuous professional development programmes at their convenience.

Strategic Priority 4: Promote healthy behaviour through access to relevant health information, education, and communication

Health information, education, and communication (IEC) services are critical for promoting healthier community lifestyles by increasing awareness and behaviour change of the society on prevention and control of communicable, noncommunicable, and neglected tropical diseases. Digital platforms, for instance social media, can be used as a tool to support health IEC initiatives through active engagement of community members and health care service providers and by reaching wide audiences. Thus, health care organisations can use digital platforms to share health-promotive messages and engage communities in health-promotion activities.

This strategic priority focuses on improving and scaling up the use of digital technologies for disease prevention and control through promoting healthy lifestyles, health-seeking behaviours, and early interventions in chronic illness. By taking advantage of the high penetration of mobile phones and networks, several mHealth initiatives, such as the use of short message service, mobile apps, and web-apps, can be implemented for public health promotion and information sharing across the health sector.

Strategic Initiatives

1. Develop guidelines for effective use of interactive digital platforms for health IEC.
2. Implement interactive digital platforms for health IEC.

Capabilities Unlocked

- Clients can access health IEC to promote healthier behaviour.
- Health sector can systematically use interactive digital platforms for health IEC.
- Health sector can provide health IEC using interactive digital platforms.

Strategic Priority 5: Enhance seamless and secure information exchange

Evidence-based decision making results in improved-quality health services and health system performance to achieve universal health care. Harmonised national HISs are essential for improving access to quality data through seamless and secure information exchange across the health sector and other sectors. Currently, the digital health landscape faces various challenges, including fragmented data systems; uncoordinated business processes; limited information exchange capabilities; inadequate data standards across the health sector; inadequate application of information security standards; and ineffective data management and dissemination mechanisms.

This strategic priority intends to strengthen ongoing efforts on developing health enterprise architecture; systems interoperability; data standards; terminology services; and registries—such as a client registry, health commodities registry, health facility registry, and health worker registry—to enhance seamless and secure information exchange across the health sector.

Strategic Initiatives

1. Finalise and institutionalise the Tanzania Health Enterprise Architecture.
2. Strengthen use of data, application, and technology standards (e.g., International Classification of Diseases, 10th Revision; Health Level-7; Digital Imaging and Communications in Medicine; Logical Observation Identifiers Names and Codes; and service codes).
3. Implement terminology services for standardised health terminologies, codes, data elements, and value sets.
4. Strengthen interoperability across different systems within health and other sectors.
5. Implement client and health worker registries.
6. Strengthen the Health Facility Registry and health commodities registries.
7. Implement shared client health records.
8. Strengthen standards and guidelines for secure data storage, processing, information exchange, and dissemination.

Capabilities Unlocked

- Health-sector stakeholders can link data systems together.
- Health sector can uniquely identify clients across health care services.
- Clients can improve their experience.
- Health sector can exchange and share quality information.
- Health sector can track individual clients over time and across multiple points of service.

Strategic Priority 6: Improve data use for evidence-based actions at all levels of the health system

The use of high-quality data is essential for optimising efficiency and effectiveness of health care services delivery. However, better data use is affected by limited data/information dissemination, inability of systems to produce required reports, limited capabilities to support data use (e.g., data visualisation and analytics), inadequate data-use skills amongst health workforce, and limited data-use aspects in health professional training curricula.

Thus, this strategic priority intends to ensure not only that high-quality data are collected but also that data are transformed into useful information for evidence-based actions at all levels of the health system.

Strategic Initiatives

1. Implement digital solutions for facility supervision.
2. Strengthen continuous professional development programmes on data use for health workers.
3. Incorporate data-use aspects in pre-service and in-service curricula.
4. Strengthen the national health data warehouse.
5. Improve the Health Management Information System, including indicators and data analytics.

Capabilities Unlocked

- Health sector will have coordinated and harmonised supportive supervision.
- Government can efficiently assess and improve quality of health services provision.
- Health workers can effectively use data for evidence-based actions.
- Health workers can access data analytics tools and data from a range of source systems.

Strategic Priority 7: Improve supply chain management of health commodities at all levels of the health system

Effective supply chain management of health commodities across different service delivery points is of paramount importance in the delivery of high-quality health services. Moreover, better management of medicines and health commodities leads to improved patient safety and individual and population health outcomes.

This key priority area intends to enhance the use of digital health solutions for supply chain management. These solutions will address several challenges, such as ineffective mechanisms for managing stocks at health facilities, inter-intra facilities stock transfers due to disconnected and multiple systems, inadequate visibility of health commodities data, uneven distribution of medicines and health products, potential medicine side effects, irrational prescription and dispensing of medicines, and high influx of counterfeit medicines.

Strategic Initiatives

1. Strengthen logistics MISs.
2. Implement digital solution for tracing and tracking of health commodities.
3. Integrate the national product registry of medicines, medical supplies, and medical devices with other systems.
4. Strengthen the adverse-drug-reactions reporting system for medicines, medical devices, and cosmetics.

Capabilities Unlocked

- Health sector can access and use data to better understand and solve supply chain challenges.
- Health sector can track incidents of adverse drug reactions.

Strategic Priority 8: Improve management of human resources at all levels of the health system

Proper management of HRH is fundamental for a well-functioning health system. Current efforts to use digital solutions for management of human resources in the health sector have been shown to improve planning, development, and management of HRH. However, there are still some key issues that need to be addressed to strengthen planning, distribution, and effective utilisation of human resources across the health sector as a catalyst for improved health services provision and health outcomes.

Thus, this priority area seeks to address the following issues: existence of multiple and disconnected HRH systems, including the Human Resources for Health Information System (HRHIS), Human Capital Management Information System, health worker regulatory board databases, Training Institution Information System, and TrainSmart and TrainTracker systems; fragmented health workforce information; and inability of health facilities to track performance of health workers.

Strategic Initiatives

1. Improve HRHISs.
2. Improve digital solutions for management and monitoring of HRH production and absorption.
3. Integrate the health worker registry with existing human resource systems (including Human Capital Management Information System, HRHIS, health worker regulatory boards databases, and Training Institution Information System) through an interoperability layer.
4. Implement biometric attendance registers at health facilities and institutions.
5. Implement digital solutions for improving and tracking performance of health workers.

Capabilities Unlocked

- Government can equitably distribute health workers across the country.
- Government can easily monitor performance of health workers.
- Government can effectively regulate health workers.

Strategic Priority 9: Improve management of financial resources

Effective management of financial resources is essential for improved infrastructure, HRH, health commodities, and health services delivery at all levels of the health system. The implementation and use of digital solutions for financial management in the health sector have shown positive results, such as improved revenue collection at the health facilities and institutions and improved planning and budgeting. However, fragmented digital financial-management systems, limited coverage, and weak transaction controls within the systems are some of the challenges affecting financial resources management.

