



# East African Community Cloud

Draft Costed Implementation  
Plan

October 9, 2023



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## OVERVIEW

The EAC Regional Digital Strategy is a cross-sectoral digital transformation initiative to improve service delivery in the EAC. The initiative brings together governments of the EAC Partner States, the private sector, and development partners to create a robust ICT and enabling environment for digital services and innovative applications. One such implementation is the **East African Community Cloud (EAC Cloud)**, a regional multi-sectoral cloud hosting environment. The EAC Cloud implementation also represents the EAC Regional Digital Strategy's initial use case implementation for the health sector. It creates the regional foundational digital assets and capabilities for future use case implementations to support the development of the regional Shared Services Platform to deliver regional e-services to EAC community citizens.

The EAC Cloud is a technology-driven, interoperable, multi-sectoral information system designed to enable real-time storage, capture, analysis, and retrieval of Partner State data across the region. The EAC Cloud builds sectoral specialisation or verticalisation within the current EAC regional data centre based in Arusha, Tanzania. This sectoral specialisation of the EAC Cloud represents the health instance of the EAC Cloud and is referred to in this document as the EAC Cloud. While the specific data stored will evolve to align with regionally approved sectoral use cases, the initial use case implementations are for the health sector. Therefore, this costed implementation plan is for implementing health-related assets and capabilities to support the delivery of health-related e-services and critical foundational sector-agnostic assets and capabilities required to develop the EAC Cloud's health instance and the Shared Services Platform.

The EAC Cloud will initially prioritise aggregate health data and the Regional Disease Surveillance System (READSCoR) use case requirements to support population-level surveillance. The health-specific data may eventually encompass information related to access to care, care delivery, health worker mobilisation and training, supply chain management, public health statistics, and surveillance and response information. Further, the EAC Cloud will create a handful of needed assets built on existing digital global goods available for all countries to use (e.g., disease registry<sup>1</sup> (DR), terminology service<sup>2</sup> (TS) [including data dictionary], and master facility registry<sup>3</sup> (MFR)). Through its implementation, the EAC Cloud will strengthen the region's digital infrastructure by implementing regional technology infrastructure standards, software, and hardware.

Regional legislation and policies will be established, and existing ones strengthened (e.g., regional cyber security policy). For example, a regional data protection and privacy law and formal data-sharing agreements and protocols across the Partner States will be established, adhering to ethical data practices, including data security, privacy, and confidentiality.

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<sup>1</sup> A disease registry is a population-based registry containing records of people diagnosed with a specific type of disease.

<sup>2</sup> A terminology service provides a centralized source for standards and definitions, including terminologies, ontologies, dictionaries, code systems, and value sets.

<sup>3</sup> A health facility registry is a central authority to collect, store, and distribute an up to date and standardized set of facility data.

To ensure effective coordination and management of the EAC Cloud, centralised oversight from the Secretariat, the East African Science and Technology Commission (EASTECO), the East African Health Research Commission (EAHRC), and other regional governance bodies will be established. These bodies will guide the overall architecture, development, implementation, and management of the EAC Cloud and the Shared Services Platform. Partner States will maintain their national cloud infrastructure or be supported to develop and host data in a virtual data centre within the EAC HQ Data Centre. Partner State data centres will be interconnected to the EAC Cloud to form a federated network, enabling data sharing for consumption and analysis.

This costed implementation plan details the EAC Cloud vision and goals. It describes how the EAC Cloud will be operated and managed and the resources required for its successful implementation. This plan also identifies risks to implementation measures of success and presents a high-level implementation timeline. The plan is supported by an Excel-based costed implementation plan detailing the activities and associated costs required to implement the EAC Cloud.

## **VISION AND GOALS**

Together, and under the mandate of The Secretariat, EAHRC, and EASTECO, the EAC Partners will set up the EAC Cloud hosting environment, providing the initial development of the regional Shared Services Platform. The regional Shared Services Platform is the collective set of technologies to host digital applications and services designed using an Enterprise Architecture approach. When designed using Enterprise Architecture, these follow a common design and implementation framework, or “blueprint.” As a result, applications and services available through the platform utilise shared resources, are interoperable where needed, and conform to agreed-upon standards. This enables efficient scaling and wide adoption of digital tools and services.

A select group of digital assets is required to support the health-sector use case implementation of the EAC Cloud. It will be built on existing regional infrastructure (e.g., EAC HQ Data Center) and contextualised digital public goods available for all countries.

The outputs of this implementation will enable national governments, regional bodies, and other stakeholders to securely access, adapt, and sustainably implement these fundamental digital assets to improve digital health environments and digital infrastructure at the Partner State and regional levels.

More specifically for the health sector, these digital assets contribute to overall health information system strengthening and the improvement of the delivery of health services. Utilising data in health programs and conducting rigorous health research requires such digital assets for managing information critical to health-system performance. This information includes details about health facilities, disease registries, performance indicators, and other data in point-of-care and management information systems. Priority digital assets for national health information management, as recognised by the International Telecommunication Union (ITU) and leaders in global health, include the master

facility registry (MFR), health data dictionary hosted in a terminology service (TS), and a disease registry (DR), which will be adapted and contextualised for regional and Partner State use.

With the support of the Regional EAC Digital Strategy's health sector governance body, led by the Secretariat EASTECO and the EAHRC, these contextualised tools will be made available to Partner States through the EAC Cloud as pre-packaged, configurable solutions, complete with regional support for implementation and institutionalisation. Data from these solutions and aggregate, anonymised Partner State health data will be shared with the EAC Cloud. More specifically, the EAC Cloud will provide five years of pre-populated Partner State health data for immediate use across the region. Overall, the EAC Cloud will improve regional and Partner States' ability to manage and use health data to inform regional health planning and performance management; improve public health decision making (e.g., early outbreak detection and response through READSCoR); provide regional data for research purposes; and strengthen regional digital infrastructure.

