

TECHNICAL PROPOSAL

This document has been prepared by Healthix Solutions Kenya Ltd

Date: 7th October 2019

Overview

FORMAL SECTOR REGISTRATION & LINKAGES TO PAYMENT GATEWAYS

The goal of the Support for Health Insurance Schemes in the Formal Sector is to **expand the scope** of the insurance members covered from informal sector into the formal sector; which includes employers, Sacco and other organized groupings. The process is best combined with the Payment workflow to ensure linkages to an accounting system and mobile payment gateways.

In that respect, the two processes combined **drive a better user experience** for the informal and formal sector signups and payment for the insurance services, **reducing paperwork** filled by the members and agents and hampering the **Turn Around Timelines (TAT)** for the issuance of the policy details to the member (to be **made electronic** and **near real-time**).

The current Beneficiary Enrolment module is monolithic and unable to scale and the migration to a new platform makes it agile. With the above changes the process of will also be shortened to a same day processing TAT.

High-Level Budget Summary

	Work Package 1 Support for Health Insurance Schemes in the Formal Sector	Work Package 2 Integration to mobile and other payment systems	Total Cost (USD)
Total Project Costs	155,120.00	158,540.00	313,660.00

Executive Summary

The goal of the Support for Health Insurance Schemes in the Formal Sector is to **expand the scope** of the insurance members covered from informal sector into the formal sector; which includes employers, Sacco and other organized groupings. The process is best combined with the Payment workflow to ensure linkages to an accounting system and mobile payment gateways.

In that respect, the two processes combined **drive a better user experience** for the informal and formal sector signups and payment for the insurance services, **reducing paperwork** filled by the members and agents. Better **Turn Around Timelines (TAT)** for the issuance of the policy details to the member (to be **made electronic** and **near real-time**) **is critical to the process**.

The current Beneficiary Enrolment module is monolithic and unable to scale and the migration to a new platform makes it agile. With the above changes the process of registration can also be shortened to a same day processing TAT. The formal sector will also have greater control on their membership's enrolment and deletions.

The Beneficiary Enrollment module & redesign and migration is critical to the project, as it entails an easier process of onboarding formal sector members, dependents, the scheme benefits and exclusions, the limits and Network of providers that the members can attend.

The process of informal sector member/ Beneficiary enrolment is full of paperwork and needs to be made easier for the agents and also the members joining the scheme.

Consortium Team

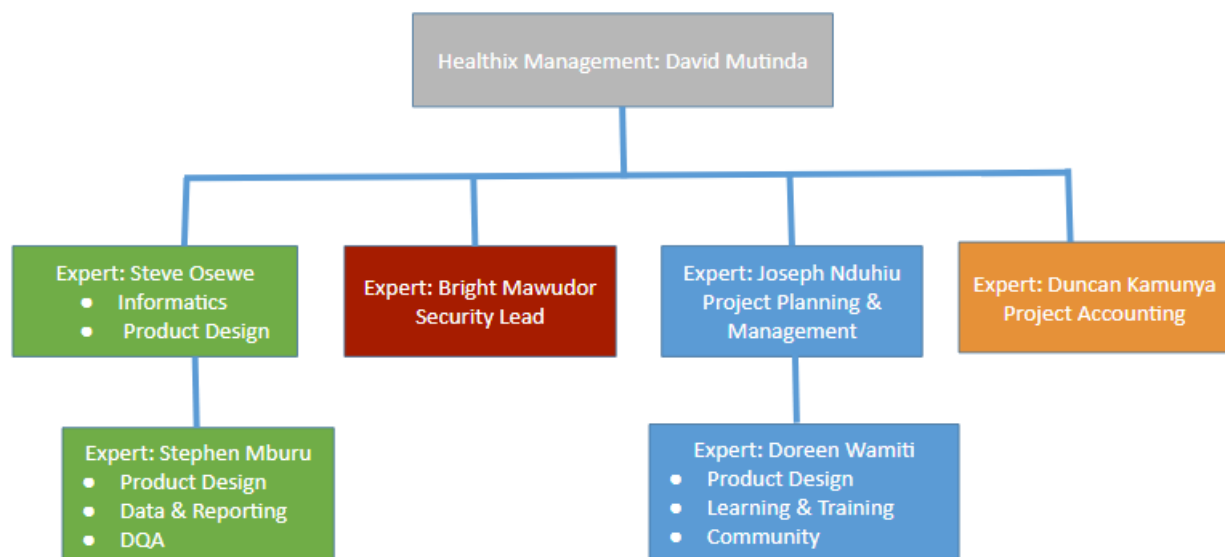
Healthix Solutions registered in Kenya is the lead in this development and deployment of digital health insurance solutions. Healthix is a technology company specializing in Healthcare (Providers) and Insurance (Payers) industry; connecting Insurance/Payers and Providers with a focus to improve patient care. We are enabling a vibrant Healthcare Ecosystem through a Shared Exchange platform (Enterprise Bus) we have developed (seamless integrated exchange services between all Healthcare players).

We provide value in Claims submission, Referral management, Preauthorization requests & responses, member eligibility verification and tracking, Claims adjudication and payment management amongst other services. The shared enterprise gateway makes it possible for the different players to exchange data real-time.

Our team is versatile and well blended to provide expertise in medical health, insurance segment, analytics and visualizations. Our experience spans more than 20 years in senior Level management and technology deployment with specialty is in the development and operationalization of digital health platforms. We have project management, Product Architects, Account Managers, Terminology specialists, Software Developers and Payer expertise.