This priority area seeks to strengthen the digital solutions for financial resource management to enhance planning, budgeting, revenue collection, accounting, auditing, and reporting at different levels of the health system.

Strategic Initiatives

1. Improve digital solutions for planning, budgeting, revenue collection, accounting, auditing, and reporting at all levels.
2. Integrate electronic revenue collection systems in all public health facilities and institutions with the Government ePayment Gateway.
3. Strengthen digital solutions for health insurance management.

Capabilities Unlocked

- Health sector can improve planning, revenue collection, and control.
- Health sector can improve efficiency of administration of insurance schemes.

Strategic Priority 10: Strengthen disease prevention, surveillance, detection, reporting, response, and control at all levels of the health system

Timely diseases detection, preparedness, and appropriate response are essential for preventing both the loss of human life and the socioeconomic impact of disease outbreaks, disasters, and emergencies. However, effective and sustainable disease surveillance and management of disasters and emergencies generally are highly dependent on timely availability of quality information for evidence-based actions across all levels of the health system. The government implemented the eIDSR system in order to improve surveillance, prevention, detection, notification, response, and control of notifiable diseases, disease outbreaks, and public health events such as injuries, disasters, and emergencies.

There is low coverage of improved latrines; low community awareness on safe water, sanitation, and hygiene (WASH); and high prevalence of WASH-related diseases, such as cholera, typhoid, dysentery, and diarrhoea. The government implemented the National Sanitation Management Information System in order to improve the quality of information for effective management of WASH services.

In this strategic priority area, the government aims to strengthen digital solutions for improving the surveillance and reporting of notifiable diseases, disease outbreaks, and public

health events. The eIDSR will be strengthened to integrate data from different sources to provide timely quality information on disease surveillance and public health events. Furthermore, this strategic priority will strengthen the electronic information system for management and monitoring of WASH services, including community-based mHealth solutions for enhanced reporting and prevention of WASH-related diseases.

Strategic Initiatives

1. Strengthen the disease surveillance and response system.
2. Strengthen integration of eIDSR with related systems in East African Community Partner States.
3. Strengthen digital solutions for promotion of safe WASH and food safety services.
4. Implement digital solutions for tracking and reporting of injuries, emergencies, and disasters.

Capabilities Unlocked

- Health sector can easily access high-quality disease surveillance data.
- Health sector can respond in a timely and coordinated manner to emergencies and outbreaks.

4. Digital Health Governance Framework

Successful implementation of the National Digital Health Strategy 2019–2024 requires strong governance and leadership. It is therefore imperative to institutionalise an inclusive governance structure with clear lines of authority, roles, and responsibilities at all levels of the health system. This Strategy seeks to strengthen the digital health governance structure that oversees planning, priority setting, strategic investment, resource mobilisation, change and adoption, and monitoring and evaluation (M&E).

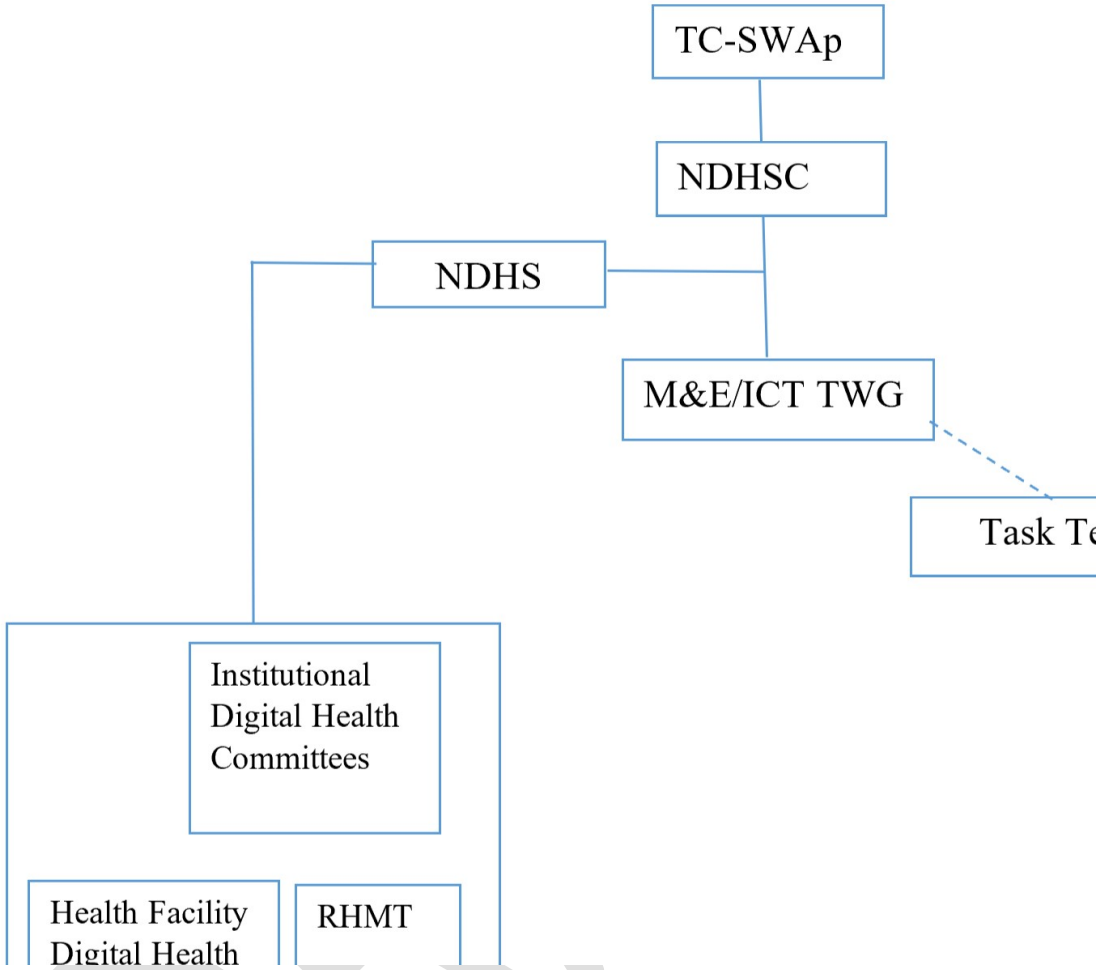
The main components of the digital health governance structure are the National Digital Health Steering Committee (NDHSC), the National Digital Health Secretariat (NDHS), Institutional Digital Health Committees, and Health Facility Digital Health Committees. The digital health governance structure is described below.

