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PATH

Regional East Africa Disease Surveillance, Control and Response

Costed Implementation Plan

October 9, 2023

TABLE OF CONTENTS

OVERVIEW

The EAC Regional Digital Strategy ("the Strategy") is a cross-sectoral digital transformation initiative to improve service delivery across the EAC's seven Partner States. The initiative brings together governments of the East African Community (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 **Regional East Africa Disease Surveillance, Control and Response (READSCoR)** application. This digitally enabled surveillance solution will establish a mechanism for regional surveillance of disease outbreaks by leveraging the shared digital assets and capabilities developed through the EAC Regional Digital Strategy's EAC Cloud implementation. These regional assets and capabilities must be operational before the READSCoR implementation, as they represent foundational sector-agnostic digital and non-digital assets and capabilities (e.g., operationalised governance structures, regional legislation and policies, regional enterprise architecture framework, and technology infrastructure). The READSCoR implementation plan is derived from the East African Health Research Commission's (EAHRC) Digital REACH Initiative (DRI). This implementation plan further refines and validates the DRI work through national consultations with the Partner State's Ministry of Health officials during the development of the EAC Regional Digital Strategy. An accompanying activity-based costing plan details the costs to develop, implement, and manage READSCoR.

The READSCoR platform has been selected and further validated by the region as a priority use case because of the importance of regional collaboration in the face of disease surveillance and response. In the aftermath of the Ebola outbreak in West Africa and the global COVID-19 pandemic, new types of response mechanisms and protocols for epidemic control are needed. To stem these outbreaks before they begin, real-time data and analysis must be available for early intervention. This is an even greater priority given open borders and the free movement of people across EAC Partner State borders.

READSCoR will promote and enable the sharing of health data and active engagement across relevant Partner State ministries, regional bodies, and global organisations to ensure that outbreak detection and prediction data is readily accessible. READSCoR will partner with key stakeholders at the WHO and Africa CDC to assist with developing algorithms and creating alert and response activities. Notably, an underlying tenant of READSCoR is to protect personal information through the regional data protection and privacy legislation designed through the EAC Regional Digital Strategy. Legislation and policies will ensure that data are securely stored and shared responsibly.

READSCoR will be designed to operate on a multitude of data sources, beginning with aggregate and case-based data from existing platforms and integrating other data over time, such as drug and consumables supply and stock-outs, weather patterns, voluntary and involuntary human behaviour patterns (e.g. displacement due to war or famine, migrant labour, nomadic movement, large scale religious pilgrimages), agricultural and livestock abnormalities, laboratory data, vital statistics, school absenteeism, and emergency services data. The system's premise is that new data sources will be added when identified and found helpful, and a framework for systematically adding new data sources will be developed.

Community-level notification systems (eIDSR) in the Partner States will be integrated into the platform to allow real-time data collection from the frontline and ingestion and semantic analysis of news articles and social media activity across the region. Data will be collected, cleaned, and warehoused in the EAC Cloud.

The core of the READSCoR platform will be an expert analytical engine leveraging machine learning algorithms and artificial intelligence to detect and predict disease outbreaks. Regional source data will be geo-coded, and the platform will allow geospatial modelling to provide insights into cross-border public health threats. The algorithms will be continually tuned and refined to ensure appropriate sensitivity and specificity as the platform matures.

EAC Cloud

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 within the current EAC regional data centre, based in Arusha, Tanzania. The health sectoral specialisation of the EAC Cloud supports the READSCoR implementation as disease surveillance data will be hosted in the EAC Cloud.

Alerts produced by the analytics engine will be categorised, escalated, and audited through the READSCoR platform. The notification workflow will be defined and operationalised to ensure that alerts are verified and escalated to the correct local, national, regional, and global levels. Outcomes of the alerts (e.g., whether an alert correctly predicted or identified an outbreak) will be recorded in the system and used to refine the algorithms. Alerts will be disseminated through the platform using various tools, including but not limited to email, voice calls, SMS, WhatsApp, and other channels. Online dashboards will be created and made available to relevant regional actors to monitor and track disease hotspots and incoming alerts. Snapshots of these dashboards could be disseminated via various channels, including traditional and social media.

