REPUBLIC OF KENYA

MINISTRY OF HEALTH

Kenya Digital Health Strategy

2025-2030

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KENYA DIGITAL HEALTH STRATEGY
2025 - 2030

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Foreword

As the Cabinet Secretary for Health, I am honored to present the Kenya Digital Health Strategy, a comprehensive blueprint designed to revolutionize our healthcare system by integrating digital technologies. This strategy is a critical component of our broader vision to achieve Universal Health Coverage (UHC) and improve the overall health and well-being of our citizens.

The digital transformation of our health sector is not merely an option but a necessity. This is a response to the growing demand for efficient, accessible, and high-quality healthcare services. By leveraging digital tools and innovations, we can bridge the gap between healthcare providers and patients, enhance data-driven decision-making, and ensure that no one is left behind in accessing essential health services.

This strategy emerged from extensive consultations and collaborations with stakeholders across various sectors. It reflects our collective commitment to building a resilient and sustainable health system that can adapt to the evolving needs of our population. I extend my deepest gratitude to all those who contributed to its development, including our partners in government, the private sector, academia, and civil society.

As we move forward, I urge all stakeholders to embrace this strategy and work together towards its successful implementation. The journey will require dedication, innovation, and a shared vision for a healthier Kenya. Together, we can harness the power of digital health to transform lives and build a brighter future for all.

Hon. Aden Duale, EGH
Cabinet Secretary for Health,
Ministry of Health

Preface

In an era where technology is rapidly transforming every aspect of our lives, the health sector stands at the forefront of this digital revolution. The Kenya Digital Health Strategy is a testament to our commitment to harnessing the power of digital innovation to enhance healthcare delivery, improve patient outcomes, and ensure equitable access to health services for all Kenyans.

This strategy outlines our vision for a digitally empowered health system that leverages cutting-edge technologies to address the unique challenges faced by our healthcare sector. It is built on the principles of inclusivity, sustainability, and resilience, aiming to create a robust digital health ecosystem that supports the needs of our diverse population.

Successfully implementing this strategy requires collaboration and partnership across all sectors. Therefore, we call upon the government, private sector, academia, and civil society stakeholders to join us in this transformative journey. Together, we can build a healthier, more connected Kenya where every individual has the opportunity to thrive.

As we embark on this ambitious path, we remain committed to continuous learning and adaptation, ensuring that our digital health initiatives are responsive to our people's evolving needs. We are confident that, through collective effort and innovation, we can achieve our goal of a healthier Kenya for all.

Dr. Ouma Oluga, OGW
Principal Secretary,
State Department for Medical Services,
Ministry of Health

Mary Muthoni, CBS,
Principal Secretary,
State Department for Public Health and Professional Standards,
Ministry of Health

Acknowledgement

First and foremost, we extend our heartfelt thanks to the Ministry of Health leadership for their unwavering support and guidance throughout this process. Their vision and commitment to improving healthcare through digital innovation have been instrumental in shaping this strategy.

We also wish to acknowledge the invaluable contributions of our partners in government, including the county governments through the ICC responsible for digital health and the Council of Governors' (CoG) Secretariat, the Digital Health Agency (DHA), national referral hospitals, the Kenya Medical Research Institute (KEMRI), and the Ministry of Information, Communication, and Technology. Their collaboration has been crucial in aligning our digital health initiatives with national policies and priorities.

Our sincere appreciation goes to our development partners, including the World Health Organization (WHO) and the US Centres for Disease Control and Prevention (CDC), for their technical and financial support. Their global expertise and resources have significantly enriched the strategy.

We thank the private sector, academia, and civil society organizations for their active participation and input. Their diverse perspectives and innovative ideas have helped us create a comprehensive and inclusive strategy that addresses the needs of all Kenyans. We extend special thanks to the healthcare professionals, community health workers, and patients who shared their experiences and insights. Their voices have been central to ensuring that the strategy is grounded in the realities of our healthcare system.

Finally, we acknowledge the dedication and hard work of the technical working group and all the individuals who contributed to the drafting, review, and finalization of this strategy. Your efforts have laid the foundation for a transformative digital health future in Kenya. Together, we can achieve our vision of a digitally empowered health system that improves the health and well-being of every Kenyan.

Dr. Patrick O. Amoth, CBS
Director General for Health,
Ministry of Health

Acronyms

AI	Artificial Intelligence
CDC	Centre for Disease Control and Prevention
CoG	Council of Governors
DHA	Digital Health Agency
DLP	Data Loss Prevention
EHR	Electronic Health Record
EMR	Electronic Medical Record
HIE	Health Information Exchange
HIRME	Health Information Research, Monitoring and Evaluation
HRH	Human Resources for Health
HRIO	Health Records and Information Officer
ICC	Interagency Coordination Committee
ICT	Information Communication Technology
KEPH	Kenya Essential Package for Health
KE-QR	Kenya Quick Response
LAN	Local Area Network
MFA	Multi-factor Authentication
ML	Machine Learning
MOH	Ministry of Health
NC4	National Cyber Security Command Centre
NIST	National Institute of Standards and Technology
NIST CSF	National Institute of Standards and Technology Cybersecurity Framework
SDGs	Sustainable Development Goals
SMEs	Small and Medium Enterprises
UHC	Universal Health Coverage
UNCTAD	United Nations Conference on Trade and Development
WAN	Wide Area Network
WHO	World Health Organization

1.0 Introduction

1.1 The Promise of Digital Technology in Transforming Healthcare

The rapid development, spread, and adoption of digital technology hold the promise of a new digitally enabled global society, with the potential to spur economic growth, improve development outcomes, transform health delivery, and lift millions out of poverty (1). When adopted responsibly in healthcare, digital technologies are transforming how health services are delivered, improving access, creating a continuum of care for patients, and enhancing the quality of care. Digital health innovations are pivotal in strengthening health systems by improving accountability, streamlining health workforce management, enhancing data-driven decision-making, and reducing costs, all of which contribute to a more resilient and responsive health system (2,3).

Digital health (DH), as defined by the World Health Organization (WHO), is "the field of knowledge and practice associated with the development and use of digital technologies to improve health." This rapidly evolving field at the intersection of healthcare and technology transforms how health services are delivered, managed, and accessed. Through innovations such as electronic health records, mobile health apps, and health information systems, digital health is revolutionizing care by making services more accessible, efficient, and patient-centered. It enhances decision-making through real-time data, streamlines workflows for healthcare providers, and expands access to care for underserved populations (4). Digital health, as a critical driver of health sector transformation, offers a clear pathway for enhancing health outcomes and addressing challenges in healthcare delivery. It serves as an essential tool for all stakeholders, both in the present and in the future (5,6).

1.2 Kenya's Strategy for Digital Health

WHO's Triple-Billion targets aim to have 1 billion more people benefit from universal health coverage, 1 billion more people better protected from health emergencies, and 1 billion more people enjoy better health and well-being (7). Aligned with this global vision, the Government of Kenya is committed to achieving Universal Health Coverage (UHC), which is firmly anchored in the country's health reform agenda. It is widely accepted that harnessing the full potential of digital health is critical to achieving our health goals. According to the World Health Organization (WHO), health information systems are one fundamental building block of a health system, and their integration with digital health technologies is essential for enhancing service delivery, enabling data-driven decision-making, and improving health outcomes (8). To achieve these benefits, the digital transformation of healthcare should be guided by principles of transparency, accessibility, scalability, replicability, interoperability, privacy, security, and confidentiality, ensuring that patient-centricity (5,9) remains at the core of all efforts.

In Sub-Saharan Africa, data on health indicators, such as maternal mortality rates and the prevalence of communicable diseases, reveal poor health outcomes (10,11). At the same time, non-communicable diseases (NCDs) like cancer and cardiovascular diseases are on the rise, creating a double burden of disease (1,12). This dual health challenge places significant strain on healthcare systems that are already struggling to cope with infectious diseases. The World Health Organization (WHO) projects that by 2030, NCDs will overtake communicable diseases as the leading cause of mortality in the Sub-Saharan region (13,14). A key barrier to addressing these health issues is the fragmented and uncoordinated deployment of digital health interventions. Poor coordination leads to duplicated efforts, wasted resources,

and inefficient health services. Without a well-structured approach to using digital health, the Sub-Saharan region risks falling further behind in its ability to manage the evolving disease landscape (15). The Kenya Digital Health Strategy recommends implementing a health information exchange (HIE) to address this.

This HIE will consolidate and harmonize health data nationwide, ensuring better coordination and integration of healthcare services. The HIE will allow for seamless sharing of health information among healthcare providers, improving disease surveillance, monitoring, and intervention efforts for both communicable and non-communicable diseases. This approach enhances the effectiveness of digital health interventions and strengthens preparedness for future health challenges through better cross-border collaboration and resource optimization.
The Government of Kenya enacted the Health Act of 2017, which facilitates the establishment and maintenance of a comprehensive, integrated health information system. Building on this, the Digital Health Act of 2023 was enacted as a critical legislative framework to drive digital transformation in healthcare, setting standards for data protection, interoperability, and innovation in health technologies. Against this background, the Government of Kenya has prioritized the development of a digital superhighway, with healthcare, agriculture, SMEs, and financing identified as priority sectors. Within healthcare, the goal is to use digital technology to enhance responsiveness, efficiency, and transparency, all of which are critical for achieving universal health coverage.

1.3 The Need for the DigitalHealth Strategy in Kenya

Kenya's healthcare system faces increasing demands that create the need for changes in the organization and management of healthcare services. This involves enhancing information systems to support timely and accurate decision-making. The Digital Health Act of 2023 plays a crucial role in this transformation by establishing a legal framework that regulates and promotes digital health technologies, ensuring data privacy, interoperability, and the safe implementation of digital solutions. The Digital Health Strategy is derived from the broader Kenya Health Policy (2014-2030) (16) and Kenya Vision 2030, which aims to achieve a "globally competitive and prosperous nation with a high quality of life by 2030." This strategy seeks to address the challenges identified during the implementation of the eHealth Strategy (2011-2017) and provide strategic direction for the country's digital health priorities.

In this context, the Digital Health Strategy lays out short-, medium-, and long-term actions designed to digitally transform Kenya's health sector and accelerate the achievement of universal health coverage (UHC). It also aims to ensure that healthcare data are used in a way that generates value while adhering to data privacy and protection regulations. Its primary goal is to offer clear strategic guidance for the health sector and to provide a roadmap for implementing the country's digital health priorities (17). The potential benefits of digital health are illustrated in Figure 1 below.

They include:

1. Mobile health applications and wearable devices enable individuals to monitor vital signs, track physical activity, and manage chronic conditions, allowing them to take control of their health and well-being.
2. Transitioning from paper-based systems to electronic health records (EHRs) and health information exchange (HIE) centralizes medical data, allowing real-time access to patient information and better coordination among healthcare providers.
3. Telemedicine and mobile health applications facilitate access to healthcare for underserved populations, enabling remote consultations, diagnoses, and access to medical records.

4. Accurate and up-to-date health information improves diagnosis, treatment planning, and continuity of care.
5. Digital tools allow for continuous tracking of health conditions, quick responses to public health threats, and better management of chronic diseases.
6. Digital health ensures a coordinated and comprehensive approach to patient care across different healthcare providers and settings.
7. Telehealth and online training platforms provide continuous professional development for healthcare workers, keeping them updated with the latest medical knowledge and practices.
8. Harnessing emerging technologies, such as artificial intelligence, big data analytics, and blockchain, enables digital health to enhance healthcare delivery, improve patient outcomes, and streamline operations.

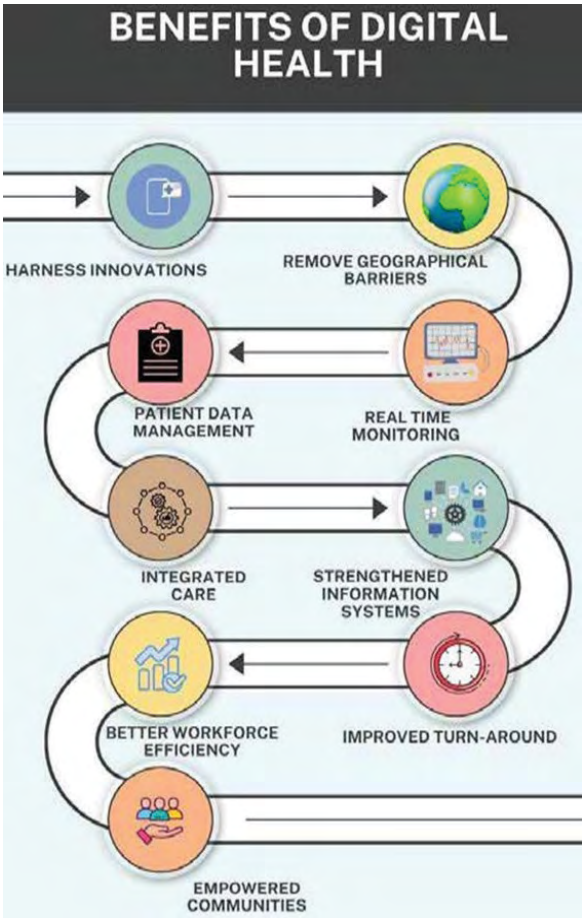


Figure 1: Digital Health Benefits

This strategy aims to harness the transformative power of digital health to achieve Kenya's healthcare goals, ensuring a balanced approach to innovation and regulation.

1.4 Strategy Development Process

The Digital Health Strategy was developed through a systematic and inclusive process, starting with consultative meetings and a comprehensive situational analysis. The initial meeting with the Ministry of Health provided essential insights into stakeholder mapping, critical stakeholder engagement, and the formulation of principles, vision, mission, and strategic focus areas. The situational analysis was informed by collaborative discussions during the Digital Health Stakeholder Convergence workshop in July 2023, followed by structural assessments using the Informatics-Savvy Health Organization (ISHO) tool. The scores from this tool were validated during the Strategy Writing Workshops.

Subsequently, strategic areas were identified and allocated to specific for teams' further enhancement. Virtual and physical meetings with digital health stakeholders and internal clients were conducted to gather valuable insights, leading to the appointment of a dedicated task team. The task team reviewed the eHealth Strategy (2011-2017) to assess the status of digital health implementation in the country and to guide the expectations for the new Digital Health Strategy.

An activity-based micro-costing approach was employed to estimate the cost of the strategy's implementation. Broad cost categories based on interventions in each strategic area were identified, which led to the creation of generic profiles and contextual definitions for specific activities, such as the standard requirements for developing a policy document. Input data were obtained from the Ministry of Health and its implementing partners through various reports, while cost data were sourced from expenditure reports and publicly available data.

End-user engagements were conducted through workshops with selected participants from national and sub-national levels. These workshops aimed to gather feedback on proposals, key challenges, lessons learned, and best practices. This comprehensive and collaborative process ensured that the Digital Health Strategy was well-informed, contextually relevant, and aligned with Kenya's broader health policy goals.

During the situational analysis of Kenya's Digital Health Strategy, key stakeholders- including the Ministry of Health, development partners, and private sector representatives-participated in a comprehensive assessment focused on areas defined in the ISHO tool. These areas include policy governance, workforce capabilities, and strategies to strengthen information systems. After an orientation on the assessment tool, stakeholders were grouped by their areas of expertise to evaluate and score their respective domains. Findings were presented in a plenary session, where scores were reviewed and a consensus was reached. The consolidated results were compiled into a workbook that generated summaries and visualizations, serving as a crucial reference for developing the situational analysis and identifying strategic areas and activities for the strategy.

