

Health Informatics in Six Places

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November 30, 2011



Where I want to end up...

- Questions about technologies, engineering, science, ideas to facilitate this work... But first
 - What is I-TECH?
 - Where do we work?
 - What do we do?
 - What do we think the problems are?
 - Information or technology



Health Information Systems Interoperability in Resource Constrained Settings

May 19th, 2011

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Biobehavioral Nursing and Health Systems (BNHS), School of Nursing
International Training and Education Center on Health (I-TECH)



CLINICAL INFORMATICS RESEARCH GROUP

UNIVERSITY of WASHINGTON

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SEARCH

Reaching across all our schools and colleges to create one of the most comprehensive academic global health programs in the world

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Global Health Lures Many

IN THE NEWS

[This Week in Global Health](#) (Latest events and news)

[Microsoft Alumna Works with UW Global Health to Bridge Faith and Science in Ethiopia](#), UW Today, November 28

[Trial for HIV Prevention Gel Halted, No Protection Shown \(Jeanne Marrazzo quoted\)](#), PBS News Hour, November 28

[Brain Drain of African Doctors Has Saved Canada \\$400-million \(Hagopian\)](#), Globe and Mail, November 25

[Bioengineering Student Cameron Turtle Working in Global Health Named Rhodes Scholar](#), UW Today, November 21

[In Ethiopia, Food Insecurity Is About More Than Just Famine](#)

MULTIMEDIA GALLERY



Every Day Leadership Series: "Un Lider Habla" (A Leader Speaks Out)

Patricia Garcia, MD, MPH, Dean,
Universidad Peruana Cayetano
Heredia School of Public Health (Lima,
Peru)

November 17, 2011

[Watch more at the Multimedia Gallery](#)

GET CONNECTED

EVENTS AND CALENDAR

2011 STD and AIDS Research Symposium

Quarraisha Abdool Karim, MD, PhD (South Africa)
Wednesday, Nov. 30, 10:00 a.m. - 5:30 p.m., Harborview
Research & Training Building (Auditorium), 300 9th Ave.

IHME Seminar: "Sustainable Parasitic Disease Control in Developing Countries"

Wednesday, Nov. 30, 4:15-5:30 p.m., Institute for Health
Metrics and Evaluation, 2301 5th Ave, Suite 600

CFAR Seminar Series: "HIV Risk in Young Women in Sub-Saharan Africa and Structural Interventions"

Thursday, Dec. 1, 4:30-5:30 p.m., Fred Hutchinson
Cancer Research Center, Pelton Auditorium, Weintraub

PROJECTS AND GLOBAL HEALTH EXPERTISE



Come explore what we are doing where!

Search by country, faculty name, health topic or
keyword. (For faster results, use Firefox).