1. **Healthix Team - David Mutinda:** He is currently the Business Development Director for Healthix Solutions (K) Limited, and is passionate about digitizing the health insurance sector. For this project, he will provide requirements gathering and analysis as well as openMIS installation and customization capabilities. As the director of Healthix Solutions, he will manage the resourcing and delivery of the project.
2. **Steve Osewe:** He holds an MSC in Computational Intelligence and a BSC in Information Technology. His career over the last 10 years has been spent in the health informatics sector in Sub-Saharan Africa working with local and international agencies to promote use of information systems in patient and hospital management. For this project, he will be the lead expert and will provide health informatics capabilities with regard to engagement with stakeholders and translating needs into technical requirements.
3. **Stephen Mburu:** He holds a PhD in Information Systems – Health Informatics. He is an expert in data science, software engineering, and development of digital health policies and software products. Dr. Mburu has supported Kenya and her technology partners key among them Word Bank Group, University of Nairobi and Strathmore University in the development of mHealth, Health Observatories and Telemedicine Solutions. Globally and regionally, Dr. Mburu worked with the United Nations (UN), World Health Organization (WHO), USAID, and KPMG to deliver various projects. Some of the key projects he has supported to successful completion include development of online database for African Network for Soil Biology and Fertility AfNET; Landscape assessment of Kenya Health Information Systems; development of the African Health Observatory (aho2.aho.afro.who.int) and Data Capture Tool (dw.aho.afro.who.int). Currently, He is working as lead developer of the Kenya Health and Research Observatory (KHRO). KHRO is an integrated repository and data analytics platform that will be used by policy and decision makers in monitoring the country's trends towards attainment of Universal Health Coverage (UHC).
4. **Bright Gameli –** He holds a PHD in Security and Software Development – Computer Technology and has over 7 years' experience in security management and assessment working with Cellulant, Seven Seas, Access Kenya and Healthix Solutions Kenya Limited. He is the brainchild of the Africa HACK-on Challenge that has been developing Africa's Nextgen security space with more than 20 Hackon Challenges done across Africa in 2018. He has a lot of experience in Security, Pentesting, User eXPerience, API Management and Data Management.

5. **Joseph Nduhiu:** He holds an MBA and BSC in Electronics Engineering. He has over 10 years' experience in the ICT sector in Sub-Saharan Africa and currently works as an independent trainer and consultant in IT Service Management, Project Management and Cyber Resilience. His experience in health informatics involved a stint with AfyaInfo, establishing technical working groups in counties bringing together government agencies, donor agencies and technology companies to synchronize efforts towards enhancing ICT in health. For this project, he will provide project management capacity, training and information management capabilities.
6. **Doreen Wamiti** - is a DHIS2 Consultant with PSI in Kenya. A dedicated and detail-oriented person who is very passionate about eHealth. She strongly advocates for health information systems that ensure evidence based decision making from the lowest to highest health service delivery levels. She provides various DHIS2 services ranging from Android apps development and deployment, core DHIS2 system deployment, she provides capacity building support, DHIS2 system administration, and performs analytics and dashboard development. She has a Masters degree in Applied Computing and a BSC Computer Science degree. She will be part of Product Design, Project Management and training and information management team.
7. **Duncan Kamunya** - He is currently the Chief Financial Officer for Healthix Solutions (K) Limited, and is passionate about digitizing the Health sector. He has a lot of experience in finance and financial analysis, audit and reporting, costing and price review, Fintech products and Account Management. He has a degree in Commerce (Finance), Level 1 – CIMA, and a CPA (K). For this project, he will be part of the Data Science and Business intelligence team and representing the Healthix Management team.



Background or Problem Statement

Problem Statement

The main objective of the OpenIMIS project is to offer medical insurance to all at a rate that is affordable. OpenIMIS's current functionality for membership enrolment is geared towards the informal sector with enrolment agents going door to door to collect beneficiary data and contributions from individuals/families. The payment process is prone to misappropriation by the agents which might include non-submission of funds.

Member Enrolment is a demanding and expensive processes in the workflow of providing insurance cover to the larger population. From our experience, member enrollment is expensive largely driven by the fact that it is paper-based, agents have to collect the details for signup from the payer and send them to the Insuree, the collection and confirmation of funds receipted is laborious and the systems to capture the documentation are not fully automated with the different checks and controls to weed out un-authorized fraudulent transactions from being introduced into the system.

The current membership enrolment functional design is not efficient if the scheme operator wishes to expand coverage to formal employers and a large number of employees and their families need to be enrolled at once. OpenIMIS would need functionality to consume large amounts of beneficiary data (ideally with synchronous interoperability with human resource IT systems) at once and assign respective policies to the individual/family, while also keeping track of the contributions requirements and the corresponding incoming payments for those policies.

For every member enrolment submission a corresponding payment confirmation is critical and needed to authorize cover by the insurance company. The mobile money payment automation and accounting system integration is vital and will be handled in this project to benefit the OpenIMIS project.

If the above changes are not effected the cost element of the insurance premiums will increase and thereby reducing the propensity of Insurance sales to the larger population.

Current challenges with the current member platform

The current setup has several challenges that need to be done away with in the new development and they include;

1. Reduced paperwork especially with the forms, membership cards
2. Combine mobile phone numbers as part of the member identification process and verification at the service points.