The task team organized three writing workshops to prioritize initiatives, develop the Monitoring and Evaluation (M&E) framework, create a strategy costing framework, and review associated data. Subsequently, the task team convened a meeting to consolidate all findings and inputs into the strategy documents, ensuring that county perspectives were consulted and integrated. The finalized, costed strategy was submitted to the Ministry of Health for review and approval.

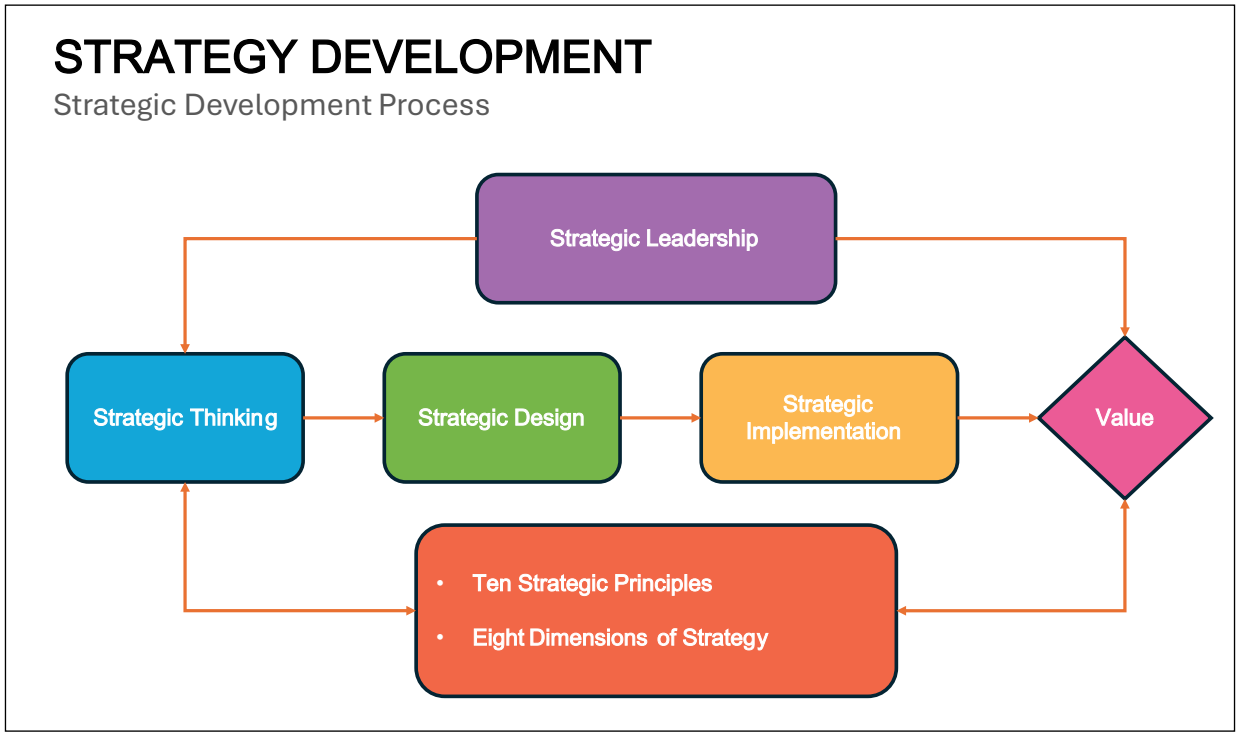


Figure 2. Strategy development process

1.5 Existing Policies and Strategies for Digital Health

The Digital Health Strategy is aligned with global, regional, and national strategies, policies, priorities, and goals. This alignment is crucial as it ensures a cohesive approach to health transformation, enhances resource optimization, and maximizes the impact of digital health initiatives across all levels of the health system.

Global alignment: The strategy aligns with the Global Strategy on Digital Health 2020-2025, endorsed by the Seventy-third World Health Assembly in decision WHA73(28) (2020). This global strategy aims to improve health for everyone, everywhere, by accelerating the development and adoption of appropriate, affordable, scalable, and sustainable, person-centered digital health solutions. The strategy is built upon several World Health Assembly resolutions, including WHA58.28 (2005), WHA66.24 (2013), and WHA71.7 (2018). Additionally, the strategy supports Sustainable Development Goals (SDGs) 3 and 9, focusing on ensuring healthy lives, promoting well-being for all ages, and fostering innovation through the development of resilient infrastructure.

Regional alignment: The strategy aligns with the Africa CDC Digital Transformation Strategy, which recommends that countries develop a digital health strategy with a compelling vision and clear direction. This strategy also aligns with the East African Community (EAC) Digital Health Policy Framework and the Digital Regional East African Community Health (Digital REACH) Initiative, which aim to address health challenges and promote interoperability and collaborative healthcare solutions across member states (18).

National alignment: Kenya's Digital Health Strategy aligns with Vision 2030, aiming to transform Kenya into a globally competitive and prosperous nation with a high quality of life (19). It also aligns with the Kenya Health Policy 2014-2030, which emphasizes the role of technology in improving health outcomes and achieving universal health coverage (UHC). Additionally, the strategy aligns with the Health Sector Strategic Plan (July 2018-June 2023), which focuses on leveraging the digital revolution to enhance the delivery of health services through digital platforms. It also aligns with other legislations and promotes multisectoral and multi-agency collaboration with existing agencies.

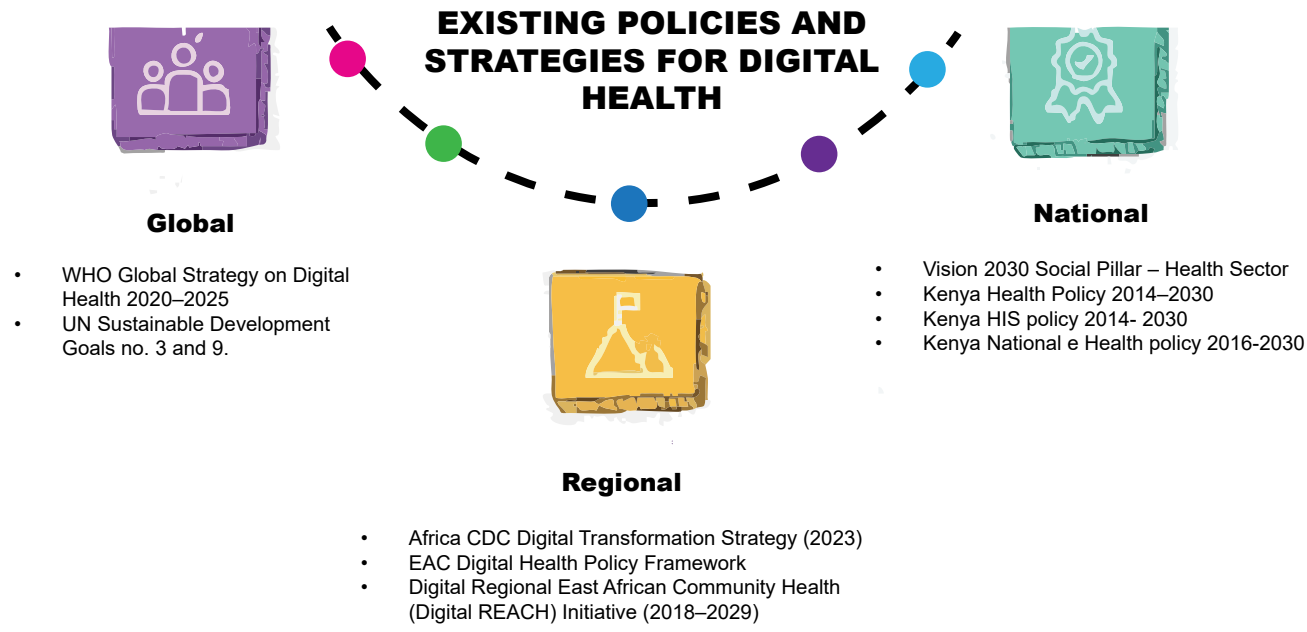


Figure 3. Existing policies and Strategies for Digital Health

2.0 Digital Health Situation Analysis

2.1 Kenya's Digital Health Overview

Digital health plays a crucial role in Kenya's healthcare infrastructure by providing health data for effective decision-making, policy formulation, and service delivery. Understanding Kenya's current digital health landscape, including the legislative frameworks, challenges, and technological capabilities, is essential for developing a robust digital health strategy. This section provides an overview of the existing frameworks and challenges, highlighting the importance of these elements in achieving Kenya's broader health goals.

Legislative and Governance Framework

The Government of Kenya has established a robust legislative framework to support digital health and data protection, embodied in the Health Act of 2017, the Data Protection Act of 2019, and the Digital Health Act of 2023. This solid legal foundation and political goodwill facilitate the operationalization of digital health initiatives. Key governance structures, such as the Health Information Research and Evaluation Inter-agency Coordination Committee (ICC responsible for digital health) and the Health Informatics Technical Working Group, play crucial roles in this process. The Digital Health Act of 2023 has established the Digital Health Agency (DHA), a semi-autonomous government entity responsible for implementing and coordinating digital health initiatives. This highlights the importance of understanding and regularly updating digital health solutions in the country.

Current Challenges

Despite these advancements, several challenges persist. Issues such as poor data quality, systems and health data security concerns, and data silos are prevalent, compounded by limited resources. These challenges hinder the effective use of digital health tools and systems. Additionally, the lack of a comprehensive monitoring and evaluation framework for digital health implementation limits oversight and accountability. Lack of Digital Health Infrastructure, especially in hard to reach areas and lower level health facilities, that is internet connectivity and computing devices. Inadequate end user capacity to manage Digital Health solutions. While the Digital Health Atlas serves as a strategic planning tool, it is essential to prioritize regular updates to this repository to reflect the current landscape of health information systems (20).

Software Development and IT Management

Flexible software development lifecycles and IT project management processes in Kenya foster innovation. However, the reliance on custom-built solutions for vertical, donor-driven programs often results in fragmented implementations (21). Ensuring the DHA can access and understand the current systems will be vital for effective planning, coordination, and integration.

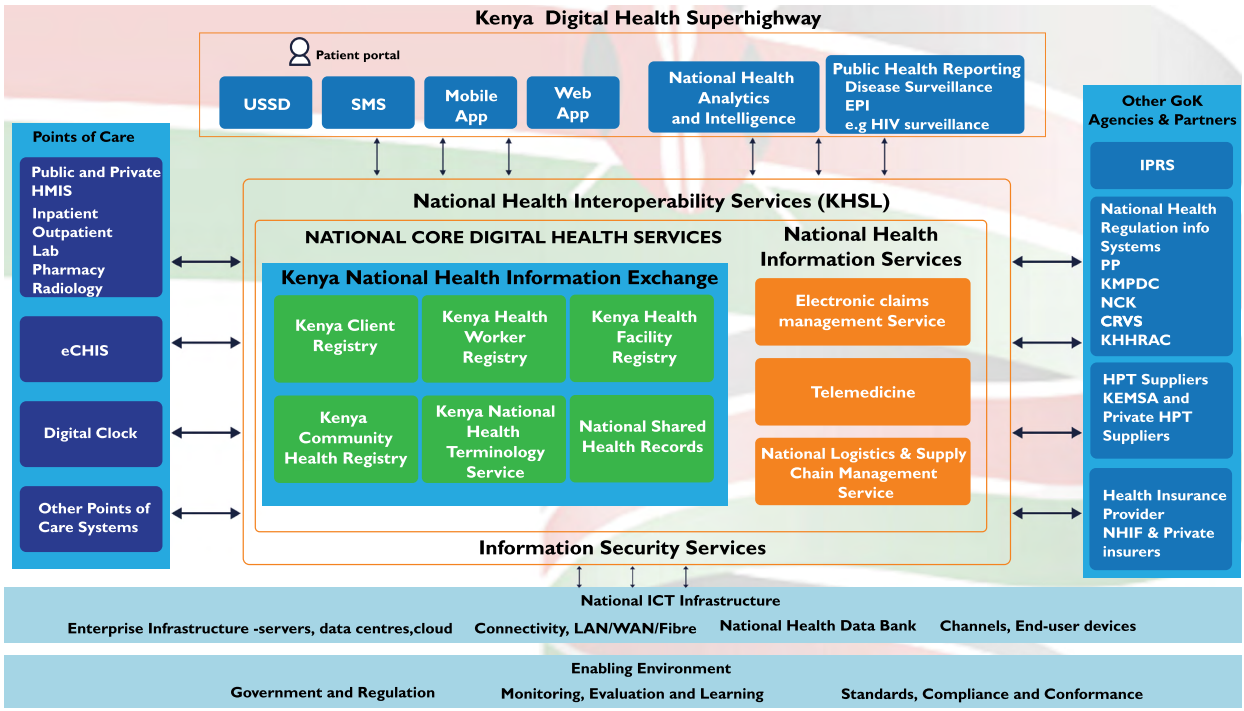


Figure 4. Kenya Health Digital Superhighway

Interoperability and Digital Health Interventions

While the widespread adoption of electronic medical records (EMRs) indicates progress, interoperability remains a significant hurdle. Existing systems often operate in silos, complicating data sharing and analysis. Efforts to set up a National Health Exchange system, guided by the Digital Health Act of 2023 and the Kenya Health Enterprise Architecture, are underway to enhance data integration and accessibility.

Information Security and Data Governance

The Ministry of Health has implemented guidelines for information security, yet gaps in compliance and execution persist. Issues such as unclear change management processes and user authentication vulnerabilities increase risks to patient data security. Strengthening these protocols is essential for building trust in digital health systems.

Data Availability and Analytical Capacity

The Ministry of Health has access to substantial data and advanced analytical tools. However, challenges related to data quality, data silos, and a shortage of skilled workforce in data management and analysis impede effective data use. There is a pressing need to promote a data-driven culture and expand digital health training programs to build capacity within the workforce.

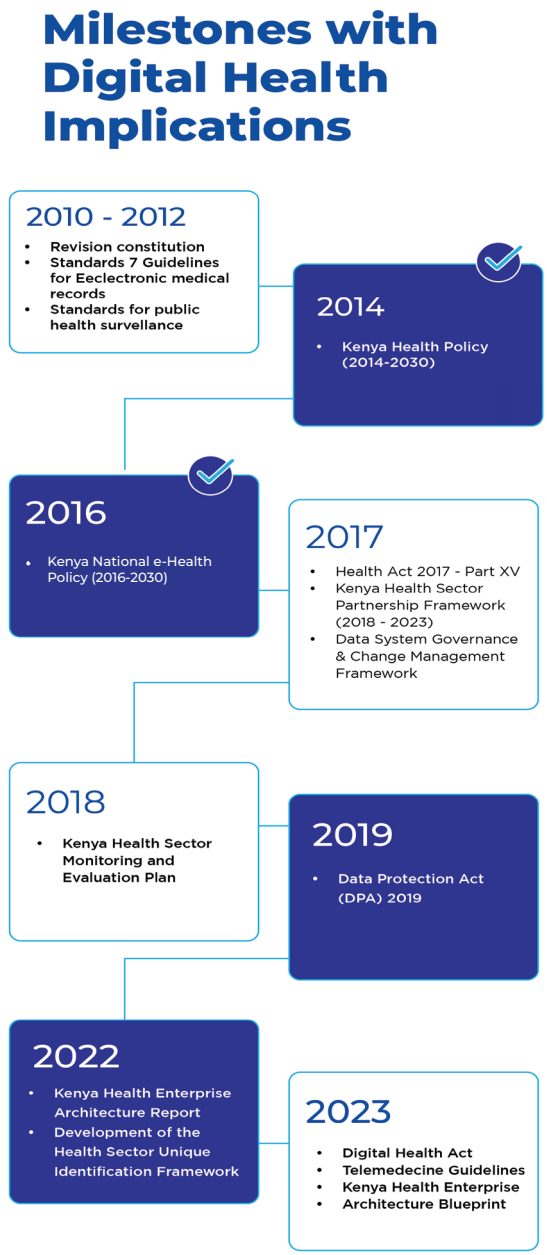
Technological Ecosystem

Kenya's growing technology ecosystem is bolstered by a young, tech-savvy population and government support for digital health initiatives. While successful mobile health projects and supportive legislation strengthen the sector, challenges persist, including insufficient funding for research and development, inconsistent internet connectivity, and a shortage of skilled health informatics professionals. Addressing these issues is vital for realizing the full potential of digital health.

