



2.1 Technical Application

Overview, Instructions, and Template

Building the openIMIS community of developers for the next phase of growth

Two-Sentence Overview

The goal of this project is to strengthen and grow the developers community for openIMIS. In line with the open source vision for the tool, Bluesquare is looking to support current and new partners to continue developing the new platform in line with the established architecture.

Executive Summary

The openIMIS community is looking to prepare for its next phase of growth, modularisation and maturity. This response will focus primarily on the workstream A and B - the modular migration of Core openIMIS and the Nepal Feature Request. Bluesquare will provide the required coordination, development and technical expertise to realise the next phase of the modular development and feature extension. With this guarantee of support, we expect the proposed, existing and new, partners to feel comfortable playing an active role in developing features and modules independently.

Through this project, we hope to ensure continuity in the community and continue development in line with the agreed upon roadmap. In the spirit of the open source community, we wish to open development work to additional teams which we believe will be key to bring openIMIS to scale. It will help ensure the tool is more sustainable and help absorb and share the workload when it is needed.

Thanks to our central role in developing the architecture we have a very clear understanding of the current status of the tool, and we are used to working with and coaching other technical partners towards a common goal. In an attempt to share our knowledge of the opportunities and associated challenges Bluesquare proposes to support interested potential partners who are looking to contribute to the further development of the tool in the next phase. We also provided an overview of our current sense of the scope required by module and item requested in this call for proposals.

Consortium Team

Bluesquare is a Belgian data company founded in 2012, focused on digital health in emerging economies around the globe. We have proven experience in designing and leading IT products in use in the UHC sector. Currently Bluesquare manages the architecture development of the openIMIS tool and would bring this experience to bear for the next phase of development. Thanks to our multidisciplinary team including developers, product managers, public health experts and data scientists we are also able to contribute to the broader community discussions.

For this project Bluesquare proposes to support the next phase of development, serving as a resource for other teams and partners towards successful development.

Jembi has indicated its interest in a partnership for the interoperability with OpenCRVS work package (work package 3). Jembi is an African non-profit company specialising in digital health and open source software development and implementation. They are currently supporting the development of a

productised OpenCRVS system for implementation in Bangladesh (as a pilot site) and we strongly believe that this partnership is the best approach to guarantee good interoperability.

Bluesquare has also reached out to potential **partners in Tanzania and Nepal** to ensure that local issues continue to remain a priority in the issues mapping and allocation, yet no agreement has been established and **Bluesquare is open to collaborate with other teams, from the openIMIS Community or additional development teams, for all other work packages.**

Background or Problem Statement

The openIMIS tool and community is the midst of a major transformation from a monolithic to a modular structure that allows individual countries to tailor it to meet their needs. We provide a detailed description of the current status of the development work in the analysis document we shared on the openIMIS wiki. It is important to stress that while the community has made great strides in developing the next version of openIMIS over the course of the current contract period, the goal of modular structure will remain less than half way done at the end of the contracting period as per the contract specification. To maintain and compelling offer for new countries and current users, to make the best use of the openIMIS tool, completing the scope will remain the activity that will bring the most value to both existing users and possible prospects.

In the framework of this new contract we see the focus is on integration, new features (AI fraud detection) or completely new topics (formal sector) rather than on completing the original scope. This will create tensions and there is a risk that this next phase of development will in fact be building on sand/mixed model.

Regardless, since the current budget provided is not enough to address all of the items requested in the scope provided, even without considering the need to finish the current work, we see a real risk in that rather than selecting the best items, we dabble in each of them without bringing any to a quality result.

So to move towards this next phase, there will be a number of critical decisions that will need to be made in the first weeks of the project on the development objectives if we wish to keep the tool usable by the current implementers while creating the modules that are required to effectively expand its use in other countries and regions. The community will need to be empowered to choose the areas of focus.

In addition, there are two specific areas we believe need to be carefully mapped out as they are entirely new scopes of work.

The first is the formal sector which we suggest addressing as a prototype with a fixed budget that allows us to get as far as possible with the objective of having something to demonstrate at the end that can be used to start a discussion with potential prospects and partners. Depending on the user needs, this could be done with no code at all (only product management), with a simple validation of the clear list of needs, prospects and a software roadmap.

