REPUBLIC OF BOTSWANA

A healthy and productive nation that enjoys the benefits of high quality eHealth services

The eHealth Strategy of Botswana (2020 – 2024)

10 March 2020

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Botswana Health Data Collaborative

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Acronyms

AIDS	Acquired Immune Deficiency Syndrome
AI	Artificial Intelligence
ART	Antiretroviral Therapy
BYOD	Bring Your Own Device
CBS	Case-based Surveillance
DHIS	District Health Information System
DHSMEQA	Department of Health Services Monitoring and Evaluation, and Quality Assurance
DTPS	Department of Telecommunications and Postal Services
eGov	Electronic Government
eHI	eHealth Impact
eHIMA	eHealth Impact Model for Africa
EMR	Electronic Medical Record
FOSS	Free and Open Source Software
GDN	Government Data Network
HIS	Health Information System
HIV	Human Immunodeficiency Virus
HR	Human Resources
HRH	Human Resources for Health
HRIS	Human Resource Information System
ICD-10	International Classification of Diseases 10th revision
ICT	Information and Communications Technology
IHE	Integrating the Healthcare Enterprise
IHSP	Integrated Health Service Plan
IMR	Infant Mortality Rate
IoT	Internet of Things
IPMS	Integrated Patient Management System
IT	Information Technology
ITU	International Telecommunications Union
M&E	Monitoring and Evaluation
MoHW	Ministry of Health and Wellness
MPI	Electronic Master Patient Index
NCD	Non-communicable Disease
NDP	National Development Plan
NGO	Non-government organisation
PHC	Primary Healthcare
PIMS	Patient Information Management System
PMI	Patient Master Index
SDG	Sustainable Development Goal
SOP	Standard Operating Procedure
TB	Tuberculosis
UHC	Universal Health Coverage
UxD	User Experience Design
U5MR	Under Five Mortality Rate
WHA	World Health Assembly
WHO	World Health Organization

Foreword

Health is a universal human right. All individuals have the right to access quality healthcare. As an epidemiologist myself, I have, over the years, witnessed the change in the landscape of medical requirements. Technology has made it even more critical to devise new ways of offering efficient and effective healthcare largely to benefit patients. Today's health business relies on the use of new technologies, computers, mobile phones that can enable prompt information and communication at all levels of care. The introduction of eHealth could not have come at a better time within the context of the Fourth Industrial Revolution than now. And what is eHealth? eHealth is the use of information and technology in the health sector for faster, safer and better care. Benefits of this include, among others, the ability of service providers to monitor patients from a distance and prevention of medical errors, saving of costs in healthcare delivery, achieving better patient outcomes thereby enhancing customer satisfaction. This strategy is critical in guiding health professionals in the application and delivery of health in today's rapidly changing health needs; countering the lack of interfacing between systems and poor real-time reporting.

By this strategy, my Ministry commits to the use of ICTs for health in line with WHOs definition of eHealth which is the use of ICTs for health. It is against this background that my Ministry is establishing eHealth as an integral part of the transformation and improvement of healthcare services in Botswana, especially to enable delivery of the Integrated Health Service Plan (IHSP).

Having realised the importance of eHealth, my Ministry started using electronic systems to collect health data; specifically using the Integrated Patient Management System (IPMS) for real time access of patient history for better treatment. IPMS is installed at all public health hospitals, clinics with maternity and laboratories on the centralised Government Data Network (GDN). The other electronic system is the Patient Information Systems Management (PIMS) installed at all the clinics with no IPMS. On the other hand, the District Health Information System (DHIS2) is deployed at district offices to collect aggregated data and surveillance data. Adoption of these systems and real-time reporting through the National Data Repository remains a difficult undertaking which will be resolved through this finalised eHealth Strategy. However, in our quest to use eHealth systems, there are challenges that we need to be aware of amongst them unreliable internet services and data protection that we will need to deal with as and when they arise.
This reviewed eHealth Strategy is the greatest milestone in the transformation of health services. And I am honoured to present the National eHealth Strategy (2020 – 2024) as a blueprint to guide the Ministry of Health and Wellness, implementing partners and stakeholders in improving the performance of the health sector.

Dr Lemogang Kwape
Honourable Minister, Ministry, Health and Wellness

Acknowledgements

This National eHealth Strategy (2020 – 2024) is the response to a call by all stakeholders for a robust, responsive, people centred and understandable National eHealth Strategy providing guidance on harmonised eHealth activities. It aligns itself with the Vision 2036, National Development Plan (NDP) 11, eGOV Strategy, Maitlamo Policy, the Ministry of Health and Wellness (MoHW) Health Strategy and the M&E Plan to enable attainment of the Sustainable Development Goals, Universal Health Coverage (UHC) and national priorities.

Various stakeholders and technical teams contributed to the compilation of this eHealth strategy. The MoHW acknowledges the collaborative work of numerous individuals and organisations and the specific leadership and guidance provided by the Department of Health Services Monitoring and Evaluation, Quality Assurance and our partner the World Health Organisation (WHO) Botswana Country Office and AFRO Regional Office. In particular, the Center for Disease Control (CDC) and the Health Data Collaborative (HDC) are being thanked for the financial support to the development of this strategy.

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Mr Solomon Sekwakwa
Permanent Secretary, Ministry, Health and Wellness

Executive summary

The national health information systems face many challenges that affect effective implementation of its health programmes. The challenges include ineffective governance systems to guide health sector digital development solutions, inadequate technological infrastructure, limited human resource base to drive implementation of eHealth solutions at all levels of the Health delivery system, and rising cost of healthcare services. By developing this eHealth Strategy, the country plans to confront these and other challenges and provide a fresh impetus for improving service delivery and achieving health outcomes for all people across all levels: central, district, facility and community.

The eHealth strategy contains the following key elements:

Vision
A healthy and productive nation that enjoys the benefits of high quality eHealth services.

Mission
To provide high quality services facilitated by an inclusive and robust, integrated eHealth system.

Guiding Principles

1. Universal Health Coverage
2. User-centric and people centred
3. Privacy and confidentiality of clients' information
4. Data security
5. Non-discrimination of clients
6. Respect for Human rights
7. Adherence to global eHealth practices and standards
8. Accountability and transparency
9. eHealth staff commitment and professionalism
10. Accessible, affordable and sustainable health services
11. Sustainable partnerships to advance eHealth.

National eHealth Strategic Goals

i. Increased access to timely, accurate, and complete reporting on the health system activities and outcomes
ii. Enhanced quality, safety, efficiency and effectiveness of clinical practices, including diagnosis and treatment
iii. Efficient patient management practices, including tracking and monitoring for optimal outcomes
iv. Effective and efficient utilisation of resources at central, district, facility, and community levels
v. Enhanced institutional capacity to implement eHealth solutions at central, district, facility, and community levels
vi. Affordable healthcare services to community members.

The strategy addresses development in seven priority areas namely, Leadership and Governance, Strategy and Investment, Standards and Interoperability, Information Communications Technology (ICT) Services and Applications, Infrastructure, Legislation, Policy and Compliance, and Workforce. It outlines strategic objectives to be achieved under each priority area, and identifies interventions to achieve the objectives. An implementation plan provides activities for each intervention and a Monitoring and Evaluation (M&E) framework provides a guide of how the strategy should be monitored and evaluated.

1. Introduction

The national stakeholder community recognises that while the new eHealth Strategy looks outwards towards medium and long term goals, it must also deliver quick wins. There is acknowledgement that previous strategic processes have covered much ground that help establish a foundation, though fail to ultimately deliver the needed eHealth solutions. The eHealth Strategy must translate planning into action for the people of Botswana, with clear accountability and oversight.

1.1. eHealth Strategic Context

In developing this Strategy both the global and local contexts of eHealth were appraised. The objective of the appraisal was to ensure that the Strategy is aligned to global protocols on eHealth, including the World Health Organisation (WHO), whilst at the same time addressing the challenges facing the national healthcare system. Results of the appraisal are summarized below.

