

“Applied Interoperability”

Bill Lober, MD MS

University of Washington

Associate Director, Center for Public Health Informatics

Director of Informatics, International Training and Education Center for Health
(UW/UCSF)

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Goal

Operational Interoperability...

...Extreme Practicality!

3 examples/use-cases

Approaches

Experiences

Strengths/Weaknesses

...seeds for discussion...



Premises

- Interoperability is good



Premises

- Interoperability is good
- Standards are not sufficient



xunileca

Posted: Tue Nov 03, 2009 3:20 pm Post subject:

[quote](#)

Joined: 27 Oct 2009
Posts: 4

Thanks. I am encountering these errors. Any ideas?

Tue Nov 3 07:49:55 2009 WARNING - Segment PID: Incompatible Field [2]: [90492/1]
Tue Nov 3 07:49:55 2009 WARNING - Segment PID: Incompatible Field [4]: [90492/1]
Tue Nov 3 07:49:55 2009 WARNING - Segment PID: Incompatible Field [19]: [233462129]
Tue Nov 3 07:49:55 2009 WARNING - Segment OBR: Incompatible Field [6]: [20091103075501]

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pacsone

Site Admin

Posted: Tue Nov 03, 2009 5:23 pm Post subject:

[quote](#)

Joined: 30 Sep 2003
Posts: 2464

The HL7 interface of PacsOne Server is developed based on version 2.3.1 of the public HL7 standards. So make sure your sending HL7 application is compatible with HL7 v2.3.1

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xunileca

Posted: Wed Nov 04, 2009 11:16 pm Post subject:

[quote](#)

Joined: 27 Oct 2009
Posts: 4

I have confirmed that the sending application is using version 2.3. I am still seeing these error messages:

Wed Nov 4 18:14:49 2009 INFO - HL-7: <2857> started from peer: 63.246.142.x
Wed Nov 4 18:14:49 2009 INFO - <2857> Receiving message
Wed Nov 4 18:14:49 2009 INFO - <2857> [711] bytes message received successfully
Wed Nov 4 18:14:49 2009 WARNING - Segment PID: Incompatible Field [2]: [99094]
Wed Nov 4 18:14:49 2009 WARNING - Segment PID: Incompatible Field [4]: [99094]
Wed Nov 4 18:14:49 2009 WARNING - Segment OBR: Incompatible Field [6]: [20091104181001]
Wed Nov 4 18:14:49 2009 INFO - <2857> Sending Acknowledgement...
Wed Nov 4 18:14:49 2009 INFO - <2857> [82] bytes ACK message sent successfully
Wed Nov 4 18:14:49 2009 INFO - <2857> Receiving message
Wed Nov 4 18:14:49 2009 ERROR - CSocketServer: Session 2857 remote error: [0]
Wed Nov 4 18:14:49 2009 INFO - Session: <2857> disconnected for client: 63.246.142.x

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pacsone

Site Admin

Posted: Thu Nov 05, 2009 1:05 am Post subject:

[quote](#)

Joined: 30 Sep 2003
Posts: 2464

No, version 2.3 is not the same as version 2.3.1 (the HL7 version PacsOne Server is using).

