

**Rwanda Health Enterprise
Architecture (RHEA)
Project Meeting
HEAF/HEART Update
26 October 2012
Kigali**

Chris Seebregts

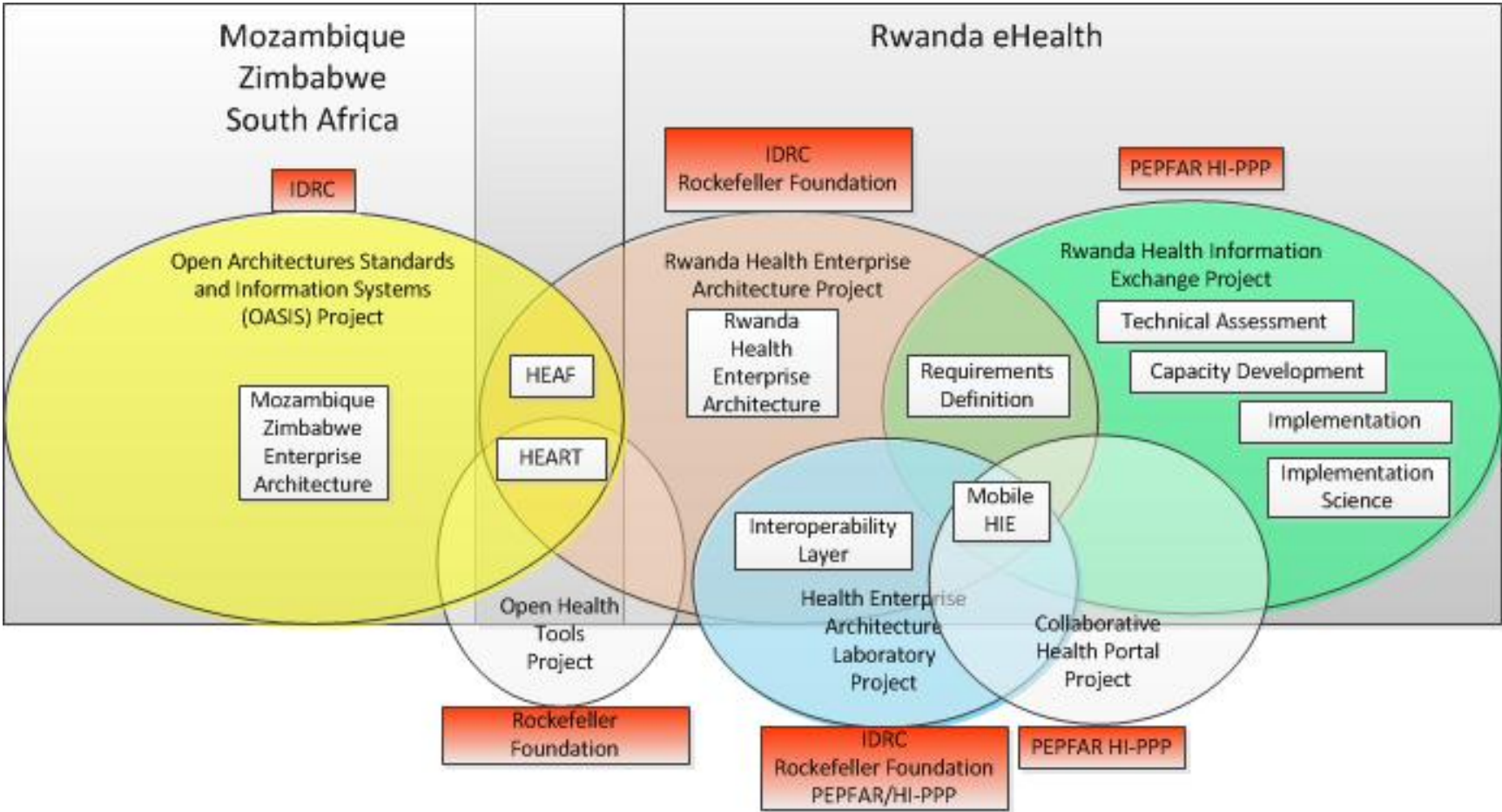
Agenda

- RHEA Context & Objectives Chris Seebregts
- EA modeling Mead Walker
- CHP project Derek Ritz
- HEART Boris Kapitanski
- Joint Initiative Council Chris Seebregts
- SKMT Chris Seebregts

Rwanda Health Enterprise Architecture (RHEA) Project

- RHEA is an initiative of the Rwandan Ministry of Health eHealth Coordination Unit.
- RHEA seeks to develop and implement a health enterprise architecture for Rwanda.
- Initial funding
 - International Development Research Center (IDRC) and Rockefeller Foundation (RF) 2009-2012 (March)
- Current funding
 - Health Informatics Public Private Partnership (HI-PPP), a project funded by the US President's Emergency Plan for AIDS Relief (PEPFAR); 2010-2012 (September)

OASIS – RHEA – HIE Projects



Sub-Projects within RHEA

1. Rwanda HIS Modeling
2. HIE Project
 1. HIE Capacity Building
 2. HIE Implementation Science
 3. HIE Technical Assessment
 4. HIE Requirements and Scoping
 5. HIE Implementation
 6. HIE Interoperability Layer
3. Contract and Financial Administration
4. Project Administration
5. HEAF
6. HEART
7. Mobile Integration

Funders and Partners

Funders

1. International development Research Centre (IDRC)
2. Rockefeller Foundation
3. President's Emergency Plan for AIDS Relief (PEPFAR)



Partners

1. Ministry of Health, Rwanda
2. Jembi Health Systems, South Africa & Rwanda
3. Pivot Access, Rwanda
4. HEAL, University of KwaZulu-Natal, South Africa
5. BLEAO Informatica em Saúd, Brazil
6. Liz Peloso Consulting
7. CDC, USA
8. Regenstrief Institute, USA
9. InSTEDD, USA
10. Partners in Health, USA and Rwanda
11. Millennium Villages Project
12. World Health Organization
13. Nethope
14. Mohawk College
15. ecGroup

RHEA/HEAF Objectives

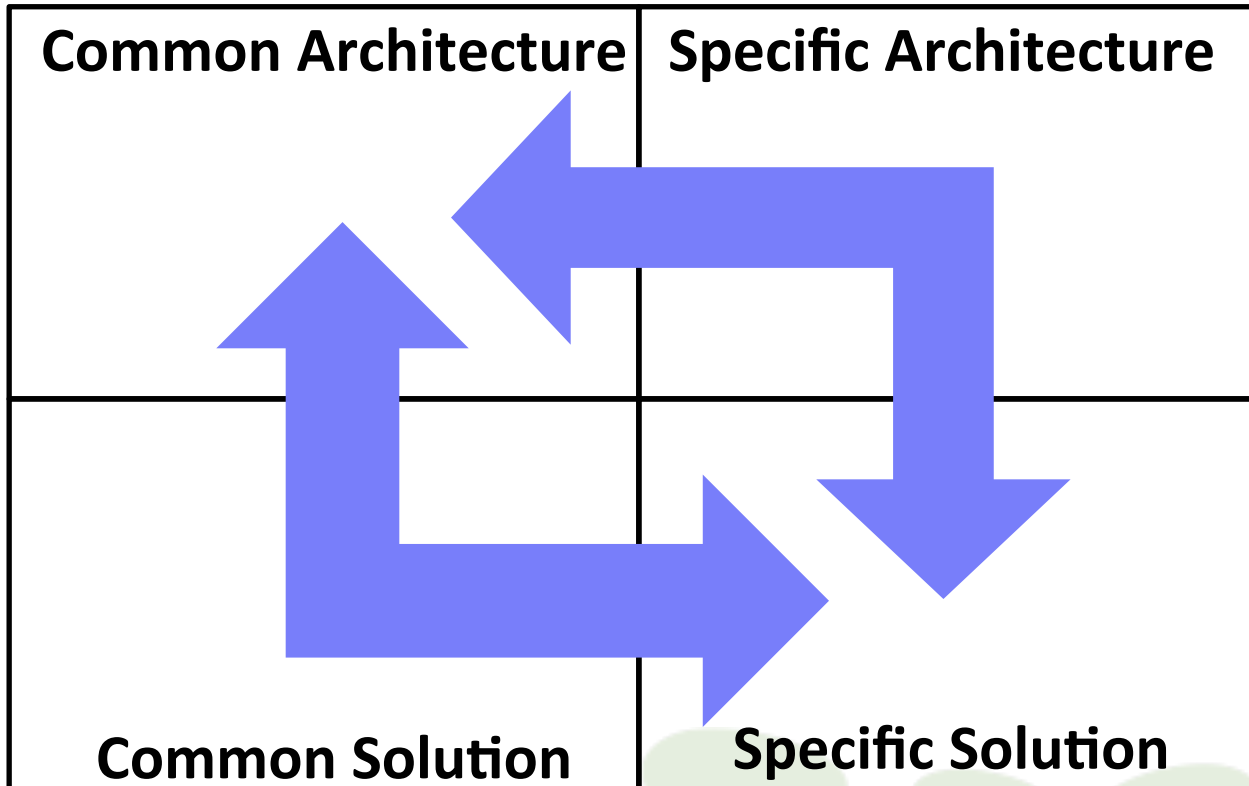
- Develop semi-formal documentation for the RHEA project on behalf of the Ministry of Health
- Reuse selected assets (artefacts) in other countries, eg Mozambique and South Africa

Architecture and Solutions Framework

Slide courtesy of David Lubinski, Path

Common to Health
Systems in Many Countries

Specific to a Health
System in a Country



Architectures

1. Requirements
2. Patterns
3. Designs
4. Standards

Solutions

1. Software Applications
2. Software Development
3. Hardware and Networks
4. Support Services

RHEA Subversion Repository

The screenshot displays the SmartSVN application window titled "SVN_RHEA - SmartSVN Foundation 6.6.11". The interface is divided into several sections:

- Menu Bar:** Includes options like Project, Edit, View, Modify, Change Set, Tag+Branch, Query, Properties, Locks, Repository, Tools, Window, and Help.
- Toolbar:** Contains icons for Refresh, Update, Commit, Add, Remove, Move, Revert, Delete, Fix, Changes, Annotate, Log, Graph, Main, and Review.
- Directories:** A tree view on the left showing the repository structure, including folders like branches, doc, InteroperabilityLayer, InteroperabilityLayer-v2, rapidsms_api, RHEAClientMock, RHEAMockServices, tags, and trunk.
- Files:** A table listing repository files with columns for Name, Revision, Local State, Copy From, and Relative Directory. The table shows various documents, spreadsheets, and PDFs, all at revision 555 and in an "Unchanged" state.
- Output:** A window at the bottom showing the results of a "Update to HEAD" operation, listing 19 entries that were added to the repository.

