Introduction to OpenHIE and interoperability for national health information systems

Chris Seebregts
CEO Jembi Health Systems NPC - Hon Assoc Prof, Discipline of Computer Science, UKZN

Carl Fourie, Ryan Crichton, Hannes Venter, Pierre Dane, Wayne Naidoo, Pascal Brandt
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Overview

- OpenHIE
- OpenHIM
- Implementations and Experiences

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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*

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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.

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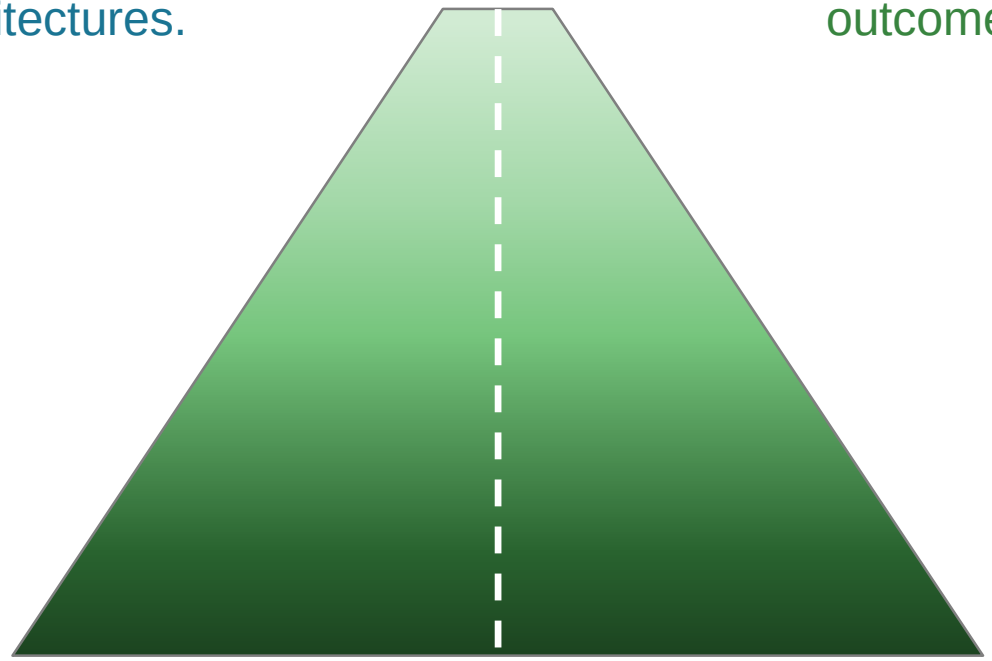
MISSION

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.



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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.

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Community of Communities

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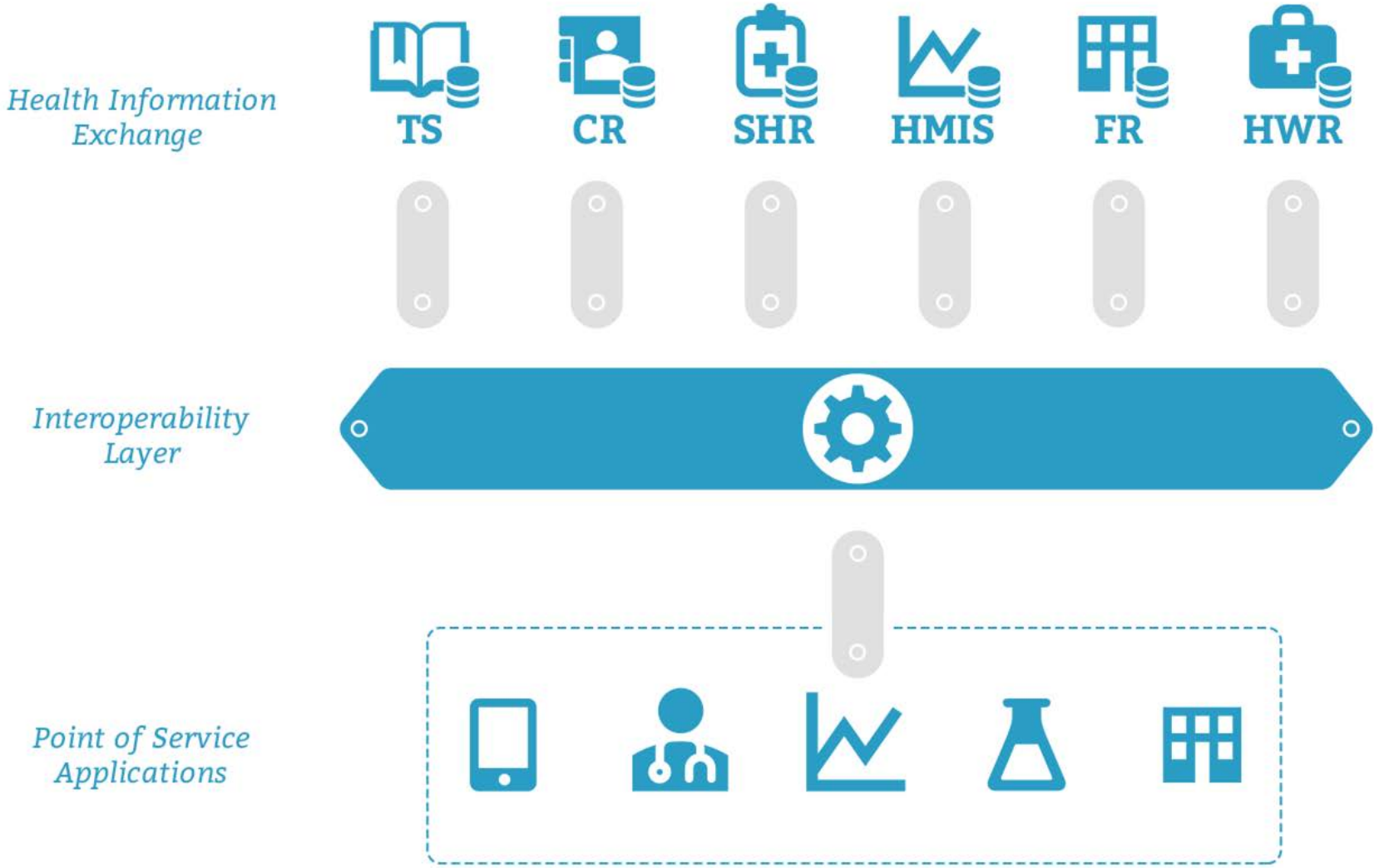

Architecture Framework

Sharing Data to Improve Health Outcomes

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Client Registry

An enterprise master patient index (EMPI), or ***Client Registry*** manages the unique identity of citizens receiving health services with the country – “For whom”

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Health Worker Registry

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

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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?"

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Terminology Service

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?"

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Shared Health Record

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.

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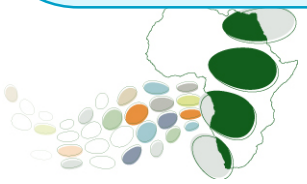
Health Interoperability Layer

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.



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Health Management Information System

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.

