DIGITAL TRANSFORMATION STRATEGY

Empowering People.
Strengthening Health Systems.

Edition 2023

AFRICA CDC DIGITAL TRANSFORMATION STRATEGY

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FOREWORD

The Digital Transformation Strategy of Africa CDC represents a significant step towards improving public health outcomes on the African continent through the use of technology. The strategy is built on the belief that digital health solutions can play a transformative role in enhancing disease surveillance and response, improving healthcare delivery, and supporting sustainable development.

The COVID-19 pandemic has underscored the urgent need for countries to strengthen their public health systems and leverage technology to improve their response to public health emergencies. The Digital Transformation Strategy of Africa CDC seeks to address this need by providing a comprehensive plan for the adoption of digital health solutions across the continent. The Strategy is aligned with the New Africa Public Health Order, which was adopted by the African Union in February 2021 to provide a new framework for the prevention, detection, and response to public health emergencies on the continent.

The strategy was developed through a collaborative process involving input from public health experts, technology companies, and other stakeholders. It is built on two key pillars: internal digital transformation aimed at making Africa CDC an informatics-savvy organization and a set of flagship initiatives aimed at supporting our Member States in accelerating the digitalization of their health systems.

The Digital Transformation Strategy of Africa CDC is not an end in itself, but rather a means to an end. Its ultimate goal is to improve the health and wellbeing of the people of Africa by leveraging technology to address the continent's most pressing public health challenges. We believe that through collaboration, innovation, and a shared commitment to public health, we can achieve this goal and build a brighter future for all Africans.

ACKNOWLEDGMENTS

INTRODUCTION AND SCOPE OF WORK

Africa CDC will support Member States in harnessing the potential of digital health to leapfrog some of the barriers affecting healthcare and public health while becoming a digital-savvy organization.

In recent years, digital transformation has emerged as a critical tool for enhancing healthcare delivery and improving health outcomes globally. The adoption of digital technologies in healthcare is transforming how health services are delivered, improving access and enhance the quality of care, improve accountability and reduce costs.

In Africa, where *health systems*[1] are faced with numerous challenges, including insufficient funding, inadequate infrastructure, and shortages of skilled healthcare workers, digital transformation presents a unique opportunity to address these challenges and improve health outcomes for millions of people. Africa comprises 16 percent of the world's population and carries 23 percent of the global disease burden[2], but in 2015 it accounted for only 1 percent of total global health expenditures. On average, the rest of the world spends 10 times more per capita on health care than Africa[3].

Digital technologies provide numerous opportunities to strengthen African health systems, from minor improvements to radical changes that, if well implemented, can help countries address some of the traditional barriers to meeting the health needs of the population, including collection, sharing and use of data as well as more efficient logistics and supply chains for improved healthcare and public health of African populations.

Some of the current transformative examples of digital technologies applied to health include *electronic health records* (EHRs), telemedicine and *mobile health* (mHealth), *health information exchange* (HIEs), precision and personalized medicine, digital supply chains and drone delivery of medical supplies or, in the field of public health emergencies, real-time analytics for early detection and contact tracing. Beyond these, other core technologies from the Fourth Industrial Revolution are advancing at a very rapid space. They include additive manufacturing, advanced robotics, *artificial intelligence* and machine learning, augmented and virtual reality, and the Internet of things. The promises are on par with the expected widespread change and upheaval.

Africa CDC was established in 2017 as a specialized technical institution of the African Union with the mandate to "support public health initiatives of Member States and strengthen the capacity of their public health institutions to detect, prevent, control and respond quickly and effectively to disease threats". Given its scope of work, it is of

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[1] A definition of words written in italics is provided in Annex
[2] Institute for Health Metrics and Evaluation, 2019. Data bank: GBD Compare. (accessed on 02/26/23)
[3] World Health Organization, 2022. Data bank: Global Health Expenditure Database. (accessed on 02/26/23)

utmost importance for Africa CDC to support and accelerate Member States' efforts to develop and implement their digital health strategies.

In 2022 the African Union executive council approved the revised status of the Africa CDC transforming the specialized agency into an autonomous public health agency, with more independence to design its own internal operations. This provides a timely opportunity to reengineer internal business processes such as Administration, Finance, Human Resources and Procurement and leverage digital approaches and tools in order to improve speed, efficiency and transparency.

The scope of Africa CDC's Digital Transformation Strategy therefore covers two complementary dimensions: (i) accelerate to use of digital technologies for advancing Africa's healthcare and public health objectives and (ii) building Africa CDC's internal capacity as an informatics- and digital-savvy organization.

This document presents the key elements of Africa CDC's Digital Transformation Strategy, including a theory of change, a vision, guiding principles and strategic objectives. A portfolio of projects and flagship initiatives contributing to achieving the strategic objectives are then presented followed by a high-level implementation plan and learning framework.

A detailed implementation plan will be designed in Q2 2023, based on the maturity assessment of each project, Member States priorities, partners' own strategies, funding gap analyses and resource mobilization.

1. RATIONALE

Investments in African digital health systems will be successful if based on Member States specific contexts and priorities, increased coordination and market shaping at the continental level.

1.1. THE CASE FOR DIGITAL HEALTH IN AFRICA

Africa has the greatest opportunity to improve health outcomes.

The average life expectancy in Africa is 64 years, compared to the global average of 72 years[4]. The infant mortality rate is 47 deaths per 1,000 live births, which is significantly higher than the global average of 28 per 1,000 live births[5]. Sub-Saharan Africa also faces the highest maternal mortality rate (MMR) in the world, with an average of 534 deaths per 100,000 live births[6].

Africa has a high burden of infectious diseases, such as malaria, tuberculosis, HIV/AIDS, and neglected tropical diseases. For example, in 2019, Africa accounted for 94% of malaria cases and deaths worldwide[7].

Non-communicable diseases (NCDs) such as diabetes, cancer, and cardiovascular diseases are on the rise in Africa. According to the WHO, NCDs are set to overtake deaths due to communicable, maternal, perinatal and nutritional diseases combined by 2030[8].

African countries generally have low levels of health expenditure. In 2018, the average health expenditure per capita in Sub-Saharan Africa was $79, compared to the global average of $1,015[9]. Out-Of-Pocket expenditures (OOP) for healthcare are also a significant burden for many individuals and families in Africa as they are estimated to amount to 36.7% of total health expenditures, compared to the global average of 18%.

These facts and data suggest that health outcomes in Africa are poor, and that there is a need for significant improvements in healthcare services, infrastructure, and funding to address these issues.

Health outcomes are lagging behind for a combination of factors.

Africa faces both a high need for healthcare services and a limited capacity to provide these services. The situation can be broken down into the following factors:

 − Poverty is a major barrier with many individuals unable to afford basic healthcare services or nutritious food, with some living in overcrowded and unsanitary conditions. Each year, approximately 97 millions Africans (8.2% of

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[4] World Bank, 2021. Global databank.
[5] UNICEF, 2021. Under-five mortality databank.
[6] World Bank, 2017. Global data bank.
[7] WHO, 2019. World malaria report.
[8] WHO AFRO, 2021. Non-communicable diseases.
[9] WHO, 2022. Global health expenditure database.

the continent's population) incur catastrophic health care costs with 15 millions people (1.4% of the continent's population) pushed into poverty[10];

- There is an acute shortage of healthcare professionals in many parts of the continent, particularly in rural areas. It is estimated that the density of healthcare workers (doctors, nurses, and midwives) in Africa is 1,55 per 1,000 population, which is significantly less than the minimum threshold recommended by the WHO, 4,45. In the 47 AFRO countries, the shortage is estimated to 6.1 million healthcare workers in 2030, a 45% increase since 2013[11];

- Many individuals lack access to basic healthcare services due to inadequate infrastructure, limited availability, and geographic barriers. While there is significant variation among and within Member States, according to the WHO, in Sub-Saharan Africa, only 23% of the population lives within 5 km from a healthcare facility and 15% is two or more hours away[12];

- Health systems are generally weak and unable to respond effectively to health crises or provide adequate healthcare services to their populations because of the poor quality of health data and poor governance and management practices – often including a lack of coordination between governments and their partners;

- The high burden of infectious diseases such as malaria, tuberculosis, HIV/AIDS, and NTDs, including dengue fever, leprosy, and river blindness contributes to putting health systems under permanent stress; and

- Low health literacy, which impacts populations' ability to take care of their health, prevent illnesses, or manage chronic conditions.

While digital technologies have been implemented throughout the continent, realizing the full potential of digital health in a sustainable way requires a paradigm shift.

Digital health solutions have been used for over a decade to address specific challenges faced by health systems. There are no dimensions that are left untouched by their ability to accelerate and improve the gathering, analysis, management, and exchange of health information.

Digital health solutions are particularly relevant when it comes to:

- Improving accessibility to healthcare in remote and underserved areas.

- Increasing the efficiency of healthcare systems by streamlining administrative tasks and reducing the time and resources required to manage patient records. This helps healthcare providers focusing more on patient care;

- Increasing affordability of healthcare by enabling providers to deliver care more efficiently and effectively, reducing the need for expensive procedures and treatments, and enabling patients to better manage their own health;

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[10] WHO, 2019. Primary Health Care on the road to Universal Health Coverage.
[11] WHO AFRO, 2017. Leave no one behind: strengthening health systems for UHC and the SDGs in Africa.
[12] Maina, Ouma, Macharia, et al. (2019). A spatial database of health facilities managed by the public health sector in Sub–Saharan Africa.

- Improving the quality of care by giving healthcare providers access to up-to-date medical information, clinical decision support tools, and other resources that can help them make more informed diagnoses and treatment decisions;

- Strengthening workforce capacity and empower healthcare workers by (i) enabling more effective methods of training of healthcare workers, (ii) rearrange some complicated tasks into simpler packages that can be handled by more abundant types of personnel and (iii) managing personnel deployment and monitoring;

- Increasing accountability, management and overall health systems governance by providing data and information to inform decision making when it comes to planning, budgeting and managing programmes;

- Improving health systems capabilities to quickly detect, investigate and respond to health threats;

- Enabling the scalability of proven interventions by making programs performance data available for decision making.

