



REPUBLIC OF SIERRA LEONE
Ministry of Health

National **Digital** **Health** Roadmap | 2024-2026





REPUBLIC OF SIERRA LEONE
Ministry of Health

National **Digital**
Health Roadmap | 2024 - 2026

TABLE OF CONTENTS

ACKNOWLEDGEMENT	v
FOREWORD	vi
LIST OF ACRONYMS	vii
EXECUTIVE SUMMARY	ix
1. INTRODUCTION	1
1.1. Background and Context	1
1.2. The National Digital Health Enabling Environment	2
1.3. The COVID-19 Pandemic Challenge and Digital Health	3
1.4. Making a Case for a National Digital Health Roadmap	3
2. SITUATION ANALYSIS	5
2.1. Landscape Assessment	5
2.2. Stakeholders analysis	13
2.3. SWOT Analysis	15
3. IMPLEMENTATION ROADMAP	17
3.1. Implementing the National Digital Health Roadmap	17
3.2. Strategic Objectives and Interventions	17
3.3. Leadership and Governance	18
3.4. Strategy and Investment	20
3.5. Services and Applications	21
3.5.1. District Health Management Information System	22
3.5.2. Electronic Health Records Systems deployment (EHR)	23
3.5.3. Electronic Logistics Management Information System (eLMIS)	24
3.5.4. Integrated Human Resource Information System (iHRIS)	25
3.6. ICT Infrastructure	26
3.7. Standards and Interoperability	27
3.8. Legislation, Policy, and Compliance	29
3.9. Health Workforce	30
4. IMPLEMENTATION FRAMEWORK	33
5. MONITORING AND EVALUATION FRAMEWORK	34
6. COSTING AND BUDGET	35
ANNEXURES	36
a. ANNEX I: IMPLEMENTATION PLAN	36
b. ANNEX II: MONITORING AND EVALUATION	64
c. ANNEX III: COSTING AND BUDGET	80
d. ANNEX IV: LIST OF CONTRIBUTING ORGANIZATIONS	83

TABLE OF FIGURES

Figure 1.0: Sierra Leone Digital Health Development Milestones	3
Figure 2.0: The Digital Health Ecosystem Action Lines	5
Figure 2.1: Digital health milestones 2018-2023	6
Figure 2.2: Average download speed in health facilities surveyed	7
Figure 2.3: Computing infrastructure Gap in 6 District Hospitals	8
Figure 2.4: Power infrastructure types in Health Facilities	8
Figure 2.5: Component Based Enterprise Systems Architecture	9
Figure 2.6: Priority health systems component areas requiring digital health interventions	12
Figure 2.7: Self-rating of computer literacy by Health Workers	13
Figure 2.8: Digital Health Stakeholders Mapping	14
Figure 2.9: SWOT Analysis of Digital Health Enabling and ICT Environments	16
Figure 3.0: Theory of Change for National Digital Health Vision	18
Figure 3.1: Proposed Digital Health Governance Structure	20
Figure 3.2: Stakeholders prioritization of health systems challenges requiring digital health interventions	22
Figure 3.3: DHIS 2 maturity profile	23
Figure 3.4: QEHSSSP “Hub” and “Spokes” facilities	24

TABLES

Table 2.0: Digital health tools deployed in health facilities assessed	10
Table 2.1: Role of key digital health stakeholder groups	14
Table 3.0: Core digital health competence mapping	32
Table 3.1: Implementation matrix	36
Table 4.0: Monitoring and Evaluation Log frame	64
Table 5.0: Indicative Costing Table	80



ACKNOWLEDGEMENT

This digital health roadmap document is the product of consultative and technical reviews by stakeholders from public health and ICT sectors, the private sector, academia, and development sector.

The Ministry of Health wishes to acknowledge the contribution of all individuals, units, departments, directorates and institutions, whose individual and collective efforts have culminated in the development of the Roadmap document.

Our appreciation goes to the Honourable Minister of Health and Sanitation, Dr Austin H. Demby whose visionary leadership and insistence on laying down a clear pathway to achieving digital transformation in the health sector has energized the achievement of this feat in a timely manner.

Our thanks and appreciation also go to the United Nations Children's Fund (UNICEF) and the United States Agency for International Development (USAID), our key partners, who provided both funding and technical support for the development of this document.

The Roadmap development would have been impossible without the direction provided by the Directorate of Policy, Planning, and Information with support of the Ministry of Communications, Technology, and Innovations (MCTI). We are therefore grateful to the Director, Dr. Francis Smart, who led the process, and other Directors and Managers from Directorates, Programmes and Agencies of both Ministry of Health and Ministry of Communications, Technology, and Innovations (MCTI).

We also want to particularly recognize the role of our District Health Management Teams for their immense contributions, passion, and commitment towards the development of this document.

Finally, we acknowledge our respected partners, both not-for-profit and private implementing organizations, who actively contributed to the development of this Roadmap and highly expected to play an even greater role during its implementation. To our Digital Health Consultant, Dr Iniobong Ekong who facilitated the roadmap development process, we say thank you.

A handwritten signature in blue ink, appearing to read 'Sartie Kenneh'.

Dr Sartie Kenneh
Chief Medical Officer
Ministry of Health



FOREWORD

Governments world over are adopting digital technologies to address health systems challenges and transform the health sector. The digital transformation agenda was further orchestrated by the global COVID-19 pandemic threat which increased the need to rapidly respond to public health threats and predict future disease outbreaks.

The Ministry of Health recognized the huge potential of enabling and delivering Universal Health Coverage (UHC) through implementation of the National Digital Health Strategy which had outlined strategic approaches linked to the UHC outcomes.

This prompted the need to develop a Digital Health Roadmap to coordinate stakeholders' actions, create ownership, mobilize resources, and guide operationalization of the Strategy.

The Roadmap development was therefore an inclusive process of co-creating a shared vision among multi-stakeholder groups to obtain their full commitment and ownership of the digital transformation agenda in the health sector in line with the national digital health vision.

This document represents the collective intended actions, outputs and outcomes, targets, timelines, resource requirements and monitoring and evaluation plan for the Roadmap by all stakeholders. It leverages the importance of partnership and collaboration to accelerate improvement in health outcomes.

The roll-out of this document is therefore timely and of strategic importance in addressing the challenges faced in implementing the Sierra Leone digital health vision. It is intended to help mobilize the required support and investments towards sustainability of digital health interventions through a transparent, accountable, and well-coordinated process.

I therefore recommend this document to all investors, donors, partners, academia, health care providers, health systems managers and the general public to take advantage of and fully participate in accelerating the achievement of UHC through an effective and sustainable National digital health programme.

This Roadmap is henceforth the guiding document and reference for digital health and should be leveraged in the preparation of annual plans at the national, programme, local council, CSO and implementing partner levels. I therefore invite you all to consult and use it extensively for the betterment of national health outcomes over the next three years and beyond.

Austin Demby
Dr Austin H. Demby
Minister of Health

LIST OF ACRONYMS

AOP	Annual Operational Plan
CHC	Community Health Centre
CHP	Community Health Post
CMMS	Computerized Maintenance Management Software
CoP	Community of Practice
CPD	Continuous Professional Development
CRVS	Civil Registration and Vital Statistics
CSO	Civil Society Organizations
DPPA	Digital Pandemic Preparedness Assessment
DPHC	Directorate of Primary Health Care
DPPI	Directorate of Policy, Planning, and information
DPG	Digital Public Good
DPS	Directorate of Pharmaceutical Services
DHMT	District Health Management Team
DHS	Demographic and Health Survey
DHSE	Directorate of Health Security and Emergencies
DICOM	Digital Imaging and Communications in Medicine
DMEO	District Monitoring and Evaluation Officers
DPRCH	Directorate of Reproductive and Child Health
DSTI	Directorate of Science Technology and Innovation
DQA	Data Quality Audit
eSMT	Electronic Stock Management Tool
EDIT	Early-Stage Digital Health Investment Tool
EMR	Electronic Medical Records System
EHR	Electronic Health Records Systems
FHIR	Fast Healthcare Interoperability Resources
GoSL	Government of Sierra Leone
HDI	Human Development Index
HL7	Health Level 7
HMIS	Health Management Information System
ICD	International Classification of Diseases
ICT	Information and Communications Technology
iHRIS	Integrated Human Resources Information System
ISO	International Standards Organization
ISSV	Integrated Supportive Supervision Visits
LMIS	Logistics Management Information Systems

LOINC	Logical Observation Identifiers Names
MCHP	Maternal and Child Health Post
MCTI	Ministry of Communications, Technology, and Innovations
MEAL	Monitoring, Evaluation, Accountability and Learning
MDC-SL	Medical and Dental Council Sierra Leone
M&E	Monitoring and Evaluation
MNCH	Maternal Newborn and Child Health
MoH	Ministry of Health
NaMED	National Monitoring and Evaluation Directorate
NATCOM	National Telecommunications Commission
NCDs	Non-Communicable Diseases
NDHS	National Digital Health Strategy
PMTCT	Prevention of Mother-To-Child Transmission
PHU	Peripheral Health Unit
QEHSSSP	Quality Essential Health Services and Systems Support Project
RRIV	Report, Request, and Issue Voucher
SARA	Service Availability and Readiness Assessment
SDGs	Sustainable Development Goals
SLeSHI	Sierra Leone Social Health Insurance Scheme
SMART	Standards-based, Machine-readable Requirement- based and Testable
STATS SL	Statistics Sierra Leone
SNOMED CT	Systematized Nomenclature of Medicine Clinical Terms
UADF	Universal Access Development Fund
UHC	Universal Health Coverage
UNICEF	United Nations International Children's Fund
UNOPS	United Nations Office for Project Services
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

Background

Sierra Leone's National Digital Health Strategy was developed in 2018 to coordinate actions and nurture the enabling environment required for digital transformation in the health sector. Despite these efforts, optimal benefits were not realized due to the absence of a roadmap to operationalize the document. This led to sub-optimal coordination output with resultant fragmentation of digital health interventions by multiple stakeholders' and slow implementation of several post COVID-19 digital pandemic assessment recommendations.

To improve coordination and implement recommended actions, the MoH, with support of partners, has collaboratively developed this investment roadmap. Implementation of the Roadmap will harness better coordination through reduction in duplication of efforts, prioritize digital health interventions, mobilize additional resources, and optimize the use of available resources over the next 3 years.

Situation analysis

The situational analysis summarizes the presence of a strong political will and action, governance structure and supporting strategy for digital health. It also captures existing digital health interventions with supporting infrastructure and health workforce. However, there exists gaps in governance, regulation, funding, infrastructure, and digital literacy of the health workforce. Stakeholders collaboratively analyzed these gaps and made recommendations which have been adapted into activities linked with inputs, outputs and outcomes using the Result Based Management approach.

Strategic orientations

The Roadmap has 7 strategic objectives corresponding to the digital health enabling and ICT environments, 25 specific objectives and 68 interventions for implementation over a period of 36 months.

Component Area	Objectives	Interventions
Leadership and Governance	3	10
Strategy and Investment	3	9
Services and Applications	4	16
Infrastructure	4	10
Standards and Interoperability	5	8
Legislation, Policy, and Compliance	3	6
Health Workforce	3	9
Total	25	68

Financing plan: To successfully implement these activities and derive optimal benefits, below is the summary of estimated costs of implementing the Roadmap activities;

Component Area	2024	2025	2026	Total Cost (NLE)	Total (USD)	%
Leadership & Governance	1,505,388	3,387,122	2,634,428	7,526,938	320,295	3.4
Strategy and Investment	1,161,982	2,614,460	2,033,469	5,809,912	247,230	2.6
Services and Applications	28,507,155	64,141,099	49,887,521	142,535,775	6,065,352	63.6
Infrastructure	4,862,824	10,941,353	8,509,941	24,314,118	1,034,643	10.8
Standards & Interoperability	321,170	722,633	562,048	1,605,850	228,334	2.4
Legislation, Policy & Compliance	1,042,228	2,345,013	1,823,899	5,211,140	221,751	2.3
Health Workforce	6,694,726	15,063,134	11,715,771	33,473,630	1,424,410	14.9
5% Inflation cost				11,023,868	477,101	
GRAND TOTAL	44,095,473	99,214,814	77,167,077	231,501,230	10,019,116	

Additional funding will be required through the Ministry of Health (MoH) statutory budget and Public-Private-Partnerships (PPP) initiatives in addition to donor support. Similarly, interventions in the three most significant barriers to digital health implementation identified by stakeholders as extremely important (Leadership & Governance, Infrastructure, and health workforce) could be prioritized over the remaining four component areas. 29 interventions have been identified in this category.

Implementation Framework

Institutions, donors, partners, and other actors have roles and responsibilities towards the implementation of the Roadmap. The MoH will provide policy guidelines and direction, ensure implementation of the Roadmap, as well as periodic evaluation and oversight. The private sector and development partners are expected to provide technical and financial assistance to the Digital health coordination hub and help in advocacy, sensitization, and resource mobilization.

Monitoring and Evaluation (M&E) Plan

The implementation of the Roadmap will be strongly guided and monitored. The M&E plan will help track progress of the Roadmap implementation based on the M&E operational framework, which links inputs to intended results, ensuring that considerations are made for performance indicators, benchmarks, data sources, frequency of reporting and responsible entities.

Conclusions

Budgetary provisions and private sector funding is required for sustainability and together with available donor supports and improved stakeholder coordination would close the anticipated funding gap.

1. INTRODUCTION

1.1. Background and Context

Country demographic

Sierra Leone is located along the West Coast of Africa covering a landmass of about 74,000 square kilometers located along the North Atlantic Ocean, and bordered to the North-West, North and North-East by Guinea and Southeast by Liberia. It has a population of about 7.5 million people with the capital city, Freetown, being the most densely populated¹. It has a tropical climate with two distinct seasons: a dry season which starts in November and ends in April and a rainy season that starts in May and ends in October. Administratively, the country is divided into five major regions, 16 districts, and 190 chiefdoms governed by Paramount Chiefs².

Population health status

Despite improvements in the last two decades, some health indicators still remain unacceptably high. Malaria is the leading cause of morbidity affecting 4 in 10 children aged 6-59 months³ with an HIV prevalence rate of 1.7%. Under-5 mortality is 122 deaths per 1,000 live while adult mortality rate is at 4.69 and 5.59 deaths per 1,000 population among women and men respectively. Most recently, there has been a significant improvement in Maternal mortality ratio which dropped from 717 to 443 deaths per 100,000 live births⁴. Post-partum hemorrhage (PPH), eclampsia, hypertension, sepsis, and post-abortion complications account for majority of these maternal deaths.

Health systems status

The Ministry of Health (MoH) is responsible for overall stewardship of the health sector while the District Health Management Teams (DHMT) on the other hand, provide oversight of health services at the district level.

The public healthcare delivery system is three-tiered consisting of (i) Peripheral Health Units (PHU) that provide first line primary health care; (ii) District hospitals that provide secondary care and (iii) regional and specialized hospitals that provide tertiary care. Also, the private sector provides complementary health care services. It is made up of both formal private for-profit and not-for-profit organizations, and faith-based organization facilities as well as informal providers. The informal private health sector includes traditional birth attendants, traditional healers, and informal drug sellers who operate mostly in rural areas and for whom there is little regulatory oversight.

¹ Statistics Sierra Leone, Mid-Term Population and Housing Census Report, 2022.

² Electoral Commission for Sierra Leone, Boundary Delimitation Wards, 2017

³ Ministry of Health and Sanitation, Sierra Leone Malaria Indicator Survey, 2016.

⁴ Trends on Maternal Mortality from 2000-2020: estimate by WHO, UNICEF, UNFPA, World Bank and UNDESA/population group, 2022.

Generally, health infrastructure is unequally distributed throughout the country, with reduced physical access to health services especially in remote under-served areas. Also, provision of essential health services with essential supplies and basic equipment still poses significant challenges. Majority of the underserved do not have the power, water, sanitation and hygiene, and equipment necessary to provide essential services.

Regarding Human Resources for Health, the current health workforce strength is estimated at approximately 20,000 health workers working in a variety of cadres at health worker-population ratio of density 6.4 per 10,000 population⁵. Unfortunately, 50% of these health personnel are volunteers and not on the government payroll⁶. Healthcare financing is fragmented with several pools and show a gradual increase in government commitment from 6.8% in 2012 to 10.5% in 2022; but still below the Abuja Declaration of 15% allocation of the total government budget for the health sector. Household out-of-pocket (OOP) spending is the main source of health financing (52.3%) in Sierra Leone, followed by donor partners (32.5%), GoSL (14.6%), and corporations (0.4%)⁷. The high OOP expenditure is indicative of a high risk of impoverishment to households from catastrophic healthcare expenditure and provides a challenge to sustaining and expanding health services to meet the growing demand for care. This has necessitated the establishment of the Sierra Leone Social Health Insurance Scheme (SLeSHI).

1.2. The National Digital Health Enabling Environment

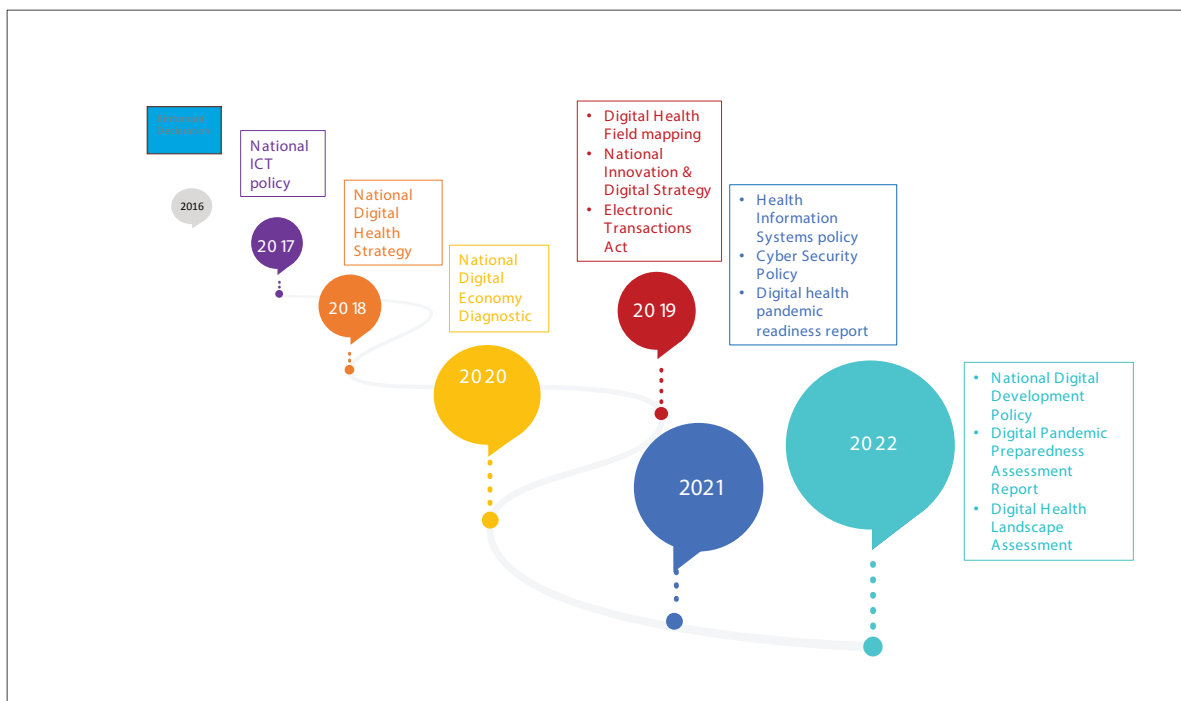
The GoSL with support of partners has made huge investments towards the digital transformation of the health sector. In the post Ebola era of 2016 and following the Bintumani Declaration, the National eHealth coordination hub, with an overarching Steering Committee to provide oversight, was established at the Directorate of Planning, Policy, and Information (DPPI) with the mandate to coordinate digital health implementation. The hub is an inter-ministerial body comprising of the Ministry of Health (MoH), Ministry of Communications, Technology, and Innovations (MCTI), Ministry of Finance, as well as development partners. Also, several Health and ICT sector plans and strategy documents were developed to provide catalytic support. The National Digital Health Strategy (NDHS) developed in 2018⁸, earmarked several milestones towards achieving institutionalized digital health capabilities with functional compliance frameworks by year 2022. Several digital health interventions are currently being deployed nationwide to support critical health systems building blocks.