Infrastructure and Connectivity

Kenya's ICT infrastructure benefits from the wide availability of hardware, which also drives competitive pricing, in addition to the recently published Ministry of Health ICT Standards and Guidelines. However, the availability of hardware at healthcare facilities remains limited, and resource allocation for core ICT infrastructure is insufficient. Strengthening these aspects will be essential for effective digital health implementation.

Key Milestones influencing digital health since 2010



2.1 Digital Health Journey in Kenya

The digital health journey in Kenya reflects the nation's commitment to leveraging technology for improved health outcomes. This journey is characterized by significant milestones, including the introduction of innovative health solutions and the integration of digital tools into healthcare delivery. Understanding this journey provides insights into the evolution of digital health initiatives, highlighting successes, lessons learned, and areas for further development. This section outlines the key phases of Kenya's digital health evolution, illustrating its impact on health service delivery and alignment with national health objectives.

The development of health policies and systems in Kenya from 2010 to 2023 has been instrumental in shaping the digital health landscape. Each milestone reflects legislative progress and establishes frameworks that govern digital health solutions, ensuring the effective integration of these solutions into healthcare. Below are the key milestones and their implications for digital health.

Year 2010:

- **The Revised Constitution of Kenya:** Articles 31, 35, 43 (1a), and (2) were amended, enhancing the legal foundation for access to information and health rights. These amendments support digital health initiatives by promoting transparency and the right to access health information.
- **Standards and Guidelines for Electronic Medical Records (EMR):** The established EMR standards ensure uniformity and interoperability across health facilities, facilitating better data management and improving patient care.

Year 2012:

- **Revised Public Health Act CAP 242:** These amendments included public health surveillance and response provisions, laying the groundwork for integrating digital tools in disease tracking and reporting.

Year 2014:

- **Development of the Kenya Health Policy (2014-2030):** This policy guides the overall direction of the health sector, emphasizing the role of technology in enhancing health service delivery, thereby providing a strategic framework for digital health initiatives.

Year 2016:

- **Development of the Kenya National eHealth Policy (2016-2030):** This policy outlines a vision for eHealth, establishing priorities for implementing digital health solutions across the country, such as telemedicine and health information systems.

- **Health Act 2017-Part XV:** This section focuses on health data management and establishes legal standards for data collection, sharing, and usage, which are crucial for supporting digital health infrastructure.

- **Kenya Health Sector Partnership Framework (2018-2023):** This framework encourages stakeholder collaboration and facilitates a coordinated approach to implementing digital health initiatives.

- **Data, System Governance, and Change Management Framework:** This framework governs the management of health data systems, ensuring that digital health solutions remain adaptable and sustainable.

Year 2018:

- **Kenya Health Sector Monitoring and Evaluation Plan:** This plan establishes performance indicators for health programs, integrating digital tools for data collection and analysis to enhance accountability.

Year 2019:

- **Data Protection Act (DPA), 2019:** This act provides guidelines for protecting personal health data, which is crucial for building trust in digital health systems.

Year 2022:

- **Kenya Health Enterprise Architecture Report:** This report outlines the structural framework for health information systems, ensuring digital health initiatives are aligned with national health objectives.

- **Development of the Health Sector Unique Identification Framework:** The continued implementation of this framework supports the integration of digital health solutions into the existing healthcare system.

Year 2023:

- **Digital Health Act, 2023:** This act establishes a legal framework for governing digital health initiatives, ensuring regulatory compliance and fostering innovation.

- **Telemedicine guidelines:** Telemedicine-related policies support remote healthcare delivery, increasing access to services, particularly in underserved areas.

- **Kenya Health Enterprise Architecture Blueprint:** This blueprint serves as a strategic guide for implementing digital health solutions, ensuring their interoperability and effectiveness.

3.0 Digital Health Strategy Vision and Guiding Principles

3.1 Vision

A digitally empowered health system that guarantees accessible, efficient, and equitable health services for every Kenyan.

3.2 Mission

To harness the power of digital innovations to strengthen health systems, enhance service delivery, and improve public health outcomes across Kenya.

3.3 Guiding Principles

The Kenya Digital Health Strategy (2024-2027) is built upon key guiding principles that enhance the health system's efficiency, inclusivity, sustainability, and population health outcomes (14,22).

- **Equity and Inclusion:** Ensuring that digital health solutions are accessible to all populations, especially marginalized and vulnerable groups.
- **Sustainability:** Promoting solutions that are locally owned, cost-effective, and aligned with long-term national priorities.
- **Interoperability:** Designing systems that can communicate and share data securely across platforms and institutions.
- **Data Privacy and Security:** Upholding the highest standards for safeguarding personal health information.
- **Innovation and Adaptability:** Encouraging the use of emerging technologies and flexible approaches to meet dynamic health needs.
- **Collaboration:** Fostering strong partnerships among government, private sector, academia, and civil society.

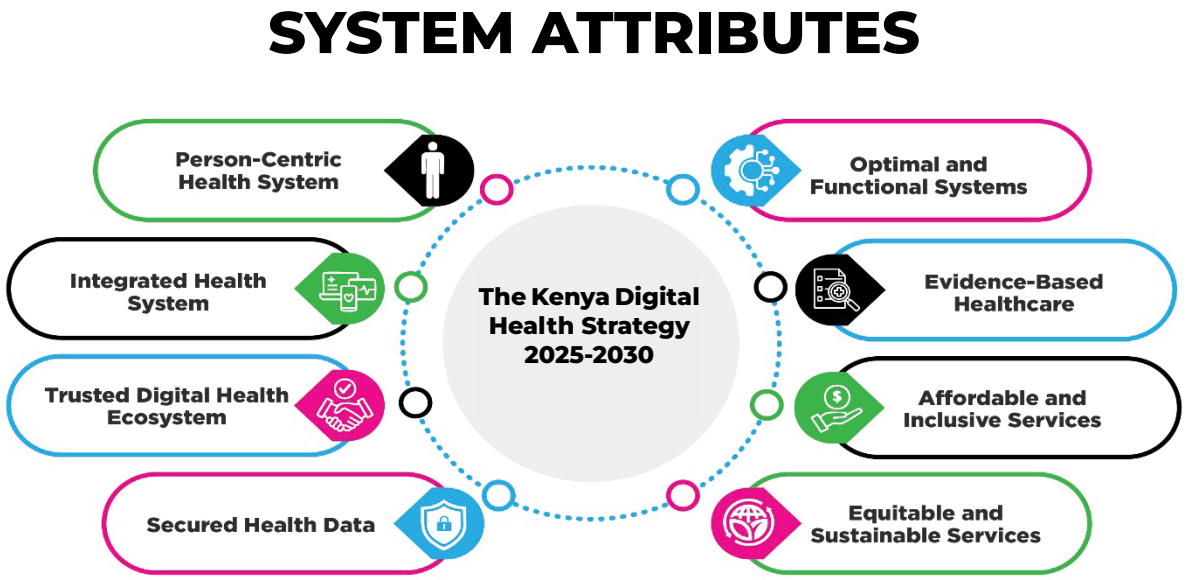


Figure 6. System Attributes

4.0 Strategic Objectives and Key Pillars

The Kenya Digital Health Strategy 2025–2030 is anchored on five strategic objectives, which are operationalized through eight key pillars. These pillars represent the foundational elements required to build and sustain a responsive digital health ecosystem.

Figure 7. Digital Health Strategic Initiatives

4.1 Strategic Objectives

- Strengthen digital health governance and leadership across all levels of the health system.
- Ensure robust health information systems through standardization, interoperability, and real-time access to quality data.
- Expand equitable access to digital health infrastructure, tools, and services, particularly in underserved areas.
- Build digital health capacity among healthcare workers, system administrators, and users.
- Foster innovation and partnerships that drive the development and scale-up of relevant digital health solutions.

4.2 Key Pillars of The Strategy

Strategic Initiative 1: Leadership and Governance

This pillar focuses on establishing strong institutional structures, policies, and regulatory frameworks to guide digital health development and oversight. It ensures clear accountability, stakeholder coordination, and strategic alignment with national and international priorities.

Strategic Initiative 2: Operationalization and Implementation of Enterprise Architecture

Strategic Initiative 2 aims to operationalize and implement a robust enterprise architecture framework that supports the integration and interoperability of digital health systems across all levels of healthcare delivery. This will ensure alignment of digital health systems and enable seamless data exchange and communication across the healthcare continuum.

Strategic Initiative 3: Systems and Information Security

The Systems and Information Security pillar will focus to enhance the security and resilience of health information systems to protect patient data and ensure the confidentiality, integrity, and availability of health information. This initiative will focus on building secure digital health environments to maintain patient trust and data privacy.

Strategic Initiative 4: Data Use for Action

This will aim to promote high-quality health data for evidence-based decision-making, policy formulation, and improved health outcomes. This strategic area will enhance data collection, analysis, and utilization to ensure that health information is actionable and used to drive policy and operational decisions.

Strategic Initiative 5: Funding Strategy and Investment

This pillar will help to secure sustainable funding and investment for digital health initiatives through strategic partnerships and innovative financing mechanisms. This initiative emphasizes the importance of mobilizing resources to ensure continuity and scalability of digital health programs.

Strategic Initiative 6: Skilled Digital Health Workforce

To build a skilled and knowledgeable digital health workforce through targeted training, capacity-building programs, and continuous professional development. This will address the need for digital literacy and technical expertise to support the implementation and maintenance of digital health solutions.

Strategic Initiative 7: Innovation, Research, and Continuous Improvement

This pillar's focus is to foster a culture of innovation and research to drive continuous improvement in digital health solutions and practices. This initiative will encourage the development of new technologies, methodologies, and approaches to address emerging healthcare challenges.

Strategic Initiative 8: ICT Infrastructure and Connectivity

The final pillar will expand and enhance ICT infrastructure and connectivity to support the widespread adoption and effective use of digital health technologies. This initiative will focus on improving access to reliable internet and communication technologies necessary for the digital transformation of healthcare.

5.0 Strategic Interventions

5.1 Strategic Area 1: Leadership and Governance

Digital health systems have the potential to revolutionize healthcare delivery, improve patient outcomes, and enhance efficiency within health systems. Kenya has made significant strides in establishing governance structures and policies within the health sector to oversee the digital health space. However, the development and sustainability of these systems still face substantial challenges that require robust governance, policies, and legislation to address.

This strategic area focuses on operationalizing governance and policy-related interventions, ensuring sustainability, and proposing digital solutions. By addressing these challenges, Kenya can effectively integrate digital health systems into its healthcare infrastructure at both national and county levels, with clear roles for various stakeholders, including donors, implementing partners, and system owners. This would foster an enabling legislative and policy environment (22).

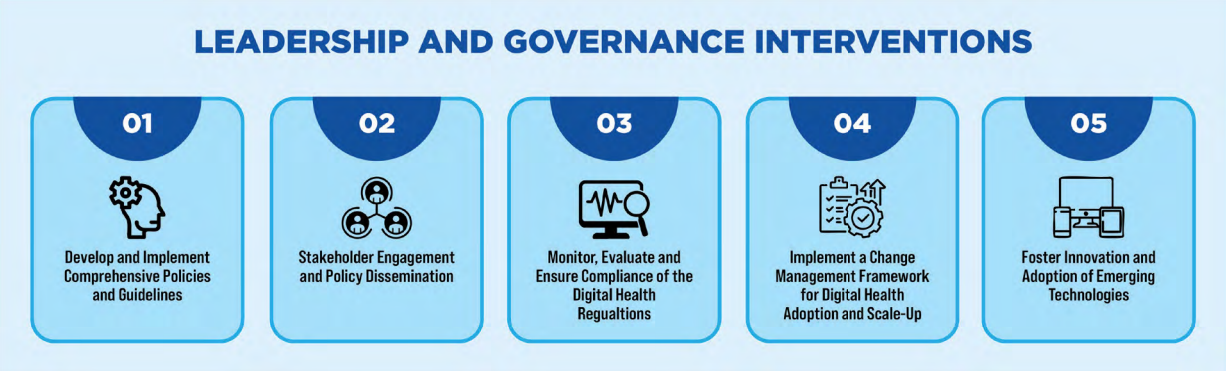


Figure 8. Leadership & Governance Interventions

Operationalize the DHA and Establish Comprehensive Policies and Guidelines for Digital Health

a. Map National and County Leadership Structures:
   - Operationalise the roles and responsibilities of the Ministry of Health (MOH), county governments, and the Digital Health Agency (DHA).
   - Clarify the role of DHA in the implementation of digital health initiatives.
   - Establish multi-stakeholder coordination mechanisms between MOH, DHA, counties, and key stakeholders such as donors and implementing partners as per the Kenya Health Sector Partnership and Coordination Framework 2018-2030 (23).

b. Finalize and standardize core digital health frameworks:
   - Kenya Health Data Governance Framework
   - Kenya Health Enterprise Architecture
   - Certification Framework
   - Telemedicine Standards and Guidelines
   - Digital Health Standards
   - Change Management Framework
   - Generic Digital Health Training Resources

c. Develop and Implement Guidelines for Legacy and Emerging Health Data
   - Guidelines for legacy data management
   - Guidelines for data migration
   - Guidelines for data quality
   - Guidelines for e-waste management in the health sector
   - Guidelines for other emerging health data

d. Create Operational Plans for Strategy Implementation:
   - Develop operational plans for strategy implementation, ensuring that national and county-level structures are involved.
   - Align these operational plans with the roles of key stakeholders, ensuring clarity on how system owners, donors, and other partners contribute.
   - Define what success looks like for digital health leadership and governance.

Stakeholder Engagement and Policy Dissemination

a. Adapt the Health Sector Partnership and Coordination Framework for Digital Health:
   - Revise and adapt the existing Health Sector Partnership and Coordination Framework (2018-2030) to incorporate digital health priorities.
b. Establish Governance and Coordination Structures:
   - Set up governance and coordination structures at the national and county levels.
   - Include representation from public sector entities, health-enabling ministries, the private sector, academia, research institutions, and bi/multilateral partners.
c. Strengthen Multisectoral Partnerships for Digital Health:
   - Engage and formalize partnerships with key stakeholders through Memoranda of Understanding (MOUs) and joint working groups.
d. Coordinate Digital Health Strategy Implementation Through Partnerships:
   - Facilitate regular collaboration meetings and joint planning sessions and coordinate project execution across sectors.
e. Conduct Dissemination Forums:
   - Organize and hold dissemination forums to update partners and stakeholders on the progress of the Digital Health
   - Develop key performance indicators (KPIs) to track the progress of governance structures at the national and county levels.
f. Implement a Policy Needs Assessment and Prioritization Mechanism:
   - Implement a mechanism to track, prioritize, and address the evolving needs for policies, standards, and guidelines within the digital health sector. Strategy's implementation.