4.1 National Digital Health Governance Structure

The following organs will govern the implementation of the Strategy at different levels of the health system (Figure 3):

1. National Digital Health Steering Committee (NDHSC)
2. National Digital Health Secretariat (NDHS)
3. Monitoring and Evaluation & Information Technology and Communication Technical Working Group (M&E/ICT TWG)
4. Regional Health Management Team (RHMT)
5. Council Health Management Team (CHMT)
6. Institutional Digital Health Committees
7. Health Facility Digital Health Committees

Figure 3. Digital health governance structure.



Abbreviations: CHMT, Council Health Management Team; ICT, information and communications technology; M&E, monitoring and evaluation; RHMT, Regional Health Management Team; TC-SWaP, Technical Committee Sector-Wide Approach; TWG, technical working group.

4.1.1 National Digital Health Steering Committee (NDHSC)

The NDHSC is an important organ for ensuring successful implementation of the Digital Health Strategy.

The main roles of the NDHSC shall include the following:

- Provide leadership and strategic guidance to all digital health initiatives in the health sector to ensure that they are well aligned with the National Digital Health Strategy and the Health Policy and Health Sector Strategic Plan priorities.
- Oversee the implementation of the Digital Health Strategy.
- Guide engagement of stakeholders in the implementation of the Digital Health Strategy.
- Provide a system-level perspective and technical guidance on digital health initiatives.
- Mobilise resources for strategic investment in digital health initiatives across the health sector.
- Review and approve digital health initiatives.

- Oversee compliance with digital health standards and guidelines.
- Establish and oversee standards and guidelines to govern issues of ownership, compliance, privacy, confidentiality, and security in the digital health ecosystem.
- Monitor and evaluate the implementation of digital health initiatives.
- Establish task teams to implement specific digital health tasks.

Membership

The committee will be composed of not more than 20 voting members and will consist of one representative from the following institutions: MDA; public, private, and faith-based health facilities; the private sector; research and training institutions; and development and implementing partners. Additional members may be co-opted at the discretion of the NDHSC and are not limited to listed members in Appendix 2.

Leadership

The NDHSC will be chaired by the permanent secretary for Health at the MoHCDGEC and cochaired by the deputy permanent secretary responsible for Health at PORALG. The director of ICT at the MoHCDGEC shall serve as the secretary of the committee.

Accountability and Reporting

- The NDHSC shall meet on a quarterly basis.
- The NDHSC shall submit reports to the Technical Committee Sector-Wide Approach meetings.

4.1.2 National Digital Health Secretariat (NDHS)

The NDHS shall be responsible for both technical and administrative matters of the NDHSC. The NDHS shall advise the NDHSC, be responsible for day-to-day operations of the Digital Health Strategy implementation, and compile and circulate various reports of the Digital Health Strategy implementation.

Membership

The NDHS shall comprise the director of ICT, who is the Digital Health coordinator at the MoHCDGEC, the director of Policy and Planning at the MoHCDGEC, and appointed officers from ICT and M&E at the MoHCDGEC.

Leadership

The NDHS shall be chaired by the director of ICT at the MoHCDGEC and cochaired by the director of Policy and Planning at the MOHCDGEC.

Roles and Responsibilities

The roles and responsibilities of the NDHS shall include the following:

- Provide technical support to the NDHSC.
- Oversee day-to-day operations and facilitate and support implementation of the Strategy at all levels.
- Prepare meeting calendar and organise meetings of the NDHSC and the M&E/ICT TWG.
- Record, compile, and circulate meeting minutes of the NDHSC and M&E/ICT TWG.
- Record and report digital health matters approved by the Chairperson of NDHSC.

Accountability and Reporting

- The NDHS shall meet on a monthly basis.
- The NDHS shall submit reports to the NDHSC.

4.1.3 Monitoring and Evaluation & Information, Communication and Technology Technical Working Group. (M&E and ICT TWG)

The M&E/ICT TWG shall be responsible for facilitation and support implementation of the Strategy at all levels.

Membership

The M&E/ICT TWG comprises the directors of ICT and M&E of both the MoHCDGEC and PORALG and assistant directors from different MoHCDGEC departments, as well as representatives from MDA, training and research institutions, and development and implementing partners.

Leadership

The M&E/ICT TWG is chaired by the assistant director of M&E of the MoHCDGEC and cochaired by the director of ICT at the MoHCDGEC.

Roles and Responsibilities

The roles and responsibilities of the M&E/ICT TWG shall include;

- Coordinating the implementation of the Digital Health Strategy to promote collaboration and prevent duplication of efforts and resources.
- Developing costed annual action plans for digital health activities.
- Ensuring proper use of allocated resources for implementing digital health initiatives.
- Developing and enforcing compliance with digital health standards and guidelines.
- Implementing digital health initiatives in accordance with national policies, regulations, guidelines, and standards.
- Implementing digital health capacity-building initiatives.
- Providing technical support, mentorship, and supportive supervision of digital health activities.

- Coordinating and engaging stakeholders in the implementation of the Digital Health Strategy.
- Promoting the Digital Health Strategy amongst stakeholders.
- Supervising Institutional and Health Facility Digital Health Committees.
- Establishing task teams to implement specific digital health tasks.
- Conducting M&E of the Digital Health Strategy implementation.

Accountability and Reporting

- The M&E/ICT TWG shall meet on a monthly basis.
- The M&E/ICT TWG shall submit reports to the NDHSC.

4.2 Regional Health Management Teams (RHMT)

The NDHSC will cascade the implementation of the Digital Health Strategy to RHMTs. RHMTs will be responsible for overall coordination of digital health initiatives at the regional level.

The roles of RHMTs shall include the following:

- Oversee the implementation of digital health initiatives.
- Enforce compliance with digital health standards and guidelines.
- Provide technical support to CHMTs on the implementation of digital health initiatives.
- Coordinate stakeholders in the implementation of digital health initiatives.
- Conduct supportive supervision and mentorship on the implementation of the Digital Health Strategy.
- Submit monthly reports to the MoHCDGEC and PORALG.
- Conduct M&E of the Digital Health Strategy implementation.

4.3 Council Health Management Teams (CHMT)

RHMTs will cascade the implementation of the Digital Health Strategy to CHMTs. CHMTs will be responsible for overall coordination of digital health initiatives at the district level.

The roles of CHMTs shall include the following:

- Appoint Council Digital Health coordinator.
- Implement digital health activities.
- Enforce compliance with digital health standards and guidelines.
- Provide technical support to health facilities.
- Coordinate stakeholders in the implementation of digital health initiatives.
- Conduct mentorship and supportive supervision of digital health activities.
- Submit monthly reports to the RHMTs.
- Conduct M&E of the Digital Health Strategy implementation.

4.4 Institutional Digital Health Committees (IDHC)

MDA, as well as training institutions under the MoHCDGEC, shall establish Institutional Digital Health Committees, which shall be responsible for overall coordination of digital health activities at the institutional level. Each committee shall be chaired by the head of the institution, and the secretary of each committee shall be the head of the ICT Department in the institution.