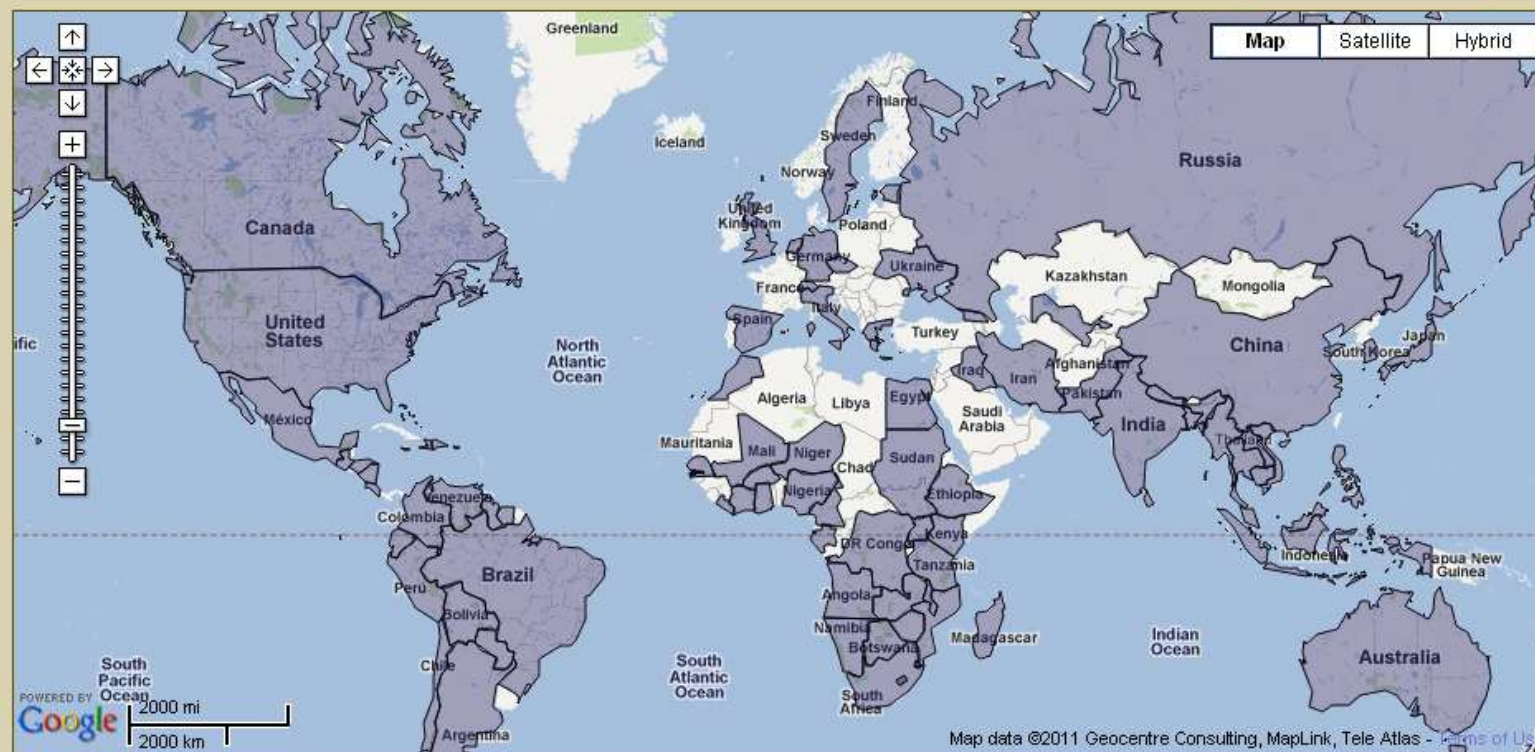
This map highlights the faculty, projects, expertise, and international affiliations in the growing Department of Global Health. We will also be expanding this map to all global health projects across campus. You can search by category or through keywords. We hope this map will facilitate communication and collaboration among those interested in global health. We welcome your feedback at bnodell@uw.edu.

SEARCH MAP

BROWSE CATEGORIES

- Health Topics
- Projects
- Organizations
- Faculty
- Countries

If you are a faculty member at UW participating in a project that is not listed, please fill out our short survey (average time 15 minutes).



Click on a highlighted country to find faculty, projects and institutional agreements associated with that country. *The map is best viewed using Firefox browsers; it may render slowly on Internet Explorer.*

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New Website On Leadership

Site presents 300 video clips from global health leaders in Africa, India, Caribbean, and beyond.

Improving Access to Care in Haiti

With partners, I-TECH is beginning work on the project goals of a new five-year CDC grant.

Developing Institutional Capacity

Strong faculty prepare students to deliver high quality care.

Informatics for Health

Designing and implementing systems to manage and improve patient and laboratory data.

Scaling Up Laboratory Capacity

Effective laboratory systems are a cornerstone of diagnosing and treating infectious disease.

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I-TECH OFFERS GLOBAL HEALTH RESOURCES ON MULTIPLE WEBSITES

With more than half a dozen separate websites online, each serving a different purpose and audience, I-TECH offer a wide variety of online resources. This overview of I-TECH's many websites

[managers](#)

ABOUT I-TECH

The International Training & Education Center for Health is a global network that supports the development of a skilled health work force and

WORLD AIDS DAY: TWO PERSONAL STORIES OF LEADERSHIP

Victor Lakay of South Africa and Vencentius Swartbooi of Namibia are two HIV-positive leaders who shared their inspiring

[HOME](#)[NEWS](#)[WHO WE ARE](#)[WHAT WE DO](#)[WHERE WE WORK](#)[RESOURCES](#)[Angola](#) Contains information on I-TECH country projects.[Botswana](#)[Caribbean](#)[China](#)[Côte d'Ivoire](#)[Ethiopia](#)[Guyana](#)[Haiti](#)[India](#)[Kenya](#)[Malawi](#)[Mozambique](#)[Namibia](#)[South Africa](#)[Tanzania](#)[Uganda](#)