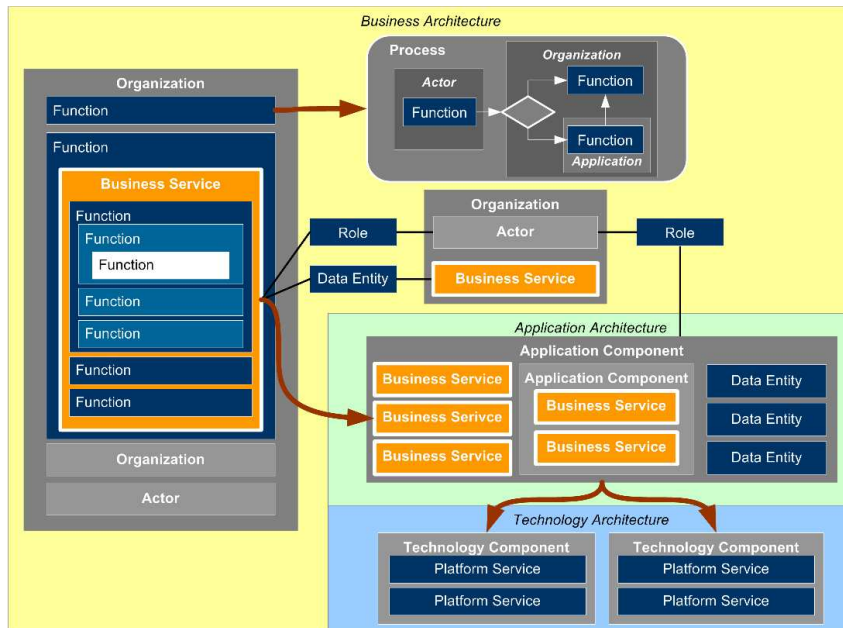
Name	Revision	Local State	Copy From	Relative Directory
eZ-Vida-Server-applications-Recommendati...	555	Unchanged		
readme.txt	555	Unchanged	doc	doc
RHEA Action Items and Issues List.xlsx	555	Unchanged	doc/control	doc/control
RHEA Status Report- ALL.xlsx	555	Unchanged	doc/control	doc/control
Document review cycle.docx	555	Unchanged	doc/control/administration	doc/control/administration
HIPPP Toll Free Number 1-1-2011.pdf	555	Unchanged	doc/control/administration	doc/control/administration
Jembi_Partners_for_the_RHEA_Phase_I.docx	555	Unchanged	doc/control/administration	doc/control/administration
readme.txt	555	Unchanged	doc/control/administration	doc/control/administration
RHEA Conference Call Minutes TEMPLATE.docx	555	Unchanged	doc/control/minutes	doc/control/minutes
Meeting Notes with BL - 2 NOV 2010.docx	555	Unchanged	doc/control/minutes/201...	doc/control/minutes/201...
RHEA Conference Call Agenda NOV 2nd 201...	555	Unchanged	doc/control/minutes/201...	doc/control/minutes/201...
RHEA Conference Call Agenda NOVEMBER 3...	555	Unchanged	doc/control/minutes/201...	doc/control/minutes/201...
RHEA Conference Call Agenda OCT 19th 20...	555	Unchanged	doc/control/minutes/201...	doc/control/minutes/201...
RHEA Conference Call Minutes AUGUST 13th...	555	Unchanged	doc/control/minutes/201...	doc/control/minutes/201...
RHEA Conference Call Minutes AUGUST 27th...	555	Unchanged	doc/control/minutes/201...	doc/control/minutes/201...
RHEA Conference Call Minutes AUGUST 6th...	555	Unchanged	doc/control/minutes/201...	doc/control/minutes/201...
RHEA Conference Call Minutes DECEMBER 1...	555	Unchanged	doc/control/minutes/201...	doc/control/minutes/201...
RHEA Conference Call Minutes FEBRUARY 19...	555	Unchanged	doc/control/minutes/201...	doc/control/minutes/201...
RHEA Conference Call Minutes FEBRUARY 5t...	555	Unchanged	doc/control/minutes/201...	doc/control/minutes/201...

Output window content:

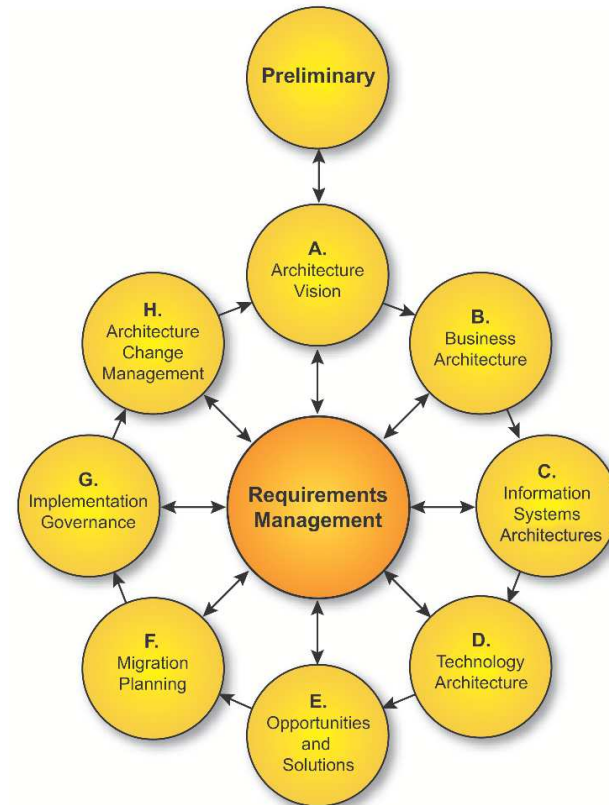
```
Update to HEAD: . at revision 555 (19 entries)
RHEAMockServices/src/main/resources/hl7/PMU_B01-list (Added)
RHEAMockServices/src/main/resources/hl7/ADT_A31 (Added)
RHEAMockServices/src/main/resources/hl7/PMU_B01-list.atom (Added)
RHEAMockServices/src/main/resources/hl7/ADT_A28-list (Added)
RHEAMockServices/src/main/resources/hl7/ADT_A28-list.atom (Added)
RHEAMockServices/src/main/resources/hl7/ORU_R01 (Added)
RHEAMockServices/src/main/resources/hl7/PMU_B01 (Added)
RHEAMockServices/src/main/resources/hl7/PMU_B01-list.rss (Added)
RHEAMockServices/src/main/resources/hl7/ADT_A28 (Added)
```

The Open Group Architecture Framework (TOGAF)

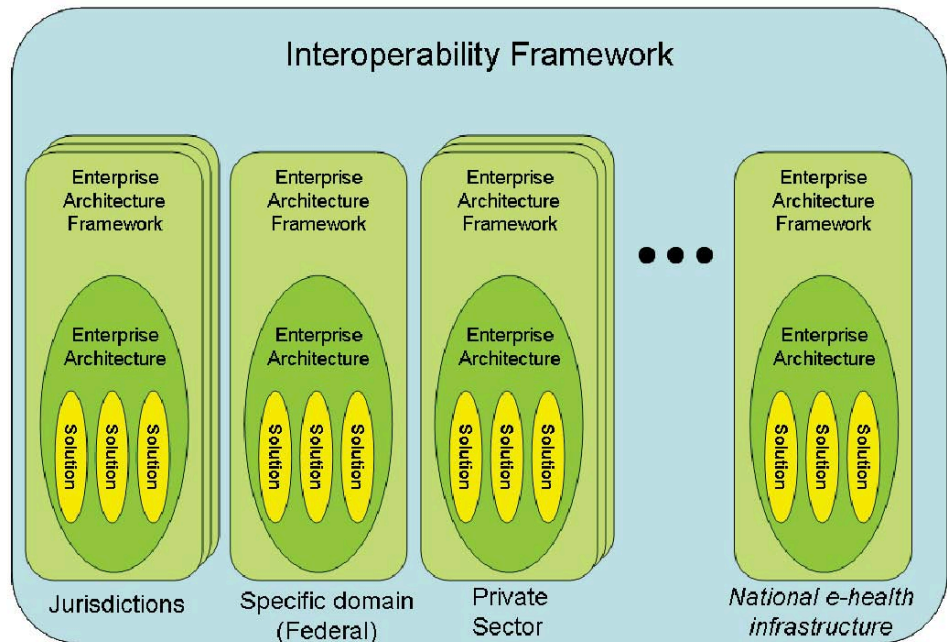
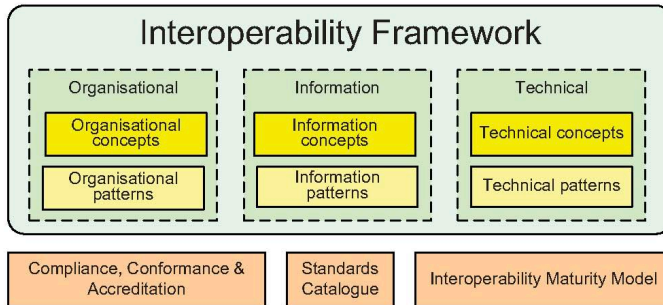
Enterprise Continuum



Architecture Development Method (ADM)