The roles of the committees shall include the following:

- Develop annual action plans for digital health activities.
- Implement digital health initiatives.
- Mobilise resources for implementing digital health initiatives.
- Enforce compliance with digital health standards and guidelines.
- Implement digital health capacity-building initiatives.
- Provide technical support and supportive supervision of digital health activities.
- Submit monthly reports to the MoHCDGEC.
- Conduct M&E of the Digital Health Strategy implementation.

4.5 Health Facility Digital Health Committees (HFDHC)

Health facilities shall establish Health Facility Digital Health Committees, which shall be responsible for overall coordination of digital health activities at the facility level. Each committee shall be chaired by the health facility in-charge, and the secretary of each committee shall be the head of ICT or appointed focal person.

The roles of the committees shall include the following:

- Create awareness on digital health in health facilities.
- Develop facility annual action plans for digital health activities.
- Mobilise resources for implementing digital health initiatives.
- Implement digital health initiatives.
- Enforce compliance with digital health standards and guidelines.
- Implement digital health capacity-building initiatives.
- Conduct mentorship and supportive supervision of digital health activities.
- Submit monthly reports on the implementation of the Digital Health Strategy to the respective authorities (MoHCDGEC, PORALG, RHMT, CHMT).
- Conduct M&E of the digital health activities.

5. Resource Mobilisation Framework

Successful implementation of digital health initiatives requires mobilisation of adequate resources at all levels of the health system, from the national to the health facility levels. Adequate financial, computing, and human resources need to be mobilised through various strategies. The Tanzania Digital Health Investment Road Map 2017–2023 indicates resources required for implementing various digital health initiatives. The Road Map will be revised from time to time to establish actual requirements as per the action plans.

5.1 Financial Resources

Financial resources required for the implementation of this Strategy will be mobilised at national and health facility levels through the following strategies:

- Budgeting and allocating funds for implementation of digital health initiatives.
- Strengthening cooperation with development and implementing partners.
- Writing proposals for grants and soft loans.
- Strengthening public-private partnership, including use of Service Agreements.
- Utilising health facility's own sources and other resources.

5.2 Human Resources

The government, in collaboration with partners, will ensure adequate skilled personnel—including ICT and M&E personnel required for the implementation M&E of this Strategy—are availed through various strategies, including the following:

- Recruiting and ensuring equitable distribution of skilled ICT personnel.
- Seconding staff to public and private health facilities.
- Developing memorandums of understanding between institutions to support the staffing of the implementation of digital health initiatives.
- Using a task-sharing approach to address shortages of ICT personnel.
- Seeking technical support from key stakeholders.

5.3 Computing Infrastructure

The MoHCDGEC will collaborate with relevant government authorities and other stakeholders to ensure availability of adequate and reliable computing infrastructure that is foundational for a successful implementation of this Strategy. The strategies for strengthening computing infrastructure will include:

- Improving availability and distribution of electricity from the national grid and other sources.
- Improving Internet connectivity in health facilities and institutions.
- Strengthening the use of existing government ICT resources (e.g., national data centre).
- Strengthening collaboration with telecommunication companies and mobile network operators.

6. Change and Adoption

Implementation of this Digital Health Strategy will require comprehensive change-management strategies. Change management is a fundamental driver of successful implementation and adoption of digital health solutions. Evidence indicates that key factors influencing the achievement of sustainable change and adoption are mostly organisational rather than technical factors. Therefore, sound change-management approaches are essential to the realisation of a bigger picture of the value and benefits of the Digital Health Strategy. These approaches will entail managerial support at all levels to ensure the uptake of digital health applications and integration into clinical workflows and administrative operations.

The change and adoption will be achieved through the following strategies:

- Create awareness amongst health managers and practitioners on digitalisation of health services.
- Provide adequate training on the use of digital health solutions.
- Create champions and communities of practice for promoting the use of digital health solutions and data use.
- Conduct mentorship and supportive supervision of digital health activities at all levels.
- Use skilled personnel with experience and expertise in system implementation and change-management practices.
- Develop and enforce change-management plan for transitioning from manual systems to digital solutions.
- Assess compliance assessment to standards and guidelines on the implementation of digital health systems.
- Implement change-management mechanisms to ensure transition from one system to another, or between versions of systems, and that changes in business processes do not negatively affect service provision.
- Collaborate with training institutions to integrate digital health and data-use aspects into pre-service and in-service health training curricula.
- Make implementation of the Digital Health Strategy a permanent agenda of all meetings at all levels of the health system.
- Implement evaluation and rating of digital health solutions at all levels.
- Improve documentation of digital health systems (e.g., systems requirements specifications, user-acceptance testing reports, system technical manuals, user manuals, and standard operating procedures).
- Improve structured user support and user feedback mechanisms.
- Collaborate with research and training institutions in the development of digital health solutions.
- Strengthen national, regional, and international collaborations as a vehicle for capacity building on emerging digital health innovations.
- Strengthen different Communities of Practice for digital health.

7. Research, Innovation, and Development in Digital Health

The health sector is amongst the most data-intensive sectors, and there is an increasing availability of large volumes of health data from more sources than ever before. It is therefore very important to explore innovative approaches that enhance effective management and efficient use of big data and emergency technologies for sustainable, scalable, and value-based transformation of health services delivery—and hence, the wider health system transformational change.

Emerging technologies—such as Internet of Things, wearables and sensors, blockchain, virtual reality, Artificial Intelligence, including machine learning, and big data analytics—have potential capacities to facilitate actionable insights that will enhance attainment of UHC, data quality, and effectiveness and efficiency in health services delivery.

The MoHCDGEC, in collaboration with universities, research institutions, and other stakeholders, will invest in research, innovation, and development to explore how existing and emerging digital technologies can be harnessed to inform evidence-based and cost-effective application of digital health technologies.

The Ministry, in collaboration with universities and research institutions, will:

- Conduct research and innovation activities to improve adoption of digital technologies in the health sector.
- Facilitate the translation of research evidence and information into policy and practice.
- Conduct operational and implementation research on digital health to inform decision-making, policy, and practice.
- Conduct research on emerging technologies to inform use in the health sector.
- Promote establishment of Digital Health incubation centres.

8. Monitoring, Evaluation, and Learning

The goal of monitoring, evaluation, and learning (MEL) is to ensure that the Digital Health Strategy delivers according to the national health priorities and that the planned activities are implemented in the right way to yield the desired outcomes. In this regard, the MEL is instituted as a strategic review mechanism to monitor progress, assess outcomes, and inform appropriate measures to be taken to ensure that the strategy delivers in accordance with the strategic priorities and expectations.