The READSCoR platform will also include a mechanism to track the status of notifications and ensure that each is followed up through an established workflow. A view of the open notifications, closed, under investigation, false alarms, or emergencies will be made available, focusing on actionable notifications and dates that actions are due. High-level monitoring of response activities, such as listing active regional and international interventions for each potential or active outbreak, will also be done through the READSCoR platform.

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

VISION AND GOALS

The READSCoR platform will establish a digital mechanism for regional surveillance of disease outbreaks. The outputs of READSCoR will support early preparedness for disease outbreaks across the region for national governments, regional bodies, and development partners. READSCoR will contribute to overall health information system strengthening and the improvement of the delivery of health services by improving prediction, detection, and response to disease outbreaks. It will support regional health security by helping authorities prevent, track, and respond to epidemic health threats from infectious diseases, including zoonotic diseases that can rapidly spread across the region. Once READSCoR is implemented, Partner States can anticipate and quickly react to emerging disease threats through real-time data analysis.

VALUE

The creation and institutionalisation of READSCoR is a core EAC Regional Digital Strategy component. Porous borders and the fluid movement of people, animals, and agricultural produce across the EAC Partner States underscore the need for a regional approach to tracking and responding to health needs and emergencies. A regionally integrated digital surveillance, alert, and early warning system will increase the speed and efficiency of data collection, analysis, prevention, and public health response to outbreaks.

In addition, the best practices and wealth of experience gained in deploying READSCoR in the EAC hold global value and will be catalogued in the Knowledge Management platform, to be developed and led by the EAC Inter-University Council of East Africa. These lessons learned from the EAC can be exported to the benefit of many other regions worldwide. The data gathered during disease outbreaks can support international and regional bodies and development partners to target disease hotspots and effectively mobilise a more efficient response.

PURPOSE

READSCoR will create a technical platform for continuous, real-time data monitoring and analyses to identify potential outbreaks and enable an effective response to these outbreaks. Further, the platform will provide regular updates on the general status of disease surveillance in the region. The design and development of READSCoR will begin by identifying one to two achievable use cases based on the availability and quality of source data for a small number of high-priority diseases. The EAC Regional

Digital Strategy's governance structures and health body mechanisms will prioritise the use cases for this implementation and future use cases implementations.

APPROACH TO IMPLEMENTATION

Overall Scope of Work

READSCoR will incorporate and strengthen existing surveillance networks such as the East African Integrated Surveillance Network (EAIDSNet) and Southern African Consortium for Infectious Disease Surveillance (SACIDS) and global initiatives such as the One Health Initiative[1].

Illustrative List of Existing Regional Surveillance Networks

East African Integrated Disease Surveillance Network (EAIDSNet)

A collaborative, intergovernmental initiative between the Partner States for human and animal health and the National health research and academic institutions of Burundi, Kenya, Rwanda, Uganda, and Tanzania.

Africa Centres for Disease Control and Prevention (CDC)

The Africa CDC supports all African Countries to improve surveillance, emergency response, and prevention of infectious diseases. This includes addressing outbreaks, man-made and natural disasters, and public health events of regional and international concern. It further seeks to build the capacity to reduce disease burden on the continent. The Africa CDC is a specialised technical institution of the African Union that serves as a platform for Member States to Share Knowledge, exchange lessons learnt, and build capacity.

South African Centre for Infectious Disease Surveillance (SACIDS)

A ONE HEALTH Virtual Centre that links academic and research institutions in Southern Africa, which deal with infectious diseases of humans and animals, in an innovative partnership with world-renowned centres of research in high-income countries.

Cased-based and aggregate data from existing electronic platforms (e.g., eIDSR, DHIS2) used in Partner States and the EAC, as well as from new sources, will be fed into READSCoR. Epidemiological algorithms will be built and refined to detect potential threats by analysing outbreaks' clinical and epidemiological characteristics. These algorithms will also generate information enabling READSCoR to reliably predict, rapidly react, and effectively respond to and contain disease outbreaks, epidemics, and other health security threats. Integrating the READSCoR platform into existing surveillance networks will be a significant focus of the programme.

[1] http://www.onehealthinitiative.com/

Governance and Advocacy

The programme will work to advocate the sharing of data, actively engaging with the relevant national ministries, regional bodies and global organisations to ensure that data necessary for outbreak detection and prediction is made available.