Current challenges with the current payment model

Contributions are collected by the enrolment agent directly. The enrolment agent transfers the cash collected to the accounting person at the SHI office. In remote areas, the collected money and forms can also be given to the enrolment officer in charge (staff of SHI Board). The officer will enter the data directly into OpenIMIS. Cash will be transferred to a SHI Bank account. The enrolment officer then drives to the villages and collect the forms and cash from the enrolment assistants. This alone presents a lot of challenges which are listed but not limited to below;

- Manual application and payment process
- Difficulty in integrating the manual processes with other systems.
- No coherent and unifying data structures.
- Difficulty sharing information

Some of the expected benefits from the mobile payment and accounting system integration are;

1. Reduce the amount of time it takes to pay for premiums
2. Reduce the amount of time it takes to reimburse individual members for claims already processed
3. Reduce fraudulent transactions perpetuated by the agents either – not remitting all the cash paid by the member
4. Allow users to pay premiums directly from their mobile phones and check their transaction balances

Digital Health Technologies

The development and work will take place in Kenya, Tanzania and Nepal and will be mainly tested in the Tanzania and Nepal environment.

Our platform will greatly depend on best developed APIs from the Health Client Registry so that validations and Verifications are confirmed real-time.

To achieve this objective, we propose the incorporation of the Domain Driven Design (DDD) in modelling the new openIMIS functionalities. Below are the benefits of the DDD approach in terms of openIMIS architecture.

- Being Aligned – talks to the business model strategies and processes.
- Being Isolated - from other domains and layers and business.
- Being loosely designed.
- Being reusable – Models re-used via endpoints and avoids duplication.
- Be an abstract and cleanly separated layer.
- Minimum dependencies on infrastructure and frameworks.
- Agile by design – allows for incremental development and delivery.
- The use of micro services concept for each service to connect with a particular MNO
- Provide REST services which can be consumed by any client regardless of the technology in use.

Suggestions that we shall incorporate in the new development

1. Enhance mobile money payment as the SHI enrolment assistants or Agents might lose the payments for made by the members.
2. Members need to be identified with an employer/ Sacco/ organized group and not only as individuals
3. Corporate scheduled payments should be allowed and tracked at individual levels.
4. Corporates should be given more access and control on the member deletions, additions and upgrades of a scheme benefits and exclusions.
5. Allow corporates to integrate to the OpenIMIS platform and submit member/ staff information without need for paper use including photo details.
6. Enhance the SHI access platform designs and information availed especially when the staff member goes to confirm registration at their offices. The process should be flawless and efficient to both parties.
7. Enhance controls and verification processes especially on dependants – age ceiling or student statuses, previous coverage, payment criteria.
8. Mobile App development for members to track their membership, benefits, exclusions, payment track, Usage of the covers, adverts from the insurance provider amongst other services.
9. Tracking of scheme expiry dates and notifications to the individuals and the companies that pay for the scheme member are notified.
10. Mobile APP capturing of birth notifications, student extensions details in a specific scheme.

The Beneficiary Enrollment module redesign, modification and migration is critical to the project, as it guarantees an easier and elaborate process of onboarding both formal and informal members & dependants onto various defined schemes, benefits and exclusions, limits and provider Networks.

The development stages will mainly be divided into the following development arenas;

- a. Requirements prioritization
- b. Phased Development of the Changes
 1. Backend extension development for Schemes management, members, Families

2. API Development to integrate to OpenIMIS and also HR systems for companies.
 3. Front-end development – web, Mobile app
- c. Testing and deployment of the
 - i.
- d. Mobile money integration
 - i. Mpesa API
 - ii. Airtel Money API
 - iii. Nepal Mobile API
 - iv. HL7 FHIR compliance testing

Use Cases and User Stories

Use Case 1: Member Registration

Below is a member registration process that allows for automated single member registration. The same process is applicable in the automated agent registration process.