The World Health Assembly (WHA) 2018 recognised the important role that eHealth plays to advance the Sustainable Development Goals (SDGs) and to support health promotion and disease prevention in all countries by improving the accessibility, quality and affordability of health services.[1 2] Converting this potential into probable benefits requires a good strategy and implementation plan.

National eHealth Strategy aligns with the Seventy-First World Health Assembly (WHA) Resolution (WHA71.7) on Digital Health adopted by the WHO Member States in May 2018. It urges Member States:

> *"...to assess their use of digital technologies for health, including in health information systems at the national and sub-national levels, in order to identify areas of improvement, and to prioritize, as appropriate, the development, evaluation, implementation, scale-up and greater utilization of digital technologies, as a means of promoting equitable, affordable and universal access to health for all, including the special needs of groups that are vulnerable in the context of digital health".*

1.2. Defining eHealth

Botswana uses the WHO definition for eHealth, which states that "*eHealth is the use of ICTs for health*".[3] The term eHealth is one of many that have been used over the last decade to describe the use of ICT for various types of health systems strengthening. Other names include health informatics, health ICT and most recently, digital health. While there are recognized differences in their meanings,[4] eHealth and digital health are frequently used synonymously.

1.3. eHealth in Botswana

1.3.1. Background

According to the Botswana Family Health Survey Report 2007,[5] the life expectancy at birth in Botswana was estimated at 54.4 years (48.8 males: and 60 females). The crude birth and crude death rates were estimated at 29.7 and 11.2 per 1000 respectively while infant and under-five mortality rates were 57 and 76 per 1000 live births respectively. The Maternal Mortality Ratio (MMR) was 193 per hundred thousand live births. A total of 25.9% of the population were stunted, of which 16.8% were moderately stunted and 9.1% severely stunted.

The Ministry of Health and Wellness (MOHW) Health Statistics Reports provide evidence that both morbidity and mortality for all ages are still dominated by infectious diseases, with HIV/AIDS and other communicable diseases causing about half of the deaths. Due to an effective ARV programme, mortality due to HIV/AIDS has been declining over the past four years, but still is a major concern. However, the Infant Mortality Rate (IMR) and under-5 mortality rate (U5MR) remain high with year-on-year fluctuations. More than two-third of these deaths is due to communicable diseases, with diarrhoea and pneumonia being the two main killers. More than 40% of neonatal deaths are within the first week of birth. The Maternal Mortality Ratio is also fluctuating. Although non-communicable diseases like hypertension, diabetes, etc. are not among the top ten causes of disease morbidity and mortality, the rates are increasing. Of these, cardiovascular diseases and cancers have been increasing alarmingly over the last decade.

The MoHW regards eHealth as the means to:

- improve access to healthcare and provision of equitable healthcare in remote facilities
- achieve better patient outcomes and quality of care
- achieve better customer satisfaction and patient experience
- provide quick access to health information across the entire health sector
- improve monitoring and evaluation of healthcare services
- save costs associated with healthcare delivery

1.3.2. National eHealth Priorities

The stakeholders have emphasised the need for a robust, responsive, people centred and understandable National eHealth Strategy. The Vision 2036, the National Development Plan (NDP11), National e-Government Strategy, the National Health Policy (2011), the MoHW Strategy (2017 – 2023), the MoHW M&E Plan, and the Integrated Health Service Plan (IHSP) identify the following national health priorities:

1. Development of world class healthcare services through technologically advanced and innovative healthcare delivery systems.
2. Collection of all relevant health information from all the health stakeholders, including donors, the private sector and Non-government Organisations (NGOs) regarding population dynamics, diseases, health services, health financing, health workforce, medicines and vaccines, infrastructure and equipment.
3. Strengthening MoHW capacity to generate, disseminate, access, secure, store and use health information for evidence based planning at all levels and policy direction.
4. Building capacity to ensure sufficient use of available systems for effective & efficient service delivery.

5. Establishing an institutional/organisational arrangement that will harmonise and link all the data management units with the aim of reducing the duplication and wastage of data, and of maximising its effective use through prompt reporting and feedback.
6. Provision of up-to-date information on the specification and capability of computer hardware and other aspects of information technology to the health sector.
7. Publishing of annual list of standards to cover operating systems, programming tools, software tools and application software packages.

It is prudent that the development of the eHealth Strategy 2020-2024 takes cognizance of the above National Health Priorities.

1.3.3. Health Management Information System (HMIS) Assessment

A recent assessment of HMIS (March 2019) has made recommendations aimed at transforming the health sector digitally. Many of these recommendations informed the development of the 2020-2024 eHealth Strategy.

1.4. Strategy development process and architecture

1.4.1. WHO/ITU National eHealth Strategy Toolkit

Botswana has adopted the WHO/ITU National eHealth Strategy Toolkit for the development of the eHealth Strategy.

Figure 1: The main parts of the WHO/ITU National eHealth Strategy Toolkit

The Toolkit provides a "comprehensive, practical guide that all governments, their ministries, departments and agencies can adapt to suit their own circumstances and their own vision and goals".[6] The Toolkit starts from the premise that eHealth strategy should be based on national health priorities, the available and potential resources, and the current eHealth environment.

Furthermore, the WHO Guideline Recommendations on Digital Interventions for Health System Strengthening released in April 2019 was also taken into consideration. The guideline provides targeted interventions and focuses on the use of mobile devices such as mobile phones and tablets due to their evident pervasive nature. The guideline emphasizes the importance of reaching vulnerable populations, taking into consideration patient privacy and ensuring that eHealth does not cause harm to the public. These recommendations are linked to an expected contribution to Universal Health Coverage.

1.4.2. Documentation review

A review of key policy documents that prompted the development of the eHealth Strategy was undertaken. Documents reviewed included the following:

- Ministry of Health and Wellness Strategy 2017-2023
- Integrated Health Service Plan: A Strategy for Changing the Health Sector for Healthy Botswana 2010-2020
- National Health Policy "Towards a Healthier Botswana" December 2011
- Data Protection Act 2018
- Data Management Policy 2014
- Botswana National Health Monitoring and Evaluation Plan 2014 – 2019.

The objective of the review was to collect and analyse strategic information that would assist the development of the eHealth Strategy. In particular, the review assisted in identifying national health priorities that informed the development of the Strategy.

1.4.3. Stakeholder Engagement

The eHealth strategy is for the people of Botswana. There is, therefore, an obligation for active engagement with stakeholders in its development and implementation, including the MOHW and well beyond. Engagement of and consultations with stakeholders was prioritized in the development of this strategy. The consultations included:

- Key Informant Interviews conducted among Ministry of Health and Wellness top management officials and representatives of other key stakeholders.
- Holding Stakeholder Consultation Workshops in Gaborone.
- Site visits to selected facilities and district offices.

1.4.4. Strategy Architecture

The strategy is constructed with the components shown in the figure below. These provide the reader with an overview of the strategic positioning, guiding principles, goals and strategic objectives, leading into the specific implementations and monitoring and evaluation (M&E) parts of the implementation plan. The figure below provides a high level view of the structure of the parts of the strategy.

Figure 2: High level architecture of the strategy

2. Situational analysis

2.1. Problem statement

The national health system is faced with many shortcomings that affect successful implementation of its health services. The following are key shortcomings:

- Ineffective leadership and governance to support Health sector technological advancements.
- Non-availability of management and coordination structures to facilitate day-to-day implementation of digital solutions.
- Disaggregated technological infrastructure and inappropriate technological applications.
- Inadequate human resource base to drive implementation at all levels of the eHealth delivery system, and demand for quality healthcare services.
- Rising cost of healthcare services and uncertain future financial sustainability of the eHealth interventions.

These shortcomings still persist after nine years of implementation of the Integrated Health Service Plan: A Strategy for the changing the Health Sector for a healthy Botswana 2010-2020[7]. The plan seeks to improve the health of Batswana through attainment of the following goals: improved service delivery; sustainable health financing; effective health information systems/monitoring and evaluation; and effective governance, leadership and management of the Health Sector among others.