The MEL will be participatory, involving stakeholders in the implementation of the Digital Health Strategy. The M&E road map for the Digital Health Strategy implementation (section 8.4) will inform undertaking of the MEL.

8.1 Monitoring

Monitoring refers to the tracking of the progress of implementation of the Digital Health Strategy. Monitoring of the Strategy will involve continuous data collection at all levels of the health system.

In order to monitor the implementation of this Strategy, the following shall be done:

- Review digital health action plans in line with the strategic priorities and initiatives of this Strategy.
- Prepare and distribute monitoring and reporting guidelines to all levels of the health system. The guidelines will include the format of data-collection instruments, indicators, flow of information, reporting formats, and reporting schedules.
- Collect information related to monitoring of structural, process, and outcome indicators that reflect the implementation of this Strategy.
- Disseminate the monitoring reports of the Strategy implementation to all levels of the health system and other stakeholders.
- Develop and implement M&E capacity initiatives to ensure high-quality outcomes.

8.2 Evaluation

Evaluation is a critical and objective appraisal of the overall Digital Health Strategy implementation. The evaluation will focus on performance and achievement of outputs, outcomes, and impacts. There shall be two main evaluation phases: the first one is at the middle of implementation of the Strategy (midterm evaluation) and the second evaluation at the end of the fifth year (end-line evaluation).

In order to evaluate the implementation of this Strategy, the following shall be done:

(i) Define structural, process, and outcome indicators that provide informative and actionable insight into the Digital Health Strategy implementation performance and adoption of digital health, as well as the tangible results for the health-sector and non-health-sector stakeholders.

(ii) Identify baseline for all types of indicators from output to outcomes to allow effective evaluation of progress over the duration of the plan.
(iii) Collect information relating to evaluation of structural, process, and outcome indicators that reflect the implementation of this Strategy.
(iv) Engage an external evaluator for the midterm and final evaluation of the implementation of the Strategy.
(v) Disseminate the evaluation reports of the implementation of the Strategy to all levels of the health system and other stakeholders.

8.3 Learning

Learning is an important component of this Strategy that aims at analysing the data gathered from the continued monitoring and periodic evaluation (baseline, midterm, and end-line) to inform and thus improve implementation of this Strategy.

The learning component of this Strategy will include:

(i) Periodic analysis and review of the process—structural and outcome indicators to have real-time indicators.
(ii) Periodic analysis and review of the stakeholders involved in implementation of this Strategy by including newly identified and appropriate stakeholders.
(iii) Periodic analysis and review of the resources required for the implementation of this Strategy.
(iv) Analysis of the monitoring reports, best practices, and research findings for continuous learning to inform the implementation of this Strategy.
(v) Analysis of the midterm and final evaluation reports, as well as documentation of the lessons learnt from implementation of this Strategy to inform the next strategy.

8.4 M&E Road Map for the Digital Health Strategy Implementation

Table 5. Monitoring and evaluation road map for the National Digital Health Strategy 2019–2024 implementation.

Priority Area	Strategic Priority	No.	Strategic Initiatives	Indicator	Target
1	Strengthen digital health governance and leadership to facilitate better coordination and implementation of digital health initiatives	1.1	Strengthen the governance structures to enable effective coordination, management oversight, and implementation of digital health initiatives across the health sector	(i) Presence of the digital health governance structure across all health system levels (ii) Presence of a functional governance structure for coordination and management of the Digital Health Strategy implementation (measured by number of meetings held, number of digital health initiatives reviewed and approved, number of implementation reports, etc.)	(i) The digital health governance structure across all health system levels established by December 2019 (ii) Digital health governance structure across all health system levels functional by June 2020
		1.2	Develop a costed action plan for the implementation of the Digital Health Strategy	(i) Presence of a 5-year costed action plan for the implementation of the Digital Health Strategy (ii) Presence of annual costed action plans for the implementation of the Digital Health Strategy	(i) A 5-year costed action plan for the Digital Health Strategy implementation in place by July 2019 (ii) Annual costed action plans for the implementation of the Digital Health Strategy in place by June of every year
		1.3	Develop a resource mobilisation plan to ensure successful implementation of	Availability of the resource mobilisation plan for implementation of the Strategy	Availability of the resource mobilisation plan for implementation of the Strategy in place by July 2019

			the Strategy		
		1.4	Improve the legal and regulatory framework to ensure client safety, data security, confidentiality, and privacy	Presence of legislation, regulations, and guidelines for ensuring client safety, health data security, confidentiality, and privacy	Legislation, regulations, and guidelines for ensuring client safety, health data security, confidentiality, and privacy developed by December 2021
		1.5	Develop a change-management plan	Presence of change-management plan	Change-management plan developed by June 2020
		1.6	Implement digital health–initiatives inventory and digital library	Availability of functional digital health–initiatives inventory and digital library	Functional digital health–initiatives inventory and digital library in place by December 2019
2	Improve efficiency, patient safety, and quality and continuity of care through digitalisation of health service delivery in a holistic manner	2.1	Digitalise health care services at health facility levels	Presence of digitalised health care services in health facilities	Health facilities with digitalised health care services in place by June 2024: • All hospitals • 80% of health centres and dispensaries
		2.2	Implement standardised ePrescription	(i) Presence of standardised ePrescription (ii) Proportion of health facilities using standardised ePrescription	(i) Standardised ePrescription in place by June 2020 (ii) Standardised ePrescription implemented in 80% of health facilities by June 2024
		2.3	Implement standardised insurance eClaim	(i) Presence of standardised insurance eClaim (ii) Proportion of health facilities and insurance providers using standardised insurance eClaim (iii) Proportion of insurance providers using standardised insurance eClaim	(i) Standardised insurance eClaim developed by December 2020 (ii) Standardised insurance eClaim utilised by all health facilities and insurance providers by June 2024 (iii)Standardised Insurance eClaims implemented in 80% of health facilities by June 2024
		2.4	Implement integrated eReferral solutions	(i) Presence of integrated eReferral solutions	(i) Integrated eReferral solutions developed by December 2020

				(ii) Proportion of referrals in health facilities done through integrated eReferral solutions	(ii) Integrated eReferral solutions utilised by all health facilities by June 2024
		2.5	Digitalise community-based health services	(i) Presence of digitalised community-based health services (ii) Proportion of community-based health services delivered through digital solutions	60% of all community-based health services digitalised by June 2024
		2.6	Implement a digital platform for managing clients' feedback on the quality of services received at the health facilities	Percentage of clients using the digital platform to provide feedback on the quality of services	Feedback by 30% of all clients on the quality of services received at the health facilities provided through use of the digital platform by June 2024
3	Improve health workforce competency and equitable access to specialised health care using telehealth	3.1	Develop guidelines to streamline implementation and operationalisation of telehealth services	Development of guidelines to streamline implementation and operationalisation of telehealth services	Guidelines to streamline implementation and operationalisation of telehealth services in place by June 2020
		3.2	Improve information and communications technology (ICT) infrastructure to support delivery of telehealth services	Proportion of health facilities with required ICT infrastructure to support delivery of telehealth services	Required ICT infrastructure to support delivery of telehealth services maintained in 70% of all health facilities by June 2024
		3.3	Implement telemedicine services	Proportion of health facilities providing telemedicine services	(i) Telemedicine services provided by all hospitals by June 2024 (ii) Telemedicine services provided by 50% of health centres and dispensaries by June 2024
		3.4	Implement digital platforms for health professional peer networking	Proportion of health workers using the health professional peer network	Operational digital platforms for health professional peer networking used by 80% of health professionals by June 2024

