Open source, open standards and interoperability – What it matters for clinicians?

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What does it all mean?

- Open Source? Open Architectures?
- Open Standards? Interoperability?

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http://xkcd.com/927/

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[Image of comic strip showing the proliferation of standards and the absurdity of trying to develop one universal standard.]

SITUATION: THERE ARE 14 COMPETING STANDARDS.

14?! RIDICULOUS! WE NEED TO DEVELOP ONE UNIVERSAL STANDARD THAT COVERS EVERYONE’S USE CASES. YEAH!

SOON:

SITUATION: THERE ARE 15 COMPETING STANDARDS.
Presentation Overview

• Overview of the National Health Normative Standards Framework for Interoperability in eHealth in South Africa (HNSF)

• Operationalization of the framework for the South Africa MomConnect Project for mobile maternal health in South Africa

• Application to HIV information management
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)
National Health normative Standards Framework for Interoperability in eHealth in South Africa

GOVERNMENT NOTICE

DEPARTMENT OF HEALTH

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

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 (HIE) 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

Demographic Registries

Clinical Repositories

Health Information Exchange

Security / Audit Services

Consumer Applications

Edge Devices

HNSF - Fully integrated national shared electronic health record system

HNSF - Standards-based building blocks

Interoperability Specification

Standards-based Profile I
Standards-based Profile II
Standards-based Profile III
Standards-based Profile IV
Standards-based Profile V

Base Standard A
Base Standard B
Base Standard C
Base Standard D
Base Standard E

Base Standard A
Base Standard B
Base Standard C
Base Standard D

Base Standard R
Base Standard S
Base Standard Z
Base Standard D

HNSF - IHE profiles mapped to a fully integrated national shared electronic health record system

MOMCONNECT PROJECT
## Data Elements

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<th>#</th>
<th>Field</th>
<th>Type</th>
<th>Description</th>
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<td></td>
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<tr>
<td>1</td>
<td>Client Language Preference</td>
<td>Char [3]</td>
<td>3 letter ISO 639-2 language code OR AF,EN,ND,NS,SO,SW,TW,TO,VE,XH,ZU</td>
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<tr>
<td>3</td>
<td>Client ID number</td>
<td>Char[20]</td>
<td>SA National ID Number or others (see next table)</td>
</tr>
<tr>
<td>5</td>
<td>Pregnancy Date</td>
<td>Char [8]</td>
<td>ISO8601 format (yyyyMMdd); If only the month is known or the date is estimated, then the value should be truncated to a year or year/month value (yyyy[MM])</td>
</tr>
<tr>
<td>6</td>
<td>Surname</td>
<td>Char [25]</td>
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<td></td>
<td><strong>Provider</strong></td>
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<tr>
<td>9</td>
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<tr>
<td>10</td>
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<td>Char [3]</td>
<td>To be defined</td>
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</table>
Architectural Design

- Architecture based on the HNSF integrated national shared electronic health record system
- Five layers:
  1. Edge Devices, eg mobile phone
  2. Consumer Applications, eg mHealth services
  3. Health Information Exchange, eg OpenHIE
  4. Demographic and Clinical Repositories, eg the National Pregnancy Registry
  5. Security / Audit Services, eg certificate service
National Pregnancy Registry
Transactions

Patient Administration

Save Clinical encounter

HIM

Patient Identity Management
ITI-30 Patient Identity Feed
HL7v2 ADT

Mobile Application Service

HIM

Save Clinical Encounter
ITI-65 Put Document Dossier
CDA

Mobile Application Service
Security

- Location security
- Data transmission security
- Data storage security
HOW IS THIS APPLIED TO HIV
Using the HIE for HIV care

• Jembi is proposed an extension to our existing and proposed architecture in Rwanda and Botswana to support HIV (and TB in some areas):
  – Integrating lab data
  – Integrating pharmacy and dispensing
  – Integrating resistance data
  – Integrating referrals
How does interoperability and standards support HIV care

• Uniquely identifying patients (EMPI)
• Providing continuity of care (SHR)
  – Sharing data uniformly between systems
• Leveraging advanced tooling at a central level
  – Drug resistance prediction
  – Central lab and pharmacy data
• Harmonizing multiple workflows and solutions into care:
  – Alerting, referrals, CHW support etc.
• Integrating Mobile, EMRs and existing software tools into a harmonized solution
PREVIOUS AND OTHER EXAMPLES
Existing Interoperability architecture
Mobile Connectathon at ICT4H, September 2013
ICT4HEALTH CONFERENCE 2014
INCLUDING
GLOBAL TELEHEALTH 2014
SOUTHERN SUN ELANGENI & MAHARANI HOTEL, DURBAN, SOUTH AFRICA
10 & 11 NOVEMBER 2014
Reference Documents

• Payne, J., Mar. 2013. The state of standards and interoperability for mHealth. mHealth Alliance.
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- GSM (Global System for Mobile Communications) Association (GSMA)
- United States President’s Emergency Plan for AIDS Relief
- United States Centres for Disease Control and Prevention
Thank you

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