⁵ United Nations Development Programme, Human Development Reports, 2021-2022.

⁶ Ministry of Health and Sanitation, Sierra Leone Malaria Indicator Survey, 2016.

⁷ Ministry of Health and Sanitation Sierra Leone, National Health Accounts, 2019-2020

⁸ 2018-2023 National Digital Health Strategy

Figure 1.0: Sierra Leone Digital Health Development Milestones

1.3. The COVID-19 Pandemic Challenge and Digital Health

With the COVID-19 pandemic in 2020 came the need to model trends in disease evolution, guide policy changes and rapidly respond to public health emergencies in an unprecedented manner. Several Digital Pandemic Preparedness Assessments (DPPA)^{9,10} identified gaps in the ICT and enabling environment and made strategic recommendations for adapting existing digital health tools to help accelerate the COVID-19 response and provide greater efficiency and more robust support to the government, health workers, clients, and other stakeholders.

1.4. Making a Case for a National Digital Health Roadmap

In response to the digital transformation strides of the GoSL, multiple digital health interventions were deployed by multiple partners resulting in fragmentation, duplication of efforts, high overall cost of deployment and poor alignment with health systems priorities. The Digital Health Roadmap will serve as a tool for improved stakeholders coordination and monitoring of digital health implementation by the MoH. It will also help improve strategy and planning, resource mobilization and fund management for digital health activities. Standardization, ease of compliance and patient data protection will be strengthened. The Roadmap will support the provision of sustainable infrastructure and improved health

⁹ Sierra Leone Digital Pandemic Preparedness Assessment Report, 2022

¹⁰ Digital Health Systems To Support Pandemic Response In Sierra Leone (COVID-19 Map and Match's analysis), 2021

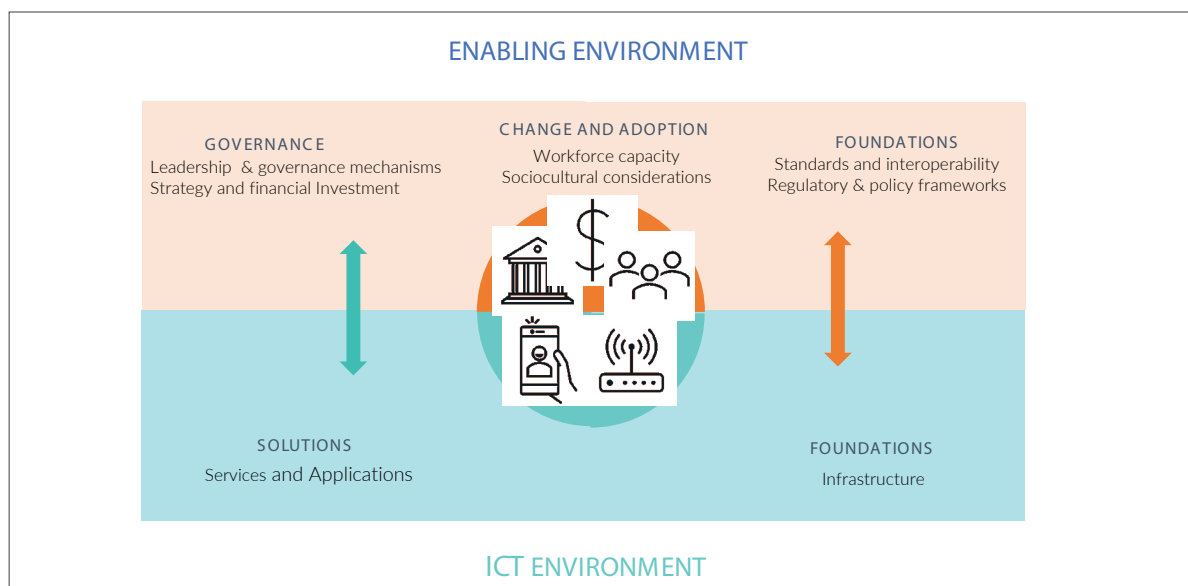
workforce capacity for wider deployment and increase use of essential digital health solutions respectively. These approaches will ensure an effective and sustainable national digital health initiative that significantly contributes to achievement of Universal Health Coverage outcomes in line with the national digital health vision. Also, the development of the Roadmap through an inclusive process of multi-stakeholders consultations involving building a shared vision with co-creation of outputs will help improve acceptance and ownership of the document.

2. SITUATION ANALYSIS

The maturity of the digital health ecosystem comprising of enabling and ICT environments depend on an interplay of several factors that influence implementation of digital health interventions. These factors are determined by a wide range of stakeholders (individuals or organizations) who have direct or indirect interests and influences. Understanding the landscape of the digital health eco-system and its bottlenecks is critical to developing an evidence based Digital Health Roadmap and action plan.

To uncover the existing bottlenecks in the digital health environments, a landscape assessment was conducted by the MoH in collaboration with partners along the Digital Health Ecosystem Action Lines (Figure 2.0)¹¹. This assessment involved stakeholders' analysis, rapid desk review of existing digital health and ICT sector plans, strategy documents and health facility assessments. Key informant interviews and SWOT analysis were also conducted to further elaborate the identified gaps.

Figure 2.0: The Digital Health Ecosystem Action Lines



2.1. Landscape Assessment

The content analysis is based on the landscape assessment conducted from 15th to 29th November 2022. The assessment was conducted in 246 health facilities across the 16 districts to determine the maturity of digital health enabling and ICT environments. Nineteen stakeholders across key MoH Directorates and Programmes, and partner organizations were also interviewed, and several health and ICT sector policy and strategy documents reviewed. Major findings are elaborated along the digital health ecosystem action lines as follows;

¹¹ WHO/ITU National eHealth Strategy Toolkit

Governance

Leadership and governance

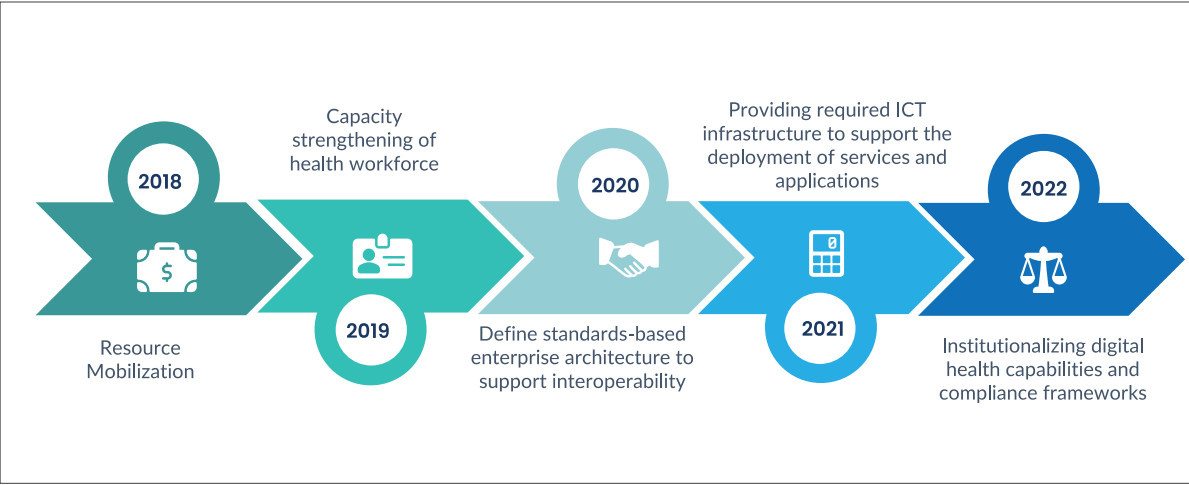
The governance structure for digital health is formally established at the National level through the eHealth Coordination Hub supported by a multi-stakeholder Technical Advisory Group with oversight by an overarching inter-ministerial Steering Committee.

However, despite recommendations by the 2018 NDHS, this structure is not replicated at the directorates, health programmes and district levels. The eHealth Coordination Hub is not adequately staffed, funded, and empowered to undertake the role of digital health governance and take full ownership of the digital health programmes in line with the National Digital Health vision.

Strategy and Investment

Sierra Leone’s NDHS was developed in 2018 though partially implemented due to the absence of a of clear roadmap to operationalize its strategic activities elaborated across specific milestones shown in Figure 2.1. Similarly, the strategic recommendations of several COVID-19 digital pandemic readiness assessments are yet to be implemented. Existing digital health interventions assessed are largely donor driven (83%) or private sector funded (17%) while public sector had no significant funding contribution. For instance, only 1% of the US\$1.2 million required to fund the NDHS was statutorily budget for by the MoH in 2019 but only 50% of the amount eventually released. There is currently no budgetary provision for digital health in the 2022 statutory budget for the MoH. Also, the GoSL signed the PPP Act into law in 2010¹² establishing the PPP unit within the office of the President. Despite this feat, guidelines for implementation of PPP projects are yet to be developed in the MoH.

Figure 2.1: Digital health milestones 2018-2023



12 The Public Private Partnership Act, 2010

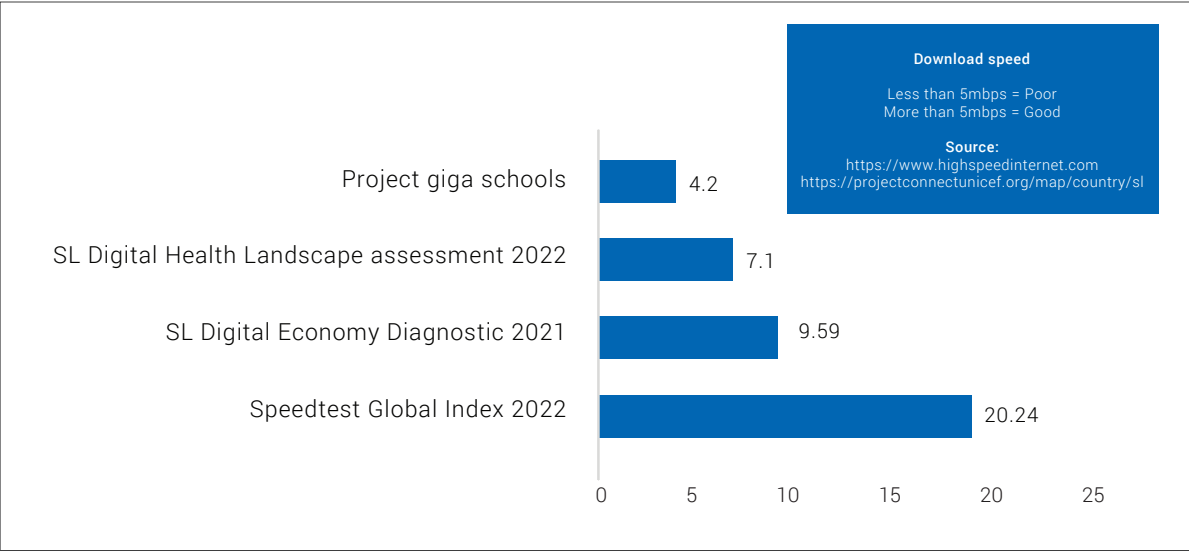
Foundations

Infrastructure

There are gaps in the availability of computing infrastructure across the health facilities visited. Figure 2.2 shows a 363% gap for computers in 6 District Hospitals visited when compared to the number of existing service points requiring computerization. However, internet connectivity was available in all the 16 districts visited though with varying network quality across the health facilities. Wireless broadband network devices were the most common connectivity infrastructure used while only two facilities connected via fiberoptic network which though expensive provides the fastest connection speed. Average download speed in health facilities visited was 7.1 mbps (range 0-98mbps) below the National average of 9.59 mbps¹³ as shown in Figure 2.3.

Power remains a major challenge particularly at the PHU level as 50% of districts visited were yet to be connected to the public power grid. While solar-inverter solutions were used as alternative power source in some health facilities, it only supplied specific units such as cold chain infrastructure or Special Care Baby Units/Labour wards. Generating sets were also commonly used in secondary facilities though not without challenges of fueling and routine maintenance. All tertiary facilities had the three types of power equipment as shown in Figure 2.4.

Figure 2.2: Average download speed in health facilities surveyed



13 Sierra Leone Digital Economy Diagnostic, 2020.

Figure 2.3: Computing infrastructure Gap in 6 District Hospitals

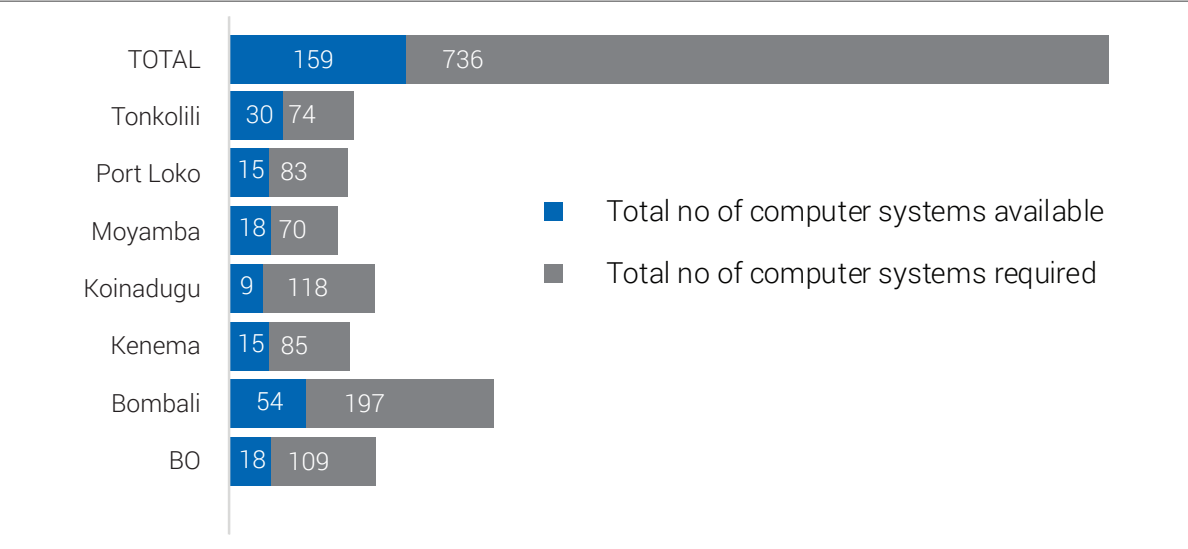
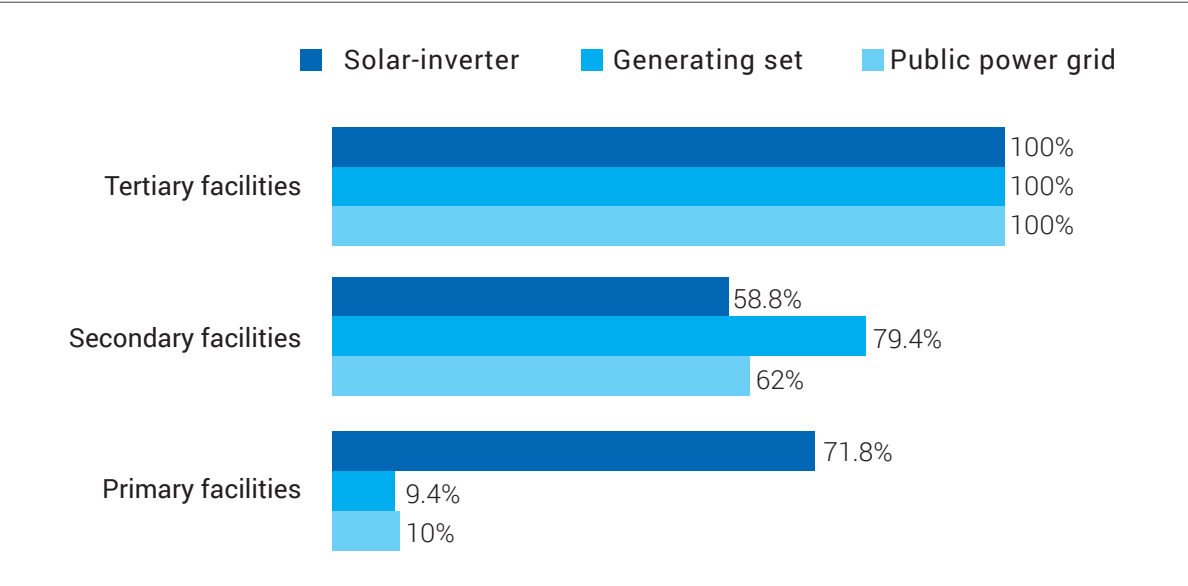


Figure 2.4: Power infrastructure types in Health Facilities

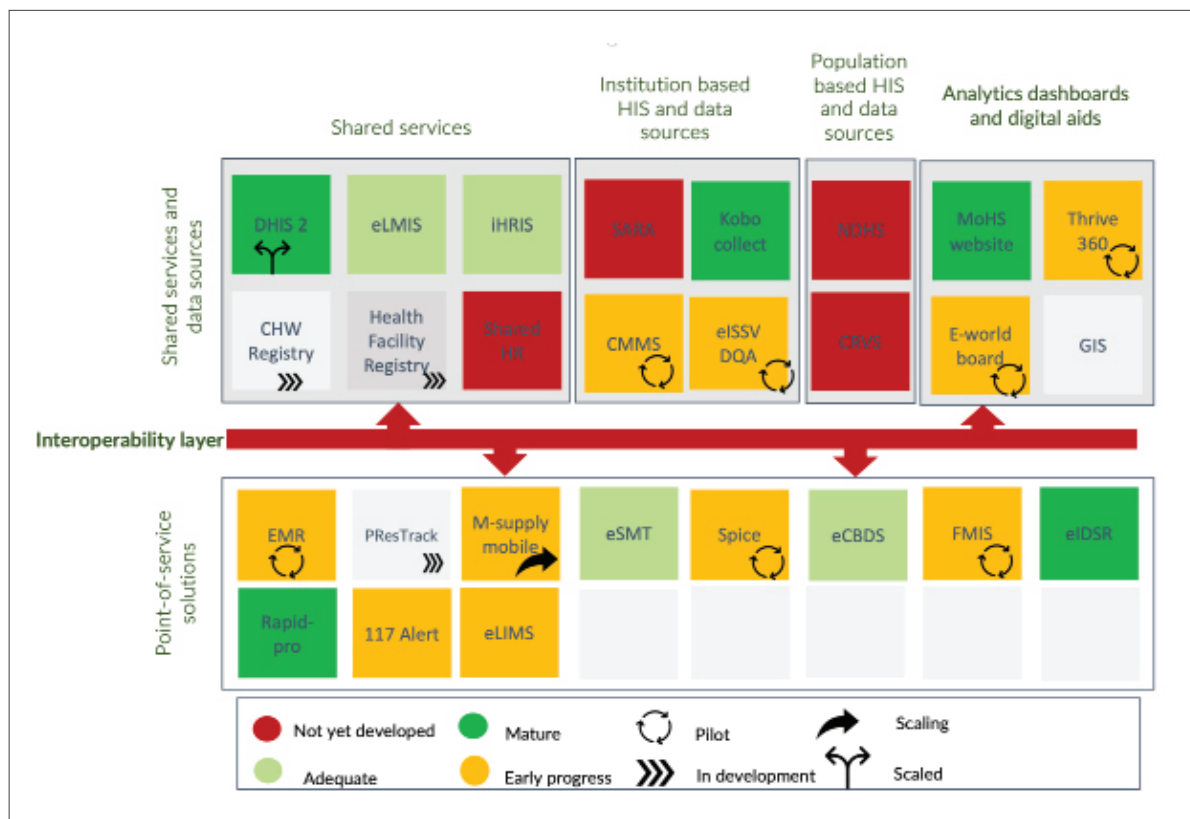


Standards and Interoperability

Standards and interoperability requirements for digital health solutions are not yet defined, adopted, and implemented. Presently, there is a complex ecosystem of digital health solutions in an undefined, un-integrated and un-exchanged enterprise systems architecture shown in Figure 2.5.