		3.5	Implement eLearning and knowledge management platforms for continuous professional development	(i) Presence of digital learning and knowledge management platforms for continuous professional development (ii) Proportion of health workers enrolled for courses on digital learning platforms (iii) Proportion of health workers who completed at least one course delivered through the digital learning platform	(i) Digital learning and knowledge management platforms developed by December 2019 (ii) 50% of health workers enrolled in digital learning and knowledge management platforms by June 2024 (iii) Courses completed by 60% of the health workers enrolled in the digital learning and knowledge management platforms for continuous professional development by June 2024
4	Promote healthy behaviour through access to health information, education, and communication (IEC)	4.1	Develop guidelines for effective use of interactive digital platforms for health IEC	Development of guidelines for effective use of interactive digital platforms for IEC	Guidelines for effective use of interactive digital platforms for IEC developed by December 2020
		4.2	Implement interactive digital platforms for health IEC	(i) Availability of interactive digital platforms for IEC (ii) Proportion of mobile phones and Internet subscribers using interactive digital platforms for IEC	Interactive digital platforms for IEC used by 75% of mobile phones and Internet subscribers by June 2024
5	Enhance seamless and secure information exchange	5.1	Finalise and institutionalise Tanzania Health Enterprise Architecture	Proportion of digital health solutions whose development is guided by the Health Enterprise Architecture	Development of all digital health solutions guided by the Health Enterprise Architecture by June 2024
		5.2	Strengthen use of data, application, and technology standards (e.g., International Classification of Diseases, 10th Revision; Health Level-7; Digital Imaging and Communications in	Percentage of health facilities using data, application, and technology standards	Health facilities with data, application, and technology standards in place by June 2024: • All hospitals • 80% of health centres and dispensaries

			Medicine; Logical Observation Identifiers Names and Codes; and service codes)		
		5.3	Implement terminology services for standardised health terminologies, codes, data elements, and value sets	Percentage of health facilities using standardised health terminologies, codes, data elements, and value sets	Health facilities with standardised health terminologies, codes, data elements, and value sets in place by June 2024: • All hospitals • 80% of health centres and dispensaries
		5.4	Strengthen interoperability across different systems within health and other sectors	Proportion of interoperable digital health solutions within health and other sectors	90% of all digital health solutions interoperable by June 2024
		5.5	Implement client and health worker registries	(i) Presence of functional client registry (ii) Presence of functional health worker registry	(i) Client registry functional by June 2020 (ii) Health worker registry functional by June 2021
		5.6	Strengthen the Health Facility Registry (HFR) and health commodities registries	(i) Presence of improved HFR (ii) Presence of improved health commodities registries	(i) Improved health facility registry functional by June 2020 (ii) Improved health commodities registries functional by June 2021
		5.7	Implement shared client health records	Proportion of health facilities using shared client health records	Shared health records utilised in all digitalised health facilities by June 2021
		5.8	Strengthen standards and guidelines for secure data storage, processing, information exchange, and dissemination	Percentage of health facilities using standards and guidelines for secure data storage, processing, information exchange, and dissemination	Standards and guidelines for secure data storage, processing, information exchange, and dissemination used by all health facilities by June 2024
6	Improve data use for evidence-based actions at all levels of the	6.1	Implement digital solutions for facility supervision	(i) Presence of digital solutions for facility supervision (ii) Proportion of health facilities supervised using the digital	(i) Digital solutions for facility supervision developed by June 2020 (ii) All health facilities supervised using digital solutions in the health service

	health system			solutions	delivery system by June 2024
		6.2	Strengthen continuous professional development programmes on data use for health workers	(i) Presence of a training package for data use for health workers (ii) Proportion of health workers trained on data use (iii) Proportion of health facilities utilising data for evidence-based actions and dissemination	(i) A training package for data use for health workers developed by December 2019 (ii) 80% of all health workers trained on data use by June 2024 (iii) Data for evidence-based actions and dissemination used by all health facilities by June 2024
		6.3	Incorporate data-use aspects in pre-service and in-service curricula	Percentage of health training institutions implementing curricula with data-use aspects	Curricula incorporated with data-use aspects by all health training institutions by June 2024
		6.4	Strengthen the national health data warehouse	Percentage of hospitals and institutions that provide data to the data warehouse	Data provided to the data warehouse by 80% of public and private health facilities and all institutions by June 2024
		6.5	Improve the Health Management Information System (HMIS), including indicators and data analytics	Presence of improved HMIS with new indicators and data analytics	Improved HMIS functionality by June 2020
7	Improve supply chain management of health commodities at all levels of the health system	7.1	Strengthen logistics management information systems (MIS)	Proportion of health facilities; Ministries, Departments, and Agencies (MDA); and local government authorities (LGAs) using electronic Logistics Management Information System (eLMIS) integrated with other information systems	An integrated eLMIS utilised at all health facilities, MDA, and LGAs by June 2022
		7.2	Implement digital solution for tracing and tracking of health commodities	Proportion of health facilities, Medical Stores Department (MSD), Tanzania Food & Drugs Authority (TFDA), and other institutions using digital solution for tracing and	Use of digital solution for tracing and tracking of health commodities by all health facilities, MSD, TFDA, and other institutions implemented by June 2021

				tracking of health commodities	
		7.3	Integrate the national product registry of medicines, medical supplies, and medical devices with other systems	Proportion of systems integrated with the national product registry for medicines, medical supplies, and medical devices	The national product registry of medicines, medical supplies, and medical devices integrated with all systems by December 2023
		7.4	Strengthen the adverse-drug-reactions reporting system for medicines, medical devices, and cosmetics	Proportion of health facilities using an adverse-drug-reaction reporting system integrated with Health Facility Electronic Management Systems	An adverse-drug-reaction reporting system integrated with Health Facility Electronic Management Systems used by 80% of all health facilities by December 2021
8	Improve management of human resources at all levels of the health system	8.1	Improve human resources for health (HRH) MISs	Proportion of health institutions and facilities using integrated HRH MIS	Integrated HRH MIS used by all health institutions and facilities by June 2022
		8.2	Improve digital solutions for management and monitoring of HRH production and absorption	(i) Presence of digital solution that enables tracking of health graduates (ii) Proportions of HRH of different cadres tracked from training institutions (iii) Proportions of HRH of different cadres tracked from employers	A functional digital solution for tracking health graduates implemented by June 2023
		8.3	Integrate the health worker registry with existing human resource systems (including Human Capital Management Information System [HCMIS], Human Resources for Health Information System [HRHIS], health worker regulatory board databases, and Training Institution Information	(i) Integration of health workers' registry to existing HR systems (ii) Proportion of health institutions and facilities that utilise health worker registry that is integrated with existing human resource systems (including HCMIS, HRHIS, health worker regulatory board databases, TIIS).	A functional health worker registry that is interoperable with existing human resource systems (including HCMIS, HRHIS, health worker regulatory board databases, TIIS) implemented by June 2023