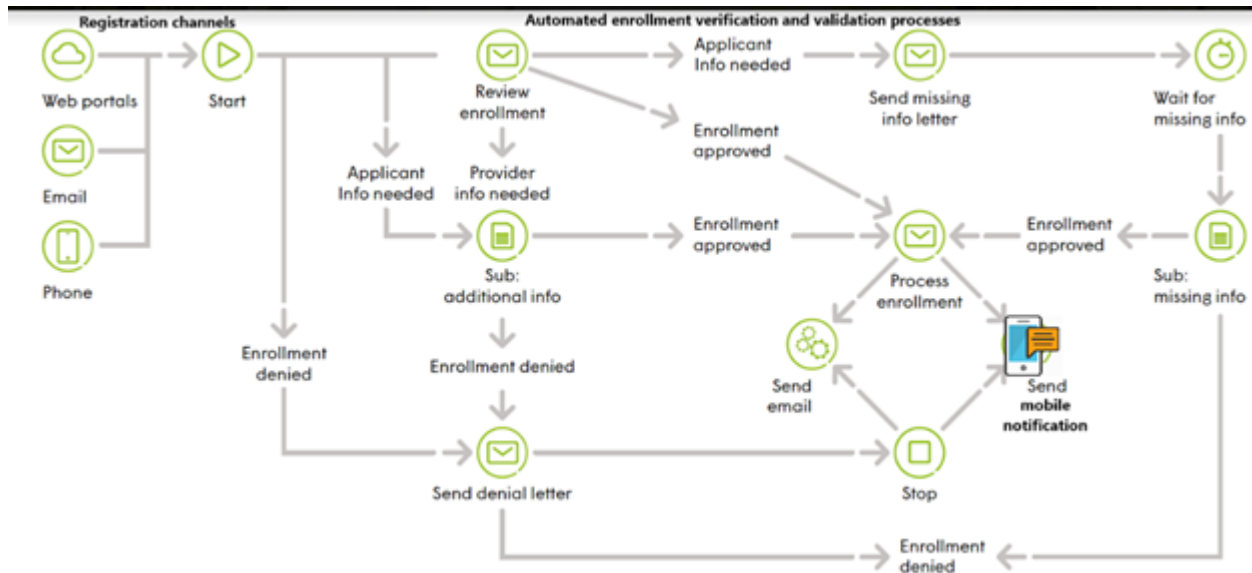
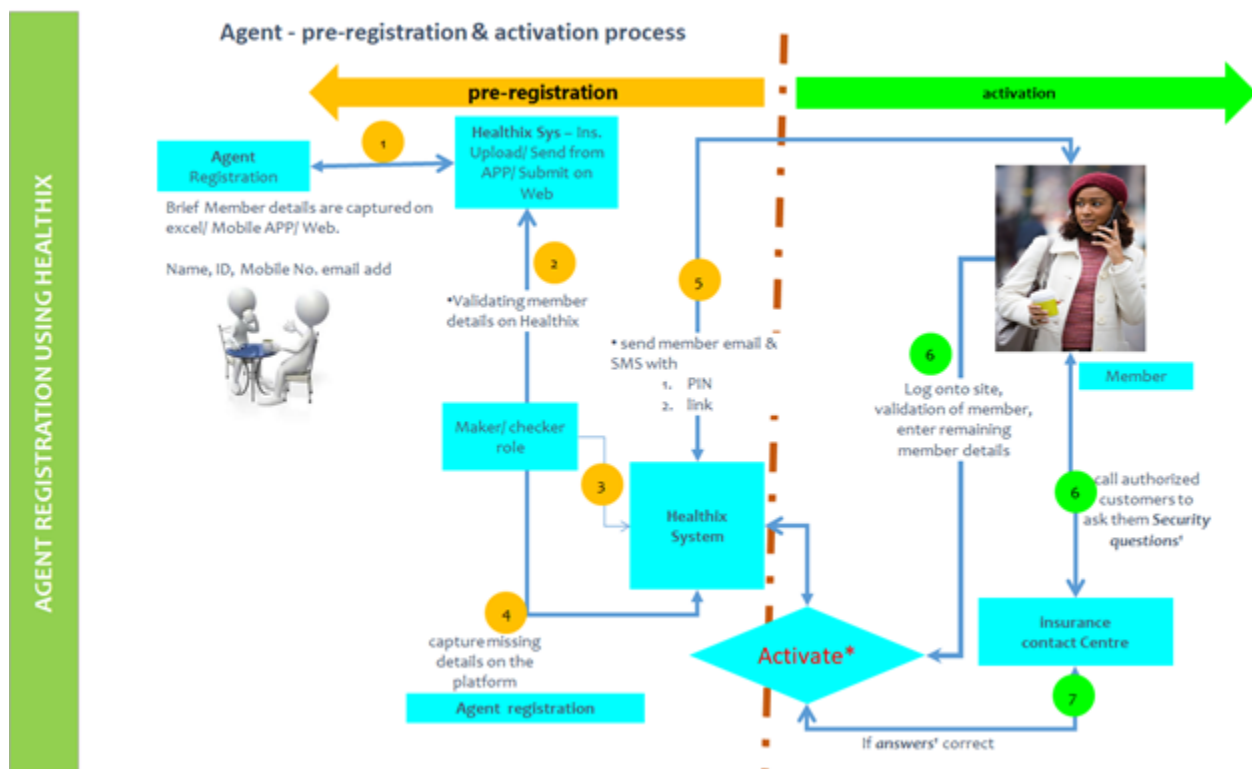
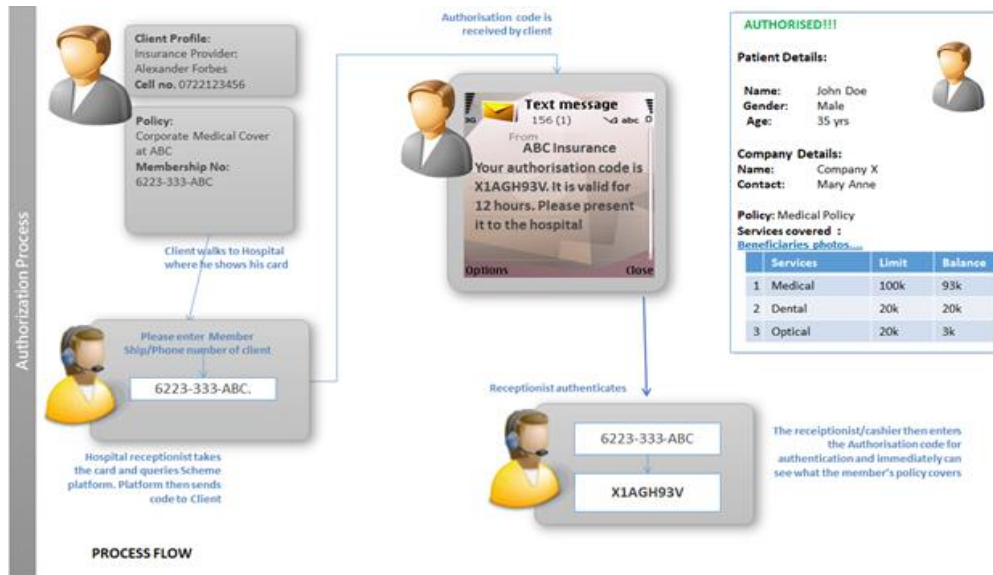


