

# A News Flash: Informatics Competencies Not Detected in Meaningful Use and Data Exchange Laboratory Staff Capabilities

*The challenges for a laboratory to build the informatics competencies needed to meet today's technology requirements starts with understanding what skills are really needed. This session provides a baseline of Laboratory Informatics Competencies and then a focus on which ones are needed to meet the challenges around Meaningful Use and Data Exchange.*

# Tasks and Techniques, Expectations/Reality

## Medical Clinic – Expectation



However, Realities are often.....

- School building “repurposed” for a day



# In Fact - Realities are often .....

- A Clinic Day in Ecuador.....



# Much Different than expected

- Active Volcano



# Expectations must often be translated

- English to ???????



# More Translation

- English to Spanish to Quechua



# Informatics Competencies

- What does all this have to do with Informatics Competencies?
  - Multiple projects
  - Multiple Message Formats
  - Multiple Technologies
  - Multiple “languages”
  - Multiple Tool Sets
  - Navigating multiple departments and in some cases agencies
  - Etc.



# New Skills and Coordination

- Complex project management
- Vocabulary Specialists
- Integration Specialists
- Technical Architects and Developers

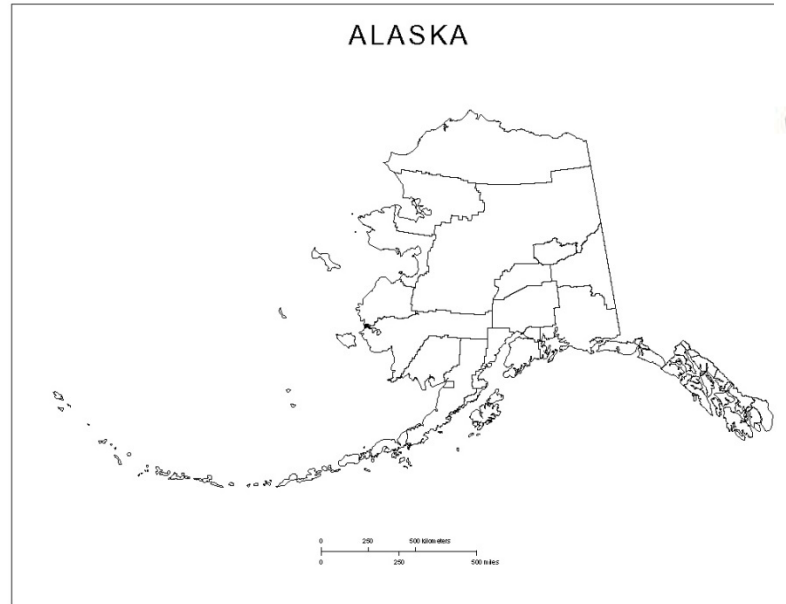
# News Flash: Data Exchange

Bernd Jilly, Ph.D., MT(ASCP), HCLD(ABB)CC  
Laboratory Director

Alaska State Public Health Laboratory

Division of Public Health  
Department of Health and Social Services  
State Of Alaska



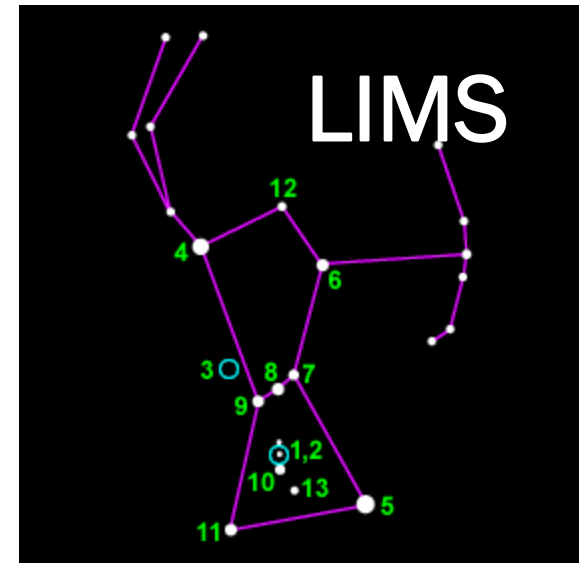
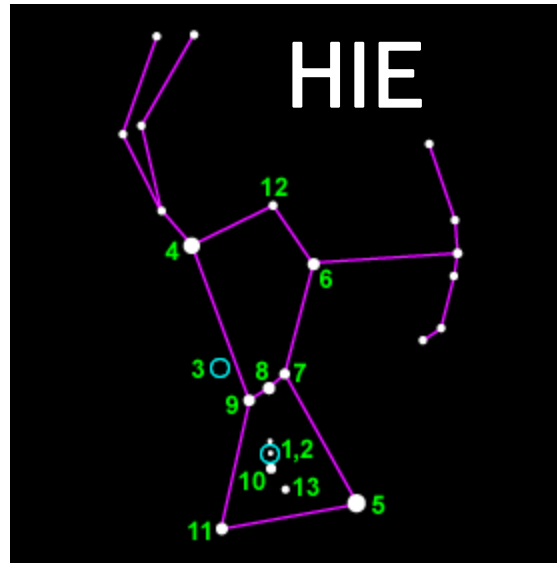