			System [TIIS]) through an interoperability layer		
		8.4	Implement biometric attendance registers at health facilities and institutions	Proportions of health institutions and facilities using biometric attendance register	Biometric attendance register used by 90% of health institutions and facilities by June 2023
		8.5	Implement digital solutions for improving and tracking performance of health workers	Presence of functional digital solutions for improving and tracking performance	Functional digital solutions for improving and tracking performance implemented by June 2021
9	Improve management of financial resources	9.1	Improve digital solutions for planning, budgeting, revenue collection, accounting, auditing, and reporting at all levels	Proportion of district councils and health facilities using improved planning and reporting system (PlanRep) software	Improved PlanRep software used by all district councils and health facilities by June 2023
		9.2	Integrate electronic revenue collection systems in all public health facilities and institutions with the Government ePayment Gateway (GePG)	Proportions of public health institutions and facilities using revenue collection systems that are integrated with GePG	Revenue collection systems integrated with GePG used by all public health institutions and facilities by June 2022
		9.3	Strengthen digital solutions for health insurance management	Proportion of health facilities utilising digital solutions for health insurance management	Digital solutions for health insurance management utilised by all health facilities by June 2021
10	Strengthen disease prevention, surveillance, detection, reporting, response, and control at all levels of the	10.1	Strengthen the disease surveillance and response system	Presence of an interoperable digital solution to support disease surveillance and response	An interoperable digital solution for supporting disease surveillance and response functional by December 2022
		10.2	Strengthen integration of the electronic Integrated Diseases Surveillance and Response System (eIDSR) with related systems in East African Community Partner	Integration of eIDSR with related systems in East African Community Partner States	eIDSR integrated with related systems in East African Community Partner States by June 2022

	health system		States		
		10.3	Strengthen digital solutions for promotion of safe water, sanitation, hygiene, and food safety services	(i) Presence of digital solutions for promotion of safe water, sanitation, hygiene, and food safety services (ii) Integration of the National Sanitation Management Information System (NSMIS) and the HMIS	A functional NSMIS integrated with HMIS by June 2022
		10.4	Implement digital solutions for tracking and reporting of injuries, emergencies, and disasters	Implementation of digital solutions for tracking and reporting of injuries, emergencies, and disasters	Digital solutions for tracking and reporting of injuries, emergencies. and disasters implemented by June 2024

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Appendices

Appendix 1: Stakeholders' Engagement in the Development of the Strategy

A wide range of stakeholders, including individuals and institutions and multidisciplinary experts, contributed in the development of Tanzania's National Digital Health Strategy 2019–2024 in order to ensure it is aligned to the national priorities and shared goals of different stakeholders. The Ministry of Health, Community Development, Gender, Elderly and Children expresses special appreciations to different stakeholders who were engaged throughout the process of developing this Strategy. Table 6 provides a list of individual names and organisations that contributed to this work during consultative meetings.

Table 6. List of contributors to the development of the Digital Health Strategy.

S/N	Name	TITLE	INSTITUTION
A: Stakeholders Engagement			
1.	Prof. Mohamad Kambi Bakari	Chief Medical Officer	MoHCDGEC
2.	Mr. Haji Bamsi	Director of ICT	MOHCDGEC
3.	Silvanus Ilomo	Acting Head, ICT	MoHCDGEC
4.	Hermes Rulagirwa	Former Head, ICT	MoHCDGEC
5.	Tumainiel Macha	Ass. Director M&E	MoHCDGEC
6.	Erick Kitali	Director of ICT	PORALG
7.	Dr. Anna Nswilla	Ass. Director Health Services	PORALG
8.	Arnold Matoyo	Ass. Director of ICT	POPSM
9.	Walter Ndesanjo	ICT Officer	MoHCDGEC
10.	Enock Mhehe	M&E	MoHCDGEC
11.	Dr. Liggyle Vumilia	Coordinator, Telehealth	MoHCDGEC
12.	Sultana Seiff	ICT Officer	MOH MoHCDGEC
13.	Esther Msechu	ICT Officer	MoHCDGEC
14.	Jackson Shayo	ICT Officer	MoHCDGEC
15.	Langson Nzoyo	ICT Officer	MoHCDGEC
16.	Sosthenes Bamhuge	SICT	MoHCDGEC
17.	Edwin Nyella	HIS Advisor	MoHCDGEC
18.	Velda Aloyce	Health Secretary, CMO	MoHCDGEC
19.	Levina Kimaro	Planning Officer	MoHCDGEC
20.	Dr. Yasinta Kisisiwe	Senior Officer, HPS	MoHCDGEC
21.	Melchiory Baltazary	SICTO	PORALG
22.	Yasinta Kijuu	PST	PORALG
23.	Dr. Boniface Marwa	Senior Medical Officer	PORALG
24.	Mark Tanda	ICTO	PORALG
25.	Mosses Makoko	MISS	eGA
26.	Goodluck Moshi	ICT Officer	eGA
27.	Dr. Saidi Jafari	Lecturer	IFM
28.	Dr. David Nzava	Registrar	Medical Council of Tanganyika
29.	Dr. Henry Mwanyika	Regional DH Director	PATH
30.	Jacqueline Patrick	Former Director, DUP	PATH
31.	Neema Ringo	Senior Programme Officer	PATH
32.	Elaine Barker	Senior Programme Officer	PATH
33.	Auson Kisanga	Technical Programme Officer	PATH
34.	Oswald Luoga	Product Development lead	PATH