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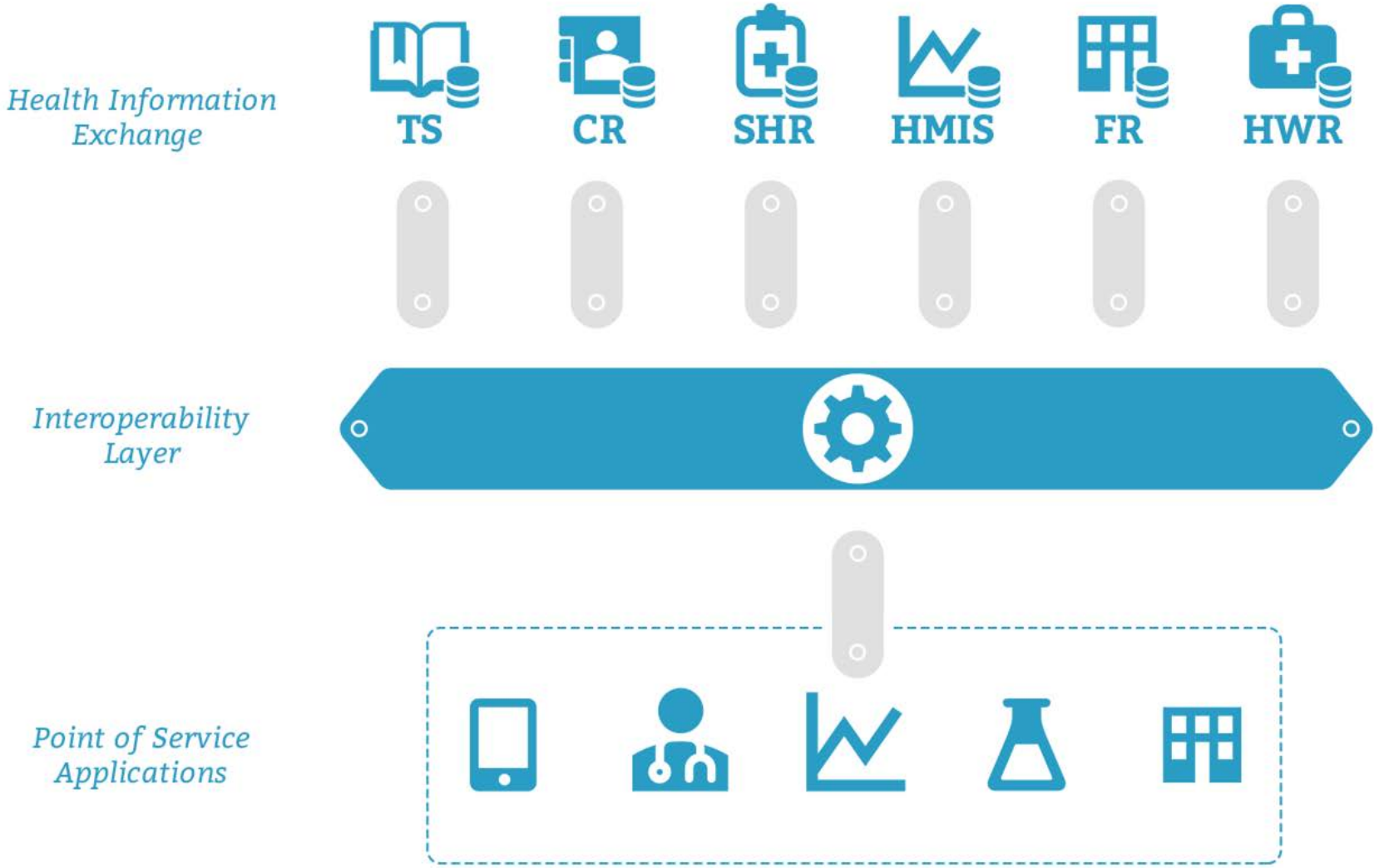

Architecture Framework

Sharing Data to Improve Health Outcomes

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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

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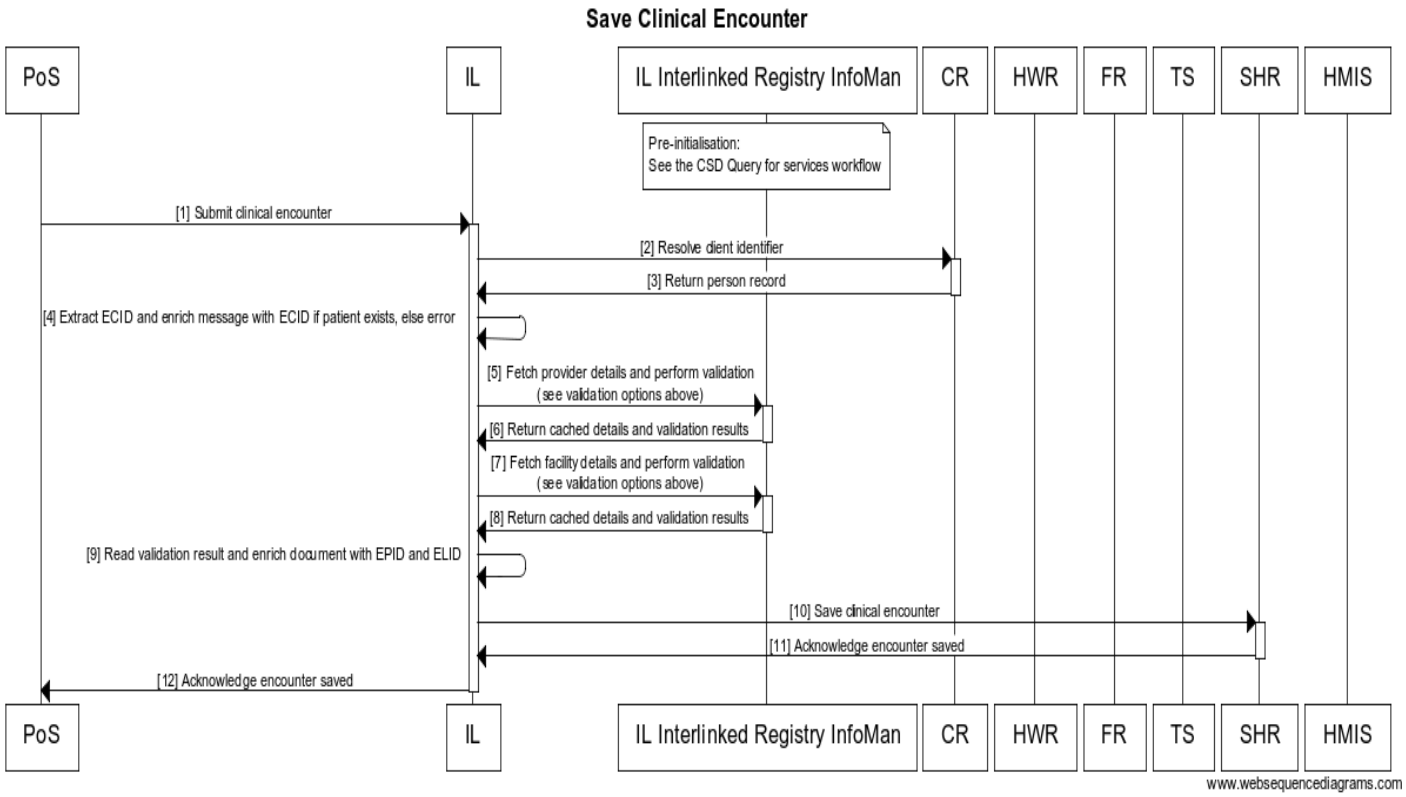
How OpenHIE Workflows work