### Pre-populated Partner State health data

Five years of pre-populated Partner State health data will be of significant value to researchers, institutions, and other practitioners, with longitudinal aggregated data providing population-level indicators of health outcomes that can support regional public health practices, disease surveillance, and clinical research.

## VALUE

Creating and institutionalising the EAC Cloud is a core component of the EAC's Regional Digital Strategy and its initial use case in developing the regional Shared Services Platform. The EAC Cloud's health sector implementation will ultimately enable real-time storing, capturing, analysing, and retrieving of health data across the region and create the infrastructure for future sectoral use case implementations. This implementation will lay essential foundations for achieving this vision by providing and adopting important digital health components across Partner States. It also accelerates future sectoral specialisation of the EAC Cloud as additional sectoral use cases are approved for implementation.

In addition, the best practices and wealth of experience gained in deploying the EAC Cloud and digital assets throughout a region hold global value. These lessons learned through implementing a regional cloud that also supports the EAC's regional Shared Services Platform, designed through the Enterprise Architecture approach, can be exported to the benefit of many other countries worldwide.

## PURPOSE

This implementation plan, level of detail, and contents will be a vehicle for mobilising the required human, financial, and technical resources to develop and implement the initial EAC Digital Strategy use case, including the EAC Cloud along with the necessary health-sector and sector-agnostic digital assets and capabilities. It serves as a roadmap to operationalising this critical foundational component

of the EAC Regional Digital Strategy and making the EAC Cloud and regional Shared Services Platform a reality.

This implementation plan is not intended to serve as a work plan or action plan for implementing the EAC Regional Digital Strategy or use cases yet to be adopted and approved through the EAC Shared Services Platform governance structures.

## KEY OUTCOMES

This implementation will achieve **critical outcomes** at the Partner State, regional, and global levels:

- **At the Partner State level:** Improved health data management and use to inform planning, performance management, and delivery decisions within the EAC community. Developed virtual data centres and services for Burundi, DRC, South Sudan and EAC Cloud connection to National Data Centres. A suite of adapted digital public goods (e.g., DR, MFR, TS) for Partner State implementation.
- **At the regional level:** Improved and collaborative approach between the EAC Partner States to manage and use health data to inform regional health planning and performance management. Improved regional public health decision-making through (e.g., early outbreak detection and response through READSCoR) data extracted from EAC Cloud. Regional-level research with access to a broader set of data for deeper insights. Operationalised EAC Cloud hosted in the EAC HQ Regional Data Centre and the regional Shared Services Platform.
- **At the global level:** Global access to learnings (e.g., white paper), a suite of adapted digital public goods (DR, MFR, TS), and sharing of regional data with global public health agencies (Africa CDC, US CDC, WHO). All necessary software components, architectural blueprints, training materials, resources required to customise for regional context (e.g., use guide), and a high-level plan for implementing and adopting regional digital assets to deliver regional e-services through a Shared Services Platform beyond the EAC.

Lastly, monitoring and evaluation (M&E) are critical to the success of creating a Shared Services Platform because the lessons and experiences of the EAC Cloud will require thorough tracking and analysis to gain an understanding of how to replicate the implementation elsewhere, as well as to understand how the creation of a Shared Services Platform will have an impact on health systems in the EAC region. (Please see the Measuring Success section for more detail on the approach to this programme component.)

## APPROACH TO IMPLEMENTATION

At the core of the EAC Regional Digital Strategy is creating a shared regional digital platform, the Shared Services Platform, through which digitally enabled services can be provided at scale across all Partner States. The central methodology employed in the design and implementation of the platform is an Enterprise Architecture approach. The approach aligns business processes and IT systems to develop a strong enabling environment, digital assets, and capabilities to achieve its vision, mission, and goals.

This implementation follows the Strategy's approach to building a supportive enabling environment and implementing regional assets and capabilities necessary to provide a secure, comprehensive regional Shared Services Platform for effective and efficient cross-sector e-services.

Over four years, partners will undertake a five-phased approach to designing, developing, implementing, and scaling the EAC Cloud and the requisite digital assets and capabilities to achieve the vision and goals, following EAC protocols to develop regional digital capabilities.

Consistent with an Enterprise Architecture approach, the EAC Cloud will be designed and built through an interactive and holistic view of the EAC's current state of the digital ecosystem, including the processes, information systems, and technology infrastructure.

A regional assessment of the current Partner State digital assets and capabilities was performed to inform the development of the EAC Regional Digital Strategy, this implementation plan, and the READSCoR implementation plan. The assessment recognised the region's digital maturity variation and the progress each Partner State is making in its digital evolution. Investment and development of digital assets and capabilities continue in each Partner State; however, challenges to providing needed infrastructure, digital assets and abilities, and supporting legislative, policy, and governance environments remain.

The implementation plan creates many digital and non-digital resources and capabilities to support the EAC Cloud implementation. Combined with these are laws and policies, structures for governance, and shared digital assets to be developed, implemented, and managed by the EAC Cloud.

The approach to implementing these digital and non-digital resources and capabilities is to utilise the well-established protocols and processes within the EAC, as the community is intimately involved in developing and implementing regional assets and services.

More specifically, the implementation plan harmonises the legal and policy environment by utilising the established EAC protocols to develop, approve, and operationalise key legislative and policy documents needed for the EAC Cloud. The implementation plan also sets the requisite regional governance bodies required to create and implement the EAC Cloud and operationalise the Shared Services Platform through these established EAC protocols.

The implementation approach builds off existing regional digital assets and capabilities already within the EAC to develop a host of digital assets needed to implement the EAC Cloud. For example, digital public health goods (i.e., MFR, TS, and DR) will be adapted for Partner State use, and their whole-resolution components will be made available on the EAC Cloud, hosted by the existing EAC HQ Data Centre.

