October 11th, 2022

An Overview of SanteIMS as an EIR/IIS – The Tanzania use case

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An Introduction to SantéIMS & Tanzania Use Case

Madeline Barber, SanteSuite Inc., Director

Webinar Format

- An overview of SantéIMS
- A use case from Tanzania
- Q&A

SantéIMS Overview

- Key functionalities

- Table of functional requirements

- Considerations for implementation support

- Typical implementation timelines

- Contracting options (SaaS vs licensing)

- Cost categories (and, if possible,)
  - cost to set up and implement,
  - running costs based on contracting mechanism

SantéIMS Key Functionalities

A proven, person-centered, Immunization Information System (IIS)

- Built from the ground up to support any type and any scale of immunization program
- Offline/online with no loss of functionality or data
- "Once and Done" workflow

Integrated Workflow

Decision Support

Supply Chain Integration

Adverse Event Reporting

Person-Centered Immunization Management

All-level Analytics

Offline-First

Interoperable

Tablet to Desktop

SantéIMS Key Functionalities

Significantly improves data quality

- Implements personal Unique Identifiers (UID), and registration search functions
- Flagging and de-duplication of patient records through integration with SantéMPI Master Person Index

SantéIMS Key Functionalities

Integration and Interoperability "Out of the Box"

- OpenHIE ready and provides interoperability via numerous global data exchange standards

- Integration with external analytics and data visualization tools such as DHIS2

- Integration with logistics management systems such as OpenLMIS

SantéIMS Key Functionalities

Leverages existing hardware investments

- Runs natively on Linux, Windows, Android, leveraging existing hardware investments in tablets, laptops, desktops etc.

- Federated deployment model which can reduce central server workloads and telecommunication costs

SantéIMS: Proven Impact & Benefits

39 % Coverage Improvement

83 % Improvement in Data Quality, Completeness and Timeliness

8 Day Avg. Reduced Health Worker Reporting Burden

55 % Improvement Identifying Missed Doses

70 % Improvement Stock Management and Supply Chain Efficiency

41 % Faster Patient Registration and Record Update

Functional Requirements: SantéIMS Checks All the Boxes

1. A communication platform that allows for targeted communication aimed at healthcare professionals and the public	✓
2. Decision support systems for vaccine providers	✓
3. Appointment scheduling with auto-calculate functions to ensure follow up appointments are booked within the correct window	✓
4. Tracking of reasons for refusal of vaccination, as well as access issues such as supply	✓
5. Reports and individual monitoring	✓
6. Microplanning enabled	✓
7. Data and charts on coverage and other relevant program indicators	✓
8. Data aggregation by geographical and/or administrative levels	✓
9. Compliant with open standards such as FHIR	✓

Functional Requirements, Continued

1. Data and information on non-vaccinated individuals	✓
2. Data to support visualization through figures and risk maps	✓
3. Client/patient access to individual vaccination history	✓
4. Registration of vaccine events	✓
5. Information on the administered vaccine	✓
6. Support for traceability of biologicals	✓
7. Monitoring and evaluation of Events Attributable to Vaccination and Immunization (EAVIs)	✓
8. Digitized, verifiable vaccine certificates	✓
9. Track and Trace of vaccines via integration with GS1 and/or TS	✓

SantéIMS: Evidence Driven Improvement

Vaccine Workflow with Decision Support

Generate Point of Care Based Data/Reports

Enable Investigation

Improvements

Outcomes

Considerations for implementation support

- Existing in-country depth and range of technical skills and capacity
- Experience providing different levels of support from Tier 1 (help desk) to Tier 3 and necessary infrastructure
- Staff retention and organizational "memory"
- Governance model

Typical implementation timelines

Dependent on variables such as

- Number of facilities/points of care and their geographic distribution
- Existing telecommunications infrastructure
- Local technical skills and capacity
- Degree of change management needed
- Current technology, whether paper–based or existing EIR and associated migration effort

Contracting options

- SaaS
- Licensing
- Hybrid

Cost categories

- Assessment
- Implementation
- Data migration
- Training and capacity building
- SaaS subscription
- Ongoing support and maintenance

Tanzania USE Case – Illustrative Content

- Overview of the problem > how did you know you needed an EIR/IIS?

