

## CareCR (AFYA Client Registry)

### Overview

The goal of the project is to develop CareCR (AFYA Client Registry) with online/offline capabilities by leveraging functionalities from existing open tools i.e. Medic CR, an open source tool which has given us an understanding to cover the gaps of function to be included in CareCR (AFYA Client Registry), where gaps covered include advanced configuration of matching attributes extended from the list in Medic CR to improve deterministic matching.

Rasello's expertise in open source tools and technologies, experience in application of principles of digital development and adherence to Open HIE guidelines will ensure the enhancement of Medic CR to achieve function of CareCR (AFYA Client Registry)

### Executive Summary

The investment from Digital square will go towards the adoption of tools and technologies in health client registry contextualizing technology across standard health practise as guided by eHealth Architecture Principles, open HIE architecture specification. The processes will include requirements and functionality elicitation, installation and deployment strategizing and documentation, quality assurance, testing and creating necessary means for building capacity among government officials, local technology teams and health workers in order to connect the underserved to better health outcomes.

The goal of the project is to develop an open-source and standards-compliant client registry being "Registration as a service" that for effective registration and unique identification of patient's information. Rasello will develop the client registry leveraging knowledge from existing works, software, tools, products and existing implementation experience such as the use of Medic CR, a master patient index tool as a base tool used to develop the National Health Client Registry - Tanzania, providing functionality of the client registry. In Rasello's work with the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC), we have been able to identify the identification gap, and disperse data locations across horizontal system (of general services, providing prevention and care for prevailing health problem), and of vertical programmes (for specific health conditions). We have been able to understand the need for community ownership and lead a collaborative team in successful conceptualization, development, and guidance to deployment procedures.

Rasello's organization expertise will contribute to achieving the overall project goal from the experience with MoHCDGEC in the development of National Health Client registry(NHCR), PATH organization in the development of an Administrative area Registry System(AReS), through which Rasello has learnt efficient development methodologies and techniques for registries. Rasello will work along with IntelliSOFT's expertise in digital health technology, to ensure further success of Open HIE compliant client registry. IntelliSOFT Consulting Limited has relevant expertise in Client Registries from 8 years ago when one of the Principals led a team that developed and implemented as a proof of concept, Kenya's first attempt at establishing a health identifier. The project, the National Unique Patient Identifier (NUPI) was funded by PEPFAR through CDC and implemented by I-TECH Kenya and successfully demonstrated multiple methods of effectively and consistently identifying subjects of care in a national HIV program. IntelliSOFT was also engaged by Management Sciences for Health Tanzania to provide technical assistance for development of the Software Requirements Specifications for the National Health Client Registry (NHCR). At a global level, IntelliSOFT is an active member of the OpenHIE Community of Practice including the Client Registry sub-community.

### Consortium Team

The consortium is open to meaningful collaboration to ensure PATH's objectives are reached and potential capability gaps assessed have been covered, subsequently feeding to the goal of connecting the world to better health.

Rasello will coordinate and lead the consortium dedicating a team of developers with over 10 years' experience in software development, project managers with a combined of 7+ years of experience, business analysts with a combined of 5+ years of experience, design team and quality assurance/ quality control personnel a combined of 10+ years of experience. Rasello creates Software as a Service (SaaS) and Platform as a Service (PaaS) solutions tailored towards an organization's system needs in emerging markets with successes in public authorities, healthcare, telecommunications, insurance, education, and non-profit organizations. Rasello's solutions range from open source to proprietary custom solutions, web-based applications, mobile applications, together with dynamic reporting, and analytics solutions. For development of the client registry, Rasello will take lead to oversee the overall project based and development-based work, project management, funds management, coordinate work between consortium members, serving as an intermediary to stakeholder.

IntelliSOFT Consulting Limited is a Kenyan company locally owned with +8 years of experience in development, implementation and use of Information, Communications and Technology (ICT) in the health sector. As a technology firm, IntelliSOFT has deliberately focused on designing, developing, implementing, supporting, and maintaining digital health solutions, particularly in Low to Medium-Income Countries. IntelliSOFT Consulting specialises in supporting the realisation and continuous optimisation of business performance and productivity (including health outcomes) through effective implementation of technology agnostic digital health solutions appropriately optimised for the implementation context. We do this through appropriate application of technical and data standards throughout the software development process of our digital health solutions. Our

approach and current focus is “health as an enterprise” aimed at strengthening the entire health system. Our current primary focus is data systems for research for health and for patient and population management.

## Project Description

### Background

Currently fast-growing health patient identifying information is distributed across multiple self-standing databases and systems, within and among organizations as separate data sources with multiple patient identifiers at country level. In different data stores of patient identifying information, there is a variation of attributes primarily used to identify a patient. The variation may depend on the choice of unique ID, names, contact details etc, resulting in difficulty to uniquely recognize the same patient across systems, or accurately matching the same client across systems. Disperse data stores subject patients to redundant records in multiple services, leading to ineffectiveness in continuity of care, challenges in population health management, poor data reference for country level health decisions and planning.

### Objectives

Technical approach/activities

The client registry will be built using open source standards enabling interoperability, sharing project outputs and practise to open HIE communities. Through participating in the open HIE community of practice, Rasello would be able to gather technology, architecture approaches relevant to successfully implementing a client registry applicable in a low resource setting.