The figure 1 below summarized the eight benefits digitalization brings to healthcare and health security systems:
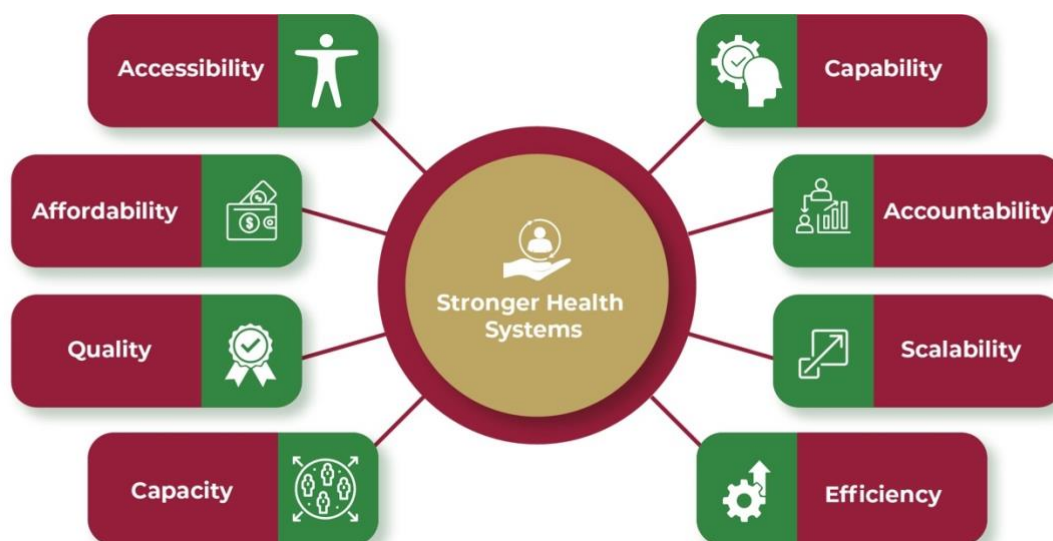
Figure 1 : Benefits of digitalizing healthcare and health security

Harnessing the full potential of digital health solutions requires to rethink large areas of health systems as they generally involve revamping work processes as well as investing in new capabilities and infrastructures – with different payback horizons.

1.2. ALIGNING THE STRATEGY TO GLOBAL BEST PRACTICES

The development of this strategy was inspired from several global best practices. In particular, the DUAL[13] model was used to ensure that the WHO and the ITU digital transformation framework[14] has been considered, while paying considerable attention to aspects of data use and change management. Figure 2, below, presents ten "building blocks". Each represents a focus area for digital health stakeholders. For each "building block", efforts have been made by a broad range of technical experts to establish maturity levels[15]. These guiding materials provide a comprehensive description of the scope of work and the path towards comprehensive and integrated digital health systems.
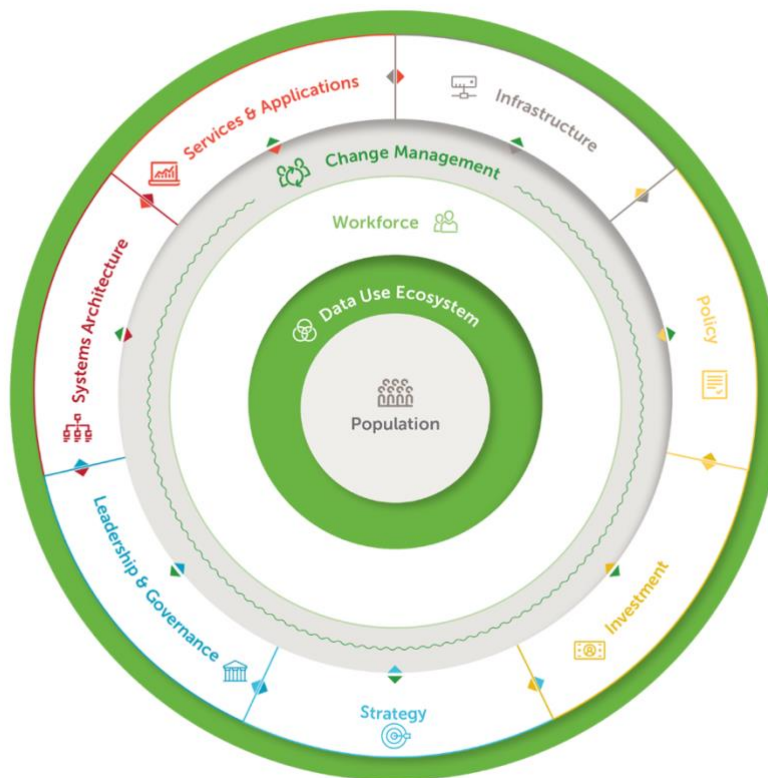
Figure 2 : DUAL Framework by PATH and Cooper/Smith

Health system transformation is an effort that requires whole-of-ecosystem engagement, involving a large range of stakeholders, including government agencies, healthcare providers, health-related and technology businesses, civil society organizations, patients and funding organizations.

Without the right level of coordination, efforts to develop digital health initiatives are often fragmented and inefficient, leading to duplication of efforts and wasted resources.

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[13] PATH and Cooper/Smith, 2022. Data Use Acceleration and Learning
[14] WHO and ITU, 2012. National eHealth strategy toolkit.
[15] Global Digital Health Index. (accessed on 02/26/23).

For example, different organizations may have overlapping goals and develop their own digital tools (e.g., mobile health, electronic medical records, telemedicine) which may not be compatible with each other, leading to data silos, limited interoperability and scalability. Moreover, the lack of coordination results in limited adoption of digital health solutions by healthcare providers and patients as they may not have the necessary training or resources to use the technologies, or may not be willing to use them.

1.3. POSITIONING AFRICA CDC TO DRIVE THE DIGITALIZATION OF HEALTH IN AFRICA

Africa CDC is an autonomous public health agency created by the AU to advance heath throughout the African continent.

Africa CDC was established in 2017 as a specialized technical institution of the African Union with the mandate to "support public health initiatives of Member States and strengthen the capacity of their public health institutions to detect, prevent, control and respond quickly and effectively to disease threats". In 2022, the African Union executive council approved the revised status of the Africa CDC transforming the specialized agency into an autonomous public health agency with more authority and flexibility to design its own internal operations.

The work of Africa CDC is aligned with the African Union (AU)'s

"Agenda 2063: The Africa we want", which is a long-term 50-year development trajectory launched in 2013 that aims at paving the way towards the AU vision[16]. Out of its 20 goals, three are directly linked to digital health: (i) "a high standard of living, and quality of life, sound health and well-being for all citizens", (ii) Healthy and well-nourished citizens, (iii) World Class Infrastructure crisscrosses Africa, and (iv) Africa takes full responsibility for financing her development.

Africa CDC activities also align with the Africa Health Strategy 2016-2030[17] that was released by the AUC's Department of Social Affairs and aimed at "an integrated, inclusive and prosperous Africa free from its heavy burden of disease, disability and premature death". This vision will be achieved through building "an effective, African-driven response to reduce the burden of disease through strengthened health systems, scaled-up health interventions, inter-sectoral action and empowerment of communities."

Africa CDC's strategic vision and New Public Health Order roadmap position the institution as a preferred partner to Member States.

Africa CDC's strategic vision is "A safer, healthier, integrated and prosperous Africa, in which Member States can efficiently prevent disease transmission, implement surveillance and detection, and always be prepared to respond effectively to health threat and outbreaks." This vision encompasses the three dimensions of health

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[16] AU, 2015. Agenda 2063 : The Africa we want.
[17] AU, 2016. Department of Social Affairs. Africa Health Strategy 2016-2030.

security: (i) strengthening disease surveillance, (ii) working with Member States to strengthen their health systems, (iii) and supporting the response to public health emergencies.

The objectives of Africa CDC, as outline in its current strategic plan[18] are:

▶ Establish early warning and response surveillance platforms to address all health threats and health emergencies and natural disasters in a timely and effective manner;

▶ Assist Member States to address gaps in capabilities required for International Health Regulations (IHR 2005) compliance;

▶ Support and/or conduct regional- and country-level hazard mapping and risk assessments for Member States;

▶ Support Member States in health emergency responses, particularly those which have been declared a public health emergency of international concern (PHEIC) emergencies;

▶ Support health promotion and disease prevention through health systems strengthening, by addressing infectious and non-communicable diseases, environmental health and NTDs;

▶ Promote partnership and collaboration among Member States to address emerging and endemic diseases and public health emergencies;

▶ Harmonize disease control and prevention policies and the surveillance systems in Member States; and

▶ Support Member States in public health capacity-building through, medium and long-term field epidemiological and laboratory training programmes.

The New Public Health Order is a call aiming at changing the global health architecture made during the 77th United Nations General Assembly[19]. It is defined by five pillars:

▶ Strong African Public Health Institutions that represent African priorities in global health governance and that drive progress on key health indicators;

▶ Expanded Manufacturing of Vaccines, Diagnostics, and Therapeutics to democratize access to life-saving medicines and equipment;

▶ Investment in Public Health Workforce and Leadership Programs to ensure Africa has the workforce it needs to address health threats;

▶ Increased Domestic Investment in Health, including the domestic mobilization of financial resources, human capital, technical resources, and networks; and

▶ Respectful, Action-Oriented Partnerships to advance vaccine manufacturing, health workforce development, and strong public health institutions.

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[18] Africa CDC, 2017. Strategic Plan 2017-2021.
[19] Africa CDC, 2022. Call for a New Public Health Order.

Africa CDC's contribution is based on a set of unique advantages: (i) political support and strong institutional link with Member States, (ii) regional expertise based on extensive knowledge and experience of African needs and challenges, (iii) technical expertise in disease control and prevention, surveillance, laboratory systems, emergency preparedness and response, and workforce development, (iv) a geographical scope of work that includes the 55 African countries and (v) a strong convening power.

Figure 3 below summarizes the pillars on which the digital transformation is built:

Figure 3 : Pillars of Africa CDC's Digital Transformation Strategy

2. STRATEGIC APPROACH

2.1. STRATEGY DESIGN

The strategy was designed through a consultative, agile and collaborative process over a period of nine months.

In line with our commitment to be a results-oriented organization at the service of Member States, Africa CDC conducted the development of the strategy in an agile manner, with a strong emphasis on consultation and dialogue with a wide range of stakeholders. The elaboration of this document was concurrently pursued with identifying and testing ideas for concrete actions and results.

The following activities were conducted as part of the design process:

▶ Desk review of strategic documents, from the Africa CDC, the AU, global health organizations and Member States;

▶ Semi-structured interviews with Africa CDC's leadership team, experts and business process owners;

▶ Workshops with Africa CDC's partners, including multilateral and bilateral development organizations, international institutions, non-governmental organizations, and foundations from headquarters and African offices;

▶ Consultations with Member States representatives through workshops and one-on-one discussions and feedback loops;

▶ Co-creation workshops with a diverse range of partners contributing to designing flagship initiatives, with several of them already being implemented at the time this document was printed.