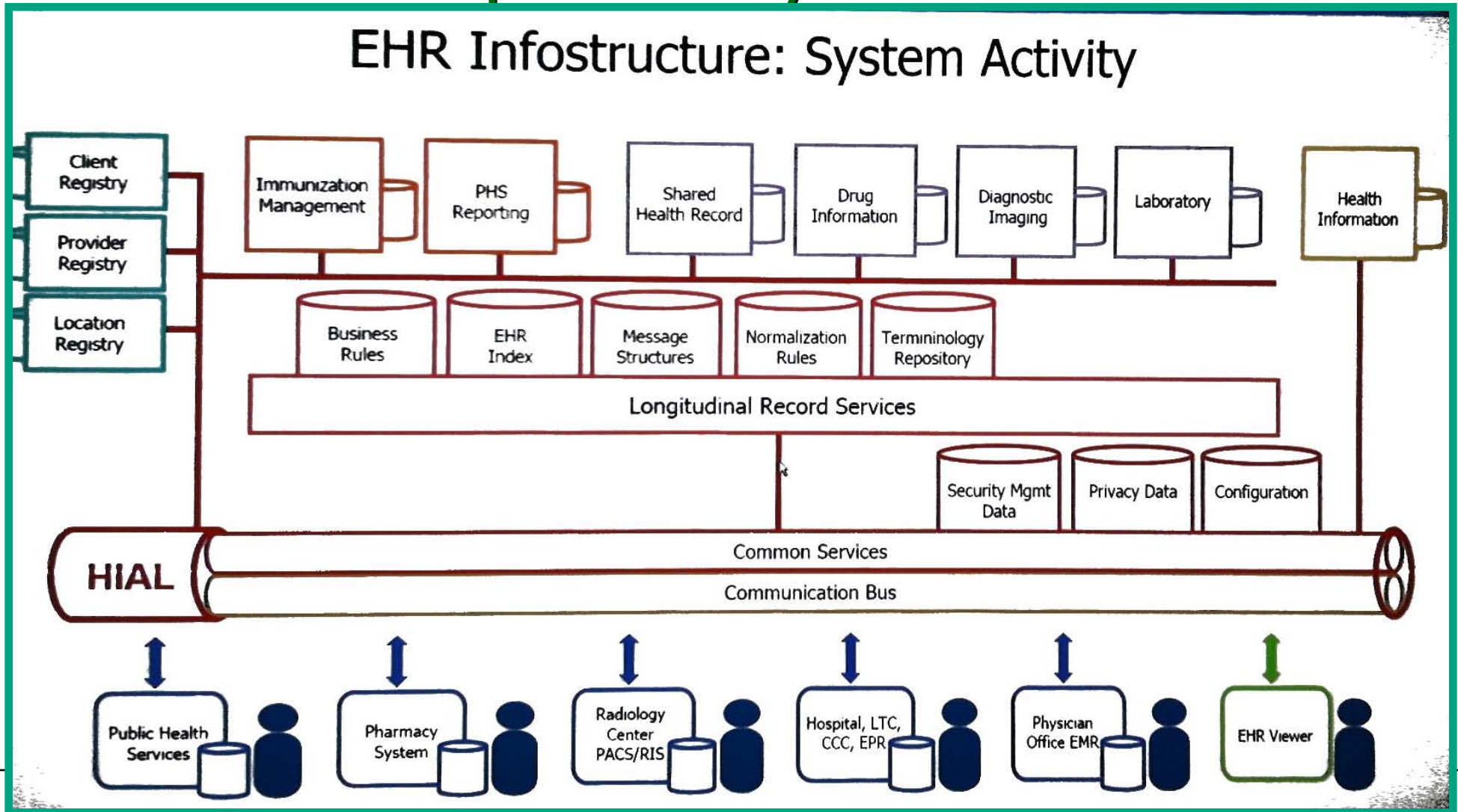
Premises

- Interoperability is good
- Standards are not sufficient
- eHealth Architecture is good



Interoperability Showcase

EHR Infostructure: System Activity



Courtesy of JEMBI, Canada Health Infoway, etc... (Thanks!)

eHealth architecture requires more than standards...

- Components
 - e.g. Lab Information Systems
 - e.g. Electronic Medical Record Systems
- Information Exchange between components
 - e.g. Lab-EMR
- Guidance to implement information exchange
 - e.g. Standards
 - e.g. Interoperability profile



Interoperability Profile

“An interoperability profile is a structured description of the content, format, and method of an information exchange, and of the business rules governing that exchange.”

- *Lober, 2010-Sep*

(Profiles are not standards; they describe the use of standards – <http://ihe.net>)



Interoperability Profile (not really my idea...!)

- Borrowed from IHE framework (www.ihe.net)
 - Commercial participants
 - Comprehensive identification of
 - use cases, transactions, standards
 - Message-based *and* document-based approaches
 - Rich, expressive, based on present practice
 - ...Complex





IHE Technical Frameworks

- [Anatomic Pathology](#)
- [Cardiology](#)
- [Eye Care](#)
- [IT Infrastructure](#)
- [Laboratory](#)
- [Patient Care Coordination](#)
- [Patient Care Devices](#)
- [Quality, Research and Public Health](#)
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- [Radiology](#)

The IHE Technical Frameworks, available for download below, are a resource for users, developers and implementers of healthcare imaging and information systems. They define specific implementations of

What's New in IHE?