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To Get Involved

ohie.org/getinvolved
info@openhie.org

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Open Health Information Mediator

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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

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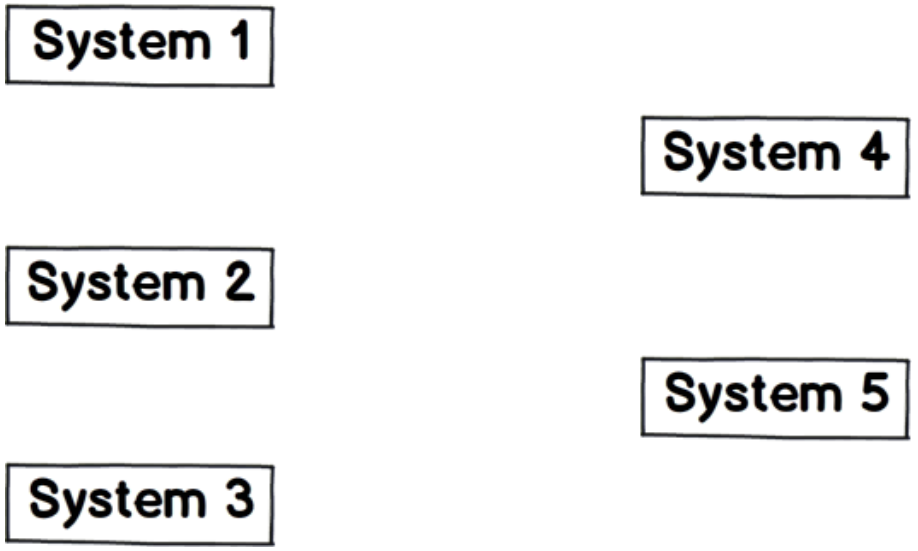
Here's a problem:

We have 5 systems that all need to talk to each other



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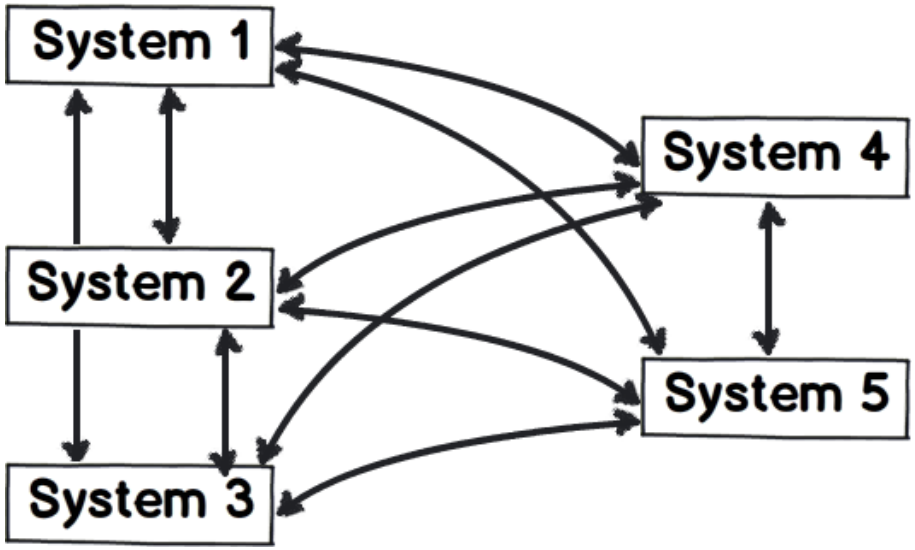
Solution 1:



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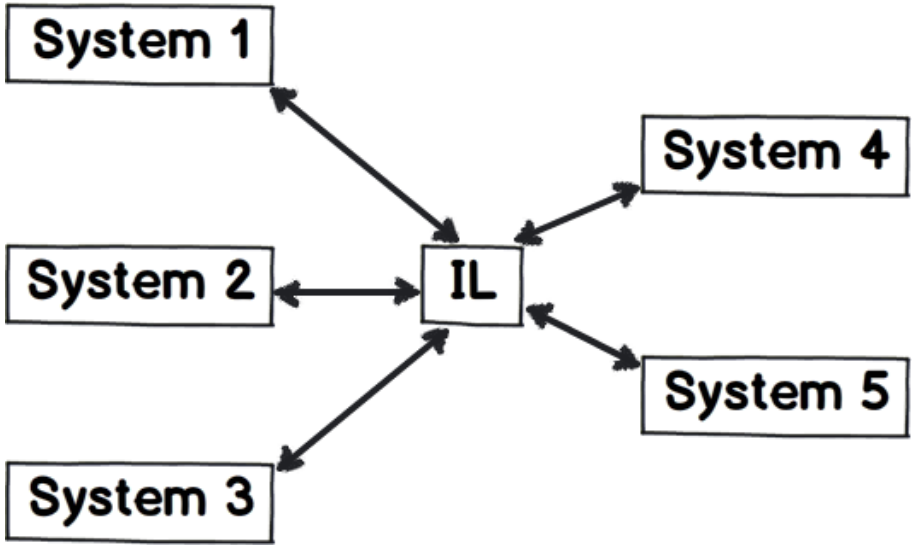
Solution 2:



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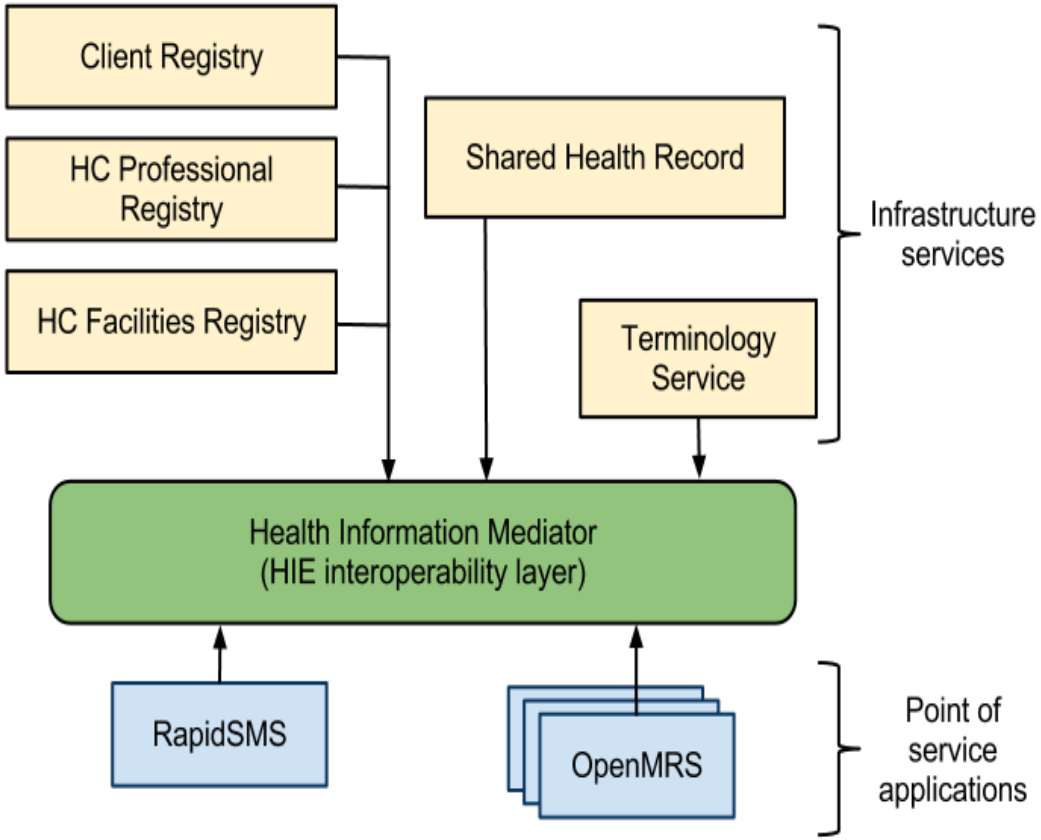
Where does the OpenHIM fit within an HIE?