Fig above – shows the Automated member registration process

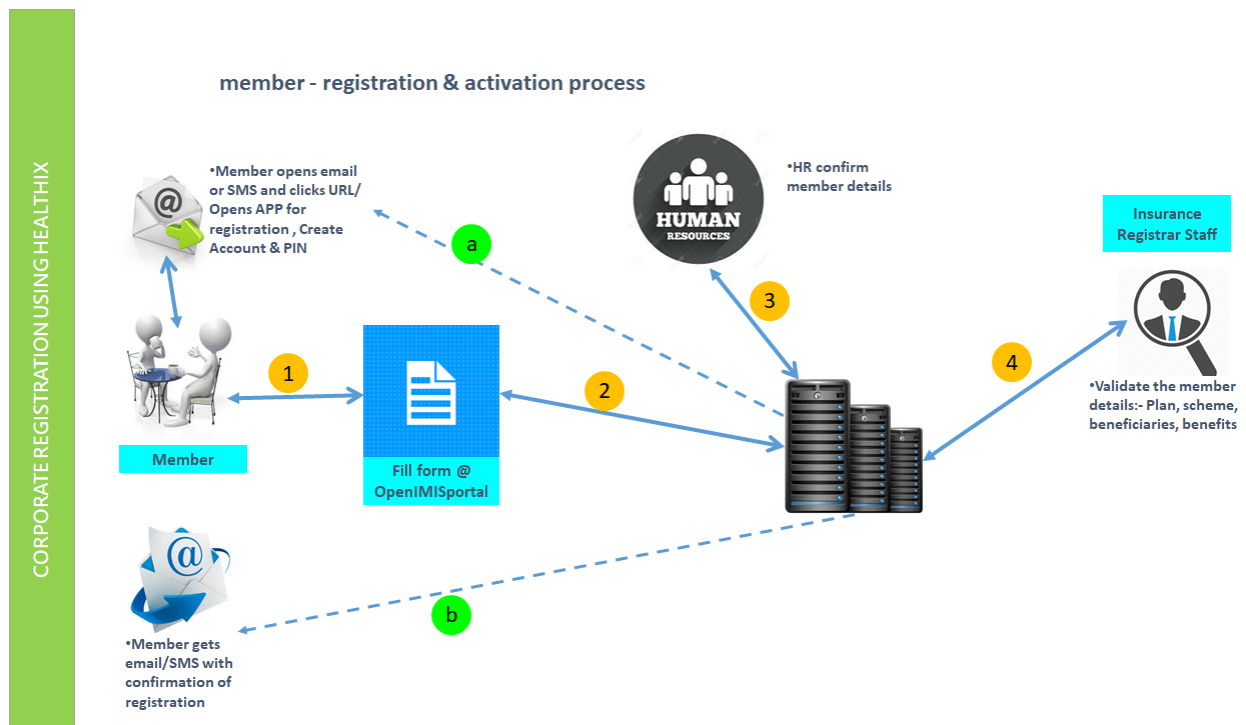


Agent registration that guarantees Agents to receive their commissions for every recruitment done.

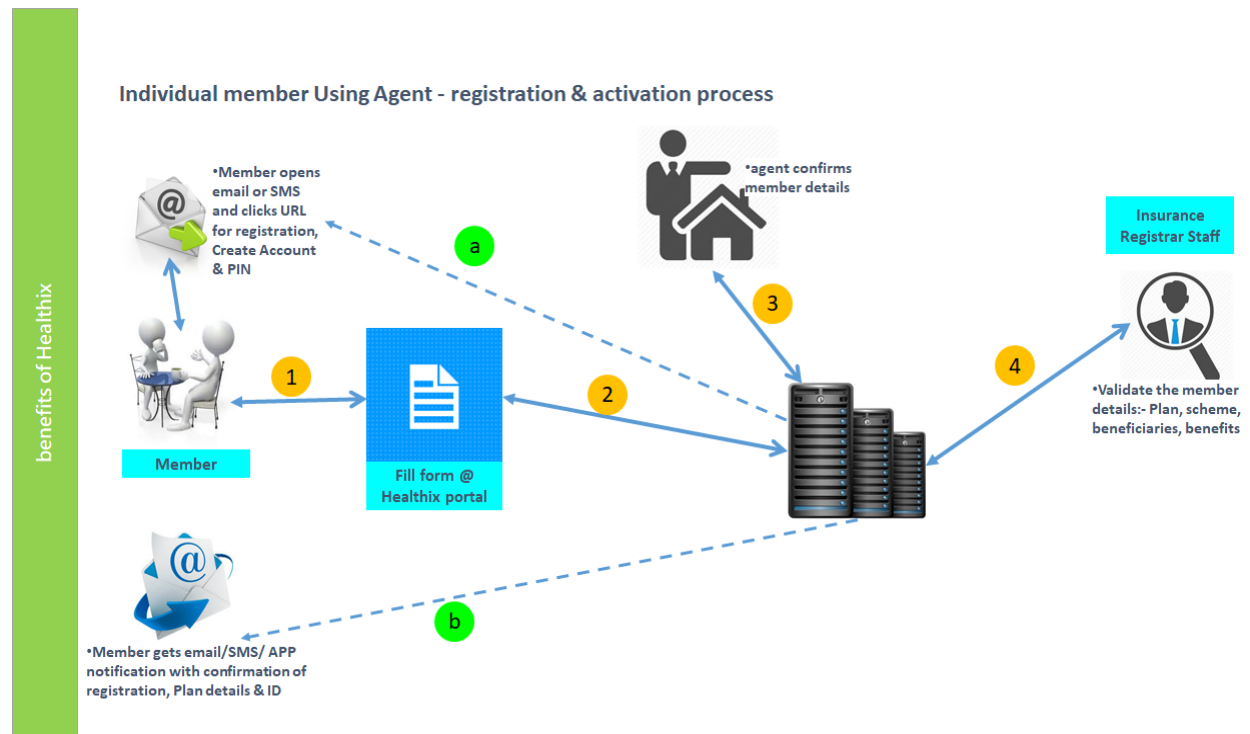
Online member Verification at Provider end;