[IHE North America Connectathon Applications Due Oct. 8](#)

[IHE offers Connectathon Manager Training](#)

[IHE Presents the 2010 IHE Educational Webinar Series](#)

[More news...](#)

Interoperability Examples

(we've developed/implemented profiles for...)

- Integrated Clinical Databases
 - HIV research databases
- Public Health Surveillance
 - Distribute/Gossamer
- Global Health (why?)
 - Haiti EMR-Lab
 - Haiti Case Surveillance/Records Transfer



HIV Research db's

- NIH funding – detailed HIV C&T data
 - CNICS (6) & NA-ACCORD (~30)
 - PRO component, integrating w EMR @ Fenway
- Semantic and syntactic constraints
- Scalable, but w/ involvement w each site
- PCAST “early model of data exchange”



Core Objectives (All Required)	EP	H	Menu Objectives (Choose 5*)	EP	H
Computerize physician order entry	X	X	Check drug-formularies	X	X
Protect electronic health information	X	X	Incorporate clinical lab test results as structured data	X	X
Report ambulatory clinical quality measures to CMS/States	X	X	Generate lists of patients by specific conditions	X	X
Implement one clinical decision support rule	X	X	Use certified EHR technology to identify patient-specific education resources and provide to patient, if appropriate	X	X
Provide electronic copy of patient's health information, upon request	X	X	Reconcile medication	X	X
Record demographics	X	X	Summarize care record for each transition of care/referral	X	X
Maintain an up-to-date problem list of current and active diagnoses	X	X	Record advanced directives for patients 65 years or older		X
Maintain active medication list	X	X	Send reminders to patients per patient preference for preventative/follow-up care	X	
Maintain active medication allergy list	X	X	Provide timely electronic access of their health information to patients	X	
Record and chart changes in vital signs	X	X	Submit electronic data to immunization registries/systems*	X	X
Record smoking status for patients 13 years or older	X	X	Provide electronic syndromic surveillance data to public health agencies*	X	X
Exchange key clinical information among providers of care and patient-authorized entities electronically	X	X	Provide electronic submission of reportable lab results to public health agencies*		X
Check drug-drug and drug-allergy interaction	X	X			
E-Prescribing (eRx)	X				
Provide clinical summaries for patients for each office visit	X				
Provide electronic copy of discharge instructions to patients at time of discharge, upon request		X			

EP= Eligible provider
H = Hospital
* At least one must be to Public Health

14 or 15 req'd
Choose 5, one from PH
Thanks to Bryant Karras




Public Health Surveillance

- Distribute
 - Influenza Surveillance – voluntary participation by 44 S/L HDs (IT support?)
 - International Society for Disease Surveillance (thanks to: CDC & Markle Foundation)
- Gossamer
 - VM appliance
 - Takes in MU data for syndromic surveillance (stds-based interoperability)



Gossamer Health

https://sites.google.com/site/gossamerhealth/



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Home

What is Gossamer Health?

Gossamer Health is an open source information system for collecting and organizing syndromic surveillance data, and other health indicator data, for a population. <http://gossamerhealth.org>

Gossamer Health:

- stands for **Good Open Standards System for Aggregating, Monitoring and Electronic Reporting of Health**.
- **is an information technology** developed at the University of Washington (UW), and is the result a decade of informatics research, syndromic surveillance, data collection and aggregation experience in the clinical and public health domains.
- is the **underlying platform** developed to support several projects at the UW
- underlies the data integration and contributor (restricted) views of the **Distribute** system, developed and operated by the International Society for Disease Surveillance (ISDS) (<https://isds-auth.cirg.washington.edu>), which was substantially expanded from a pilot system for collaborative data exchange during the 2009 H1N1 Pandemic.
- is now released as **open source** under the "3 clause" BSD license (<http://www.gossamerhealth.org/documentation/bsd-license>) to provide state and local health jurisdictions with a cost-effective way to support **local and state health jurisdiction** syndromic surveillance activities and dynamically participate in networks of surveillance, to facilitate elective data sharing with other organizations that have similar health indicator data, including Influenza-Like Illness (ILI) data
- enables the rapid elective sharing of situational awareness between jurisdictions during a significant outbreak or an

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Release History

Short version of release history with a [link](#) to the full page.