An example - The Rwandan Health Information Exchange

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OpenHIE in Action

CURRENT AND PAST PROJECTS

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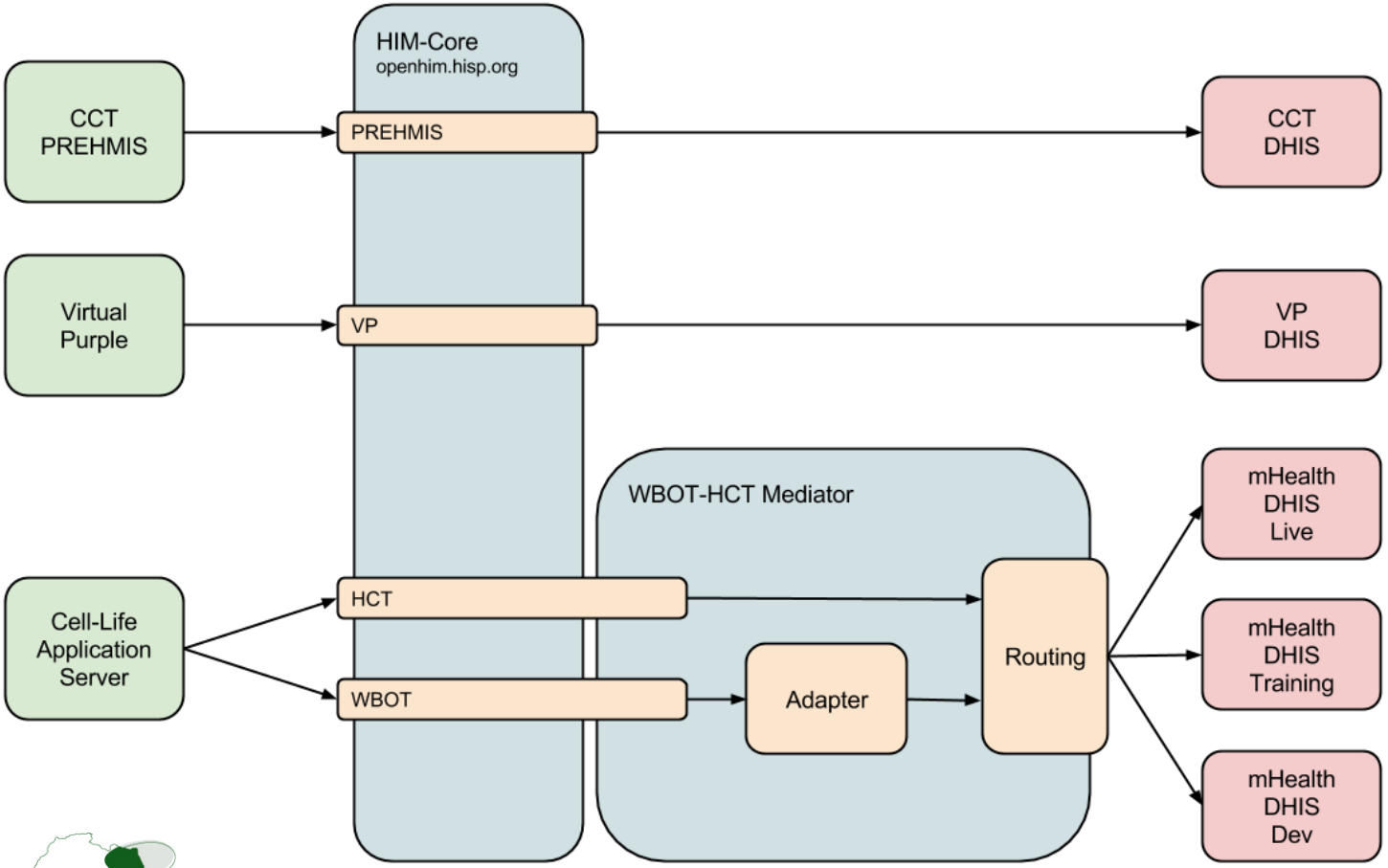
Current Implementations of the OpenHIM



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MomConnect Project

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MomConnect

- Project of the South African National Department of Health, under the guidance of the Minister
- Operationalized through the mobile maternal health task team

News

Motsoaledi wants all expectant mothers to be assessed regularly

NEW PLAN

Health Minister Aaron Motsoaledi wants pregnant women registered to keep tabs on their health during pregnancy in a bid to reduce maternal and child mortality PICTURE: CINDY WAXA

KEEPING TRACK OF PREGNANCY

HE NATIONAL Department of ealth is to launch a campaign to ck pregnant women, aimed at pre- nting maternal mortality, said ealth Minister Aaron Motsoaledi. Speaking in Cape Town yesterday, ngside the Inclusive Healthcare novation Summit, Motsoaledi said aternal mortality in South Africa was unacceptable levels, partly because significant number of women did t go for any prenatal check-ups. The st time they were seen medically was ien they went to a health centre to e birth, which was too late to pick up y pregnancy complications.

The aim of the plan was to follow ese women in their own communi- s instead of waiting for them to go to clinics.

The country was battling to reduce maternal and newborn mortality as part of its commitments to the Millennium Development Goals project.

Motsoaledi has previously said teen moms were a big obstacle to achieving these goals, with under-18s making up 36 percent of maternal deaths.

South Africa has committed itself to reducing maternal mortality to 38 deaths in 100 000 births. Currently the rate is 269 deaths in 100 000 births.

Experts have warned that it is impossible to get down to 38 within a single year. The country has also committed itself to reducing the deaths of under-fives from 60 deaths in 100 000 births to 20 by next year. Statistics show that about half of these children die within a week of being born, due to prematurity, infection or suffocation during birth.

Motsoaledi said: "Just because there are hospitals and clinics doesn't mean that every pregnant woman is going to be catered for.

"The aim is to know these women individually... has she done HIV testing and counselling? If she is HIV-positive is she taking precautions that the baby is born HIV-negative or are we just increasing the number of babies born like that? Has she gone to the hospital before 14 weeks, or is she just going to appear in hospital one day to give birth? These are practical things we want to know beforehand."

While he wouldn't give full details of their plans as the campaign was yet to be launched, Motsoaledi hinted that women would be registered via their cellphones. They would be able to send a call-back to a team of agents, who would assist them about access to health care. These women would also be able to register their complaints via telephone if they had had been mistreated at clinics or hospitals, and their problems would be solved in real time.