The second is the AI component which we advise to be reviewed to ensure we understand the real business needs (fraud detection). In our experience, answering this need for fraud detection can be tackled in multiple ways and AI is not always the best fit solution.

Bluesquare stays open to discuss with the openIMIS community on a role as outlined below, but we think that without this clarity on the state of the software and the lack of adequate funding for the current project's ambition, going forward remains risky if clear choices are not made in time. Balancing these differing needs will require timely decision making and additional development resources from the broader community.

Digital Health Technologies

Digital Health Tools

openMIS is an open-source software tool for the digitalisation and efficient management of health financing workflows. Currently being used to manage health protection schemes in Nepal and Tanzania, openMIS offers seamless connections between beneficiaries, health service providers and payers. Without licensing fees! More information on the tool are available [here](#).

A Civil Registration and Vital Statistics (CRVS) system records the details of all major life events, such as births and deaths. Birth registration is the first step in securing legal identity and accessing other basic rights like education, healthcare and social protection. Plan International and Jembi are building an open-source digital CRVS system that works in every country and for every individual. OpenCRVS will be free and adaptable for different country contexts, designed with and for the people it serves. The software is intended to be easy to deploy and requires minimal skills for customisation, maintenance and support. For more about openCRVS please go [here](#).

Digital Health Standards

FHIR (Fast Healthcare Interoperability Resources) specification is a standard for exchanging healthcare information electronically. For a helpful overview of the standard, and road map for first-time readers of the specification we refer you to this [page](#). In fact, this would also align to the proposal submitted in notice D "Towards an Integrated HIE Approach to Patient-Level Indicator Reporting".

Use Cases and User Stories

Currently openMIS is in use in two contexts: Nepal and Tanzania. A key priority will be to ensure these two current cases run smoothly and effectively. In addition, we provide the use case for the potential additional country needs. How to ensure the openMIS tool is modularized to meet the needs of a broader case.

Nepal - In Nepal, the openMIS roll-out is already well underway using the legacy platform. Currently it is being used to support the Health Insurance Board in accomplishing their efforts. The status of the roll-out is currently in 36 of the 77 districts. The program is structured as a single scheme for all, specifically it is family based. Addressing this particularity while maintaining the envisaged modularity will require a clear delimitation of the functionalities required from the modular version of openMIS.

Tanzania - The original openMIS (2012) roll-out took place in Tanzania to support the Community Health Funds operated by the President Office Regional Administration and Local Government. The scope of the deployment includes an online and offline component supported also by mobile devices. It is currently implemented in 3 regions (23 districts) with the ambition to grow to all 26 regions. For this case to be effectively supported by the openMIS community a number of additional components will need to be modularized to ensure they are able to manage their program effectively.

There are additional planned roll-outs but their level of deployment remains limited (Cameroon, DRC, Tchad and others). However, it is good to note that the case study of the new countries also requires a clear look at making the tool fully modular in order to more effectively 'mix and match' elements to meet local needs.

Objectives and Activities

Bluesquare proposes to support the openMIS community by leveraging our experience in the current architectural rework to help bring direction and support all teams of developers to help accelerate the development. Bluesquare would ensure alignment to the general vision and the community agreed upon needs for the development work to be completed.

We would manage this in an agile way, supporting with our own software development capabilities and building a stronger community of developers for openIMIS. We include below the various work packages we think are required and provide a first division between the default work packages and the nice to have packages to help support a first prioritisation to realise the use cases described above.

Our desire for additional team support is articulated in the team section as well. In addition, and in response to the potential work that will be awarded for workstream C we would support the dialogue required with the current instances thanks to the help of local partners (both current openIMIS community members and new local teams that we are already beginning to identify). We have also highlighted these potential collaborations in the team section.

Suggested Default Work Packages

Work package 1: Migration of the Beneficiary Enrollment

The “Beneficiary Enrollment” as a set of business processes to manage insurees, families and their policies requires features from several modules: Persons & Families, Policies and Contributions.

This first work package is primarily dedicated to migrate these three modules from the legacy openIMIS to the new modular architecture.