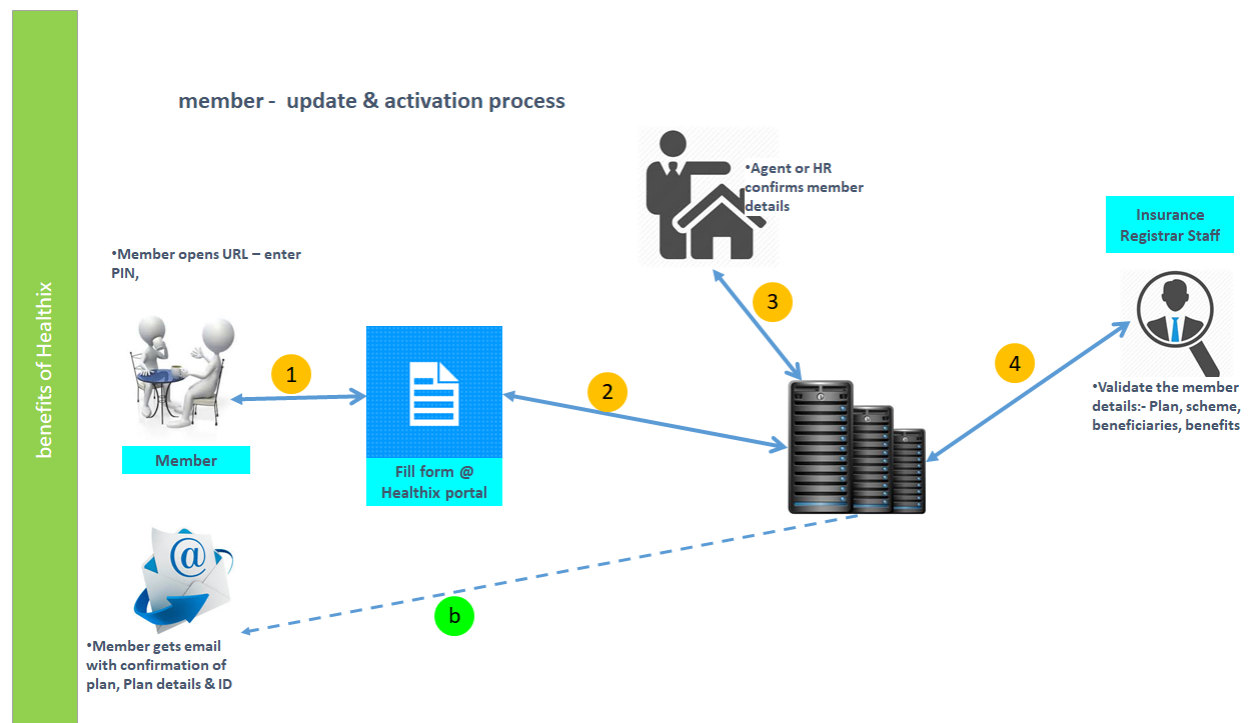
Corporate Registration Process.



Individual member registration by an agent



Member updating data using mobile APP/ Web



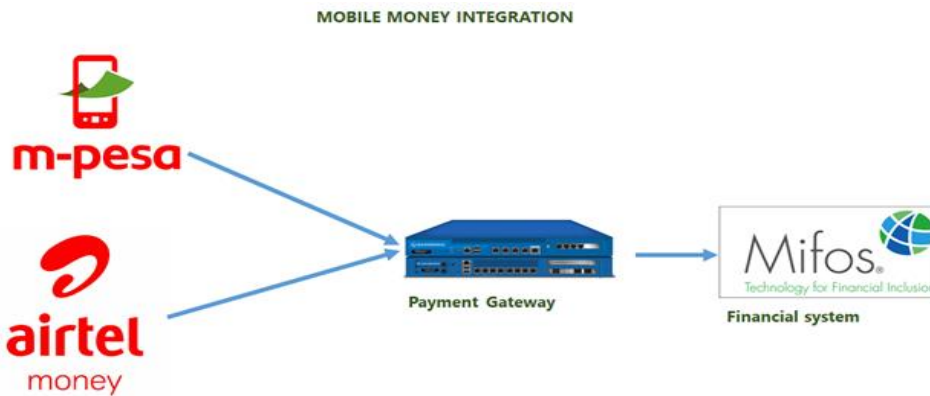
Use Case 2: Payment Integration

Mobile Money Integration

Mobile money aggregation and integration to the accounting platforms is a great gain for the member registration process. The gateway will be developed using the concept of micro services where each service will be connecting with a particular MNO e.g. Safaricom or Airtel. The micro services will be developed using any modern technology such as node.js. The services will be rest services and can be consumed by any client regardless of the technology being used.