All downloadable components and a regional instance will be developed, managed, and updated through the Secretariat's ICT function. Partner States can choose between downloading and implementing their Partner State-specific instance of the MFR, TS, or DR or utilising the regional

instance. If desired, Partner State-specific instances will be made interoperable with the regional instance, allowing for the eventual sharing of all information. At the same time, virtual data centre environments will be created for Burundi, DRC, and South Sudan within well-established and physical data centre facilities already in the EAC. Such virtual data centre environments will allow Burundi, DRC, and South Sudan to host and fully manage their Partner State data and data sharing with the EAC Cloud in the near term. The virtual data centre environments will be hosted on The Secretariat's EAC HQ Data Centre.

A vital component of this work will be identifying best practices, lessons learned, and key learnings on implementing and using the EAC Cloud and other digital assets developed through this implementation plan. A parallel effort will be taken alongside the regional implementations to document and socialise these details amongst the digital health and international development communities. These inputs will also be incorporated into a high-level plan and guide for Partner State adoption and implementation by creating replicable processes to implement future use cases successfully.

## Implementation Outputs

Therefore, the primary achievements from this implementation include:

- **A roadmap** for developing the digital assets (sector-agnostic and health-sector-specific) and capabilities for centralised hosting of the EAC Cloud and the Shared Services Platform.
- **Adoption and implementation of the critical regional digital assets** (sector-agnostic and health-sector-specific) and capabilities required to implement the EAC Cloud.
- **Three regionally adapted shared assets** (e.g., master facility registry, terminology service, and disease registry) using global digital health public goods, as selected and agreed upon through established EAC governance protocols of the regional EAC Digital Strategy.
- The development and operationalisation of **the EAC Cloud's** health instance hosted at EAC HQ Data Centre to store, access, and utilise Partner State health data. Partner States will influence regional best practices identified by the OpenHIE community and other resources such as Instant OpenHIE.
- **Development of virtual data centres** for Burundi, DRC, and South Sudan to support their efforts in participating in the EAC Cloud and the regional Shared Service Centre.
- Development of **functionality applicable for future use cases** that facilitates planning, management, and data use in areas that would benefit from increased regional cooperation (e.g., sharing best practices, planning related to facilities or workers in border regions, or disease outbreak tracking).

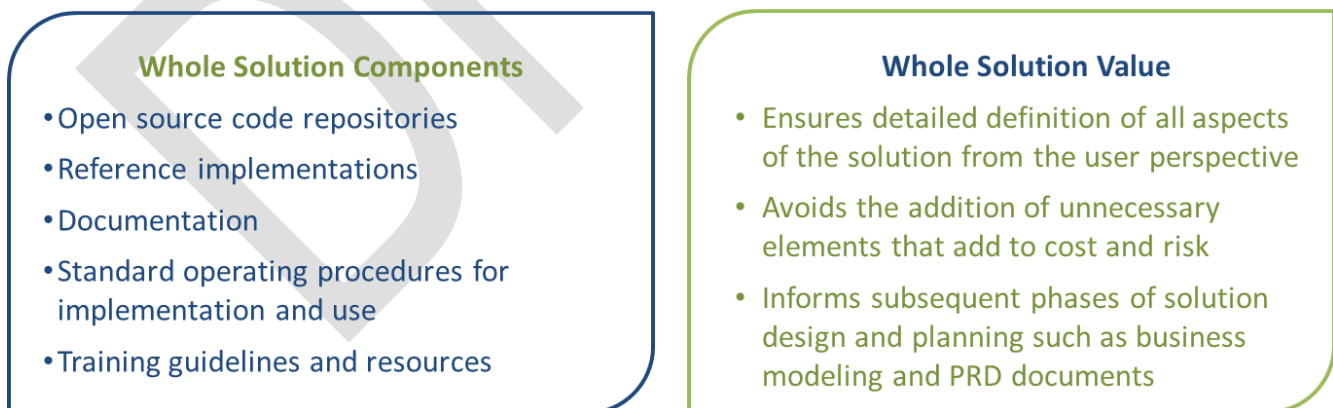


- **High-level plan** of replicable processes for developing, implementing, and adopting regional digital assets and capabilities to support **future use case implementations** and the Shared Services Platform beyond the EAC.
- **Documentation of EAC experiences** in developing the regional digital assets and capabilities for the EAC Cloud and Shared Services Platform. In addition, regional collaboration and identification of opportunities for broader availability and use of the EAC Cloud and Shared Services Platform outside the EAC (e.g., whitepaper).

The EAC Cloud will be developed through a collaborative approach that solicits continuous input and direct contribution by EAC governance bodies and mechanisms, implementing partners, technology providers, and global experts. Each partner within the consortium will bring a set of complementary technical skills and approach to achieving results, including experience in designing, implementing, and scaling digital assets and capabilities, stakeholder management, data use, business processes, capacity building, and a vast network of technology vendors, local expertise, and global digital health experts. Furthermore, the consortium is designed to employ a flexible and adaptive approach. This means that activities and even technical expertise can be realigned to fit the specific Partner State needs, priorities, and individual contexts as the life of the EAC Cloud and Shared Services Platform evolves.

In addition, partners will develop the “whole solution” for the EAC Cloud and shared regional assets from existing tools, including existing Partner State implementations and open-source digital public good software (Figure 1). The whole solution includes technical and, often, the more critical, non-technical aspects of a digital solution. The whole solution will consist of elements such as training materials, standard operating procedures, and other resources to ensure solution uptake and scale.

**Figure 1: Whole Solution Approach to Digital Solution Development**



Partners will employ an iterative feedback loop between the development of the EAC Cloud and shared regional assets at the EAC and global levels, ensuring optimal value is created for all parties.

Ultimately, this implementation and its outputs will empower Partner State governments, regional bodies, and other stakeholders to securely access, adapt, and implement these fundamental digital assets to improve digital health environments at the Partner State and regional level within the EAC and globally.

## Overall Scope of Work

This work will be broken up into five phases. These phases focus on designing and creating the ICT and enabling environment for deploying the EAC Cloud and the associate technologies. However, it is recognised that the timeline and staggering of implementations may be modified based on the design phase and how the initiative unfolds over its lifespan. Per the national consultations and a regional feasibility assessment, it is evident that each Partner State has a varying level of digital health infrastructure, unique barriers and constraints, and overall maturity of the health system that will need to be considered.