Majority (81.2%) of these solutions neither connects with DHIS 2 nor integrate with other solutions due to their limited adoption with standards. For instance, only 10% of the digital health tools are reportedly compatible with the HL7-FHIR standards, the globally adopted data exchange and interoperability standard. Also, the level of fidelity of these digital health solutions to existing national guidelines for clinical care and public health services is unknown. These adoption issues will ultimately result in high level of redundancy and huge cost of feature upgrade, maintenance, and scaling of existing digital health solutions.

Figure 2.5: Component Based Enterprise Systems Architecture



Legislation, Policy, and Compliance

Despite the existence of some ICT regulatory frameworks^{14,15,16,17} regulation of access, storage and sharing of health-related data within digital health solutions remains a major challenge. This is as a result of the nonexistence of specific compliance, conformance, and accreditation of protocols to help in their implementation. A draft Electronic Medical Records (EMR) guidelines was developed by the MoH in 2020 but yet to be validated and published.

¹⁴ Cyber Security Policy, 2020.

¹⁵ National Digital Development Policy, 2021.

¹⁶ National ICT policy, 2017.

¹⁷ National Innovation & Digital Strategy, 2019.

Many digital health implementers also admitted availability of Standards Operating Procedures (SOPs) or guideline supporting implementation of the digital health solutions, but their use was limited and were not sighted at health facilities visited.

Solutions

Services and Applications

There are several digital health interventions targeting health systems challenges as shown in Table 2.0. These interventions are predominantly for health systems managers, healthcare providers and data services with limited interventions for healthcare clients. A significant number (60%) of the interventions are at the pilot and informal stages of early adoption with limited formal processes, policies, and documentations. Also, 42% of the deployed tools have proprietary licenses with source code not publicly available and accessible. This portends a high risk of vendor lock-in, high cost of upgrade and maintenance as well as interoperability and data privacy concerns which will negatively impact on sustainability.

While DHIS 2 and tracker applications are widely used with 96% coverage of public health facilities, there is no corresponding adoption by private facilities. Logistics and supply chain management was the most predominant disease programme area covered by digital health interventions at the health facilities. This may be attributed to the ongoing m-supply pilot in 25 last mile facilities. Deployment of Point-of-care solutions for patient care continuum including Electronic Medical Records (EMR) systems was also observed to be on the increase both at pre-implementation and early pilot stages.

Despite the increasing number of digital health interventions, only 29% of deployed tools could be used with little or no data indicating decreased opportunities for future telemedicine and remote health worker training. Data generated by these applications are stored across multiple server hosting platforms with limited access by the MoH. This is not only cost prohibitive but raises concerns about data privacy, security, and confidentiality.

Table 2.0: Digital health tools deployed in health facilities assessed

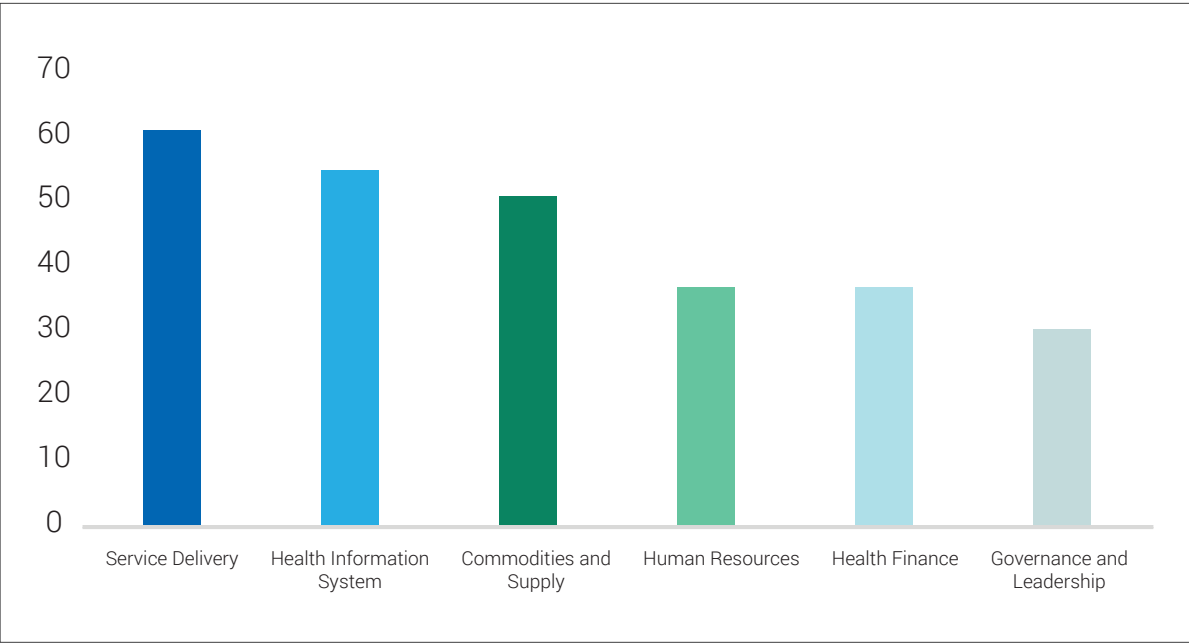
No	Digital Health Tool	System Category	Pilot site	Organization Deploying	Deployment phase/ Maturity stage
1	Elysium EMR	Electronic Medical Records (Client Health Records)	PCMH	CUAMM Doctors with Africa	Pilot
2	OpenMRS	Electronic Medical Records (Client Health Records)	Wellbody clinic, Kono	Partners In Health	Pilot
3	SPICE	Point-of-Service Solution for NCD, Maternal Health, Malaria &TB (Client Health Records).	13 Facilities, in WAU, WAR, Port Loko and Bombali	Medtronic Labs	Pilot

4	Facility Management Information System (FMIS)	Electronic Medical Records (Client Health Records)	1 each PHU in Kambia and Port Loko Districts	GOPA-GIZ	Pilot
5	Sierra Rutile EMR	Electronic Medical Records (Client Health Records)	Sierra Rutile clinic, Freetown	Sierra Rutile Ltd	Prototype
6	PReSTrack	Point-of-Service Solution for ANC (Client identification and registration)	WAU and WAR	DSTI/MoH	Prototype
7	Salone EMR	Electronic Medical Records (Client Health Records)	Waterloo PHU	GIZ	Pre-implementation
8	OpenMRS	Electronic Medical Records (Client Health Records)	Ola During Children's Hospital	UNICEF	Pre-implementation
9	m-Supply	Health System Managers (Logistics management- drugs / consumables)	25 Facilities in Kailahun, WAR, WAU	Project Last mile/USAID	Post pilot/ Demonstration
10	iHRIS	Health System Managers (Human Resource Management)	All Districts	MoH/GIZ	Scaling
11	e-SMT	Health System Managers (Logistics management- vaccine)	All Districts	UNICEF/ WHO	Scaling
12	e-IDSR	Health System Managers (Public health and disease surveillance system)	All Districts	MoH/WHO	Scaled
13	e-CBDS	Health System Managers (Public health and disease surveillance system)	All Districts	MoH/ AFENET	Scaled
14	CMMS	Health System Managers (Equipment and asset management)	All District Hospitals	MoH/UNICEF	Pilot
15	DHIS2	Data Service (Health Management Information System)	All Districts	MoH	Scaled
16	Redcap	Data Services (Non-routine data collection and management)	Non-routine data collection and management	iCARIA	Pilot
17	Magbenteh hospital staff Information management system	Health System Managers (Human Resource Management)	1 facility	Magbenteh Hospital (Bombali)	Prototype
18	eISSV/DQA	Data Services (Non-routine data collection and management)	9 PHUs in Kambia and Kailahun Districts	GOPA-GIZ	Prototype

19	Health Connect EMR	Electronic Medical Records	34 Military Hospital	Health Connect	Pilot
20	Health Connect EMR	Electronic Medical Records	Connaught Hospital	Health Connect	Pre-implementation

Also, against the backdrop of using digital health interventions to effectively address health systems challenges, stakeholders selected and prioritized digital health interventions using a mentimeter poll as shown in Figure 2.6 below. Digital health interventions for service delivery had the highest priority while those for Leadership and Governance had the least priority.

Figure 2.6: Priority health systems component areas requiring digital health interventions



Change and Adoption

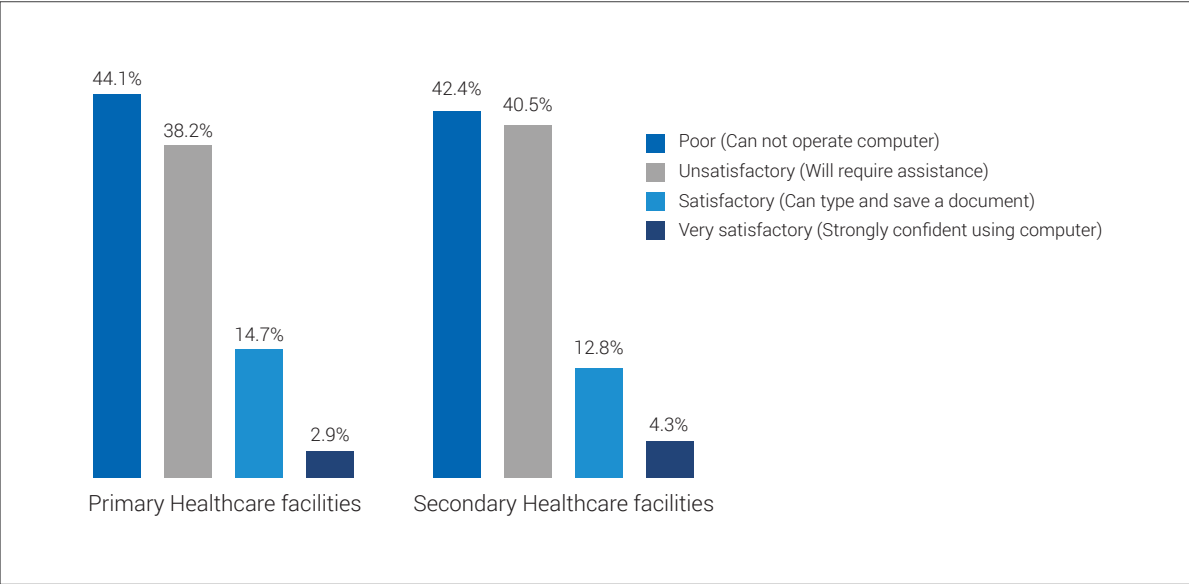
Health Workforce

There is limited skills, experience, and knowledge among health workers in the use of digital health services for the delivery, management, and operations of healthcare services. Over 80% of health workforce at the primary and secondary health facility levels will require assistance to effectively operate computer systems as shown in Figure 2.7.

In the same vein, several skills set required to sustain adoption and effectiveness of digital health solutions are also sub-optimal. These include skills for basic data analysis and use for decision making, and technical skills for software, network and hardware troubleshooting and maintenance.

Despite these capacity gaps, there are existing opportunities to leverage both for digital skilling and general capacity building of health workers. These include the In-service Training Policy of the MoH¹⁸ and existing e-Learning platforms such as the Sierra Leone Learning Passport¹⁹ and the iHRIS Train module among others.

Figure 2.7: Self-rating of computer literacy by Health Workers



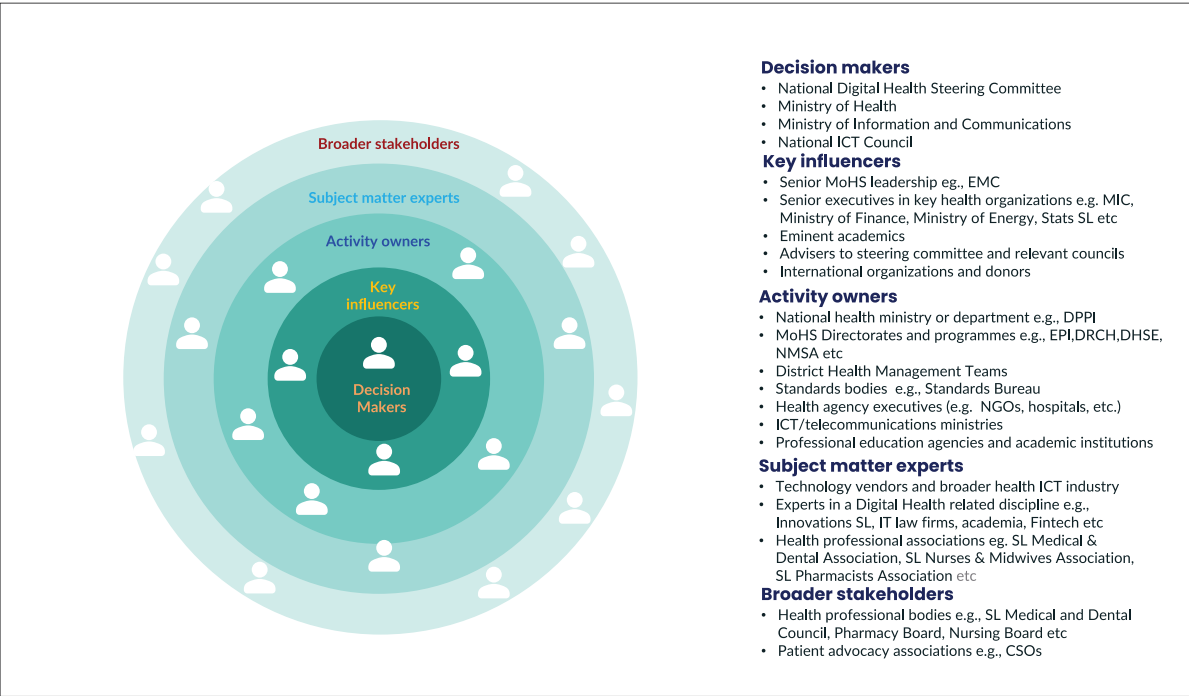
2.2. Stakeholders analysis

Key stakeholders who will be involved in the GoSL digital transformation agenda through implementation of the digital health roadmap were identified and their roles analyzed.

These roles include governance, management, advisory, funding and resource mobilization as well as technical support. The different stakeholders categories across both public, private and development sectors whose actions will significantly influence the digital transformation agenda are shown in Figure 2.8 below.

18 GoSL 2019-2029 In-service Training Policy
19 The Sierra Leone Learning Passport

Figure 2.8: Digital Health Stakeholders Mapping



*Adapted from the WHO-ITU eHealth Toolkit

The role of each stakeholder group across the digital health enabling and ICT environments is shown on Table 2.1 below.

Table 2.1: Role of key digital health stakeholder groups

Stakeholder category	Role	Expectations/ interests	Likely reaction and impact if expectation is not met	Why they should be engaged	Engagement strategy
Decision-makers	Give overall vision and strategic direction. Approve, endorse, and own digital health interventions. Secure spending authority and resources. Assist with resolution of major issues and conflicts	Improved health systems functioning Achievement of broader health outcomes	Lack of political support Reduced allocation of resources for digital health	Highest decision-making body.	Frequent and formal contact to seek input and guidance, present roadmap for final review, acceptance and endorsement. Support implementation of the Roadmap

Key influencers	Influence decision makers. Act as vocal and visible champion individually or through its representative organizations	Well-functioning and effective digital health implementation Alignment with strategic plan High impact and return on investments.	Reduced sectoral support . Reduced investments	Acknowledged eminence in the field. Role as formal or informal advisers to decision-makers Ability to influence resources available for delivering the Roadmap.	Frequent and more informal contact to seek input, guidance and assistance in developing and implementing the Roadmap.
Activity owners	Manage and deliver digital health or related interventions. Make decision at key project stages. Provide technical support and guidance in related domains	Achievement of health programme goals and related domains	High risk of failure in implementing digital health interventions Poor adoption and acceptability	Potential accountability for delivering many core activities In the Roadmap.	Targeted consultation and participation to seek input and guidance in identifying and definition of activities required for a particular digital health enabler.
Subject matter experts	Serve as critical source of expertise. Assist in defining activities and processes for delivering roadmap.	Alignment with industry standards and best practices in related domains.	Lack of credibility Poor adoption Poor alignment with standards in related domains	Experts in digital health related domains	Consulted on an ad hoc basis to seek specialized knowledge in key areas
Broader stakeholders	Key beneficiaries of digital health interventions Hold public servants accountable. Provide feedback on deliverables	Improved service delivery Increased physical and financial access.	Poor public accountability Poor client satisfaction Reduced demand for health care services	Target audience and beneficiaries	Engage as necessary and provide access for feedback

*Adapted from WHO-ITU eHealth Strategy Toolkit

2.3. SWOT Analysis

The SWOT analysis conducted during a brainstorming session by a diverse set of health and ICT stakeholders identified key strengths, weaknesses, opportunities, and threats to the digital health programme is summarized in Figure 2.9. Existence of strong political will and establishment of digital health coordination hub and availability of National Digital strategy for both health and ICT sectors were identified as the major strengths; while inadequate

digitally skilled workforce and poor infrastructure were identified as the major weaknesses. The existence of multiple but fragmented digital health interventions is a major threat while increasing donor investments in digital technologies especially post COVID-19 era is identified as an opportunity .

Figure 2.9: SWOT Analysis of Digital Health Enabling and ICT Environments

STRENGTHS	OPPORTUNITIES
Governance: <ul style="list-style-type: none"> Political will and support for digital health Established governance structure for digital health at national level Strategy and Investments <ul style="list-style-type: none"> Existence of National Digital Health Strategy Establishment of SLeSHI Infrastructure <ul style="list-style-type: none"> Functional health facilities with some ICT and power infrastructure. Health Workforce <ul style="list-style-type: none"> Available health workers with some digital health skills Services and Applications <ul style="list-style-type: none"> Existence of some digital health interventions 	<ul style="list-style-type: none"> Increasing donor investments in digital technologies for pandemic control Existence of supporting policies, strategies, and programs in digital health related domains e.g., eGovt, Cyber Security, eLearning, PPP, renewable energy, and last mile fiberoptic connectivity project etc
WEAKNESS	THREATS
Governance: <ul style="list-style-type: none"> No governance structure at District and Health facility levels. Strategy and Investments <ul style="list-style-type: none"> No statutory budget for digital health Infrastructure <ul style="list-style-type: none"> Inadequate ICT and power infrastructure and Poor maintenance culture Health Workforce <ul style="list-style-type: none"> Inadequate digitally skilled health workers Services and Applications <ul style="list-style-type: none"> Multiple fragmented digital health interventions Standards & Interoperability: No adopted standards and protocols Legislation, Policy and compliance: Weak regulation	<ul style="list-style-type: none"> Non-alignment of donor activities with digital health vision Inadequate budgetary allocation to health in the national health budget Erratic public power supply and poor internet connectivity

3. IMPLEMENTATION ROADMAP

3.1. Implementing the National Digital Health Roadmap

The MoH under the leadership of the Honourable Minister of Health shall take overall responsibility for implementing the Roadmap. To achieve this, the DPPI should be adequately empowered to effectively coordinate and supervise all stakeholders involved in the implementation process through the established governance structures. The interventions are outlined in the implementation framework in Table 3.2 below. Also, Annual Operational Plan drawn from the Roadmap should be developed to guide yearly implementation. Stakeholders at all levels should be mobilized to adopt the interventions in line with their respective roles described earlier in Table 2.1 above.