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# AK Foray Into HIE (Vision)



HC Provider



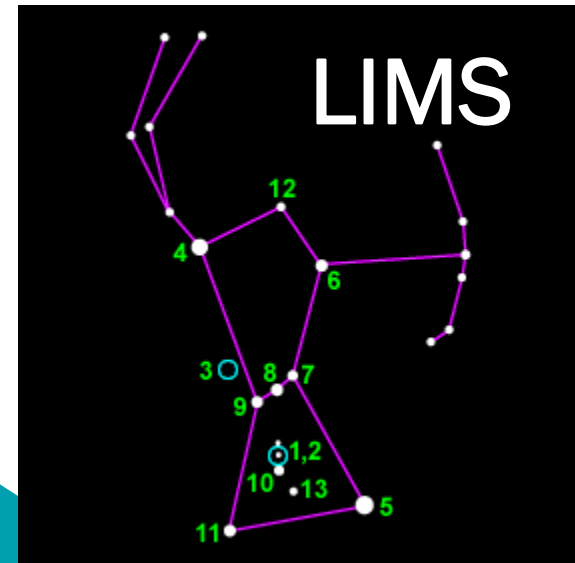
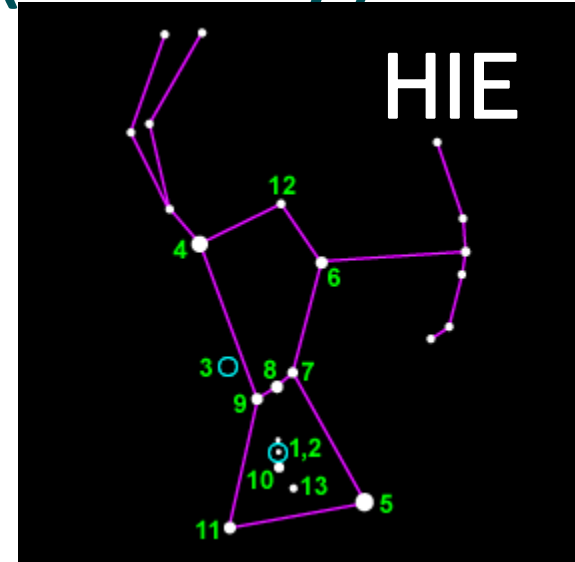
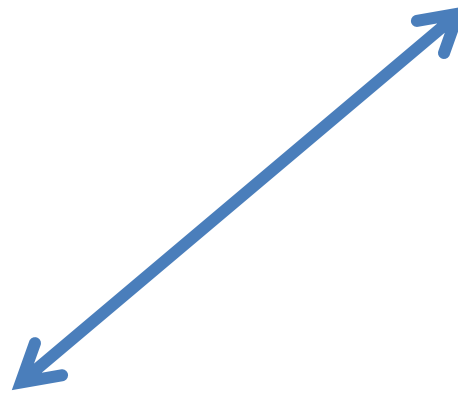
# AK Foray Into HIE (Reality)



HC Provider



BizTalk



# AK HIE Participants

- HIE Provider
  - Orion Health (Rhapsody)
- Lab
  - Alaska State Public Health Laboratory (Chemware LIMS, Orion Rhapsody); 2 locations, ANC & FAI, ~175K tests/yr
  - ITS (BizTalk); ETS (Enterprise)
- Healthcare Provider
  - Anchorage Neighborhood Health Clinic, ~17K tests/yr
  - LaTouche Pediatrics, ~100 tests/yr