An underlying tenant of the READSCoR programme is the protection of personal information and the development of data governance procedures to ensure that the data are securely stored and shared in a responsible manner.

READSCoR will partner with key stakeholders at the WHO and Africa CDC to assist with developing algorithms and creating alert and response activities.

Data Sources

READSCoR will be designed to operate on a multitude of data sources, beginning with aggregate and case-based data from existing platforms and integrating other data such as drug and consumables supply and stock-outs, weather patterns, voluntary and involuntary human behaviour patterns (e.g. displacement due to war or famine, migrant labour and nomadic movement, large scale religious pilgrimages), agricultural and livestock abnormalities, laboratory data, vital statistics, school absenteeism and emergency services data. The premise of the system is that new data sources will be added when they are identified and found to be useful. A framework for systematically adding sources will be developed.

Community level notification systems will be integrated into the platform to allow real-time data collection from the frontline, as well as ingestion and semantic analysis of news articles and social media activity from across the region. Data will be collected, cleaned, and warehoused in the EAHC. Genomic sequence data will also be collected to provide details on the evolution of viruses and bacteria and trace routes of transmission of diseases.

Analytics Engine

The core of the READSCoR platform will be an expert system analytical engine leveraging machine learning algorithms and artificial intelligence to detect and predict disease outbreaks. Regional source data will be geo-coded, and the platform will allow geospatial modelling to provide insights into cross-border populations. The algorithms will be continually tuned and refined to ensure appropriate sensitivity and specificity as the platform matures.

Over three-and-a-half years, partners will undertake a four-phased approach to the design, development, implementation, and scaling of the READSCoR platform. These phases provide an initial structure for the programme. Yet, it is recognised that the timeline and staggering of implementations may be modified based on the planning phase and how the programme unfolds over its lifespan. Following 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.

Alerting and Notification

Alerts produced by the analytics engine will be categorised, escalated, and audited through the READSCoR platform. The notification workflow will be defined and operationalised to ensure that alerts

are verified and escalated to the correct local, national, regional, and global levels. Outcomes of the alerts, e.g., whether an alert correctly predicted or identified an outbreak, will be recorded in the system and used to refine the algorithms. Alerts will be disseminated through the platform using a variety of tools, including but not limited to email, voice calls, SMS, WhatsApp and other channels. Online dashboards will be created and made available to relevant regional actors to monitor and track disease hotspots and incoming alerts. Snapshots of this dashboard could be disseminated via various channels, including traditional and social media.

Response

READSCoR platform will also include a mechanism to track the status of notifications and ensure that each is followed up through an established workflow. A view of the open notifications, closed, under investigation, false alarms or emergencies will be made available, focusing on actionable notifications and dates that actions are due. High-level monitoring of response activities, such as listing active regional and international interventions for each potential or active outbreak, will also be one through the READSCoR platform.

PHASES OF WORK

Over a four-year period, partners will undertake a four-phased approach to the design, development, implementation, and scaling of READSCoR. These phases provide an initial structure for the programme. Yet, it is recognised that the timeline and staggering of implementations may be modified based on the planning phase and how the programme unfolds over its lifespan. The below section provides a high-level overview of the phasing and the activities required to implement the READSCoR.

Phase 1: Design to Execution (~ 6 months)

The design phase will address the complexities involved in the work, help mitigate associated risks, refine READSCoR requirements, further refine the implementation plan details, and streamline implementation and uptake. Over six months, the Strategy's governance body, led by EASTECO, EAHRC, and EAC Secretariat and supported by Vital Wave as a primary technical assistance partner, will identify and assess areas to increase potential programme impact, reduce risk, further socialise, and obtain regional buy-in to the Strategy and the READSCoR platform implementation. This phase will leverage existing identified assets where possible, identify the most critical needs and refine programme requirements and the implementation plan based on findings. This will ensure that the implementation of the READSCoR programme is designed to leverage all relevant investments from day one, build on current data, and avoid duplication. This includes the design of needed procurement processes to ensure they are streamlined once requirements have been finalised and equipment orders are fully defined.

This phase aims to develop a detailed blueprint that speaks to a finer level of detail on how READSCoR and its foundational health-sector-specific assets and capabilities will be developed and implemented across the EAC Partner States.