The below section provides a high-level overview of the phasing of the activities required to implement the EAC Cloud and the operationalisation of the Shared Services Platform through its implementation. This implementation plan is also supported by an activity-based costing plan describing the costing activities and assumptions for five phases.

### Phase 1: Design to Execution (~6 months)

The design phase will address the work's complexities, help mitigate associated risks, refine programme requirements, develop a refined implementation plan, and streamline implementation and uptake. Over six months, the Regional Digital Strategy health governance body led by EASTECO, EAHRC, the Secretariat, and its partners will identify and assess areas to increase potential programme impact, reduce risk and further socialisation, and obtain regional buy-in to the Regional Digital Strategy and the EAC Cloud implementation. This includes initial planning to procure software, hardware, and other equipment requirements. This phase aims to develop a detailed blueprint that speaks to a finer level of detail on how the EAC Cloud and its foundational sector-agnostic and health-sector-specific assets and capabilities will be developed and implemented across the EAC Partner States.

### Phase 2: Leadership and Governance (~9 months)

A comprehensive set of activities will be undertaken to ensure effective regional governance. The first step involves developing an inclusive and robust regional digital governance structure and management framework that will serve as a guiding mechanism for developing and implementing the EAC Cloud and selecting, developing, and implementing digital assets that support it.

This framework will define a governance structure that outlines clear roles and responsibilities for all participants. Procedures and guidelines will also be established to facilitate the active involvement of EAC partner states in the technical, programmatic, and operational aspects of regional shared digital platforms. In addition, monitoring and evaluation criteria will be developed to assess the implementation

progress for these shared platforms, ensuring transparency and accountability. Once the framework is complete, it will undergo validation and approval to ensure its effectiveness and gain broad acceptance.

Furthermore, a series of activities will be undertaken to operationalise the regional governance framework. Firstly, the Secretariat will serve as the central hub for coordinating and facilitating the implementation of the EAC Cloud and the Shared Services Platform the implementation creates. Its responsibilities will include overseeing the technical aspects, ensuring programmatic alignment, and providing operational support to all participating entities.

In addition to the Secretariat, a dedicated governance body for the health sector led by EAHRC will be formed within the regional framework. This body will comprise cross-sectoral Partner State members, such as Ministries of Health and National ICT authorities. A collaborative and comprehensive approach to addressing health-related challenges through digital solutions will be ensured by including representatives from different sectors.

### Phase 3: Legal and Policy (~9 months)

This phase will create a cohesive legal and policy environment across the Partner States to ensure a strong foundation and enabling environment that supports the successful development, implementation, and operation of the EAC Cloud and the Shared Services Platform. To develop a cohesive legal and policy environment in key areas, including data protection and privacy, data sharing, cybersecurity, cloud usage, and digital inclusion, several steps will be taken to develop, validate, facilitate approval, operationalise, and socialise the regional legislation and policies required for the EAC Cloud.

First, **stakeholder consultations** involving EAC and Partner States representatives will be conducted. These consultations foster collaboration and gather insights from diverse perspectives, ensuring the policy development process is inclusive and comprehensive.

Following the consultations, the **requirements for the regional policies will be gathered**. This involves identifying the specific needs and expectations of the EAC and Partner States regarding data protection and privacy, data sharing, cybersecurity, cloud usage, and digital inclusion within the region. These requirements will serve as the foundation for the policy development process.

A thorough review of existing Partner State policies will be conducted to ensure alignment and coherence. This review will identify commonalities, areas of convergence, and potential gaps or inconsistencies that need to be addressed in the regional policies.

Based on the stakeholder consultations, requirements gathering, and policy review, the next step will be to develop regional policies. These policies will outline the principles, standards, and guidelines to be followed by the EAC and Partner States in data protection and privacy, data sharing, cybersecurity, cloud usage, and digital inclusion within the region.

Validation and approval of the policies are crucial to ensure effectiveness and broad acceptance. This involves seeking input and feedback from relevant stakeholders, including legal experts, privacy

advocates, and government representatives. After incorporating their insights and recommendations, the policies will be refined and finalised.

Once the policies are approved, they will be operationalised and socialised across the region. This includes disseminating the policies to all relevant stakeholders, raising awareness about provisions, and ensuring adoption and adherence by the EAC and Partner States.

Joint efforts will align national legislation and policies with regional policies, creating a harmonised legal and policy environment. This cooperation will facilitate a consistent and replicable implementation process driving adoption across the region, enhancing data protection and privacy, data sharing, cybersecurity, cloud usage, and digital inclusion practices.

## Phase 4: Shared Digital Assets and EAC Cloud (~18 months)

Phase 4 involves several activities that culminate in the Shared Services Platform. These include the design, development, and implementation of multiple shared regional digital assets and capabilities to support the development and implementation of the EAC Cloud following the EA approach.

First, an EAC Enterprise Architecture framework to support the Shared Service Platform will be developed and informed by data collected during the national consultations. Supplemental data will be gathered for additional insights and inputs from EAC organs, institutions, and Partner States as needed. The framework will be developed based on these inputs, outlining the regional principles, standards, and guidelines for shared digital services. The framework will then undergo validation, ensuring approval among stakeholders.

In addition to the enterprise architecture framework, a regional interoperability framework will be developed and informed by existing Partner State frameworks identified during the national consultations. Stakeholder collaboration will be conducted to gather additional inputs from regional and Partner State representatives. The framework will facilitate integration and interoperability between services and applications across the Shared Services Platform. After development, the framework will undergo a validation and approval process.

Standardised DevOps tools and processes will be developed to support the implementation and deployment of the EAC Cloud and future use cases. Using open-source digital health public goods software, regionally shared assets, including the MFR, TS, and DR, will be created, adapted to the regional context, and populated with relevant data. Noting the selection of digital public goods will follow established EAC governance protocols to select the product and procure any necessary vendor contracts.