Provided that Work Package 6 (Configurable Workflow Engine) is selected and realized, the activities within the migrated Beneficiary Enrollment could then be coordinated via the Workflow Engine.

Each module will be migrated according to the same methodology:

Objective 1: Migration of (1.1) Persons and Families / (1.2) Policies / (1.3) Contributions

Activity 1.x.1: Evaluation of the scope of work

Starting from [openIMIS user guide](#), clearly identify the screens, backend procedures (services, batches,...) and necessary reports to be migrated.

Identify any Nepali specificities that need to be integrated (via contributions/events principles).

Activity 1.x.2: Screen mockups

Develop screen mockups to migrate existing to Material standard (sandboxing from <https://material-ui.com/>).

Activity 1.x.3: Development - iterations

In two (or more) short (2-3 weeks) iterations:

Frontend module development

The current frontend module ([openimis-fe-insuree_js](#) / [openimis-fe-policy_js](#)) only contains what was strictly necessary to implement the claim module (InsureePicker,...) and needs to be extended to provide the overviews, search/edition pages,....

Note: since contributions were not involved in claim processing, the corresponding module has not been bootstrapped.

Backend module development

The current backend modules ([openimis-be-insuree_py](#), [openimis-be-policy_py](#), [openimis-be-contribution_py](#)) only contain what was strictly necessary for the claim module and the FHIR API, so it needs to be extended to provide all business logic (validations,...), participate in the event-driven approach enabled by the new architecture,...

1.x.4: Testing/validation

A test plan will be written, [following chosen standards](#) and the module will be deployed for testing on a test platform based on openIMIS demo environment.

Activity 1.x.5: Technical documentation of migrated module

Finally, technical documentation of the frontend module will be provided, describing the foreseen contribution points, the published components, the events published and consumed on redux middleware and the registered contributions to other modules.

A similar documentation will be provided for the backend module, with published django signals,...

Objective 1.4: Migration of Beneficiary Enrollment Workflow

This objective is optional and requires the Workflow Engine (work package 6) to be in place. One reference workflow will be designed and configured into the Workflow Engine and serve as a reference for any country-specific adaptation.

Activity 1.4.1: Design of the workflow

Starting from the available features (and dependencies), identify the required flexibility and/or additional (side) tasks to be accomplished. Model the enrollment workflow context required and conditional routings.

Activity 1.4.2: Configuration of the workflow

Within the selected workflow engine, configure the Beneficiary Enrollment process (context instantiation and routings).

Activity 1.4.3: Testing of the workflow

Deploy the configured workflow on a test platform to allow users to simulate real cases and fine tune the configured reference process.

Work package 2: Prototype for an Insurance Scheme for the Formal Sector

Starting from the [analysis](#) of the current status, this work package is dedicated to bootstrapping concrete support for the formal sector.

Objective 2.1: Analyse the scope of work

Activity 2.1.1: Confirm the need/possibility for both models to be in the same openIMIS instance

Activity 2.1.2: Identify necessary adaptations in modules that can easily work for both approaches (ie claim processing, medical items/services (and price lists), location and health facility (and related reports)).

Activity 2.1.3: Identify modules that are difficult to combine and detail their expected 'formal sector' version

Activity 2.1.4: Review (re-design) business processes that require adaptations

Objective 2.2: Assemble a (separate from current openIMIS) platform prototype to manage formal sector

Based on the detailed analysis of point 2.1, we propose to bootstrap a new openIMIS assembly context, dedicated to formal sector prototype.

Activity 2.2.1: New database scripts (empty and demo)

Activity 2.2.2: New openIMIS assembly (legacy + new platform)

Objective 2.3: Develop necessary modules (versions) to support the formal sector

Based on the detailed analysis of point 2.1, and platform prepared in 2.2, we propose an agile approach with 2-3 week sprints, for each module that requires rework (and/or new module versions). We would follow the same methodology for each one:

Activity 2.3.1: Define backend services (business logic) and design screens

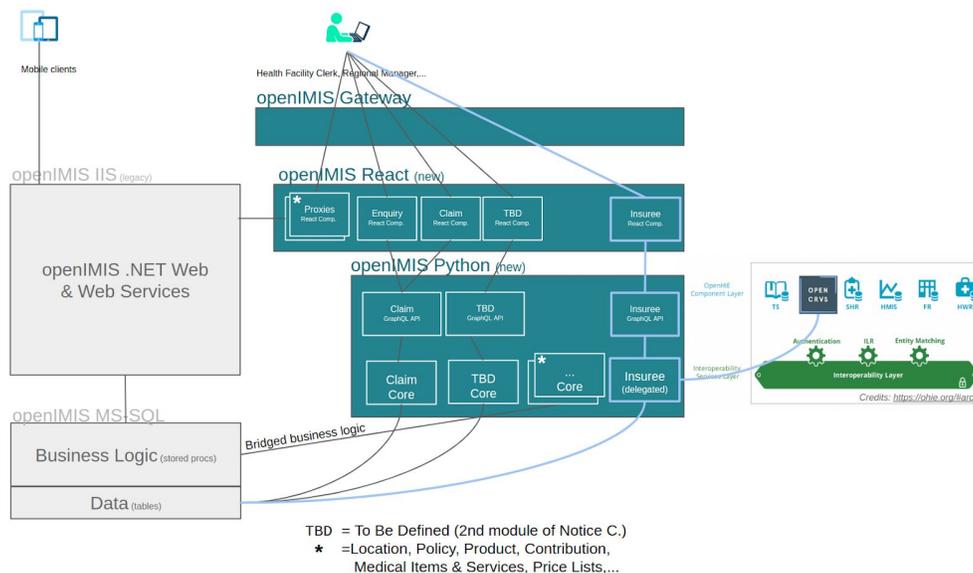
Activity 2.3.2: Develop related backend and front module

Activity 2.3.3: Deploy developed component and define the scope of the next iteration

Additional Optional Work Packages to be decided by Community Decision

Important assumption: any work package selected here will reduce the budget of what is available to complete the formal sector prototype...

Work package 3: Interoperability with OpenCRVS



Insurees (and families) management is intensively used by openIMIS users, related data (insurees and families) are often created/updated. We therefore suggest a full integration, with in depth UI adaptations to ensure the technical integration is as transparent as possible for users.

Completing interoperability will be a shared task between an openIMIS-dedicated team and a team dedicated to OpenCRVS. The complexity will depend on the flexibility of OpenCRVS to have the necessary features for openIMIS. So we propose to begin with a gap analysis and then proceed to configuration and connectivity.

Objective 3.1: Gap Analysis

Activity 3.1.1: Analyse the ability for OpenCRVS to cover the needs of openIMIS

Activity 3.1.2: Map out any potential gaps which will require additional development

Objective 3.2: Configure and Connect

Activity 3.2.1: Configuration/adapt OpenCRVS to fit openIMIS needs

Activity 3.2.2: Create the technical links between both tools (via OpenHIE platform)

Objective 3.3: openIMIS Adaptations

Activity 3.3.1: openIMIS backend adaptations

Activity 3.3.2: openIMIS frontend adaptations

Objective 3.4: Testing and documentation

Activity 3.4.1: Ensure the viability of the interoperability with a live case.

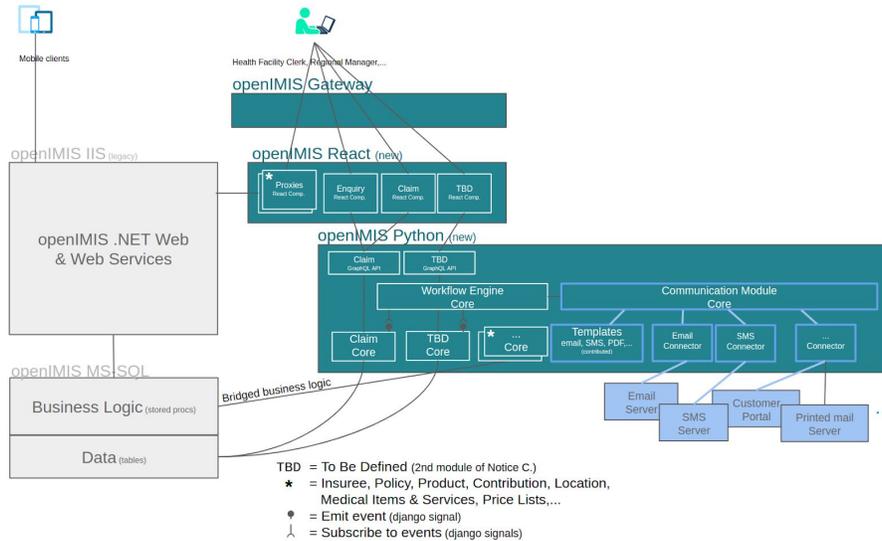
Activity 3.4.2: Technical documentation of delivered components (backend and frontend)