There is, therefore, a compelling need to devise ways and means of closing the gap between the shortcomings and the goals of the Integrated Health Service Plan.

This eHealth Strategy seeks to provide additional guidance to the MoHW and all partners to minimize the gaps through the application of eHealth initiatives to improve service delivery and health outcomes, as a complement to other health systems initiatives.

2.2. The current situation

The status of eHealth in Botswana is summarised under three headings: successes, challenges and opportunities.

2.2.1. Successes

Botswana has made substantial progress in setting the platform for operationalising the eHealth. The country has achieved tremendous success in various areas which will have a significant overall impact on the expected outcomes for eHealth. Some of key strategic successes are:

- There is political will and commitment from the Presidency to have a digitally developed country by 2036.
- A Department of Health Services Monitoring and Evaluation, Quality Assurance (DHSMEQA) has been established at the Ministry of Health and Wellness to spearhead eHealth developments in the Health Sector.
- The Government has taken a decision that all line ministries need to establish an M&E department.

- A data repository facility has been established for storage of different data sets.
- There is local capacity to drive the implementation of the eHealth strategy in MOHW.
- Findings of recent studies on HIV and AIDS in Botswana provide a good baseline for developing a comprehensive eHealth strategy.
- Availability of support by development partners and other stakeholders for implementing the eHealth strategy.
- Availability of enabling legal and regulatory frameworks that support eHealth implementation [such as Maitlamo ICT Policy 2004 and Data Protection Act 2018].
- Key strategic documents have been developed which can support the eHealth implementation, such as IHSP; National Health Policy; eGoV strategy.
- Large number of systems (37) reduced to a manageable number (10).
- Availability of other digital systems coordinated by other Ministries [MFDP and DPSM].
- All public hospitals have an Electronic Medical Record (EMR) that is real time, with much higher coverage.
- Availability of health care workers trained on electronic systems and usage.

These key successes provide a platform for Botswana to build on for the establishment of a robust and inclusive eHealth strategy.

2.2.2. Challenges

Recognising challenges, understanding them, and dealing with them deliberately is an important part of developing an effective plan to move forward. Key challenges are listed below.

- There are inadequate leadership and governance structures at all levels (centrally, district and community).
- Constant political changes distress smooth implementation of eGovernment thus affecting implementation of eHealth due constant leadership shift.
- There is unclear ownership of eHealth and too many vertical structures that hamper effectiveness of implementing the eHealth Strategy.
- There are inadequate policies and Standard Operating Procedures (SOPs) and guidelines for an effective eHealth strategy implementation.
- Inadequate clarity on the roles and responsibilities creating silo mentalities within the health sector in general.
- There is inadequate uptake and utilization of IPMS. Moreover, IPMS is not iterfaced to other systems.
- There is inadequate information flow at all levels, proliferation of systems, reporting tools are not synthesized and too many systems not communicating adequately.
- There is inadequate funding or budget for the new technology required, for skills development, for new systems and maintaining software licences.
- There is little commitment to implement, inadequate custodianship of implementation with no clear implementation budget mechanisms and no certainty of sustainability.
- There is no common vision of eHealth across all stakeholders and on the management of expectation by the MOHW as the previous eHealth strategy was technically-focused.
- Inadequate coordination and collaboration between different partners.
- There is duplication of efforts (EMR and DHIS2 data), data coming from the same source and some of the software are not in real time.

- Data Warehouse or data repository does not include all data so is not a useful resource for generating analysis and other data from various studies in the sector is not housed under one credible entity.
- Reporting and sharing of data is manual based and there are no standard operating procedures, thus posing challenges of confidentiality and loss of patient information.
- There is user duplication of efforts and fatigue of relevant staff for reporting. Additionally, medical practitioners are not quite versatile with information use for decision making.
- System functionality is mainly driven by funders and not the user. Consequently, development of DHIS2 and PIMS has been skewed towards requirements of the donor community.
- The quality of data is not well observed and there is no clear data quality mechanism. Moreover, there is inadequate data management and flow.
- The districts (DHMTs) are not using information to make management decisions at district level.
- There is no full utilization of devices and Internet of Things (IoT). The use of mobile technology is limited.
- No overarching systems architecture and connectivity available in all health facilities.

Some of the challenges elaborated above can be addressed immediately by the Ministry to facilitate and ensure that implementation of eHealth is effective. The eHealth Strategy provides a structured approach to help prioritise the most critical decisions needed for an effective eHealth implementation.

2.2.3. Opportunities

Botswana has significant opportunities to realise health service strengthening through eHealth. This section summarises of some of the key opportunities. They include

1. Political commitment
    - The Presidency is leading an agenda of digital transformation
    - The Ministry of Health and Wellness is leading an agenda to leverage eHealth as an enabler of health transformation and recognising the need to turn eHealth investments into tangible benefits that are felt by patients and health workers
    - There is recognition that technological advancement provides an opportunity for Botswana to establish and assert itself internationally

2. Alignment of stakeholder objectives
    - All stakeholders recognise the eHealth opportunity and want to engage in eHealth activities
    - Recognition of the need for a more person-centred focus, to deliver eHealth initiatives that serve patient and health worker needs
    - Call for strong ownership and coordination to secure eHealth success
    - Acknowledgement of the need for more interoperability and consolidation of existing information systems
    - A desire to have home-grown solutions, which leverage global goods

3. Extensive activities already underway
    - The MOHW has established the Department of Health Services Monitoring and Evaluation, Quality Assurance
    - Substantial experience with numerous electronic systems in various levels of maturity

The opportunities elaborated above provide a supportive context for making progress with eHealth in Botswana.

Use of information

While electronic systems are not fully functional, largely because of fragmentation, absent connectivity in some facilities and some usability issues, stakeholders have a clear understanding of what they require and what the eHealth Strategy 2020 – 2024 must deliver. This includes:

- Data available where and when it is needed
- Data not captured multiple times
- Data used to react quickly to emerging health issues
- System generated reports that are directly relevant to users' decision making needs
- Data available on mobile devices
- Key data sets available to the public
- Repository of research housed at MOHW.

User experience

eHealth is about transforming the user experience, particularly for patients and health workers, so that their experience of the health system changes, care improves, and the health and productivity of Batswana improves.

Engaging users in the development of systems is a key opportunity to improve user experience and unlock the potential of eHealth solutions. User experience Design (UxD) is a cornerstone of how National eHealth Strategy 2020 – 2024 will be person-centred. It will result in better, more integrated solutions and help to disrupt more traditional methods that have resulted in fragmented, siloed information systems, which do not provide what users need.

Opportunities created by emerging technologies

Technology advances quickly, with new opportunities and innovations presenting themselves. National eHealth Strategy provides the priorities to help focus resources on the most pertinent health needs of Botswana, and a structure to help govern how these investments are translated into value for the country.

These advances require a minimum foundation of:

- Digital literacy
- Connectivity
- Alignment to health needs
- Sufficient evidence-base to avoid the risks of using unproven approaches.

Specific emerging technologies that offer potential value, if they can be adequately deployed to serve national health priorities, include:

- Mobile devices and the emergence of the Internet of Things (IoT)

- Data science disciplines such as advanced analytics, Artificial Intelligence (AI) and Machine Learning (ML)
- Emerging connectivity technologies, such as Television white-space and 5G
- Sensors to populate digital devices with data.

For Botswana, additional aspects are:

- Empowerment of patients and clinicians
- High usability of all solutions, particularly ensuring:
    - System availability
    - Performance
    - User friendly interfaces.

There are now emerging global goods that have sufficient maturity, and large international development communities, to provide a Free and Open Source (FOSS) starting point of tried-and-tested tools. Botswana will use these to grow local capacity, without having to start from scratch. Examples include solutions such as DHIS2, OpenMRS and interoperability architecture tools such as OpenHIE and OpenHIM.