The EAC Cloud will then be designed based on input from consultations with EAC and Partner State stakeholders. The capabilities of the EAC Cloud, such as authentication and authorisation, interlinking and routing services, and data storage, will be defined. Additionally, functional and non-functional requirements for all components of the EAC Cloud, including registries, business services, dashboards,

and health information mediators, will be specified. Health-specific security measures will also be outlined.

Next, a health interoperability framework and platform will be developed. This will involve defining the Health Information Mediator's (HIM) architecture to enable interoperability between disparate health information systems operationalising the regional health interoperability platform. A data pipeline vendor will be identified and secured to facilitate data exchange and integration.

A comprehensive health data management strategy will be developed to ensure effective health data management. This will involve defining standard operating procedures for data capture, processing, and storage, establishing data sharing agreements and templates, and structuring the data management layer to help enforce data management policies.

Security and privacy guidelines and tools specific to health data will also be developed to safeguard the confidentiality and integrity of the information. Countermeasures such as cryptography, digital signature, firewall, user identification and authentication, intrusion detection, virus protection, and data and information backup will be defined and implemented.

Finally, the infrastructure necessary to set up the EAC Cloud with health-sector specialisation will be established in the EAC HQ Data Centre. This process will identify the specific requirements and regulations of the health sector, such as health compliance standards, health security protocols, and health sector-specific data handling requirements and protocols. The information will then be used to design and implement the regional health data centre infrastructure tailored to meet the unique needs of the health sector, including any specialised software, hardware, and network configurations. The strategy may also involve data migration from the regional data centre to the sector-specific data centre, e.g., COVID data in the Regional Electronic Cargo and Driver Tracking System. Extensive testing and quality assurance will be conducted to ensure the reliability and performance of the infrastructure. Once established, Partner State health data will be preloaded onto the system.

This phase also develops the needed infrastructure, specifically virtual data centres in Burundi, DRC, and South Sudan, as they lack national data centres. These Partner States will host their national data in their respective virtual environments in the EAC HQ Data Centre. The activities to design, develop, and implement the virtual data centres for Burundi, DRC, and South Sudan will be established in coordination with Partner States and the Secretariat.

## **Phase 5: Deployment, Scale-up, and Institutionalisation (~6 months)**

This phase deploys the EAC Cloud to National Data Centres and virtual data centres and provides the regional shared digital assets for Partner State use through the Shared Services Platform.

Additional centralised capital and distributed equipment will be procured for the cloud-hosting server environment with the requisite failover redundancy and disaster recovery. Secondly, the necessary connectivity infrastructure will be established, with a budget set aside to support efforts already

underway for electricity, cloud hosting, and connectivity to the Partner States, including broadband access.

Several implementation activities will occur once the cloud-hosting environment's equipment and infrastructure have been established. These include the initial configuration of settings, user accounts and data configuration involving data migration and custom scheme or data type setup. Regarding integration and interoperability, communication and standards compliance between the cloud system and existing systems will be established.

Following the deployment of the EAC Cloud, Standard Operating Procedures (SOPs) will be developed along with a comprehensive training framework, including a training curriculum and material, as well as end-user support.

## Designing Digital Assets for Long-Term Sustainability

As with any digital development initiative, long-term sustainability is a critical question that must be addressed as early as possible in the initiative's design and implementation. This includes technical, environmental, and financial sustainability. The approach to this initiative places a primary emphasis on sustainability to ensure that the outcomes of this work will continue to be realised beyond its current timeframe and funding. There are several critical success factors addressed to contribute to the long-term sustainability of this initiative:

- **Prioritization of digital public goods:** The shared regional digital assets developed for implementation will use a suite of digital public goods where possible. These solutions are not bespoke but built upon existing tools and initial infrastructure already available globally or within the EAC. With the support of the Secretariat, EASTECO and EAHRC, these tools can also be made available to Partner States through the EAC Cloud as pre-packaged, configurable solutions (e.g., MFR), complete with regional support for implementation and institutionalisation. In addition, the best practices and wealth of experience gained in deploying these shared assets in the EAC region hold global value. These lessons learned and adapted digital public goods can be exported to the benefit of many other countries around the world.
- **Regional ownership:** The original vision and mission for the Strategy was conceived within the region itself and is a driving force in creating the strategic and implementation plans. The Secretariat's ICT function owns the Strategy, which will drive the effort forward, leveraging support from key partners. The Secretariat's ICT function will hire the necessary programme staff to oversee the initiative and move implementations forward over the long term.
- **Solidified commitment:** The EAC and Partner States approved the DRI Strategic Plan's EAC Cloud implementation, which this implementation plan achieves. In addition, the Partner States are in the final stages of validating the EAC Regional Digital Strategy, which was developed in collaboration with over 100 Partner State representatives through established EAC protocols. The EAC is a unique regional body in which decisions ratified at the regional level are legally binding to all seven Partner States, such as implementing the EAC Cloud. The EAC and its headquarters in Arusha are also seen as neutral regional actors, which will further aid the long-term success of this work. This collective commitment will lead to a more

expansive and robust digital health foundation for each Partner State and the EAC, which is critical to long-term success.