2.2. GUIDING PRINCIPLES

Two sets of principles were developed during the course of the strategy design: (i) values and work principles for Africa CDC teams and (ii) guiding principles for the strategy.

Africa CDC's digital transformation strategy is based on the following guiding principles and convictions[20]:

▶ **National ownership of digital health systems**: systematically involve national governments and local stakeholders in the design, implementation, and management of their digital health systems, including continental digital solutions, in order to ensure that the systems are aligned with local health priorities and needs, and that they are sustainable over the long term.

▶ **Leapfrogging through innovation:** leverage digital technologies to digitalize –not digitize– and unlock the potential to enable African countries to "leapfrog" traditional stages of development and adopt innovative solutions that can

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[20] These principles are aligned with the Principles for Digital Development.

significantly improve health outcomes. This requires embracing new technologies and approaches, and fostering a culture of innovation and experimentation.

▶ **Design for scale and build for sustainability**: develop digital health solutions that can handle growth and expansion and can be maintained over the long term. This requires taking into account the technical, organizational, and financial factors from the onset of projects.

▶ **Empowerment of healthcare workforce**: use digital health solutions to provide healthcare workers with additional skills and involve them in decision-making. This requires investing in training and capacity building programs, and ensuring that healthcare workers have access to the necessary hardware and software.

▶ **Open standards and adoption of digital public infrastructure (DPI) and digital public goods (DPGs)**: build on existing digital health solutions and infrastructure, rather than start from scratch. This can help to reduce costs and improve efficiency, and can enable countries to learn from each other's experiences.

▶ **Regional integration of capabilities**: integrate critical digital health capabilities across the African continent, in order to enable seamless sharing of expertise and resources, starting within each regional economic community. Regional networks, communities of practice and partnerships can be leveraged to achieve this integration.

▶ **People-centric approaches**: design digital health solutions that are centered around the needs and preferences of patients and empowers them with access to their own data This requires involving patients and communities in the design and implementation of digital health solutions, and ensuring that solutions are accessible and easy to use.

▶ **Collaboration and co-creation**: involve a broad range of stakeholders to leverage world class expertise and available resources. Stakeholders include bilateral and multilateral organizations, international institutions, governments, private sector organizations, civil society organizations, and local communities.

▶ **Gender-lens, equity and inclusion**: ensure that digital health solutions are designed and implemented in a way that take into account the unique needs and challenges faced by different groups, such as women, children, and marginalized populations. Digital health solutions should not exacerbate existing disparities.

Figure 4 below provides a summary of these guiding principles, with core principles surrounded by cross-cutting ones:

Figure 4 : Guiding principles to strengthen digital health systems in Africa

2.3. VALUES AND WORK PRINCIPLES

Africa CDC digital transformation strategy is rooted on principles based on a unique positioning and specific values.

Africa CDC's contribution is based on a set of unique advantages: (i) political support and strong institutional link with Member States, (ii) regional expertise based on extensive knowledge and experience of African needs and challenges, (iii) technical expertise in disease control and prevention, surveillance, laboratory systems, emergency preparedness and response, and workforce development, (iv) a geographical scope of work that includes the 55 African countries and (v) a strong convening power.

The following values were developed during a workshop with Africa CDC digital health internal stakeholders. They serve as a guidepost for Africa CDC's culture and are aimed at shaping the teams' behaviors and actions while implementing the Digital transformation strategy.

▶ **Efficiency**: the ability of Africa CDC teams to accomplish tasks and meet their goals in a timely and cost-effective manner, using the least amount of resources possible;

▶ **Expertise**: the individual and collective specialized knowledge and skills that Africa CDC possess in the digital field;

- ▶ **Innovation**: the ability of Africa CDC teams to develop new ideas, processes, products, or services that can lead to improved health outcomes and health security;

- ▶ **Agility**: the ability of Africa CDC teams to respond quickly and effectively to changing circumstances, Member States' priorities, or new technologies while building continuous improvement at every stage of the work processes.

- ▶ **Design for context**: the process of developing solutions or products that are tailored to the specific needs, constraints, and preferences of the individuals and communities that will use them, taking into account the broader social, cultural, and environmental context.

- ▶ **Collaboration**: the process of Africa CDC working together with Member States and global health organizations, towards a common goal, with each organization contributing their expertise and skills, sharing ideas and knowledge, and supporting each other to achieve the best possible outcome.

Based on the aforementioned values, the following work principles were subsequently defined. They provide a clear direction to guide the teams decision-making and behaviors while reinforcing Africa CDC's identity and promoting staff engagement. Work principles include:

- ▶ "**We strive for the best**": Africa CDC teams are committed to continuous improvement and excellence in everything they do. They set high standards for themselves and strive to meet or exceed them through hard work, dedication, and a commitment to ongoing learning and development.

- ▶ "**We are a result-driven organization**": Africa CDC teams focus on achieving tangible outcomes and measurable results, rather than just going through the processes and procedures. They set clear goals and objectives and focus on achieving them, using data, analytics, and other tools to track their progress and measure their impact.

- ▶ "**We recognize Member States specificities**": Africa CDC teams understand and acknowledge the unique challenges and complexities faced by Member States. They take these factors into account when developing strategies, solutions, and delivering technical assistance, and make sure their technical assistance meet the specific needs and expectations of African citizens.

- ▶ "**Iterations and learning loops are part of our collaboration processes**": Africa CDC teams value ongoing learning and improvement as part of our collaborative approach to problem-solving and decision-making. They work together to identify opportunities for improvement, test new ideas and solutions, gather feedback and data, and then refine and iterate our approach based on what they learn.

▶ **"We provide best-in-class solutions"**: Africa CDC teams are committed to providing the highest quality solutions to Member States, thanks to in-house expertise, knowledge management and the cultivation of a group of partners.

▶ **"We innovate by embracing experimentation and continuous learning"**: Africa CDC teams take calculated risks, explore new ideas, try new approaches, challenge the status quo, and experiment with different approaches. They learn from their successes and failures.

2.4. VISION AND MISSION

Given the scope of this strategy, two complementary vision statements were developed; they feed into Africa CDC's mission statement.

The first vision concerns Africa CDC's role in supporting Member States. The second vision focuses on Africa CDC's internal operations. One single mission that embodies Africa CDC's purpose in the field of digital health was then developed.

Figure 5 below showcases these three statements:

Internal digital transformation

"Africa CDC is a **digital-savvy** institution with **efficient**, **transparent** and **intelligent internal operations** to support its programmes. Its digital-enabled business processes bring the **cost optimization**, **compliance**, **speed** and **agility** required to support Member States."

Member States' digital health transformation

"By 2030, African Union Member States have **accessible**, **affordable**, **qualitative** and **person-centric digital health systems** that contribute to sustainable health outcomes and health security."

Africa CDC mission

"Africa CDC **collaborates** with Africa Union Member States and global health organizations to provide **guidance** and **services** that help them build **nation-wide** and **interoperable** digital health systems that contribute to **healthier** and **productive citizens of Africa**."

Figure 5 : Africa CDC's vision and mission in digital health

3. STRATEGIC OBJECTIVES

Africa CDC digital transformation strategy comprises seven specific strategic objectives that provide a roadmap to support the achievement of the overall strategy.

The digital health landscape is rapidly evolving in Africa, driven by advances in technology, increasing mobile penetration, a young population and a growing demand for access to healthcare services. A variety of organizations are active in this space, and while Africa CDC is a relatively young institution, it intends to play an increasing and catalytic role in this collective effort.

As described in chapter 2.1, Africa CDC organized a series of consultations with Member States representatives and digital health stakeholders to identify areas where Africa CDC's support would be most relevant. This work informed the prioritization of six strategic objectives, with a specific subset of activities where Africa CDC's contribution is required. These activities fall into several categories depending of the Africa CDC's role: (i) awareness and advocacy, when Africa CDC supports the understanding of specific issues and promote causes to stakeholders, including Member States decision makers, (ii) strategy and organizational change, which relates to direct technical assistance for the design of national digital health strategies and the management of organizational consequences (iii) services, for activities Africa CDC leads for the direct benefit of Member States and finally (iv) guidelines, when specific instructions or recommendations are made to Member States for the design, use, implementation or maintenance of any component of digital health systems.

An overview of the six strategic objectives is provided in Figure 6 below, followed by a detailed description for each of them:

Strategic objective 1:
Digital health governance & strategy

Member States have established relevant digital governance mechanisms and strategic documentsdocuments

- Support restructuring of digital health coordination
- Knowledge management
- Maturity assessments

Strategic objective 2:
Interoperable platforms & solutions

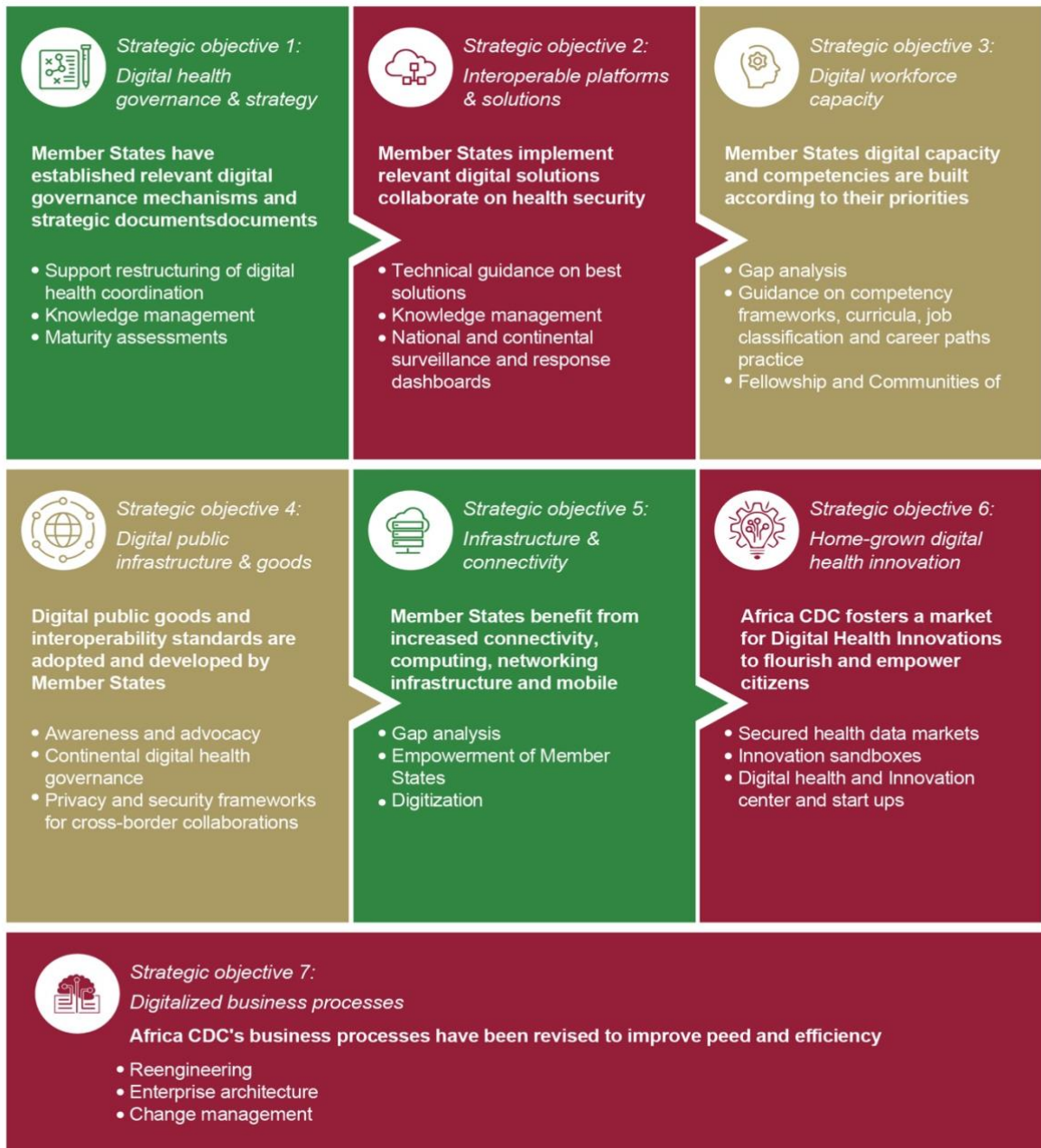**Member States implement relevant digital solutions collaborate on health security**