3.2. Strategic Objectives and Interventions

Based on the maturity assessment of the digital health ecosystem, key objectives have been defined and linked to specific outputs through interventions distributed along the seven digital health enablers. This will ensure that the interventions produce outcomes that will facilitate attainment of the UHC outcomes in line with the digital health vision as shown in the theory of change elaborated in Figure 3.0 below.

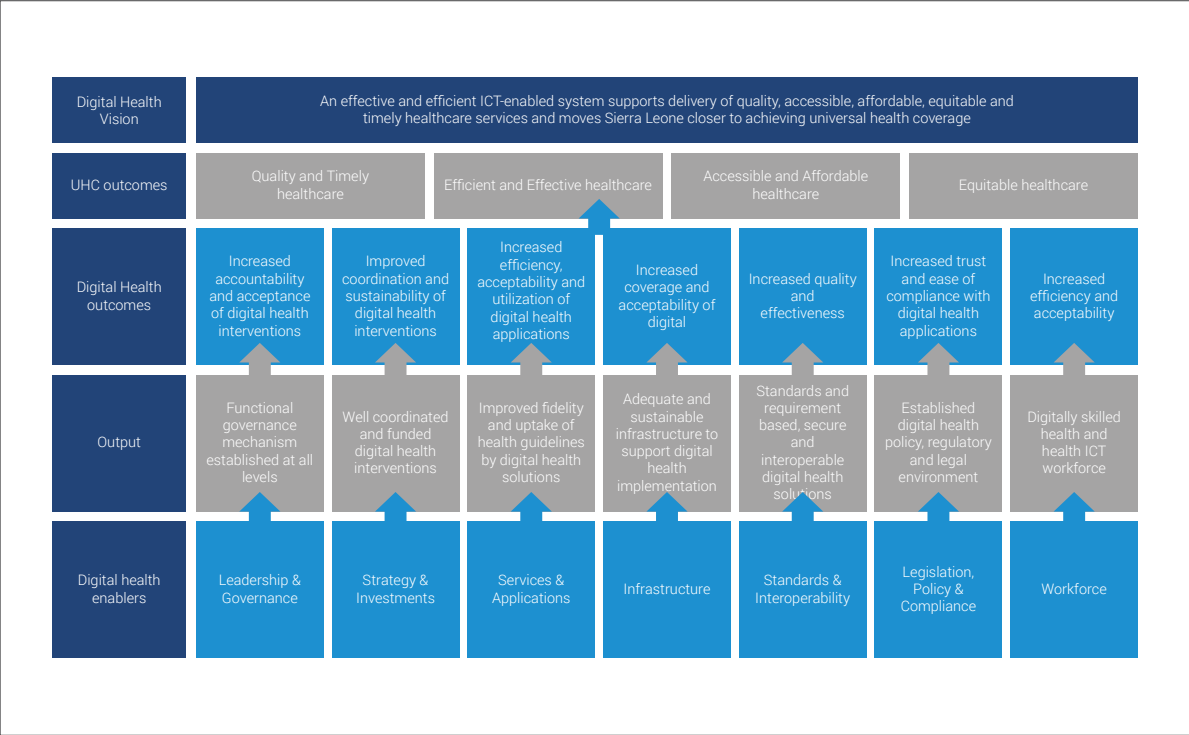


Key digital health outcomes that will enable Universal Health Coverage include;

- Increased accountability and acceptance of digital health interventions by healthcare providers and clients
- Improved coordination by health systems managers and sustainability of digital health interventions

- Increased efficiency and utilization of digital health applications by healthcare workers
- Effective coverage of digital health interventions
- Increased quality and effectiveness of digital health interventions
- Increased trust and ease of compliance with digital health applications by end users

Figure 3.0: Theory of Change for National Digital Health Vision



The following strategic objectives, specific objectives, and key interventions have been outlined across each of the digital health enabling environments in line with the National digital health vision.

3.3. Leadership and Governance

Strategic objective

Institutionalize functional digital health leadership and governance at all levels.

Interventions

Coordination and oversight of the digital health activities should be executed through reinforcement and strengthening of existing digital health governance structures and establishment of new governance structures at all levels.

A National digital health focal point should be designated within the Digital Health Coordination Hub at DPPI to provide the technical leadership and programme management function in the short term. This function should among others include coordination of all digital health activities within DPPI, MoH Directorates and programmes, DHMTs and health facilities, and other MDAs as shown in Figure 3.1. This structure should be replicated across key MoH Directorate and programs, DHMTs and health facilities. The focal points at all levels should be empowered through capacity strengthening, adequate operational funding and support to carry out their designated functions.

As the availability of human resources within the MoH improves, the e-coordination hub should be upgraded to a full-fledged Digital Health Unit headed by a Coordinator. The unit should have a full complement of staff with expertise to manage sub-component areas of the digital health enabling environment such as strategy & investments, policy & compliance, ICT environment and workforce. These staff may be redeployed from other units, departments, or agencies. The Unit should be supported by the private sector and development partners through the Community of Practice.

The key objectives with recommended interventions for leadership and governance are:

Objective 1: Strengthen coordination and oversight of digital health implementation at all levels.

- 1.1 Formalize digital health governance structures at all levels.
- 1.2 Provide operational support for Digital Health Coordination Hub
- 1.3 Convene periodic stakeholders' coordination meetings.

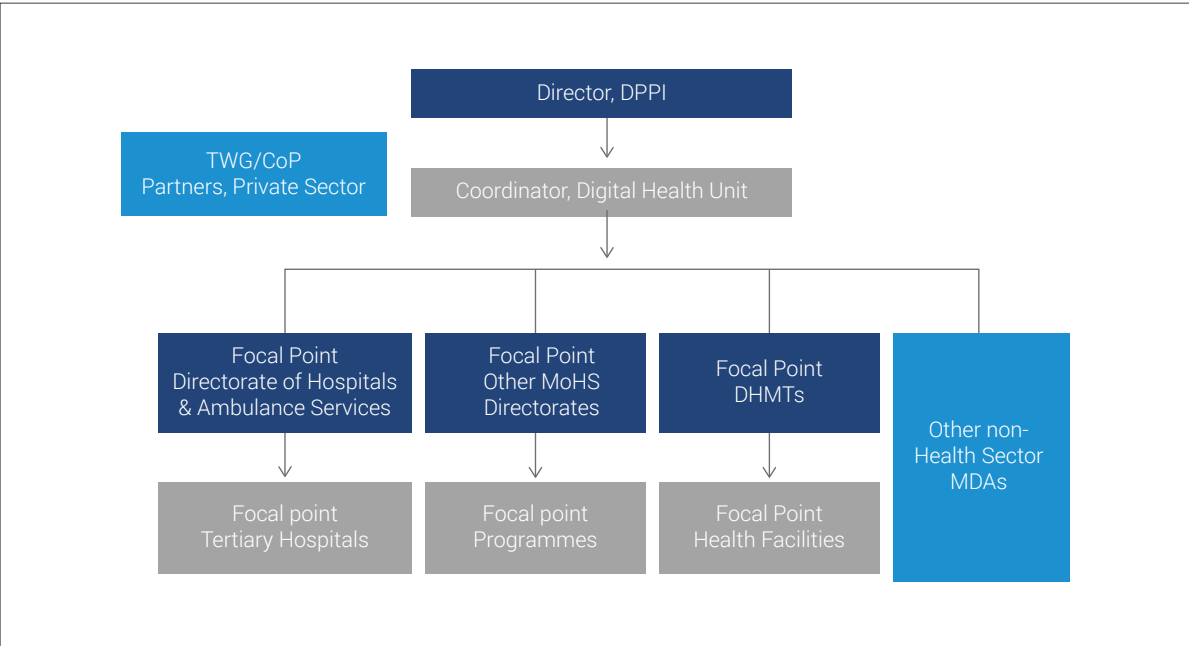
Objective 2: Promote stakeholders' commitment and inclusion.

- 2.1 Conduct stakeholder's sensitization workshops
- 2.2 Organize Leadership retreat on digital health roadmap.

Objective 3: Institutionalize an effective Monitoring, Evaluation, Accountability and Learning (MEAL) system.

- 3.1 Conduct supportive supervision visits
- 3.2 Conduct learning review meetings
- 3.3 Conduct Mid-term review of progress of digital health roadmap implementation
- 3.4 Conduct End-term review of progress of digital health roadmap implementation
- 3.5 Conduct annual National Digital Health Forum

Figure 3.1: Proposed Digital Health Governance Structure



3.4. Strategy and Investment

This targets strategy and planning, funding and investment management for development and operation of the National digital health environment.

Strategic Objective

Supports coordination and align financing with donor, private- sector, and government priorities.

Interventions

Strategic planning and investments from multiple funding sources is highly critical for a sustainable digital health programme. The digital health roadmap will require sustainable funding at start-up and on an ongoing basis over a its lifecycle. A resource mobilization plan is required to identify funding sources and outline strategic actions for harnessing additional funding from both private sector and other statutory sources. A critical funding source to leverage is the Universal Access Development Fund (UADF) established through the National Digital Development Policy in the Ministry of Communications, Technology, and Innovations (MCTI) to support the provision of widespread mobile or fixed wireless or fixed line internet services and toll-free lines for universal access and service.

High level advocacy should be conducted for improved funding such as creation of a dedicated Trust Fund for digital health, sub-head for digital health in the MoH statutory budget, and dedication of a percentage of SLeSHI capitation payment to health facilities for ICT Infrastructure. Feasibility studies should be conducted to catalyze the development of

PPP investment cases for priority digital health intervention projects such as EMR and other infrastructural projects. PPP and fund management guidelines should be developed and implemented to harness and efficiently manage private sector funding for digital health.

Key objectives with recommended interventions are as follows;

Objective 1: Support strategy and planning for digital health.

- 1.1 Develop and launch a costed digital health investment roadmap.
- 1.2 Develop Annual Work Plan (AWP)
- 1.3 Mainstream digital health into Health and non-health Sector plans, policies, and programs

Objective 2: Strengthen fiduciary system for digital health funding and investment management.

- 2.1 Engage DHMT and Local Councils staff including finance officers and units to appropriate more funds for digital health.
- 2.2 Develop operational guidelines for PPP.
- 2.3 Conduct economic evaluation of proposed priority digital health interventions
- 2.4 Conduct training of programme officers on the One Health Costing Tool

Objective 3: Mobilize resources to support the National digital health programme.

- 3.1 Develop Advocacy and Resource Mobilization Plan (RMP) for digital health.
- 3.2 Conduct advocacy visits for improved funding and creation of digital health trust fund

3.5. Services and Applications

Digital health services and applications support the collection, storage and sharing of trusted health information, and patient care management including diagnosis and treatment decisions.

Optimized digital health interventions should be secure, standards-based and aligned with health guidelines. The WHO SMART Guidelines focuses on localizing generic guidelines to improve fidelity (Layer 1) and translating the guidelines into computable machine-readable care guidelines through the Digital Adaptation Kits (Layer 2). Health sector stakeholders have identified priority health system challenges requiring optimized and scaled digital health applications as shown in Figure 3.2 below. DHIS 2, EMR and eLMIS are highlighted below with recommended areas for strengthening.

Figure 3.2: Stakeholders prioritization of health systems challenges requiring digital health interventions

Health Systems Priority Area	Health Systems Challenges	Recommended Digital Health Interventions	Priority Level
Service Delivery	Poor patient experience Poor adherence to guidelines Insufficient continuity of care Delayed provision of care	Client Health Records systems, Telemedicine systems, Decision support systems, Client communications systems, Referral coordination system, Laboratory and diagnostic imaging management systems	1st Priority
Health Information System	Lack of access to data and insufficient utilization for policy formulation and decision making. Lack of quality and reliable data.	Data collection, management and use systems, Identity registries including CRVS, Data exchange and interoperability systems, Public health surveillance systems	
Commodities and Supply	Insufficient supply of commodities. Lack of transparency and accountability in commodity transaction Low quality health commodities	Electronic logistics management information Systems, Counterfeit drug notification system, Drug regulation and registration system, Procurement management system	
Human Resources	Insufficient supply of qualified health workers. Insufficient health worker competence	Health workers registry, Provider registry, e- Learning systems	2nd Priority
Health Finance	Lack of effective resource allocation Lack of coordinated payer mechanism	Health insurance systems, Client payment systems, Payroll management systems, Budget and financial management system	
Governance and Leadership	Poor planning and coordination	Provider communications systems, Health facility location mapping system, Equipment and assets management systems	3rd Priority

3.5.1. District Health Management Information System

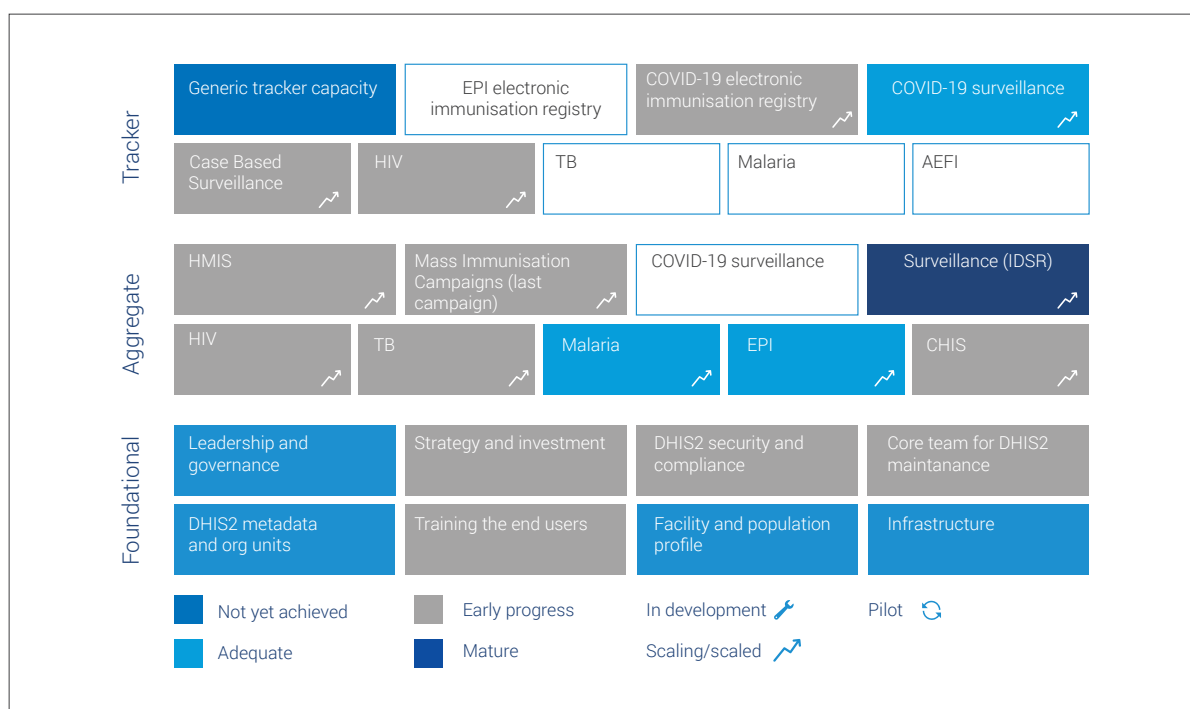
DHIS 2 was first implemented as the national health management information system (HMIS) tool in Sierra Leone in 2008. By 2010, DHMTs started reporting data directly into a centralized online version. To date, several trackers have been introduced for electronic Integrated Disease Surveillance and Response (e-IDSR) system, HIV, and electronic Case-Based Disease Surveillance management (eCBDS) within the IDSR program. A maturity assessment conducted in 2022 identified several areas for strengthening including;

- Conduct HMIS needs assessment and develop a costed work plan.
- Strengthen the DHIS2 core team.
- Update revised tools configuration in DHIS 2

- Improve DHIS2 and data security compliance.
- Develop data use guidelines, setup WHO recommended dashboards and automated quarterly bulletin for HIV, TB, CHIS, IDSR and Malaria.
- Configure aggregate form for data collection and analysis during the next immunisation campaign.
- Set up an online platform for basic DHIS2 capacities training.

The DHIS 2 maturity profile for Sierra Leone is shown in Figure 3.3 below.

Figure 3.3: DHIS 2 maturity profile



*Adapted from Sierra Leone DHIS2 maturity profile and plans (November 2022)

3.5.2. Electronic Health Records Systems deployment (EHR)

Eight (8) EMR projects are currently on-going at different stages of deployment. This is in addition to several point-of-service solutions targeting specific health systems strengthening domains.

The deployment of a centrally governed Electronic Health Records (EHR) system reusable across multiple health facility settings nationwide should be prioritized. This will ensure interoperability, operational efficiency and lowered long-term maintenance costs.

The recommended interventions for EHR deployment are as follows;

- Deployment of a secure, open-source, FHIR compatible and reusable National EHR system
- Leveraging existing health sector programs such as the GoSL's Quality Essential Health Services and Systems Support Project (QEHSSSP) shown in Figure 3.5 for EHR deployment will ensure cost effectiveness and sustainability .
- A phased deployment approach linking health facilities within the referral systems in a 'hub' and 'spokes' model should be adopted.
- Innovative funding approaches such as Public-Private-Partnerships model should be prioritized in health facilities with relative advantage in ICT and power infrastructure, and digital skilled health personnel as well as those with high patient turnover and financial viability e.g., Tertiary and District hospitals.

Figure 3.4: QEHSSSP “Hub” and “Spokes” facilities

District	Hub facilities (CHC)	Spokes facilities (CHC/ CHP/MCHP)	Th GoSL QEHSSSP Project The project focuses on improving quality, efficiency, and effectiveness of Reproductive, Maternal, Newborn, Child Health, and Nutrition Services in five (5) districts; Bonthe, Kailahun, Falaba, Tonkolili and Western Rural by provision of staff, supplies, equipment, infrastructure and strengthening M&E systems through the deployment of EMRs to target health facilities in a "hub and spokes" model.
Bonthe	3	36	
Falaba	3	25	
Kailahun	3	43	
Toinkolili	3	53	
Western Area Rural	2	18	
TOTAL	14	175	

3.5.3. Electronic Logistics Management Information System (eLMIS)

M-Supply mobile is an open source, android application with offline capabilities designed to provide real-time or near-real-time visibility to last-mile inventory management as an extension of the larger mSupply suite already deployed at central and district levels. The tool was successfully piloted in 25 last mile health facilities across 3 districts in 2022.

Currently, the pilot is being expanded to the demonstration phase integrating a Last Mile Delivery Model (LMDM) with ongoing resourcing and infrastructure provision to support national scale-up to Peripheral Health Units and Hospitals. However, several areas that require strengthening and optimization have been identified including;

- Technical enhancements of the application
- Integration with DHIS 2, m-supply suite used at central and district levels and the electronic Stock Management Tool (eSMT) used for vaccine logistics management.

3.5.4. Integrated Human Resource Information System (iHRIS)

iHRIS is an open source, Human Resources (HR) management application for storing, reporting, and analyzing longitudinal HRH data from pre-service training, in-service period and exit from service. It has three modules designed to support key health workforce functions of training (iHRIS Train), registration and licensure (iHRIS Qualify) and management (iHRIS Manage).

iHRIS Manage was introduced in 2012 with data collected from all MoH employees. After a successful pilot in the Kailahun and Kambia Districts in 2019, data collection was extended to all districts. However, only 85% (12,365) of health workers data have been captured to date due to funding and technical challenges. There is need to strengthen iHRIS to support collaboration for human resources decision and health workforce training module.