- **Capacity strengthening:** A fundamental tenet to the success of the EAC Regional Digital Strategy will be capacity building at the regional and Partner State level. Although the initiative includes Vital Wave as a technical partner, emphasis will be placed on maximising and building upon local talent. Vital Wave is well-versed in what can be called a “lead-from-behind” approach. Prime examples of this were Vital Wave’s work in Ethiopia and Zimbabwe. In Ethiopia, the firm embedded technical experts within the Ministry of Health to work alongside their team in completing the initiative’s activities. This allowed for the transfer of skills and a hands-on process to improve the skill set of in-country staff, specifically the MOH technical staff. This approach ensured that the foundational health system components (e.g., health facility registry, data dictionary) and other initiative aspects would live on and are still used today. Over the last two-and-a-half years in Zimbabwe, Vital Wave has provided strategic technical assistance to the Zimbabwean Ministry of Health and Childcare (MoHCC) as they implement and scale their national electronic health record (EHR), Impilo. Vital Wave has a strong team of technical experts who work from the MoHCC to support the implementation of the technical roadmap. This includes direct capacity-building efforts such as specialised training and development of standard operating procedures (SOPs) and technical advisory support on approaches and tooling. These initiatives have matured the local software development process and built local knowledge and expertise on data standards (e.g., FHIR/HL7) and security practices (vulnerability assessment and penetration testing (VAPT)).
- **Incentives and efficiencies:** In the context of this proposed work, adoption and institutionalisation will be the most challenging and critical for success. As such, incentives for adoption are a key component of the whole solution. Through the implementation, the Partners will refine the incentives for Partner States to adopt and utilise the EAC Cloud and host the shared regional assets (Table A). A key part of this is the efficiencies created through shared digital assets and the EAC Cloud. What each Partner State can achieve by working together is much larger than that on its own.

**Table A: Incentives for Adoption and Regional Hosting**

Incentives for member states to adopt common goods	Incentives for member states to host in the EAHRC
<ul style="list-style-type: none"> <li>• <b>Aggregate demand for new features</b> from member states can influence technology providers to develop core improvements to chosen software platforms. Results in improvements for all member states instead of duplicative investment to customize individual, country-specific implementations.</li> <li>• <b>Direct, regional technical support</b> to member states using common goods including upgrades to core software. Country-specific implementations are often heavily customized, which may make it difficult or impossible to upgrade the software over time. Region can facilitate further support from the open-source software communities behind the software selected for common goods.</li> <li>• <b>Portability of technical human resources.</b> Member state staff able to assist other EAC member states more easily, given their familiarity with key software tools.</li> <li>• <b>Industry standards in security and data protection</b> that adhere to regional and member state laws. Ongoing updates to local legislation may make it illegal or cost-prohibitive for legacy systems to continue collecting personally identifiable information, in which case hosting in the EAHRC will ensure legal compliance.</li> <li>• Aligning health worker certifications across the region and standardizing the digital representation of certifications through use of common HWRs will improve the portability of health workers and their skills, <b>allowing more free movement of health workers across the region</b>, notably, to support public health emergencies.</li> <li>• Use of a common regional DD and TS, or harmonizing and mapping country DDs with each other and global data standards may make <b>reporting to WHO and other international donors easier</b>, and facilitate cross-border information exchange for disease surveillance, another EAC Digital REACH priority'.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Free or low-cost hosting</b> of country-specific common good instances. Incremental costs for hosting additional instances are covered by the region or shared across member states, resulting in lower costs than member states would incur if hosting alone.</li> <li>• <b>Free or low-cost server and software maintenance</b> can be provided by regional staff, eliminating the need for dedicated country-level system administrators, or allowing country-level staff to take on varying levels of responsibility to build their capacity while supported by a regional-level backstop.</li> <li>• <b>Increasing value and quality of regional technical support</b> as more systems are supported and knowledge and experience of regional tech support staff increases. Regional tech support can work together with country-level tech support staff.</li> </ul>

## RESOURCES REQUIRED

### Partner Role and Scope

The primary partners within the consortium have been involved with the Regional Digital Strategy since its inception. Years earlier, these partners also collaborated on developing and ratifying the ten-year Digital REACH Initiative Strategic Plan. Led by the EAHRC and with ongoing support from EASTECO, the Secretariat, and Vital Wave, the consortium's work has created a solid foundation upon which this implementation can be built. Collectively, the skills and expertise of the consortium members are uniquely positioned to deliver the activities described and set the overall initiative for long-term sustainability.

### The Secretariat: Lead EAC Partner

The East African Community (EAC) is a regional intergovernmental organisation whose mission is to widen and deepen economic, political, social, and cultural integration to improve the quality of life of the people of East Africa through increased competitiveness, value-added production, trade, and investment.

As the East African Regional Economic Community, the EAC co-operates, negotiates, and collectively determines legislation and policy that are legally binding at the national and regional levels. EAC's ultimate goal is to have a Political Federation of the East African countries. This process is guided by four pillars of integration: a Customs Union, a Common Market, a Monetary Union, and a Political Federation.



The EAC Digital Strategy calls for the Secretariat’s ICT function to be the mechanism for regional coordination, development, deployment, and management of the regional Shared Services Platform. The Secretariat is mandated to manage the Shared Services Platform; as such, its ICT function will operate as this EAC organ. (Table B) and oversee and manage the development and deployment of the EAC Cloud and Shared Services Platform.

**Table B: EAC Secretariat Role**

Phase 1: Design	Phases 2 & 3: Legal, Policy, and Governance	Phase 4: Shared Services Platform Development	Phase 5: Rollout and Institutionalization
<ul style="list-style-type: none"> <li>• Co-lead EAC partner discussions</li> <li>• Socialise the Regional Digital Strategy and the EAC Cloud implementation</li> <li>• Gain active participation and further commitments from Partner States</li> <li>• Support legislation, policy, and governance activities</li> <li>• Begin procurement processes</li> </ul>	<ul style="list-style-type: none"> <li>• Drive EAC protocols for regional meetings</li> <li>• Support the design of the governance framework</li> <li>• operationalisation and staffing</li> <li>• Support regional legislation and policy efforts</li> <li>• Socialise governance bodies and newly approved laws and policies</li> </ul>	<ul style="list-style-type: none"> <li>• Drive EAC protocols for regional meetings</li> <li>• Support EA framework development and implementation</li> <li>• Support applications and services assets development and implementation</li> <li>• Support data and infrastructure asset development and implementation</li> <li>• Socialise the EAC Cloud and Shared Services Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Support the EAC Cloud deployment</li> <li>• Support Partner States onboarding</li> <li>• Co-identify additional use cases and needs</li> <li>• Communicate progress and ensure cross-border learning</li> <li>• Cultivate relationships in all areas (geographically)</li> </ul>

**EASTECO: Lead EAC Partner**

The EASTECO is established to develop and implement regional science, technology, and innovation (STI) policies, programmes, and projects. The EASTECO is the principal advisory institution to the EAC on the development, adoption, and utilisation of ICT technologies. The EAC organ also mobilises resources for science, technology, and innovation in the EAC and promotes the STI centres of excellence in the Community. Its vision is to contribute to a prosperous, competitive, secure, and united East Africa through science, technology, innovation, and collaboration.