- Technical guidance on best solutions
- Knowledge management
- National and continental surveillance and response dashboards

Strategic objective 3:
Digital workforce capacity

Member States digital capacity and competencies are built according to their priorities

- Gap analysis
- Guidance on competency frameworks, curricula, job classification and career paths practice
- Fellowship and Communities of

Strategic objective 4:
Digital public infrastructure & goods

Digital public goods and interoperability standards are adopted and developed by Member States

- Awareness and advocacy
- Continental digital health governance
- Privacy and security frameworks for cross-border collaborations

Strategic objective 5:
Infrastructure & connectivity

Member States benefit from increased connectivity, computing, networking infrastructure and mobile

- Gap analysis
- Empowerment of Member States
- Digitization

Strategic objective 6:
Home-grown digital health innovation

Africa CDC fosters a market for Digital Health Innovations to flourish and empower citizens

- Secured health data markets
- Innovation sandboxes
- Digital health and Innovation center and start ups

Strategic objective 7:
Digitalized business processes

Africa CDC's business processes have been revised to improve peed and efficiency

- Reengineering
- Enterprise architecture
- Change management

Figure 6 : Strategic objectives contributing to advancing digital health in Member States

3.1. DIGITAL HEALTH GOVERNANCE AND STRATEGIC DOCUMENTS

This strategic objective focuses on establishing or strengthening governance mechanisms and strategic documents for digital health in each Member State in a way that is relevant to national context and sustainable.

The scope of governance includes all processes of decision-making, policy setting and the system by which decisions are implemented. Effective governance requires a legal framework, effective leadership, sound management practices, and accountability.

Strategic documents include strategic plans, budgets, operational plans, monitoring and evaluation mechanisms. These documents provide a roadmap for digital health investments, set priorities, and outline paths for achieving the goals of the health system.

Over the last decade, 42 Member States have released strategic documents that cover digital health[21]. Some areas to strengthen include the prioritization of investments, the implementation capacity, weaknesses in change management, the lack of authority of teams responsible for strategy design and decision making, strategies focused on a limited scope, strategies focused on information technologies instead of digital health solutions. Across Member States, strengthening cross-sector collaboration between Ministries of Information and Communication Technology and Ministries of Health has proven effective in nurturing digital health expertise. Similarly, elevating the anchoring of the digital health coordination function to a strategic level, reporting directly to Ministers increase the capacity to transform health systems.

At the continental level, integration of surveillance systems is being hampered by a lack of clarity on data governance. Rules around data ownership, access controls, data quality standards, metadata management, and data retention policies must be defined while the value of data sharing is made clear to Member States.

The following table describes the initiatives Africa CDC envisions to reach strategic objective 1:

Type	#	Activities
Awareness and Advocacy	1.1	Lead advocacy initiatives at Head of State and Minister of Health levels to discuss systemic changes associated with digital health (e.g., high-level engagements, convenings)
Strategy and organizational change	1.2	Support the re-structuring of the digital health coordination at national level, encourage a stronger collaboration between Ministries of digital economy and health and propose a higher-level reporting line (directly to Ministers) and sufficient capacity
	1.3	Support the development of national digital health strategies and actionable action plans based on *SMART* objectives, available funding and implementation capacity
	1.4	Support the development of adequate legal and regulatory frameworks for digital health, including on cross-border data sharing
	1.5	Support active coordination of digital health efforts with partners, encouraging clear national leadership
Services	1.6	Support and contribute to continental digital c*ommunities of practice* in order to best harness available expertise and scale up capacity building efforts.

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[21] See examples of strategic documents from Member States in Annex

	1.7	Work with partners to develop and amplify a collaborative process to assess the maturity of Member States digital health systems (e.g., African Digital Health Index) providing a shared view on maturity levels, areas to strengthen and in incentive to act[22]

Associated with complementary support activities from other organizations, such as the WHO, the AUC, and Smart Africa, Africa CDC aims at the following outputs:

▶ Each Member States has designed and implemented robust and sustainable governance mechanisms that suits their national context;

▶ Each Member States has made digital health a fully integrated part of their in national health strategies;

▶ Each Member States has established digital working groups to align and coordinate all stakeholders;

▶ Continental digital communities of practices have become central nodes for digital knowledge transfer and networking; and

▶ Africa CDC publishes an annual index on digital health to incentive investments on priority domains.

3.2. INTEROPERABLE DIGITAL PLATFORMS AND SOLUTIONS

This strategic objective focuses on supporting Member States to adopt best practices while implementing digital health platforms and solutions.

The scope of digital health platforms and solutions is vast and covers a wide range of technologies and applications that enable the delivery of healthcare services and support the management of health-related data. They include the following: (i) *electronic health records* and *electronic medical records*, (ii) *telehealth* and *telemedicine*, (iii) *wearable* and *mobile health devices*, (iv) *health information platforms*, (v) *clinical decision support systems*, (vi) *connected diagnostics systems*, and (vii) *population health management platforms*.

Beyond challenges associated with workforce capacity, interoperability and infrastructure addressed via strategic objectives 3, 4 and 5[23], Member States have been facing issues typical of an emerging digital industry.

The first and fundamental one is the proliferation of different digital technologies, that leads to fragmentation in the health system making it difficult to ensure consistency and continuity of work processes. This is a by-product of the rapid pace of technology change and the lack of action from regulators, which have difficulties to keep up with the innovation and shape the landscape. Another root cause for proliferation is the

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[22] Action 1.7 was selected as a flagship initiative, see summary in Annex
[23] See strategic objectives 3, 4 and 5

often weak collaboration frameworks between governments and non-governmental organizations. While NGOs can test and prove the value of the digital health solutions they implement, often, systematic impact review and prioritization of approaches and solutions is missing.

Data integration is the second most immediate challenge faced by Member States, whether at the national level or at the continental level, the latter being of the utmost importance for surveillance of potential public health emergencies.

In the absence of a well-defined *enterprise architecture* and *reference implementation* Member States also face limited scalability, limited alignment with their programmatic objectives and limited supervision of solutions deployed.

Addressing these issues requires a coordinated effort by all stakeholders across the ecosystem. The following table describes the initiatives Africa CDC envisions to reach strategic objective 2:

Type	#	Activities
Strategy and organizational change	2.1	Support the appropriation and implementation of enterprise architecture for digital health in each Member State
Knowledge management	2.2	Work with partners to support Member States' efforts to map and evaluate existing digital solutions with the objective of recommending specific digital tools to *use cases* and avoid proliferation leveraging existing registries (e.g., Digital Health Atlas overseen by the WHO)
Guidelines	2.3	Support the development and implementation of dashboards for data-based and timely decision making for public health emergencies at the Member States level
Services	2.4	Develop existing Africa CDC dashboards for continental surveillance and other related public health emergency activities with clear data governance and incentives for Member States to share information[24]

Associated with complementary support activities from other organizations, such as the WHO, UNICEF and digital square, Africa CDC aims at the following outputs:

▶ Member States have the ability to make informed decisions when designing and implementing their enterprise architecture and implement digital health solutions; and

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[24] Action 2.4 was selected as a flagship initiative, see summary in Annex

▶ Africa CDC surveillance and other dashboards supporting public health emergency management are relevant to Member States, functional, and populated with quality data.

3.3. DIGITAL WORKFORCE CAPACITY

Workforce development is a pillar of Africa CDC who already leads a number of initiatives in the field. This strategic objective aims at adding digital as a core domain of health workforce development by addressing specific roadblocks to building digital health capacity in Member States.

Workforce development is critical to the success and sustainability of digital health initiatives as the successful implementation and adoption of these technologies requires a workforce with the necessary knowledge, skills and competencies. Increasing the digital capacity of individuals active in health systems requires to better understand the gaps and needs, design human resource plans, build the capacity through training and new job creations, and retain healthcare workers. Finally, digital health leaders are also critical to drive the transformation.

The following table describes the initiatives Africa CDC envisions to reach strategic objective 3:

Type	#	Activities
Services	3.1	Support the analysis of existing human capital in Member States in order to identify existing skills, numbers and prioritize capacity gaps
	3.2	Launch a Health Informatics Fellowship hosted at Africa CDC in collaboration with National Public Health Institutes[25]
	3.3	Provide online trainings to African health informaticians through Africa CDC Institute for workforce development
	3.4	Work with existing communities of practice to develop a Pan African Health Informatics Network that can elevate health informatics on the continental and global agenda[26]
	3.5	Lead the organization of the African Health Tech Summit to elevate the role of digital in public health discourse and provide a platform for digital health thought leaders to share about the projects and initiatives they are investing in.
Guidelines	3.5	Work with partners to define digital competency frameworks for clinical and non-clinical health personnel
	3.6	Define technical guidelines for the revision of job classifications and career tracks supporting health informaticians

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[25, 20] Action 3.2, 3.4 and 3.5 were selected as a flagship initiatives, see summary in Annex

Strategy and organizational change	3.7	Work with partners to design and improve curricula and educational materials for digital health in Africa and ensure they are institutionalized at the Member State level, for professional training and academic education

Associated with complementary support activities from other organizations, such as GIZ, HELINA, Mastercard Foundation, PATH, RTSL, Speak Up Africa, Smart Africa, TransformHealth, WHO, Africa CDC aims at the following outputs:

► Each Member State has a human resource plan for digital health;

► A public health informatics fellowship is created with alumna leading the transformation of their home country digital health systems and joining a community of practice;

► Job classification pertaining to digital health systems have been adopted in each Member State;

► Each regional economic community has at least one updated health informatics academic training; and

► Training curricula and materials pertaining to digital health jobs are made available to Member States.