Opportunity for a local eHealth ecosystem

National eHealth Strategy (2020 – 2024) recognises the opportunity for eHealth to contribute to long term Local Economic development and sustainability for Botswana through a growth of a vibrant local ecosystem of teams and organisations that provide high quality information systems development, maintenance and support services for Botswana.

This opportunity will be unlocked by investing deliberately in existing public benefit organisations to create the foundation for growth and establish the critical mass of expertise necessary to coordinate the development and maintenance of home-grown solutions for Botswana.

This ecosystem will be led by organisations responding directly to the leadership and oversight of the Ministry of Health and Wellness (MOHW). Organisational characteristics include:

- Deep understanding of the potential for emerging opportunities.
- Ability to deliver immediate value, while also contributing to a roadmap of long-term sustainable solution and ecosystem development.
- Innovative approaches that respond to connectivity challenges, such as investing in innovative ways to expand connectivity, while providing both online and offline functionality in solutions so that information continues to flow, while connectivity is rolled out.
- Appropriate agreements with MOHW.
- Capacity for research and development.

3. Strategic direction

The strategic elements described below define the direction that eHealth will take in Botswana during the next five years.

3.1. Vision

The National eHealth Vision is:

> A healthy and productive nation that enjoys the benefits of high quality eHealth services.

3.2. Mission

The National eHealth Mission is:

> To provide high quality services facilitated by an inclusive and robust, integrated eHealth system.

3.3. eHealth Guiding Principles

Implementation of the National eHealth Strategy will be guided by ten principles that express the manner in which Botswana wishes all aspects of the eHealth Strategy to be implemented. They are listed in the table below.

Table 1: Guiding principles for eHealth in Botswana

Principle	Description
1. Universal Health Coverage	Universal health coverage (UHC) means that all people and communities can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective, while also ensuring that the use of these services does not expose the user to financial hardship[8]
2. User-centric	Health services provided should address both the specific needs of the patient and the healthcare provider
3. Privacy and confidentiality of clients' information	The need for confidentiality and privacy of patient information must be observed at all times
4. Data Security	All data on patients' health must be securely kept
5. Non-discrimination of clients	Patients must not be discriminated against on any account
6. Respect for Human rights	Fundamental human rights of patients must be respected at all times
7. Adherence to global standards on eHealth practices	eHealth activities within the health system should comply with WHO standards
8. Accountability and transparency	All practitioners in eHealth should be held accountable for their activities, and should operate transparently
9. eHealth staff commitment and professionalism	Operators in eHealth should uphold a high degree of professionalism and display commitment to their responsibilities at all times
10. Accessible, affordable and sustainable health services	Healthcare services provided in all centres should be affordable, sustainable, and should deliver a net benefit, bringing about improved lives to all persons irrespective of their social and economic status
11. Sustainable partnerships to advance eHealth	Collaborative and constructive working relationships between all those contributing to eHealth initiatives in Botswana, including public and private organisations, and NGOs, to ensure that they contribute effectively and sustainably towards health service benefits

3.4. National eHealth Goals

The primary goal of the eHealth strategy is to strengthen health service delivery through utilization of digital solutions that address the needs of the health system in Botswana. The goal will be accomplished through attaining the following outcomes:

i. Increased efficiency in the use of information for health management at central, district, facility, and community levels.
ii. Increased access to timely, accurate, and comprehensive information on healthcare practices and outcomes.
iii. Enhanced efficiency and effectiveness in the delivery of healthcare services at central, district, facility and community levels.

iv. Enhanced quality, safety, efficiency and effectiveness of clinical and non-clinical practices in the Health Sector, including diagnosis and treatment.

v. Efficient patient management practices, including tracking and monitoring for optimal outcomes.

vi. Effective and efficient utilisation of resources at central, district, facility, and community levels.

vii. Enhanced institutional capacity to implement eHealth solutions at central, district, facility, and community levels.

viii. Affordable cost of the provision of healthcare services to citizens.

3.5. Strategic objectives and implementing interventions

Strategic objectives and corresponding interventions have emerged out of stakeholder consultations. The objectives are aligned to National eHealth Goals elaborated in the preceding section. They are divided according to the components of the WHO/ITU National Digital Health Toolkit, which is illustrated in Figure 3 below.

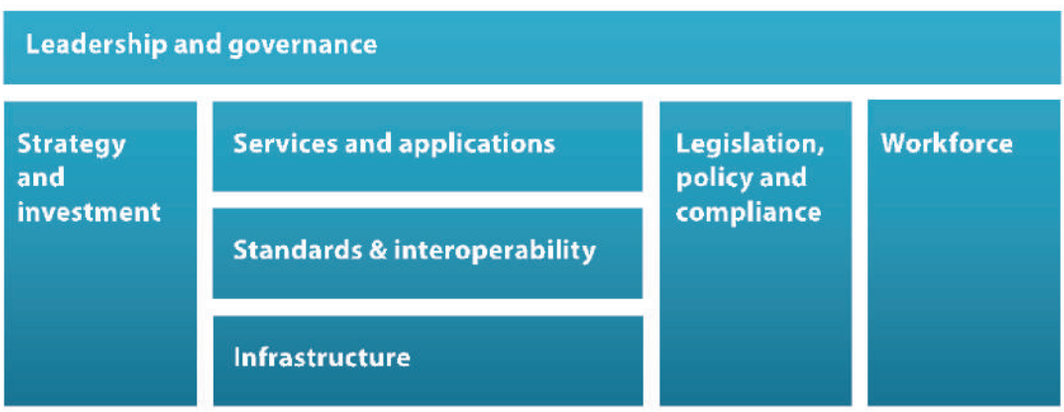

Figure 3: Components of the WHO/ITU National eHealth Toolkit

3.5.1. Leadership and governance

One of the key challenges affecting successful implementation of digital health solutions in the Health Sector is that of weak, uncoordinated and ineffective management frameworks. For the eHealth Strategy to be effectively implemented, it requires dedicated leadership and governance structures at all levels of implementation.

Table 2: Leadership and governance objectives and interventions

STRATEGIC OBJECTIVE	STRATEGIC INTERVENTION
1. Management and coordination of the implementation of the eHealth Strategy strengthened by end of 2020	· Resuscitate an eHealth Cluster to oversee the implementation of the eHealth strategy · Strengthen the DHSMEQA in the MOHW · Develop eHealth structures to manage and coordinate eHealth activities at various levels of implementation
2. Collaboration and cooperation strengthened among Ministries, Departments and Agencies (MDAs) that participate in the implementation of the eHealth strategy by end of 2020	· Establish strategic partnerships for the implementation of the eHealth strategy · Promote active participation of stakeholders in the implementation of the eHealth strategy
3. eHealth outcomes achieved through effective monitoring and evaluation of the strategy from January 2020	· Develop a M&E framework for the eHealth Strategy

3.5.2. Strategy and investment

eHealth requires adequate and robust investment systems in place, and the components required to develop, operate and sustain the national eHealth environment. Botswana will require having clear strategies and clear investment mechanisms to guide the implementation of the eHealth strategy.

Table 3: Strategy and Investment objectives and interventions

STRATEGIC OBJECTIVE	STRATEGIC INTERVENTION
1. Sustainable funding for implementation of eHealth strategy attained by 2021	· Advocate for increased government budget allocation for eHealth · Mobilize the private sector to provide financial support for implementation of the eHealth strategy · Mobilize donor funding to provide financial support for implementation of the eHealth strategy
2. Investment climate on eHealth enhanced by 2021	· Establish an investment committee to facilitate investment flow at all levels of the national Healthcare system · Monitor and track the investment platform performance

3.5.3. Services and applications

eHealth is about users, who use health information systems productively as part of an integrated and effective health system. eHealth applications must meet these users' needs.