Monitor, Evaluate, and Ensure Compliance with Digital Health Regulations

a. Establish Continuous Monitoring and Evaluation (M&E) Framework:
   - Set up a system for continuous tracking of key performance indicators (KPIs) related to digital health regulation compliance.
   - Implement regular reviews of the M&E framework.
b. Develop and Implement an IT System for Compliance Monitoring:
   - Design and deploy an IT system to track onboarding, certification, and suspension of Digital Health Systems (DHS)
   - Provide automated alerts for compliance issues.
c. Establish Roles and Responsibilities for Compliance Oversight:
   - Assign specific staff members or teams to oversee onboarding and suspension of DHS.
   - Define responsibilities, including reviewing of compliance data, decision-making on enforcement actions, and reporting to senior management.
d. Develop and Disseminate Training Guidelines for Compliance Areas:
   - Create and distribute guidelines for training in data quality, data management, and certification standards.

e. Conduct Regular Training and Capacity Building:
   - Organize ongoing training sessions for health professionals and IT staff on data quality, data management, certification, and the M&E framework.

f. Conduct Regular Assessments of Digital Health Quality:
   - Periodically assess the quality and performance of digital health interventions, services, and applications.
   - Monitor key performance indicators (KPIs) for adopting and using digital health systems.

Implement a Change Management Framework for Digital Health Adoption and Scale-Up

a. Develop a Change Management Communication Plan:
   - Create a comprehensive communication plan for health workers who are managing change related to digital health adoption.
   - Align the plan with international best practices.

b. Establish Change Management Strategies and Methodologies:
   - Develop and implement strategies and methodologies for managing change in the adoption of digital health.

c. Collaborate with Training Institutions and Partners:
   - Partner with educational and training institutions to enhance organizational leadership capacity.

d. Create a Cascade Framework for Digital Health Transformation:
   - Design and implement a cascade framework to guide digital health transformation efforts.

e. Strengthen Governance Capacity:
   - Develop and implement programs to enhance governance structures and processes related to digital health.

Foster Innovation and Adoption of Emerging Technologies

a. Identify and Evaluate Emerging Technologies:
   - Conduct ongoing assessments to identify new and promising technologies relevant to the health sector.
   - Develop a policy on artificial intelligence and machine learning in health.

b. Develop a Technology Adoption Framework (24):
   - Create a structured framework for assessing, piloting, and scaling new technologies.

c. Promote Research and Development (R&D) Partnerships:
   - Establish partnerships with research institutions, technology developers, and innovators.

d. Implement Pilot Programs and Trials:
   - Launch pilot programs to test emerging technologies in real-world settings.

e. Create an Innovation Ecosystem:
   - Foster an environment that supports and encourages innovation.

5.2 Strategic Area 2: Operationalization and implementation of Enterprise Architecture

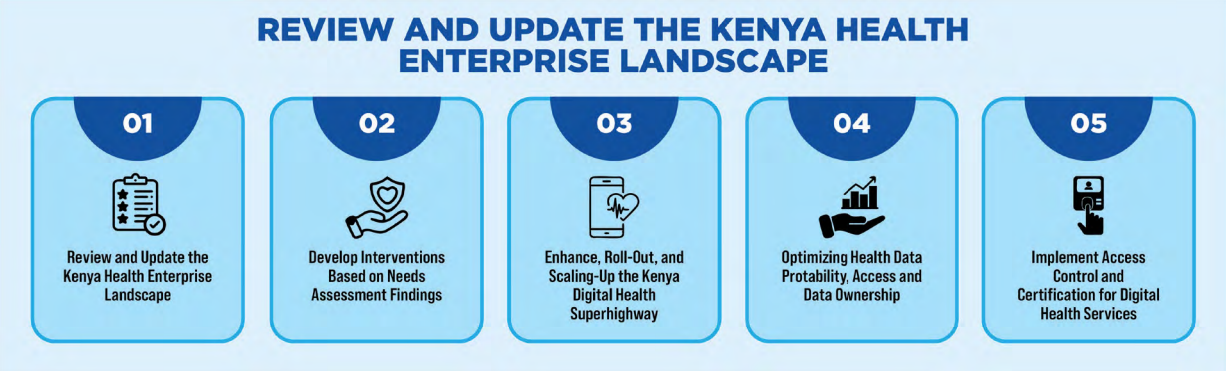


Figure 9. Review and update the Kenya health enterprise landscape

Kenya's Health Enterprise Architecture (KHEA) for 2025-2030 aims to establish strong, uniform, and interlinked national, comprehensive, and integrated health information systems. These systems are designed to generate high-quality data to improve health service delivery, guiding efforts towards the modernization and reorganization of Kenya's digital health ecosystem into an enterprise.

KHEA also focuses on improving the quality of healthcare services by promoting a unified and centralized approach for streamlined service delivery at all levels. This approach reduces redundancies, simplifies healthcare delivery, and ensures efficient resource utilization. By enhancing the interoperability of healthcare systems, the architecture empowers healthcare providers to offer more accurate diagnoses, personalized treatment, and more robust data analytics for public health decision-making. This strategic area aims to guide the operationalization and implementation of The Kenya Health Architecture, specifically focusing on:

1. Enhancing, rolling out, and scaling up the Kenya digital health superhighway.
2. Digitizing health facilities and Primary Care Networks (PCNs) by establishing SMART (PCNs)
3. Optimizing health data portability, access, and data ownership.
4. Enabling the health system to provide targeted or on-demand communication with persons (the public) to provide health education and behavior change communication based on need such as:
5. Transmitting targeted health information to persons based on health status or demographics
6. Enabling access of information on health topics or health services

Review and update the Kenya Health Enterprise Landscape

a. Develop Assessment Tools for KHEA Components:
   - Create tools and methodologies for assessing various KHEA components.

b. Validate and Refine Assessment Tools:
   - Conduct a validation process through data collection and analysis, and refine tools for accuracy and reliability.

c. Conduct a Maturity Assessment of the Health Enterprise:
   - Conduct the assessment using developed tools to determine the maturity status of the health enterprise in Kenya.

d. Develop and Validate the Assessment Report:
   - Compile a report based on assessment findings, including investment plans, gap analyses, and implementation strategies, and validate the report.

e. Disseminate the Assessment Report:
   - Share the final report with stakeholders, including health sector leaders, policymakers, and partners, to guide decision-making.

Develop Interventions Based on Needs Assessment Findings

a. Identify and Prioritize Digitalization Requirements:
   - Determine optimal digitalization needs for health services, classified by level and type according to the Kenya Essential Package for Health (KEPH).

b. Rationalize and Optimize Digital Health Infrastructure:
   - Review and streamline existing digital health infrastructure to align with new data banks and digitalization requirements.

Operationalize the Kenya Health Enterprise Architecture (KHEA)

a. Establish Guidelines and Standard Operating Procedures (SOPs) for Shared Services:
   - Develop and implement guidelines and SOPs for managing and utilizing shared health services.
   - Implement Access Controls and Certification for Digital Health Services:
   - Provide authorized access to shared health services and establish a certification framework that includes a self-attestation tool.

b. Roll Out and Integrate Digital Health Interventions and Applications:
   - Implement digital interventions and services, including integrated point-of-care systems, and deploy data analytics tools to enhance decision-making.
   - Create and deploy a platform (mobile app, SMS service, social media or web portal) capable of sending customized health messages, notifications for health events, focused campaigns, directory for nearby healthcare facilities, reliable information on diseases, symptoms, treatments, and prevention methods and repository for frequently asked questions on health topics.
   - Use AI-driven chatbots for real-time health queries.

5.3 Strategic Area 3: Systems and Information Security

Protection of systems and information is paramount to ensuring the confidentiality, integrity, and availability of health data. Safeguarding against potential threats and vulnerabilities is essential to maintaining public trust and promoting the effective use of health technologies. Integrating advanced digital solutions into the healthcare system offers unprecedented opportunities to transform service delivery, enhance patient outcomes, and streamline operations. Safeguarding against security incidents increasingly depends on user engagement rather than solely on the technology itself. Elevating user awareness is critical to enhancing the overall security posture of health systems. Continuous education and lifelong sensitization are essential for maintaining the integrity of health data and the broader digital health ecosystem. By fostering digital literacy and empowering users to understand their role in protecting sensitive information, we can create a more resilient and secure society, advancing digital health initiatives and promoting individual responsibility in safeguarding vital resources.

This section outlines Kenya's commitment to implementing robust systems and information security measures to strengthen the processes and practices designed to protect healthcare-related devices, systems, and networks, as well as the data within them, from security risks, unauthorized access, breaches, and cyberattacks. This strategy aims to build a resilient digital health ecosystem by establishing comprehensive security protocols, building cybersecurity capacity, fostering a culture of vigilance, and promoting continuous improvement.

Figure 10. Strategic Area 3: Systems and Information Security

Conduct a Comprehensive Assessment of Systems Information Security in Kenya

a. Develop a framework for identifying the MOH and implementing partner (IP) health facilities' key digital assets, including its people, processes, locations, systems, and data:
   - Ongoing and systematic analysis of the cybersecurity environment, focusing on identifying vulnerabilities, threats, and threat actors that present the most significant risks through targeted assessments.
   - Develop and validate assessment tools using a maturity model approach:
   - Create and test tools and frameworks to assess the maturity status of systems and information security in Kenya, including criteria and indicators for evaluation.

b. Conduct a systematic analysis of the cybersecurity environment, focusing on identifying vulnerabilities, threats, and threat actors that present the greatest risks through targeted assessments:
   - Use the ISO/IEC 27001 framework to guide cybersecurity assessment.
   - Review and map current digital health practices against legal requirements
   - Review existing digital health practices to assess alignment with the Digital Health Act of 2023, Data Protection Act of 2019, and Computer Misuse and Cybersecurity Act of 2018.

Develop Security Action Plans Based on Assessment Findings:

a. Create action plans addressing specific vulnerabilities and gaps, prioritizing security measures and implementation timelines.

b. Update and Implement Systems and Information Security Policies:
   - Revise existing security policies or develop new ones based on assessment results; implement these policies across systems and organizations, including setting up incident detection and reporting procedures.
   - Establish a Zero-Trust (ZT) and Security-by-Design (SBD) framework.
   - Implement a zero-trust security system and a security-by-design approach for digital health services to enhance security.

c. Establish a framework for conducting regular vulnerability testing:
   - Arrange for regular penetration testing and vulnerability assessments and apply necessary patches and updates.
   - Create Awareness and Train Stakeholders on New Security Measures.
   - Develop and deliver cybersecurity training programs and awareness campaigns to ensure stakeholders understand and can implement new security measures.

Optimize and Align with Relevant Legal Frameworks

a. Develop and Update Policies and Procedures in Compliance with Legal Frameworks:
   - Create or update internal policies and SOPs to ensure compliance with legal frameworks, integrating the latest regulations into healthcare operations.

b. Conduct Training and Capacity Building on Legal Compliance:
   - Organize training sessions for healthcare professionals, IT staff, and management to enhance understanding of legal obligations under relevant laws.

c. Establish a Monitoring and Reporting Mechanism for Legal Compliance:
   - Set up a monitoring system to track compliance with legal frameworks, including a reporting mechanism for breaches and corrective actions.

d. Collaborate with Regulatory Bodies to Ensure Ongoing Compliance:
   - Engage with regulatory authorities to stay updated on legal requirements, ensure alignment of digital health practices, and participate in audits and consultations.

Promote Capacity Building and Awareness of Information Security

a. Develop and Implement a Comprehensive Training Program on Information Security:
   - Create a training curriculum on information security, covering data protection, cybersecurity best practices, and legal compliance; implement it across the healthcare sector.

b. Identify a team of cybersecurity trainers:
   - Work with stakeholders with cybersecurity expertise to lead the cybersecurity training.
   - Develop an online, regularly updated resource hub with up-to-date information, guidelines, tools, and a forum for sharing experiences and solutions.

c. Implement a Certification Program for Information Security Competence:
   - Introduce a certification program aligned with the industry's best practices and standards, recognizing healthcare workers and IT staff who demonstrate competence in information security practices.

Implement a Continuous Risk Evaluation and Learning Framework

a. Define Monitoring, Evaluation, and Learning (MEL) Objectives and Expected Results:
   - Establish clear objectives and outcomes for monitoring, evaluation, and learning within the risk evaluation framework.

b. Develop Specific Indicators for MEL Objectives:
   - Generate indicators to measure progress towards MEL objectives, tailored to assess the effectiveness of risk management interventions.

c. Implement Continuous Monitoring of Key Risk Indicators:
   - Conduct ongoing monitoring of risk indicators to track security status, detect potential vulnerabilities in real-time, and develop action plans to remediate or proactively address risks.

d. Establish a Feedback Mechanism for MEL Results:
   - Develop a structured plan for providing feedback on MEL results to stakeholders, ensuring continuous and coordinated improvement in risk management.

e. Facilitate Adaptive Learning and Risk Mitigation Actions:
   - Use findings from continuous risk evaluation to implement adaptive learning initiatives in alignment with emerging security trends, update security protocols, and deploy targeted interventions.
   - Conduct Data Protection Impact Assessments (DPIAs)
   - Regularly perform DPIAs for point-of-care systems to identify and mitigate data privacy and security risks.

5.4 Strategic Area 4: Data use for Action

Globally, the health sector collects data through population censuses, civil registration and vital statistics systems, household surveys, health management systems, and public health surveillance. In Kenya, data collection occurs at various levels, including in health facilities, communities, and research institutions. This data is collected manually or electronically and analysed according to specific needs before it is published and disseminated.

Kenya's healthcare sector has national systems for collecting, processing, analysing, and disseminating health-related data from health facilities across the country. These systems are crucial for monitoring health service delivery, disease surveillance, and resource allocation.

Many facilities, particularly those run by the government, still rely on paper-based systems due to limited access to electronic health record systems or because of inconsistent internet connectivity. Healthcare workers manually record patient information, diagnoses, treatments, and outcomes on standardized forms or registers, following national guidelines and data management protocols. This data often remains isolated within each facility and is not seamlessly integrated into a centralized electronic database. Summaries of aggregate and case-based data are submitted to the next level using various methods.

The lack of integration results in fragmented health records, hindering effective analysis and coordination of healthcare services at all levels. Despite these challenges, ongoing efforts aim to digitize health records and improve connectivity to facilitate more efficient data collection, sharing, and analysis across the healthcare system.

While significant progress has been made in using data for action, gaps in data collection and data quality continue to hinder effective data use. Consistent with the general gaps in health information system (HIS) status, these gaps include inadequate capacities in human resources, technology, internet access, demand for data, and documented evidence on data use. This strategic objective focuses on enhancing data use in healthcare by addressing these gaps and ensuring that high-quality data is available for informed decision- making and improved health outcomes.