NEHTA Interoperability Framework and EA



Artefacts

nehta

Interoperability Framework

Version 2.0 — 17 August 2007

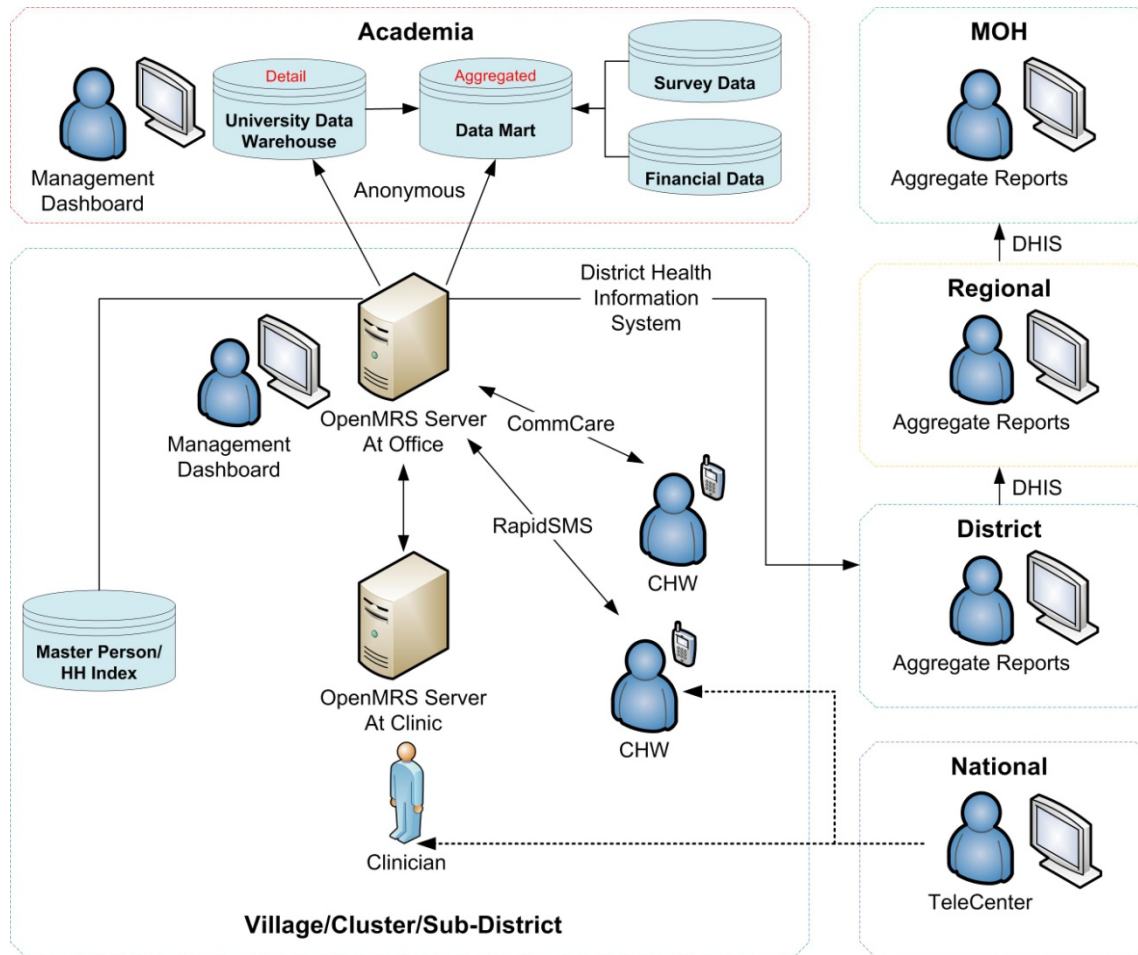
nehta

**National E-Health Standards
Catalogue**

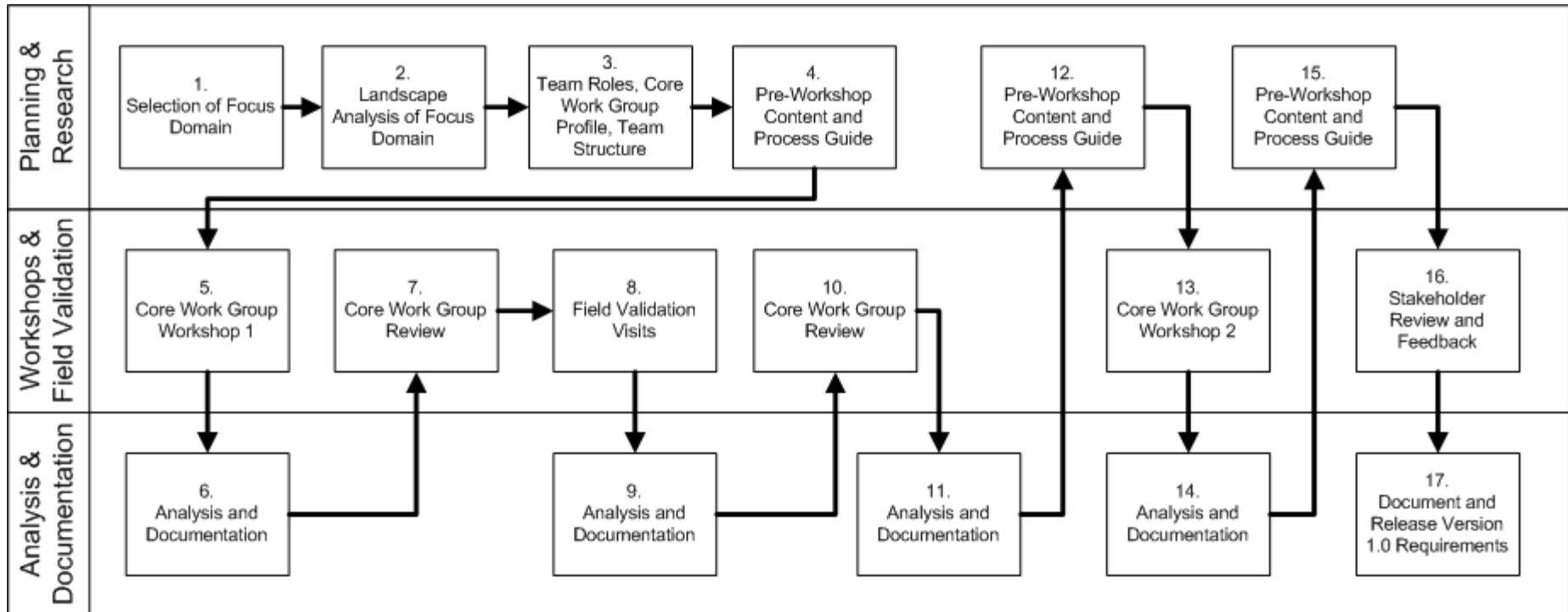
Supporting Standards Implementation

Version 4.0 - 05/12/2007

Patterns of Healthcare – Sierra Leone



CRDM Activity Flow Model

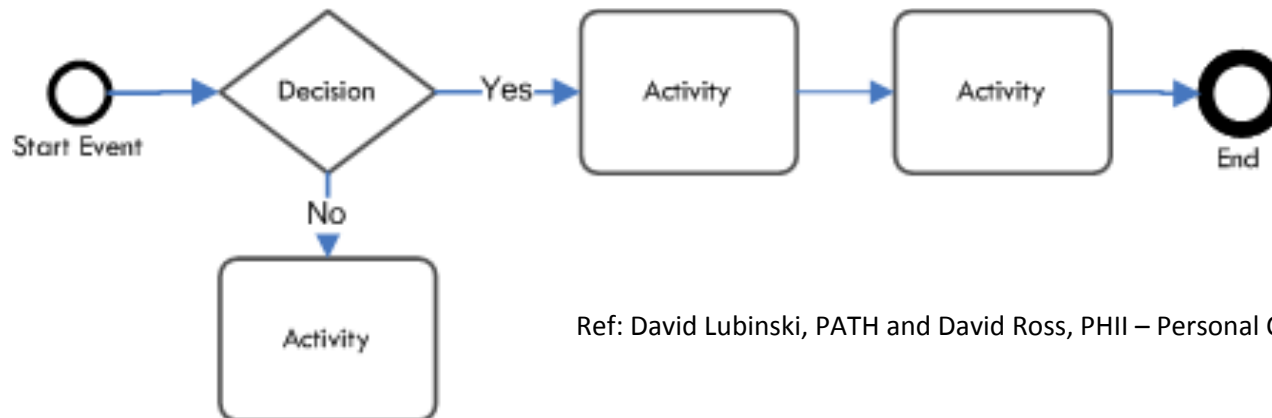
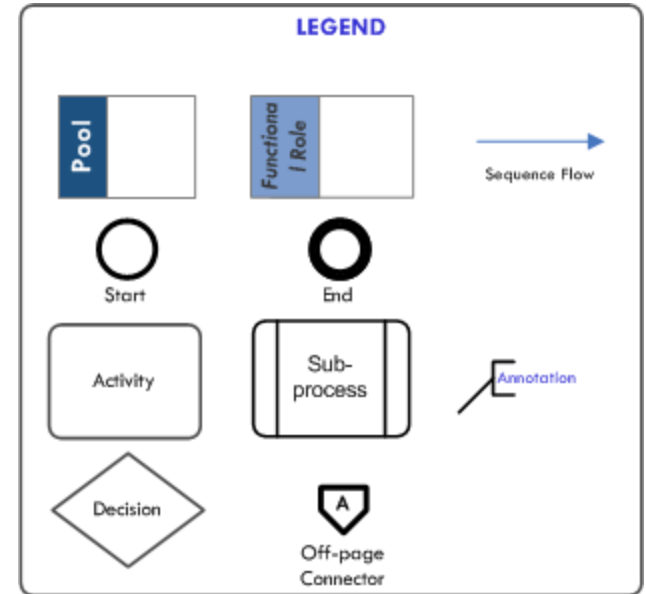