Website On Leadership

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Moving Access to Care in Haiti

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and Evaluation](#)[Prevention, Care,
and Treatment of
Infectious Diseases](#)

DOWNLOADS

[Capacity Statement:
Systems
Strengthening in
Health Care,
Training, and
Education \(PDF\)](#)

INFORMATICS PROGRAM

I-TECH's Informatics Team lies within the Health Systems Strengthening division. The team, directed by Dr. Bill Lober, has significant capacity in the rapidly expanding field of health informatics for resource-limited clinical settings. I-TECH develops and deploys systems and provides technical assistance and training on electronic medical records, laboratory information management, disease surveillance, national eHealth architecture design, national standards for data transfer and system interoperability, and data use for improved clinical service delivery.

HAITI

Since 2005, I-TECH has led the development and nationwide implementation of the iSanté HIV electronic medical record for Haiti, which is now used at over 60 sites in the country and captures data on more than 50,000 patients. iSanté is expanding to capture women's health and primary care data, and I-TECH is collaborating with Partners in Health, MSPP and CDC on the use of mobile devices to interact with patient records, and on the development of national data standards to support system interoperability. I-TECH is working with the National Public Health Reference Laboratory in Haiti (LNSP) to adapt the OpenELIS open-source laboratory information system for use at LNSP and clinical laboratories around the country.



CÔTE D'IVOIRE

In Cote d'Ivoire, I-TECH is building on experience in Haiti to develop additional adapted versions of OpenELIS for use at three central reference laboratories: the National Public Health Laboratory; the Pasteur Institute (IPCI), acting as the national reference laboratory for TB; and Retro-CI, a US Centers for Disease Control and Prevention (CDC) laboratory in Abidjan. I-TECH is also providing technical assistance to formulate national standards that address indicators, data sources, data management, data quality, confidentiality, dissemination and use. Future system design work to support clinical laboratory applications of OpenELIS would be based upon these national

Global Health: Our work in resource poor settings

□ Haiti, Cote d'Ivoire, Kenya, Mozambique, Namibia, Vietnam





Who We Are

Mission: Application of information and computer science strategies and technologies to improve individual and population health in the domestic and global health context.

- *Applied informatics*
- *TA (Technical Assistance) on architecture and design*
- *Research & Evaluation*



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UNIVERSITY of WASHINGTON

I-TECH INFORMATICS (UW TOWER, NJB)



How do we do it?

I-TECH's informatics activities in a country typically include one or more of:

- National eHealth architecture and use-case/standards identification
- Facility level implementation of open source health information systems
- Informatics capacity development



What's the problem?

- What do we start w/?
- What actually happens?



Common Facility-level Information Architecture

- Paper forms everywhere for collecting data... by donors, ministries
- Paper registrations for logging data that is collected
 - Multiple pages, add-ons taped in, slips of paper, etc.
- All copied by hand to produce reports for donors, ministries, etc.

The image shows two open paper forms. The left form is titled 'Fiche de suivi des Personnes Vivant avec le VIH' (HIV Follow-up Form) and contains various fields for patient information, including name, date of birth, and clinical history. The right form is titled 'Fiche de prélèvement au Suivi' (Follow-up Sampling Form) and contains fields for laboratory test results, including CD4 count and viral load. Both forms are filled with handwritten data and have checkboxes for various clinical indicators.