3.4. ADOPTION OF DIGITAL PUBLIC INFRASTRUCTURE APPROACHES AND DIGITAL PUBLIC GOODS

This strategic objective aims at promoting *adoption and use of digital public infrastructure (DPIs)* digital public goods (DPGs). DPI is the technology infrastructure that supports digital services and applications used by the public sector to deliver services to citizens. DPGs, on the other hand, refer to digital resources, tools, and platforms that are available to the public, free of cost, and can be used to improve the delivery of public services. The adoption of DPIs and DPGs are expected to bring many benefits, including rapid and low cost development and deployment of integrated digital health services.

There is a wide enough range of DPGs for healthcare and public health to cover a broad range of needs. Examples of DPGs include DHIS2 (platform for health data management and analysis), OpenELIS (laboratory information system), OpenHIE (health information exchange platform), OpenMRS (medical record system), mHERO (messaging platform for public health emergencies).

While the benefits of DPGs are clear and many Member States have implemented one or several of the abovementioned solutions, several barriers to a wider adoption have been identified: limited political will, digital health data expertise, resources to finance

upfront investments and ongoing maintenance, lack of *standards*, data privacy and security concerns.

Standards will also be promoted in the field of *Health information exchange* by using data exchange technologies such as *HL7* and *FHIR.* Standards will also be promoted in the field of *Application programing interfaces*, including protocols, routines and tools for building software application.

Overall, interoperability requires a multi-faceted approach that includes adopting common data standards, building a common technical infrastructure, encouraging collaboration and partnerships, investing in capacity building, and establishing regulatory frameworks. The following table describes the initiatives Africa CDC envisions to reach strategic objective 4:

The following table describes the initiatives Africa CDC envisions to reach strategic objective 4:

Type	#	Activities
Awareness and Advocacy	4.1	Lead advocacy initiatives at the Head of State and Minister of Health level to discuss interoperability and the adoption of DPIs and DPGs for health
Services	4.2	Establish a digital health data governance mechanism at the continental level to promote the adoption of open standards, DPIs and DPGs and streamline health data sharing on the continent, including genomic, surveillance and diagnostic data[27].
Strategy and organizational change	4.3	Support Member States in developing policies and regulations that ensure that health data is collected and shared in a secure and standardized way, as well as establishing data protection laws that protect the privacy and confidentiality of health data

Associated with complementary support activities from other organizations, such as FIND, Health Enabled, HETA, PATH, UNICEF, WHO, Africa CDC aims at the following outputs:

▶ Guidance on interoperability standards and technical infrastructure for interoperability has been made available to Member States;

▶ Each Member State has developed a policy and regulatory framework for data collection and sharing; and

▶ A continental data governance mechanism is established to Member States data exchange.

3.5. DIGITAL INFRASTRUCTURE AND CONNECTIVITY

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[27] Action 4.3 was selected as a flagship initiative, see summary in Annex

This strategic objective aims to help Member States design and implement the physical infrastructure needed to provide digital health solutions to health facilities and healthcare providers.

The scope of investment is large and includes internet connectivity, networking equipment, cloud infrastructure, cybersecurity, computers and servers, mobile devices, digital medical devices and maintenance. Power infrastructure is essential to ensure that hardware is operational.

Although 61% of Africans own a mobile phone and 42% have an active mobile-broadband subscription, there is limited official data on the share of African healthcare facilities connected to internet. 15% of the continent population is not covered by any signal and 14% only has access to 2G network, meaning that 29% cannot access internet[28]. 300 million Africans live more than 50 kilometers from a fiber or cable broadband connection[29].

Extending network coverage and access to internet is one of the difficult challenges faced by African governments and policymakers as high investment are required to build and maintain broadband networks, whether fiber optic cables, cellular networks or satellite internet which is becoming an option in some parts of Africa despite of limited bandwidth and high latency.

Providing electrical power to health facilities is a very similar challenge. The main barriers faced by Member States in the infrastructure space include lack of investment, weak planning, regulatory challenges, geographical challenges and competing priorities.

The following table describes the initiatives Africa CDC envisions to reach strategic objective 5:

Type	#	Activities
Awareness and advocacy	5.1	Partner with investors in health systems strengthening to build a case for major investments in electrical power and connectivity
Services	5.2	Map health facilities, monitor connectivity and empower Member States to connect more health facilities and healthcare workers[30]
Guidelines	5.3	Work with Member States and partners to establish technical guidance on infrastructure, equipment and core digital public infrastructure elements (e.g., *terminology*, digital identity, cybersecurity, *registries*)
Strategy and organizational change	5.4	Work with Member States and partners to digitize primary healthcare[31]

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[28] ITU, 2022. Measuring digital development: facts and figures 2022.
[29] https://www.statista.com/statistics/269329/penetration-rate-of-the-internet-by-region
[30, 25] Action 5.2 and 5.4 were selected as flagship initiatives, see summary in Annex

Associated with complementary support activities from other organizations, such as AU, UNICEF, ITU, GSMA, Africa CDC aims at the following outputs:

▶ Member States have connected 100,000 additional health facilities and 1,000,000 additional healthcare workers; and

▶ Member States are empowered with guidance materials to make informed decisions on infrastructure and equipment investment.

3.6. PROMOTING HOME-GROWN DIGITAL HEALTH INNOVATION

This strategic objective focuses on fostering the development of a market for digital health innovations that tackle African health challenges and encouraging the development of African digital health solution providers.

As described in part one, African health systems present unique and complex challenges (limited resources, high burden of infectious diseases, growing burden of NCDs, inadequate infrastructures, shortages of healthcare workforce). Innovation allow the development of new and creative approaches, products and solutions to addressing these challenges in ways that can be more effective, efficient and sustainable.

In order for innovation to flourish in the digital health field, it is critical to create conditions that allow experimentation. These include conducive regulatory frameworks, human resource capacity, infrastructures, access to funding, and market access. A critical element to digital innovation is data often dubbed as the "new oil". Because trial and error is part of the innovation process, and because successful innovation go through a funnel (from idea, to concept, feasibility, prototyping, testing, launch and scaling) it is also important to generate large volume of projects.

Working with the AUC, and other stakeholders, Africa CDC will focus on spearheading the development of a market for health data, encouraging digitization and sharing of anonymized and *pseudonymized* data to feed research and experimentation. Africa CDC will also encourage the development and contribute to organizing "*sandboxes*", safe spaces to test and learn.

The following table describes the initiatives Africa CDC envisions to reach strategic objective 6:

Type	#	Activities
Awareness and advocacy	6.1	Lead advocacy on the imperative of creating health data markets within and across Member States that allows National Public Health Institutes, researchers and private sector to use health data in a trusted and secure way

Guidelines	6.2	Work with Member States and other organizations to define regulatory frameworks to enable citizens to share health data across borders while meeting security and privacy standards (e.g., management of *personal identifiable information*)
Services	6.3	Create digital health innovation sandboxes allowing innovators to access data, tools and resources, and engage with various stakeholders to design innovative digital health solutions[32]
	6.4	Lead an initiative to close the gender digital gap[33]
Strategy and organizational change	6.5	Support the design and implementation of a Digital Health and Innovation Lab hosted in a pioneer Member State

Associated with complementary support activities from other organizations, such as AMREF, AWS, BMGF, Novartis Foundation, and Qhala, Africa CDC aims at the following outputs:

▶ At least one innovation sandbox is created

▶ A Digital Health and Innovation Lab is created

▶ Data sharing agreements for innovation and research are implemented

3.7. DIGITALIZATION OF AFRICA CDC BUSINESS PROCESSES

Digitalization of Africa CDC business process provides a major lever to drive the operational excellence of the institution. The rapid growth of Africa CDC and its recent change of legal status as a specialized autonomous agency brings a timely opportunity to revise its operational processes and procedures. Africa CDC's mandate on health security also commands operational readiness, ensuring that all necessary resources, personnel, equipment, and procedures are in place and ready to be deployed when needed.

Given the new leeway, the ambition goes beyond digitization: key business processes can be digitalized: a more profound redesign of analog and manual processes to improve speed, efficiency, transparency, and accountability (i.e., eliminate redundancy, reduce unnecessarily complex procedures, minimize organizational risk and ensure clear accountability of outcome). This is particularly important as the institution has and will continue to experience a growth of its activities and footprint with the development of its regional collaborating centers (RCCs).

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[32] Action 6.3 and 6.4 were selected as a flagship initiatives, see summary in Annex

Critical to the success of this strategic objective are: (i) the clarity of Africa CDC's goals and deliverables, whether they are services led by the institution and provided to Member States, or support to Member States via guidance materials, advocacy work, health systems strategy and organizational advisory, or support to operations; (ii) a willingness to invest in technology and digital skills, (iii) strong leadership to drive the transformation and effective change management capacity to ensure adoption of new business processes.

This ambitious transformation will be led by the Management and Administration division, supported by the Digital Delivery and Innovation team (see Implementation approach chapter). It requires the expertise from consulting firms with expertise on both digital transformation and each of the key functions (i.e., administration, financial management, human resources, procurement, partnerships) as well as a good command of Africa CDC's business processes.

The following table describes the initiatives Africa CDC envisions to reach strategic objective 7:

Type	#	Activities
Alignment	7.1	Work with the Senior Leadership and Management & Administration division to agree on which financial and programmatic impacts are sought and develop target metrics for business process performance
Analysis	7.2	Map and evaluate key business processes required to conduct the work of Africa CDC, and the various models of digital service delivery which may be implemented to increase the efficiency and cost effectiveness of such processes
Design	7.3	Recommend key process changes which can be implemented and provide quantified detail on potential implications (financial, organizational structure, capacity and skills) from each modified workflow
	7.4	Develop an Enterprise Architecture framework for managing an organization's information technology assets, processes, and strategies[34]
Adoption	7.5	Provide workflow documentation and business process models to be used for implementation of new procedures
Change management	7.6	Guide managers and key stakeholders in change management activities which may be used in implementing the agreed process changes (e.g., training and development plans, communication plans, implementation plans, metrics)

Africa CDC aims at the following outputs:

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[34] Action 7.4 was selected as a flagship initiative, see summary in Annex

► New business processes are adopted; and

► Africa CDC staff is equipped with the necessary skills to effectively perform their roles in the new processes.