Ref: David Lubinski, PATH and David Ross, PHII – Personal Communication

Example of CRDM Process Modeling Tools

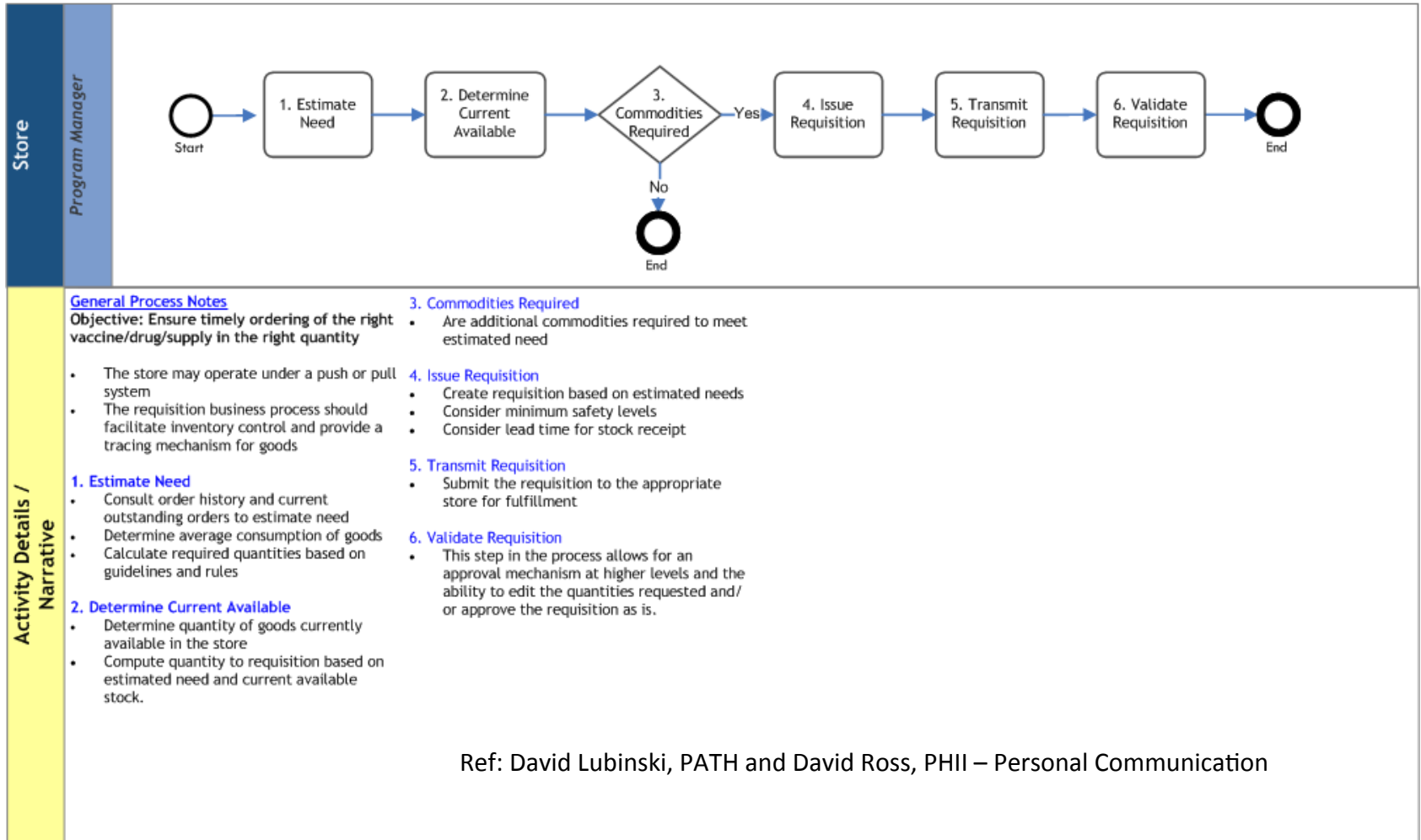
CRDM – Collaborative Requirements Definition Methodology

- Show how things work
- Visualize the work flow
- Standard flowchart
- Basic modeling tools



Ref: David Lubinski, PATH and David Ross, PHII – Personal Communication

Example Nontechnical Activity Diagram



Maternal Concept Lab

mcl

[About](#) [Projects](#) [Team](#) [Contact](#)

The banner features a photograph of a woman in a colorful patterned shirt holding a baby wrapped in a blanket. Overlaid on the top of the image is a horizontal flowchart with arrows pointing right, divided into two rows. The top row contains five stages: 'Adolescence & Pre-pregnancy', 'Pregnancy', 'Birth', 'Postpartum', and 'Maternal Health'. The bottom row contains three stages: 'Neonatal Postnatal', 'Infancy', and 'Childhood'. A central green arrow points from left to right across the middle of the flowchart, with the text 'LINKING ACROSS THE TIMES OF CAREGIVING' written inside it. On the left side of the banner, there is a light blue text box with a dark border containing the following text:

MCL is a cross-cutting project working to improve the delivery of maternal health services using technology by collaboratively making eHealth tools more reusable, evidence-based, and effective.

MCL:Search

Search the MCL/CIEL concept dictionary:

[MCL:Search](#)

Search

About MCL

Learn more about MCL and how to get involved. [More](#)

News

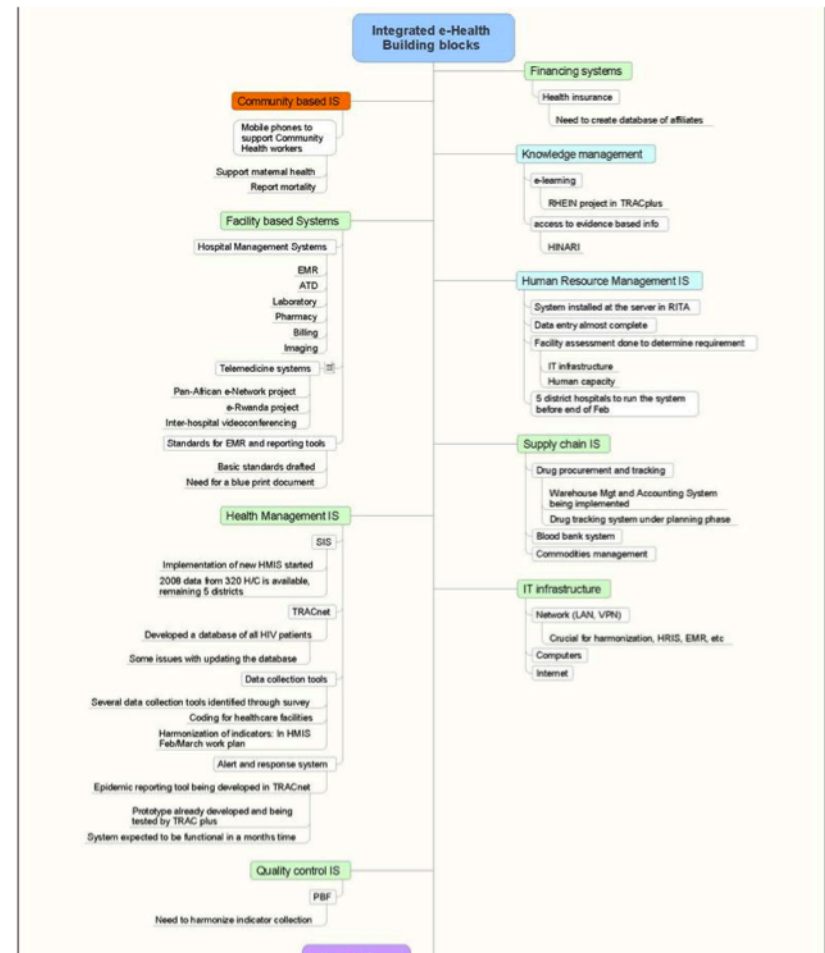
[New MCL:Search Released!](#) - The overhauled Concept Search Tool has a host of new features, including a better look and feel, inline search operators, batch queries, and more. [Read More](#) [June 2, 2011]

S1. Rwanda HIS Modeling Sub-Project

- Aim: Model the HEA in Rwanda
- Leads: Mead Walker, Chris Seebregts
- Status: Ongoing
- Deliverables:
 - Models for overall HIS
 - Models for HIE Prototype
 - Contribution to HEAF

S1. Rwanda eHealth Building Blocks

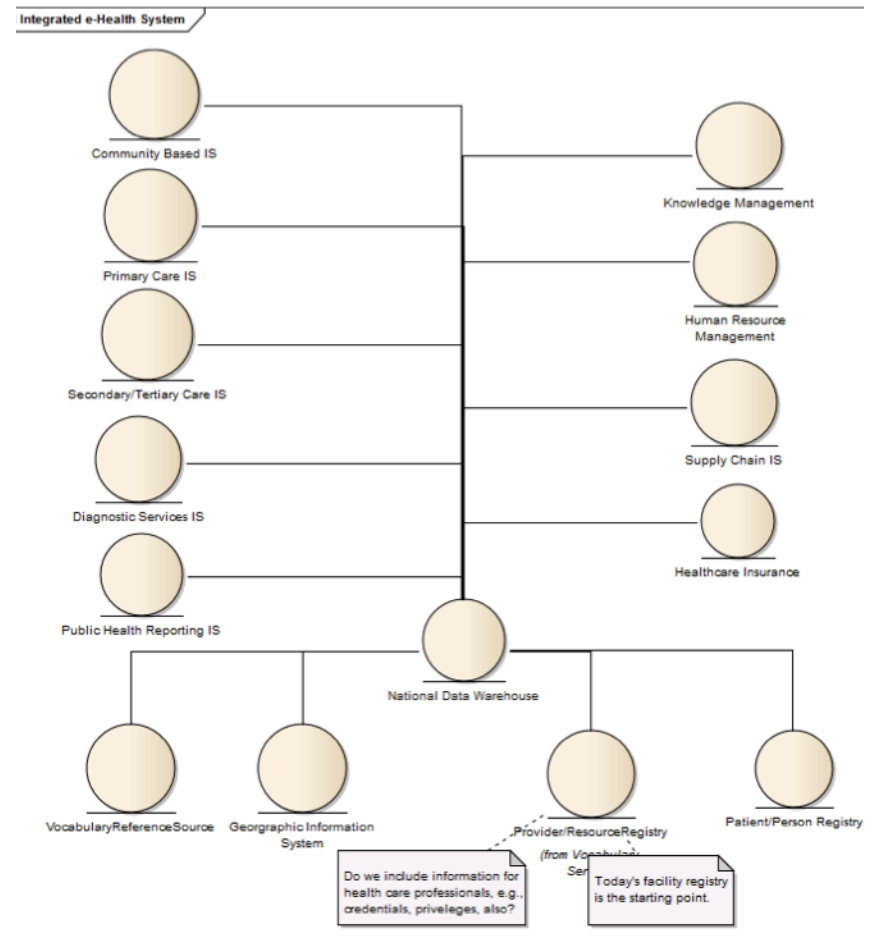
- Aim: Model the HIS in Rwanda
- Leads: Mead Walker, Chris Seebregts
- Status: Ongoing
- Description of Deliverables:
 - Models for overall HIS
 - Models for HIE Prototype
 - Contribution to HEAF