Main Activities:

- Create a detailed design blueprint for the READSCoR programme.
- Develop a project procurement plan.
- Advocate for READSCoR across global, regional, and national bodies to secure buy-in from diverse stakeholders within government and development partners.
- Design implementation learnings plan.

This phase of work will be completed through a combination of consultations across the Partner States and development partners, secondary and primary research, and working sessions, where appropriate. Previous assessments (e.g., EAC Digital Strategy Feasibility Assessment, Digital REACH Initiative) and resulting documentation will also contribute to this process.

Phase 2: Governance and Policy (~ 9 months)

Implementation of the READSCoR platform requires regional governance and policies to support effective regional disease surveillance, control, and response. This phase develops these non-digital assets to implement READSCoR successfully and is in alignment with the EAC Regional Digital Strategy's governance bodies and mechanisms.

Governance. The regional disease surveillance, control, and response governance body will be established in alignment with the governance framework. Clear roles, responsibilities, procedures, and guidelines will also be established to facilitate the active involvement of EAC Partner States in the technical, programmatic, and operational aspects of READSCoR. In addition, monitoring and evaluation criteria will be developed to assess the implementation progress, ensuring transparency and accountability.

Policy. READSCoR requires an underlying regional disease surveillance and emergency response policy. This phase will develop, validate, facilitate approval, operationalise, and socialise the policy. In addition, Partner States will agree on the disease surveillance data to be shared with READSCoR and hosted in the EAC Cloud. This agreement will follow the established legislation and policies approved and operationalised through the EAC Cloud implementation. This will create a cohesive legal and policy environment across the Partner States to ensure a strong foundation that supports the successful development, implementation, and operation of READSCoR through the Shared Services Platform.

Main Activities:

- Establish a regional disease surveillance and response governance body.
- Develop a regional disease surveillance framework.

- Develop regional disease surveillance and emergency response policies.
- Establish Partner State data sharing agreement health-specific addendum for health-related READSCoR-specific data.

Phase 3: Technology Design and Development (~15 months)

This phase will result in the inputs needed for the technical, programmatic, and operational design of the READSCoR platform, anchored in the country and regional-level realities that will ensure the application developed is realistic, robust, and set up for long-term sustainability. A design process will take place, utilising targeted secondary and primary research and user-centred design processes to collect the critical needs and technical requirements for how users will interact with READSCoR, how the platform will be operated, and how feedback and use will result in continuous improvement.

This phase will also revolve around developing the READSCoR technical platform and the algorithmic models that will be used to detect and predict disease outbreaks. Routine and automated mechanisms for the extraction, transformation, and loading (ETL) of data from various sources into the EAC Cloud will be implemented, and the software required for analysing this data and generating dashboards, automated alerts, and notifications will be developed.

Finally, this phase will include all necessary documentation to implement and scale READSCoR fully. This consists of creating standard operation procedures (SOPs) and protocols for data analysis, escalation, and monitoring of associated regional response if an outbreak is predicted or detected.

Main Activities:

- Develop detailed solution requirements for selected use cases and relevant dashboard and analytical views following the EAC Regional Digital Strategy enterprise architecture, frameworks, policies, guidelines, and procedures.
- Identify necessary partners and approaches to data collection based on country and regional realities, including data sources and activities to clean and deidentify data.
- Establish teams, collaboration platforms, reporting platforms, and development roadmap.
- Identify and hire vendors and human resources needed to develop the READSCoR software platform and algorithmic models.
- Establish and conduct iterative touchpoint reviews with global, regional, and country-level stakeholders and users throughout the development process.
- Create a monitoring and evaluation plan.
- Design and develop architecture.
- Develop and integrate application modules.

- Develop processes for extracting, transforming, and loading disease surveillance data from multiple sources into the EAC Cloud regional disease registry.
- Validate READSCoR software components with global, regional, and country-level stakeholders.
- Conduct software and user testing and develop user feedback mechanisms.
- Develop READSCoR dashboards.
- Develop disease surveillance data capture, processing, storage, security, and sharing SOPs and guidelines.
- Develop associated SOPs and protocols defining regional response for when an outbreak is detected.
- Continue to advocate for the value of READSCoR within countries and ministries to support the sharing of necessary data.