[More...](#)

Site owners

Mark Stewart
Blaine Reeder

Gossamer

- At home in the cloud... (VM, SOA)
- Component Architecture
 - Stds link components
- Issues
 - Narrow domain, simple data set
 - Lack of (well-used) stds for summarized data
 - Distribute, GIPSE, SDMX-HD, QRDA



EMR-Lab information system

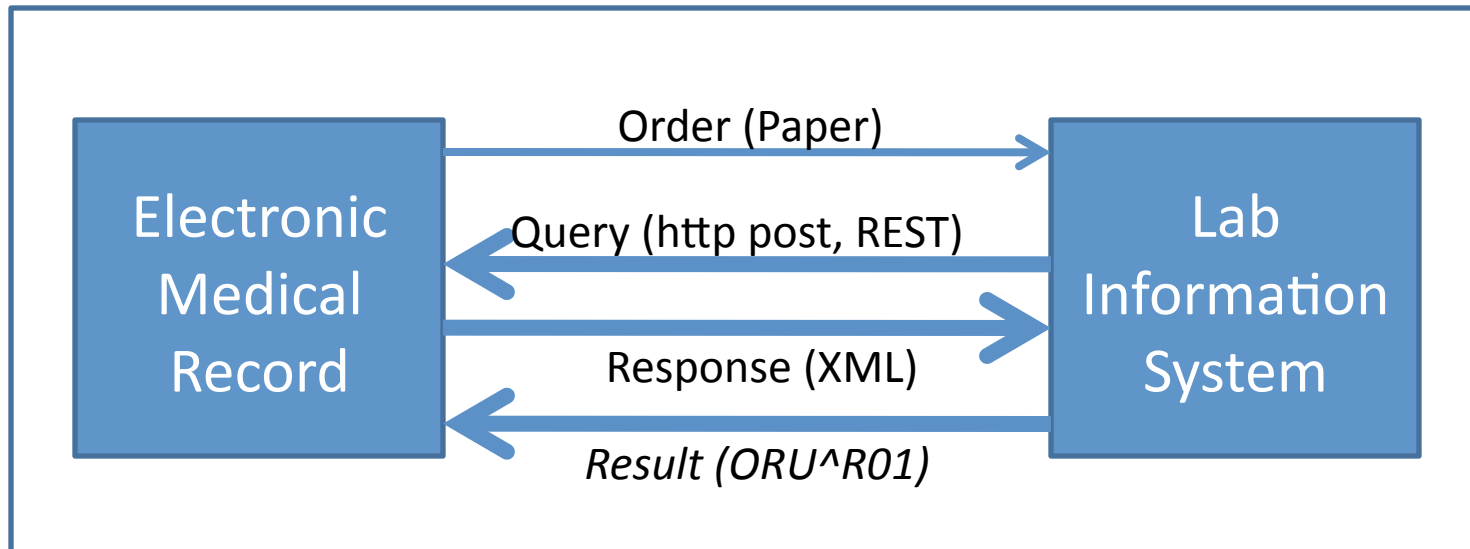
- Easy, right...?!
- Just use HL7
 - Hard to use... Varied implementation guidance
 - How to apply it?
 - Access to standard for Kenyan/Namibian/Haitian programmers?
- Back to profiles...

Lober, William B, Debra Revere, and Rebecca Hills. "A Lab-EMR interoperability profile as an eHealth architecture component for resource-constrained settings." *Studies In Health Technology And Informatics* 160.Pt 1 (2010) : 257-261.