4. IMPLEMENTATION APPROACH

Implementing the digital transformation strategy requires the setup of a dedicated internal team at Africa CDC, strategic and operational alignment with partners implementing related activities, before resource mobilization and operational planning.

4.1. DIGITAL DELIVERY AND INNOVATION TEAM

Implementing the strategy and driving the internal transformation requires a dedicated team.

The role of the Digital Delivery and Innovation (DDI) team is to lead and coordinate Africa CDC's efforts to adopt and leverage digital technologies and innovative models to drive services to Member States and improve internal operations. Specific responsibilities of the DDI team include:

1. Developing, continuously reviewing and implementing a digital transformation and innovation strategy to ensure that it is aligned with Africa CDC's general strategy and meets the needs of MS;

2. Identifying and prioritizing initiatives and projects that will support the digital transformation and drive innovation. The portfolio will comprise both internal and external initiatives and projects with dedicated teams;

3. Coordinating the work of cross-functional teams and stakeholders to ensure that the transformation and innovation efforts are successful;

4. Tracking and reporting on the progress and impact of the transformation and innovation efforts;

5. Managing and communicating change to stakeholders, including providing guidance and support to colleagues as they adapt to new digital technologies and models;

6. Collaborating with external partners, such as technology vendors and service providers, to identify and implement solutions that support the transformation and drive innovation; and

7. Conducting market and industry research to identify digital trends and opportunities for innovation.

The DDI team's anchoring supports its responsibilities

The DDI team is hosted within Africa CDC's Secretariat, based at Africa CDC's headquarters and reports to the Africa CDC Director General.

The team leads two types of collaborative processes: the first one aims at providing digital expertise services to Africa CDC in order to improve their outcomes, the second one aims at contributing to a group of external initiatives, run with external partners.

The DDI team has no permanent touchpoints with Member States and aims at strengthening existing Africa CDC divisions.

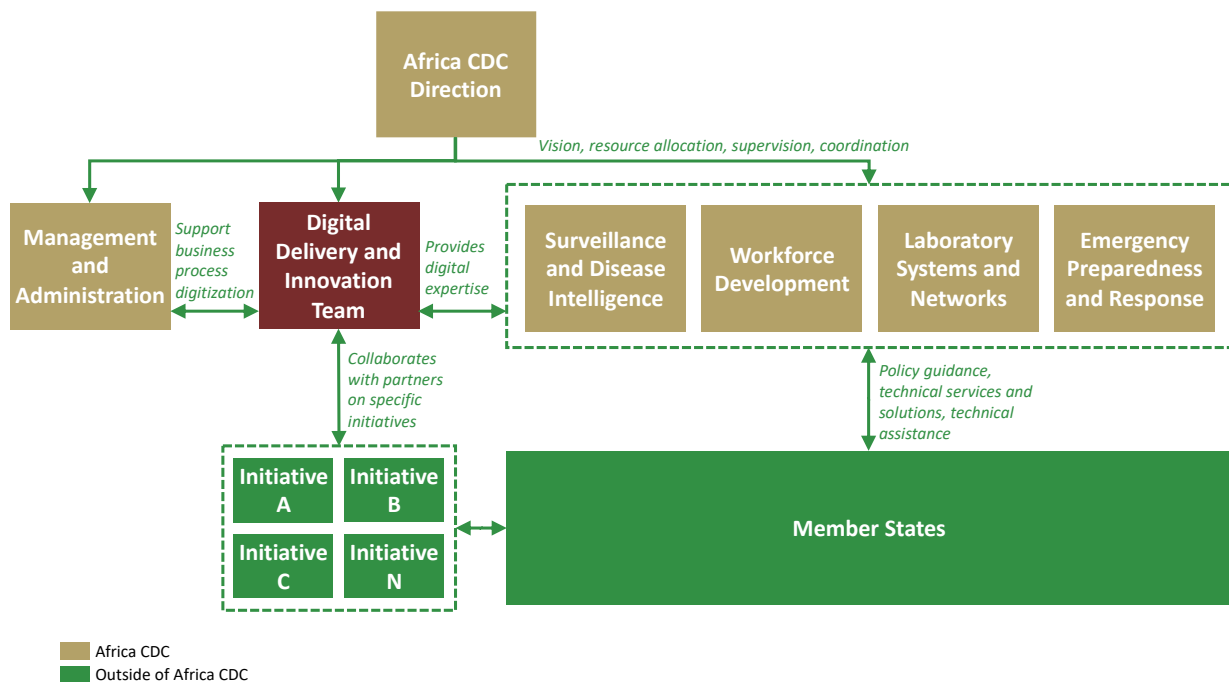Figure 7 bellow showcases the DDI team's touchpoints within and outside of Africa CDC.

Figure 7: Anchoring of the Digital Delivery and Innovation Team

The envisioned DDI team gathers a small group of digital experts under the leadership of a Chief Digital Officer. Together, they bring a specific set of six complementary capacities to drive internal and external digital transformation: (i) leadership and coordination, (ii) public health policy and strategy (iii) data science, (iv) system and product engineering (v) project management, (vi) partnership and resource mobilization

A low level of hierarchy and decentralized decision-making is preferred, as flat organization will improve communication and collaboration, increase agility and responsiveness and enhance employee engagement.

4.2. ALIGNMENT WITH PARTNERS

Africa CDC will lead efforts to identify stakeholders who can contribute to the effort, establish clear communication channels et mechanisms for collaboration.

Africa CDC will work with five types of stakeholders:

▶ **International organizations** such as WHO, UNICEF, Gavi, the Global Fund and the World Bank, with the objective of leveraging their experience in implementing digital health programs in resource-limited settings, and define coordination mechanisms, including a clear distribution of roles and responsibilities for shared objectives.

▶ **Bilateral and multilateral development organizations**, in order to leverage and amplify their expertise in supporting healthcare, health security and technology initiatives in low resource settings, as well as their resources for digital health, including financing and policy support.

▶ **CSOs and NGOs** in order to leverage their strong relationships with local communities and expertise in community-based healthcare delivery. Partnering with them would ensure that digital health solutions meet the specific needs of communities, are culturally appropriate, and sustainable. They can also play a key role in advocacy and awareness-raising and capacity building initiatives.

▶ **Private sector companies**, particularly those in the technology and telecommunications industries, to develop innovative technologies and platforms.

▶ **Academic and research institutions**, to support the development of evidence-based digital health solutions. These partnerships could involve joint research projects and knowledge sharing.

Alignment between Africa CDC and these partners will first require joint planning sessions. These will aim at identifying areas of overlap and complementary activities, as well as the establishment of shared outcomes, distribution of roles and responsibilities as well as metrics to track progress and ensure accountability. Throughout the process, it will be important to remain focused on the overarching goal of advancing digital health in Africa, while also respecting the unique perspectives and contributions of each individual organization involved.

Funding gap and resource mobilization strategy session will then be organized with the objectives of assessing the funding needs of Africa CDC's portfolio of digital transformation projects, and to identify strategies for securing the necessary resources, such as seeking new funding sources or exploring opportunities for cost-sharing or in-kind contributions.

4.3. MONITORING, EVALUATION AND LEARNING FRAMEWORK

Developing a sound monitoring, evaluation, and learning (MEL) framework is crucial for the success Africa CDC's digital transformation strategy.

Once alignment has achieved with partners, Africa CDC will develop a MEL framework with clear goals and objectives, and specific outcomes to be measured. This may

involve developing a logic model or theory of change that outlines the expected pathways from inputs to outputs to outcomes.

Appropriate indicators and data sources for measuring progress towards the desired outcomes will be defined. These indicators should be relevant, reliable, and feasible to collect, and may include both process and outcome indicators, in order provide a judgement on both whether Africa CDC is on the right path to achieve its objectives and whether the objectives have indeed been achieved.

The MEL framework should also include a plan for data collection, management, and analysis, as well as strategies for dissemination and use of findings to inform decision-making and improve the quality and impact of the digital transformation strategy.

5. ANNEX

5.1. SUMMARIES OF FLAGSHIP INITIATIVES

Figure 8 presents the ten flagship initiatives mentioned in chapter 3. Each flagship initiative is driven by a collaboration between Africa CDC and its partners. Below figure 8, a short presentation of each flagship initiative is provided.
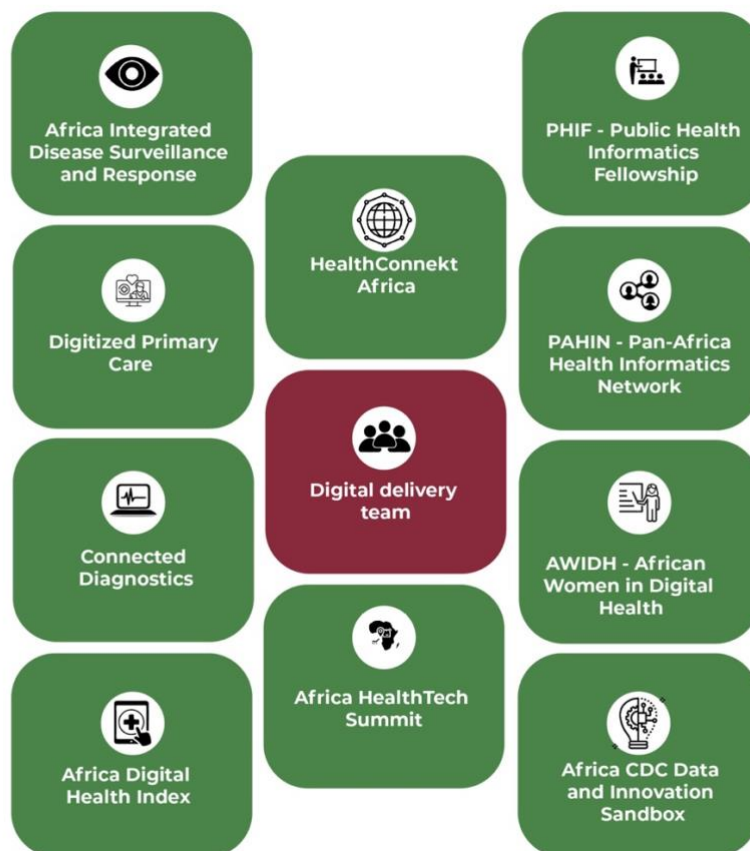

Figure 8: Scope of flagship initiatives (March 2023)

Africa Women in Digital Health (AWiDH)

The Africa Women in Digital Health initiative will work to close the gender digital gap in Africa. Selected Member States will be supported to design or update their digital health strategy to include a gender lens approach, with quantitative targets set to clearly measure the impact of these partnerships. AWiDH will focus on achieving equal gender representation in incubators and accelerators, and within both the public and private sectors. In addition to increasing representation, AWiDH will sustain partnerships that invest in upskilling and executive training for women already working in the digital health space.