Phase 4: Deployment, Scale-up, and Institutionalisation (~12 months)

This phase will operationalise the READSCoR platform to enable disease surveillance, control, and response operations across the EAC Partner States, enhance regional health security, and facilitate coordinated efforts in managing disease outbreaks and health emergencies.

To ensure READSCoR's successful implementation, the READSCoR hosting environment in the EAC Cloud will be operationalised. After that, several implementation activities will take place. These include the initial configuration of settings, user accounts, data configuration involving any necessary data migration, and custom scheme or data type setup. Regarding integration and interoperability, communication and standards compliance between READSCoR and existing systems will be established.

Following the deployment of READSCoR, standard operating procedures (SOPs) will be developed along with a comprehensive training framework, including a training curriculum and material, an eLearning platform, and a train-the-trainers program for facilities that require training.

Main Activities:

- Add additional use cases and make incremental changes to the READSCoR models and platform.
- Continual tuning of algorithms to support additional data inputs and filter out poor-quality data.
- Expand implementation to include additional types of data.
- Institutionalise processes for iterative improvement to the models and platform, training, support, and feedback.

- Develop training materials to support deployment.
- Conduct initial implementation training and deployment in Partner States.
- Continue to refine and socialise protocols, standard operating procedures, and training materials as needed.
- Integrate help desk support into the established regional Shared Services Platform help desk.
- Conduct continuous monitoring and evaluation of READSCoR in Partner States.
- Organise EAC disease surveillance and response stakeholder meeting(s) for the READSCoR launch.
- Develop regional implementation learnings documentation across all phases to support the institutionalisation of READSCoR.

Designing Digital Assets for Long-term Sustainability

As with any digital development initiative, long-term sustainability is a key question that must be addressed as early as possible in the initiative's design and implementation. 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:

- **Regional ownership**: The original vision and mission of the DRI Strategy were conceived within the region itself and is a driving force in the creation of the strategic and implementation plans, such as READSCoR. EAHRC owns the DRI Strategy and is responsible for driving the effort forward and leveraging support from key partners. EAHRC will hire the necessary programme staff to oversee the READSCoR implementation and other health use case implementations. EAHRC will work alongside EASTECO and the EAC Secretariat, the EAC implementing body for the Shared Services Platform, to drive this implementation forward over the long term.
- **Solidified commitment**: The EAC and Partner States approved the DRI Strategic Plan's READSCoR 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 Strategy will be capacity building at the regional and country levels. 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 are Vital Wave’s work in Ethiopia and Zimbabwe. In Ethiopia, the firm embedded technical experts within the Ministry of Health to work alongside in completing the initiative’s activities. This allowed for the transfer of skills and a hands-on process to improve the skill set locally, 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 support 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)). A similar approach will be used to build critical knowledge and skills within EAC regional and Partner State institutions to operate, sustain, and continually improve the READSCoR system.

- **Incentives and efficiencies**: In the context of this proposed work, adoption and institutionalisation will be the most challenging and critical to success. As such, incentives for adoption are a vital component of the whole solution. Through the design phase development, Partners will identify a variety of incentives for Partner States to adopt the READSCoR platform and further reinforce the utilisation of the Shared Services Platform.

RESOURCES REQUIRED

Programme Team

The READSCoR implementation team will consist of a:

- **Programme Lead** who will be responsible for developing and maintaining partnerships with international, regional, and national bodies and organisations, advocating for READSCoR, overseeing the overall implementation of READSCoR’s activities and designing and modifying the READSCoR strategy. An Implementation Coordinator and a team of epidemiologists and data scientists will support the Programme Lead.

- **The Programme Coordinator** will be responsible for managing the day-to-day activities, overseeing the work being done by the READSCoR team and vendors, reporting on M&E, and tracking the overall budget. The Coordinator will also be responsible for managing the delivery of activities by selected vendors where applicable.

- **Data Scientists and Epidemiologists** who will work together with vendors to develop, build and tune the algorithmic models used for outbreak detection and ensure that data inputs are used in a scientifically robust manner.

- **Database Engineers** who will build and maintain the ETL processes, data models and databases used by the READSCoR platform and support the Data Scientists and Epidemiologists in accessing and structuring relevant data.