HAS SHE GONE TO HOSPITAL BEFORE 14 WEEKS, OR IS SHE GOING TO APPEAR ONE DAY TO GIVE BIRTH?

CAPE ARGUS 31/1/14

Physiotherapy @ Home

We are a home visiting

WEATHER SUMMARY

TODAY TOMORROW SUNDAY MONDAY TUESDAY

HNSF Act

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

http://www.health.gov.za/ehealth.php

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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)

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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

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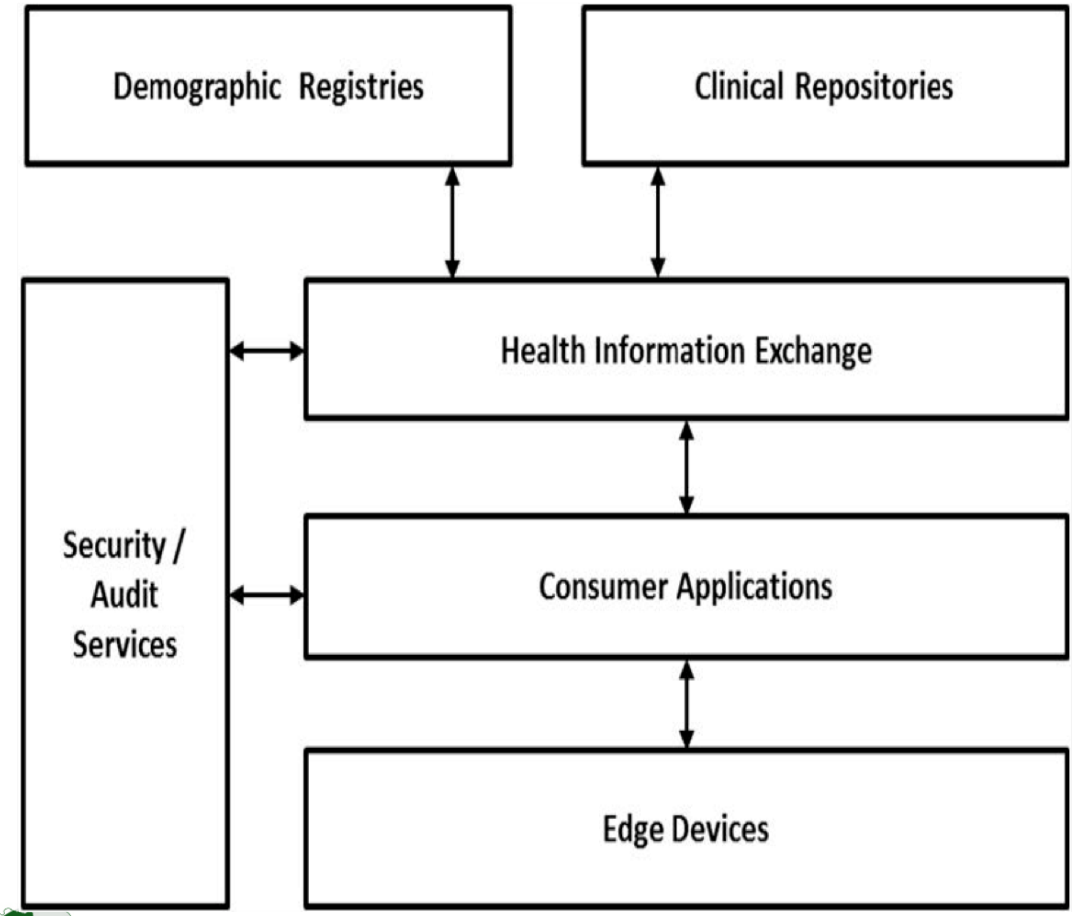
National Health Normative Standards Framework (HNSF)
Generic eHealth Architectural Components



Ref: NDOH, CSIR. National Health Normative Standards Framework for Interoperability in eHealth in South Africa. Version 2.0, March 2014

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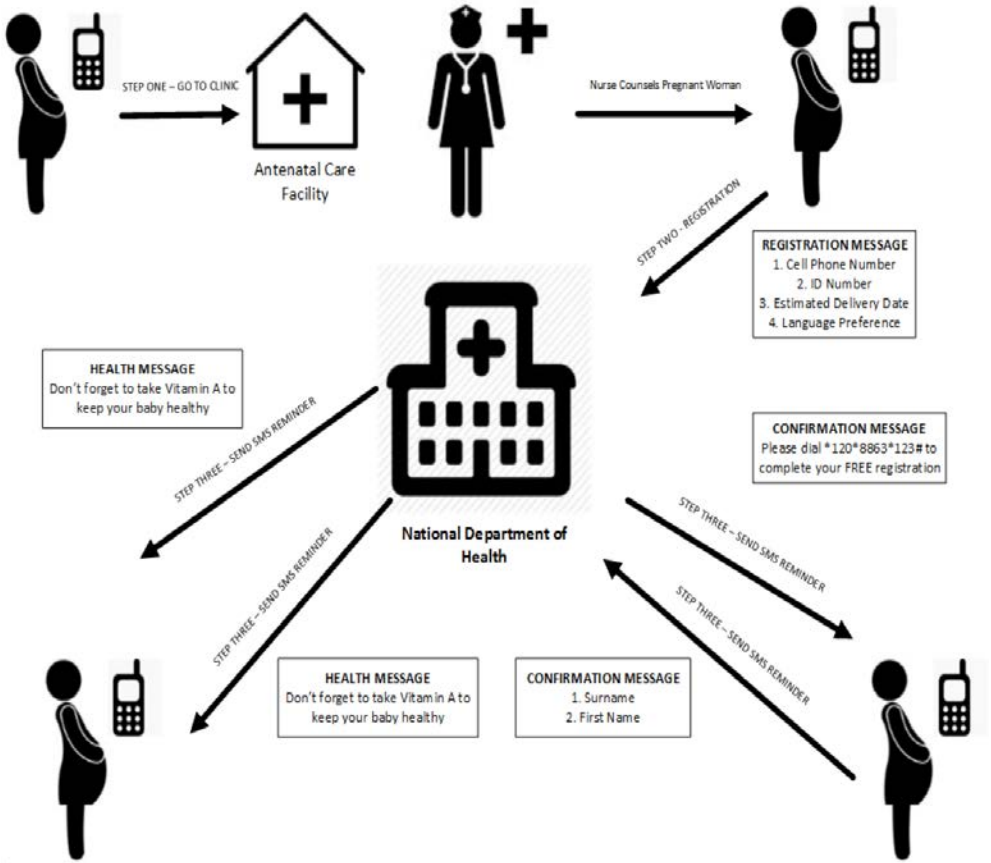
MomConnect

Partners:

- NDOH
- Jembi
- Praekelt Foundation
- CSIR
- HISP-SA



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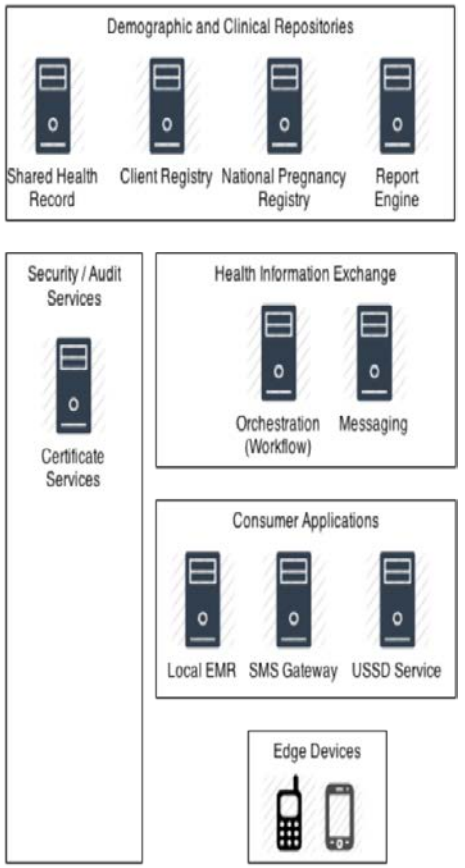
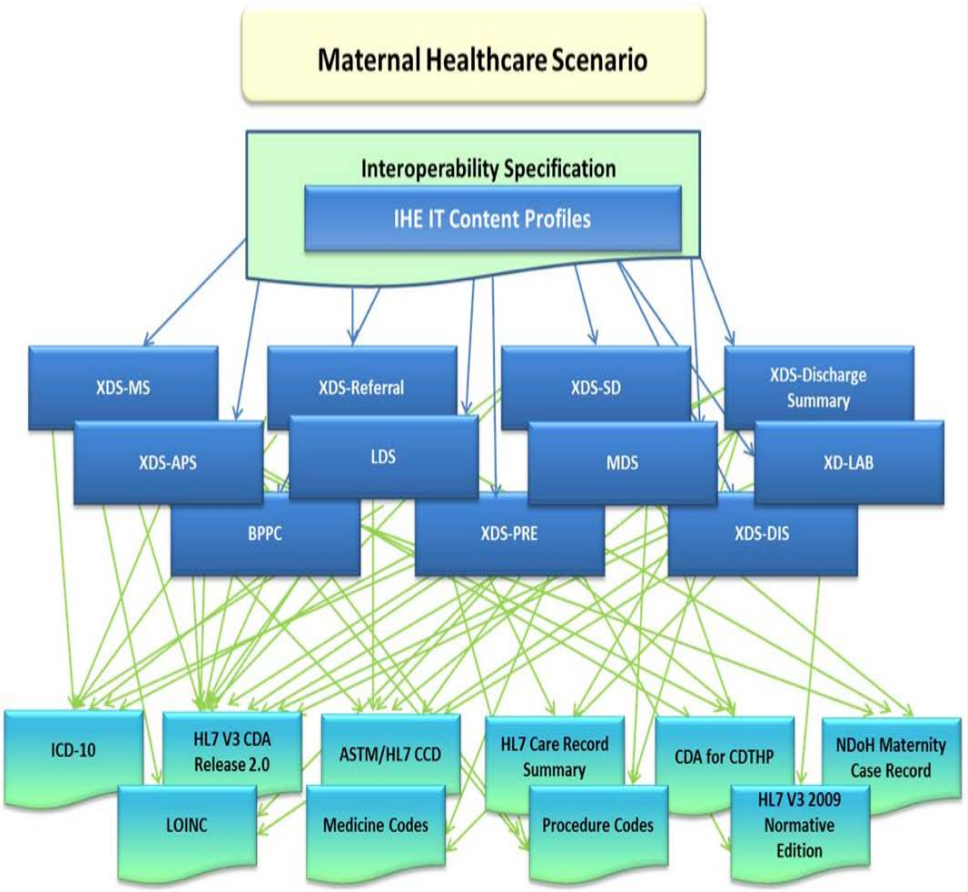
Architectural Design

- 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



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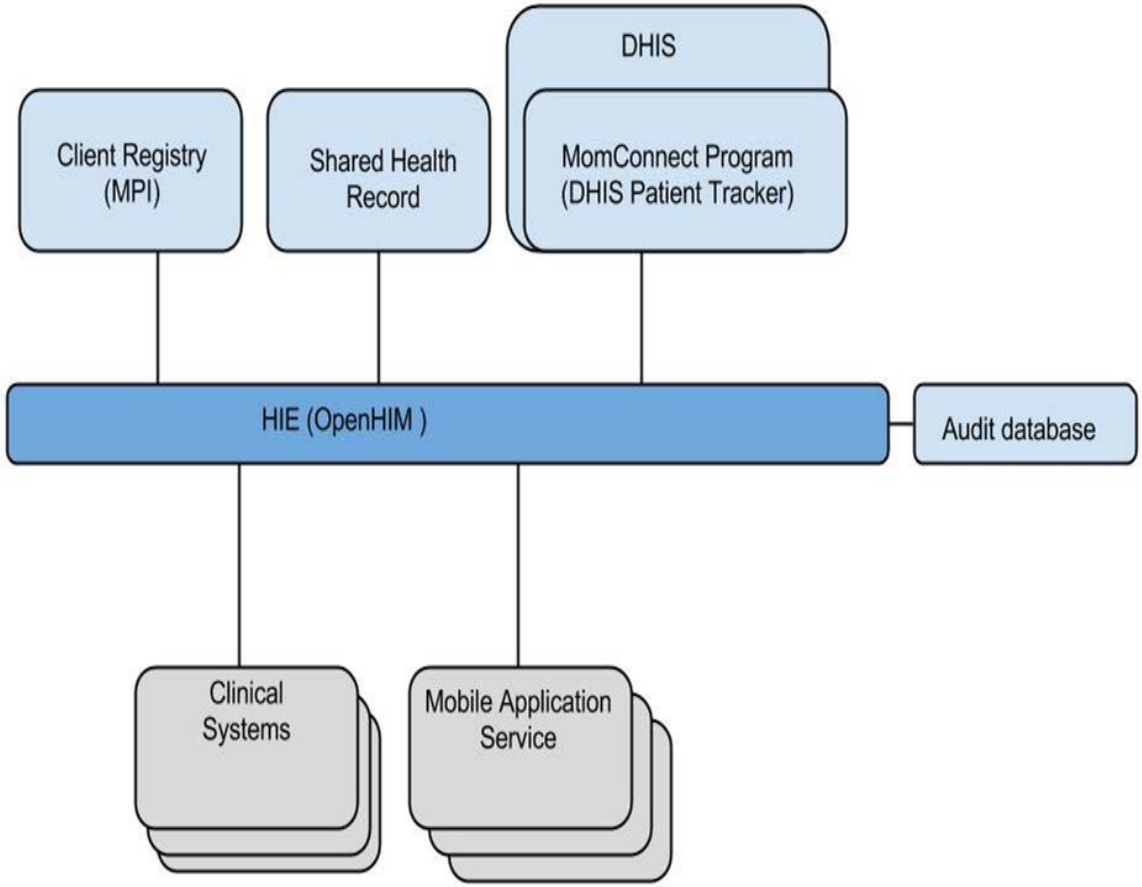
MomConnect Backend System



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Results

South African Government

www.gov.za

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Minister Aaron Motsoaledi: Health Dept Budget Vote 2015/16