The EASTECO skills in stakeholder management, knowledge of the region, and the technical expertise it holds within its organisation will also enable it to work with each Partner State in developing and implementing the EAC Cloud and the sector-agnostic assets and capabilities.

## **EAHRC: Lead EAC Partner**

The EAHRC is established as a mechanism for making available to the Community advice on all health matters and health-related research and findings necessary for knowledge generation, technological development, policy formulation, practice, and other related issues. EAHRC is the principal advisory institution to the EAC on Health Research and Development (R&D). Its vision is high-quality health research to improve the health and well-being of the people of East Africa. The mission of EAHRC is to coordinate, conduct, and promote the conduct of health research in the region and source, gather, and disseminate findings from research for policy formulation and practice.

Therefore, the EAHRC focuses on improving EAC's citizens' health as a tangible approach towards poverty eradication. It coordinates efforts that guide the provision of safe, high-quality, affordable, and effective healthcare services in the region. The EAHRC worked across the region to garner inputs for and, ultimately, the approval of the Digital REACH Initiative's roadmap and strategic plan. This included gathering information from EAC Partner States, EAHRC Commissioners, EAHRC National Focal Point's experts, health experts, ICT and eHealth government officials from EAC Partner States, non-governmental organisations, and development partners. The EAHRC's skills in stakeholder management, knowledge of the region, and technical expertise will enable it to work with each Partner State in implementing the EAC Cloud for the health sector along with the regional shared assets (e.g., MFR, TS, DR) hosted on the EAC Cloud.

## **Vital Wave: Primary Implementing Partner**

Through a formal Memorandum of Understanding (MOU) with EASTECO EAHRC and Vital Wave, the EAC has recognised Vital Wave as the EAC's primary partner to implement the DRI Strategic Plan, develop and implement the EAC Regional Digital Strategy/Agenda, EAC Enterprise Architecture, and the establishment of an Innovation Hub that serves as a Centre of Excellence to enable a shared digital platform to deliver e-services across the region.

Vital Wave is a recognised leader in digital health solutions and works to address system issues through digital technology in low- and middle-income countries (LMICs). With 18 years of experience, Vital Wave has collaborated with major technology firms, foundations, and international development organisations to create and scale health technologies sustainably. The company specialises in designing and implementing digital health solutions at a national scale, particularly in low-resource environments across Africa, Latin America, and Asia.

Vital Wave fosters a culture of data use through foundational systems and change management processes. They have been engaged by the Bill and Melinda Gates Foundation to enhance data utilisation in health system management in Malawi and Ethiopia, contributing to strategic planning, national strategy development, and interoperable information exchange. The firm also emphasises using open-source tools and digital public goods, with experience in implementing and exploring their benefits and limitations and actively participating in global discussions, such as active participation in the OpenHIE community.

For this programme, the firm will create a team of global and local experts well-versed in digital health, East Africa, solution design and implementation, capacity building, and prior experience working with the EAHRC, EASTECO, and the Secretariat. Vital Wave will incorporate local experts as much as possible across all phases of the implementation (Table C) to ensure the transfer of skills and knowledge to the EAC region.

**Table C: Vital Wave Role**

Phase 1: Design	Phases 2 & 3: Legal, Policy, and Governance	Phase 4: Shared Services Platform Development	Phase 5: Rollout and Institutionalization
<ul style="list-style-type: none"> <li>• Lead the overall design of the Shared Services Platform</li> <li>• Support regional coordination and socialisation of the Regional Digital Strategy and the Shared Services Platform</li> <li>• Create materials to support further buy-in from Partner States</li> <li>• Drive initial planning for governance, legislation, and policy activities</li> </ul>	<ul style="list-style-type: none"> <li>• Lead the legislative and policy process from development to implementation and socialisation</li> <li>• Develop, validate, facilitate approval, operationalise, and socialise regional governance framework</li> <li>• Support the establishment of staffing</li> </ul>	<ul style="list-style-type: none"> <li>• Lead the overall development of the Shared Services Platform</li> <li>• Develop an enterprise-architecture framework</li> <li>• Develop whole solutions for selected digital public goods</li> <li>• Develop regional cloud hosting</li> <li>• Develop virtual data centres</li> <li>• Lead vendor coordination and management</li> <li>• Design training materials, SOPs, and other critical foundational materials</li> </ul>	<ul style="list-style-type: none"> <li>• Deploy EAC Cloud and Shared Services Platform</li> <li>• Lead initial implementation training</li> <li>• Set up a user support system</li> <li>• Identify and add additional use cases</li> <li>• Assist in building capacity around financing mechanisms and budgeting</li> <li>• Assist in expanding training and implementation</li> <li>• Develop and feed into global digital public goods</li> <li>• Lead broader socialisation</li> </ul>

## Estimated Timeline and Budget

It is estimated that this work will span four years. Table D (below) provides an overview of each phase's estimated timing. Note that, as mentioned, the timeline for uptake and use by each Partner State will depend on the progress of each Partner State, its current infrastructure, and other aspects that are not in the partners' control. However, partners are well-equipped to work flexibly and adaptatively with the Partner States to maximise the platform's value to each country within a minimum timeframe.

The implementation plan budget is developed through an activity-based costing plan. Costing assumptions, validated through multiple working sessions with key EAC partners and stakeholders, are critical to the costing plan. They are articulated for each costing category and its activities in a companion Excel-based file.

The total cost for this scope of work is \$13,090,197. The implementation plan budget was developed through an activity-based costing plan.