- **Software Developers** who will develop the technical platform, including implementing machine learning platforms, web-based dashboards, and communication and alert escalation platforms.
- **System Engineers** will build and maintain the infrastructure required for the platform to operate.
- **Researchers** who will continually monitor new research and development of tools used for disease surveillance and multiple sources of infectious disease information, which can be integrated into the platform.

A proposed organisation chart (Figure 1) is below.

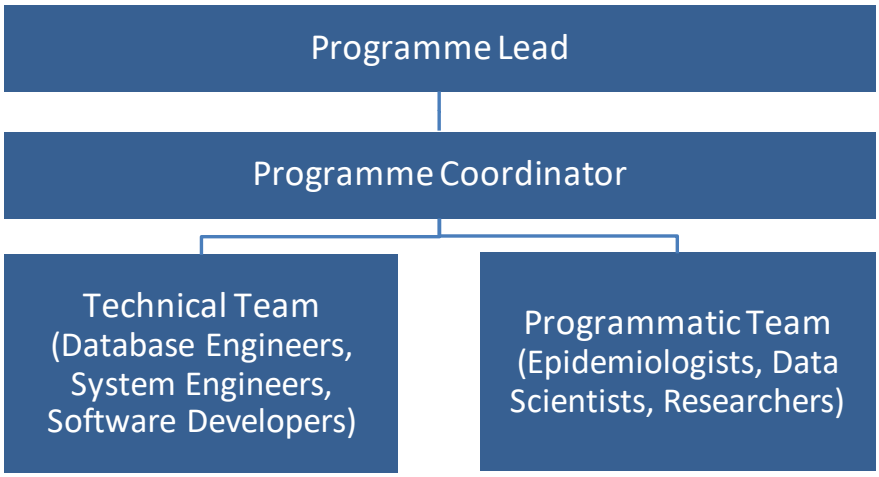

Figure 1 - Programme Staffing Model

Partner Role and Scope

The consortium's primary partners (Table A) have been involved with the DRI and the Strategy since its inception. The EAHRC leads them 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. Additional partners will be identified as needed, such as technology vendors.

Table A - Partner Roles and Responsibilities

EAHRC, EASTECO, EAC Secretariat: Lead EAC Partners	Vital Wave: Primary Implementation Partner	Technology Vendor(s): Platform Providers
• Lead overall vision process • Lead advocacy activities • Establish project governance and policy environment • Develop a project work plan • Coordinate input from the Partner States • Contribute to solution design • Select technology vendors and partners • Establish and conduct iterative touchpoints with Partner States • Create feedback loops and communicate progress • Lead socialisation and capacity building in Partner States • Manage procurement • Facilitate agreement on protocols and standards	• Create advocacy materials • Design and conduct vision and design workshops • Research to gather inputs • Identify high-value use case(s) • Develop high-level solution requirements for selected use cases • Design the whole solution • Design training materials, SOPs, and other key foundational materials • Pilot initial training and deployment • Set up user support system • Identify and add additional use cases • Support vendor selection process • Assist in expanding training and implementation	• Produce software development roadmap including timelines and details of the software development lifecycle and tools • Produce technical specifications, test cases, and acceptance criteria • Develop READSCoR algorithmic models for testing and iteration • Develop READSCoR software platforms • Set up and maintain hardware infrastructure • Provide technical support where needed • Make incremental changes to algorithmic models and software based on additional use cases and proof of concept outcomes

EAHRC: EAC Lead

The EAHRC is established as a mechanism for making available to the Community advice on all health 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 to provide the region with safe, quality, affordable, and effective healthcare services. 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 the technical expertise it holds within its organisation will enable it to work with each Partner State in implementing READSCoR.

EASTECO: EAC Implementer

The EASTECO is established to develop and implement common 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, and innovation 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 country in developing and implementing READSCoR.

EAC Secretariat: EAC Implementer

The EAC Secretariat is the mechanism for regional coordination, development, implementation, and management of the priority use cases through the regional Shared Services Platform, including READSCoR. The EAC Secretariat will work with the EAHRC to design, develop, and implement READSCoR across the region.

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 sustainably develop and scale health technologies. 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.