S1. Modeling the Rwanda HIS

(Mead Walker)

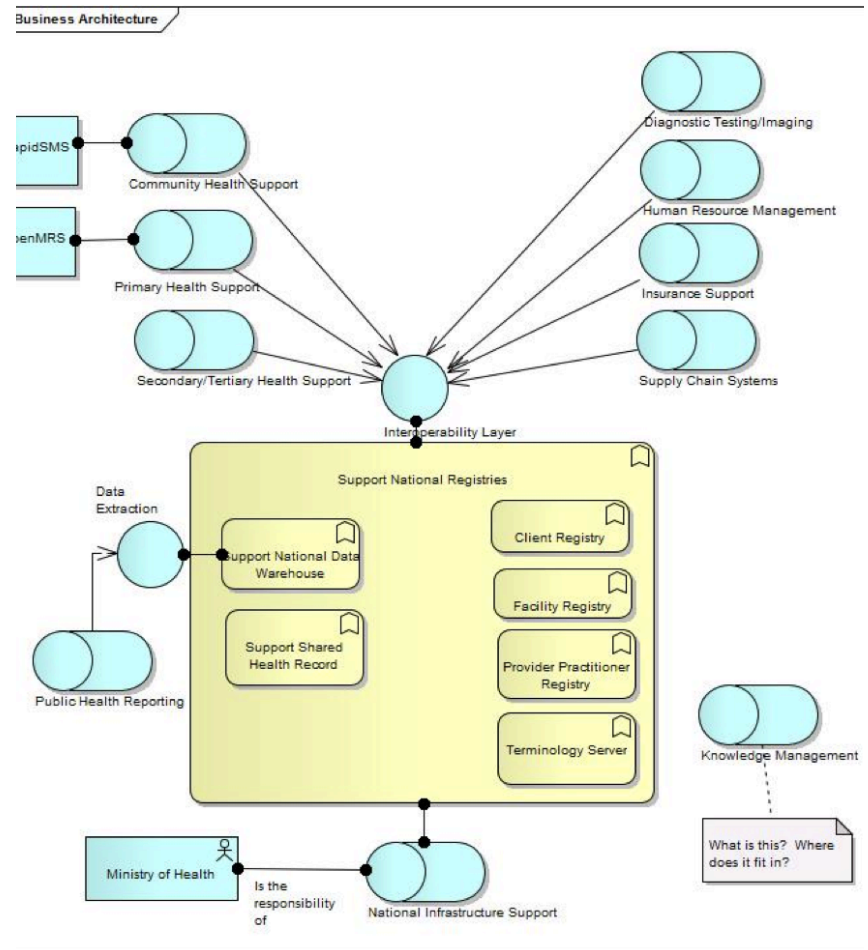
- Initial models developed by Mead Walker from Rwanda eHealth Strategic plan
- Current focus on modeling the HIE (as part of the data warehouse)



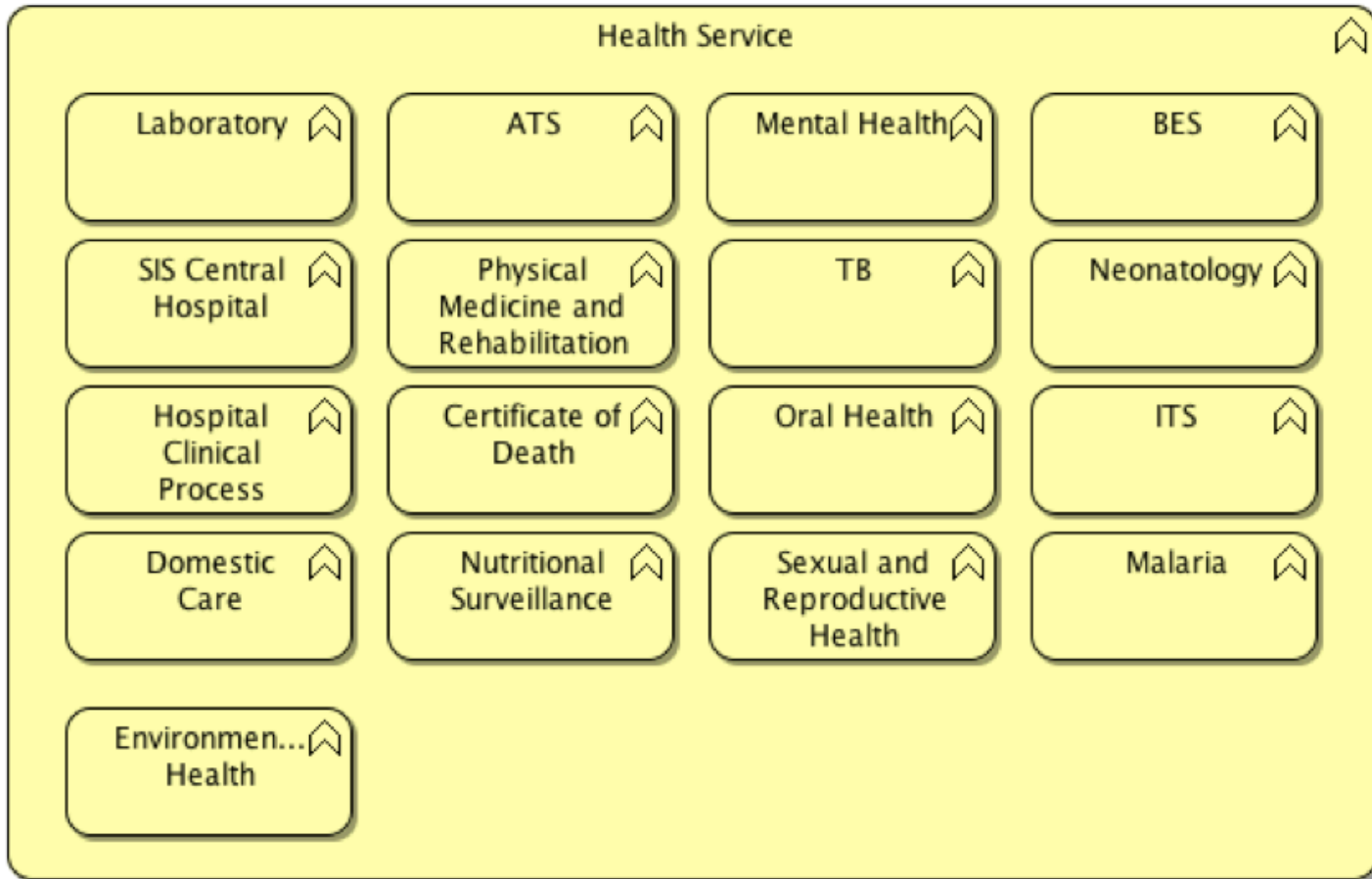
S1. Modeling the Rwanda HIS

(Mead Walker)

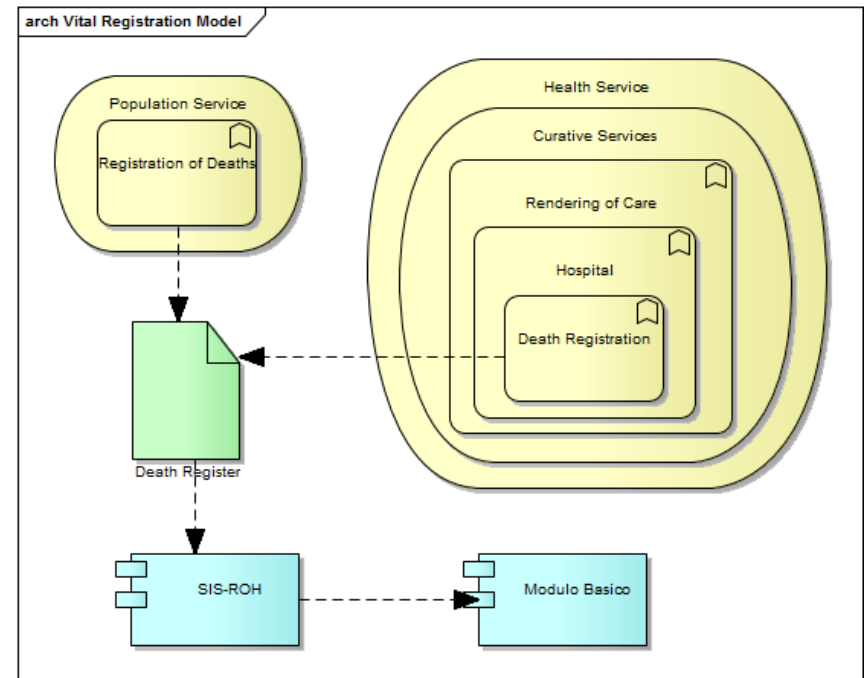
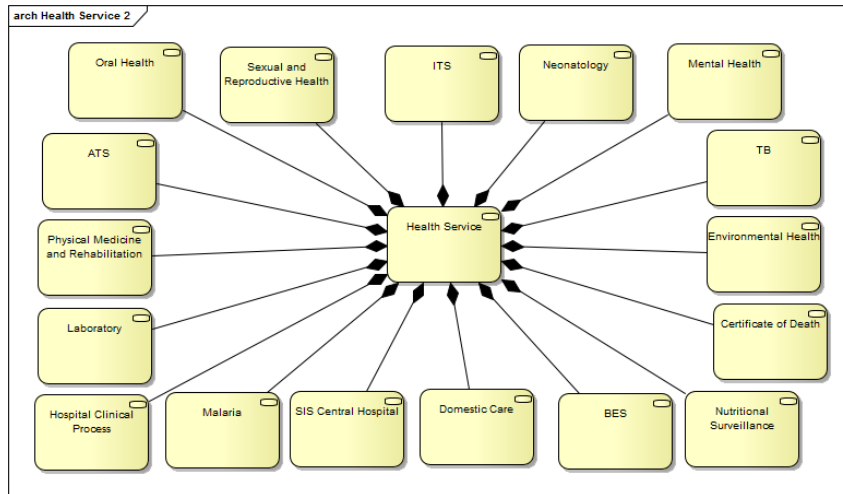
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- Current focus on modeling the HIE (as part of the data warehouse)