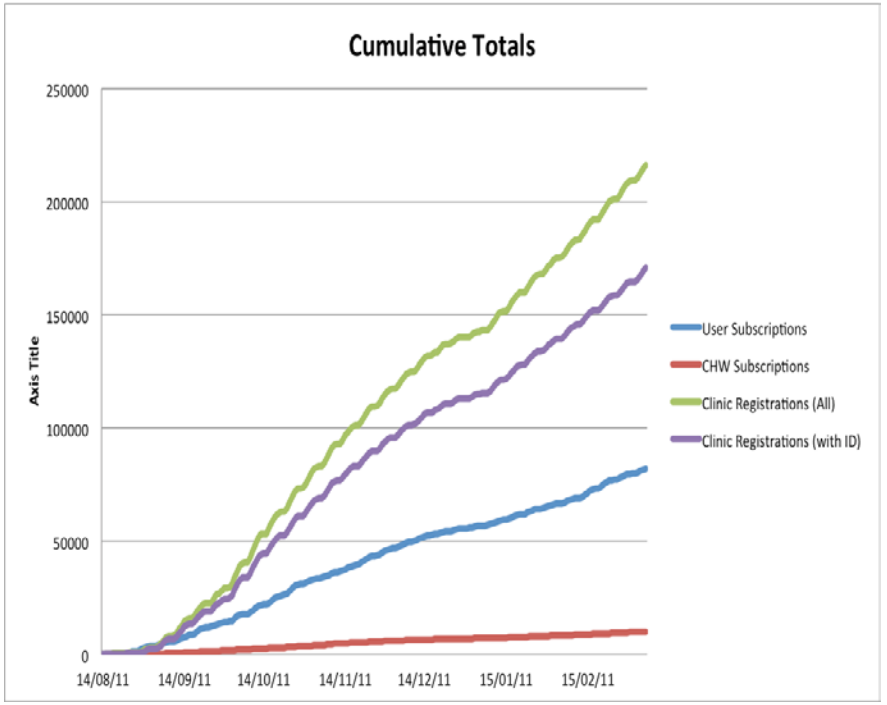
5 May 2015

In August last year, we launched the MomConnect project at Motubatse 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.



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Thank You

Q&A

PHYSICAL Unit D11, Westlake Square,
Bell Crescent, Westlake, Cape Town
POSTAL Postnet Suite 280, Private Bag X26,
Tokai 7966, South Africa
TEL +27 (0)21 701 0939
FAX +27 (0)21 701 1979
EMAIL info@jembi.org
WEBSITE **www.jembi.org**

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OpenHIM

The **OpenHIM** is an **IL** – an **Interoperability Layer**

www.openhim.org

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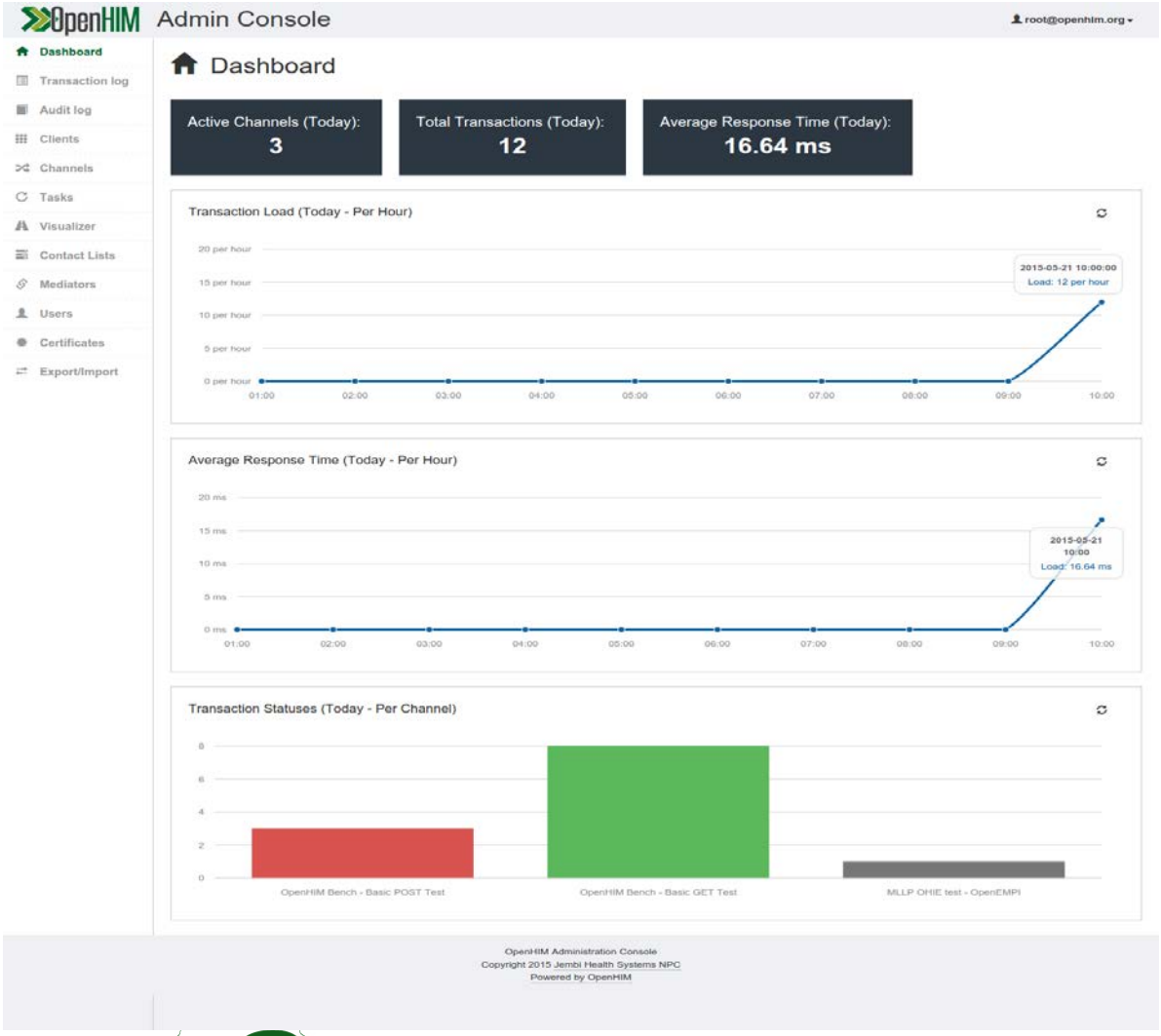
OpenHIM Dashboard