Usability is a critical requirement. High usability should be built into priority projects such as tele-medicine, EHR and patient summary records; applications for notifiable disease surveillance, CRVS notification systems, medicines visibility, supply chain, revenue collection; patient portal to make health information accessible to the public and other critical projects such as the HRH registry for customer care (feedback mechanisms), facility assessment and performance reviews. Aspects highlighted by stakeholders include the need for eHealth applications to:

- Be available always
- Have intuitive user interfaces
- Only require data to be captured once, while also utilising automated capture of data wherever feasible, using digital devices

Table 4: Services and applications objectives and interventions

STRATEGIC OBJECTIVE	STRATEGIC INTERVENTION
1. National eHealth Platform established by 2023	· Identify priority user requirements and relevant applications to address these needs · Establish Botswana's approach to the development of eHealth services and applications · Develop a National Data Warehouse · Establish a home-grown EHR for Botswana
2. Patients' experience of care improved by implementing priority applications by 2021	· Establish a web-based engagement tool to support implementation of the eHealth Strategy · Reduce waiting times at facilities by implementing appointment scheduling applications

An architectural approach is described by the International Telecommunications Union (ITU).[9] This provides an overall architectural goal for Botswana's systems development.

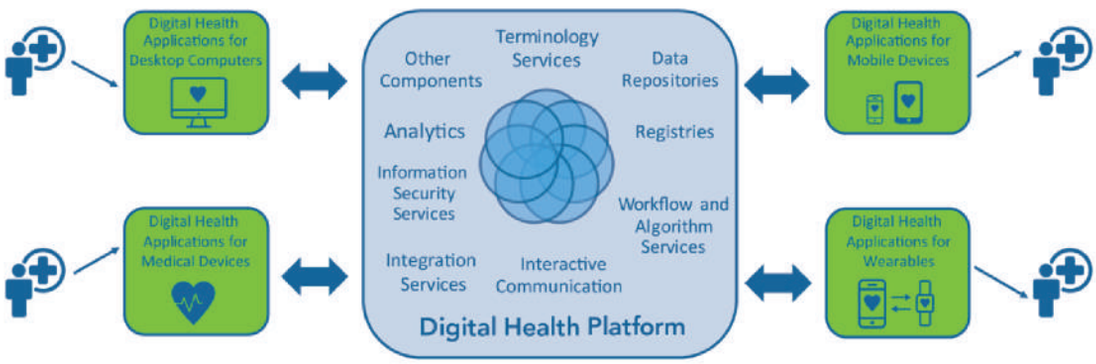

Figure 4: Digital health platform architecture published by the ITU

Applications will be prioritised using available global goods development platforms, wherever possible, to provide a starting point for new applications development. These will be further developed in line with user requirements. An example of a technology to be targeted is the DHIS2. It has emerged as an important part of many countries' routine information systems. DHIS2 is supported by a global network of developers, coordinated through the University of Oslo, and is appropriate for the following types of work:

- Aggregation of routine health information into a national data warehouse
- Configuration of android apps for data collection
- Analytics and reporting.

3.5.4. Standards and interoperability

Health data standards are critical to attain interoperability. The WHO has developed a number of standards that this strategy will adapt including the ICD11. Interoperability is the ability of two or more systems to exchange information and use the information that has been exchanged. The layers of interoperability include technical layers, semantic layers, process layers and clinical layers. Interoperability between different health information systems is a critical requirement for these systems to provide the required holistic view of the health event or programme they describe.

It is achieved through a number of processes, most importantly the agreement of information systems standards. These standards apply to many different parts of information systems and promote the ability for systems to share information and thereby allow users to have integrated views of health data.

An approach to these standards and standards architectures will be established, and compliance will be enforced. It will involve the following aspects of the health information system:

- Infrastructure
- Connectivity
- Operating systems
- Database management systems
- Applications
- Messaging between information systems
- Systems architectures.

Interoperability will be further supported by establishing an interoperability architecture that simplifies the complexity of interfaces that will be built between different information systems by creating a mediation layer, called a Health Information Mediator (HIM). All systems in the environment will build one interface to this mediation layer, and the mediation layer will manage subsequent sharing of information between multiple individual systems.

Table 5: Standards and interoperability objective and interventions

STRATEGIC OBJECTIVE	STRATEGIC INTERVENTION
Health information availability and sharing strengthened by 2021	· Establish a standards and interoperability framework · Design the interoperability platform · Implement the interoperability platform

3.5.5. Infrastructure

Technology infrastructure is a critical requirement for eHealth. It includes a number of aspects and has a close relationship with the eHealth workforce needed to establish, maintain and support the infrastructure. Infrastructure aspects will include at least the following:

- Workstations, potentially including a wide range of devices such as desktop PCs, mobile tablets and mobile phones, which may be owned and managed by the MOHW or may be the personal devices of health workers or officials, known as Bring Your Own Device (BYOD)
- Connectivity infrastructure both between facilities, and also within facilities, to ensure that users have the connection they need to use their applications effectively
- Server hosting infrastructure, which includes the physical machines, as well as the software that shall be loaded onto those machines, and maintained and supported, so that the machines function optimally and securely.

Table 6: Infrastructure strategic objective and interventions

STRATEGIC OBJECTIVE	STRATEGIC INTERVENTION
Access to eHealth information and tools improved by end of 2023	· Connect all health facilities in the country with minimum bandwidth · Electrify all facilities · Establish a server hosting environment for MOHW · Provide all users with necessary ICT devices for accessing information · Establish a common electronic Unique Identifier (UID) and electronic Master Patient Index (MPI) for use for by patients interfacing with the health system at all levels countrywide · Establish registries and national data dictionaries

3.5.6. Legislation, policy and compliance

For an effective implementation of the eHealth Strategy, policy and legislative frameworks are essential. Policy and legislation will ensure coordination and collaboration among stakeholders and that compliance of systems is adhered to. It is through legislation and policy that challenges encountered by the country will be addressed including coordination of eHealth implementation and that compliance to recognised standards will be implemented and smoothly coordinated.

Table 7: Legislation, policy and compliance objective and interventions

STRATEGIC OBJECTIVE	STRATEGIC INTERVENTION
A regulatory framework for eHealth established and functional in the country by end of 2023	· Review and update policies and laws that govern eHealth in the country · Monitor compliance with the policies and laws

3.5.7. Workforce

Successful implementation of the eHealth strategy requires a pool of skilled and competent manpower at all implementation levels. It is therefore critical that a comprehensive eHealth human resource development strategy be developed and implemented to address manpower shortages at central, district, hospital and facility levels.

Table 8: Workforce objectives and interventions

STRATEGIC OBJECTIVE	STRATEGIC INTERVETION
1. Capacity of the Ministry of Health and Wellness to implement the eHealth Strategy strengthened by 2021	· Develop a Human Capital Development plan for those managing and leading the eHealth Strategy · Implement the Human Capital Development plan for those managing and leading the eHealth Strategy
2. Capacity of both public and private eHealth implementers strengthened by 2022	· Develop a national Human Capital Development programme and National eHealth Curriculum for eHealth implementers · Implement the Human Capital Development programme for eHealth implementers
3. Terms and conditions of service for eHealth professional staff improved by 2022	· Develop a staff retention policy for eHealth professional staff

4. Implementation plan

The implementation plan is based on the foundation elements of Strategic Pillars and interventions described above. For each intervention, activities have been identified through stakeholder engagements. These activities have been allocated to years between 2020 and 2023