The firm also works extensively in designing, scaling, and using open-source tools and digital public goods. For instance, before starting Vital Wave, the firm's founder led a team for Hewlett-Packard that commercialised global, open-source solutions across LMICs. Vital Wave has implemented other national-scale, open-source health information system solutions within LMICs and explored their benefits and limitations for the digital-for-development community at large. Vital Wave is also an active participant in the global dialogue on open source, for instance, through OpenHIE, where it is an operational committee member.

For READSCoR, 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 use as many local experts as possible to ensure the transfer of skills and knowledge to the EAC region.

Estimated Timeline and Budget

This work is estimated to span three-and-a-half years, with an additional six months of operating costs. Table B (below) provides an overview of the estimated timing for each phase. 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 READSCoR's value to each country within a minimum timeframe.

The total cost for this scope of work is $8,174,644. The implementation plan budget was developed through an activity-based costing plan. Costing assumptions have been validated through multiple working sessions with key EAC partners and stakeholders.

Table B - Implementation Timeline

Phase	2025			2026							2027			2028
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Phase 1: Design to Execution	Phase 1													
Phase 2: Governance and Policy			Phase 2											
Phase 3: Technology Design and Development						Phase 3								
Phase 4: Deployment, Scale-up, Institutionalize											Phase 4			

MEASURES OF SUCCESS

The following are proposed measures that will be used to develop READSCoR monitoring and evaluation plan through this implementation plan (Table C):

Table C - Measures of Success

Technical measures	Programmatic measures
• Technical roadmap produced • Formal documentation of technical specifications, use cases, test cases, software development lifecycle and tools approved • ETL process operational • Machine learning models developed and implemented • Alert notification and escalation system operational • Dashboards developed	• Successful early prevention of outbreaks • Coordinated regional response mechanism functional • Response protocol developed and followed

RISKS AND MITIGATION STRATEGIES

Potential risks to the success of READSCoR 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 disease surveillance and response. In this context, implementing enterprise-grade programme management best practices will reduce inherent execution risk. These best practices include validating assumptions, detailed planning and performance tracking, building strong relationships, and ensuring partnership transparency.

Additionally, various exogenous risks to the implementation of READSCoR exist because of this work's low- and middle-income country environments and multi-stakeholder nature. Further risk mitigation strategies, described below (Table D), will be developed in the design phase.

Table D - Risk and Mitigation Strategies

Potential Risks	Mitigation Strategies
Data quality: Data from various country systems may be of varying quality and reliability	Explore strategies for utilising data independent of specific-country systems (e.g., social media, online news) to mitigate variance in data quality. Work with existing initiatives that are strengthening disease surveillance systems in each country.
Sustainability: Lack of funding to maintain the platform once the initial grant has concluded	The partners will create a holistic solution, including important aspects such as training, change management, and SOPs. Technical partners will also employ a "lead from behind" approach to implementation. Care will be taken to consider and look for ways of securing sustainable, long-term funding for READSCoR human resources from the start. Examples of this could include partnerships with regional academic bodies and the EAHRC.
Procurement: Technology needed may be expensive or difficult to procure	If required, partners will explore different strategies (e.g., use software-as-a-service provider or as a short-term solution) and start the procurement process early.
Infrastructure: Lack of reliable and affordable internet connectivity	Partners will have a clear understanding of bandwidth and connectivity needs at scale (upfront) and negotiate long-term agreements with network providers who support the potential for increased demand. Offline data collection capabilities will also be designed into the system where appropriate.
Data Sharing: Challenges with data sharing between individual countries and individual directorates within each country and the regional platform	Ongoing advocacy will ensure that Partner States realise the value of data sharing and are comfortable with the security of this shared data. EAC protocols will be adhered to per the regional data protection and privacy legalisation the EAC Cloud implementation establishes.
Capacity: Lack of human and financial capacity to respond to alerts	Ongoing work with EAC and development partners (e.g., WHO, Africa CDC) focusing on disease surveillance to mount coordinated responses to alerts and to leverage existing mechanisms and channels to outbreak response.
Data Governance: Sensitive information is not secured	EAC Secretariat and industry-standard measures to ensure data security will be implemented, and data governance SOPs will be developed and adhered to. Patient-identifiable information will be anonymised.