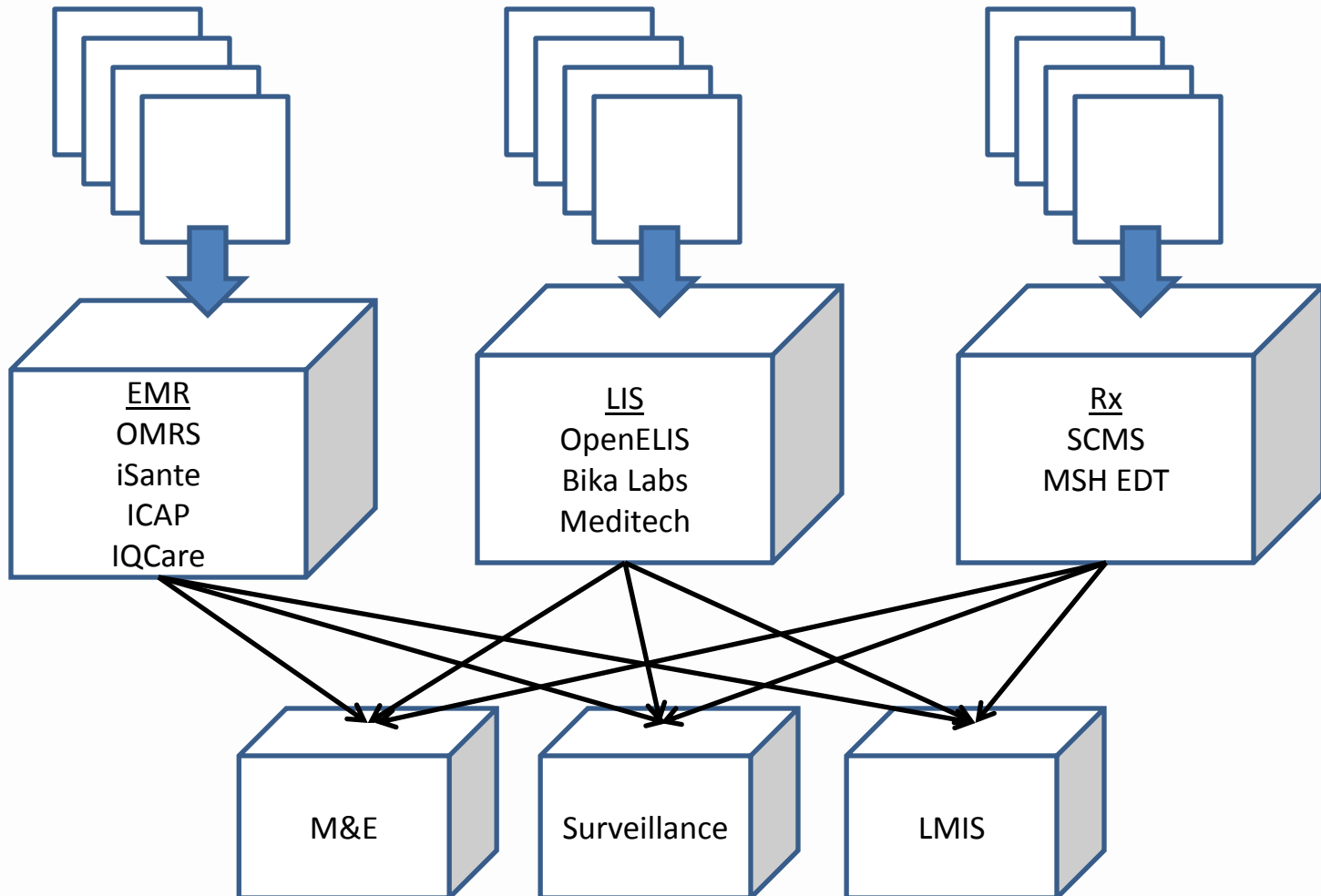
Efforts to computerize processes and information

- Lots of systems (some O/S listed below)
 - OpenMRS, iSante, IQCare (EMR)
 - OpenELIS, Bika, BLIS (Lab)
 - --- (Pharmacy)
 - OpenLMIS, OpenBoxes (Logistics)
 - DHIS2 (Monitoring & Evaluation)
 - iHRIS, TrainSmart (human resource, training)
 - Mirth (interface engine)
 - ODK (Android forms/data)
 - Mobile platforms (several others...)



Systems

- ❑ Development of health systems at the facility-level...dozens of different ones by different groups using different technologies



The Problem

- Lots of systems
- Hard to deploy
- Difficult circumstances
 - Power, connectivity, security
- Hybrid of paper, computerized systems
- Little data exchange between systems
- Seldom a “master plan”, ? drivers



Solutions

- Create a master plan...
 - Interoperability (value)
 - Deployment/maintenance strategies
 - Capacity Development



Interoperability

- What? Why?
 - Value proposition
- How?
 - Use existing strategies, standards
 - Tailor for resource poor settings
 - Develop an architecture



To implement an eHealth architecture

...

- ❑ You need scalable, repeatable, interoperability
 - All components have to be well described, in functional requirements
 - The business processes that require data interactions should be well described in use cases
 - The standards used to support those data interactions, and *the specific ways* those standards are to be used, should be integrated with the use cases as interoperability profiles.
 - Those profiles help expose design patterns in the architecture.