Work package 4: Communication Platform

The [Nepali requirements](#) include a [communication platform to communicate with the users, insurees and beneficiaries](#).

We strongly believe that communication with users and customers (insurees and beneficiaries... but also payers,...) are two separate things that should be addressed independently.

We propose to focus on how to manage the communication with customers.



Objective 4.1: Creation of a small core generic module, within the openIMIS platform, that would standardize the way each openIMIS module communicates with “the outside world”

Activity 4.1.1: Select an (email) templating engine and integrate it in the openIMIS technology stack (i18n management,...)

Activity 4.1.2: Enable openIMIS backend to dynamically register the templates within that engine (contributions mechanism)

Activity 4.1.3: Connect the communication module to an email server

Objective 4.2: Identify one current (customer) communication and provide a default email representation

Activity 4.2.1: Identify one existing customer communication, triggered by a migrated module (currently only claim management)

Activity 4.2.2: Develop a default template for the communication, register it in the templating engine and configure the Communication Platform module to actually send the (email) communication

Objective 4.3: Integrate with Workflow Engine for more comprehensive communication schemes (reminders, escalation,...)

This objective is only possible provided that a Workflow Engine is added to openIMIS platform (see work package 6).

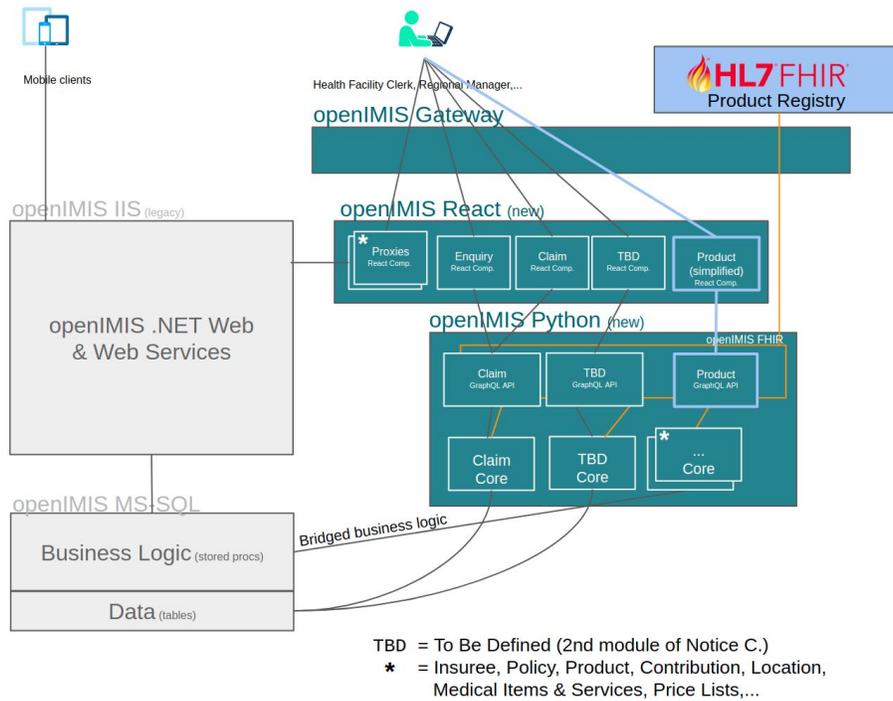
Activity 4.3.1. Design the communication scheme for the selected customer communication

Activity 4.3.2. Configure the Workflow Engine and Communication Platform to replace the straight communication by a Workflow Engine - managed one

Work package 5: Interoperability with Product Registry

Products are not changed/updated very often. We therefore suggest a “data only” (using the FHIR standards) integration. Completing interoperability will be a shared task between an openIMIS-dedicated team and a Product Registry tool team. The complexity will depend on the flexibility of the product registry tool to have the necessary features for openIMIS. So we propose to begin with a gap analysis and then proceed to configuration and connectivity.