Africa Digital Health Index (ADHI)

The ADHI developed as part of an Africa CDC Digital Transformation Strategy flagship initiative will empower Member States to collaboratively assess their digital health capabilities, using a shared view on maturity levels and areas for strengthening. The ADHI will leverage existing expertise within Member States to establish a common vision for how digital health maturity can be continually advanced. This vision will enable a clear roadmap for digital investment, and will further catalyze resource mobilization necessary to achieve this advancement.

Pan-Africa Health Informatics Network (PAHIN)

The PAHIN initiative will create a foundation for increasing public health informatics expertise amongst practitioners of all levels –from aspiring students through to senior leadership. The network will establish peer-to-peer learning and mentorship, aggregate and disseminate advances in the field, and accelerate greater investment and retention of health informatics talent on the continent. This initiative seeks to build strategic partnerships with similar capacity-building networks in order to drive more effective and efficient use of health informatics towards better health outcomes.

Africa HealthTech Summit (AHTS)

The AHTS seeks to elevate the role of digital in public health discourse, continuing on the successful inaugural event in Kigali in December 2022. This event is the premier digital health convening, providing a platform for both digital health thought leaders to share about the projects and initiatives they are investing in. During the event, Public Health and ICT stakeholders met to forge partnerships and showcase innovative digital health solutions, while also highlighting areas for new or continued investment within conversations with donors and investors.

Africa CDC Data and Innovation Sandbox

Africa CDC's Innovation Sandbox will accelerate innovation, from seed through to scale, by creating a setting where innovators and entrepreneurs can work alongside regulatory and health sector stakeholders. The three components which will enable

rapid and responsible development within this sandbox include policy and regulation, innovation, and data. Experts will design and develop policy that can be harmonized and adapted across Member States. Health technology providers can design and test new technologies against health regulations and using simulated ecosystems before implementing the product publicly, in order to increase success of scaling for products that are much-needed. Data experts will be engaged to unlock the power of advanced analytics while ensuring health data protection. The *Innovation Sandbox* will encourage the scale up and competitiveness of home-grown innovation.

Digitized Primary Care

This initiative aims converting analog and manual processes from primary health centers into digital formats that can be stored, processed, and transmitted using digital technologies. The initiative will involve the use of specialized hardware and software to capture, digitize, and store data in digital formats, and upskilled personnel. Digitization will enhance the efficiency, accuracy, and accessibility of data and information.

Public Health Informatics Fellowship (PHIF)

PHIF aims to provide a robust health informatics capacity to promising public health professionals from Africa through a one-year fellowship providing in-class and field-experience training building skills in computer science, data science, information technology and leadership. Fellows will be hosted by Africa CDC, work with selected national public health institutes and regional collaborating centers and join a community of practice once they have graduated.

Africa Integrated Disease Surveillance and Response

Through this initiative, Africa CDC will provide guidance and technical assistance to Member States on how to strengthen laboratory capacity, overall data collection, analysis and reporting systems for timely and accurate detection of disease outbreaks, reduce the burden of infectious diseases and promote overall public health

HealthConnekt Africa

HealthConnekt Africa will connect 100,000 health facilities and 1,000,000 health workers, including Primary Health Care delivery points and Community Health Workers across Africa by 2030. Universal broadband access will enhance the efficiency of healthcare and health investments through rapid communication and dissemination of information, improved longitudinal data management, complete and timely disease surveillance, workforce development, and supported decision making. Internet connectivity further provides the opportunity to leverage innovative services such as telemedicine, personalized medicine, and other solutions powered by advanced analytics. This initiative will operate through complementary actions with Member States that facilitate cross-border sharing of innovation in infrastructure and supply chain logistics, and in catalyzing investment in identifying or scaling up proven models.

Connected Diagnostics

Through the Connected Diagnostics Initiative, Africa CDC will provide guidance on and establish collaborative approaches to selection and implementation of evidence-based interoperable digital health technologies. Under this initiative, harmonized data frameworks and taxonomies will enable collection of key diagnostic metrics across Member States, which will further strengthen Member State capability to develop, evaluate, and implemented connected diagnostics. An impactful innovation ecosystem spurred by this initiative will facilitate strides towards decentralization of diagnosis and increased universal health coverage, leading to improved health outcomes measurable in real-time.

Internal Enterprise Architecture

Africa CDC will undertake an initiative to map its internal technology systems and supported workflows and identify points of integration that can enable stronger and more efficient collaboration, leading to a synergistic approach to supporting Member States. Progress towards defining and implementing an enterprise architecture for internal systems will be accelerated through this flagship initiative. This implementation will serve as a platform for streamlined operational efficiency, minimizing overhead and maximizing investment in Member State-selected priority areas.

5.2. NATIONAL DIGITAL HEALTH STRATEGIES

- ▶ Angola: Estrategico do Sistema de Informação Sanitária 2010
- ▶ Benin: Stratégie Nationale de Cybersanté 2018-2022
- ▶ Botswana: Health Information and Communication Technology Strategy 2010
- ▶ Burkina Faso Cyberstratégie Sectorielle eSanté 2016 – 2020
- ▶ Burundi: Plan National de Développement de l'Informatique Sanitaire 2011-2015
- ▶ Cabo Verde: Política Nacional de Saúde – 2020
- ▶ Chad: Plan National de Developpement Sanitaire II 2013-2015
- ▶ Cameroon: National Digital Health Strategic Plan 2020-2024
- ▶ Comoros: Stratégie Nationale de CyberSanté 2017–2021
- ▶ Congo: Plan de Développement Sanitaire 2007-2011
- ▶ Cote d'Ivoire: Cybersanté en Côte d'Ivoire 2011
- ▶ DRC: Plan National de Développement de l'Informatique de la Santé 2014
- ▶ Egypt: National ICT Strategy for 2012-2017
- ▶ Eswatini: eHealth Strategy 2016 – 2020
- ▶ Ethiopia: Information Revolution Strategic Plan 2018-2025
- ▶ Gabon: Schéma Directeur Stratégique du Système d'Information 2017 – 2022
- ▶ Gambia: Gambian ICT4D-2012 Plan
- ▶ Ghana: Ghana e-Health Strategy 2010
- ▶ Guinea: Plan National de Développement Sanitaire (PNDS) 2015-2024
- ▶ Kenya: National eHealth Policy 2016-2030
- ▶ Lesotho: ICT Policy 2005
- ▶ Liberia: Health Information System & ICT Strategic Plan 2016-2021

- ▶ Madagascar: Plan de Développement du Secteur Santé 2015–2019
- ▶ Malawi: Monitoring, Evaluation and Health Information Systems Strategy 2017–2022
- ▶ Mali: Politique Nationale Cybersanté 2013
- ▶ Mauritania: Project National de Telemedicine 2005
- ▶ Mauritius: National eHealth Strategy 2010-2015
- ▶ Mozambique: Plano Estratégico do Sistema de Informação para a Saúde 2009-2014
- ▶ Namibia: National Health Policy Framework 2010-2020
- ▶ Niger: Stratégie Nationale E-Santé 2019-2023
- ▶ Nigeria: National Health ICT Strategic Framework 2015-2020
- ▶ Rwanda: National Digital Health Strategic Plan 2018-2023
- ▶ Senegal: Plan Stratégique du Système d'Information Sanitaire 2018-2023
- ▶ Sierra Leone: National Health Sector Strategic Plan 2018-2023
- ▶ South Africa: National eHealth Strategy 2019-2024
- ▶ South Sudan: Health Sector Development Plan 2011-2015
- ▶ Sudan: National eHealth Policy 2005
- ▶ Tanzania: Tanzania National Digital Health Strategy 2019-2024
- ▶ Togo: Plan Stratégique de Développement de la Cybersanté 2013-2015
- ▶ Uganda: Uganda National eHealth Strategy 2017-2021
- ▶ Zambia: National eHealth Strategy 2017-2021
- ▶ Zimbabwe: National eHealth Strategy 2012-2017

5.3. GLOSSARY

Application programming interface (API)

a set of protocols, routines, and tools for building software applications. It allows different applications to communicate with each other and exchange information in a standardized way, regardless of the programming languages or platforms they use. APIs allow developers to access the functionality and data of other software applications without needing to know how it works internally. This simplifies the process of integrating different applications and services, allowing for the creation of more complex solutions. APIs are an essential part of modern software development.

Artificial intelligence (AI)

a branch of computer science that aims to create intelligent machines that can perform tasks that typically require human intelligence, such as recognizing speech, making decisions, and solving problems. AI systems use algorithms, statistical models, and deep learning techniques to analyze and learn from large amounts of data, allowing them to improve their performance over time. AI is used in a wide range of applications, from self-driving cars and virtual assistants to medical diagnosis and scientific research.

Clinical decision support systems (CDSSs)

computer-based tools designed to assist healthcare professionals in making clinical decisions. They use patient-specific data and evidence-based knowledge to provide recommendations and alerts to clinicians at the point of care. CDSS can improve patient safety, reduce errors, and optimize clinical workflows by providing real-time decision support and helping clinicians stay up-to-date with the latest clinical guidelines

and best practices. CDSS can be integrated into EHRs and other healthcare systems to provide seamless decision support across the care continuum.

Connected diagnostics systems

Connected diagnostics are a range of technologies and processes that allow diagnostic devices and medical equipment to transmit data to other devices or systems for analysis, storage, and sharing. This enables healthcare providers to access real-time diagnostic data and make more informed decisions about patient care. Connected diagnostics can also enable remote monitoring, reducing the need for in-person visits and improving patient outcomes.

Digitalization

Digitalization of business processes involves the transformation of analog or manual business processes into digital or automated ones using digital technologies such as software, cloud computing, artificial intelligence, machine learning, and the Internet of Things (IoT). The aim is to improve efficiency, reduce costs, and enhance data management and decision-making through the use of digital tools and technologies. While digitization refers to a reduced scope: the process of converting analog or physical data into digital format.