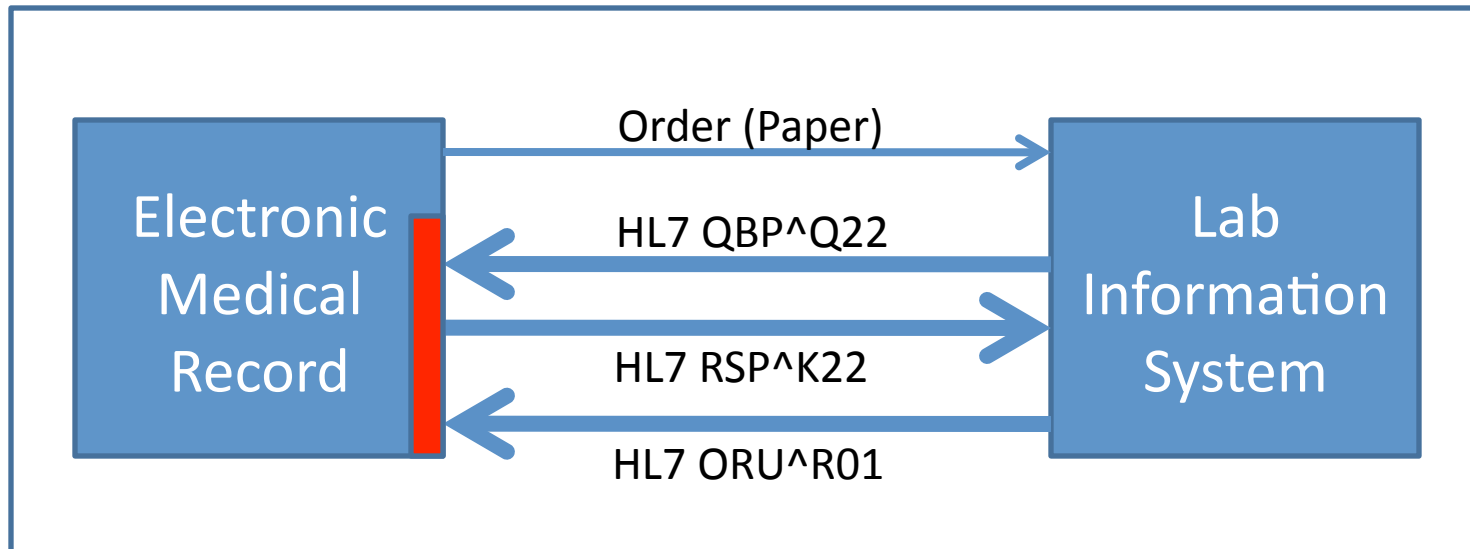
#1 OpenELIS <---> iSante

- Haiti (67+ sites) – OpenELIS in 10 labs
- Patient ID profile used by Lab, Pharm, Transfer...