Ideally, the chosen Product Registry tool supports FHIR standard and (data) integration will be performed based on FHIR format.



Objective 5.1: Gap Analysis

Activity 5.1.1: Analyse the ability for the product registry to cover the needs of openIMIS

Activity 5.1.2: Map out any potential gaps which will require additional development

Objective 5.2: Configure and Connect

Activity 5.2.1: Configuration/adapt the Product Registry to fit to openIMIS needs

Activity 5.2.2: Create the technical links between both tools (via OpenHIE platform)

Objective 5.3: openIMIS Adaptations

Activity 5.3.1: openIMIS backend adaptations (re-synchronization, product expiry management,...)

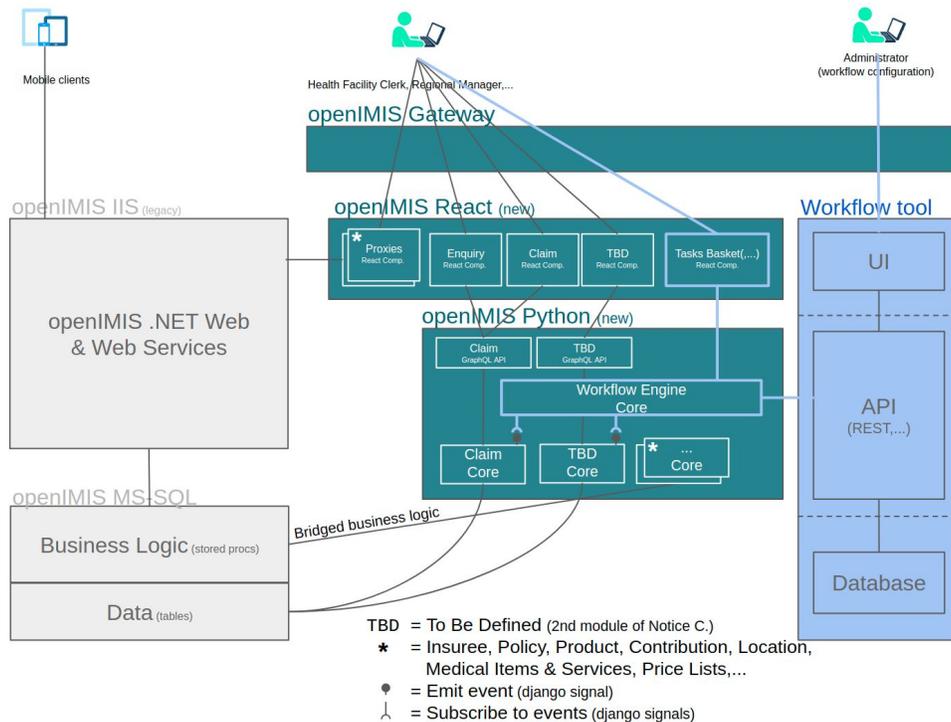
Activity 5.3.2 openIMIS frontend adaptations (UI simplification: removing product management screens)

Objective 5.4: Testing and documentation

Activity 5.4.1: Ensure the viability of the interoperability with a live case.

Activity 5.4.2: Technical documentation of delivered components (backend and frontend)

Work package 6: Configurable Workflow engine



Objective 6.1: Select Workflow Management tool

Activity 6.1.1: List ('must have' / 'nice to have') features expected to be taken in charge by Workflow Management tool

Activity 6.1.2: Select 2-3 open source tool candidates and perform gap analysis, leading to tool selection

Objective 6.2: Plug workflow engine into new openIMIS platform

Activity 6.2.1: Enable workflow engine for (module) contributions (workflow design/configuration)

Activity 6.2.2: Enable workflow engine for event triggering (workflow context instantiation and workflow instance triggering)

Objective 6.3: openIMIS UI module for Workflow Engine

Activity 6.3.1: Develop generic components to integrate Workflow Engine into users' work environment (task baskets, 'follow the link' actions,...)