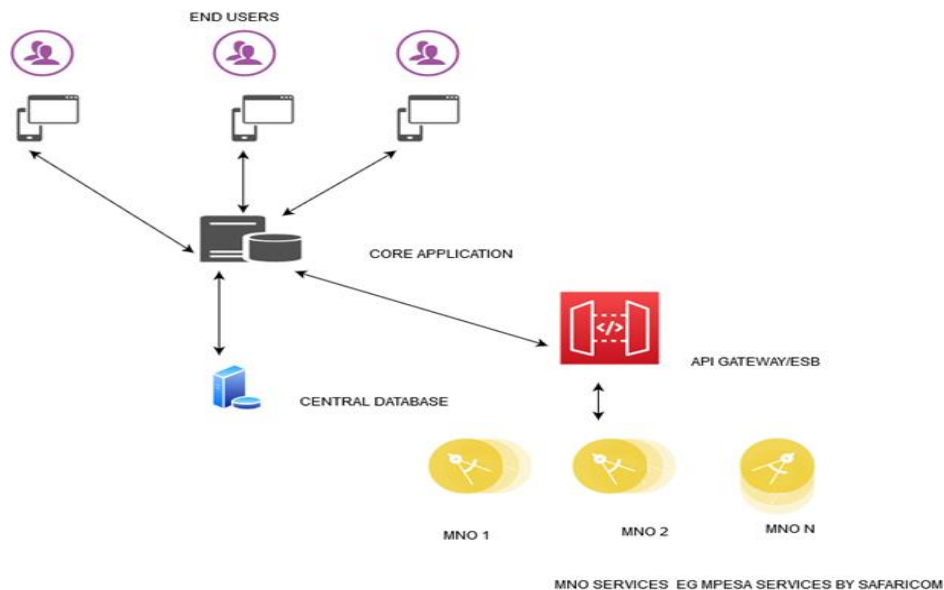
We shall use HL7 FHIR standards for the integration to the OpenIMIS platform.

See below our integration architecture.



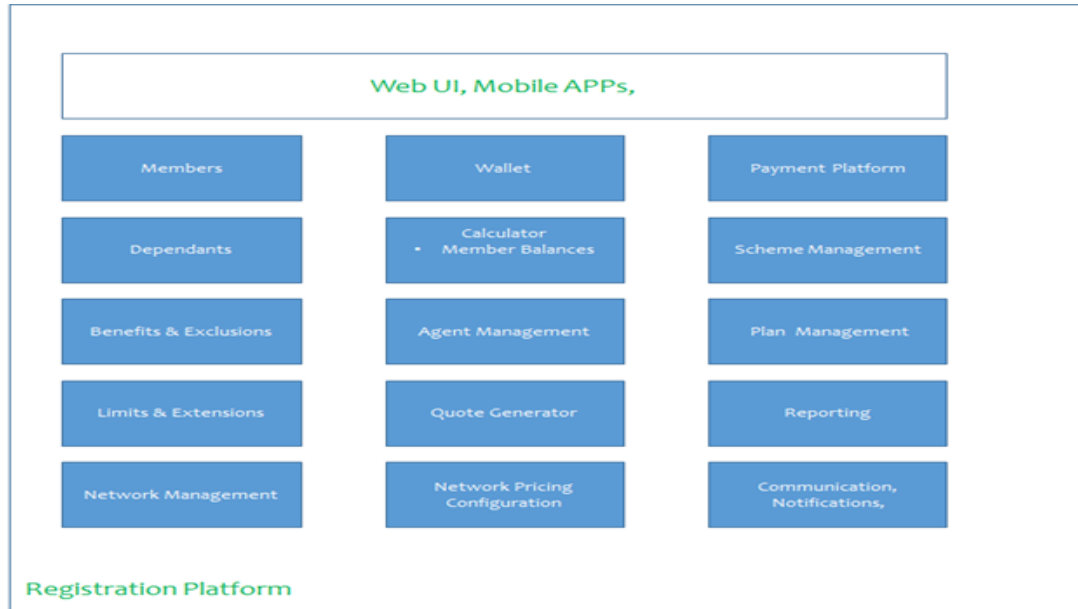
System High-level Architecture

The below diagram illustrates how the gateway will connect with the insurance system



Objectives and Activities

Below is a Member Enrollment modular design that ensure scalability and detail capturing.



The member registration platform needs to be versatile and accommodate additional features that reduce paperwork and TAT on the registration and activation of the members and their dependants.

Work package 1: Support for Health Insurance Schemes in the Formal Sector

Formal sector member registration has multiple pillars that guarantee an automated member registration even for the informal sector. The driving force is efficiency in the enrolment.

Objective 1.1: Member Registration

Activity 1.1.1: Development of UI, Web, APP:

- UI upgrades for the Agent, User, and Provider & Insurance/Payer.
- Upgrade of the mobile APP to be able to allow for issuance of the medical card that is APP based.
- Digitise all the forms by Agents

Objective 1.2: Development of a notification process

Activity 1.2.1: Integration of a SMS, Email, Web and APP notifications:

- Members should be alerted of renewals on SMS, email & other platforms.
- Payment confirmations.
- Agents communications about renewals

Objective 1.3: Integration to Registries

Activity 1.3.1: development of the Facility and Product Registry

- Facility Registry API
- Product Registry API configuration

Objective 1.4: Support Staff Integration

Activity 1.3.1: Agent Module – configure for formal sector

- Commission Management
- Agent module

Work package 2: Integration to mobile and other payment systems

Payment enablement i.e. mobile money and corporate contributions is a critical COG to the development and deployment of the Formal Sector member registration. The platform has to be integrated to the Accounting system and also the Facility and Product Registry to drive enrolment efficiency in the Universal Health coverage mandate.

Objective 1.1: Research on mobile money integration

Activity 1.1.1: MNO API exchange:

- Get Nepal MNOs to exchange details.
- Get Tanzania MNOs to exchange details.
- Assign a project team at the MNO for the integration.

Objective 1.2: API Development to Provide Mobile money integration

Activity 1.2.1: Open APIs to the Accounting system to:

- Reduce the amount of time it takes to pay for premiums
- Reduce the amount of time it takes to reimburse individual members for claims already processed.
- Reduce fraudulent transactions perpetuated by the agents either – not remitting all the cash paid by the member.
- Allow users to pay premiums directly from their mobile phones and check their transaction balances.