Electronic health records (EHR)

digital records of a patient's health information, including medical history, medications, allergies, test results, and treatment plans. EHRs provide healthcare providers with instant access to patient data, enabling more efficient and coordinated care. They also improve patient safety by reducing the risk of errors and duplication of services. EHRs are more comprehensive than EMR and accessible across healthcare organization

Electronic medical records (EMR)

digital records of a patient's medical information created and stored by a single healthcare organization, such as a hospital or clinic. EMRs typically include patient demographics, medical history, medications, allergies, test results, and treatment plans. EMRs allow healthcare providers within a single organization to access and share patient data more efficiently, reducing the risk of errors and improving patient safety. They also facilitate electronic prescribing, appointment scheduling, and other administrative tasks.

Enterprise architecture (EA)

a discipline that involves creating and maintaining a comprehensive framework for managing an organization's information technology (IT) assets, processes, and strategies. EA provides a blueprint for aligning an organization's technology and business objectives, ensuring that IT investments support the overall goals of the organization. EA typically involves analyzing and documenting the organization's current IT environment, defining future-state goals and strategies, and developing a roadmap for implementing and evolving the IT architecture to support those goals. EA is a key component of IT governance and helps ensure that technology investments are made strategically and effectively.

Fast Healthcare Interoperability Resource (FHIR)

a standard for exchanging healthcare information electronically. FHIR is based on modern web standards and is designed to be flexible, easy to implement, and scalable. FHIR provides a framework for exchanging clinical and administrative data between healthcare systems, devices, and applications, making it easier to share and use health information across the care continuum.

Health information systems (HIS)

systems that manage healthcare data and facilitate the flow of information between healthcare providers, patients, and other stakeholders. HIS include electronic health records, clinical decision support systems, telehealth systems, and other technologies that support the collection, analysis, and sharing of health information. HIS can improve the quality of care, increase efficiency, and reduce costs by enabling better decision-making, reducing duplication of services, and improving communication and coordination among healthcare providers.

Health information exchange (HIE)

the process of sharing electronic health information between different healthcare organizations, providers, and systems. HIE enables healthcare providers to access and share patient information in real-time, regardless of where the patient received care. HIE can improve the quality of care, reduce errors, and lower costs by enabling better coordination and communication among healthcare providers. HIE is facilitated by standards-based interoperability and secure data exchange technologies, such as FHIR and HL7.

Health Level 7 (HL7)

a set of international standards for the exchange, management, and integration of electronic health information. The HL7 standard defines a framework for the transmission of healthcare data between different healthcare systems, such as hospitals, laboratories, clinics, and pharmacies. includes a set of messaging formats, data structures, and code sets that enable healthcare organizations to exchange information in a consistent and interoperable manner. The standard supports a wide range of healthcare information, including patient demographics, laboratory results, clinical notes, imaging data, and medication orders.

Interoperability

the ability of different systems, applications, or devices to exchange data and operate together seamlessly. In the context of healthcare, interoperability refers to the ability of different health information systems, devices, and applications to exchange and use data in a way that is accurate, timely, and meaningful for patient care. Interoperability is essential for achieving the goals of connected care and improving health outcomes.

Mobile health (mHealth)

refers to the use of mobile devices, such as smartphones and tablets, to support healthcare delivery and management. mHealth technologies can enable remote monitoring of patient health, facilitate communication between healthcare providers and patients, support clinical decision-making, and promote patient engagement and self-management. mHealth can improve access to care, increase efficiency, and enhance the overall quality of care.

Digital Public Goods (DPGs)

resources that are openly available to anyone in the world, regardless of their location or economic status. These include knowledge, technology, data, and cultural works that are made freely accessible and shared with the global community. Open global goods are often created collaboratively through open-source projects and are governed by open licenses that allow for reuse, modification, and redistribution. Examples of open global goods include open-source software, scientific research publications, creative commons licensed content, and open data sets. The aim of open global goods is to foster global collaboration and innovation, while promoting equal access to valuable resources for all.

Population health management platforms (PHM)

software tools that enable healthcare providers to identify and manage the health needs of specific patient populations. PHM platforms can aggregate and analyze data from various sources, such as electronic health records and claims data, to identify patient risk factors and improve care coordination. PHM platforms can also support preventive care, chronic disease management, and population health interventions.

Personal identifiable information (PII)

refers to any data that can be used to identify a specific individual. This can include a person's name, address, phone number, email address, social security number, passport number, or any other information that can be used to uniquely identify someone. PII is considered sensitive information that requires careful handling to protect the privacy and security of individuals. Organizations that collect and store PII are subject to various laws and regulations that mandate data privacy and security practices.

Pseudonymization

a data privacy technique that involves replacing PII with artificial identifiers or pseudonyms. This process allows for the storage and processing of sensitive data while preserving privacy by making it more difficult to identify individuals. Pseudonymization can be an effective way to protect sensitive data, while still allowing for its use in research, analysis, and other applications that require access to personal information.

Reference implementation

an implementation of a software or technology specification that serves as a standard or example for others to follow. Reference implementations are typically created to provide guidance to developers who are implementing the same specification or standard. Reference implementations can help ensure consistency and interoperability across different implementations, making it easier for users to adopt and use the technology or standard.

Registry

database or other type of repository that collects and stores information about a specific set of entities, such as patients, diseases, or medical devices. Registries can be used for research, quality improvement, or public health purposes.

Innovation sandbox

a controlled environment that provides a platform for innovators, startups, and other stakeholders to develop, test, and refine new digital health technologies and solutions. The sandbox provides a safe and supportive space for experimentation, where innovators can access data, tools, and resources to accelerate the development and validation of their products and services. The sandbox also serves as a collaborative platform, where innovators can engage with healthcare providers, policymakers, and other stakeholders to address challenges and ensure that their solutions align with real-world needs. Overall, the innovation sandbox is an essential component of the digital health ecosystem, providing a critical pathway for translating ideas into scalable and impactful solutions.

Standard

a set of rules, guidelines, or specifications that establish a common language, format, or process for a particular activity or industry. Standards can promote interoperability, efficiency, and quality by providing a common framework that can be used by different

organizations or stakeholders. Standards are used in healthcare to support the exchange and use of health information, ensure patient safety, and promote quality of care.

Telehealth

refers to the use of telecommunication technologies, such as video conferencing, remote monitoring, and mobile apps, to support healthcare delivery and management. Telehealth can enable remote consultations, diagnosis, and treatment, and can support home-based care and self-management. Telehealth can increase access to care, improve convenience, and reduce costs, particularly for patients with chronic conditions or those who live in rural or underserved areas.

Terminology service

vocabulary, language, and concepts used to describe a particular field or subject area. In healthcare, terminology plays a critical role in ensuring accurate and consistent communication among healthcare providers, researchers, and other stakeholders. Standardized healthcare terminologies, such as SNOMED CT and LOINC, can support interoperability and enable the exchange and use of health information.

Universal health coverage

refers to the goal of ensuring that all individuals and communities have access to quality health services without suffering financial hardship. Universal health coverage encompasses a range of healthcare services, including preventive, curative, and rehabilitative services, as well as essential medicines and vaccines. Achieving universal health coverage requires a strong healthcare system that is accessible, affordable, and equitable for all.

Use case

a technique used in software development, project management, and systems engineering to identify, define, and analyze how a system, software application, or process is intended to be used by its users or stakeholders. Use cases typically describe a sequence of actions or interactions between the user and the system, and can be used to inform design decisions, identify requirements, and validate system functionality. In healthcare, use cases can be used to identify how healthcare technology can support clinical workflows and improve patient outcomes.

Wearable health devices

a small electronic device that is worn on the body, typically on the wrist, chest, or head, and is designed to monitor or collect health-related data. Wearable health devices can track a range of biometric data, such as heart rate, blood pressure, activity levels, and sleep patterns. This data can be used by individuals to monitor their health and fitness, or by healthcare providers to support clinical decision-making and improve patient outcomes. Wearable health devices can also enable remote monitoring and home-based care.

5.4. REFERENCES

▶ AU, 2002. Constitutive Act of the African Union.

▶ AU, 2015. Agenda 2063 : The Africa we want.

▶ AU, 2016. Department of Social Affairs. Africa Health Strategy 2016-2030.

▶ AU, 2020. Digital Transformation Strategy for Africa 2020-2030.

▶ Africa CDC, 2017. Strategic Plan 2017-2021.

▶ Africa CDC, 2022. Call for a New Public Health Order.

▶ Digital Investment Principles, 2021. The Principles of Donor Alignment for Digital Health.

▶ Digital Public Goods Alliance, Digital Public Goods Definition.

▶ European Union, DigComp 2.2, 2022. The Digital Competence Framework for Citizens.

▶ Global Digital Health Index.

▶ USAID, 2020. A Vision for Action in Digital Health 2020- 2024.

▶ ITU and WHO, 2012. National eHealth Strategy Toolkit.

▶ WHO, 2021. Global Strategy on Digital Health 2020-2025.

▶ WHO, 2016. Global Diffusion of eHealth: Making Universal Health Coverage Achievable.

▶ WHO AFRO, 201. Leave no one behind: strengthening health systems for UHC and the SDGs in Africa.

▶ WHO, 2020. Digital Health Platform: Building an Infostructure for Health.

▶ WHO, 2019. Primary Health Care on the road to Universal Health Coverage.

▶ WHO, 2020. Digital Implementation Investment Guide.

▶ WHO AFRO, Framework For Implementing The Global Strategy On Digital Health In the WHO African Region.

▶ Maina, Ouma, Macharia, et al., 2019. A spatial database of health facilities managed by the public health sector in sub–Saharan Africa.

5.5.ORGANIZATIONS CONSULTED

- African Union - Policy and Regulation Initiative for Digital Africa
- Africa Health Business
- AMREF
- Amazon Web Service
- Babyl
- Babylon Health
- BMGF
- EU - Directorate General for International Partnerships
- Foundation Novartis
- GIZ
- Global Fund
- GSMA
- HealthTech Hub
- HELINA
- IFRC
- IntraHealth
- ITU
- Kaikai
- Last Mile Health
- Living Goods
- Mastercard Foundation
- McGovern Foundation
- Medtronic Labs
- Norrsken Foundation
- Novartis Foundation
- PATH
- Qhala
- Resolve to Save Lives
- Rockefeller Foundation
- RTSL
- Rwanda Events
- Sida
- Smart Africa
- Speak Up Africa
- The Commons Projects
- Tony Blair Institute for Global Change
- TransformHealth
- UNICEF
- University of Washington
- US CDC
- USAID
- WHO
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