**Table D: Implementation Timeline**

Phase	2024				2025				2026				2027			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Phase 1: Design to Execution	Phase 1															
Phase 2: Leadership and Governance			Phase 2													
Phase 3: Legal and Policy					Phase 3											
Phase 4: Shared Digital Assets and EAC Cloud								Phase 4								
Phase 5: Deployment, Scale-up, Institutionalize															Phase 5	

## MEASURES OF SUCCESS

Monitoring and evaluation (M&E) are critical to the success of creating shared region digital assets. The lessons and experiences of the EAC Cloud will require thorough tracking and analysis to maximise performance over time, achieve platform sustainability, understand how the creation of shared regional digital assets impact health systems in the EAC region, and even gain an understanding of how to replicate the implementation in other geographies. This M&E plan, including identifying the most appropriate indicators, will be further validated and refined during the development of the regional governance framework.

The M&E for this programme aligns with the hypothesis that access to, and scaled implementation of, a set of technologies for managing information critical to health-system performance can contribute to improved health outcomes and programmatic benefits (e.g., improved research for regional-level early disease outbreak detections). The central challenges that this programme seeks to address relate to problems and inefficiencies with health data, data systems, and data use, including the lack of:

- High-quality data
- Access to data
- Capacity to use data
- Fundamental core components for national health information management

- Evidence that investing in data systems and use will drive health impact
- Funding to scale and integrate with other systems
- Knowledge of best practices and experience gained in the deployment of digital public goods

The M&E framework is designed around three primary outcomes grouped into the Partner State, regional, and global levels to ensure the programme activities support a wide range of benefits within the EAC and in geographies beyond. Specific and highly measurable outputs support the outcomes below.

- **Country-level outcomes** are focused on improved management and use of health data to inform planning, performance management, and delivery decisions within each of the seven Partner States, made possible by access to the digital health public goods and increased capacity and ownership by Partner State-level stakeholders to sustainably manage the systems.
- **Regional-level outcomes** seek to support an improved, collaborative approach between EAC Partner States to manage and use health data to inform regional health planning, performance management, and delivery decisions.
- At the **global level, outcomes** will ensure global access to, and learnings from, the implementation of a Shared Services Platform, inclusive of all necessary digital and non-digital assets (e.g., software and hardware solutions, components, training materials, and resources) required to operationalise a regional cloud and a Shared Services Platform. This will enable assets and lessons learned from the EAC region to be leveraged by LMICs globally, further extending the reach and impact of this three-and-a-half-year programme.

Partner States, EASTECO, EAHRC, and the EAC Secretariat will participate actively in M&E for this implementation. Recognising the importance of an M&E plan, the partners have included substantial hours in the scope of work for ongoing monitoring and evaluation efforts during the EAC Cloud implementation. Partners will examine existing M&E systems and processes and will work to develop a comprehensive M&E model, framework, and data tools. In addition, local institutions, such as universities, can be incorporated into the process, which will help build local capacity and ownership. Partners will look to build M&E results into regular reporting to the EAC and, where possible, tools and dashboards that provide real-time, dynamic views into digital public goods uptake.

The M&E will also include building an evidence base to demonstrate the impact of the EAC Cloud while sharing learnings across the region. This will make it possible to identify evidence of influence and apply that evidence in a way that structures and drives work on the regional enabling environment and subsequent use cases. Therefore, at its core, M&E is an evidence-based and implementation-science-led initiative.

Partner States will provide feedback on the innovative implementations to build the evidence base. A mechanism for standardising the collection and dissemination of evidence from implementations will be

developed to allow comparable insights across findings. Findings will be published in peer-reviewed journals.

## RISK AND MITIGATION STRATEGIES

Potential risks to the programme's success are considered in the programme design. This programme aims to work across various countries and stakeholders to improve access to and scaled implementation of software tools for managing information critical to health-system performance. In this context, applying enterprise-grade, programme-management best practices will reduce inherent execution risk. These best practices include validating assumptions, detailed planning and performance tracking, building solid relationships, and ensuring partnership transparency.

Additionally, various exogenous risks to the programme exist because of the low- and middle-income Partner State environments and the multi-stakeholder nature of this work. Further risk mitigation strategies, described below (Table E), will be developed in the design phase.

**Table E: Risk and Mitigation Strategies**

Potential Risks	Mitigation Strategies
<b>Cloud privacy and security:</b> Concerns on privacy and security of data collected	The EAC is seen as neutral. In addition, counties have a choice in terms of implementation, starting with hosting either in the EAC HQ Data Centre or locally.
<b>Sustainability:</b> Ensuring sustainable solutions that live beyond the life of the programme	The partners will create the whole solution, including essential aspects such as training, change management, and standard operating procedures. All the technical partners will also employ a “lead from behind” approach to implementation.

Potential Risks	Mitigation Strategies
<b>Adoption:</b> Ensuring adoption and uptake of solutions	Incentives for adoptions are a known challenge. However, regional implementation enables a set of efficiencies that no Partner State could experience alone. Partners have identified several incentives for the countries (which are highlighted earlier in this proposal).
<b>Multi-stakeholder nature of the programme:</b> Gaining buy-in and coordinating amongst all key stakeholders	All consortium partners have experience in stakeholder management and have worked with all stakeholders in previous phases of this work (e.g., the roadmap, strategic plan, and costing.)
<b>Diverse Partner State environments:</b> Each Partner State is at a different stage in terms of digital health implementation	All consortium partners have regional experience and work on digital health in low-resource environments. The Secretariat, EASTECO, and EAHRC will also bring an intimate knowledge of the local situation in each Partner State.
<b>Procurement:</b> The data centre infrastructure needed may be expensive	Partners will explore different strategies (e.g., using a cloud service provider such as Azure or AWS) and start the procurement process early if required.
<b>Infrastructure:</b> Internet connectivity is a commodity, and partners have no control over available bandwidth and cost	Partners will clearly understand bandwidth and connectivity needs at scale (upfront) and negotiate long-term agreements with network providers who support the potential for increased demand.