Table 9: Implementation plan details

Strategic Objective	Intervention	Activity	Deadline	Accountability
Strategic pillar 1. Leadership and governance				
Strategic Objective 1.1: Management and coordination of the implementation of the eHealth Strategy strengthened by end of 2020	1.1.1 Resuscitate the eHealth Cluster to oversee the implementation of the eHealth Strategy	1.1.1.1 Publish Terms of Reference (TOR) for the National eHealth Cluster, invite membership candidates, and appoint members	2020	Minister of Health
		1.1.1.2 Manage the secretariat of the National eHealth Cluster and conduct regular cluster engagements to fulfil the TOR	2020	Permanent Secretary: MoHW
	1.1.2 Strengthen the Health Informatics unit in the Ministry of Health and Wellness	1.1.2.1 Develop and institutionalise SOPs for all roles within the DHSMEQA	2020	Deputy Permanent Secretary: DHSMEQA
	1.1.3 Develop eHealth structures to manage and coordinate eHealth activities at various levels of implementation	1.1.3.1 Develop and publish a Data Governance framework for health information, with appropriate stakeholder engagement in its development	2020	Director: DHSMEQA
Strategic Objective 1.2: Collaboration and cooperation strengthened among Ministries, Departments and Agencies (MDAs) that participate in the implementation of the eHealth strategy by end of 2020	1.2.1 Establish strategic partnerships for the implementation of the eHealth strategy	1.2.1.1 Establish a functional Digital Technical Working Group (Standards, Regulation, Interoperability) led by MOHW	2020	Deputy Permanent Secretary: DHSMEQA
	1.2.2 Promote active participation of stakeholders in the implementation of the eHealth strategy	1.2.2.1 Host an annual stakeholder conference, led by MOHW, with active support from the eHealth Cluster and Technical Working Groups	2020	Director: DHSMEQA
Strategic Objective 1.3: eHealth outcomes achieved through effective Monitoring and Evaluation (M&E) of the strategy from January 2020	1.3.1 Develop a M&E framework for the eHealth Strategy	1.3.1.1 Present M&E milestones to the eHealth Cluster on a regular basis	2020	Deputy Permanent Secretary: DHSMEQA
		1.3.1.2 Review and align the National M&E plan with the National eHealth Strategy	2020	Director: DHSMEQA

Strategic Objective	Intervention	Activity	Deadline	Accountability
Strategic pillar 2. Strategy and investment				
Strategic Objective 2.1: Sustainable Funding for resourcing implementation of eHealth Strategy attained by 2021	2.1.1 Advocate for increased Government budget allocation for eHealth	2.1.1.1 Submit an investment case for the eHealth Strategy for National Treasury to consider addressing through voted funds	2020	Permanent Secretary: MoHW
		2.1.1.2 Develop a standard Business Case template for use by individual initiatives to show prospective eHealth impact when request government funding	2021	Director: DHSMEQA
	2.1.2 Mobilize the private sector to provide financial support for implementation of the eHealth strategy	2.1.2.1 Invite private sector stakeholders to propose how they will support implementation of the eHealth Strategy	2021	Permanent Secretary: MoHW
	2.1.3 Mobilize donor funding to provide financial support for resourcing the implementation of the eHealth strategy	2.1.3.1 Invite donors to propose how they will support implementation of the eHealth Strategy	2021	Permanent Secretary: MoHW
Strategic Objective 2.2: Investment climate on eHealth enhanced by 2021	2.2.1 Establish an investment committee to facilitate investment flow at all levels of the Botswana Healthcare system	2.2.1.1 Develop Terms of Reference (TOR), invite members to join the committee and conduct regular meetings to fulfil the TOR	2020	Deputy Permanent Secretary: DHSMEQA
	2.2.2 Monitor and track the investment platform performance	2.2.2.1 Submit regular reports on action plans for discussion by the investment committee	2021	Director: DHSMEQA

Strategic Objective	Intervention	Activity	Deadline	Accountability
		Strategic pillar 3. Service and applications		
Strategic Objective 3.1: National eHealth Platform established by 2023	3.1.1 Identify priority user requirements and determine relevant solutions to address these user needs	3.1.1.1 Identify key user types and for each type, establish a user group to review and priorities and evaluate usability of systems	2021	DPS
		3.1.1.2 Conduct a needs assessment, with extensive stakeholder and user group engagement, to establish the gaps, and publish findings	2021	Director: DHSMEQA
	3.1.2 Establish national approach to the development of eHealth services and applications	3.1.2.1 Develop and publish an over-arching systems architecture to align systems development activities to the priorities identified in the needs' assessment, which will be known as the National eHealth Platform	2021	Director: DHSMEQA
		3.1.2.2 Develop and publish policy guidelines requiring all stakeholders to align development activities to the National eHealth Platform systems architecture	2021	Director: DHSMEQA
		3.1.2.3 Evaluate existing software and establish a roadmap for transitioning them to the National eHealth Platform architecture	2021	Director: DHSMEQA
	3.1.3 Develop a National Data Warehouse	3.1.3.1 Assess requirements and options and for a National Data Warehouse that integrates all routine information systems, aligned to the National Minimum Data Set (see below) to meet the needs of users	2020	Director: DHSMEQA
		3.1.3.2 Establish the National Data Warehouse	2020	Director: DHSMEQA
	3.1.4 Establish a home-grown EHR for Botswana	3.1.4.1 Establish a roadmap for implementing a holistic patient-focused Electronics Health Record (EHR), including utilising FOSS where appropriate, for an affordable and sustainable systems environment, specifically to support the needs of patients and health workers, aligned with the National eHealth Platform	2021	Director: DHSMEQA
		3.1.4.2 Evaluate existing software solutions and establish a roadmap for transitioning them to the EHR roadmap	2021	Director: DHSMEQA
		3.1.4.3 Implement the roadmap to achieve a holistic patient-focused EHR	2022	Director: DHSMEQA
		3.1.4.4 Roll out the EHR to all facilities	2023	Director: DHSMEQA
Strategic Objective 3.2: Patients' experience of care improved by implementing priority applications by 2021	3.2.1 Establish a web-based engagement tool to support implementation of the eHealth Strategy	3.2.1.1 Implement a web-based engagement tool to support the effective collaboration of stakeholders and oversight of the eHealth Strategy and its Strategic Objectives	2021	Director: DHSMEQA
		3.2.1.2 Provide patients with access to key information, such as appointments, through a patient portal	2021	Director: DHSMEQA
		3.2.1.3 Explore connectivity options such to facilitate easy access for patients and families to information systems	2022	Director: DHSMEQA
	3.2.2 Reduce waiting times at facilities by implementing appointment scheduling applications	3.2.2.1 Prioritise developing appointments scheduling functionality accessible to all patients and health workers	2021	Director: DHSMEQA

Strategic Objective	Intervention	Activity	Deadline	Accountability
Strategic pillar 4. Standards and interoperability				
Strategic Objective 4.1: Health information availability and sharing strengthened by 2021	4.1.1 Establish a standards and interoperability framework	4.1.1.1 Review existing digital health system standards across public and private sectors, locally and internationally	2020	Director: DHSMEQA
		4.1.1.2 Adapt and publish a Normative Standards Framework for National eHealth initiatives		
	4.1.2 Design the interoperability platform	4.1.2.1 Develop interoperability architecture for the National eHealth Platform (specifically prioritising: Master facility list, National data dictionary and minimum indicator set, and registries)	2020	Director: DHSMEQA
		4.1.2.2 Design and build the technical components required to deliver the interoperability architecture	2021	Director: DHSMEQA
	4.1.3 Implement the interoperability platform	4.1.3.1 Publish the interoperability artefacts required for information systems to interoperate with the national platform	2021	Deputy Permanent Secretary: DHSMEQA
		4.1.3.2 Secure the required resources (human and infrastructure) needed to implement the national eHealth Interoperability Platform	2021	Deputy Permanent Secretary: DHSMEQA
		4.1.3.3 Deploy and maintain the National eHealth Platform	2021	Director: DHSMEQA