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IHE Technical Frameworks

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

5 Types of Interoperability*

□ Priority areas for achieving interoperability

- Unique person identifier
- Meaning (semantics)
- Structure/format (syntax)
- Core data sets
- Data quality and use

*Hammond WE, Bailey C, Boucher P, Spohr M, Whitaker P. Connecting Information To Improve Health. Health Affairs. 2010;29(2):284 -288.



Interoperability Profile

- Borrowed from IHE framework (www.ihe.net)
 - Commercial participants, comprehensive
 - Complex, cost of standards compliance
- These **resource constrained** facility level profiles are **simpler**, and contain...
 - **(Fewer)** Actors, whose actions are described in
 - **(Fewer)** Use cases, which are implemented using
 - **(Simpler)** Transactions, which are based on
 - **(constrained)** standards



CLINIC

1. Patient visits provider
2. Provider determines appropriate laboratory tests



3. Clinic staff places order for laboratory tests

8. Results received



4. Order is transported to laboratory

LABORATORY

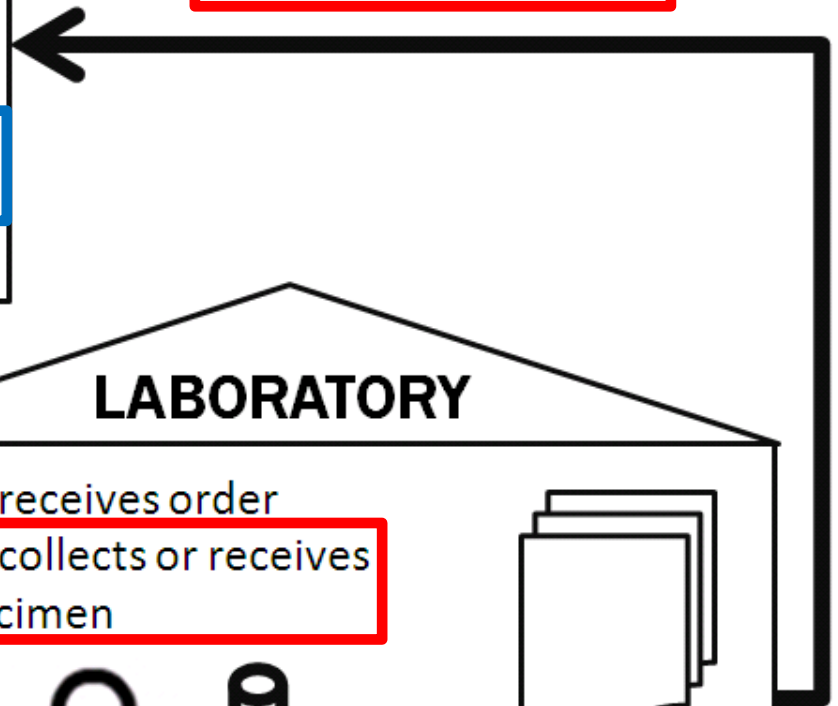
5. Staff receives order
6. Staff collects or receives specimen