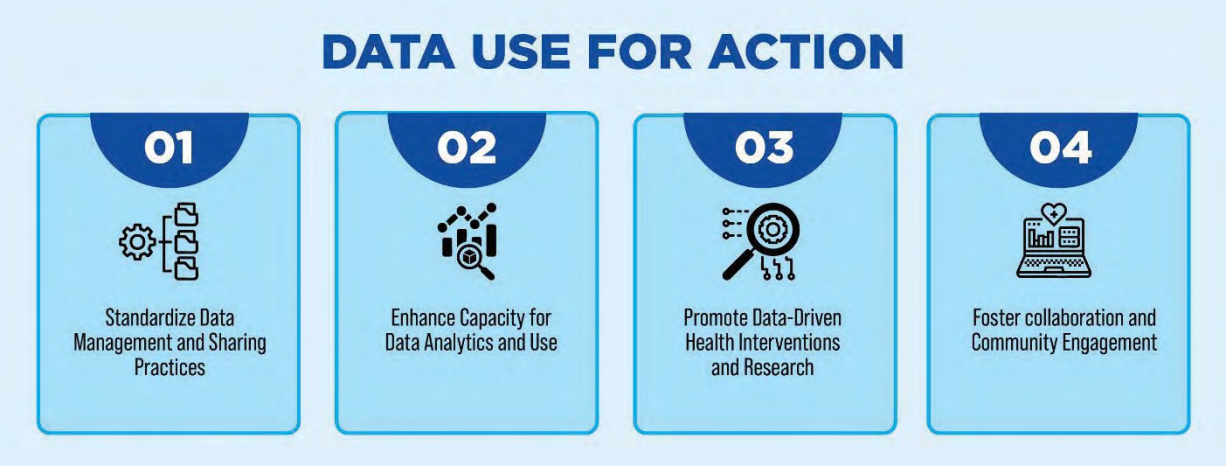


Figure 11: Data use for action

Standardize Data Management and Sharing Practices

a. Implement Data Collection and Sharing Protocols:
   - Create standardized data collection, processing, and sharing protocols to ensure consistency and interoperability across health systems.

Enhance Capacity for Data Analytics and Use at National, County, and Sub-County Levels

a. Develop and Deliver Training on Data Analytics:
   - Deliver training on data analytics, focusing on different audiences based on their interest and capacity level.

b. Organize Data Dissemination Conferences and Peer-Reviewed Publications:
   - Host conferences at county, national, and regional levels to share data insights, discuss findings, and promote best practices in data use.
   - Publish peer-reviewed articles in line with research protocols to promote data interrogation, interpretation, and sharing of findings.

c. Regulate data use:
   - Develop and implement a comprehensive data use monitoring and evaluation framework to guide the collection, analysis, and application of health data, ensuring alignment with strategic objectives and fostering evidence-based decision-making across the health system.
   - Implement measures to ensure adherence to data protection principles, including developing policies, providing training, and deploying systems that safeguard personal health information while promoting compliance with relevant data protection regulations.

Promote Data-Driven Health Interventions and Research

a. Leverage Data for Evidence-Based Health Interventions:
   - Use data to design and implement targeted health interventions, improving resource allocation and addressing specific health needs.

b. Develop Predictive Analytics for Health Trends:
   - Implement predictive analytics to forecast health trends and potential outbreaks, enabling proactive responses.
   - Integrate predictive analytics, virtual assistants, and personalized treatment recommendations into existing digital health platforms.

c. Utilize Data for Health Research and Innovation:
   - Support research initiatives using health data to foster innovation and develop new health solutions.
   - Provide standard operating procedures and mechanisms for data access and use by research institutions and individual researchers.

d. Enhance Patient Engagement and Care:
   - Use data to personalize treatment plans and improve patient engagement through data sharing and interoperability, fostering better preventive and promotive health for individuals.

e. Monitor and Evaluate Health Interventions:
   - Continuously monitor and evaluate the effectiveness of health interventions using data insights to refine and improve strategies.

Foster Collaboration and Community Engagement

a. Collaborate with Local Institutions and Experts:
   - Partner with local institutions and experts to enhance data use and improve health service delivery through collaborative efforts.

b. Hold Community Engagement Meetings:
   - Organize town hall meetings to share data on health issues with local communities, fostering transparency and community involvement.
   - Run digital and offline campaigns to promote the importance of digital health literacy, encouraging communities to use available tools and platforms.

c. Train Journalists in Data-Driven Storytelling:
   - Provide training for journalists on health data to create impactful stories that raise awareness and inform the public while adhering to ethical and data access sharing agreement parameters and research protocols, and in compliance with the Data Protection Act.

d. Collaborate with Academic Institutions:
   - Work with higher education institutions to integrate digital health and data management into training curricula, enhancing the health workforce's capabilities.

e. Promote Data-Driven Health Communication Strategies:
   - Utilize data to develop and implement effective health communication strategies that address specific issues and engage with the public by leveraging data insights to tailor messaging for different audiences, optimize outreach channels, and measure the effectiveness of communication campaigns in real-time for continuous improvement.
   - Create Multilingual and Inclusive Content by developing health education materials in local languages to ensure accessibility and use text-to-speech and other assistive technologies to reach users with disabilities.

f. Evaluate and Improve Digital Health Programs
   - Collect feedback on existing digital health literacy initiatives and adapt strategies to address gaps.
   - Use community surveys or focus groups to identify barriers and success factors.

Data Elements and Indicators Review Process

The process of reviewing data elements and indicators is triggered by the review of the National Health Sector Strategic plan as well as review of program specific indicators. The change of indicators in the Health Sector Strategic Plan and consensus on new priorities for the Health Sector triggers the review of data elements and indicators after every five years. The MOH (Division of Health Informatics) is informed on the new data elements and indicators and the need to change. The Division invites proposals from Directorates and Divisions to submit health indicators that need to be redefined and any new ones for inclusion in the Indicator Manual and subsequently used in the revision of the data collection and reporting tools. Upon receipt of the proposals, the Division shall constitute a TWG to review, define health indicators and eventually revise the Health Indicators Manual.

Procedures of Designing and Reviewing MoH Data Collection and Reporting Tools

New data requirements from programs and changes in the Health Sector priorities raise the demand for revising or developing new data collection and reporting tools. Upon finalization of the Health Sector Indicator Manual the Division of Informatics shall convene stakeholder meetings to build consensus on required data collection and reporting tools. A task force will be formed to review, revise and where necessary design the data collection and reporting tools using the list of data elements and indicators in the Health Sector Indicator Manual and prepare instruction manual on how to fill out the tools. A pre-test on the use of the new tools as well as the Instructions Manual shall be carried out to assess the usability and make recommendations based on the pretest results adopted. Upon completion the health workers will be sensitized on new or revised tools and the revised data reporting tools shall then be incorporated into the relevant digital health solutions.

5.5 Strategic Area 5: Investment Plan

Digital health financing in Kenya is critical for advancing the country's healthcare system. By leveraging innovative financial strategies, Kenya can ensure sustainable funding for digital health initiatives, which is essential for improving healthcare delivery and outcomes. The strategic interventions outlined aim to create a robust framework for resource mobilization, stakeholder collaboration, and the optimization of funding models. These efforts will enhance the efficiency and effectiveness of digital health projects and ensure they are scalable and sustainable in the long term.

To achieve sustainability of health outcomes, it is important to develop a comprehensive resource mobilization strategy that includes detailed costing frameworks and engagement with diverse funding sources. Enhancing stakeholder collaboration will facilitate the leveraging of resources and foster partnerships that are crucial for the success of digital health initiatives. Additionally, reviewing and optimizing existing funding models, promoting best practices, and strengthening investment in digital health innovation will create a conducive environment for the growth and sustainability of digital health in Kenya. These strategic interventions will collectively contribute to a more resilient and responsive healthcare system that is capable of meeting the evolving health needs of the population.

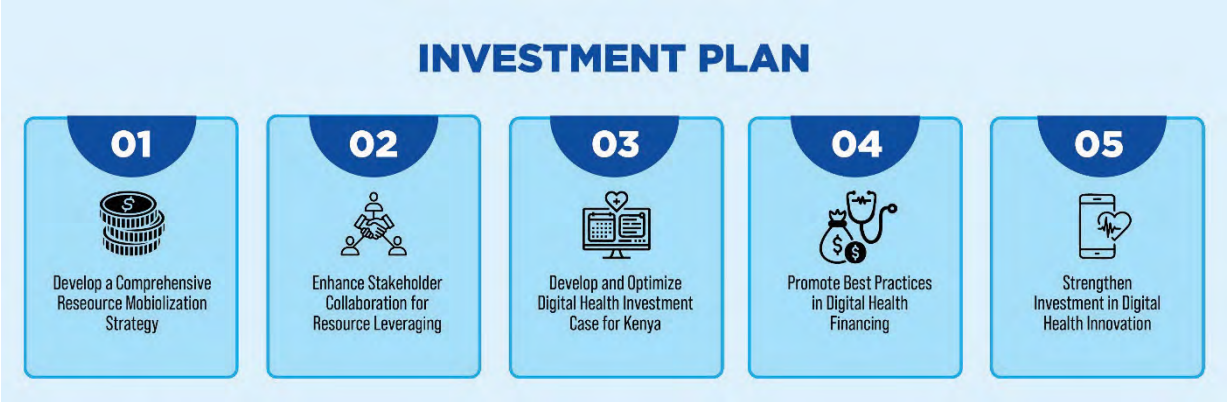


Figure 12. Investment Plan

Develop a Comprehensive Resource Mobilization Strategy

a. Create a detailed costing framework that estimates the financial requirements for all digital health initiatives, including capital and operational expenditure.
b. Develop a detailed resource mobilization plan outlining target amounts, timelines, and responsible entities.
c. Establish a monitoring and evaluation framework to track the effectiveness of resource mobilization efforts.

Enhance Stakeholder Collaboration for Resource Leveraging

a. Map out key stakeholders in the health sector and their potential contributions to digital health initiatives, in line with the adapted partnership framework.
b. Facilitate multi-stakeholder workshops to explore resource-sharing opportunities.
c. Develop partnership agreements that outline each stakeholder's roles, responsibilities, and resource commitments.
d. Create a shared platform for stakeholders to regularly update resource needs and available support.
e. Promote joint funding applications to maximize resource allocation and impact.

Develop and Optimize Digital Health Investment Case for Kenya

a. Conduct a thorough analysis of existing digital health funding models in Kenya and other comparable contexts.
b. Engage with experts and stakeholders to develop recommendations for optimizing digital health funding approaches.
c. Pilot innovative funding models by assessing their effectiveness in various contexts and disseminating findings to inform policy decisions and future funding strategies.
d. Publish and disseminate findings to inform policy decisions.

Promote Best Practices in Digital Health Financing

a. Develop guidelines for implementing best practices in digital health financing at the national and county levels.
b. Develop and implement an investment strategy that integrates mechanisms to protect public interest in private investments, including guidelines for equitable resource allocation, public-private partnership frameworks, and accountability measures to safeguard the public good.
c. Establish a knowledge-sharing platform to disseminate information on successful digital health financing models.
d. Regularly update best practice guidelines based on new research and evolving financial landscapes.

Strengthen Investment in Digital Health Innovation

a. Identify priority areas for digital health innovation that align with national health goals.
b. Develop an investment framework that incentivizes innovation in digital health technologies and solutions.
c. Leverage the existing National Research Fund (NRF)-Kenya to fund or grant programs dedicated to supporting digital health startups and research.
d. Partner with academic institutions and tech companies to foster innovation and accelerate digital health advancements.
e. Monitor and evaluate the impact of investments in digital health innovation, adjusting strategies as necessary.
f. Promote sustainability of digital health through comprehensive resource mobilization:
    - Conduct advocacy campaigns and engage policymakers to secure the inclusion of digital health programs in annual governmental budgets.
    - Design and pilot cost-recovery mechanisms, such as user subscriptions for premium digital health services, while ensuring affordability and equity for underserved populations.
    - Establish a dedicated resource mobilization team to identify funding opportunities, prepare proposals, and manage grants aligned with long-term national digital health strategies.
    - Implement training curriculums and programs for healthcare workers, IT staff, and community leaders to build expertise in digital health tools, increasing the pool of tech-savvy health workers in all counties reducing reliance on external consultants.

5.6 Strategic Area 6: Digital Health Workforce

The digital health workforce strategic area aims to address the critical need for a skilled and well-trained workforce to support the implementation and sustainability of digital health initiatives in Kenya. Recognizing the importance of human resources in achieving digital health goals, this strategic area focuses on developing, strengthening, and mainstreaming digital health professionals at all levels of the health system. Critical interventions include conducting comprehensive needs assessments to identify gaps and opportunities, formulating development plans aligned with existing human resources for health (HRH) strategies, ICT strategic guidance, and defining standardized

roles and qualifications for digital health professionals. Additionally, the approach emphasizes the importance of strategic partnerships for capacity building, the management of Health Records Information Management Officers, ICT officers, and the development of pre-service and in-service training programs. By integrating these efforts into broader health sector plans, the strategy ensures a cohesive and sustainable approach to enhancing the digital health workforce in Kenya.

Figure 13. Digital Health Workforce

Develop and Implement a Digital Health Workforce Strategy

1. Conduct a comprehensive needs assessment to identify the current gaps, strengths, and opportunities in the digital health workforce across different health system levels (institutional, sub-national, and national).
2. Formulate a digital health workforce development strategy with an operational plan that aligns with existing human resources for health (HRH) strategies and policies on skills gap analysis, training and certification programs, defined roles and responsibilities, and capacity building at national and county levels.
3. Define clear roles, job descriptions, and required qualifications for digital health professionals to standardize employment across the health sector.
4. Establish monitoring and evaluation mechanisms to regularly assess the effectiveness and impact of the digital health workforce strategy.
5. Integrate the digital health workforce development strategy into broader health sector strategic plans to ensure cohesive implementation and sustainability.
6. Implement gender mainstreaming policies in line with policies and implementation tools recommended by State Department of Gender and Affirmative Action:
   - Establish and enforce gender equality policies within the digital health sector that ensure equal access to opportunities and fair treatment.
   - Develop policies that promote a healthy work-life balance, including flexible working hours, remote work options, and parental leave.
   - Develop recruitment strategies that specifically target women and underrepresented groups in digital health roles.
   - Implement training programs that address specific challenges faced by women and marginalized groups in digital health, including affirmative actions that provide opportunities for education scholarships, studentships, career progression and mentorship opportunities for underrepresented groups.

Facilitate Strategic Partnerships for Digital Health Workforce Capacity Building

a. Identify and engage potential local and international partners, including academic institutions, industry leaders, and healthcare providers, to support digital health capacity building. This engagement includes developing and formalizing memoranda of understanding (MoUs) with key stakeholders to outline roles, responsibilities, and expectations in capacity-building.

b. Organize outcome-based joint training programs, workshops, and seminars with partner institutions to enhance the digital health skills of the workforce.
c. Facilitate knowledge exchange and technology transfer programs through collaborations with leading digital health institutions globally.
d. Monitor and evaluate the outcomes of partnership activities to ensure they contribute to the overall capacity-building objectives and adapt strategies as needed.

Facilitate the Management of HRI Officers, Digital Health Officers and Other Allied Professionals Employed/Supporting Digitalization in the Health Sector

a. Conduct a labor market survey for digital health to identify the availability of high-end talent that can be mainstreamed into digital health initiatives.
b. Develop targeted recruitment and retention strategies to attract and retain high- end Digital Health talent within the health sector.
c. Create specialized career pathways for Digital Health professionals in digital health, including opportunities for career advancement and leadership roles.
d. Implement mentorship and coaching programs to support the professional development of Digital Health talent in health.
e. Establish a recognition and reward system for Digital Health professionals who contribute significantly to digital health innovations and outcomes.
f. Reskilling of existing workforce handling health information systems in line with digitization efforts.
g. Build capacity for data management and analytics.

Develop Pre-Service and In-Service Training Programs in Digital Health and Evaluate Learning Outcomes

1. Collaborate with educational institutions such as KMTC and TVET institutions to develop standardized digital health curricula for pre-service training and evaluate learning outcomes.
2. Liaise with the Commission of University Education and accreditation bodies to integrate digital health competencies into existing health training programs, ensuring all healthcare professionals receive foundational knowledge in digital health.
3. Design and implement in-service training modules that provide continuous professional development (CPD) opportunities for current health workers and assess learning outcomes.
4. Develop online learning platforms and resources to make digital health training more accessible to health professionals nationwide through private and public funding models.
5. Establish certification programs in collaboration with regulators to ensure digital health training meets industry standards and enhances professional qualifications.