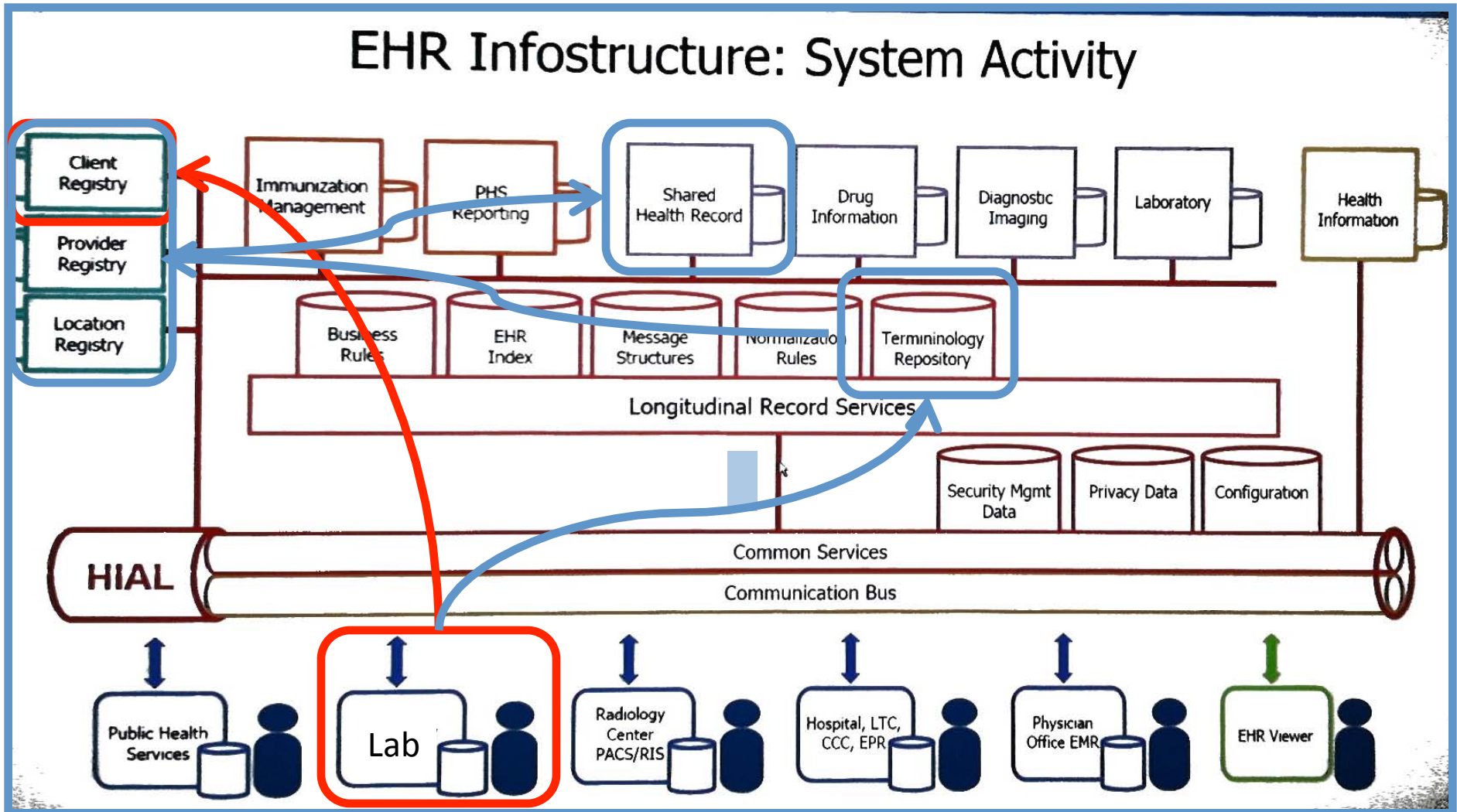


#2 OpenELIS <---> OpenMRS

- Module for OpenMRS to implement profile
- Google Summer of Code...



#3 OpenELIS <---> Health Infoway



Important because...

- Light(er) weight, simpler set of transactions
- The profile describes information interactions in three settings
- Generalizable Patterns... (Pharm, Rads...?)
- (socio-technical) Research Questions
 - Does it work in a wider set of implementations?
 - Does it help other developers?
 - Does it aid in understanding the information exchange?
In clarifying business rules?



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Wiki pages

Welcome to iSanté

iSanté is an electronic medical record (EMR) that supports both individual and population health care of patients in Haiti. The EMR is currently actively implemented in **67 sites** and tracks over **50,000 patients**.



Source: Our EMR Training training site staff on customer

HIV Medical Record Summary Exchange

- iSante Electronic Medical Record (Haiti)
 - >50K patients, almost all HIV+, 67+ sites
 - Open source, web based EMR
- ICAP EMR / CDC household surveillance (Kenya)
- Use Cases
 - Haiti: HIV Case Surveillance Report to MOH
 - *Haiti: EMR-EMR referral (IDRC funded)*
 - *Kenya: +EMR-household surveillance linkage*
 - *Kenya: archiving of individual level data*



HIV Medical Record Summary

- CDA-based summary exchange
 - Why not HL7 v2? Why documents?
 - CDA (PCAST: metadata-tagged, data elements)
- Case Surveillance, easier since we got to define own elements
- Other user cases:
 - Fit the WHO Min Data Set (eg. Kenya MOH 257) to an existing CDA?
 - Roll our own CDA constraints? Can we use just one?



Extreme Practicality

- Tight semantics/syntax – NIH research db's
- “new standards” – summarized data
- HL7 2 messages – Lab-EMR
- HL7 3 documents – medical record summaries



Summary

- Interoperability is good
- Interoperability can be hard
- New ideas may not fit in old standards
- HL7 v2 messages don't fix everything
- HL7 v3 documents (CDA) don't fix everything
... what does?! ...
- The details matter