5. Staff fills order

6. Results produced

7. Results sent to clinic

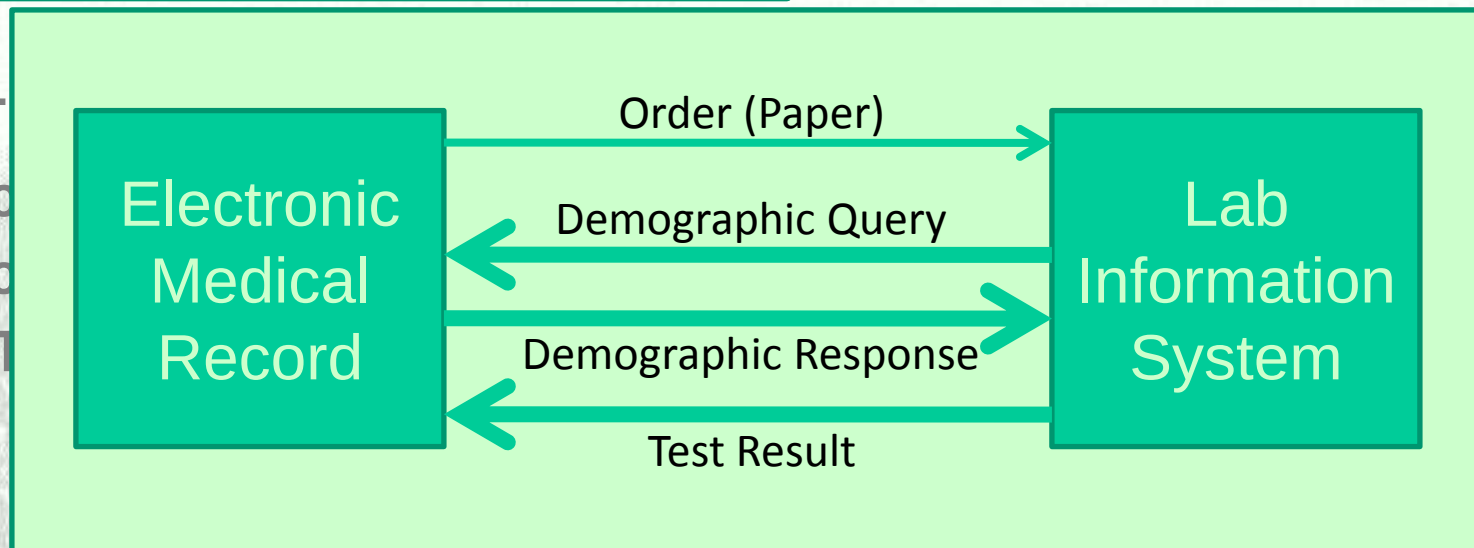


Lab Profile – Simplified Use Cases (in 3 implementation phases)

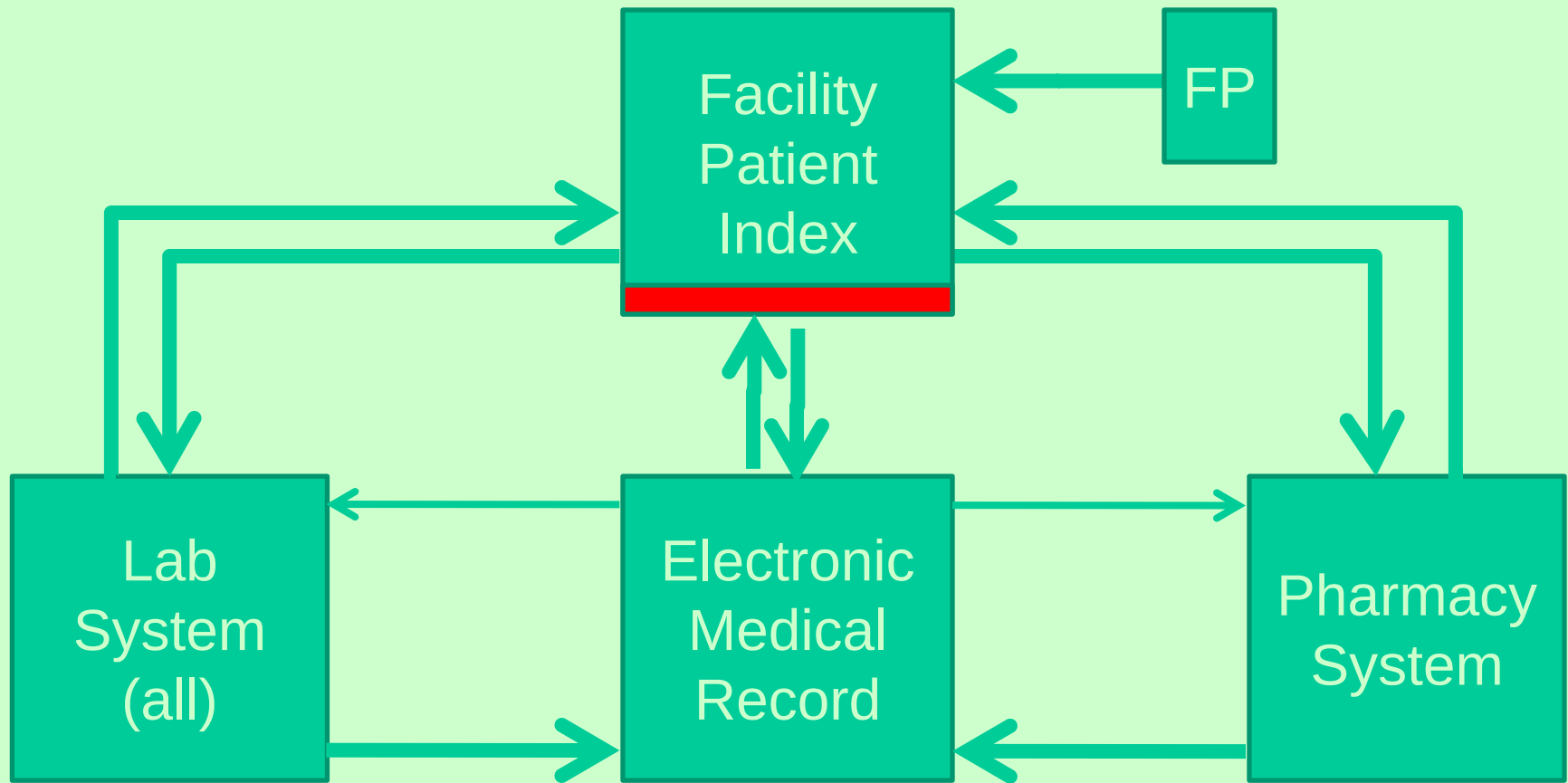
- *Order Transmission on Paper*
- Identification of Patient in EMR