Strategic Objective	Intervention	Activity	Deadline	Accountability
Strategic pillar 5. Infrastructure				
Strategic Objective 5.1: Access to eHealth information and tools improved by end of 2023	5.1.1 Connect all health facilities in the country with minimum bandwidth	5.1.1.1 Assess connectivity landscape and identify gaps and, identify communication technologies to close the gaps	2020	Director: DHSMEQA/ IT Manager
		5.1.1.2 Establish a minimum specification for connectivity required by the MOHW, detailing specifications for different types of facilities, and different types of users	2020	Director: DHSMEQA
		5.1.1.3 Implement a regular update schedule to update this specification according to new applications emerging in the eHealth environment	2020	Director: DHSMEQA
		5.1.1.4 Complete the rollout of national connectivity to support the minimum connectivity specification	2021	Permanent Secretary: Ministry of Transport and Communication
	5.1.2 Electrify all facilities	5.1.2.1 Establish an accelerated plan to electrify facilities remaining without electricity, including exploring innovative options	2021	MoHW PS
	5.1.3 Establish a server hosting environment for MOHW	5.1.3.1 Identify the most appropriate server hosting approach to meet the needs of emerging health services and applications, and interoperable platform	2020	Director: DHSMEQA
		5.1.3.2 Develop a master configuration plan for the server infrastructure approach identified	2020	Director: DHSMEQA
		5.1.3.3 Procure the appropriate infrastructure and/or services for the server infrastructure approach identified	2021	Director: DHSMEQA
		5.1.3.4 Establish SOPs for all key systems administration processes, including: user management, server management, instance management, and security	2021	Director: DHSMEQA
		5.1.3.5 Develop policy document for all systems administration processes, aligned to the eHealth Strategy	2021	Director: DHSMEQA
		5.1.3.6 Train all relevant stakeholders on SOPs	2022	Director: DHSMEQA
		5.1.3.7 Initiate a regular internal audit cycle of all SOPs	2022	Deputy Permanent Secretary: DHSMEQA
	5.1.4 Provide all users with necessary equipment for accessing information	5.1.4.1 Develop a minimum specification for all user ICT equipment	2020	Director: DHSMEQA
		5.1.4.2 Develop a compliance plan for bringing user ICT equipment up to the minimum specification	2020	Director: DHSMEQA
		5.1.4.3 Conduct an assessment on the use of emerging approaches such as BYOD	2023	Director: DHSMEQA
		5.1.4.4 Develop a pro-active maintenance and replacement plan for all ICT equipment, including a plan for supply of consumables, where appropriate	2021	Director: DHSMEQA
	5.1.5 Establish an electronic UID and electronic MPI for use for the national health system	5.1.5.1 Investigate UID options and identify a preferred approach	2020	Director: DHSMEQA
		5.1.5.2 Publish detailed technical specifications on how the preferred approach will be implemented	2021	Director: DHSMEQA
		5.1.5.3 Build the technical infrastructure to support the preferred approach	2022	Director: DHSMEQA
	5.1.6 Establish registries and national data dictionaries	5.1.6.1 Establish an electronic national facility register	2020	Director: DHSMEQA
		5.1.6.2 Establish an electronic national data dictionary for the minimum indicator and data set	2020	Director: DHSMEQA
		5.1.6.3 Establish an electronic national health workforce register	2023	Deputy Permanent Secretary: DHSMEQA

Strategic Objective	Intervention	Activity	Deadline	Accountability
Strategic pillar 6. Legislation and compliance				
Strategic Objective 6.1: A regulatory framework for eHealth established and functional in the country by end of 2023	6.1.1 Review and update policies and laws that govern eHealth in the country	6.1.1.1 Conduct an assessment of the policies and laws required by the National eHealth strategy	2020	eHealth Regulation Technical Working Group
		6.1.1.2 Identify appropriate regulatory process for each priority regulatory aspect (Policy and/or Guideline and/or Legislation)	2020	Deputy Permanent Secretary: DHSMEQA
		6.1.1.3 Draft regulatory documents (including a Comprehensive eHealth Policy) in consultation with stakeholders	2021	Director: DHSMEQA
		6.1.1.4 Publish regulations after processing through appropriate channels	2022	Deputy Permanent Secretary: DHSMEQA
		6.1.1.5 Publish specific policy and regulations on: cyber-security, data protection and local "home-grown" solution development	2022	Deputy Permanent Secretary: DHSMEQA
	6.1.2 Monitor compliance with the policies and laws	6.1.2.1 Conduct regulatory compliance testing on priority aspects	2023	eHealth Regulation Technical Working Group

Strategic Objective	Intervention	Activity	Deadline	Accountability
Strategic pillar 7. Workforce				
Strategic Objective 7.1: Capacity of the Ministry of Health and Wellness to implement the eHealth Strategy strengthened by 2021	7.1.1 Develop a coordination guideline for the implementation of the eHealth Strategy	7.1.1.1 Engage with Ministry of Health and Wellness eHealth Stakeholders to detail the roles and responsibilities for coordinating the eHealth Strategy	2020	Director: DHSMEQA
		7.1.1.2 Develop and disseminate the coordination guideline for implementing the eHealth strategy	2020	Director: DHSMEQA
	7.1.2 Develop a Human Capital Development plan for those managing and leading the eHealth Strategy	7.1.2.1 Conduct skills assessment for the eHealth management workforce	2020	Deputy Permanent Secretary: DHSMEQA
		7.1.2.2 Develop and publish a comprehensive human resources development plan to provide the management workforce for the strategy	2020	Director: DHSMEQA
	7.1.3 Implement the Human Capital Development plan for those managing and leading the eHealth Strategy	7.1.3.1 Conduct skills assessment for the eHealth implementing workforce	2020	Director: DHSMEQA
		7.1.3.2 Manage effective implementation of the Human Capital Development plan	2021	Director: DHSMEQA
		7.1.3.3 Include the establishment of an eHealth Leadership Development programme	2021	Director: DHSMEQA
Strategic Objective 7.2: Capacity of both public and private eHealth implementers strengthened by 2022	7.2.1 Develop a national Human Capital Development programme and National eHealth Curriculum for eHealth implementers	7.2.1.1 Conduct an implementation stakeholders' workshop to identify opportunities and requirements to support a workforce strengthening plan	2020	Deputy Permanent Secretary: DHSMEQA
		7.2.1.2 Develop and publish a comprehensive human resources development programme for the implementation workforce for the strategy	2021	Director: DHSMEQA
	7.2.2 Implement the Human Capital Development programme for eHealth implementers	7.2.2.1 Develop an implementation plan for the Human Capital Development program	2022	Director: HR
		7.2.2.2 Create incentives for local ICT organisations to recruit and retain local information science professionals to contribute to systems development and maintenance for the eHealth Strategy	2022	Deputy Permanent Secretary: DHSMEQA
		7.2.2.3 Manage implementation of the Human Capital Development programme	2022	Director: HR
Strategic Objective 7.3: Terms and conditions of service for eHealth professional staff improved by 2022	7.3.1 Develop a skills retention policy for eHealth professional staff	7.3.1.1 Develop eHealth skills retention policy in consultation with stakeholders	2021	Deputy Permanent Secretary: HSMEQA
		7.3.1.2 Implement the eHealth skills retention policy	2022	Director: HR

5. Monitoring and Evaluation

For the Ministry of Health and Wellness to effectively implement the eHealth Strategy, a Monitoring and Evaluation framework has been developed to guide the implementation process. The M&E framework deals with each of the Strategic Pillars, corresponding Strategic Objectives and Strategic Initiative/Strategy/interventions as developed from the strategy development. At this level, the M&E Framework provides outcome indicators which will be used to determine the performance level of achieving each Strategic Objective. The M&E framework provides the baseline and the target for each intervention to be achieved and measured, and the data source from which information will be gathered. Some of the data sources will require to be generated while other will be revised.

The M&E framework will guide the Ministry in identifying the most valuable and efficient use of resources, while at the same time guiding strategic information required for the implementation of the eHealth Strategy. The M&E framework will assist the Ministry to improve performance and achieve the anticipated results for each Strategic Pillar, Strategic Objective and Interventions. The M&E framework will also improve current and future performance and management of outputs, outcomes and impact.

The Strategic Pillars are presented in the matrices below along with corresponding objectives, implementing interventions and expected outcomes. A high level costing is also provided for each Strategy/Intervention. The costing is provided in US Dollars.