- IIS selection process > what drove you to choose your IIS/EIR?

- How was the platform applied to the context to solve the problem?

- What are the system's most useful core functionalities?

- What are the benefits to the program and impact on the health system of the EIR/IIS?

- Pros and cons (functional, financial, sustainability)

- Lessons learnt

Electronic Immunization Registry Solutions Development Process : The case of Tanzania

John Richard: Software Development and QA Lead

Electronic Immunization Registry Solutions Development Process
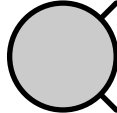
The case of Tanzania

October 2022

Presenters:
John Richard: Software Development and QA Lead
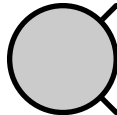
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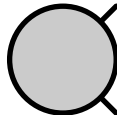
Overview of the challenges

Inaccurate denominator

Inability to trace defaulters

Complexity of data collection tools

Low data use capacity
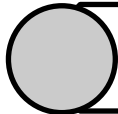
Lack of visibility of consumption and supplies at facility level

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Tanzania Electronic Immunization Registry (TIMR)

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Selecting Solution Technology

Guiding Considerations

1. Digital Health policy and Strategy requirements
2. Existing technology landscape in the country
3. Technical skillset and capacity in the country.
4. Local ICT infrastructure
5. Openness, scalability and re-usability

Open IZ Platform

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Overview of TIMR and Coverage

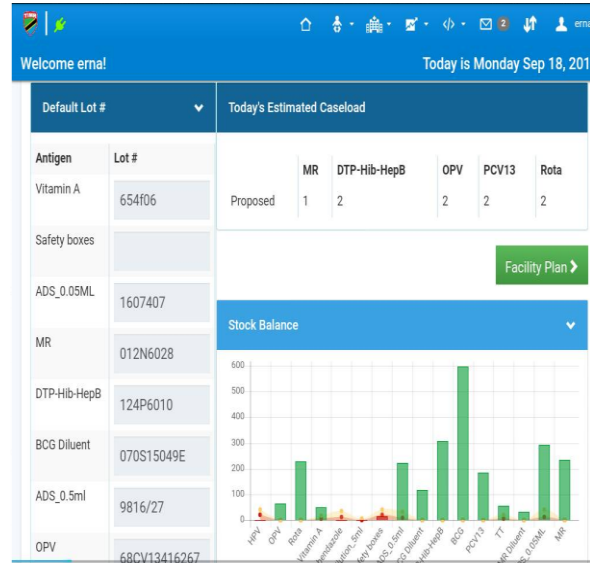The Tanzania Immunization Registry (TImR) mobile application enables front-line healthcare workers to register, store, and track child immunization information such as what immunizations a child has received and when a child is due for upcoming immunizations.

Over 2M

children are registered in Tanzania immunization Registry.

3800+

health facilities in 15 regions in **Tanzania**

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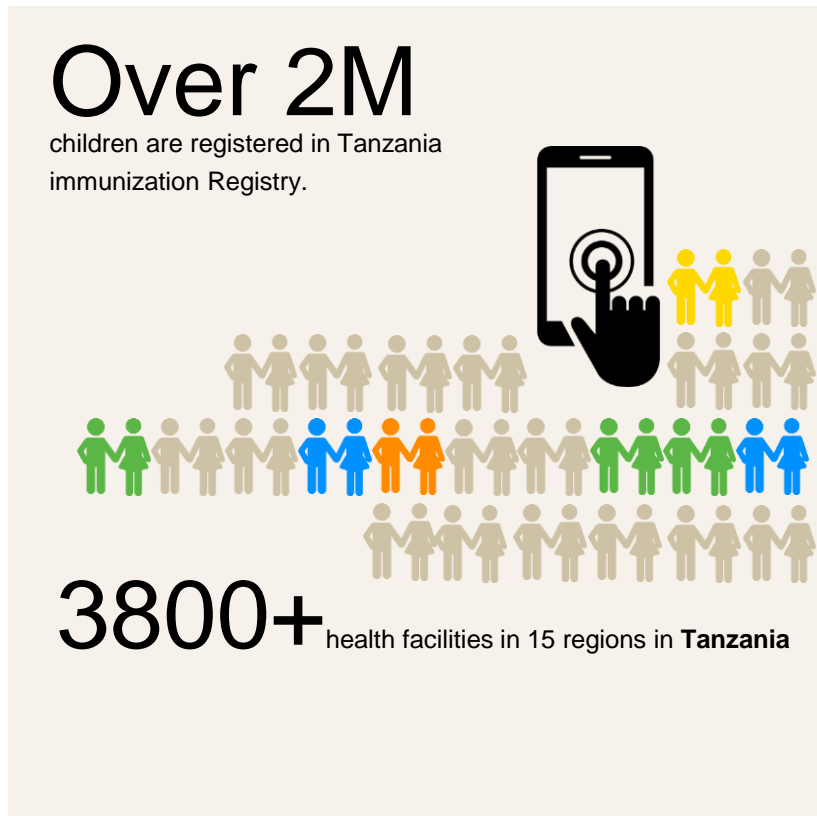
Platform Used to Develop TImR