35.	David Karunda	Programme Officer	PATH
36.	Emma Nicodemus	Programme Coordinator	MoHCDGEC/PATH
37.	Eden Mathew	Digital Health Specialist	PORALG/PATH
38.	Pascal Pastory	Director ICT	MSD
39.	Ambele Mwafula	Head of ICT	TFDA
40.	Alexander Sanga	DICT	NHIF
41.	Bakari Yahya	PICTO	NHIF
42.	Ernest Itwana	Head, ICT	CSSC
43.	Modou Gaye	DICT	MNH
44.	Yu Shibui	Health Specialist	UNICEF
45.	Bayo Emmanuel	Innovation Officer	UNICEF
46.	Rashida A. Khatib	Principal Scientist	IHI
47.	Hellen Magige	M&E Advisor	MSH
48.	Revocatus Mtesigwa	Information System Manager	PS3
49.	Tuzo Englebert	DHIS2 Team Lead	UDSM
50.	Erick Msofe	Senior Advisor	GIZ
51.	Sri Perera	HSS Advisor	CDC
52.	Bonita Kilama	Associate Director Strategic Information, and Evaluation	EGPAF
53.	Kakunda Kassongo	M –Health Advisor	Family Health International 360
54.	Mavere Jukai	Chief of Party	GHSC TA – TZ
55.	Patrick Muro	Head, ICT	MNH
56.	Zabron Abel	Business Development & Digital Health Manager	TTCIH – Ifakara
57.	Irene Mwoga	Strategic HIS Officer	WHO
58.	Paul Bwathondi	Directorate, Planning & Development	MSH
59.	Giampiero Baldassari	Social Protection lead	GIZ
60.	Kira Thomas	Chief Health	KOICA
61.	Sabine Flessenkamper	Programme Manager	GIZ
62.	Geert Haverkamp	Programme Director	PharmAccess
63.	Ingrid HerkerWeipra	Technical Director	PharmAccess
64.	Ally Kebby	Technical Advisor	HPSS
65.	Claudette Jollebo	Programme Manager	HDIF
66.	Dr. Honest Kimaro	Senior Lecturer	UDSM
B: Strategy Development Team			
1.	Dr. Felix Sukums	Lead Consultant and DICT	MUHAS
2.	Dr. Gasto Frumence	Consultant & Senior Lecturer	MUHAS
3.	Dr. Tumaini Nyamhanga	Consultant & Senior Lecturer	MUHAS
4.	Dr. Nathanael Sirili	Consultant & Lecturer	MUHAS
5.	Dr. Respickius Casmir	Consultant & Senior Lecturer	CBE
6.	Dr. John Kaswija	Consultant & Medical Specialist	ZHRC-LZHTI, MoHCDGEC
7.	Prof. Edda Tandi Lwoga	Consultant & Deputy Rector	CBE

Abbreviations: CBE, College of Business Education; CMO, chief medical officer; CSSC, Christian Social Services Commission; DHIS2, District Health Information System software version 2; DH, Digital Health; DUP, Data Use Partnership; eGA, e-Government Agency; EGPAF, Elizabeth Glaser Pediatric AIDS Foundation; GHSC TA-TZ, Global Health Supply Chain Technical Assistance – Tanzania; GIZ, Deutsche Gesellschaft für Internationale Zusammenarbeit; HDIF, Human Development Innovation Fund; HIS, health information systems; HPS, Health Promotion Section; HPSS, Health Promotion and System Strengthening; HSS, health systems strengthening; ICT, information and communications technology; IHI, Ifakara Health Institute; KOICA, Korea International Cooperation Agency; Lake Zone Health Training Institute, LZHTI; M&E, monitoring and evaluation; MNH, Muhimbili National Hospital; MoHCDGEC, Ministry of Health, Community Development, Gender, Elderly and Children; MSD, Medical Stores Department; MSH, Management Sciences for Health; MUHAS, Muhimbili University of Health and Allied Sciences; NHIF, National Health Insurance Fund; PORALG, President's Office– Regional Administration and Local Government; PS3, Public Sector Systems Strengthening; TFDA, Tanzania Food & Drugs Authority; TTCIH, Tanzanian Training Centre for International Health; UDSM, University of Dar es Salaam; UNICEF, United Nations Children's Fund; WHO, World Health Organization; Zonal Health Resource Centre, ZHRC.

Appendix 2: Members of National Digital Health Committees

Table 7. National Digital Health Steering Committee (NDHSC) members.

S/N	Designation	Institution	Role
1.	Permanent Secretary	MoHCDGEC	Chairperson
2.	Permanent Secretary	PORALG	Co-Chairperson
3.	Chief Medical Officer	MoHCDGEC	Member
4.	Director of ICT	MoHCDGEC	Secretary
5.	Director of Policy and Planning	MoHCDGEC	Member
6.	Chief Accountant	MoHCDGEC	Member
7.	Director of Legal Unit	MoHCDGEC	Member
8.	Chair of DPG Health	DPG Health	Member
9.	Chief Executive Officer	eGA	Member
10.	Director General	COSTECH	Member
11.	Director of ICT	POPSM&GG	Member
12.	Director of ICT	PORALG	Member
13.	Representative from RMOs	Region	Member
14.	Representative from DMOs	Council	Member
15.	Representative	APHFTA	Member
16.	Representative	CSSC	Member
17.	Representative	BAKWATA	Member
18.	Representative	ACADEMIA	Member
	Co-opted members		
1.	Director of Administration Human Resources Management	MoHCDGEC	Member
2.	Director of Curative Services	MoHCDGEC	Member
3.	Director of Preventive Services	MoHCDGEC	Member
4.	Director of Human Resource Development	MoHCDGEC	Member
5.	Chief Pharmacist	MoHCDGEC	Member
6.	Director of Nursing Services	MoHCDGEC	Member
7.	Assistant Director M&E	MoHCDGEC	Member
8.	Director of Health, Social Welfare and Nutrition Services	PORALG	Member
9.	Director General	NHIF	Member
10.	Director General	TMDA	Member
11.	Director General	MSD	Member
12.	Chief Executive Officer	TTCL	Member
13.	Chief Executive Officer	NIDA	Member
14.	Chief Executive Officer	RIDA	Member
15.	Representatives	Implementing Partners	Member

Abbreviations: APHFTA, Association of Private Health Facilities in Tanzania; BAKWATA, Baraza Kuu la Waislamu Tanzania (National Muslim Council of Tanzania); COSTECH, Commission for Science and Technology; CSSC, Christian Social Services Commission; DMO, District Medical Officer; DPG, Development Partners Group; eGA, e-Government Agency; ICT, information and communications technology; M&E, monitoring and evaluation; MoHCDGEC, Ministry of Health, Community Development, Gender, Elderly and Children; MSD, Medical Stores Department; NHIF, National Health Insurance Fund; NIDA, National Identification Authority; POPSM&GG, President's Office, Public Service Management and Good Governance; PORALG, President's Office–Regional Administration and Local Government; RIDA, Regional Identification Authority; RMO, Regional Medical Officer; TMDA, Tanzania Medicines & Medical Devices Authority; TTLC, Tanzania Telecommunications Corporation Limited.