Table 10: M&E framework

Strategic Objective	Intervention	Outcome indicator	Baseline	Target	Data Source	
Strategic pillar 1. Leadership and governance						**Cost: USD**
Strategic Objective 1.1: Management and coordination of the implementation of the eHealth Strategy strengthened by end of 2020	Rescucitate the eHealth Cluster to oversee the implementation of the eHealth Strategy	Coordination of eHealth intervention in the country managed in an efficient and effective manner	0	1 eHealth Cluster	MOHW Senior Management reports	21,000.00
	Strengthen the Health Informatics unit in the MOHW	Coordination and management of health data is used to inform decision making	0	2021	MOHW Senior Management reports	19,000.00
	Develop eHealth structures to manage and coordinate eHealth activities at various levels of implementation	Structures for coordination and management of eHealth activities efficiently involved in providing direction on eHealth	0 (struc-tures)	4 (eHealth structures)	MOHW Senior Management reports	38,000.00
Strategic Objective 1.2: Collaboration and cooperation strengthened among Ministries, Departments and Agencies (MDAs) that participate in the implementation of the eHealth strategy by end of 2021	Establish strategic partnerships for the implementation of the eHealth strategy	Harmonized partnership between all actors in implementation of eHealth	0	By 2021	MOHW Senior Management reports	36,375.00
	Promote active participation of stakeholders in the implementation of the eHealth strategy	An inclusive participation from various actors (Disaggregated by MDAs) during implementation of eHealth	0	By 2021	MOHW Senior Management reports	26,262.50
Strategic Objective 1.3: eHealth outcomes achieved through effective Monitoring and Evaluation (M&E) of the strategy from January 2021	Develop a monitoring and evaluation framework for the eHealth Strategy	Reporting culture embedded in all stakeholders on eHealth and decision making based on eHealth outcomes achieved / Revised National M&E Plan and improved monitoring at all levels of health care	0	By 2021	Quarterly national M&E reports	57,125.00

Strategic Objective	Intervention	Outcome indicator	Baseline	Target	Data Source	
Strategic pillar 2: Strategy and investment						**Cost: USD**
Strategic Objective 2.1: Sustainable Funding for resourcing implementation of eHealth Strategy attained by 2021	Advocate for increased Government budget allocation for eHealth	Adequately increased annual budget allocation for eHealth	0	By 2021	MOHW financial reports/ Annual Budget estimates	34,000.00
	Mobilize the private sector to provide financial support for implementation of the eHealth strategy	Annual private sector financing significantly increased to the ministry's budget allocation	0	By 2021	MOHW financial reports/ Annual Budget estimates, Annual investment report	12,000.00
	Mobilize donor funding to provide financial support for resourcing the implementation of the eHealth strategy	Increased donor funding support for implementation of the eHealth strategy	0	By 2021	MOHW financial reports	12,000.00
Strategic Objective 2.2: Investment climate on eHealth enhanced by 2021	Establish an investment committee to facilitate investment flow at all levels of the Healthcare system	Adequate investment opportunities and flow of investment coordinated at all levels in the country	0	By 2020	Annual investment report	6,000.00
	Monitor and track the investment platform performance	Investment platform more attractive for new investors on eHealth and informed through decisions making	0	By 2021	Annual investment report/M&E Reports	21,000.00
Strategic pillar 3. Services and applications						**Cost: USD**
Strategic Objective 3.1: National eHealth Platform established by 2023	Identify priority user requirement and determine relevant solutions to address these user needs	Increased user needs addressed by implementing priority needs of the users	0	By 2021	MOHW annual reports	150,200.00
	Establish an approach to the development of eHealth services and applications	Solutions and implementation of EMR supported by local/home-grown actors	0	By 2021	MOHW annual reports	342,300.00
	Develop a National Data Warehouse	Available and well-coordinated health information and sharing for all actors in the sector	0	By 2020	MOHW annual reports	178,000.00
Strategic Objective 3.2: Patients' experience of care improved by implementing priority applications by 2021	Establish a web-based engagement tool to support implementation of the eHealth Strategy	Number of patients who indicate improved satisfaction on web-based platform	0	By 2021	Knowledge, Attitude and practice survey	164,000.00
	Reduce waiting times at facilities by implementing appointment scheduling applications	Level of patient satisfaction on service provision improved at all health facilities	0	By 2021	MOHW annual reports/ Client satisfaction survey	0

Strategic Objective	Intervention	Outcome indicator	Baseline	Target	Data Source	
Strategic pillar 4. Standards and interoperability						**Cost: USD**
Strategic Objective 4.1: Health information availability and sharing strengthened by 2021 in Botswana	Establish a standards and interoperability framework	Upgraded standards of eHealth at all levels of care	0	By 2020	eHealth Standards body report	33,000.00
	Design the interoperability platform	All reporting systems able to communicate with one another	0	By 2021	Interoperability application report	78,000.00
	Implement the interoperability platform	All reporting systems harmonized with one another	0	By 2021	Interoperability application report	358,600.00
Strategic pillar 5. Infrastructure						**Cost: USD**
Strategic Objective 5.1: Access to eHealth information and tools improved by end of 2023	Connect all health facilities in the country with minimum bandwidth	More informed reports due to improved Network and infrastructure systems	0	By 2020	Health Facility survey	151,900.00
	Electrify all Facilities	Network down time and unavailability of electricity in facilities reduced significantly for implementation of eHealth	0	By 2021	Health Facility survey	120,000.00
	Establish a server hosting environment for MOHW	Data for the health sector well hosted in the server system	0	By 2020	MOHW M&E reports	344,700.00
	Provide users with necessary equipment for accessing information	Improved reporting for the users at all health care facilities and district level	0	By 2020	MOHW M&E reports	69,000.00
	Establish an electronic UID and electronic MPI for use for health system in Botswana	Reduced duplication of patient information at the districts private sector ,community levels and central levels	0	By 2020	MOHW M&E reports	50,700.00
	Establish registries and national data dictionaries	Common data sets submitted from the facilities private sector ,community levels and the districts	0	By 2020	MOHW M&E reports	130,000.00
Strategic pillar 6: Legislation, policy and compliance						**Cost: USD**
Strategic Objective 6.1: A regulatory framework for eHealth established and functional in the country by end of 2023	Review and update policies and laws that govern eHealth in the country	All actors observe policies and regulatory frameworks for implementation of eHealth	0	By 2022	MOHW M&E reports	0
	Monitor compliance with the policies and laws	Systematic compliance from all key stakeholders and partners on eHealth	0	Up to 2023	MOHW M&E reports	0

Strategic Objective	Intervention	Outcome indicator	Baseline	Target	Data Source	
Strategic pillar 7: Workforce						**Cost: USD**
Strategic Objective 7.1: Capacity of the Ministry of Health and Wellness for implementing the eHealth Strategy strengthened by 2021	Develop a coordination guideline for the implementation of the eHealth strategy	Improved coordination efforts from the MOHW on implementing eHealth	0	By 2020	MOHW routine reports	39,300.00
	Develop a Human Capital Development plan for those managing and leading the eHealth Strategy	Skills and approach to eHealth improved for Ministry of Health and Wellness personnel	0	By 2020	MOHW HR reports	75,000.00
	Implement the Human Capital Development plan for those managing and leading the eHealth Strategy	Knowledge, attitudes, practices and appreciation of eHealth in the MOHW increased	0	By 2020	MOHW HR survey report	210,000.00
Strategic Objective7.2: Capacity of both public and private eHealth implementers strengthened by 2022	Develop a national Human Capital Development programme and National eHealth Curriculum for eHealth implementers	Skills and approach to eHealth improved for implementers at both the public and private sectors of the system	0	By 2021	MOHW HR reports	38,500.00
	Implement the Human Capital Development programme for eHealth implementers	Knowledge and appreciation of eHealth for implementers increased	0	By 2022	MOHW HR survey report	72,200.00
Strategic Objective 7.3: Terms and conditions of service for eHealth professional staff improved by 2022	Develop a staff retention policy for eHealth professional staff	Reduced level of staff attrition of health professionals	0	By 2022	MOHW HR statistical reports	103,100.00

6. References

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