TImR Solution was build on OpenIz Platform.

Open Immunize is a community software project intended to provide a generic platform upon which jurisdictions can build immunization information systems.

It provides an open source, customizable, enterprise scale jurisdictional IMS solution founded on the tenants of Open Architecture, Interoperability, Security & Privacy and Extensibility.

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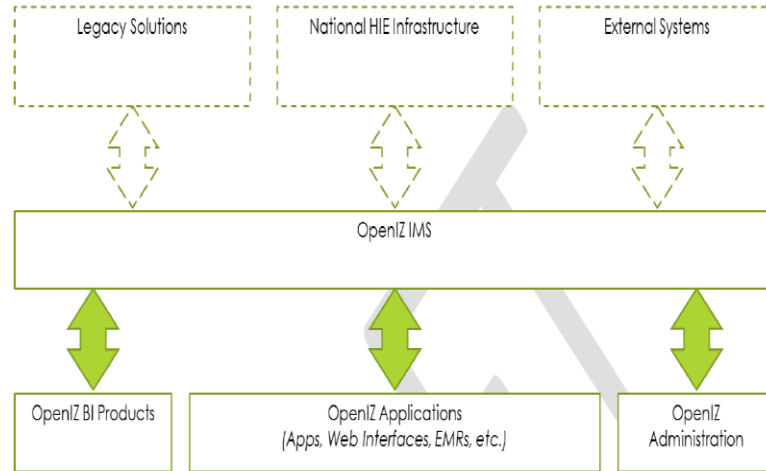
Solution Architecture

- The Tanzania Immunization Registry (TImR) is a multi-application, scalable immunization registry platform.

- TImR consists of many components:
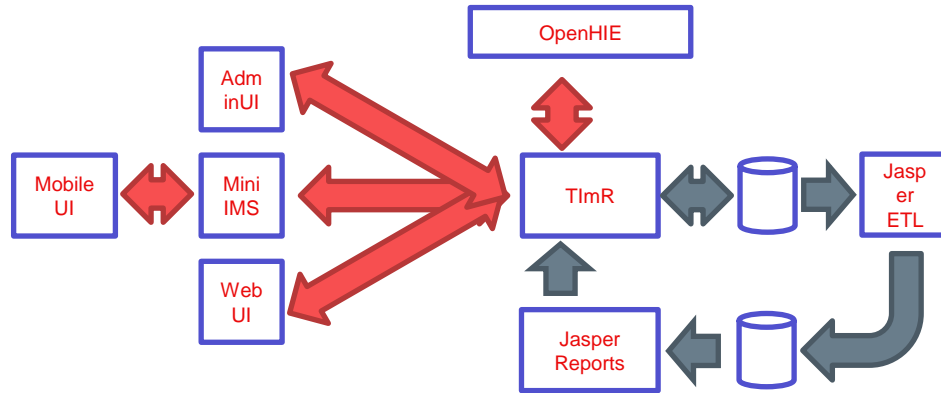
Solution functionalities

TIMR Development & Deployment

Timeline:

- 01/May/2016 — Inception (16/May/2016)
- 23/Sep/2016 — Alpha Release
- 21/Oct/2016 — Beta Release
- 18/Nov/2016 — Release Candidate 1
- 03/Jan/2017 — RC1 Demonstration
- 08/Feb/2017 — UAG Testing
- 04/Apr/2017 — Release Candidate 2
- 03/May/2017 — UAT
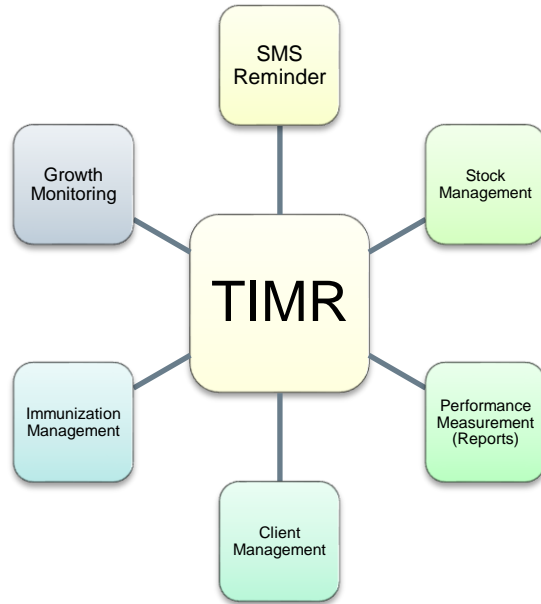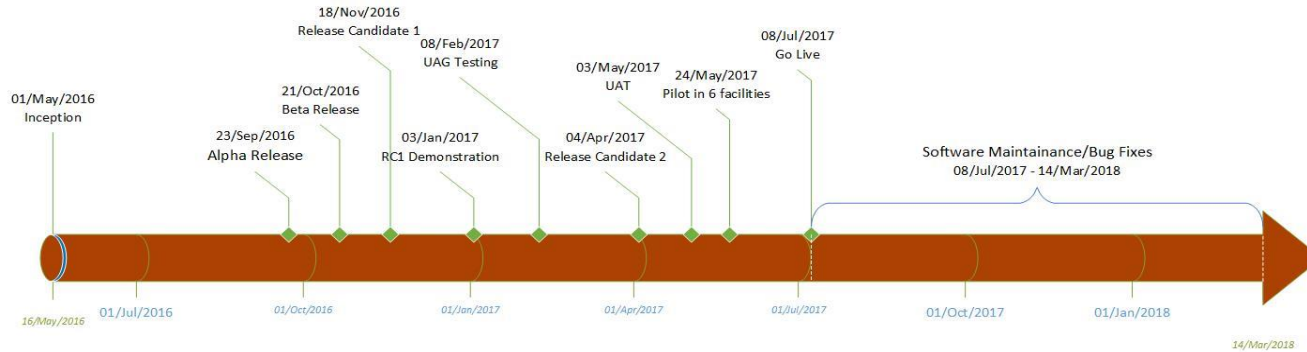- 24/May/2017 — Pilot in 6 facilities
- 08/Jul/2017 — Go Live
- Software Maintainance/Bug Fixes 08/Jul/2017 - 14/Mar/2018

Timeline axis: 01/Jul/2016, 01/Oct/2016, 01/Jan/2017, 01/Apr/2017, 01/Jul/2017, 01/Oct/2017, 01/Jan/2018, 14/Mar/2018

Pilot.

- System piloted in 6 facilities in Arusha.
- Facilities with different setups i.e best internet connections, moderate internet connections and limited/poor internet connections.

Rollout Approach

- 1 week TOT training.
- At least 5 TOTs from each Districts.
- TOTs provides onsite trainings
(1st Visit – Orientation, 2nd Visit : Go live
3rd visit support identified gaps)
- Approach was revised to classroom based training.