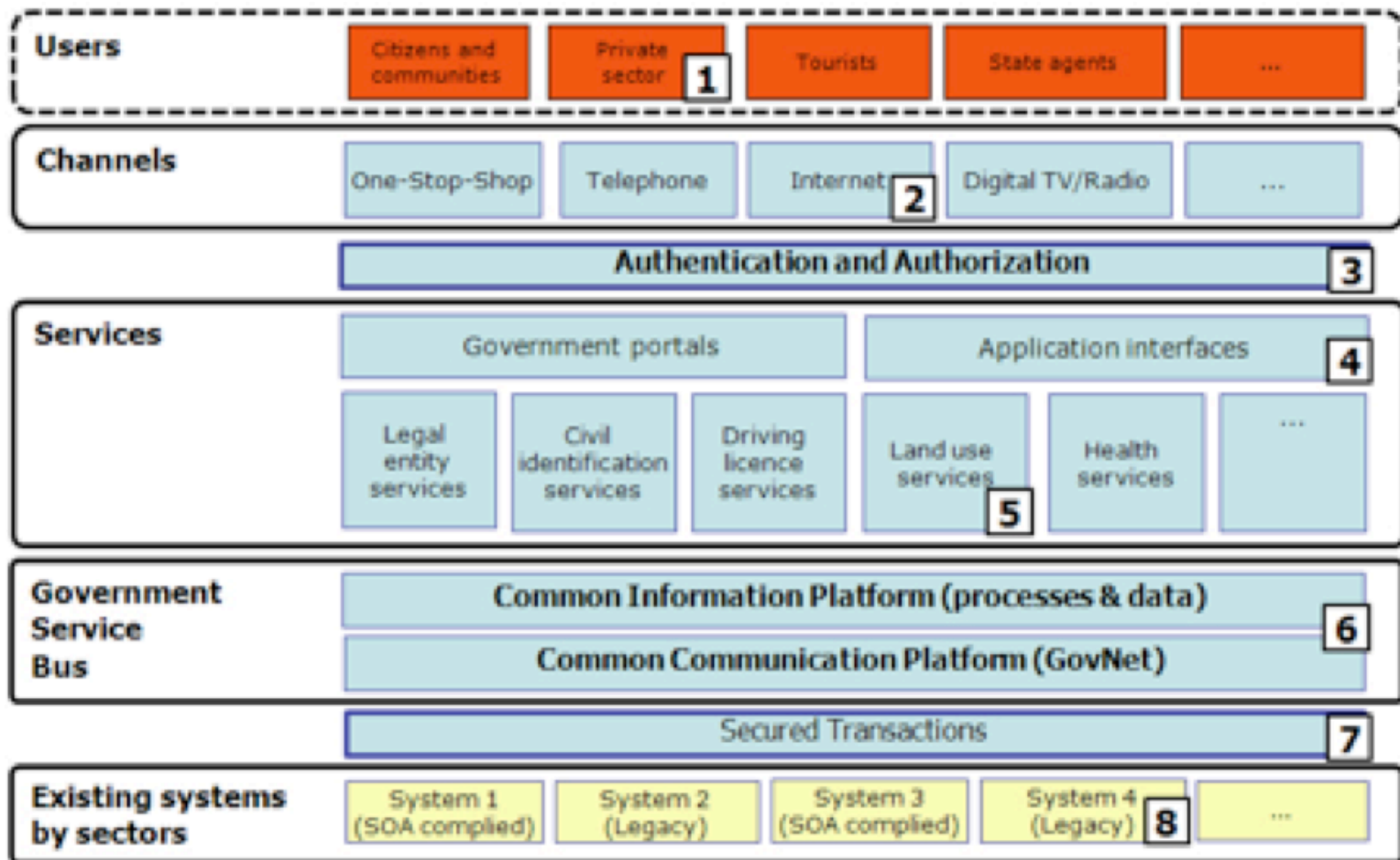
Mapping of eHealth in Mozambique



S5. HEAF and Elaboration (Mozambique, South Africa)



Mozambique e-Gov Framework



MIOS v4.1



MINIMUM INTEROPERABILITY STANDARDS (MIOS) for Information Systems in Government

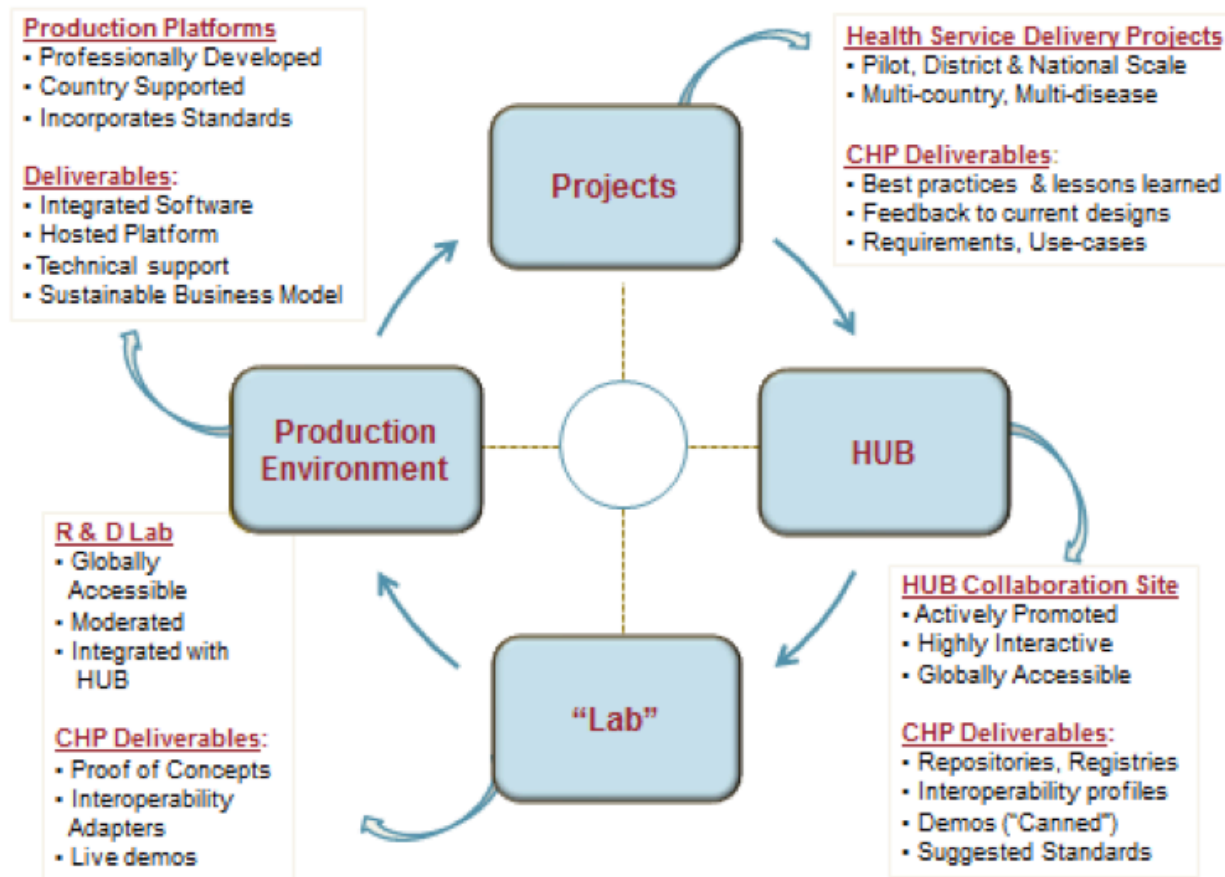
(version 4.1)

S7. Collaborative Health Portal Project

- Aim(s):
 - Develop an integrated, scalable and adaptable m/eHealth solution service platform
 - Dramatically reduce development and implementation timelines for Ministries of Health, NGOs & other organization who want to benefit from m/eHealth solutions
 - Complement existing Enterprise Architecture research by incorporating mHealth technologies to ensure reach to handheld devices
- Lead(s): Chris, Carl, Ed, Paul
- Status: In Progress
- Deliverables:
 - mHealth platform specifications