Rasello is an endorser of the principles for digital development and has effectively operationalised the Principles for Digital Development framework by using its approach of adaptation and implementation of Medic CR to power the NHCR of MoHCDGEC - Tanzania. Some of the principles are as elaborated in the table below.

PRINCIPLE	APPLICATION
Design with User	In Rasello's work with client such as MoHCDGEC, PATH, FHI360 etc. we collaboratively discussed to understand the intended end users, and their level of engagement to NHCR and AReS respectively. After understanding the context and skill of users, we then categorized experts and non-experts of the system, creating relevant user stories and translating requirements to suit each user group. The process is progressive throughout the project to gather and incorporate feedback accordingly.
Understand the existing ecosystem	In NHCR Rasello reviewed the structure of the existing ecosystem in order to understand the positioning of NHCR and its interaction with other existing systems like the enterprise service bus, Health Information Mediator (HIM), HMIS data domain, EMR etc. for ecosystem sustainability, refined choice of tools and digital techniques.
Design for Scale	From the initial stage of designing, Rasello conceptualized the intention to reach a large network of health facilities in all resource settings and determine what will be optimal to the whole country. The intended client registry will be implemented to accommodate an increasing number of users in health facilities in all levels of administrative areas.
Build for Sustainability	Rasello's work with MoHCDGEC and PATH aimed to achieve long term impact by including government technical personnel to fully understand the program codes and likewise capacitate non-experts via system demonstration. Rasello further prepared relevant phase wise documents so as any new users will be able to review and easily understand the scope and implementation. The process ensures sustainability of the system beyond Rasello's project team personnel.

The consortium will leverage on the Open HIE community to derive best practices in developing CareCR (AFYA Client Registry), by reviewing documented practises in Open HIE specifications and the Client Registry planning and implementation guide. In addition, the consortium will take part in the community to raise awareness among relevant practitioners in governments, health structures, technology developers. Anticipated outcomes from following the technical approach and activities will help in building system sustainability and scalability, raising awareness and practical use of the CR in underserved settings.

To deliver a successful project that aligns stakeholders' needs and meets the relevant project requirements, Rasello will employ a Result-based Monitoring and Evaluation Management approach. This will entail: (1) Drafting a comprehensive M&E plan in collaboration with stakeholders to define key KPIs that will ensure the project is on track. (2) Monitoring: Process monitoring(project activities), Context monitoring(project risks, assumptions and dependencies), Financial monitoring(project costs), Organizational monitoring(stakeholders collaboration and communication) and Results monitoring(project deliverables).(3) Evaluation at different times of the project: Real-time evaluation(to provide immediate feedback for modifications), Participatory evaluation(during capacity building), and Final evaluations (upon project completion).

### Deliverable & Schedule

Rasello will conduct the project following agile methodology of development, whereas the project in general will be guided by a work plan of activities and deliverables. The work plan will be refined at project start to ensure that all activities and expected deliverables are outlined and time referenced accordingly. During the implementation of the project, we will work towards delivering reports such as: (1) Weekly & Monthly status reports - These reports will document updates of the activity plans to be submitted regularly every month. (2) Draft/interim report - This report will have a summary of the project and a brief description

of the progress. This will be submitted halfway through the project execution. (3) Final project report - This report will provide a detailed description of the final results of the project and will be presented during the closure of the project.

Below is a high level work plan for the development of the client registry.

Activity	Deliverable	M1	M2	M3	M4	M5	M6	M7	M8	M9
<b>INITIATION</b>										
Kickoff meeting	<b>Technical Specification Document and documentation of the data module</b>									
PM Tools setup i.e. JIRA, Confluence										
Documentation review										
<b>ANALYSIS</b>										
Scope and requirement analysis, Conceptual design	<b>System Architecture, Database design</b>									
System and database design										
Integration analysis										
System and database design finalization										
<b>DEVELOPMENT</b>										
Sprint based client registry development and testing	<b>Fully functioning Afya client registry system per the requirements along with feedback gathered through development process.</b>									
Weekly demo meetings										
<b>TESTING AND DEPLOYMENT</b>										
Overall system testing and Integration testing	<b>Documentation of Testing and Testing R</b>									
User Acceptance testing										
Deployment strategies										
<b>TRAINING</b>										
Initiate capacity building approach	<b>User manual, system administration m and facilitators training guide develop</b>									
<b>MAINTENANCE AND MONITORING</b>										
Monitoring system efficiency and stability	<b>Monitoring reports</b>									
Project Closure and Handover	<b>Reporting and Documents</b>									

## Risk Mitigation

The Rasello team will manage project risks on an ongoing basis throughout the project. Risk management process will involve foreseeing by evaluation of potential risks at every project phase, ensuring that these potential risks are communicated to key project stakeholders early in the phase. The process will include identifying, analysing, planning, monitoring, and responding to risks. Evaluation of potential risks in the project phase will go hand in hand with aligning the acceptable risk mitigation strategy to either accept, transfer, avoid or reduce, depending on the type of risk i.e. privacy and security, project life cycle, stakeholder.