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

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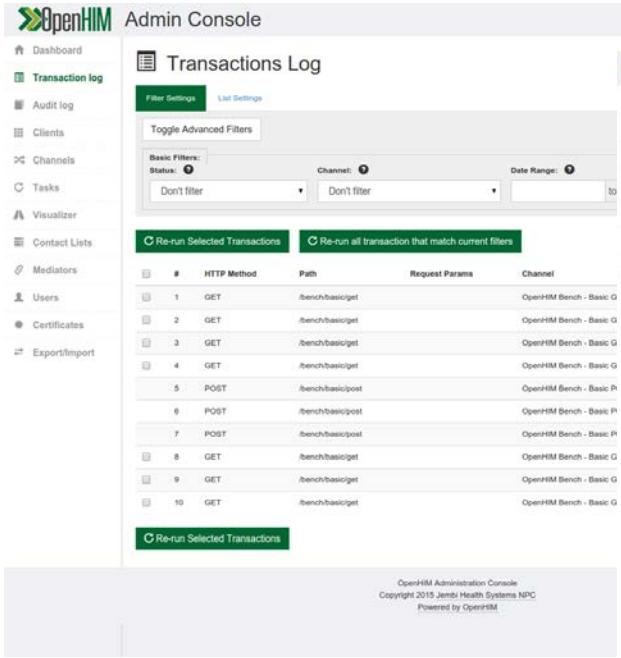
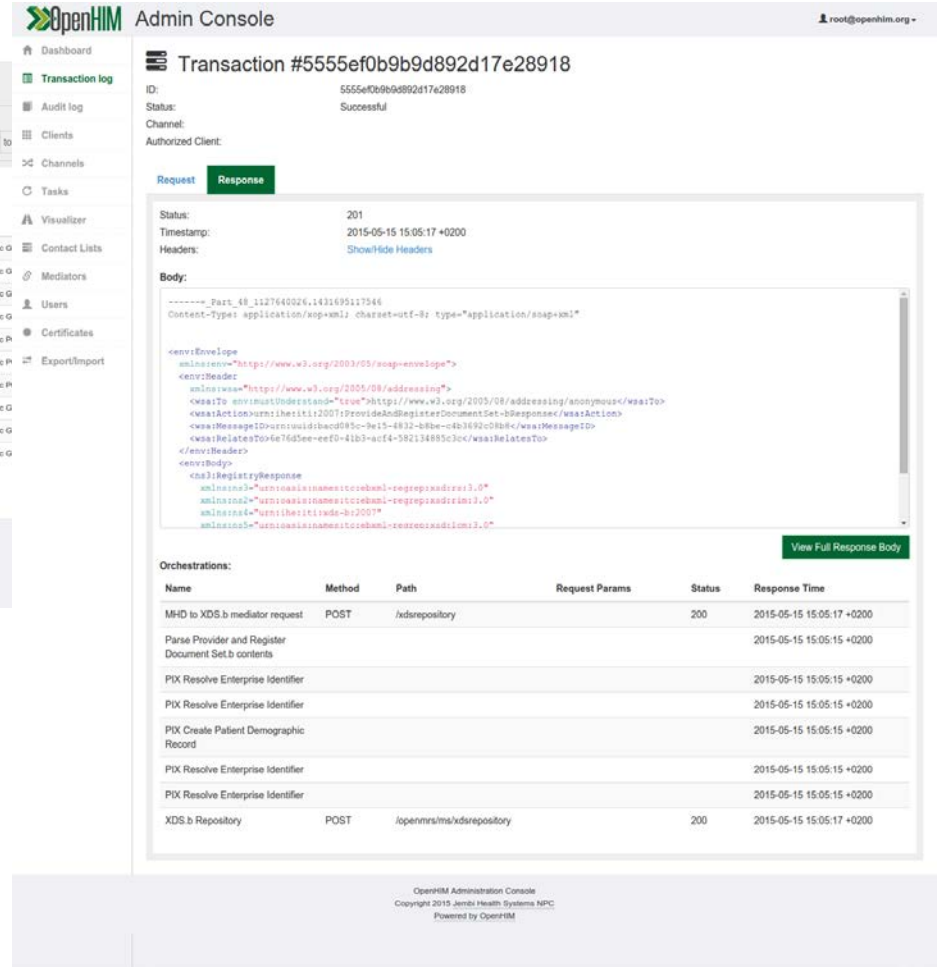
OpenHIM transaction log





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

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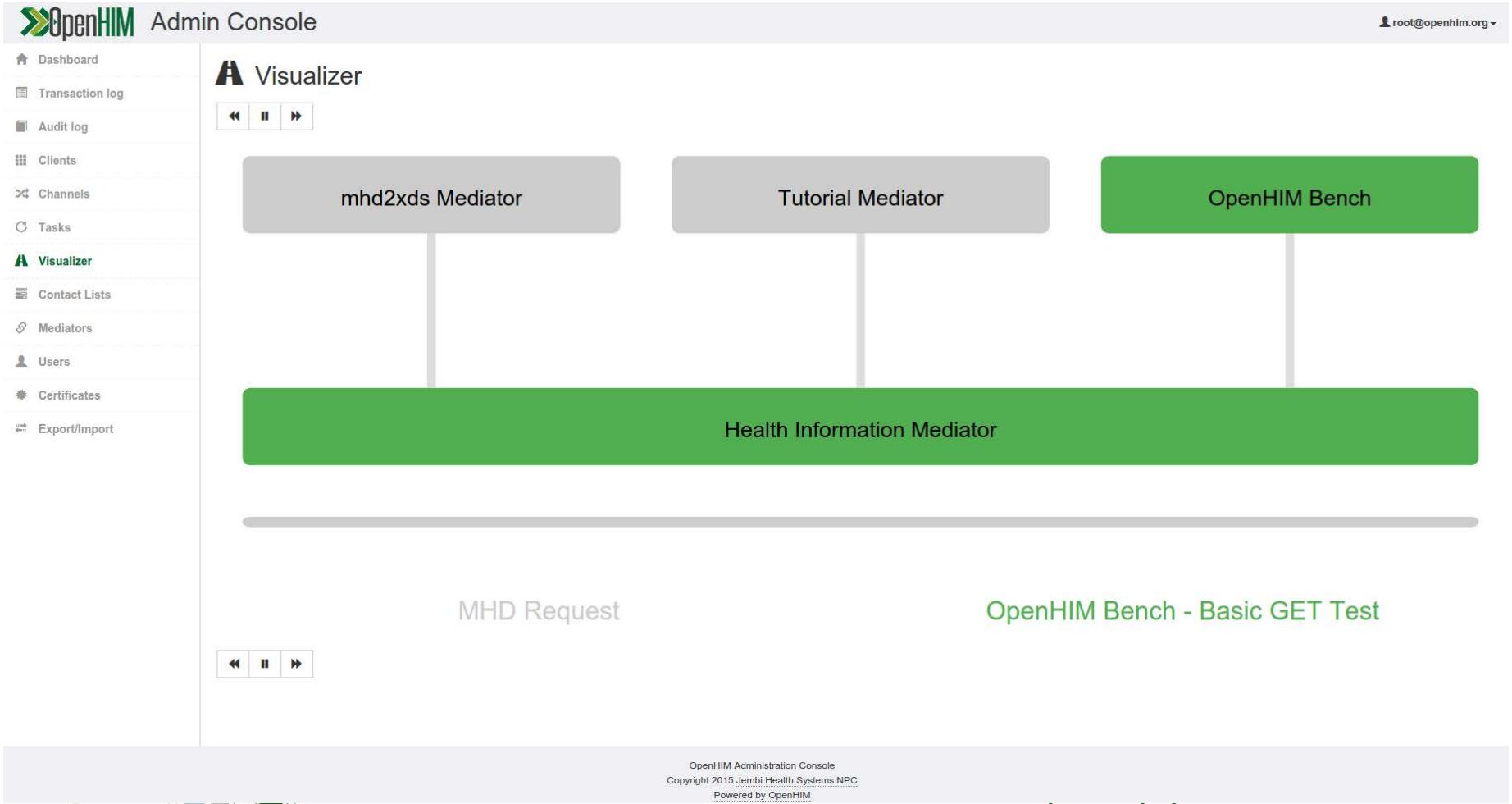
Visualizing transactions



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