Activity 6.3.2: Apply the workflow Engine for one specific use case (Beneficiary Enrollment, Communication Platform,...) (to be selected by the community)

Community Feedback

This project will interact with the broader community in several ways.

1. Identifying the activity with highest impact and priority.
2. Updating the wiki page accordingly.

3. Bringing in new teams of developers to support the development work required.
4. Participation in the weekly developer calls to ensure alignment.

To monitor results we propose to continue to work with weekly developers calls and monthly community sessions to discuss and monitor progress, re-evaluate priorities and keep each other informed of major developments between work streams. Since this process currently works well we see no reason to change the functioning.

Schedule

As we propose to work in an agile manner each step will be part of an iterative process. It will be adapted based on user needs and realities.

Activity	Team Location Month/Quarter	Month					
		1	2	3	4	5	6
Work package 1: Migration of the Beneficiary Enrollment Workflow to the modular platform							
Migration of Persons and Families	Bluesquare and/or Additional Partner, Globally						
Migration of Policies	Bluesquare and/or Additional Partner, Globally						
Migration of Contributions	Bluesquare and/or Additional Partner, Globally						
Migration of Beneficiary Enrollment Workflow (requires work package 6)	Bluesquare and/or Additional Partner, Globally						
Work package 2: Prototype for an Insurance Scheme for the Formal Sector							
Analyse the scope of work	Bluesquare and/or Additional Partner, Globally						
Assemble a (separate from current openIMIS) platform prototype to manage formal sector	Bluesquare and/or Additional Partner, Globally						
Develop the necessary modules (versions) to support the formal sector	Bluesquare and/or Additional Partner, Globally						
<i>OPTIONAL</i>							
Work package 3: Interoperability with openCVRS							
Gap analysis	Bluesquare, Jembi						

	and/or Additional Partner, Globally						
Configure and connect	Bluesquare, Jembi and/or Additional Partner, Globally						
openIMIS adaptation	Bluesquare, Jembi and/or Additional Partner, Globally						
Testing and documentation	Bluesquare, Jembi and/or Additional Partner, Globally						
Work package 4: Communication Platform							
Creation of a small core generic module for the communication platform	Bluesquare and/or Additional Partner, Globally						
Identify one current communication and provide default	Bluesquare and/or Additional Partner, Globally						
Integrate with workflow engine for more comprehensive communication schemes	Bluesquare and/or Additional Partner, Globally						
Work package 5: Interoperability with Product Registry							
Gap Analysis for the Product Registry	Bluesquare and/or Additional Partner, Globally						
Configure and Connect the Product Registry	Bluesquare and/or Additional Partner, Globally						
Test the Product Registry	Bluesquare and/or Additional Partner, Globally						
Work package 6: Configurable Workflow Engine							
Select workflow management tool	Bluesquare and/or Additional Partner, Globally						
Plug workflow engine into new openIMIS platform	Bluesquare and/or Additional Partner, Globally						
openIMIS UI module for workflow engine	Bluesquare and/or Additional Partner, Globally						

Deliverables

Depending on the work packages selected the deliverables and their month due will be subject to additional review and input from the broader community.

Deliverable	Month Due
Work package 1: Migration of the Beneficiary Enrollment Workflow to the modular platform	
Complete migration of persons and families	M4
Complete migration of policies	M5
Complete migration of contributions	M5
Complete migration of beneficiary enrollment workflow	Dependent on other work packages
Work package 2: Prototype for an Insurance Scheme for the Formal Sector	
A prototype of the insurance scheme for formal sector	M6
<i>OPTIONAL</i>	
Work package 3: Interoperability with openCVRS	
Interoperability is set up	M5 (if work package is selected)
Work package 4: Communication Platform	
Communication platform sample is provided	M5 (if work package is selected)
Work package 5: Interoperability with Product Registry	
Product Registry interoperability is set up	M5 (if work package is selected)
Work package 6: Configurable Workflow Engine	
Complete configurable workflow engine is set up	M5 (if work package is selected)

Global Good Maturity Model Assessment

openIMIS Global Good Maturity Model Assessment is available [here](#). It is periodically updated by the community.