Based on a needs assessment conducted in 2022, the following recommendations are made;

- Retrain HR officers on the iHRIS Manage platform.
- Optimize the iHRIS application to include the iHRIS Train and iHRIS Qualify modules, Individual Performance Appraisal Systems (IPAS) and the Attendance Monitoring System (AMS) .
- Update existing database to capture new recruitment, transfers and promotion, attrition, retirements, and deaths.
- Provide continuous technical and financial support to ensure sustainability.

Strategic Objective:

Support deployment of digital health solutions that maximize health impact through improved fidelity and uptake of existing guidelines and recommendations.

Interventions

Key objectives with recommended interventions for services and applications are as follows;

Objective 1: Strengthen digitization of routine Health Management Information Systems to facilitate accurate and consistent data collection, analysis, and use.

- 1.1 Conduct in-depth assessment of the National HMIS and enterprise systems architecture of digital health solutions
- 1.2 Revise HIS strategic plan.
- 1.3 Improve data quality and use.
- 1.4 Optimize DHIS 2 deployment by implementing maturity assessment recommendations.

Objective 2: Support optimization and scale up deployment of existing services and applications for addressing priority health systems challenges.

- 2.1 Optimize eIDSR and eCBDS deployment for improved One Health surveillance, early warning, and response.
- 2.2 Strengthen eSMT deployment through implementation of Effective Vaccine Management Assessment (EVMA) recommendations.
- 2.3 Deploy EMR to improve patient care coordination, clinical decision support and data management.
- 2.4 Strengthen iHRIS deployment to support collaboration for human resources decision and health workforce training.
- 2.5 Optimize PReSTrack deployment to meet the DPG status.
- 2.6 Pilot Community Health Workers mobile application.
- 2.7 Optimize mSUPPLY mobile deployment and integrate with existing logistics and data management systems.
- 2.8 Deploy new reusable digital health applications and shared services to support interoperability.

Objective 3: Improve collaboration among implementers of digital health services and applications.

- 3.1 Support services and applications community of practice
- 3.2 Develop partners collaboration portal.

Objective 4: Ensure meaningful use of digital health solutions to address health systems challenges by integrating recommended clinical and public health practices, and data recommendations.

- 4.1 Localize the WHO SMART guidelines (L1- Narrative) to improve health content of digital health solutions.
- 4.2 Develop and implement a checklist for evaluating Services and Applications
- 4.3 Evaluate priority services and applications.
- 4.4 Organize hackathons/connectathon (L2-Semi structured) to support adoption of Digital Adaptation Kit by priority services and applications.

3.6. ICT Infrastructure

Successful digital health implementation will require adequate and functional computing, connectivity and power infrastructure. These equipment should be continuously maintained and promptly replaced when worn out or obsolete. Baseline infrastructural assessment will identify existing gaps and support planning and maintenance based on a pre-defined minimum infrastructure package for each health facility type. To reduce costs, existing power and connectivity projects by the Ministry of Energy and Ministry of Communications, Technology, and Innovations (MCTI) should be leveraged for infrastructural provision and expansion to off-grid health facilities. For sustainability of new and existing infrastructure, an effective infrastructure inventory management and maintenance system is highly critical. PPP initiatives should also be explored to mobilize private sector funding for infrastructure

provision and maintenance. A critical mass of health IT technicians with hardware, network and software maintenance skills should be trained and deployed at both district and health facility levels to provide technical support.

The key objectives with recommended interventions are as follows:

Strategic Objective

Provide and continuously maintain physical infrastructure to support digital health implementation

Interventions

Objective 1: Determine current state of infrastructure for digital health interventions.

- 1.1 Conduct inventory of ICT infrastructure & needs assessment.
- 1.2 Develop infrastructure masterplan

Objective 2: Prioritize the provision of basic computing, connectivity, and power infrastructure to support deployment of priority digital health solutions.

- 2.1 Procure ICT hardware.
- 2.2 Procure back up power equipment.
- 2.3 Set up Local Area Network (LAN) for connectivity.
- 2.4 Provide internet bandwidth.
- 2.5 Establish digital learning centres in health facilities.
- 2.6 Set up Data Centre infrastructure for MoH.

Objective 3: Leverage existing investments to support sustainable infrastructure provision.

- 3.1 Conduct high level advocacy for infrastructure provision

Objective 4: Institutionalize preventive and corrective maintenance of new and existing ICT infrastructure.

- 4.1 Conduct periodic review of infrastructure status

3.7. Standards and Interoperability

The data and interoperability standards are composed of data structure standards, common terminologies, secure messaging standards and software accreditation standards.

Several interventions are required to ensure that digital health interventions are standards-based and interoperable in an enterprise manner to collectively address health systems challenges. The current efforts by the MCTI to develop digital eco-system standards through the National eGovernment enterprise systems Architecture should be leveraged to support the development of a National enterprise systems architecture blueprint for the health

sector. This will help elaborate the current state and interoperability requirements for linking existing point-of-service applications with common services.

This approach would allow the MoH re-use existing functional digital health applications and connect applications across different programme areas to support health information exchange. To achieve this future state will require targeted and sustained investments for both new and existing digital health applications.

Investments required for new and existing digital health solutions;

- Deployment of new software including artificial intelligence, identity management, social accountability and financial services.
- Optimizing and strengthening existing software.
- Scaling functional and optimized software.
- Integrating software within health programme areas and national HMIS.
- Improving health content and DPG maturity.

The key objectives with recommended interventions for standards and interoperability are as follows.

Strategic Objective

Establish and maintain a well-defined, standards and requirement based, interoperable enterprise architecture for consistent and accurate collection and exchange of health information.

Interventions

Objective 1: Domestic minimum standards and interoperability requirements for digital health solutions.

- 1.1 Define, adapt/adopt and document minimum standards and interoperability requirements for digital health solutions.

Objective 2: Determine current state of existing digital health interventions based on adopted standards and interoperability requirements.

- 2.1 Assess status of existing digital health solutions on adopted standards.
- 2.2 Conduct diagnostic assessment of identity management services

Objective 3: Mobilize stakeholders support and build consensus for adoption of standards.

- 3.1 Create awareness on adopted standards.
- 3.2 Build capacity of key stakeholders on adopted standards.

Objective 4: Facilitate standards implementation, conformance, and use.

4.1 Develop plan to implement standards.

Objective 5: Promote an exchanged digital health enterprise systems architecture that contributes to broader health sector goals.

5.1 Develop national enterprise systems architecture blueprint.

5.2 Pilot an interoperability use case based on the enterprise systems architecture blueprint.

3.8. Legislation, Policy, and Compliance

This covers the National health and ICT legislation, policy and regulatory frameworks that govern health information access, storage and sharing. It also includes policy governing privacy of health-related data and requirements for compliance, conformance and accreditation of digital health products and services.

Laws or regulations for privacy, consent, confidentiality, and access to health information should be prioritized and leveraged to protect individual privacy, govern ownership, consent, access and sharing of individually identifiable data. A suite of protocols, policies, frameworks, or guidelines governing use of digital technologies including ethics and governance of Artificial Intelligence (AI) and Machine Learning should be developed and consistently enforced. These should be leveraged to ensure conformance with the national digital health vision across the digital health enabling and ICT environments. Mainstreaming digital health requirements into existing monitoring checklist and protocols offers a cost effective and inclusive approach to achieving compliance with digital health policy directions.

Key objectives with recommended interventions for Legislation, policy and compliance are as follows;

Strategic objective

Establish a digital health policy, regulatory and legal environment that facilitates ease of compliance.

Interventions

Objective 1: Support development and implementation of policies and regulations governing priority digital health interventions including AI for health.

1.1 Develop operational guidelines for health facilities/organizations deploying digital health services and applications.

1.2 Sensitize stakeholders on the operational guidelines.

Objective 2: Ensure continued relevance and update of the national digital health programme.

2.1 Revise the 2018-2023 National Digital Health Strategy

Objective 3: Establish mechanisms to ensure compliance and accreditation of digital health and AI for health products and services.

- 3.1 Develop/adapt standards compliance and accreditation guidelines for digital health interventions.
- 3.2 Conduct assessment and document accredited digital health services and applications.
- 3.3 Mainstream digital health policy thrusts into existing monitoring protocols and checklists

3.9. Health Workforce

Digital skilling of the health workforce is highly critical for increased acceptance and efficient use of digital health applications at all levels of the health sector. Sustaining the digital skills acquired by health workers will require both the traditional didactic, off-site training workshops and onsite, practice-based skills reinforcement and mentoring delivered at the health facility to simulate real-life experience. The following considerations should be made;

- Trainings should be delivered at an appropriate dose and frequency.
- Training modules should be user-friendly and presented in multimedia and multi-lingual modes to facilitate learning.
- Digital learning platforms should be leveraged to upload training modules where possible and offline devices utilized in off-grid facilities.
- Digital skills reinforcement should be mainstreamed into the integrated supportive supervision visits (ISSV) and the Quality Improvement initiatives.
- Core digital health competencies should be integrated into pre-service training curricula and in-service training with certification, by health training institutions and health regulatory bodies respectively.

Stakeholders identified 10 priority digital health core competencies requiring urgent attention as shown in Table 3.0 and mapped each to corresponding health workers job roles.

The key objectives with recommended interventions for workforce are as follows;

Strategic Objective

Deliver a gender sensitive health and health ICT workforce that has the requisite skills, experience, and knowledge to apply digital health in the management and delivery of care and supporting digital health services.

Interventions

Objective 1: Create demand and uptake of digital health interventions by health workforce.

- 1.1 Conduct training needs assessment for health workers
- 1.2 Advocacy visit to key decision-makers for health workforce development.

Objective 2: Build capacity of health workforce on skills, experience, and knowledge to apply digital health in the management and delivery of care and supporting digital health services.

- 2.1 Develop training modules for core digital health competencies and identified health priority areas.
- 2.2 Conduct offsite trainings for health workforce on prioritized competencies.
- 2.3 Conduct onsite training reinforcements and coaching/mentoring visits.
- 2.4 Conduct coaching review meetings.
- 2.5 Build digital health expertise at eHealth Coordination Hub

Objective 3: Build partnerships for capacity development of health workforce.

- 3.1 Support health workforce community of practice.
- 3.2 Collaborate with academia for research fellowship/ mentoring at eHealth coordination hub.

Table 3.0: Core digital health competence mapping

Priority Competencies	
C1	Digital health orientation and change management
C2	Basic Computer Literacy and internet skills including typing skills and Microsoft Office skills
C3	Basic Medical Terminologies, Abbreviations and Common Disease classifications
C4	Basic Monitoring and evaluation skills
C5	Data Privacy and IT security including cybercrime act, credential management, and virus protection
C6	Data management skills including data analysis using excel, power BI, tableau etc.
C7	DHIS 2 frontend and backend management skills
C8	Basic ICT hardware, software and network maintenance and troubleshooting skills
C9	Digital Health leadership and IT project management skills
C10	Planning National Digital Health Systems

4. IMPLEMENTATION FRAMEWORK

To successfully operationalize this document, a detailed implementation plan has been developed for each of the digital health enabling and ICT environments based on its strategic objectives. Each component area has several sub-objectives with activities, activity description, desirable outputs, timelines, and responsible stakeholders mapped to the activities.

A result-based management approach was adopted with programme efforts focused on performance and achievement of results. It is expected that this will help improve effectiveness and sustainability of interventions as well as accountability for resources used.

The framework has 7 strategic objectives corresponding to the digital health enabling and ICT environments, 25 specific objectives and 68 interventions distributed along the enabling environments over a period of 36 months.

- Leadership and Governance pillar consists of 3 objectives with 10 interventions.
- Strategy and Investments pillar consists of 3 objectives with 9 interventions.
- Services and Applications pillar consists of 4 objectives with 16 interventions.
- Infrastructure pillar consists of 4 objectives with 9 interventions.
- Standards and Interoperability pillar consists of 5 objectives with 8 interventions.
- Legislation, Policy, and Compliance pillar consists of 3 objectives with 6 interventions.
- Health workforce pillar consists of 4 objectives with 14 interventions.

Each of the interventions are described and mapped to the expected outputs with the specific tasks, key cost assumptions, responsible persons and key supporting partnerships outlined.

The implementation matrix is elaborated at Annex i (Table 3.1).

5. MONITORING AND EVALUATION FRAMEWORK

Monitoring and evaluation of the Roadmap implementation is elaborated in the M&E framework on Table 4.0. Performance indicators have been defined and assigned for each output to guide how the indicators will be measured or appropriately estimated. Baseline data and timebound targets expressed quantitatively as percentages or qualitatively as “Yes or No” are also defined for each indicator.

Monitoring

The performance indicators will be continuously tracked throughout the Roadmap implementation lifecycle using the M&E framework as a monitoring tool. Performance data should be collected and analyzed to provide updates during periodic review meetings such as the Digital Health core team meetings and the monthly CoP meetings. The data sources and their Means of Verification (MoV) are also specified for each performance indicator. These should include administrative reports of activities, population-based surveys, technical activity reports, routine HMIS, health facility assessments e.g., ISSVs and reporting interface of digital health applications and reports on the MoH website.

The frequency of data collection and reporting is stated for each indicator along with the responsible persons or agencies for reporting.

Evaluation

The Roadmap will be evaluated at specified intervals during its implementation life cycle including midterm (2025) and end-term (2026). The evaluation will involve collecting and analyzing performance data to determine the extent to which the expected results are being achieved, factors that led to the results and how they can be sustained. Associated risks should be promptly identified, and corresponding mitigation strategies documented. The annual review meetings should serve as the platform for reviewing evaluations reports and making important programme decisions which should be captured for implementation in the next annual workplan.

Integration with the National M&E System

Finally, efforts should be made to embed all digital health and related activities in the Roadmap within the M&E implementation plan of the National Health Sector Strategic Plan and other relevant plans and strategies. This will reduce associated M&E cost, enhance coordination, and align with the overall goal of one M&E system for the health sector.

The M&E framework is outlined at Annex ii (Table 4.0).

6. COSTING AND BUDGET

Considering the huge cost of implementing the Roadmap, there is need to prioritize critical areas in the enabling and ICT environments. While it is desirable to target ambitious investments and wide coverage, availability of resources will determine the scope, timing, and delivery of the Roadmap interventions. Investments towards a strong governance and ownership; an adequate and functional infrastructure; and a digitally skilled workforce should be prioritized in line with documented evidence from the landscape assessment.

Services and applications addressing priority health systems challenges should also be prioritized in line with health systems goals.

Available funding confirmed funding sources and existing funding gaps for the Roadmap interventions should be identified. Also, a resource mobilization plan with short-term and long-term financial goals and strategy to achieve them should be developed. This will facilitate the high-level advocacy and donor engagements outlined in the Strategy and Investments section.

To cost the Roadmap, an Activity Based Costing methodology was adopted. Following a systematic analysis of all the interventions, cost drivers and assumptions related to each intervention was highlighted with overheads and indirect costs allocated. The existing costing template of the MoH for services, equipment and operations was adopted in determining specific costs.

The indicative cost estimates and budget for financing the Roadmap is highlighted in Annex iii (Table 5.0).

ANNEXURES

a. ANNEX I: IMPLEMENTATION PLAN

Table 3.1: Implementation matrix

LEADERSHIP AND GOVERNANCE

Objective	Activity	Description (Sub-activity)	2024				2025		
			Q1	Q2	Q3	Q4	Q1	Q2	
Strategic Objective: Ensure an empowered and appropriately functioning digital health leadership and governance at all levels									
Objective 1: Strengthen coordination and oversight of digital health implementation at all levels	1.1 Formalize digital health governance structures at all levels.	Inaugurate the Digital Health Focal points at the MoH, Directorates and Programmes, DHMTs and Health facilities including the Communities of Practice. National inauguration done during the launch of the Roadmap document and support provided for inauguration at District level during routine DHMT meetings.							
	1.2 Provide operational support for Digital Health Coordination Hub	Computer, furniture, website, and communications etc							
	1.3 Convene quarterly stakeholders coordination meetings	Quarterly coordination meeting of Digital Health Coordination unit, Directorates & programmes focal points and DHMT focal points and partners to review roadmap implementation							
	1.4: Recruit Digital Health Coordinator								
Objective 2: Promote stakeholders' commitment and inclusion	2.1 Conduct stakeholders sensitization workshops	Sensitize stakeholders from Health facili-ties, DHMT, MoH Directorates & pro-grammes, partners organizations, private sector, MCTI, and other non-health sector Directorates & programmes on alignment with roadmap							

2025			2026				Key Cost Drivers/ Assumptions	Responsible	Partnership	Expected Output
	Q3	Q4	Q1	Q2	Q3	Q4				
							No cost. Activity conducted during launch of digital health Roadmap at National level and DHMT routine meetings	MoH-DHMT	Health facilities, MoH Directorates and Programmes, Relevant Ministries, Partners	Digital Health governance structure activated and empowered at all levels
							Lump sum	DPPI	Digital Health coordination hub	Operational capacity of digital health coordination hub enhanced
							10 unit, 1 -day facilitated workshop for 60 persons	DPPI	MoH Directorates and Programmes, DHMT,MCTI, Relevant Ministries, Partners	Digital health stakeholders continuously engaged
							1 personnel *12 month * 3 years	DPPI	MoH Directorates and Programmes, DHMT, MCTI, Relevant Ministries, Partners	
							1-day (5 unit) facilitated workshop for National level and 4 Regions for the first year (300 persons)	DPPI	MoH Directorates and Programmes, DHMT,MCTI, Relevant Ministries, Partners	Stakeholders commitment and buy-in obtained

	2.2 Organize Leadership retreat on digital health roadmap	Retreat on the National Digital Health Roadmap for senior MoH leadership (Hon. Minister, Deputy Minister, CMO, Deputy CMO and MoH Directors)							
Objective 3: Institutionalize an effective Monitoring, Evaluation, Accountability and Learning (MEAL) system	3.1 Conduct supportive supervision visits	Quarterly supportive supervision visits by Digital Health unit to facilities deploying priority digital health interventions							
	3.2 Conduct learning review meetings	Quarterly learning review meetings for priority services and applications including DHIS 2, iHRIS, PResTrack, eCBDS, M-supply etc							
	3.3 Conduct Mid-term review of progress of digital health roadmap implementation	Desk review and analysis of Roadmap implementation with stakeholders by the Digital Health Coordination hub/DPPI in collaboration with focal points at MoH Directorates & programs and DHMT and partners							
	3.4 Conduct End-term review of progress of digital health roadmap implementation	Desk review and analysis of Roadmap implementation digital health stakeholders							
	3.5 Conduct annual National Digital Health Forum	Annual Digital Health stakeholders forum with plenary workshops, panel presentations, poster sessions and exhibitions etc							

						2-day Residential workshop for 50 persons	DPPI	Health Development partners	Commitment of senior MoH leadership obtained and shared vision for digital health created
						7-day staggered visits to health facilities across the 16 district by 8 persons	DPPI	Health Development partners	Implementation and monitoring support provided for digital health interventions
						10 unit, 1-day facilitated meeting by 50 stakeholders and partners	DPPI, CoP	MCTI, MoH Directorates, and programmes, DHMT, Health Development partners	Learning review meetings Conducted
						Staff time, 3-day facilitated workshop for 100 stakeholders.	DPPI	MCTI, MoH Directorates, and programmes, DHMT, Health Development partners, DSTI, relevant ministries and agencies	Performance review of roadmap implementation and corrective actions documented
						staff time, 3-day facilitated workshop for 100 stakeholders.	DPPI	MCTI, MoH Directorates, and programmes, DHMT, Health Development partners, DSTI, relevant ministries and agencies	Performance review of roadmap implementation and corrective actions documented
						2-day facilitated workshop for 160 participants	DPPI	MCTI, MoH Directorates, and programmes, DHMT, Health Development partners, DSTI, relevant ministries and agencies, media organizations, academia, general public	Annual performance review conducted