Mainstream Digital Health Professionals in the Health Sector

a. Advocate for the inclusion of key digital health roles in health sector staffing norms and their establishment at national and county levels.
b. Develop and disseminate guidelines for integrating digital health professionals into existing healthcare teams and workflows.
c. Create awareness campaigns targeting healthcare institutions to promote the value and necessity of digital health professionals in improving service delivery.
d. Facilitate the placement of digital health professionals in key health institutions, ensuring they have the necessary resources and support to succeed.
e. Monitor the impact of digital health professionals on health outcomes and service delivery to continuously improve integration strategies.

5.7 Strategic Area 7: Innovation, Research, and Continuous Improvement

Successful implementation of these solutions requires a robust framework that supports innovation, research, and continuous improvement. Despite the progress made, several gaps remain in the digital health ecosystem. A cohesive community of practice that gathers professionals, researchers, and stakeholders to share knowledge and collaborate on projects is needed. Translating research into practical applications ensures that innovations are effectively implemented and scaled.

Ethical considerations in research and data use are paramount to maintaining trust and integrity in digital health. Establishing clear guidelines and monitoring compliance are necessary steps to uphold ethical standards.

This strategic area emphasizes the importance of innovation, research, and ongoing improvements to ensure the effective integration of digital solutions in healthcare.

Figure 14: Innovation, research and continuous improvement

Establish a Community of Practice to Develop a Health Ecosystem (Professional Association)

a. Promote the formal association of digital health professionals, researchers, and stakeholders.
b. Host/co-host conferences, seminars, and workshops for members to share knowledge, discuss trends, and collaborate on projects.
c. Facilitate networking opportunities to strengthen community ties.
d. Create an online platform where members can share research findings, best practices, and resources.
e. Establish certification programs for digital health professionals.
f. Develop standards and accreditation processes to ensure quality and competence in the field.
g. Work with policymakers to promote policies that support the growth of the digital health ecosystem.
h. Provide recommendations and advocacy to influence positive changes in regulations and funding.
i. Compile and analyze case studies of successful digital health financing initiatives globally.
j. Organize training sessions and workshops for health sector financiers and policymakers on best practices.

Strengthen and Fund Technical Assistance Programs Translating Research into Practice

a. Utilize existing health research institutes and centers, such as Kenya Medical Research Institute (KEMRI), other research institutions, universities, NGOs, and hospitals, to improve the capacity to translate research findings into practice, which already have established infrastructure, expertise, and networks.
b. Allocate funding to support pilot projects and initiatives that apply research findings in real-world settings. Offer grants or subsidies to organizations and projects with promising potential.
c. Establishing innovation grants and partnerships with Kenyan universities and tech hubs to foster the development and scaling of local digital health solutions through the National Research Fund (25) or other similar mechanisms.
d. Organize training sessions and workshops for organizations and practitioners to enhance their ability to implement research-based solutions. Focus on practical skills and strategies for successful implementation.
e. Develop frameworks for assessing the effectiveness of technical assistance programs. Implement regular evaluations to ensure that research is effectively translated into practice and identify areas for improvement.

Promote Ethical Electronic Data Management Practices

1. Create and disseminate comprehensive guidelines for ethical data collection, sharing, and data use in accordance with National Commission for Science, Technology and Innovation (NACOSTI) regulations and policies (26). Ensure that researchers and organizations widely adopt these standards.
2. Train researchers, data managers, and other stakeholders on ethical electronic data management. Focus on topics such as consent, privacy, and data security.
3. Develop procedures for DHA board to receive applications, review and approve the use of electronic data to ensure ethical standards are adhered to and data is procedurally acquired and effectively utilized in a meaningful manner.
4. Implement policies requiring electronic data users to disclose conflicts of interest and report ethical issues. Encourage open communication and accountability in research practices.
5. Develop mechanisms for monitoring compliance with ethical standards and address any violations related to electronic data management. Create a system for reporting and investigating ethical research and data use concerns.
6. Create comprehensive toolkits with guidelines, best practices, and resources for translating research into practical applications. Make these toolkits widely accessible to stakeholders.

5.8 Strategic Area 8: Digital Public Infrastructure for Health/ICT Infrastructure and Connectivity

Kenya has a robust ICT environment that can support the transformation of health information management. The prevalence of end-user hardware ownership, an enabling policy environment, and the existing supervision and licensing roles of regulatory bodies provide a solid foundation for digital health initiatives. Additionally, the affordability and diversity of portable devices and the extensive bandwidth and connectivity options create a conducive environment for digital health advancements. The National Research and Education Network (NREN) and the increased mainstreaming of core IT skills in large facilities further increase the potential for successful digital health implementation. Additionally, the establishment of the National Computer and Cybercrime Coordination Committee (NC4) with a Cybersecurity command center and the presence of local device assemblers offer further opportunities.

However, the increased use of technology in health opens the ecosystem to cybersecurity threats and challenges. To address cyber threats, high migration costs, and time-limited investments, strategic interventions will focus on comprehensive resource mobilization. Enhancing connectivity, securing connections via VPN or IP, and high-speed internet within and between facilities will improve digital health delivery. Setting up and operationalizing data centers at national and county levels, establishing regional information security and response centers to tackle cybersecurity challenges, and facilitating the acquisition and deployment of end-user devices will ensure the effective utilization of digital health.

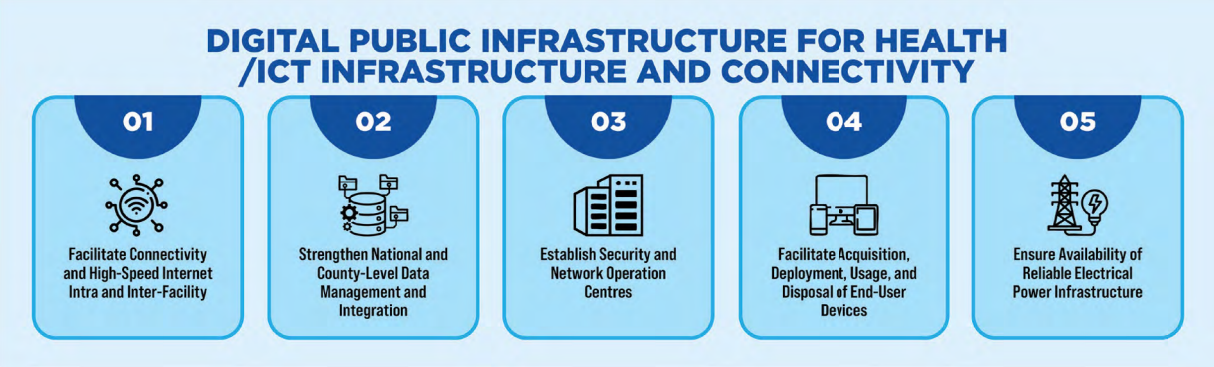


Figure 15. Digital Public Infrastructure for Health/ICT Infrastructure and Connectivity

Facilitate Connectivity and High-Speed Internet Intra- and Inter- Facility

a. Assess the current state of internet connectivity and identify readiness levels for technology to connect all level 2 to level 6 public health facilities to the National Optic Fiber Backbone Infrastructure (NOFBI) and implement local area networks (LANs) to enable intra- and inter-facility digital health delivery.
b. Develop a comprehensive network plan for the health sector and deploy local area networks (LANs) in the health facilities using a phased approach. Extend the health-wide area network (WAN) to offer last-mile connectivity. Consolidate fragmented connectivity in health facilities to strengthen Health Information Exchanges (HIEs) between and within facilities, guided by the assessment results.
c. Create an alternative connectivity network, such as the Kenya Health Network, to provide reliable and secure communication channels for digital health.
d. Partner with the Kenya Education Network (KENET) to leverage their expertise in data center and network engineering, broadband, and ICT skills development (8).
e. Promote the use of the Universal Service Fund by the Communications Authority of Kenya (CA) and the Ministry of ICT to enhance, support, and maintain connectivity across underserved areas.

Strengthen National and County-Level Data Management and Integration

a. Leverage partnerships between MoH, Konza Technopolis and Olkaria Eco cloud Data Center for Health Electronic Data Infrastructure:
    - Formalize partnerships/collaborations through memorandums of understanding (MOUs) or service agreements.
    - Design a roadmap for integrating health data into the cloud infrastructure provided by Konza Technopolis and Olkaria Eco cloud Data Center.

- Establish data security standards and protocols in line with national health data privacy regulations.
- Develop and operationalize localized county specific data centers with implementation guidelines at both national and county levels to support local data management and processing needs.

b. Design and implement a framework for the development of data centers in partnership with county governments.
   - Conduct needs assessments in counties to understand the specific requirements for local data centers.
   - Ensure alignment with the national data infrastructure by integrating county-level systems into the central data platform.
   - Develop guidelines and technical support for counties to build, maintain and utilize these local data centers effectively.

c. Support the development or adoption of public digital good reference implementations, such as national or county health data banks, to standardize and streamline data management.
d. Regularly assess and enhance the performance and utilization of the national data center to ensure it meets evolving digital health needs.
e. Oversee the approval and integration of digital medical devices, including biomedical, lab, and radiology equipment, to ensure compatibility and functionality.
f. Implement infrastructure and processes to digitize and integrate legacy and manual data, enhancing accessibility and usability.

Establish Security Operation Centers (SOCs) and Network Operation Centers (NOCs) at National and County Levels

a. Perform comprehensive systems security assessments of existing digital solutions and services to identify security vulnerabilities and risks.
b. Establish regional information security and response centers linked to the national health information security center to address local cybersecurity challenges and coordinate responses.
c. Develop and implement information security management systems in accordance with ISO 27001 standards to protect data and systems.
d. Advocate for and facilitate the discovery and sharing of cybersecurity risks across the healthcare sector to improve overall security posture.
e. Regularly perform vulnerability assessments and penetration testing to ensure the resilience of digital health systems against cyber threats.

Facilitate Acquisition, Deployment, Usage, and Disposal of End-User Devices

a. Identify and map service points where end-user devices are needed and forecast future requirements based on service expansion plans.
b. Evaluate the gap between mapped service points and those already served and mobilize resources to bridge this gap.
c. Create and implement policies for using personal devices to ensure secure and effective health service provision.
d. Oversee end-user device acquisition, deployment, and installation at service points. Provide technical support and user training to ensure effective utilization.
e. Establish and support business continuity and disaster recovery processes to ensure digital health services remain operational during disruptions.

Ensure Availability of Reliable Electrical Power Infrastructure

a. Advocate for the connection of all health facilities to the national grid.
b. Engage with the Ministry of Energy and Petroleum and the relevant SAGAs on renewable and hybrid power solutions

implementation standards.

c. Advocate for the deployment of renewable and hybrid power systems for digital health applications in health facilities.
d. Provide alternative electrical power options to functionalize digital systems: Identify and install alternative power sources, such as solar energy, backup generators, or battery storage systems, that can provide consistent power to digital systems.

Facilitate Implementation of Core ICT Infrastructure and Adoption of Cloud Services

a. Evaluate the current state of ICT infrastructure across facilities to determine readiness for digital healthcare delivery. Identify gaps and prioritize areas for improvement.
b. Collaborate with county and facility stakeholders in ICT infrastructure planning, budgeting, and work planning to ensure alignment with digital health needs.
c. Communicate identified gaps in infrastructure with key ICT stakeholders to facilitate targeted interventions and resource allocation.
d. Adopt cloud services across health facilities by offering training, guidelines, and other resources on scalability, data security, disaster recovery, and cost savings. Work with cloud service providers to offer secure, reliable platforms for health data storage and digital health applications.
e. Create and implement detailed cloud migration and utilization plans for health facilities, outlining the steps for transitioning from traditional infrastructure to cloud-based platforms.

6.0 Digital Health Governance Framework

6.0.1 Constitutional and Legal Anchor

This strategy governance framework is grounded in the Constitution of Kenya and sector statutes that collectively assign: (i) national policy and standards to the national government; (ii) service delivery and county health systems to county governments; and (iii) cooperative intergovernmental relations across both levels of government. The key anchors are Articles 31 (privacy), 35 (access to information), and 43(1) (a) (right to the highest attainable standard of health); Articles 6(2) and 189 (cooperation between levels of government); and the Fourth Schedule, which assigns health policy, capacity building, technical assistance, and national referral facilities to the national level and county health services to counties.

Implementation is further guided by the Intergovernmental Relations Act, 2012 (structures and dispute resolution), the Health Act, 2017 (national health system organization, intergovernmental forums), the Digital Health Act, 2023 (establishes the DHA and the comprehensive integrated digital health information system), the Data Protection Act, 2019 (rights and duties for processing health data), and the Public Finance Management Act, 2012 (planning, budgeting, fiduciary accountability).

6.0.2 Governance Design Principle: Distinct but Complementary Functions

The digital health governance model is organized around three distinct and complementary functions—Oversight, Coordination, and Implementation/Regulation—mapped to constitutionally and legislatively mandated institutions. This preserves devolution, protects rights, and ensures accountable delivery.

6.1 Oversight (Policy, Standards, Regulation & Accountability)

Mandate holder: Ministry of Health (MoH)—exercising the national policy role (Fourth Schedule) and sector stewardship provided for in the Health Act; with Parliament providing oversight on performance and the use of public resources under the PFM Act.

MoH oversight responsibilities

- Set national digital health policy and standards (including enterprise architecture, interoperability, certification criteria, information security baselines, and telehealth norms) and ensure their consistency with the Digital Health Act and the Data Protection Act
- Issue sector guidance and circulars, and approve normative instruments for digital health (guidelines, toolkits, conformity assessment procedures) in consultation with counties and relevant state agencies.
- Guarantee rights and safeguards: uphold privacy (Art. 31), access to information (Art. 35), and the right to health (Art. 43) through policy, supervision, and corrective directions to implementers.
- Assure intergovernmental accountability: require routine reporting from implementing bodies (including the DHA) and counties; table sector reports to Parliament; and enforce PFM compliant planning and budgeting.
- Coordination and oversight.
- Provide technical and capacity building to counties on digital health.

Secretariat: The Secretariat function that services sector coordination bodies for digital health shall be housed in the MoH directorate responsible for Digital Health.

6.2 Coordination (Intergovernmental & MultiStakeholder)

Purpose: Enable whole of sector planning, harmonization, and monitoring without creating a parallel layer of governance. Coordination instruments do not exercise policy or regulatory authority; they facilitate alignment and accountability across actors.

Instruments and structures:

- Health Sector Partnership & Coordination Framework (2018–2030): The sector's primary coordination instrument. It provides a common planning/budgeting/M&E approach and defines fora such as the Health Sector Advisory & Oversight Committee (HSAOC), Health Sector InterGovernmental Consultative Forum (HSIGCF), Health Sector InterAgency Steering Committee (HSISC) and InterAgency Coordinating Committees (ICCs). These fora are used to align priorities, resources, and partner support in digital health. They do not replace MoH's policy authority nor county executive mandates.
- ICC responsible for digital health: The Health Information, Research, Monitoring & Evaluation ICC functions as a sector coordination forum for information systems, analytics, and research—supporting joint planning, standards dissemination, and performance review. It does not exercise governance authority; it advises and escalates through HSISC/HSIGCF as needed. The Secretariat support to ICC responsible for digital health is provided by the MoH digital health directorate per 6.1.
- Intergovernmental Relations Act structures: Where matters require formal intergovernmental decisions or dispute resolution, the Sector escalates through the Summit, Technical Committee, and the Council of Governors mechanisms as provided by law.