CHP Project

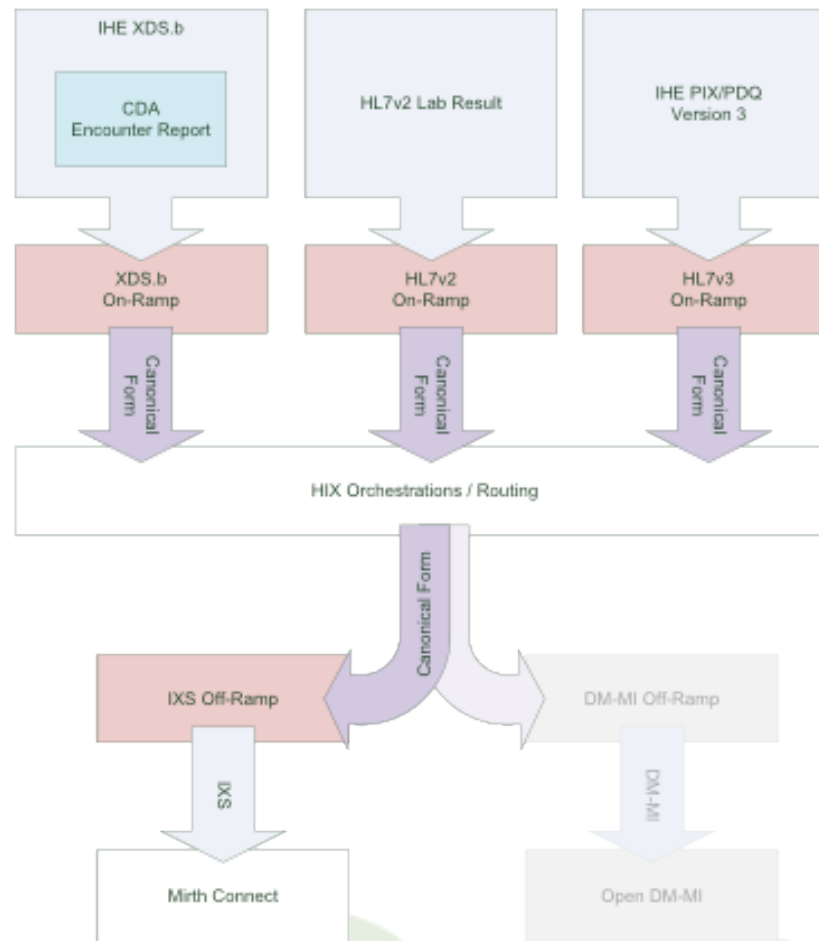
Collaborative Health Platform (CHP) - A Virtuous Cycle



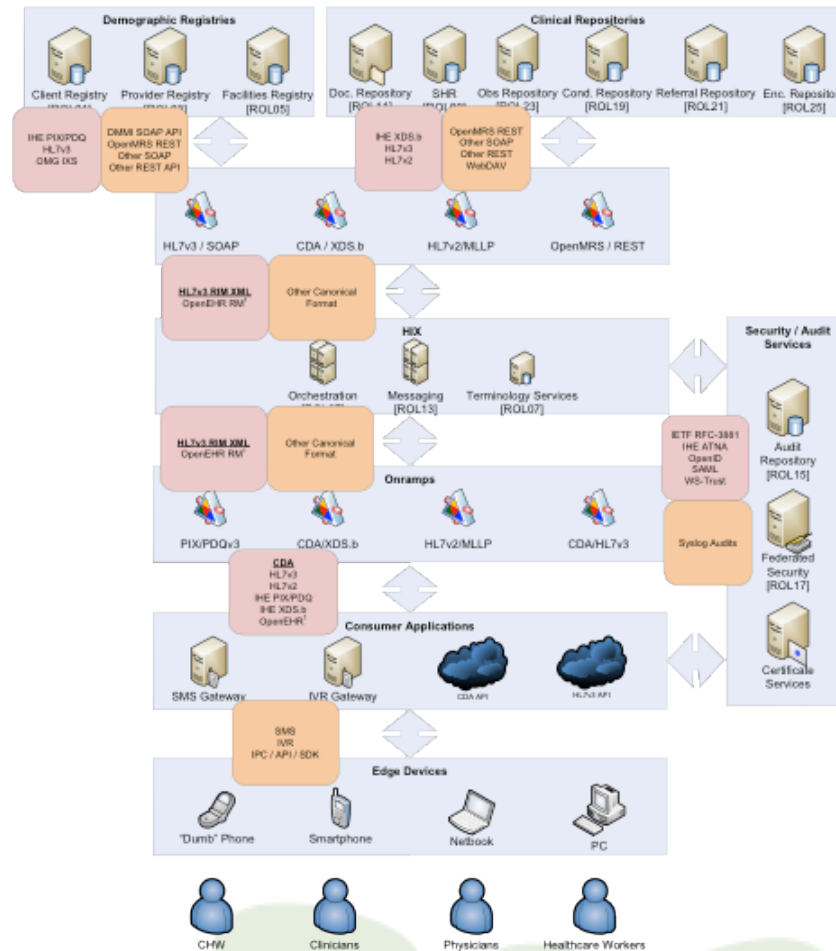
Approach

1. Establish representative workflows required to support the 3 projects of interest (Rwanda, Bihar and Zambia).
 1. Engage with each project
 2. Collect the use cases / requirements
2. Develop the technical artifacts (UML diagrams) that describe these use cases.
 1. Activity diagrams (workflow, swim lanes)
 2. Interaction diagrams (shows messaging between point solutions)
 3. Class diagrams (illustrates the information requirements)
3. Employ the technical experts at HEAL/Mohawk to develop software specifications to connect the target applications into an interoperability infrastructure.
4. Share these specifications broadly with the target software communities for comment.
5. Have the HEAL/Mohawk team develop level-of-effort estimates to accomplish the work, based on their experience and understanding and informed by the lessons learned from last year's Medinfo project. (included as part of #3)
6. (Optional) Prototype exploration using both SOAP & RESTful APIs.
7. Report back to PEPFAR – use case descriptions, engineering, and estimates

On/Off Ramping Pattern



On/Off Ramping Pattern Applied



S7. THE HEALTH ENTERPRISE ARCHITECTURE REPOSITORY AND TERMINOLOGY SERVICE (HEART) COMMONS PROJECT

- Aim(s):
 - The Health Enterprise Architecture Repository and Terminology service (HEART) is an open source common repository that will help facilitate and accelerate affordable implementations of health IT solutions by fostering the discovery, exchange, and incremental improvement of reusable, interrelated health IT documents, requirements, processes, applications, tools, source code, data sets, templates, or any other digital assets
- Lead(s): Rob Kolodner, Chris, Carl, Paul
- Status: In Progress
- Deliverables:
 - Repository

Health Enterprise Architecture Registry of Tools Project

HEART project
Reusable healthcare IT assets registry

I'm interested in information for: **All Audiences** ▼

DISCOVER
LOCATE ASSETS PUBLISHED IN THE REGISTRY USING FREE TEXT OR STRUCTURED SEARCH

SHARE
DESCRIBE YOUR ASSETS IN THE REGISTRY AND CONTROL USER ACCESS

ABOUT HEART PROJECT

HEART is a health IT asset registry and repository to facilitate and accelerate affordable and sustainable health information implementations by making them more discoverable, more accessible, and more useful than they are today. The ability to register all types of assets and make the relationships among assets explicit will encourage organizations to contribute assets useful to them and find complementary assets they are interested in using. [Learn More](#) »

Registry Statistics	
Registered Assets	31
Metadata Attributes	15
Domain Values	465
Users	8

Most Used Assets	
3	HUMAN RESOURCES FOR HEALTH STRATEGIC PLAN 2011-2016
2	Rwanda Prevention Plan HIV
1	ANTI-MALARIA DRUG POLICY FOR GHANA
1	MDR-TB Module

Most Followed Assets	
3	HUMAN RESOURCES FOR HEALTH STRATEGIC PLAN 2011-2016
2	Rwanda Prevention Plan HIV
1	ANTI-MALARIA DRUG POLICY FOR GHANA

Recent Discussions	
Any suggestions how I should approach this architectural design?	(Reply)
Thread starter: John Smith	
Hi, I'm from the national ministry of health and have been assigned a responsibility for setting health policy (particularly, eHealth policy). So, I'm in a process of drafting an eHealth policy/strategy...(by John Smith)	
Aspects of Health Information System	(Reply)
Thread starter: Jack Daniels	
The Ministry has appointed me as a HIS architect to develop a national blueprint for our country. It is a substantial undertaking, and I would like to do that in multiple stages...(by Jack Daniels)	
HEART is great, thank you so much!	(Reply)

Discover Architectural Assets

The screenshot shows a web browser window displaying the HEART Registry Discover page. The browser's address bar shows the URL heart.itghealth.com/HEART.Registry/Discover. The page has a navigation menu with options: HOME, ABOUT, DISCOVER (selected), DISCUSS, SHARE, MY HEART, and a user greeting 'Welcome, Chris Seebregts' with a 'Logout' button. A search bar is present with the text 'SEARCH'. Below the search bar, it indicates 'Found 18 Registered Assets'. There are filters for Audience, Coverage, and Format. The Audience filter includes Architect, Business Analyst, Clinician, Developer, and Implementer. The Coverage filter includes Ghana and Rwanda. The Format filter includes Enterprise Architect, HTML, Image, Microsoft Access, and Microsoft Excel. The search results list several assets:

- NATIONAL COMMUNITY BASED NUTRITION PROTOCOL (NCBNP)**
The general objective of CBNP is to support and in close cooperation with the local communities, the implementation of a minimum package of progressive and adjustable community based activities, particularly in the field of health, nutrition, hygiene and sanitation in order to contribute to the reduction of death rate among younger children as well as the fall in the rate of malnutrition (P/A) among children who are 0 to 5 years old within project sites.
Last modified by: (Dmitry Bakuntsev), on (3/9/2012 7:52:22 PM)
- Rwanda Health Facilities**
Rwanda keeps a database of all health facilities in the country with a range of metadata to describe each facility
Last modified by: (Dmitry Bakuntsev), on (3/12/2012 8:06:09 PM)
- Rwanda Health Facilities Metamodel**
The Ministry of Health of Rwanda has defined metadata descriptors defining the data collected for each healthcare facility
Last modified by: (Dmitry Bakuntsev), on (3/12/2012 8:11:51 PM)
- Rwanda Health Sector Strategic Plan July 2009 – June 2012**
The Ministry of Health of Rwanda has developed a strategic plan for the health sector, covering the period from July 2009 until June 2012
Last modified by: (Dmitry Bakuntsev), on (3/12/2012 8:12:37 PM)
- ANC Register**

Share and Reuse Assets

HOME ABOUT DISCOVER DISCUSS **SHARE** MY HEART Welcome, Chris Seebregts **Logout**

Like (0) Follow 0 Use 0 Discuss 10 Use as a Template Add New Attribute Edit Asset

Basic Information

Title	Rwanda Health Enterprise Architecture (Enterprise Architect)	2012-02-08 Chris Seebregts
Abstract	The RHEA enterprise architecture team is storing assets and models in a software application - Enterprise Architect	2012-02-08 Chris Seebregts
URI	http://dl.dropbox.com/u/2822968/RwandaAssets/RwandaEA.eap	

General

Author	Mead Walker
Coverage	Rwanda
Description	Complex database with stored assets, relationships and models (views)
Format	Enterprise Architect
Language	English
License	Public Domain
Owner	Rwanda Ministry of Health
Relevant Standard	Archimate UML

Opening RwandaEA.eap

You have chosen to open

RwandaEA.eap
which is a: Binary File (3.3 MB)
from: <http://dl.dropbox.com>

Would you like to save this file?