STRATEGY AND INVESTMENTS

Objective	Activity	Description (Sub-activity)	2024				2025		
			Q1	Q2	Q3	Q4	Q1	Q2	Q3
Strategic Objective: Support coordination and align financing with donor, private- sector, government, and community priorities									
Objective 1: Support strategy and planning for digital health	1.1 Develop and launch a costed digital health investment roadmap.	Baseline assessment with inception, consultative, costing and validation meetings, Printing of 100 copies of the Roadmap document. Launch of the Roadmap document by the Hon. Minister, CMO, EMC and DMOs							
	1.2 Develop Annual Operational Plan (AOP)	Consultative and validation workshops to develop annual workplan and ensure relevance of planned activities							
	1.3 Advocate for mainstreaming of digital health into Health and non-health Sector plans, policies, and programs	Advocacy visit to relevant MDAs by CoP on aligning plans and programs with digital health							
Objective 2: Strengthen fiduciary system for digital health funding and investment management	2.1 Engage DHMT and Local Councils staff including finance officers and units to appropriate more funds for digital health	Sensitization meetings with finance staff and relevant officers at DHMT and Local Councils							
	2.2 Develop operational guidelines for PPP	Develop PPP guidelines to support private sector participation in provision of digital health services leveraging the 2010 National PPP Act							
	2.3 Conduct economic evaluation of proposed priority digital health interventions.	Conduct cost benefit analysis and investment case for priority digital health use cases under PPP							
	2.4 Conduct training on One Health Costing Tool	Train programme officers in DPPI, MoH directorates and programmes, DHMT on the One Health Tool and cascade training to district level							

2025		2026				Key Cost Drivers/ Assumptions	Responsible	Partnership	Expected Output
Q3	Q4	Q1	Q2	Q3	Q4				
						Landscape Assessment, 3 units 4-day facilitated workshops (1 day for validation) ,Printing cost (250 copies) , Hall for 1-day launch, refreshments, media publicity (120 persons)	DPPI, MCTI	NCRA & HDPs (UNICEF ,WHO), DSTI	A costed roadmap for digitalization in the health sector
						3-day staggered stakeholders consultative (2 days) and 1 day validation meeting workshop for 100 persons	DPP, MCTI	NCRA & HDPs, DSTI	Detailed costed action plan with responsibilities and timelines developed
						Advocacy visit to key MDAs by CoP	DPP, MCTI	SLICOM, HDPs, DSTI , DHMT, SLeSHI, PPP, MoF, MoE, MCTI, Local Government & other MDAs	Commitment to align and mainstream digital health with the national and other sectorial digital strategies obtained
						1-day, 5-unit regional workshop (200 persons)	DPPI	DHMT & HDPs , Local Govt Finance Department	Commitment of DHMT and Local Councils to factor digital health into annual workplans obtained
						3-day facilitated workshop (40 persons)	DPPI -MCTI	PPP Unit (Office of the President), HDPs, MoPED, MoF & other MDAs	Operational guidelines for fund access and administration including PPP developed
						Technical Assistance	Director DPPI	HDPs, MoF & other MDAs	Outline/Full Business Case for proposed digital health interventions developed
						Technical Assistance and mentoring.	DPPI	HFU, DRCH, PI, DHSE, DPHC, NMSA, DPS, DHMTs, All programmes	Technical capacity of programme officers built on use of the One Health Tool

Objective 3: Mobilize resources to support the National digital health programme	3.1 Develop Advocacy and Resource Mobilization Plan (RMP) for digital health	Identify and map new and existing funding sources, conduct desk review of private sector landscape, develop advocacy kits/ briefs and operational plan for securing new and additional funding for prioritized digital health interventions								
	3.2 Conduct advocacy visits for improved funding	High level advocacy to identified funding sources using the RMP as an advocacy tool and for creation of a dedicated funding pool (digital health trust fund)								

						4-day staggered technical workshops: consultative (3 days) and validation (1 day)	DPPI	HDPs, MoF & other MDAs	A resource mobilization plan for digital health developed
						High level advocacy visits by Digital Health Core Team and Community of Practice	DPPI	HDPs, MoF & other MDAs, private sector	Partners commitment for new and additional funding obtained.

SERVICES AND APPLICATIONS

Objective	Activity	Description (Sub-activity)	2024				2025			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Strategic Objective: Support deployment of digital health solutions that maximize health impact through improved fidelity and uptake of existing services										
Objective 1: Strengthen digitization of routine Health Management Information systems to facilitate accurate and consistent data collection, analysis, use and health information exchange.	1.1 Conduct in-depth assessment of the National HMIS and enterprise systems architecture of digital health solutions	In-depth assessment of routine HMIS (including data management processes, workforce capacity and existing enterprise systems architecture for digital health tools etc) with development of a National enterprise systems architecture blueprint								
	1.2 Revise HIS strategic plan.	Technical workshop to develop an action plan for improving HMIS performance and supporting infrastructure based on identified gaps								
	1.3 Improve data quality and use	Quarterly data review meeting								
	1.4 Optimize DHIS 2 deployment	Implement DHIS 2 maturity assessment recommendations								
Objective 2: Support optimization and scale up deployment of existing services and applications for addressing priority health systems challenges	2.1 Optimize eIDSR and eCBDS deployment for improved One Health surveillance, early warning, and response	Integrate more functionalities e.g., decision support tools , SMS and USSD gateways, vaccine verification etc.								
	2.2 Strengthen eSMT deployment through implementation of Effective Vaccine Management Assessment (EVMA) recommendations	Scale up, operations and maintenance, training, monitoring and change management, integrate with DHIS 2 and mSupply								

		2026				Key Cost Drivers/ Assumptions	Responsible	Partnership	Expected Output
3	Q4	Q1	Q2	Q3	Q4				
existing guidelines and recommendations									
						Technical Assistance to conduct assessment and develop HIS strategic plan. Lump sum	DPPI	MoH Directorates and Programmes, DHMT, Health facilities, Health Development Partners	In-depth assessment of the National HMIS and enterprise systems architecture of digital health solutions conducted
						10-days staggered workshops ;inception, consultative, validation and dissemination.(60 persons)	DPPI	MoH Directorates and Programmes, DHMT, Health facilities, Health Development Partners	HIS Strategic plan revised
						Technical Assistance, 12 units facilitated workshops and quarterly review meetings for 60 persons	DPPI	MoH Directorates and Programmes, DHMT, Health facilities, Health Development Partners	HMIS indicators updated
						Lumpsum as per costed workplan	DPPI	MoH Directorates& programmes, DHMT, Health facilities and Health Development Partners	DHIS2 maturity assessment recommendations implemented
						Technical Assistance and mentorship. Facilitated training workshops (Lump sum) as per costed workplan	DPPI-DHSE	DHMT, AFENET, WHO,UNICEF , eHealth Africa and other relevant Health Development Partners	Improved functionality of surveillance and data management tools
						Technical Assistance and mentorship. Training workshops and supportive supervision. 44 PHUs (Lump sum as per DIPC costed workplan)	National EPI-DPPI	DHSE, DPHC, DHMT, Health facilities and relevant partners	EVMA continuous improvement plan implemented

<p>2.3 Deploy EMR to improve patient care coordination, clinical decision support and data management</p> <p>2.4 Strengthen iHRIS deployment to support collaboration for human resources decision and health workforce training</p> <p>2.5 Optimize PReSTrack deployment to meet DPG status</p> <p>2.6 Pilot Community Health Workers mobile application</p> <p>2.7 Optimize mSUPPLY mobile deployment and integrate with existing logistics and data management systems</p> <p>2.8 Deploy new reusable digital health applications and shared services to support interoperability</p>	<p>Phased expansion of EMR to all Tertiary/district hospitals and selected PHUs linking the “hub and spoke” model</p>								
	<p>Update personnel information on iHRIS Manage, integrate IPAS, deploy iHRIS train, Retrain HR officers and change management, procure hosting services.</p>								
	<p>Software roadmap development and implementation, improve interoperability and data access. Integrate precision and analytic tools</p>								
	<p>Link to CHW geo-referenced registry and integrate performance management, incentive payment and logistics supply</p>								
	<p>Scale up, operations and maintenance, training, monitoring and change management, integrate with DHIS 2, mSupply and eSMT</p>								
	<p>This includes CRVS, Telemedicine, Artificial Intelligence systems, Health Insurance systems, Health Facility Registry.</p>								

						Technical Assistance and mentoring, infrastructure procurement, training workshops and implementation support 12 facilities	DPPI	DHMT, Health Facilities, relevant Partners	Functional EMR deployed at all tertiary and district hospitals and selected PHUs
						TA, Lump sum as per 2022 costed workplan	DPPI-DHRH	All Key relevant Partners in Services and Applications	iHRIS updated and successfully utilized for HR management and training
						TA, Lump sum as per costed software roadmap	DPPI/DRCH/DSTI	DHMT, Health facilities, relevant partners	PreSTrack deployment optimized to meet DPG status and listed on DPG registry
						Technical assistance and mentorship, lumpsum (costed Birsch workplan)	DPPI-DPHC	UNICEF, last mile health, CHAF, Medtronic LABS, other partners	CHIS application piloted
						TA, Lump sum as per costed workplan	DPPI-NMSA	DPS, DHMT, Health facilities, Health Development Partners	mSUPPLY mobile deployment scaled and optimized
						TA, Lump sum	DPPI	Relevant MDAs and Health Development partners	Adaptation of current enterprise systems architecture to interoperability requirements enhanced

Objective 3: Improve collaboration among implementers of digital health services and applications	3.1 Support services and applications community of practice									
	3.1 Develop partners collaboration portal	Develop a portal to curate partner activities and milestones on the e-Health Coordination hub's sub-domain of MoH website.								
Objective 4: Ensure meaningful use of digital health solutions to address health systems challenges by integrating recommended clinical and public health practices, and data recommendations.	4.1 Localize the WHO SMART guidelines (L1-Narrative) to improve health content	Conduct technical workshop to review WHO SMART guidelines for priority health programme areas e.g., ANC and immunization								
	4.2 Develop a checklist for evaluating Services and Applications	Technical workshop to review and adapt DPG maturity assessment tool and SMART Guidelines into an assessment checklist								
	4.3 Evaluate priority services and applications	Assess level of adoption of recommended clinical and public health practice guidelines, and data recommendations by selected digital health applications								
	4.4 Organize hackathon/connectathon (L2-Semi structured) to support adoption of Digital Adaptation Kit by priority services and applications	Hackathon for software code developers to develop standards-based codes reflecting Digital Adaptation Kits for identified health content gaps in selected applications								

						30 units Monthly review meetings for 40 persons	DPPI / MCTI	All Key relevant Partners in Services and Applications	CoP Meetings Conducted
						Technical assistance and mentorship, (lumpsum)	DPPI	All Key relevant Partners in Services and Applications	Portal developed for no objection authorizations and depository of partner activities
						2 units, 3 day facilitated workshops for 40 persons	DPPI-DSTI	MoH Directorates and programmes, UNICEF, Innovations SL, relevant partners, and implementers	Relevant WHO guidelines localized
						2 day facilitated workshop for 40 persons	DPPI-DSTI	MoH Directorates and programmes, UNICEF, Innovations SL, relevant partners, and implementers	Checklist developed
						Desk work to develop assessment tool on kobocollect and administer virtually	DPPI-DSTI	MoH Directorates and programmes, UNICEF, Innovations SL, implementers	Health content of selected digital health solutions evaluated
						4 days ideation workshop and prizes for developers (Lumpsum as per costed workplan for hackathon)	DPPI-DSTI	MoH Directorates and programmes, UNICEF, Innovations SL, start-ups	Standards- based codes reflecting guidelines decision logic and requirements developed

INFRASTRUCTURE

Objective	Activity	Description (Sub-activity)	2024				2025		
			Q1	Q2	Q3	Q4	Q1	Q2	Q3
Strategic Objective: Provide and continuously maintain physical infrastructure to support digital health implementation									
Objective 1: Determine current state of infrastructure for digital health interventions	1.1 Conduct inventory of ICT infrastructure & needs assessment	Baseline infrastructure gap assessment and inventory at National and sub-national level. Desk work for district hospitals using CMMS and fieldwork to other health facilities							
	1.2 Develop infrastructure masterplan	Workshop to identify gaps based on minimum requirements and develop infrastructure provision and maintenance plan for health facilities							
Objective 2: Prioritize the provision of basic computing, connectivity, and power infrastructure to support deployment of priority digital health solutions	2.1 Procure ICT hardware	Computer devices (desktops, laptops, and tablets), connectivity equipment (CAT 6 cables, routers, networking devices,) for Health facilities, DHMTs, MoH Directorates and programmes							
	2.2 Procure back up power equipment	Procure hybrid solar-inverter solutions for Health facilities, DHMT, MoH Directorates and programmes							
	2.3 Set up Local Area Network (LAN) for connectivity	Last mile wireless connectivity from existing fiberoptic nodes to District hospitals							
	2.4 Provide internet bandwidth	Internet bandwidth subscription for health facilities, DHMTs and MoH Directorates and programmes							
	2.5 Establish digital learning centres in health facilities	Set-up, equip and continuously support digital learning centres in 14 District hospitals and 2 Tertiary hospitals to serve as training hub for health workers							
	2.6 Set up Data Centre Infrastructure for MoH	Provide at least 3-years cloud server subscription to centrally store and manage databases from existing digital health solutions. Leverage the proposed Government Data Centre project by MCTI in the long-term.							

2025		2026				Key Cost Drivers/ Assumptions	Responsible	Partnership	Expected Output
Q3	Q4	Q1	Q2	Q3	Q4				
						10-day fieldwork for 50 assessors	MoH-MCTI	Health Development partners	Inventory and needs assessment conducted
						6-day staggered, facilitated workshops; (50 persons)	MoH-MCTI	Health Development partners	ICT infrastructure masterplan developed
						Procurement cost for computer devices and routers (lumpsum)	MoH, MCTI	Health Development partners	ICT hardware procured
						Procurement and installation cost for solar inverter (lumpsum)	MoH, MCTI	Health Development partners	Power back up equipment procured, installed, and activated
						Long range radios, Installation, and activation cost (lumpsum)	MoH, MCTI	MS, DMO, Health Development Partners	Hybrid LAN for connectivity created
						Monthly internet subscription (lumpsum)	MoH, MCTI	DHMTs, MoH Directorates and programmes, Health Development partners	Connectivity equipment activated and functional
						16 furnished centres fitted with computing, connectivity, and power infrastructure	MCTI	DPPI, DHRH, DSTI,HDPs	Digital learning hubs for continuous hands-on skills training established
						3-year virtual server hosting subscription cost	MoH, MCTI	Health Development partners, Telcos	Central server hosting infrastructure with active subscription

Objective 3: Leverage existing investments to support sustainable infrastructure provision	3.1 Conduct high level advocacy for infrastructure provision	High level advocacy to extend existing infrastructure projects to health facilities e.g., Ministry of Energy's Renewable energy project, DSTI's project Giga (fiberoptic connectivity) schools and MNO's broadband expansion projects							
Objective 4: Institutionalize preventive and corrective maintenance of new and existing ICT infrastructure	4.1 Periodic review of infrastructure status	Quarterly meeting to review status of existing ICT infrastructure based on the inventory. Collaborate with other government sectors and engage partners to support the replacement of old and worn-out infrastructure and maintenance of the functional ones.							

STANDARDS AND INTEROPERABILITY

Objective	Activity	Description (Sub-activity)	2024				2025	
			Q1	Q2	Q3	Q4	Q1	Q2
Strategic Objective: Establish and maintain a well-defined, standards and requirement based, interoperable enterprise architecture for consistent digital health solutions								
Objective 1: Domesticate minimum standards and interoperability requirements for digital health solutions	1.1 Define, adapt/adopt and document minimum standards and interoperability requirements for digital health solutions	Technical workshops to review, localize and continuously update standards including but not limited to common terminologies (ICD, SNOMED CT, LOINC etc), technical standards (ISO/TC HIS 215), Data exchange standards (HLF-FHIR), unique patient ID system, defacto standards etc.						
Objective 2: Determine current state of existing digital health interventions based on adopted standards and interoperability requirements	2.1 Assess status of existing digital health solutions on adopted standards	Baseline assessment of existing digital health solutions and services including identity management services						
	2.2 Conduct diagnostic assessment of identity management services	Technical review of existing unique health ID systems (clients, health workers and facilities) and develop implementation plan						

							4 units high-level advocacy visit by Community of Practice	MoH-MCTI	DSTI, Ministry of Energy, Health Development Partners, Telcos etc	High level advocacy for infrastructure provision conducted
							Quarterly review meetings (50 persons) in the first 6 months and bi-annual meetings for next 24 months	MoH-MCTI	Relevant MoH Directorates and programmes, DHMT, Ministry of Energy, Health Development Partners, Telco, others	Infrastructure status reviewed by stakeholders

2025			2026				Key Cost Drivers/ Assumptions	Responsible	Partnership	Expected Output
2	Q3	Q4	Q1	Q2	Q3	Q4				
Consistent and accurate collection and exchange of health information.										
							12 units , staggered facilitated workshops (60 persons)	MoH-MCTI	NCRA, Standards Bureau, MoH Directorates and Programs, DSTI, Health Development partners, technology vendors, academia	Minimum Interoperability standards documented, published, and continually updated
							Technical assistance and mentorship. 3-day staggered, facilitated workshop to review assessment tool/ validate standards assessment (40 persons)	MoH-MCTI	Standards bureau, Health Development partners	Standards conformance status (baseline) of existing digital health solutions documented and published
								MoH-MCTI	NCRA,GRID 3, Health Development partners	Interoperability requirements for identity management services defined

Objective 3: Mobilize stakeholders support and build consensus for adoption of standards	3.1 Create awareness on adopted standards	Sensitization workshops for key stakeholders on adopted standards including use of Health identifier systems and registries. Agree timeframe for standards conformance.							
	3.2 Build capacity of key stakeholders on adopted standards	Stakeholders capacity building workshops on adopted standards							
Objective 4: Facilitate standards implementation, conformance, and use	4.1 Develop plan to implement standards	Stakeholders workshop to develop standards implementation plan and accreditation guideline							
Objective 5: Promote an exchanged digital health enterprise systems architecture that contributes to broader health sector goals	5.1 Develop national enterprise systems architecture blueprint	Identify existing common (shared) services and enabling components, assess gaps, develop plan for linking shared services with point of services applications through standards adoption and APIs, and upgrades, maintenance, remodeling, and additions of new applications in the enterprise systems architecture							
	5.2 Pilot an interoperability use case based on the enterprise systems architecture blueprint	Deploy an enterprise service bus or an Integration Platform as-a-service (iPaaS) to support a data exchange “interoperability layer” linking shared services with point-of-service application and the National Health Observatory.							

							2 units, 1-day facilitated workshops (60 persons)	MoH-MCTI	Health Development partners, Technology vendors and implementers	Stakeholders consensus and commitment on adopted standards obtained
							4-units, 3-day Facilitated workshops (50 persons)	MoH-MCTI	Standards Bureau, Health Development partners, Technology vendors and implementers	Stakeholders capacity built on adopted standards
							3-day facilitated workshop (50 persons)	MoH-MCTI	Standards Bureau, Health Development partners, Technology vendors and implementers	Standards and Interoperability guidelines documented and published
							Technical Assistance (Enterprise systems architecture and data exchange expert)	MoH	MCTI, Standards Bureau, Relevant partners, and implementers	National enterprise systems architecture blueprint developed and published
							TA and mentoring ,Lumpsum	MoH	MCTI, Standards Bureau, Relevant partners, and implementers	National enterprise systems architecture blueprint implemented

Objective 4: Facilitate standards implementation, conformance, and use	4.1 Develop plan to implement standards	Stakeholders workshop to develop standards implementation plan and accreditation guideline								
Objective 5: Promote an exchanged digital health enterprise systems architecture that contributes to broader health sector goals	5.1 Develop national enterprise systems architecture blueprint	Identify existing common (shared) services and enabling components, assess gaps, develop plan for linking shared services with point of services applications through standards adoption and APIs, and upgrades, maintenance, remodeling, and additions of new applications in the enterprise systems architecture								
	5.2 Pilot an interoperability use case based on the enterprise systems architecture blueprint	Deploy an enterprise service bus or an Integration Platform as-a-service (iPaaS) to support a data exchange “interoperability layer” linking shared services with point-of-service application and the National Health Observatory.								

