

# openMIS-based Client Registry

## Two-Sentence Overview

The goal of this project is to increase the scope of the open-source Insurance Management Information System (openMIS<sup>1</sup>) by extending the beneficiary management module, which already deals with insurees' personal and identification information, to respond to Client Registry's (CR) requirements and standards, to be self-sufficient and, at the same time, compatible with the largest open-source programs for healthcare providers through the existing but yet to be extended openMIS FHIR module.

The team composed by Swiss Tropical and Public Health Institute (Swiss TPH), the designer and developer of the legacy openMIS version, implemented in five countries, and experienced with Civil Registration and Vital Statistics (CRVS) systems, and SolDevelo, the developer of the openMIS FHIR module and with experience in integrating health systems, will join their expertise to respond to OpenHIE project requirements in general and to OpenHIE Client Registry Community's requirements and expectations.

## Executive Summary

Although several CR specific tools exist, we are convinced that openMIS can be easily and effectively enhanced to compete in this very specific and well defined market. With already existing functionalities to manage beneficiaries, we will use Digital Square's investment to build a tool that manages all the client registration in one place.

The openMIS-based CR will be a self-sufficient product. As a standalone tool, the openMIS-based CR will work with open-source libraries and tools, making it free for use and accessible in Low and Middle Income Countries. In the core of our tool, we will allow a flexible data model, a strong de-duplication mechanism, a strong and configurable ID mechanism, and an advanced search feature.

Specific user interfaces will be developed for clients management and administration, including import and export functionalities. Specific "patient identification" modules (based on technologies like fingerprint or QR codes) will allow an easy and effective user identification, allowing the implementers to use the best suited solution for their needs.

The existing openMIS FHIR module will be enhanced with resources that will meet the relevant Fast Healthcare Interoperability Resources (FHIR) profiles and will support "Registration as a Service".

Quality Assurance and documentation are part of our development processes. To allow an easy and efficient installation, we will provide Docker packaging mechanisms satisfying Instant OpenHIE requirements.

## Consortium Team

### **SolDevelo (prime organisation)**

SolDevelo is a dynamic Polish IT company (+80 staff) focused on delivering high-quality software and innovative solutions. SolDevelo is currently involved in several openMIS projects, including the 'maintenance and support project', HL7 FHIR module development, openMIS integration with OpenMRS and enhancing the security of the legacy system. SolDevelo has been involved in many opportunities that required skill sets relevant to this particular project, for example OpenMRS (core

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<sup>1</sup> <https://openimis.org/>

contributors), HL7 FHIR (OpenMRS Sync 2.0 module), nationwide micro-service based implementations (OpenLMIS), nationwide OpenHIE architecture based implementations (National Health Infrastructure project with such components like OpenELIS, DHIS2, OpenMRS and many other HIE compatible applications, health standards-based workflows for the Client Registry, Facility Registry, Health Management Information System, Shared Health Record, and Interoperability Layer). SolDevelo will be responsible for technical project management, gather exact requirements, prepare project timeline, manage development according to SCRUM principles and deliver the final results back to the community.

### **Swiss TPH**

Swiss TPH is a leading institute in global health with a particular focus on low and middle-income countries with a staff strength of over 850 from 80 different nations, currently active in 300 projects across 100 countries. Swiss TPH's relevant experience includes involvement in the design and implementation of the Insurance Management Information System (which is the genesis of the openIMIS Initiative) since its inception in Tanzania. Swiss TPH is currently implementing two projects at scale for the deployment of insurance schemes through openIMIS, in Tanzania and Cameroon, and two openIMIS pilots in Chad and Democratic Republic of Congo. Additionally, Swiss TPH is actively involved in the development of openIMIS as part of the Implementers and Developers Committees of the openIMIS Initiative. In addition, Swiss TPH is also implementing projects focused on systems' interoperability, specifically the integration of health systems with Civil Registration and Vital Statistics (CRVS) system (under the Bloomberg Data for Health Initiative) and integrating them as tracked entities in DHIS2. Swiss TPH is also a part of the advisory group for OpenCRVS. Swiss TPH will be responsible for the expertise on health financing and beneficiary registries, openIMIS, drafting of business and technical specifications, supporting the system and architecture design.

## **Project Description**

### **Background and problem statement**

Developed from 2012, openIMIS was built by Swiss TPH as a monolithic system using Microsoft technologies (the legacy openIMIS version). openIMIS supports beneficiaries management and already covers information like personal information (including ID card number), family relations, identification mechanisms (unique insuree number, photo, QR code).

Since 2018, the solution has been redesigned and redeveloped by Bluesquare using open source technologies (Python/Django and Javascript/ReactJS) to compose a modular architecture of the solution (the modular openIMIS version). Because the migration from the legacy to the modular version is a long process, openIMIS Initiative, the group behind openIMIS, has decided to migrate the solution module-by-module. On this day, the modular architecture is well specified and developed, and two openIMIS modules were already migrated (Claim and Location modules).

In addition, the new modular architecture has permitted SolDevelo to develop the FHIR module, allowing the integration of three open source health systems (OpenMRS, Bahmni and DHIS2), a first step for OpenHIE architecture integration. The development of the FHIR module focused on the claim submission process that limits the support of beneficiary registration workflows.

Under the Digital Square D1 scope, the enrollment process related modules will be migrated and we expect the Insuree module to be available at the beginning of this project.

Building an openIMIS-based Client Registry has several advantages: openIMIS already integrates beneficiary management features, both organizations know very well openIMIS' infrastructure and we know exactly what new functionalities are required to create a fully and successful Client Registry tool.

## Objectives

The following activities will be covered in this project:

- OpenIMIS DB migration to PostgreSQL in order to be free to use and which allows to extend the beneficiary data structure with a flexible data model (using JSONB data type). These activities are already on the OpenIMIS roadmap.
- Enhance OpenIMIS FHIR module with new resources to support "Registration as a Service"
- Develop specific user interfaces for clients management and administration, including import and export patients functionalities and advanced search mechanisms.
- Implement different identification modules (QR and fingerprint) in OpenIMIS. These modules are used by implementations based on their requirements. QR code identification mechanism has already been implemented in OpenIMIS mobile application.
- Improve logging and full audit trails of all changes to both configurations as well as entities within the tool by users. It is already implemented in OpenIMIS, however we want to be sure that it works as expected. Moreover, the authentication and authorization part will be done in Notice D1 Formal Sector part.
- Create docker packaging mechanisms satisfying Instant OpenHIE requirements.
- Create automatic tests
- Create a documentation for OpenIMIS-based Client Registry

## Deliverables and Schedule

Deliverable	Schedule	Deliverable	Schedule
OpenIMIS DB migration to PostgreSQL	November 2020	Docker packaging	March 2021
Create a flexible data model	December 2020	Integration/System automatic testing	April 2021
Enhance OpenIMIS FHIR module	December 2020	Developer documentation	April 2021
Develop specific user interfaces for clients management and administration	February 2021	Implementer documentation	April 2021
Implement QR and fingerprint modules in OpenIMIS	March 2021	Administrator documentation	April 2021
Improve logging and full audit trails of all changes	March 2021		

## Risk and Mitigation

Developing a module may show many problems and risks even when the program is developed by experienced organizations. We do not rule out the appearance of certain problems, but if they occur, they will be used to meticulously describe case studies, which will serve as knowledge for less experienced developers and for the whole open-source community. At our job we are open so we won't be afraid to show problems which we meet during the project. Also, SwissTPH and SolDevelo will share their experiences to avoid problematic situations and lead the project without any bigger threats.