Objective 1.3: Connectivity to accounting systems

Activity 1.3.1: HL7 FHIR Standard Configuration and testing

- Membership Renewal
- Membership formal sector

Objective 1.4: End to End Configuration and UATs

Activity 1.3.1: User Acceptance Tests

- UI – APPs, web, Mobile apps
- Payment enablement
- Alerts and notifications

Community Feedback

The following schedule is proposed to ensure that all the project outcomes are achieved:

Time Driven Activities

Deliverable	Timeline	Responsible
Inception Evaluation and reporting	2 weeks after project kick off	Lead Expert
Status updates on the designs & progress	Every 2 weeks	Lead Expert
Monthly publishing of the completed modules and source Code	Monthly updates on Atlasian	Lead Expert
Quarterly reports and updated work plans	5th day of every month	Project Team
Final report	Oct.2020	Lead Expert

Event Driven Activities

Deliverable	Event	Responsible
Conceptual Design of the new modules and the migration path	Review of the different deployments and any enhancements.	Project Team
Review and monthly discussions of Designs of the API endpoints	After conceptual review of the new system & monthly reviews	Project Team
Gap Analysis	After collective review of the new system architecture	Project Team
Design and Testing of the APIs	After agreed design is commissioned	Healthix Team
OpenMIS modules Appended to the new architecture	After new system has been deployed and is operational	Project Team
Project Completion	After the system architecture has been adopted and deployed.	Healthix Team

Schedule

The following is a high-level work plan.

Activity	Team	[Month]						
	Location							
	Month/	Dec	Jan	Mar	Apr	May	Jun	Jul
	Quarter	1	2	3	4	5	6	
Payment Integration								
Explore the selected mobile wallets architecture	[Healthix, TZ, Nepal]							
Design Mpesa & Airtel integration	[Healthix, Kenya]							
Design APIs into the Mifos system	[Healthix, Kenya]							
Linking of the MNO API to mobile wallets	[Healthix, TZ, Nepal, Kenya]							
Linking the Mifos system to openIMIS - HL7FHIR design and configuration	[Healthix, Kenya]							
	[Healthix, Kenya]							
Formal Sector Member Registration								
Research, design and signoff of the Formal sector needs	[Healthix, TZ, Nepal]							
Redesign of the UIs and Backend of the - APPs, Web	[Healthix, Kenya]							
Digitizing the current physical forms and Output files	[Healthix, Kenya]							
Connect to the respective Backend processes for calculation of Premiums	[Healthix, Kenya]							
Facility and product Registry integration	[Healthix, Kenya]							
Commission for agents	[Healthix, Kenya]							
Payment & Formal Sector Activities								
synchronise member enrolment to payments	[Healthix, Kenya]							
Notifications on SMS, email, APPs	[Healthix, Kenya]							
UATs with other platforms	[Healthix, TZ, Nepal]							
End user acceptance tests & Signoffs	[Healthix, TZ, Nepal]							

Deliverables

Deliverable	Month Due
Mobile payment architecture structure	Jan-20
Formal Sector Designs	Jan-20
Model outputs and evaluation metrics	Mar-20
API that works with any MNO	May-20
Mifos system API	May-20
APPs, Web upgraded Version	May-20
Facility and Product Display on UI	May-20
Micro services API testing environment	Jun-20
Mifos system API testing environment	Jun-20
Notifications on SMS, Email, APPIs	Jun-20
UAT test plans	Jul-20

Global Good Maturity Model Assessment

Example Rating of a Digital Health Software Global Good (make a copy of this document to use)			
Core Indicator and Calculated Score [0-10]	Sub-Indicator	change rating here	
Global Utility - 2	Country Utilization	Low	Less than two countries or states actively use the tool as part of their health information system
	Country Strategy	Low	Less than two countries or states have included the tool as part of their eHealth strategy or framework
	Digital Health Interventions	Medium	The tool partially meets digital functional requirements (as defined by WHO's Classification of Digital Health Interventions) without significant customization or configuration
	Source Code Accessibility	Low	Source code not publically available or not released under an open-source license
	Funding and Revenue	Medium	Multiple revenue streams/funders exist across project implementations
Community - 5	Developer, Contributor and Implementor Community Engagement	Low	Less than 10% of estimated total number of developers, contributors, and implementers are on a communication platform
	Community Governance	Medium	Some informal processes for community management exist to direct continued development of the digital health tool
	Software Roadmap	High	New features and functionality are documented as part of a software roadmap as part of a release cycle. There are forums for community members to discuss new feature requests. A clear prioritization process exists and is utilized for the development of new features and functionality as part of a product backlog
	User Documentation	High	A full suite of user documentation exists including training manuals, online courses, tutorials and implementation guides addressing most of the common functionality. Documentation has been released under a Creative Commons license
	Multi-Lingual Support	Low	Limited or no support in the software for multiple languages. Multi-lingual documentation / user resources are practically non-existent
Software - 7	Technical Documentation	Medium	Some technical documentation exists of the source code, use cases, and functional requirements
	Software Productization	Medium	Full documentation available for deployment and configuration. A new implementation does not require the involvement of the core development team

	Interoperability and Data Accessibility	High	A robust API is available for key data and metadata exchange needs for the primary business domain with functional requirements for the API having been developed in conjunction with appropriate country, regional and global stakeholders. API endpoints exist for core data and metadata elements which adhere to standards developed by an appropriate Standards Development Organization relevant to the tools business domain. Standards-based API endpoints are used in at least four jurisdictions (e.g. countries or states)
	Security	Medium	Role-based authorization exists, if appropriate. Guidance on encrypting all remote access (web interface, APIs) is available to implementors
	Scalability	High	There is at least one jurisdictions (e.g. country, state) deployment for which 30% of all "entities" are managed within the software. Performance and load testing is a part of routine releases and results are publicly available.