6.3 Implementation & Regulation (Technical Execution and Service Delivery)

6.3.1 Digital Health Agency (DHA)

Established under the Digital Health Act, 2023, the DHA is the technical implementing arm for national digital health infrastructure and services, operating within MoH policy and under its Board governance. Core functions include development and administration of the Comprehensive Integrated Health Information System (CIHIS); health data banks and exchange services; standards operationalization; conformity assessment/certification; and enabling e health service delivery in line with data protection and cybersecurity requirements.

6.3.2 County Governments

Counties are responsible for planning, financing, and delivering county health services, including facility digitization, operations of county HIS assets, data quality, and frontline analytics, in accordance with national standards and the County Governments Act. Counties participate in coordination fora (Section 6.2), integrate digital health within CIDPs/sector plans, and account for resources via PFM processes.

6.3.3 Other Statutory Interfaces

At the intersection of digital health, public health surveillance, and emergency response, a coordinated data sharing and governance is required. This aligns digital health architecture (including DHA platforms) with national public health functions to ensure lawful and time bound data sharing with safeguards.

6.4 Secretariat Arrangements

- The Secretariat for digital health sector coordination (including support to ICC responsible for digital health and linkages to HSISC/HSIGCF) is located in the MoH directorate responsible for Digital Health. The Secretariat convenes, documents and tracks actions.

6.5 Roles and Responsibilities

Function	National MoH	DHA	County Governments	Coordination Fora
Policy & Standards	Set/approve national digital health policies, standards, and guidance; Provide TA	Implement approved standards	Adopt and implement; adapt to local context	HSAOC/HSISC/ HSIGCF/ICCs facilitate consensus and dissemination
Regulation & Compliance	Supervise compliance; ensure DPA/ health rights integration; report to Parliament	Operate certification and conformity mechanisms per Act; maintain registries Advise on feasibility	Enforce standards in county operations; assure data quality	ICC responsible for digital health coordinates technical reviews and escalations
Systems & Infrastructure	Stewardship and investment prioritization	Develop/operate CIHIS, exchange, data banks; Train	Digitize facilities; maintain county systems; allocate resources	Partnership Framework aligns investments; avoids duplication
Data Governance & Privacy	Issue data governance directives consistent with DPA	Embed privacy/ securitybydesign; support DPIAs; breach notifications	Enforce lawful processing at source; protect subjects' rights	ICCs share practice; ODPC liaison via MoH/DHA as appropriate

6.6 Accountability, Reporting, and Financing

- Performance & Compliance Reporting: DHA and counties submit routine performance, security, and dataprotection compliance reports to MoH, which consolidates sector reporting to Parliament and the public, consistent with the Constitution (Art. 35) and the PFM Act.
- Planning & Budgeting: All digital health investments shall be integrated in MTEF/CIDP processes and adhere to PFM controls; partner financing is aligned through the Partnership Framework to minimize fragmentation.
- Intergovernmental Resolution: Any crossjurisdictional disputes follow the Intergovernmental Relations Act procedures prior to litigation.

6.7 County Level Governance Arrangements

Each county establishes or designates a County Digital Health Committee under the County Department of Health to steer county digital health planning, compliance with national standards, resource mobilization, and progress reviews—reporting to the County Executive Committee Member (CEM) for Health, and interfacing with MoH/DHA through the coordination fora. This aligns with county executive mandates under the County Governments Act.

6.8 Phased Implementation

- StartUp (Year 1): Confirm Secretariat in MoH; publish governance instruments; map county focal points; issue priority standards; agree partner compacts.
- Scale Up (Years 2–3): DHA operationalizes CIHIS/data banks; counties digitize facilities and PCNs to agreed maturity levels; joint reviews track compliance and outcomes.
- Institutionalization (Year 4+): Routine interoperable operations; continuous improvement and audits; sustained financing through PFMcompliant plans at national and county levels.

6.9 Safeguards for Rights and Ethics

All actors must ensure that design and operations protect privacy and human dignity (Art. 31), enable appropriate access to information (Art. 35), and advance the right to health (Art. 43), with explicit compliance to the Data Protection Act and relevant health laws and guidelines.

APPENDICIES

Appendix I: Implementation Framework

Strategic Area	Intervention	Key Activity	Indicator	Baseline 2025	Mid-Term Target 2028	Final Target 2030	Responsible Institutions	Means of Verification
Leadership & Governance	Policy framework development	Finalize core digital health frameworks (Data Governance, Telemedicine Standards, KHEA Certification, Digital Health Standards, Change Management)	Number of national digital health frameworks finalized and adopted	2	7	8	MOH Digital Health Directorate	Published policy documents, MOH gazette notices
Leadership & Governance	Policy guidelines	Develop guidelines for legacy data management, migration, data quality and e-waste	Number of operational guidelines published	1	5	6	MOH	Official guideline documents, dissemination reports

Leadership & Governance	Emerging technology governance	Develop and operationalize AI & ML in Health policy	AI policy approved and implemented	0	1	1	MOH, DHA, M&E Directorate, Ministry of ICT	Policy approval documents
Leadership & Governance	Regulatory oversight	Establish digital health compliance monitoring system	Functional compliance monitoring platform operational	0	1	1	MOH	Compliance monitoring reports
Enterprise Architecture	Digital health enterprise maturity	Conduct national digital health enterprise architecture maturity assessment	National architecture maturity assessments completed	0	2	3	MOH, DHA, ICT	KHEA assessment reports
Enterprise Architecture	Interoperability	Operationalize national Health Information Exchange	% of national digital health systems interoperable	20%	65%	90%	DHA	HIE system dashboards
Systems & Information Security	Cybersecurity governance	Conduct national cybersecurity maturity assessment	National cybersecurity maturity assessment completed	0	2	3	DHA, ICT Authority, National KE-CIRT	Cybersecurity assessment reports
Systems Security	Security implementation	Implement zero-trust and security-by-design frameworks	% of national digital health platforms compliant with security standards	10%	65%	90%	DHA, ICT Authority	Security compliance audits

Systems Security	Capacity building	Implement cybersecurity training programmes	Number of trained digital health security personnel	50	500	900	MOH, DHA, training institutions, County Governments	Training reports, certification records
Data Use for Action	Data governance	Implement national data sharing standards	National health data sharing framework operational	1	1	1	MOH, DHA	Published framework
Data Use for Action	Analytics capacity	Strengthen county data analytics capacity	Counties using digital health analytics dashboards	10	35	47	MOH, DHA, County Governments	DHIS2 dashboards
Data Use for Action	Research and innovation	Promote data-driven health research	Number of research projects using national digital health datasets	5	30	50	MOH, KEMRI, KNPHI, Universities and other research institutions	Research publications
Digital Health Investment	Resource mobilization	Develop national digital health investment strategy	Investment strategy approved	0	1	1	MOH, National Treasury, DHA	Strategy document
Digital Health Investment	Financing	Mobilize funding for digital health programmes	Annual digital health funding secured (USD millions)	40	100	150	MOH, Treasury, Development Partners	National budgets, funding agreements
Digital Health Workforce	Workforce strategy	Implement digital health workforce strategy	Digital health workforce strategy approved	0	1	1	MOH HRH Directorate, DHA	Strategy document

Digital Health Workforce	Skills development	Train digital health professionals nationally	Number of trained digital health professionals	300	2500	5000	MOH, Training Institutions	Training reports
Digital Health Workforce	Institutional capacity	Establish digital health units in counties	Counties with functional digital health units	10	40	47	MOH, Council of Governors, Counties	County HR reports
Innovation & Research	Digital health ecosystem	Establish digital health community of practice	Operational national digital health professional network	0	1	1	DHA, Universities, professional bodies, MOH	Membership registry
Innovation & Research	Innovation financing	Support digital health innovation grants	Number of funded innovation projects	2	15	25	MOH, National Research Fund, DHA	Grant programme reports
ICT Infrastructure	Connectivity	Connect health facilities to broadband	% of Level 2–6 facilities connected to broadband	35%	75%	95%	ICT Authority, Counties, MOH, DHA	Connectivity surveys
ICT Infrastructure	Data infrastructure	Establish national and county health data banks	Number of operational health data banks	1	20	47	DHA, Counties	Data bank reports
ICT Infrastructure	Equipment	Deploy digital health devices in facilities	% facilities with functional digital health equipment	40%	80%	95%	Counties, Referral facilities, MOH	Facility infrastructure surveys

Appendix II: Risks and Mitigation Measures

While the potential of digital health is immense, the strategy acknowledges implementation risks must be addressed.

a. Fragmentation of systems – Enforce standards and interoperability.
b. Inadequate infrastructure – Partner to extend connectivity and power.
c. Limited technical capacity – Invest in training and literacy.
d. Data privacy concerns – Strengthen legal and regulatory frameworks.
e. Dependency on donors – Develop sustainability plans.
f. Resistance to change – Promote stakeholder engagement

Informatics-Savvy Health Organizations (ISHO) Situation Analysis
Informatics-Savvy Health Organizations (ISHO) Framework for the Development of Kenya's Digital Health Strategy.

Introduction

The ISHO above-site-level assessment tool aims to determine strengths and deficiencies in an organization's information capabilities and provides a baseline of information from which to prioritize, plan, and measure progress over time. The ISHO framework is built on three core pillars: Vision, Policy, and Governance; a Skilled Workforce; and Effective Information Systems. The framework includes an assessment tool that provides a comprehensive overview of health information systems, aiding in strategic planning and decision-making. Tailored to complement existing tools, the ISHO framework focuses on health system leaders, helping them address critical gaps and set priorities. Utilizing a capability maturity model, the ISHO framework supports systematic development and progress measurement, ensuring alignment with organizational goals and enhancing health outcomes.

Method

In conducting the situational analysis for Kenya's Digital Health Strategy, key stakeholders in Health Information Systems (HIS), including the Ministry of Health (MOH), development partners, and implementing organizations, participated in a comprehensive assessment. This assessment focused on evaluating policy vision and governance, workforce capabilities, and information systems. Stakeholders were first oriented to the assessment tool and then organized into groups based on their interests and expertise. Each group assessed and scored their respective domain areas. The groups then presented their findings in a facilitated plenary session, where scores were reviewed and consensus was reached. The consolidated results were compiled into a single workbook, which automatically generated summaries and visualizations. These results were instrumental in crafting the situational analysis section of the strategy and served as a key reference for developing strategic focus areas and corresponding activities.

Results

Vision, Policy, and Governance
This section assesses several key activities, all aligned with vision, policy, and governance. Out of a possible 5 aggregate score, this section scored 2.75 points. By the end of the current strategy, the country's objective is to develop a costed plan with a robust monitoring and evaluation (M&E) framework to achieve a target score closer to 5. The strategy will be integrated into existing Ministry of Health policy documents and disseminated across all 47 counties.

Significant progress has been made, including the enactment of the Digital Health Act and the Data Protection Act, alongside advancements in governance and financial mobilization for digital health. The National Unique Patient Identifier (NUPI) system is functional and will support these efforts. However, challenges remain in policy implementation and enforcement.

Description	Maturity Score
Costed digital health strategy	2
Digital health policies and legislation	4
Digital health governing body	4
Financing and resource mobilization plans	4
Digital health M&E plan	1
Data management and data quality (or data quality assurance) policies and procedures	3
Data governance policies and procedures	3
Secure data exchange policies and protocols	2
Informatics focal point	3
Personally identifiable information policies and procedures	3
Information system standards	3
Policies governing the use of artificial intelligence in public health informatics	1
Aggregate Score	**2.75**

Some of the key areas identified by this assessment for improvement include:

- Developing a comprehensive M&E framework to track the Digital Health Strategy's progress and establish a clear roadmap for nationwide digitization.
- Creating an M&E framework specifically for data governance policies, ensuring the Health Information Technical Working Group (HITWG) includes data governance as a standing agenda item.
- Operationalizing the Kenya Health Data Governance Framework (KHDGF).
- Establishing formal policies and procedures for the use of artificial intelligence (AI) and machine learning (ML) in health.

Skilled Workforce

According to the ISHO framework, human resources strategies for digital health encompass comprehensive, organization-wide efforts to align staffing with the country's strategic needs. This includes defining the required number of staff, their skills, roles, responsibilities, and training requirements. It covers performance management, career progression, and sustainability planning to support the broader informatics strategy. Workforce planning may involve the assessment, recruitment, training, retention, and succession of staff. Specifically for informatics, this strategy might also include creating new roles or upskilling existing employees who show aptitude and interest in informatics.

According to the ISHO framework's assessment results, this section scored an aggregate of 2.33, with skills to support geospatial activities and staff informatics training support, scoring highest at 3. All other areas scored a 2. Below are some of the reasons presented for these scores.

Description	Maturity score
Informatics workforce strategy	2
Informatics professional job classifications	2
Staff informatics training support	3
Competent informatics in key roles	2
Information system capabilities among key personnel	3
Informatics capabilities among leadership/management	2
Geospatial capabilities	3
Aggregate Score	**2.33**

The assessment revealed that Kenya has established norms and standards for HR but offers a limited focus on informatics specifics. While the HRIOs' responsibilities are defined, health informatics roles are primarily confined to the Directorate of Policy, Digital Health, and Innovation, with no formal recognition in the broader scheme of service. The Ministry has appointed staff to informatics positions, yet formal structures beyond the Directorate are still lacking. Although training programs, such as the Field Epidemiology Training Program (FETP), aim to enhance informatics skills, they do not cover the full spectrum of informatics competencies. Currently, informaticians are underutilized, and their deployment does not align with their expertise. There is a need for regulatory involvement to formally recognize health informatics as a specialty. While some personnel possess informatics skills, many lack an understanding of system requirements and informatics needs.

No established process exists to ensure comprehensive informatics knowledge among leaders, with only sporadic, ad hoc sensitization efforts in place. Geospatial informatics programs exist but are not institutionalized, although they have been used in specific contexts, like malaria and HIV, to develop shape maps.

Effective Information Systems

The information systems domain includes digital information systems that support the delivery of health services. According to the ISHO framework assessment results, the information systems were generally scored at 2.9-the highest score of the three assessed domains. The lab information systems scored the highest at 5, followed by Electronic Medical Record (EMR) interoperability at 4. All other areas scored between 2 and 3 points.

The assessment established that a standard Software Development Life Cycle (SDLC) process is in place, but its application remains inconsistent. Similarly, an inventory management system has been implemented, though it is not consistently utilized across operations.

Initial steps have been taken to adopt formal project management procedures for IT projects, marking a move towards more structured practices. While several facilities have implemented EMR systems to support clinical workflows and patient documentation, the adoption is partial, with coverage ranging from minimal to moderate (up to 50%), combining both electronic and paper-based systems. Although the EMR systems are capable of generating reports, global or national standards are not consistently applied.

Basic interoperability between systems exists, allowing some data to be exchanged. However, these exchanges often rely on custom-built "bridges," which are not standardized and are challenging to maintain. While systems are updated, the methods for automated data exchange remain burdensome.

Description	Maturity score
Software development life cycle	3
IT project management procedures	2
Health Information system and services inventory	3
Electronic Medical Records (EMRs) system coverage	3
Electronic Medical Records (EMRs) interoperability	4
Laboratory Information System	5
National Data Repository	2
National-level aggregate data reporting system	3
Integrated Disease Surveillance and Response	2
Secure digital health data exchange capabilities across health pro-grams	3
Organization-wide service sharing and integration	3
Unique Patient Identifier (UPI)	2
Aggregate score	2.9

Several facilities (up to 50%) in laboratory settings use Laboratory Information Systems (LIS) to support laboratory procedures and document test results. The adoption is minimal to moderate, with a mix of electronic and paper systems. The LIS can generate both summary reports and individual patient results, but global or national standards are not consistently followed.