- *Order Transmission on Paper*
- Identification of Patient in EMR
- Computerized Result Transmission

- Order T
- Identific
- Identific
- Result T



Facility level information flow



Transaction Set

❑ Identification of Patient in EMR

- IHE Patient Demographic Query (PDQ) Profile (ITI-21 transaction)
 - HL7 QBP^Q22 message for Query
 - HL7 RSP^K22 message for Result

❑ Result Transmission

- IHE Lab Testing Workflow (LTW) Profile (LAB-3 transaction)
 - Filler Order created by the laboratory (w/o notification)
 - HL7 ORU^R01 message for Result
(matched on Patient ID, not order number)
 - Elincs for semantic constraints (coding schemes, required elements)



4 examples

- ❑ OpenELIS <---> iSante
- ❑ OpenELIS <---> OpenMRS
- ❑ Extension of DQ to support Facility Patient Index for common Identity Mgt./Verification
- ❑ *OpenELIS <---> Health Infoway*



A Lab-EMR Interoperability Profile as an eHealth Architecture Component for Resource-Constrained Settings

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Abstract

Implementation of computerized systems in resource-constrained settings have been gaining traction as a means of improving the delivery of health care, the use and reuse of information, and providing a standards-based capacity for assessing the process and impact of health care. In a resource-constrained environment, systems are often implemented as stand-alone entities focused on specific care activities (for example, delivering antiretroviral therapy). As such, in many countries, taking a generalized approach to linking electronic medical record systems with laboratory information systems (EMR-LIS) is an important area in which to achieve interoperability. In this paper we describe a scenario of use and information interaction interoperability profile based on

This paper proposes the use of interoperability profiles as one component of an eHealth architecture framework that integrates laboratory information systems (LIS) and electronic medical records (EMR) in resource-constrained environments. The goal of this interoperability profile is to enable point-to-point healthcare information exchanges between these two primary and heterogeneous health information systems.

Following background information regarding health architectures and the accepted protocols for creating and elaborating the components and steps of an information interaction profile, we describe a scenario of use and interoperability profile that enables LIS-EMR integration appropriate to the constraints of resource-constrained settings.

Background

Deployment/Maintenance

- Why?
 - Value proposition

- How?

VMs

- Isolate system, simplify configuration

-> Appliances

- Simplify admin

-> ?

- Self discovery? Updates? Remote admin/monitoring?



Capacity Development

- Local Development
 - Kenya, Vietnam
- Local Deployment
 - Cote d'Ivoire, Haiti, Namibia,
- Training
 - Kenya, Haiti
- Mentoring
 - Haiti, Kenya, Cote d'Ivoire



Ideas for Capacity Development

- Model after the Rwanda training program (structured mentoring)
- Distance learning, particularly asynchronous DL
- Sharpening distance mentoring
 - Haiti and Kenya formulas



So...

- There are problems
- We get to try and solve them
- Some of it is publishable
- Some of it helps people



Questions

- How to package and deploy to remote places w/ power, connectivity issues? Is it as simple as “use mobile technologies”?
- How do we create and disseminate an information centric “master plan”?
- What part of this is science, and what part is engineering?
- What (else) should we publish (system descriptions, evaluations)?
- Anyone interested in helping...?!