							3-day facilitated workshop (50 persons)	MoH-MCTI	Standards Bureau, Health Development partners, Technology vendors and implementers	Standards and Interoperability guidelines documented and published
							Technical Assistance (Enterprise systems architecture and data exchange expert)	MoH	MCTI, Standards Bureau, Relevant partners, and implementers	National enterprise systems architecture blueprint developed and published
							TA and mentoring, Lumpsum	MoH	MCTI, Standards Bureau, Relevant partners, and implementers	National enterprise systems architecture blueprint implemented

LEGISLATION, POLICY, AND COMPLIANCE

Objective	Activity	Description (Sub-activity)	2024				2025		
			Q1	Q2	Q3	Q4	Q1	Q2	Q3
Strategic objective: Establish a digital health policy, regulatory and legal environment that facilitates ease of compliance									
Objective 1: Support development and implementation of policies and regulations governing priority digital health interventions including AI for health	1.1 Develop operational guidelines for health facilities/organizations deploying digital health services and applications	Development of guidelines for priority digital health enabling and ICT environment: governance, privacy security & confidentiality, infrastructure maintenance and replacement, workforce capacity building.							
	1.2 Sensitize stakeholders on the operational guidelines	Orientation of health workers, health systems managers and partners on the guidelines							
Objective 2: Ensure continued relevance and update of the National digital health programme	2.1 Revise the 2018-2023 National Digital Health Strategy	Develop, launch, and disseminate policy and implementation strategy with costed operational plan							
Objective 3: Establish mechanisms to ensure compliance and accreditation of digital health and AI for health products and services.	3.1 Develop/adapt standards compliance and accreditation framework for digital health interventions	Adapt existing assessment frameworks such as DPG maturity tool and SMART guidelines (L1,L2) etc to develop check-list/guidelines							
	3.2 Conduct assessment and document accredited digital health services and applications	Annual (Bi-annual in the first year) assessment of existing digital health services and applications. List accredited digital health interventions on Digital Health Coordination hub website							
	3.3 Mainstream digital health policy thrusts into existing monitoring protocols and checklists	Advocacy to health sector regulatory bodies/ MDAs to mainstream digital health requirements into existing accreditation /monitoring protocols and checklists e.g., ISSV tool							

2025			2026				Key Cost Drivers/ Assumptions	Responsible	Partnership	Expected Output
2	Q3	Q4	Q1	Q2	Q3	Q4				
							10- day, staggered facilitated workshops (60 participants)	MoH(DPPI)-MCTI	MoH Directorates and programmes, DHMT, Standards Bureau, Ministry of Energy, Relevant Health Development partners	Operational guidelines for digital health services and applications developed and disseminated
							5 units, 2-day regional sensitization workshop (150 persons)	MoH(DPPI)-MCTI	Relevant MoH Directorates and programmes, DHMT, Health facilities, Health Development partners	Stakeholders sensitized on operational guidelines
							14-day staggered workshops for 60 persons	MoH(DPPI)-MCTI	MoH Directorates and programmes, DHMT, Standards Bureau, DSTI, Ministry of Energy, Health Development partners etc	National Digital Health Strategy revised
							Validation done during CoP meeting	DPPI	MCTI, DPG Council, Innovations SL, UNICEF, other Health Development partners, implementers	Compliance checklist developed
							Desk work (staff time) to administer self-assessment tool	DPPI	MCTI, other Health Development partners, implementers	Accredited digital health interventions listed on MoH website and continuously updated
							High Level advocacy visit by digital health core team and CoP	DPPI, CoP	ISSV Office-DPHC, NAMED, MoH Directorates and Programmes, DHMT, Medical and Dental, Council, Nursing council, Pharmacy Board	Digital health checklist mainstreamed into ISSV and existing health sector monitoring/accreditation protocol

HEALTH WORKFORCE

Objective	Activity	Description (Sub-activity)	2024				2025	
			Q1	Q2	Q3	Q4	Q1	Q2
Strategic Objective: Deliver a gender sensitive health and health ICT workforce that has the requisite skills, experience, and knowledge to app								
Objective 1: Create demand and uptake of digital health interventions by health workforce.	1.1 Conduct training needs assessment for health workers	Comprehensive assessment of training gaps including specific training require-ments of health workers on existing digital health interventions						
	1.2 Conduct advo-cacy visit to key decision-makers for health workforce development	Develop advocacy kits for high level advocacy to Minister of Health for implementation of an ICT cadre in MoH; Health training institutions and regulatory bodies to adopt digital skills training as part of pre-service training and in-service CPD for of health workers respectively.						
Objective 2: Build capacity of health workforce on skills, experience, and knowledge to apply digital health in the management and delivery of care and supporting digital health services.	2.1 Develop training modules for core digital health com-petencies and iden-tified health priority areas	Technical assistance to develop user friendly multimedia-based (Audio visual, animation) health worker training modules for onboarding on e-Learning platform and offline devices						
	2.2 Conduct offsite trainings for health workforce on prioritized competencies	National Training of Trainers (Peer support coaches) workshop and Regional stepdown Training workshops for prioritized competencies						
	2.3 Conduct onsite training reinforce-ments and coach-ing/mentoring visits	Coaching visits by trained peer support coaches to provide onsite skills practice and consolidation of skills after the initial training exposure						
	2.4 Conduct coach-ing review meet-ings	Quarterly review meetings for onsite peer support coaches						

2025			2026				Key Cost Drivers/ Assumptions	Responsible	Partnership	Expected Output
Q2	Q3	Q4	Q1	Q2	Q3	Q4				
to apply digital health in the management and delivery of care and supporting digital health services.										
							TA cost, 2-day stake-holders dissemination meeting (60 persons)	DPPI,DHRH	HDPs, CoP, Health Training institutions	Training needs as- sessment conducted
							2-day facilitated work-shop to develop advo-cacy kits (50 persons), Advocacy visit by Digi-tal Health Core team and CoP	DPPI, CoP	MCTI, Health Training institu-tions, universi-ties, Health Regu-latory bodies, Health Develop-ment Partners, DSTI (Tas-SL Diaspora) CSO	Advocacy for health workforce capacity development con-ducted
							Technical Assistance and mentorship. 5-day validation workshop (40 persons)	DPPI, MCTI	DHRH, QOC, Health Development Partners, DSTI ,TEC	Digitized health worker training modules developed
							1 unit, 5-day staggered ToT workshop in Free-town (40 persons) and 5-units, 3-days stag-gered monthly, step down regional training workshops (1000 per-sons)	DHRH/ICT/ eHealth Hub/ QOC/DPPI	MCTI/Health Development Partners/ DSTI	Peer coaches and health workforce training conducted
							Coaching visit / travel to selected health facili-ties (district hospitals and PHUs) by 32 peer coaches; 2 per district and 8 National staff (24 visits)	DHRH/ICT/ eHealth Hub/ QOC/DPPI	MCTI/Health Development Partners/ DSTI	Continuous practical skills reinforced and consolidated
							2-day Quarterly coach-ing review meeting in Freetown (60 persons)	DHRH/ICT/ eHealth Hub/ QOC/DPPI	MCTI/Health Development Partners/ DSTI	Quarterly coaching review meetings conducted

	2.5 Build digital health expertise at eHealth Coordina-tion Hub	Sponsor digital health certification courses (COBIT 5,TOGAF,Planning National Digi-tal Health Systems etc) for digital health core team at MoH							
Objective 3 : Build partnerships for capacity development of health workforce	3.1 Support health workforce commu-nity of practice	Monthly meetings of Health workforce community of practice							
	3.2 Collaborate with academia for re-search fellowship/ mentoring at eHealth coordina-tion hub	Provide research allowance/ publication fees for interns from health training insti-tutes to support community of practice , mentoring and operational research at ehealth hub							

							International travel and/or course fees and allowance for 5 DH Health Core team (lumpsum)	DPPI (Director of Training), MCTI	DHRH, Health Development Partners, MOF	Technical capacity of digital health core team strengthened
							1 day CoP meeting (40 persons)	DPPI/DHRH/ ICT/eHealth Hub/ QOC/ Health Promotion	MCTI/Health Development Partners/ DSTI (Tas-SL Diaspo-ra) CSO/MOF	Community of practices meeting conducted
							Monthly allowance for 6 interns, 3 units research publication fees (lump-sum)	DPPI (Research and Publication	DHRH, MCTI, Health Training Institutions, HDPs	Digital health research and published in per reviewed journals

b. ANNEX II: MONITORING AND EVALUATION

Table 4.0: Monitoring and Evaluation Log frame

LEADERSHIP AND GOVERNANCE

Activity	Expected Output	Indicator	Numerator	Denominator	
1.1 Formalize digital health governance structures at all levels.	Digital Health governance structure activated and empowered at all levels	% of DHMTs and MDAs with digital health focal points	No with digital health focal points	Total no. of DHMTs and MDAs	
1.2 Provide operational support for Digital Health Coordination Hub	Operational capacity of digital health coordination hub enhanced	% of required funding secured	Amount secured	Total amount required	
1.3 Convene quarterly stakeholders coordination meetings	Digital health stakeholders engaged	% of scheduled meetings held	No of meeting held	Total no of expected meetings	
2.1 Conduct stakeholders sensitization workshops	Stakeholders commitment and buy-in obtained	% of stakeholders who attended sensitization meeting	No of stakeholders who attended meeting	Total no of expected stakeholders	
2.2 Organize Leadership retreat on digital health roadmap	Commitment of senior MoH leadership obtained and shared vision for digital health created	% of senior management staff sensitized	No of senior management staff	Total no of expected senior management staff	
3.1 Conduct quarterly supportive supervision visits	Implementation and monitoring support provided for digital health interventions	% of quarterly supportive supervision visits conducted	No of quarterly supportive supervision visits conducted	Total no of planned supportive supervision visits	
3.2 Conduct quarterly learning review meetings	Learning review meetings Conducted	% of scheduled quarterly learning review meetings held	No of learning review meetings held	Total no of planned quarterly learning review meetings	
3.3 Conduct Mid-term review of progress of digital health roadmap implementation	Performance review of roadmap implementation and corrective actions documented	Mid-term review meetings held and documented(Yes/No)	N/A	N/A	
3.4 Conduct End-term review of progress of digital health roadmap implementation	Performance review of roadmap implementation and corrective actions documented	End-term review meetings held and documented(Yes/No)	N/A	N/A	
3.5 Conduct annual National Digital Health Forum	Annual performance review conducted	Annual digital health forum held (Yes/No)	N/A	N/A	

	Baseline (%)	Target (%)			Data Source/MoV	Frequency	Responsible
		2024	2025	2026			
	0	100	-	-	Inaugural meeting report with attendance list	Once	MoH/DHMT/ Directorates and programmes
	0	100	100	100	Budget document/ DCT face form	Annual	eHealth coordination hub
	0	100	100	100	Meeting report/attendance register/pictures	Quarterly	eHealth coordination hub
	0	100	-	-	Meeting report/attendance register/pictures	Once	eHealth coordination hub
	0	100	-	-	Meeting report/attendance register/pictures	Once	eHealth coordination hub
	0	100	100	100	Reports/completed checklists/pictures	Quarterly	eHealth coordination hub
	0	100	100	100	Meeting report/attendance register/pictures	Quarterly	eHealth coordination hub, CoP
	N/A	No	Yes	No	Meeting report/attendance register/pictures	Once	eHealth coordination hub
	N/A	No	No	Yes	Meeting report/attendance register/pictures	Once	eHealth coordination hub
	N/A	Yes	Yes	Yes	Meeting report/attendance register/pictures/ published communique	Annual	eHealth coordination hub

STRATEGY AND INVESTMENTS

Activity	Expected Output	Indicator	Numerator	Denominator	
1.1 Develop and launch a costed digital health investment roadmap.	A costed roadmap for digitalization in the health sector	Costed digital health investment roadmap developed and launched (Yes/No)	N/A	N/A	
1.2 Develop Annual Operational Plan (AOP)	Detailed costed action plan with clear responsible body developed with timelines	Costed Annual Operational Plan developed (Yes/No)	N/A	N/A	
1.3 Mainstream digital health into Health and non-health Sector plans, policies, and programs	Commitment to align and mainstream digital health with the national and other sectorial digital strategies obtained	No of key MDAs with advocacy visits conducted	N/A	N/A	
2.1 Engage DHMT and Local Councils staff including finance officers and units to appropriate more funds for digital health	Engagement meeting conducted for DHMT and Local Councils to factor digital health into annual workplans	No of DHMT and Local Council staff who attended engagement meetings held	N/A	N/A	
2.2 Develop operational guidelines for PPP	Operational guidelines for fund access and administration including PPP developed	PPP Operational guidelines developed (Yes/No)	N/A	N/A	
2.3 Conduct economic evaluation of proposed priority digital health interventions	Cost-benefit analysis for proposed digital health interventions developed	Economic evaluation of priority digital health interventions conducted (Yes/No)	N/A	N/A	
2.4 Conduct training on the One Health Tool	Train programme officers in DPPI, MoH directorates and programmes, DHMT on the One Health Tool	% of programme staff trained (Yes/No)	No of programme officers trained	Total no of Directorates, programmes and DHMTs	
3.1 Develop Advocacy and Resource Mobilization Plan (RMP) for digital health	Advocacy and Resource Mobilization Plan for digital health developed	Advocacy and Resource Mobilization Plan developed (Yes/No)	N/A	N/A	
3.2 Conduct advocacy visits to identified funding sources	High level advocacy visits for improved funding and creation of digital health trust fund conducted	No of identified funding sources with advocacy conducted	N/A	N/A	

	Baseline (%)	Target (%)			Data source/MOV	Frequency	Responsible
		2024	2025	2026			
	N/A	Yes	No	No	MoH website, physical copies	Once	eHealth coordination hub
	N/A	Yes	Yes	No	MoH website, physical copies	Annually	DPP, MCTI
	N/A	N/A	-	-	Advocacy meeting report/attendance register/pictures	Once	DPPI (Planning unit), MCTI
	N/A	N/A	-	-	Meeting report/attendance register/pictures	Once	Health Finance Unit (DPPI)
	N/A	Yes	Yes	No	MoH website, physical copies	Once	Health Finance Unit (DPPI)
	N/A		Yes	Yes	Cost-benefit analysis report published on MoH website, physical copies	Once	Health Finance Unit (DPPI)
	0	25	75	0	Training report with attendance list.	Yearly	Health Finance Unit (DPPI)
	N/A		Yes	-	Resource Mobilization plan published on MoH website/ physical copies	Once	Health Finance Unit (DPPI)
	N/A		N/A	N/A	Minutes of advocacy meetings/pictures	Annual	eHealth coordination hub

SERVICES AND APPLICATIONS

Activity	Expected Output	Indicator	Numerator	Denominator	
1.1 Conduct in-depth assessment of the National HMIS and enterprise systems architecture of digital health solutions	In-depth assessment of the National HMIS and enterprise systems architecture of digital health solutions conducted	In-depth assessment conducted (Yes/No)	N/A	N/A	
1.2 Revise HIS strategic plan.	HIS Strategic plan revised	HIS Strategic plan revised (Yes/No)	N/A	N/A	
1.3 Improve data quality and use	HMIS indicators updated	HMIS indicators updated (Yes/No)	N/A	N/A	
	Data review meetings held	% of data review meetings held	No of quarters with data review meetings held	Total number of expected quarterly meetings	
1.4 Optimize DHIS 2 deployment by implementing the maturity assessment recommendations	DHIS2 maturity assessment recommendations implemented	% of DHIS maturity assessment recommendations implemented	No of DHIS maturity assessment recommendations implemented	Total no of DHIS maturity assessment recommendations	
2.1 Optimize eDSR and eCBDS deployment for improved One Health surveillance, early warning, and response	Improved functionality of surveillance and data management tools	New features/One health functionalities integrated (Yes/No)	N/A	N/A	
2.2 Strengthen eSMT deployment through implementation of Effective Vaccine Management Assessment (EVMA) recommendations	EVMA continuous improvement plan implemented	HIS recommendations of EVMA implemented (Yes/No)	N/A	N/A	
2.3 Deploy EMR to improve patient care coordination, clinical decision support and data management	EMR deployed to all Tertiary/ district hospitals and selected PHC facilities	% of selected health facilities with EMR deployed	No of health facilities with EMR deployed	Total no of health facilities targeted for EMR deployment	
2.4 Strengthen iHRIS deployment to support collaboration for human resources decision and health workforce training module	iHRIS updated and successfully utilized for HR management and training	iHRIS updated and utilized in HR Management and training (Yes/No)	N/A	N/A	
2.5 Optimize PReSTrack deployment to meet DPG status	PReSTrack deployment optimized to meet DPG status and listed on DPG registry	% of DPG maturity tool assessment criteria met	No of DPG maturity tool assessment criteria met	Total no of DPG maturity tool assessment criteria	

	Baseline (%)	Target (%)			Data source/MoV	Frequency	Responsible
		2024	2025	2026			
	N/A	Yes	-	-	Assessment Report/ Enterprise systems architecture blueprint published on MoH website	Once	eHealth coordination hub
	N/A	Yes	Yes	-	Copy of HIS Strategic plan published on MoH website	Once	DPPI (HMIS Unit)
	N/A		Yes	Yes	HMIS Registers/monthly summary forms/DHIS 2		DPPI (HMIS Unit)
	N/A	50	100	100	Meeting report, attendance registers, and pictures	Quarterly	DPPI (M&E unit)
	0	10	50	75	DHIS 2 platform	Annually	DPPI (HMIS Unit)
	N/A	Yes	Yes	Yes	eIDSR and eCBDS trackers on DHIS 2	Once	DHSE
	N/A	Yes	Yes	No	DIPC project reports	Quarterly	National EPI
	5%	10	15	25	Project implementation report/EMR platform interface	Annually	eHealth Hub
	N/A	Yes	Yes	-	Personnel mgt and training data on iHRIS platform	Annually	DHRH
	7%	10	50	100	DPG Maturity assessment report/ DPG Alliance registry listing	Annually	DSTI

2.6 Pilot Community Health Workers mobile application	CHIS application piloted	CHIS application piloted (Yes/No)	N/A	N/A	
2.7 Optimize and Scale up mSUPPLY mobile deployment and integrate with existing logistics and data management systems	mSUPPLY mobile deployment scaled	% of health facilities utilizing mSupply mobile	No of health facilities utilizing mSupply mobile	Total number of planned health facilities for deployment	
	mSUPPLY mobile optimized and integrated with existing logistics and data management systems	mSUPPLY mobile integrated with DHIS 2, mSupply and eSMT (Yes/No)	N/A	N/A	
2.8 Deploy new reusable digital health applications and shared services to support interoperability	Adaptation of current enterprise systems architecture to interoperability requirements enhanced	% of new digital tools deployed	No of new digital tools deployed	Total no of priority digital tools identified for deployment	
3.1 Support services and applications community of practice	ToR Developed CoP Meetings Conducted	% of CoP meetings conducted	No of CoP meetings conducted	Total no of expected CoP meetings	
3.2 Develop partners collaboration portal	Portal developed for no objection authorizations and depository of partner activities	Develop partners collaboration portal developed (Yes/No)	N/A	N/A	
4.1 Localize the WHO SMART guidelines (L1-Narrative) to improve health content	Relevant WHO guidelines localized	WHO guidelines localized in selected use cases (Yes/No)	N/A	N/A	
4.2 Develop a checklist for evaluating Services and Applications	Checklist developed	Assessment Checklist developed (Yes/No)	N/A	N/A	
4.3 Evaluate priority services and applications	Health content of selected digital health solutions evaluated	Selected digital health use case(s) evaluated (Yes/No)	N/A	N/A	
4.4 Organize hackathons/ connectathon	Standards- based codes reflecting guidelines decision logic and requirements developed	Standards-based software codes developed for selected use case(s) (Yes/No)	N/A	N/A	