Cancel Save File

Annotate Assets and Add Attributes

The screenshot shows the HEART Registry web application interface for editing an asset. The browser address bar indicates the URL is `heart.itghealth.com/HEART.Registry/Share/Edit/25`. The main content area displays a list of attributes for the 'Facility Registry' asset, including 'Country Data', 'Architect', 'Business Analyst', 'Developer', and 'Implementer'. A 'New Attribute Information' dialog box is open, allowing the user to define a new attribute with fields for Name, Definition, Type (Wiki), Cardinality (Many), and Visibility (Private). The dialog also includes 'Create' and 'Cancel' buttons. The background interface includes a sidebar with 'Add Attribute' and 'Relations' sections, and a footer with 'Email Us' and 'HEART project © 2012 | Privacy policy'.

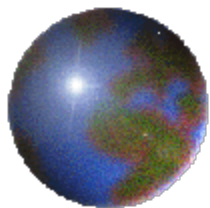
Classification of Standards

- Can classify standards in four dimensions
- Organization
- Process
- Information
- Technology

- <http://www.hiwiki.org>

Slide courtesy of Bron Kisler, Elizabeth Keller, Don Newsham, All Geneva Participants

Joint Initiative Council (JIC) & Partners

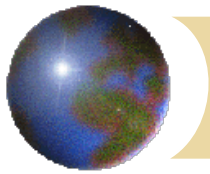


Working Meeting on Enabling Standards for LMIC's

MEETING REPORT

Geneva

September 29/30, 2011



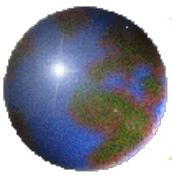
Genesis for Working Meeting

Hosted by Joint Initiative Council for Global Health Informatics Standardization

Joint Initiative - 6 SDO's collaborating to enable common, timely harmonized health informatics standards

✚ Working meeting was convened to:

- ✚ build upon the standards needs for emerging and developing countries
- ✚ begin formulating a plan to address those needs
- ✚ advance past conversations, communiqués, bi-lateral and multi-lateral related meetings
- ✚ bring about broad and sustained progress for standards in emerging and developing countries.
- ✚ bring a small group of key leaders together
 - Global SDO's, E&D Countries, WHO, IMIA, Donors, ...
 - with strong facilitators



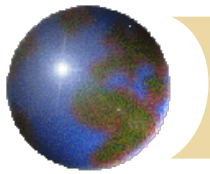
Foundation to Strategic Action

- ✦ **“Mission”** – to enable the fullest and equal awareness, access, participation and adoption for health informatics standards that can be used in low and middle income countries to ensure better health information for better health

- ✦ **“Scope”** - All countries, regions and communities unable to participate with (access, attend and adopt) health informatics standards and related SDO’ s effectively and fully with a focus on lower and middle (lower and upper middle) income countries, regions and communities, also known as emerging and developing countries

- ✦ **“Goal”** Strategic Action Plan – focused on:
 - opportunities and barriers
 - strategies (broad what statements)
 - tactics (specific actions desired / needed)
 - stakeholder identification, roles

- ✦ Followed up by a business plan



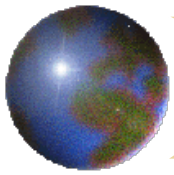
Value of Standards for LMIC's

If a developing country were to get access to standards (and also participate and adopt standards) it could:

- ✦ Build national eHealth Architecture based on standards.
- ✦ Develop a “policy enabling environment” to enhance IT infrastructure (national governing bodies adopt / adapt standards, then apply policy)
- ✦ Improve Donor alignment in funding priorities for health information system strengthening
- ✦ Enable Health-IT based microeconomic development to occur at all levels (small business's, NGO's,)
- ✦ Enable shared investment of implementation costs among various stakeholders (line ministries and local governments and communities)
- ✦ End of day / end point is better health care delivery with key for much is “not reinventing”

Unique Perspectives LMIC's bring:

- ✦ Delivering healthcare under limited technical environments;
- ✦ innovations can be introduced as a solution to the existing problems in healthcare delivery
- ✦ Share knowledge and country-experience



Key Requirements (1)

3 BROAD TYPES OF APPLICABLE STANDARDS for LMICs

✦ *Data and Reporting Standards:*

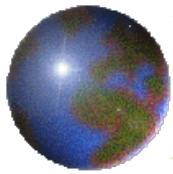
- ✦ Monitoring and evaluation, usually donor set (not SDO based), disease specific, disease specific EMR's also, addressing indicators, utilization, counts, etc, country or region based, some research data collection
- ✦ “DHIS 2 provides a comprehensive HIS solution for the reporting and analysis needs of Community, health facilities and District at any level” (Kenya – Samuel Cheburet)

✦ *Health Information Systems Standards*

- ✦ Based on Health Metrics Network Framework for health information and statistical systems, standard framework and framework specifications, widely used becoming an ISO standard.
- ✦ Standards used relate to seven business domains namely health services, laboratory, pharmacy, human resources for health, environmental monitoring including disease surveillance, decision support and finance.

✦ *eHealth or Health Informatics Standards*

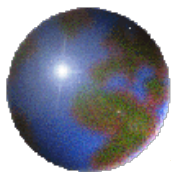
- ✦ Person and clinician focused, records focused, information and communications technology based, health informatics based
- ✦ Standards relate to infrastructure and specific domains (structure, interchange, semantic content / terminology, identifiers, privacy / security, clinical research, identifiers,
 - HI is the intersection of clinical, IM/IT and management practices to achieve better health



Key Requirements (2)

EXAMPLE REQUIREMENTS LIST (Kenya)

- ✦ Data standards
 - ✦ Data linkages database systems in the health sector e.g. in Kenya Human resources for health (IHRIS, Nursing systems), KEMSA or LMIS, IFMIS, NHIF, MFL, DHIS etc.
 - ✦ Data dictionary, metadata used in manual system and technology system.
 - ✦ plausibility checks, data backups, storage, system maintenance, data warehousing and archiving of data
- ✦ Technical standards
 - ✦ ICT standards in health information management
- ✦ Information System Standards
 - ✦ DHIS, MFL, M-Health, e-health, EMR, FTP, and EHR systems,
- ✦ Privacy and Security standards
 - ✦ Data Security Mechanisms, archiving, back-up services and data encryption guidelines,
- ✦ EHR and EMR standards
 - ✦ Deployment of the EHR and EMRs

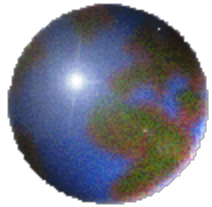


Key Requirements (3)

STANDARDS OF INTEREST (first list of 33) (1-18)

❖ Note: Need to further rationalize the 50 standards needed into 4-5 buckets / business requirements – using enterprise view (the house picture) (use SKMT)

Deployment of a Clinical Data Warehouse	TS 29585
Provider Identification	TS 27527
Health Indicators for Conceptual Framework	IS 21667
Health Informatics -Service Architecture -Enterprise Viewpoint	IS 12967-1
Health Informatics -Service Architecture -Information Viewpoint	IS 12967-2
Health Informatics -Service Architecture -Computational Viewpoint	IS 12967-3
Identification of Subjects of Health Care	TS 22220
EHR Definition, Scope and Context	TR 20514
Good Principles and practices for a clinical data warehouse	TR 22221
Health Indicators for Conceptual Framework	TS 21667
Harmonized Data Types for Information Interchange (name change 2007)	IS 21090
Guidelines for terminology development organizations	TR 12309
Common Glossary for ISO/TC 215	TS 28379
Directory services for security, communications and identification of professions	TS 21091
Secure Archiving of electronic health records Part1 Principles and Requirements	TS 21547
Privilege Mgmt and AC-1 Overview & Policy Mgmt	TS 22600-1
HC Info Privilege Mgmt & Access Control P-2 Priv Mgmt	TS 22600-2
HC Info Privilege Mgmt & Access Control P-3 AC Mgmt	TS 22600-3



Thank you.

Bron Kisler

Elizabeth Keller

Don Newsham

All Geneva Participants

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Partners

1. Ministry of Health, Rwanda
2. Jembi Health Systems, South Africa & Rwanda
3. Pivot Access, Rwanda
4. HEAL, University of KwaZulu-Natal, South Africa
5. BLEAO Informatica em Saúd, Brazil
6. Liz Peloso Consulting
7. CDC, USA
8. Regenstrief Institute, USA
9. InSTEDD, USA
10. Partners in Health, USA and Rwanda
11. Millennium Villages Project
12. World Health Organization
13. Nethope
14. Mohawk College
15. ecGroup