A national data warehouse for people living with HIV and tuberculosis (TB) with 95% coverage has been established, and a health data governance framework is in place. The country/organization also has a fully functional Aggregate Data Reporting System (ADRS) that is regularly evaluated, with findings used to enhance data quality, utilization, and overall performance.

Efforts to develop a digital Integrated Disease Surveillance and Response (IDSR) system are in the preliminary stages, with infrastructure being established and data sources identified. Initial steps are also being taken to define data governance and sharing procedures, including those related to data privacy and confidentiality. The country is beginning to develop capabilities for secure data exchange, enabling the transfer and processing of patient-level electronic health data across health programs, facilities, and partners. However, these efforts are still manual and not yet secure.

Implementation of key shared services is underway. Although some services exist, their utilization remains inconsistent. A standardized national method for generating and assigning Unique Patient Identifiers (UPIs) is in place, but the system is not fully unique due to the absence of a mechanism to link and verify IDs belonging to the same patient across different facilities.

Appendix III: Costing

Cost Estimates by Strategic Area and Strategic Intervention
Strategic Area 1: Leadership and Governance

The main cost drivers for the leadership and governance strategic area were meeting costs to develop and implement the identified policies and guidelines, the meetings to develop the monitoring and evaluation frameworks for these policies and guidelines and the costs associated with meetings to disseminate the policies, guidelines and frameworks developed.

	Cost for the activities	
Strategic intervention	**KSH**	**US$**
Develop and Implement Policies and Guidelines	**251,002,500**	**$1,945,756**
Stakeholder Engagement and Policy Dissemination	**232,033,500**	**$1,798,709**
Monitor, Evaluate, and Ensure Compliance	**149,865,000**	**$1,161,744**
Implement a Change Management Framework for Digital Health Adoption and Scale-Up	**66,332,500**	**$514,205**
Foster Innovation and Adoption of Emerging Technologies	**40,469,000**	**$313,713**
Total	**739,702,500**	**$5,734,128**

Strategic Area 2: Operationalization and Implementation of the Health Enterprise Architecture

The main cost drivers for the strategic area on operationalization and implementation of the enterprise architecture were the PCN level dissemination meetings focused on the shared services, certification, security. Another intervention contributing a large share of the costs of this strategic area were the costs associated with conducting regular assessments of digital health quality. We include the hardware costs of digitizing facilities in the costs under Strategic Area 8.

	Cost for the activities	
Strategic intervention	**KSH**	**US$**
Review and update the Kenya Health Enterprise Landscape	**55,942,500**	**$433,663**
Develop Interventions Based on Identified Gaps	**12,320,000**	**$95,504**
Operationalize the Kenya Health Enterprise Architecture (KHEA)	**562,195,000**	**$4,358,101**
Monitor and Evaluate for Improvement	**171,240,000**	**$1,327,442**
Total	**801,697,500**	**$6,214,709**

Strategic Area 3: Systems and Information Security

The main cost driver for the systems and information security strategic area were the costs associated with developing the assessment tools for system security and then conducting the comprehensive assessment. Note that the costs associated with training the workforce on system security were costed under the workforce strategic area.

	Cost for the activities	
Strategic intervention	**KSH**	**US$**
Conduct an Assessment of Systems Information Security in Kenya	**55,942,500**	**$433,663**
Develop Targeted Security Interventions Based on Assessment Findings	**27,147,500**	**$210,446**
Optimize and Align with Relevant Legal Frameworks	**21,300,000**	**$165,116**
Promote Capacity Building and Awareness on Information Security	**17,627,500**	**$136,647**
Implement a Continuous Risk Evaluation and Learning Framework	**16,975,000**	**$131,589**
Total	**138,992,500**	**$1,077,461**

Strategic Area 4: Data Use

The main data use cost driver were meetings to standardize the data management and analytics practices and disseminate the standards. The meetings related to community development were assumed to happen at county level and so accounted for a large share of the costs under this strategic area.

	Cost for the activities	
Strategic intervention	**KSH**	**US$**
Standardize Data Management and Sharing Practices	**14,647,500**	**$113,547**
Enhance Capacity for Data Analytics and Use	**14,170,000**	**$109,845**
Strengthen Health Information Systems and Data Sharing	**28,495,000**	**$220,891**
Promote Data-Driven Health Interventions and Research	**21,300, 000**	**$165,116**
Foster Collaboration and Community Biannual Conference	**37,038, 500**	**$287,120**
Total	**115, 651, 000**	**$896,519**

Strategic Area 5: Strategy and Investment

The main cost driver for this strategic area was the meeting costs associated with various activities included in this strategic area including developing the resource mobilization strategy, frameworks for monitoring the impact of the investments, costs for developing the funding models and promoting best practices with health financing and the costs associated with dissemination of these strategies, frameworks and models.

	Cost for the activities	
Strategic Intervention	**KSH**	**US$**
Develop a Resource Mobilization Strategy	**40,190,000**	**$311,550**
Enhance Stakeholder Collaboration for Resource Leveraging	**18,839,000**	**$146,039**
Review and Optimize Digital Health Funding Models	**23,840,000**	**$184,806**
Promote Best Practices in Digital Health Financing	**28,670,000**	**$222,248**
Strengthen Investment in Digital Health Innovation	**43,572,500**	**$337,771**
Total	**155,111,500**	**$1,202,415**

Strategic Area 6: Workforce

The bulk of the costs for the strategic area on workforce were the costs associated with conducting the in-service training programs that are mentioned in the other strategic areas. Training that is to be conducted with PCN-level staff accounts for a large share of the costs, due to the number of trainees assumed.

	Cost for the activities	
Strategic intervention	**KSH**	**US$**
Develop and Implement a Digital Health Workforce Strategy	**122,595,000**	**$950,349**
Facilitate Strategic Partnerships for Digital Health Workforce Capacity Building	**239,688,000**	**$183,628**
Facilitate the management of Health Records Information Management Officers, ICT officers and other Allied professionals employed/seconded to support digitization in the health sector.	**13,800,000**	**$106,977**
Develop Pre-Service and In-Service Training Programs in Digital Health	**3,133,191,000**	**$24,288,302**
Mainstream Digital Health Professionals into the Health Sector	**493,137,500**	**$3,822,771**
Total	**3,786,411,500**	**$29,352,027**

Strategic Area 7: Innovation, Research and Continuous Development

The main cost driver for this strategic area are the costs associated with developing and disseminating the frameworks for the community of practices and disseminating the frameworks. Costs for developing the comprehensive toolkits that include guidelines, best practices, and resources for translating research into practical applications and dissemination of these toolkits also account for a large share of the costs.

	Cost for the activities	
Strategic intervention	**KSHS**	**US$**
Establish a Community of Practice to Develop a Health Ecosystem (Professional Association)	**86,450,500**	**$670,159**
Strengthen and Fund Technical Assistance Programs Translating Research into Practice	**32,905,000**	**$255,078**
Promote Ethical Research and Data Use Practices	**220,527,500**	**$1,864,554**
Total	**339,883,000**	**$2,789,791**

Strategic Area 8: ICT Infrastructure and Connectivity

The largest share of costs were costs for developing data banks and data centers at national and county level. Costs for developing and deploying local area networks (LANs), wide area networks (WANs) across the level 2 to level 6 facilities without existing infrastructure accounted for almost US$1 billion. This includes only the estimated capital costs for establishing this system. The capital and operating costs associated with establishing national level and county level data banks were estimated at approximately US$400 million. With the costs associated with the procurement of end-user devices (tablets) also accounted for a large share of costs, accounting for US$36 million. Having costed for facility level data storage under networking and county level data centers, we did not cost for the implementation of core ICT infrastructure and adoption of cloud services as this needs an implementation plan to determine transition to cloud services. If we cost this separately, it will be double-counting as either system and not both would be implemented.

	Cost for the activities	
Strategic intervention	**KSH**	**US$**
Facilitate Connectivity and High-Speed Internet Intra and Inter-Facility	**128,730,302,063**	**$997,909,318**
Strengthen National and County-Level Data Management and Integration	**51,287,551,474**	**$397,577,918**
Establish security & network operation centers at national level	**1,620,000,000**	**$12,558,140**
Facilitate Acquisition, Deployment, Usage, and Disposal of End-User Devices	**4,654,750,000**	**$36,083,333**
Ensure Availability of Reliable Electrical Power Infrastructure	**Not costed**	
Facilitate Implementation of Core ICT Infrastructure and Adoption of Cloud Services	**40,061,000**	**$310,550**
Total	**186,332,664,537**	**$1,444,439,260**

Summary of costs across the strategic areas.

We estimate that the strategic interventions will cost KSh.192,430,114,037 or US$1,491,706,310 over the 3-year period. The largest share of costs are ICT infrastructure and connectivity (Strategic Area 8), followed by workforce (Strategic Area 6). Some of the costs can be rationalized /reduced by combining some activities, but this can be done within the context of developing an implementation roadmap.

Cost by Strategic area	KSH	US$
Strategic area 1: Leadership and Governance	**739,702,500**	**$5,734,128**
Strategic area 2: Operationalization and Implementation of the Enterprise Architecture	**801,697,500**	**$6,214,709**
Strategic area 3: Systems and Information Security	**138,992,500**	**$1,077,461**
Strategic area 4: Data Use	**115,651,000**	**$896,519**
Strategic area 5: Strategy and Investment	**155,111,500**	**$1,202,415**
Strategic area 6: Workforce	**3,786,411,500**	**$29,352,027**
Strategic area 7: Innovation, Research and Continuous Development	**359,883,000**	**$2,789,791**
Strategic area 8: ICT Infrastructure and Connectivity	**186,332,664,537**	**$1,444,439,260**
Total	**192,430,114,037**	**$1,491,706,310**

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Glossary

"data" means information which:

a. is processed by means of equipment operating automatically in response to instructions given for that purpose;
b. is recorded with the intention that it should be processed by means of such equipment;
c. is recorded as part of a relevant filing system;
d. where it does not fall under paragraphs (a), (b), or (c), forms part of an accessible record; or
e. is recorded information which is held by a public entity and does not fall within any of the categories (a) to (d).

"data analysis" means the process of inspecting, cleaning, transforming, consolidating, and modelling data with the goal of discovering useful information, extracting meaningful insights, suggesting conclusions, and supporting decision- making.

"data bank" means an organized collection of data designed to efficiently store and retrieve data that can be accessed, managed, and updated electronically, allowing users to easily search for and access the information they need to derive insights, make informed decisions, and improve performance.

"data disposal" means the process of destroying manual or electronic records or data completely, ensuring it is not used or accessed for an unauthorized purpose.

"data governance" means the overall management of the availability, usability, integrity, and security of data used in an organization.

"data integrity" means the overall completeness, accuracy, and consistency of data.

"data privacy" means the aspect of information technology that deals with the ability an organization or individual to determine what data in a computer system can be shared with third parties for the purpose of keeping information private and safe.

"data security" means the protection of electronic health data, and, specifically, the methods used to protect the privacy of health information contained in electronic health data, ensuring professionals hold that information in confidence.

"data management" means the development, execution, and supervision of plans, policies, programs, and practices that control, protect, deliver, and enhance the value of data and information assets, and involves policy formulation and adherence to data management procedures, such as reporting rates and harmonized and standard data collection tools.

"digital health" means the field of knowledge and practice that is associated with the development and use of digital technologies to improve health.

"e-Health" means the combined use of electronic communication and information technology in the health sector, including telemedicine.

"e-Health ecosystem" means the combined application of e-Health infrastructure, standards, technology, systems applications, investment, health workforce, and governance that support patient-centred models of healthcare.

"electronic health data" means an electronic record of personal health-related information about an individual and includes:

a. information concerning the physical or mental health of the individual;

b. information concerning any health service provided to the individual;
c. information concerning the donation by the individual of any body part or any bodily substance
d. information derived from the testing or examination of a body part or bodily substance of the individual;
e. information that is collected in the course of providing health services to the individual; or
f. information relating to details of the health facility accessed by the individual.

"e-waste" means waste resulting from electrical and electronic equipment, including components and sub-assemblies thereof.

"health data" means data related to the state of physical or mental health of the data subject and includes records regarding the past, present, or future state of health, data collected in the course of registration for or provision of health services, or data which associates the data subject with the provision of specific health services.

"health information bank" means an electronic database under the custody and control of the Ministry of Health, county director for health, and county health departments, that contains personal health information and is designated by the Cabinet Secretary as a health information bank

"health informatics" means the practice of acquiring, studying, and managing health data and applying medical concepts in conjunction with health information technology systems to help clinicians provide better healthcare.

"health records and information management" means the practice of acquiring, analysing, and protecting digital and traditional medical information vital to providing quality patient or client care.

"health information system" means a health ecosystem designed to manage health and health-related system data that provides the foundation for decision- making and includes a system that collects, collates, stores, manages, analyses, synthesizes, and transmits patients' or clients' electronic health records and uses health and health-related data for operational management or supporting healthcare policy decisions.

"integrated e-Health information system" means a health information system that collects health and health-related data and addresses the needs of all users for decision-making.

"Kenya Health Enterprise Architecture" refers to a blueprint that guides the design, development, and evolution of the comprehensive integrated health information system to align investments in technology, information, and processes that are cost-effective, sustainable, and aligned with the Kenya health sector's strategic goals.

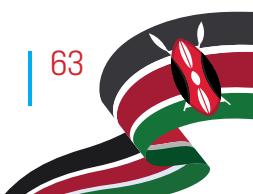
"m-Health" means the delivery of medical services using mobile technologies.

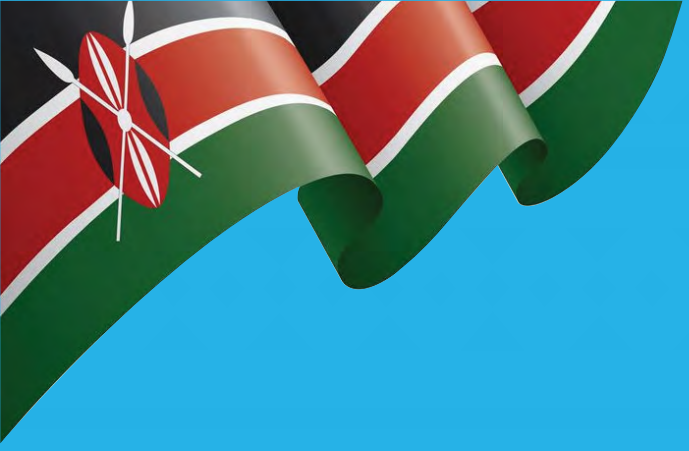
"personal health information" means data related to the state of physical or mental health of an individual and includes information provided by the client, records regarding the past, present, or future state of health, data collected in the course of registration for, or provision of, health services, or data which associates the individual with the provision of specific health services.

"system integration" refers to the merging or combining of two or more components or configuration items into a higher-level system element and ensuring that the logical and physical interfaces are satisfied and that the integrated system satisfies its intended purpose.

"system interoperability" refers to the capability to communicate, execute programs, or transfer data among various functional units such that the user needs little or no knowledge of the unique characteristics of those units.

"telemedicine" refers to the provision of healthcare services and sharing of medical knowledge over distance using telecommunications, and it includes consultative, diagnostic, and treatment services.





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