TImR Capabilities

1. System needs less internet bundle; data is compressed during synchronization.
2. On device and server back up of data incase system crashes or device stolen; data can still be retrieved.
3. Ability to work offline for weeks at a time and synchronize data when internet connectivity is available.
4. Secured and encrypted local storage so data is safe offline.
5. Interoperable with other systems.
6. Simplified and automated system upgrades is simple and is done centrally to avoid the need of requiring physical access.
7. Built in bug & issues reporting
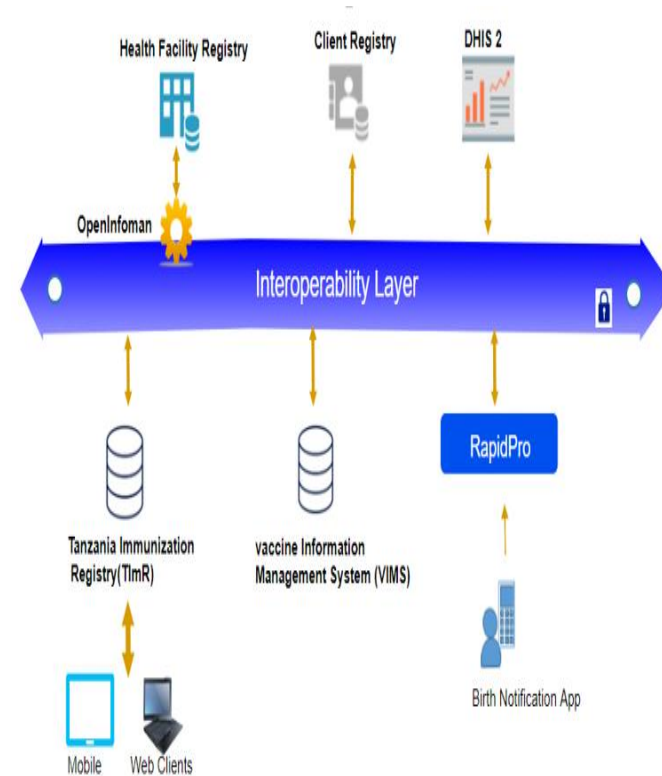
Lesson Learned

- **Software development process** ; End users' involvement;
- **Roll out the system in phases.**
- **Implementation Strategy;** Touches, evolution of rollout strategy and stakeholder involvement, Experience with District Data Use Mentors
- **Devices ;** MOH through IVD and ICT unit has procured special tablet devices different from the current Samsung devices that are used in existing four regions. The current devices idea came up from experiences and lesson learned from four existing regions using EIS through Samsung tablet devices.
- **Champions for digital solutions are the key in advocating use of digital system.**

Limitations/Technical challenges.

- First login requires internet connections for app to sync with server.
- Users are not notified when stock is sent from District level, sometimes they forget to acknowledge stock receipt.
- System works offline but for facilities with no connection at all need to find a place to sync data to server.
- Staff retraining due to movements. Mentors must be on top of things in retraining if need arises.
- Some of the facilities are relying on a specific health care worker when it comes to system use which becomes a problem when that particular person is not around.

Skill set needed

Developer.
o Moderate Javascript / HTML5 using AngularJS.
o Moderate PostgreSQL skills (for reporting)
o Experience with REST APIs (XML).

System Administrator
o High technical skill, expertise in systems management., log monitoring, installations.
o windows and linux administration skills (creating tasks, backups, etc.)

Technologies Used.

	IMS	Warehouse	Web	Admin	Mobile	Scanner	AVIC
Platform	Microsoft .NET 4.5	Jasper ETL	ASP.NET MVC4	ASP.NET MVC4	Microsoft Xamarin / Mono	OMR MarkEngine (.NET 4.5)	ASP.NET MVC3
Database	PostgreSQL	PostgreSQL	SQL Server Express	SQL Server Express	SQLite	N/A	SQL Server Express
Standards	NHAPI (HL7v2)	N/A	AtnaAPI (ATNA)	AtnaAPI (ATNA)	Newtonsoft JSON.NET	N/A	AtnaAPI (ATNA)
	Everest (CDA)		Newtonsoft JSON.NET	Newtonsoft JSON.NET	AtnaAPI (ATNA)		
	AtnaAPI (ATNA)						
	Newtonsoft JSON.NET						
	XDSApi						
User Interface	N/A	Jasper Reports			AngularJS	Windows Forms	JQuery
					ChartJS		Select2
					VisJS		ChartJS
					FullCalendar.IO		

Thank you!

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Q & A