Introduction to OpenHIE and interoperability for national health information systems

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Overview

• OpenHIE

• OpenHIM

• Implementations and Experiences
The Challenge

Clinicians need accurate, timely and complete information for decision-making but healthcare information solutions are often siloed making it difficult to share information across different systems, different facilities and different locations.
Who is OpenHIE

• OpenHIE is a diverse mission-driven community of practice including countries, organizations, individuals and donors working to promote sharing of health data across many different software products.

• We make and improve standards-based software to improve the exchange of health information.
MISSION

Our mission is to improve the health of the under-served through the open collaborative development and support of country driven, large scale health information sharing architectures.

VISION

We envision a world where all countries are empowered to pragmatically implement sustainable health information sharing architectures that measurably improve health outcomes.
How OpenHIE started

**PARTNERS**
- OpenHIE initiative begins in partnership with *Health Informatics Public Private Partnership (HIPPP).*

**FUNDING**
- U.S. President’s Emergency Plan for AIDS Relief (PEPFAR)

**OUR WORK**
- To support the development of *Rwanda Health Enterprise Architecture (RHEA)* project.
- HIPPP & RHEA project partnered up to support and deliver a health information exchange in Rwanda.
Community of Communities

- Interoperability Layer Community
- Facility Registry Community
- Client Registry Community
- Health Management Information System Community
- Health Worker Community
- Shared Health Record Community
- Terminology Services Community

OpenHIE
Architecture Framework
Sharing Data to Improve Health Outcomes
An enterprise master patient index (EMPI), or Client Registry manages the unique identity of citizens receiving health services with the country – “For whom”
Health Worker Registry

A Health Worker Registry is the central authority for maintaining the unique identities of health providers within the country – “By whom”
Facility Registry

A *Health Facility Registry* serves as a central authority to uniquely identify all places where health services are administered within the country – “Where?”
A **Terminology Service** serves as a central authority to uniquely identify the clinical activities that occur within the care delivery process by maintaining a terminology set mapped to international standards such as ICD10, LOINC, SNOMED, and others – “What?”
A Shared Health Record is a repository containing the normalized version of content created within the community, after being validated against each of the previous registries. It is a collection of person-centric records for patients with information in the exchange.
A Health Interoperability Layer receives all communications from point of service applications within a health geography, and orchestrates message processing among the point of service application and the hosted infrastructure elements.
A Health Management Information System is a repository containing the normalized version of aggregate-level content created within the community, after being validated against each of the previous registries. It is a collection of indicator-centric records for cohorts with information in the exchange.
Architecture Framework
Sharing Data to Improve Health Outcomes
OpenHIE workflows

- Managing patient demographics
  - Create patient demographic record
  - Update patient demographic record
  - Query patient demographic records by identifier
  - Query patient demographic records by demographics
- Managing clinical data
  - Save patient-level clinical data
  - Query patient-level clinical data
- Query health worker and/or facility records
How OpenHIE Workflows work
To Get Involved

[Website Screenshot]

ohie.org/getinvolved
info@openhie.org
Open Health Information Mediator
OpenHIM

Open Health Information Mediator (OpenHIM)
- Middleware tool focuses on the exchange of Health Data
- Developed and maintained by Jembi as open source (www.openhim.org)
- Developed to facilitate standards compliant data exchange
- Reference tool of the OpenHIE Interoperability Layer Community (IOL)
- Acts as the lock within an HIE
Here’s a problem:
We have 5 systems that all need to talk to each other
Solution 1:
Solution 2:

- System 1
- System 2
- System 3
- IL
- System 4
- System 5
Where does the OpenHIM fit within an HIE?

An example - The Rwandan Health Information Exchange
OpenHIE in Action

CURRENT AND PAST PROJECTS
Current Implementations of the OpenHIM
MomConnect Project
MomConnect

- Project of the South African National Department of Health, under the guidance of the Minister

- Operationalized through the mobile maternal health task team
HNSF Act

STAATSKOERANT, 23 APRIL 2014

GOVERNMENT NOTICE

DEPARTMENT OF HEALTH

No. 314

23 April 2014

NATIONAL HEALTH ACT, 2003 (ACT NO. 61 OF 2003)

NOTICE IN TERMS OF THE NATIONAL HEALTH ACT NO 61 OF 2003: NATIONAL HEALTH NORMATIVE STANDARDS FRAMEWORK FOR INTEROPERABILITY IN EHEALTH

Development of the HNSF

- Commissioned by the National Department of Health (NDoH)
- Developed by the Meraka Institute of the Council for Scientific and Industrial Research (CSIR) in collaboration with the Nelson Mandela Metropolitan University (NMMU)
HNSF Some Highlights

- Patient-centric approach including a shared health record
- Maturity levels based on paper and electronic records
- Based on international standards, including base standards, profiles and interoperability specifications (IHE, ISO, HL7 etc)
- Adopt, adapt and develop (in that order) standards
- Interoperability architecture based on Health Information Exchange with demographic and clinical registries
- Requires a unique patient identifier and identification system
- Enterprise Architecture required to extend HNSF for a particular implementation
National Health Normative Standards Framework (HNSF)
Generic eHealth Architectural Components

MomConnect

Partners:
- NDOH
- Jembi
- Praekelt Foundation
- CSIR
- HISP-SA
Architectural Design

- Architecture based on the HNSF integrated national shared electronic health record system
- Five layers:
  - Edge Devices, eg mobile phone
  - Consumer Applications, eg mHealth services
  - Health Information Exchange, eg OpenHIM
  - Demographic and Clinical Repositories, eg the National Pregnancy Registry
  - Security / Audit Services, eg certificate service
HNSF Maternal Health Standards and Profiles

MomConnect Backend System

- Client Registry (MPI)
- Shared Health Record
- DHIS
  - MomConnect Program (DHIS Patient Tracker)

HIE (OpenHIM)

Clinical Systems
Mobile Application Service
Audit database
In August last year, we launched the MomConnect project at Motubase clinic in Soshanguve, Tshwane Metro.

This project uses cellphone technology to register pregnant women – all pregnant women in both public and private health care. This empowers them to get all the information and instructions necessary for them to ensure a healthy pregnancy and deliver a healthy vibrant baby.

After delivery, the messages switch over to focus on information on the health needs of a new-born and will continue for up to one year after birth.

Honourable Speaker, I am very happy to announce that in a short space of only 8 months we have been able to register 383,354 pregnant women on the system. It is regarded as the largest number in the world. Before we started, Bangladesh was regarded as a world leader after registering 100,000 women in 18 months, while other countries are having only small pilot projects – nothing yet on a massive scale like we have.
Thank You

Q&A

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The OpenHIM is an IL – an Interoperability Layer

www.openhim.org
OpenHIM Dashboard

Key function of the OpenHIM is to give you a view into what is happening within your HIE.
OpenHIM transaction log

View technical details about the transaction (messages) flowing through your HIE
Visualizing transactions