	0	Yes	Yes	-	Pilot report, CHW mobile application, CHIS data on DHIS 2	Once	DPPI-DPHC
	N/A	-	25	50	Facility reports, ISSV reports	Annually	NMSA
	N/A	Yes	Yes	-	Developed Application Programme Interface for DHIS 2, mSupply and eSMT	Annually	NMSA
	0	10	25	50	Deployed tools interface	Annually	DPPI
	0	25	50	100	Meeting reports and issued resolutions/communiques	Quarterly	DPPI
	N/A	-	Yes	-	MoH website subdomain	Once	DPPI (ICT)
	N/A	Yes	Yes	-	Workshop reports and attendance registers	Once	DPPI (ICT) and DSTI
	N/A	Yes	Yes	-	Published checklist on kobocollect/ MoH website	Once	DPPI (ICT) and DSTI
	N/A	Yes	Yes	Yes			DPPI(ICT) and DSTI
	N/A	Yes	Yes	-	Source code files, boot camp workshop/ hackathon reports and pictures	MoH website	DPPI (ICT)and DSTI

INFRASTRUCTURE

Activity	Expected Output	Indicator	Numerator	Denominator	
1.1 Conduct inventory of ICT infrastructure & needs assessment	Inventory and needs assessment conducted	Inventory of ICT infrastructure & needs assessment conducted (Yes/No)	N/A	N/A	
1.2 Develop infrastructure masterplan	ICT infrastructure masterplan developed	ICT infrastructure masterplan developed (Yes/No)	N/A	N/A	
2.1 Procure ICT hardware	ICT hardware procured, installed, and activated	% of health facilities/ MDAs with ICT hardware installed and activated	No of health facilities/MDAs with ICT hardware installed and activated	Total no of health facilities /MDAs with documented infrastructure needs	
2.2 Procure back up power equipment	Power back up equipment supplied, installed, and activated	% of health facilities/ MDAs with power back up equipment installed and activated	No of health facilities/MDAs with power back up equipment installed and activated	Total no of health facilities/ MDAs with documented power back up equipment needs	
2.3 Set up Local Area Network (LAN) for connectivity	Hybrid (wired and wireless) LAN for connectivity created	No of District Hospitals with connectivity equipment installed and activated	N/A	N/A	
2.4 Provide internet bandwidth	Connectivity equipment activated and functional	% of health facilities/ MDAs with at least 1 year internet bandwidth subscription provided	No of health facilities/MDAs with at least 1 year internet bandwidth subscription provided	Total no of health facilities/ MDAs with documented internet bandwidth subscription needs	
2.5 Establish digital learning centres in health facilities	Digital learning hubs for continuous hands-on skills training established	% of District hospitals with digital learning Centres	No of District hospitals with digital learning centers	Total no of District hospitals	
2.6 Set up data Centre for MoH	Centralized virtual server hosting infrastructure set-up	Centralized virtual hosting platform with active subscription (Yes/No)	N/A	N/A	

	Baseline (%)	Target (%)			Data source/ MOV	Frequency	Responsible
		2024	2025	2026			
	N/A	Yes	Yes	No	Infrastructure module of CMMS software, needs assessment report	Once	DPPI (ICT)
	N/A	Yes	Yes	No	Published infrastructure masterplan on MoH and MCTI website	Once	DPPI (ICT)
	0	5	10	25	Store receipt vouchers, pictures of branded hardware, inventory data on CMMS	Annually	DPPI (ICT)
	0	5	10	25	Store receipt vouchers, pictures of branded equipment, inventory data on CMMS	Annually	DPPI (ICT)
	0	2	8	4	Store receipt vouchers, pictures of branded equipment, inventory data on CMMS	Annually	DPPI (ICT)
	0	5	10	25	Subscription invoices from MNOs, Reports of connectivity spot checks	Annually	DPPI (ICT)
	0	25	25	50	Facility assessment reports/ISSV, Pictures	Annually	eHealth Hub
	N/A	No	Yes	Yes	Server Control panel	Annually	DPPI(ICT)

3.1 Conduct high level advocacy for infrastructure	High level advocacy for infrastructure provision conducted	% of identified MDAs and private organizations with advocacy visits conducted for infrastructural support	No of identified MDAs and private organizations with advocacy visits conducted for infrastructural support	Total number of identified MDAs and private organizations with ongoing/ planned infrastructural projects	
4.1 Periodic review of infrastructure status	Infrastructure status reviewed by stakeholders	% of scheduled infrastructure status review meetings held	No of infrastructure review meeting held	Total no of expected (Quarterly) infrastructure review meeting held	

STANDARDS AND INTEROPERABILITY

Activity	Expected Output	Indicator	Numerator	Denominator	
1.1 Define, adapt/adopt and document minimum standards and interoperability requirements for digital health solutions	Minimum Interoperability standards documented, published, and continually updated	Minimum Interoperability standards documented and published (Yes/No)	N/A	N/A	
2.1 Assess status of existing digital health solutions on adopted standards	Standards conformance status of existing digital health solutions documented and published	% of digital health solutions assessed	No of digital health services and applications assessed	Total no of existing digital health services and applications	
2.2 Conduct diagnostic assessment of identity management services	Interoperability requirements for identity management services defined	Interoperability requirements for identity management services defined (Yes/No)	N/A	N/A	
3.1 Create awareness on adopted standards	Stakeholders consensus and commitment on adopted standards obtained	% of stakeholders sensitized	No of stakeholders attending workshop	Total no of stakeholders	
3.2 Build capacity of key stakeholders on adopted standards	Stakeholders capacity built on adopted standards	% of stakeholders trained on standards	No of stakeholders trained	Total no of stakeholders	
4.1 Develop plan to adopt and implement standards	Standards implementation plan developed and published	Standards implementation plan developed and published (Yes/No)	N/A	N/A	

	0	25	50	100	Minutes of meetings, CoP reports, pictures	Annual	eHealth coordination hub
	0	0	100	100	Meeting report/attendance register/pictures	Quarterly /bi-annually	eHealth coordination hub

	Baseline (%)	Target (%)			Data Source/MoV	Frequency	Responsible
		2024	2025	2026			
	N/A	Yes	Yes	Yes	Minimum standards published on MoH website	Annually	eHealth Hub
	0	25	100	100	List of digital health solutions with standards conformance status published on MoH website	Annually	MoH-MCTI
	N/A	No	Yes	Yes	Technical report published on MoH website	Once	MoH-MCTI
	N/A	-	100	-	Meeting report/attendance register/pictures	Once	eHealth coordination hub
	N/A	-	100	-	Meeting report/attendance register/pictures	Once	eHealth coordination hub
	N/A	-	Yes	-	Standards implementation plan published on MoH website/hardcopy	Once	eHealth coordination hub

5.1 Develop national enterprise systems architecture blueprint	National enterprise systems architecture blueprint developed and published	National enterprise systems architecture blueprint developed and published (Yes/No)	N/A	N/A	
5.2 Pilot an interoperability use case based on the enterprise systems architecture blueprint	National enterprise systems architecture blueprint implemented	Digital health (integration) platform deployed (Yes/No)	N/A	N/A	

LEGISLATION, POLICY, AND COMPLIANCE

Activity	Expected Output	Indicator	Numerator	Denominator	
1.1 Develop operational guidelines for health facilities/ organizations deploying digital health solutions	Operational guidelines developed and disseminated	Operational guidelines developed (Yes/No)	N/A	N/A	
1.2 Sensitize stakeholders on the operational guidelines	Stakeholders sensitized on operational guidelines	% of stakeholders sensitized	No of stakeholders attending workshop	Total no of expected stakeholders	
2.1 Revise the 2018-2023 National Digital Health Strategy	National Digital Health Strategy revised	2018-2023 National Digital Health Strategy revised (Yes/No)	N/A	N/A	
3.1 Develop/adapt standards compliance and accreditation guidelines for digital health interventions	Standards compliance checklist /guidelines developed	Standards compliance guidelines developed (Yes/No)	N/A	N/A	
3.2 Conduct assessment of digital health services and applications	Accredited digital health interventions listed and continuously updated on MoH website	% of digital health services and applications assessed	No of digital health services and applications assessed	Total no of existing digital health services and applications	
3.3 Mainstream digital health policy thrusts into existing monitoring protocols and checklists	Digital health policy requirements mainstreamed into ISSV and other existing protocols and checklists of health sector regulatory bodies/ MDAs	% of health program monitoring checklist including ISSV with digital health mentioned	No of health program monitoring checklist including ISSV with digital health mentioned	Total number of health program monitoring checklist including ISSV	

	N/A	-	Yes	-	National enterprise systems architecture blueprint published on MoH website/hardcopy	Once	eHealth coordination hub
	N/A	-	-	Yes	Digital health platform implementation report and software interface	Once	eHealth coordination hub

	Baseline (%)	Target (%)			Data Source/MoV	Frequency	Responsible
		2024	2025	2026			
	N/A	-	Yes	-	Operational guidelines published on MoH website/hardcopy	Once	eHealth Hub
	N/A	-	100	-	Meeting report/ attendance register/ pictures	Once	eHealth coordination hub
	N/A	-	-	Yes	2026-2031 National Digital Health Strategy published on MoH website/hardcopy	Once	eHealth Hub
	N/A	-	Yes	-	Standards compliance guidelines published on MoH website/hardcopy	Once	eHealth Hub
	0	50	100	100	Accredited digital health interventions listed on MoH website and continuously updated	Annually	DPPI
	0	-	75	100	ISSV and other health sector program monitoring checklist	Annually	DPPI, CoP

HEALTH WORKFORCE

Activity	Expected Output	Indicator	Numerator	Denominator	
1.1 Conduct training needs assessment for health workers	Training needs assessment conducted	Training needs assessment conducted(Yes/No)	N/A	N/A	
1.2 Conduct advocacy visit to key decision-makers for health workforce development	Advocacy for health workforce capacity development conducted	Advocacy for health workforce capacity development conducted(Yes/No)	N/A	N/A	
2.1 Develop training modules for core digital health competencies and identified health priority areas	Digitized health workers training modules developed	% of core competencies training modules digitized and uploaded on e-platform and offline devices	No of core competencies training modules digitized and uploaded on e-platform and offline devices	Total no of identified core competencies	
2.2 Conduct offsite trainings for health workforce on prioritized competencies	Peer coaches and health workforce training conducted	No of health workers trained at health facility, District and National levels	N/A	N/A	
2.3 Conduct onsite training reinforcements and coaching/mentoring supports	Continuous practical skills reinforced and consolidated	% of trained health facilities visited for coaching and mentoring	No of health facilities visited for coaching and mentoring	Total no of trained health facilities	
2.4 Conduct coaching review meetings	Quarterly coaching review meetings conducted	% of coaching review meetings held	No of coaching review meetings held	No of expected coaching review meetings	
2.5 Build digital health expertise at eHealth Coordination Hub	Technical capacity of digital health core team strengthened	% of ehealth hub core team members with digital health certification	No of % of ehealth hub core team members with digital health certification	Total no of ehealth hub core team members	
3.1 Support health workforce Community of Practice	Community of practice meeting conducted	% of CoP meetings conducted	No of CoP meetings conducted	Total no of expected CoP meetings	
3.2 Collaborate with academia for research fellowship/ mentoring at eHealth coordination hub	Digital health research and published in peer reviewed journals	No of digital health related publications in peer reviewed journals	N/A	N/A	

	Baseline (%)	Target (%)			Data Source/MoV	Frequency	Responsible
		2024	2025	2026			
	N/A	Yes	-	-	Assessment report	Once	eHealth Hub
	N/A	Yes	-	-	Minutes of advocacy meetings/pictures	Once	eHealth Hub
	0	50	100		Digitized training modules uploaded on e-platform e.g., SL Learning Passport and offline devices in health facilities	Once	DPPI, MCTI
	N/A	N/A	N/A		Training reports, attendance registers, pictures	Annually	DHRH/ICT/ eHealth Hub/ QOC/DPPI
	0	100	100	-	Coaching visit reports/ Learning evaluation score/ pictures/ISSV reports	Quarterly	DHRH/ICT/ eHealth Hub/ QOC/DPPI
	0	100	100	-	Reports of coaching visits	Quarterly	DHMT (Coaches)
	0	50	50	-	Training Certificates	Annually	DPPI (Director of Training), MCTI
	0	100	100	100	Meeting reports and issued resolutions/communiques	Quarterly	eHealth Hub
	0	-	Yes	Yes	Published papers in peer reviewed journals	Annually	DPPI (Research and Publication)

c. ANNEX III: COSTING AND BUDGET

Table 5.0: Indicative Costing Table

Code	COMPONENT AREAS/SPECIFIC OBJECTIVES	2024 (NLe)	2025 (NLe)	2026 (NLe)	TOTAL COST(NLe)	TOTAL (USD)
LEADERSHIP AND GOVERNANCE						
1	Strengthen coordination and oversight of digital health implementation at all levels	308,600	694,350	540,050	1,543,000	65,660
2	Promote stakeholders' commitment and inclusion	482,255	1,085,074	843,946	2,411,275	102,607
3	Institutionalize an effective Monitoring, Evaluation, Accountability and Learning (MEAL) system	714,533	1,607,698	1,250,432	3,572,663	152,028
Sub-total		1,505,388	3,387,122	2,634,428	7,526,938	320,295
STRATEGY AND INVESTMENT						
1	Support strategy and planning for digital health	811,388	1,825,622	1,419,928	4,056,938	172,636
2	Strengthen fiduciary system for digital health funding and investment management	322,475	725,568	564,331	1,612,374	68,612
3	Mobilize resources to support the National digital health programme	28,120	63,270	49,210	140,600	5,983
Sub-total		1,161,982	2,614,460	2,033,469	5,809,912	247,230
SERVICES AND APPLICATIONS						
1	Strengthen digitization of routine Health Management Information systems	3,493,580	7,860,555	6,113,765	17,467,900	743,315
2	Support optimization and scale up deployment of existing services and applications for addressing priority health systems challenges	24,622,550	55,400,738	43,089,463	123,112,750	5,238,840
3	Improve collaboration among implementers of digital health services and applications	59,500	133,875	104,125	297,500	12,660
4	Ensure meaningful use of digital health solutions to address priority health systems challenges by integrating recommended clinical and public health practices, and data recommendations.	331,525	745,931	580,169	1,657,625	70,537
Sub-total		28,507,155	64,141,099	49,887,521	142,535,775	6,065,352
INFRASTRUCTURE						
1	Determine current state of infrastructure for digital health interventions	268,644	604,448	470,126	1,343,218	57,158

2	Prioritize the provision of basic computing, connectivity, and power infrastructure to support deployment of priority digital health solutions	4,256,180	9,576,405	7,448,315	21,280,900	905,570
3	Leverage existing investments to support sustainable infrastructure provision	4,800	10,800	8,400	24,000	1,021
4	Institutionalize preventive and corrective maintenance of new and existing ICT infrastructure	333,200	749,700	583,100	1,666,000	70,894
Sub-total		4,862,824	10,941,353	8,509,941	24,314,118	1,034,643
STANDARDS AND INTEROPERABILITY						
1	Domesticate minimum standards and interoperability requirements for digital health solutions	40,400	90,900	70,700	202,000	8,596
2	Determine current state of existing digital health interventions on adopted standards and interoperability requirements	238,070	535,658	416,623	1,190,350	50,653
3	Mobilize stakeholders support and build consensus for adopted standards	11,240	25,290	19,670	56,200	2,391
4	Facilitate standards implementation, conformance, and use	31,460	70,785	55,055	157,300	6,694
5	Promote an exchanged digital health enterprise systems architecture that contributes to broader health sector goals	752,000	1,692,000	1,316,000	3,760,000	160,000
Sub-total		1,073,170	2,414,633	1,878,048	5,365,850	228,334
LEGISLATION, POLICY, AND COMPLIANCE						
1	Support development and implementation of policies and regulations governing priority digital health component areas	467,494	1,051,862	818,115	2,337,470	99,467
2	Ensure relevance and alignment of the digital health programme with emerging National health and ICT policies and legislations	570,984	1,284,714	999,222	2,854,920	121,486
3	Establish mechanisms to ensure compliance and accreditation of digital health products and services.	3,750	8,438	6,563	18,750	798
Sub-total		1,042,228	2,345,013	1,823,899	5,211,140	221,751
HEALTH WORKFORCE						
1	Create demand and uptake of digital health interventions by health workforce	292,128	657,288	511,224	1,460,640	62,155

2	Build capacity of health workforce on skills, experience, and knowledge to apply digital health in the management and delivery of care and supporting digital health services.	6,178,598	13,901,846	10,812,547	30,892,990	1,314,595
3	Build partnerships for capacity development of health workforce	224,000	504,000	392,000	1,120,000	47,660
	Sub-total	6,694,726	15,063,134	11,715,771	33,473,630	1,424,410
	GRAND TOTAL	44,847,472	100,906,813	78,483,077	224,237,362	9,542,015

*Not inclusive of 5% inflation cost

d. ANNEX IV: LIST OF CONTRIBUTING ORGANIZATIONS

Directorate of Policy, Planning and Information (DPPI)
Directorate of Health Security and Emergency (DHSE)
Directorate of Primary Health Care (DPHC)
Directorate of Reproductive and Child Health (DRCH)
Directorate of Environment Health (DEH)
Directorate of Human Resource for Health (DHRH)
Directorate of Hospital and Ambulance Services
Directorate of Pharmaceutical Services (DPS)
Directorate of Laboratory Services
National Medical Supplies Agency (NMSA)
Sierra Leone Pharmacy Board
Medical and Dental Council Sierra Leone (MDC-SL)
Sierra Leone Social Health Insurance Scheme (SLeSHI)
National AIDS Secretariat (NAS)
National Tuberculosis and Leprosy Control Program (NTLCP)
National HIV/AIDS Control Programme (NACP)
Expanded Programme on Immunization/Child Health (CH/EPI)
Ministry of Communication and Behaviour Change (MCBC)
College of Medicine and Allied Health Science (COMAHS)
Njala University (NU)
National Monitoring and Evaluation Directorate (NaMED)
Statistics Sierra Leone (Stats SL)
Sierra Leone Standards Bureau

National Civil Registration Authority (NCRA)
German Agency for International Cooperation (GIZ)
Geo-Referenced Infrastructure and Demographic Data for Development (GRID 3)
International Federation of Red Cross and Red Crescent Societies (IFRC)
Last Mile Health
E- Health Africa
African Field Epidemiology Network (AFENET)
Community Health Access Finance (CHAF)
Digital Square
Johns Hopkins Program for International Education in Gynaecology and Obstetrics (JHPIEGO)
Medtronic Lab
Metabiota
Partners In Health (PIH)
World Vision International (WVI)
Project Last Mile
Population Services International (PSI-Impact Malaria)
US Centre for Disease Control (CDC)
United States Agency for International Development (USAID)
United Nations Aids (UNAIDS)
United Nations Population Fund (UNFPA)
United Nations Children's Fund (UNICEF)



REPUBLIC OF SIERRA LEONE
Ministry of Health