# CLIA Report Requirements (42 CFR 493.1291)

- Positive pt ID (2 identifiers)
- Name & address of lab
- Test report date
- Test performed
- Specimen source
- Test results (& units if applicable)
- Specimen condition (if applicable)
- Reference or normal range (if applicable)
- Method

# What We Sent

Alaska State Public Health Laboratory  
CLIA 02D0674496  
5455 Dr. Martin Luther King Jr. Ave.  
Anchorage, AK 99507-2107  
Phone (907)334-2100  
Fax (907)334-2161

**Report To** Jon Lyon, MD  
3340 Providence Dr Bldg A #452  
Anchorage, AK 99508

## Patient Information

<b>Name</b>	Test, Redsox 123 Test Drive Anchorage, AK 99508	<b>Date of Birth</b>	1/1/2002
		<b>Gender</b>	Female
		<b>Race</b>	Unknown
		<b>Patient ID</b>	A500116568

**County of Residence** Anchorage

## Sample Information

<b>Sample ID</b>	N/A	<b>Date Collected</b>	4/4/2013
<b>Lab ID</b>	1311300001	<b>Date Received</b>	4/23/2013 09:34 AM
<b>Chain of Custody</b>		<b>Date Reported</b>	4/23/2013 09:41 AM
<b>Specimen Source</b>	Nasopharyngeal Swab	<b>Description</b>	

### Comments

Bordetella PCR and culture testing must be correlated with patient history to confirm as a case of pertussis infection. The BpIS481 PCR detects the presence of a specific DNA sequence present in Bordetella pertussis. This sequence is also present in Bordetella holmesii, an uncommon respiratory pathogen of humans. The BpplS1001 PCR detects the presence of a specific DNA sequence present in Bordetella parapertussis. This test was developed and its performance characteristics determined by ASPHL. It has not been cleared or approved by the US Food and Drug Administration.

Test/Observation	Result	Method
Bordetella PCR		
B. pertussis (IS481 DNA)	NEGATIVE	PCR
B. parapertussis(BpplS1001DNA)	POSITIVE	PCR



# What We Got Back (1<sup>st</sup> Try)

ORION<sup>®</sup>  
HEALTH

## LABORATORY REPORT

### Patient Information:

**First Name:** Redsox  
**Last Name:** Test  
**Gender:** F  
**Date of Birth:** 1-1-2002  
**Medical Record Number:** 1234

### Order Information:

**Date Performed:** 4-4-2013 0:0  
**Ordering Provider:** J Lyon  
**Order Number:** A500116568  
**Source System:** 21684011142224114410  
**Status:** F

### Result Name:

Result Name	Result Value	Reference Range	Abnormal Flag
	POSITIVE		
	NEGATIVE		
	NEGATIVE		

Note: The data in this report was automatically generated from an HL7 message

# What We Got Back (Current)

Alaska State Public Health Laboratory  
CLIA 02D0674496  
5455 Dr. Martin Luther King Jr. Ave.  
Anchorage, AK 99507-2107  
Phone (907)334-2100  
Fax (907)334-2161

## LABORATORY REPORT

### Patient Information:

**First Name:** Redsox  
**Last Name:** Test  
**Gender:** F  
**Date of Birth:** 1-1-2002  
**Medical Record Number:** N/A

### Order Information:

**Date Performed:** 4-4-2013  
**Ordering Provider:** J Lyon  
**Order Number:** A500116568  
**Source System:** 21684011142224114410  
**Status:** F

**Result Name:** B pertuss DNA Panel

Result Name	Result Value	Reference Range	Abnormal Flag	Method
Bordetella pertussis	NEGATIVE	Not Provided	Not Provided	PCR
B parapertussis	POSITIVE	Not Provided	Not Provided	PCR

Note: The data in this report was automatically generated from an HL7 message



# Lessons Learned

- Need bi-directional “Geek Speak”
- Need MOU’s and SLA’s
- Current HIE paradigm is hospital-centric
- PHL: square peg in round hole
- MVP: Laboratory Informatician
- All laboratorians need certain level of informatics competencies
- KISS



# A Horse of a Different Color: Incorporating HL7 Into LRN Data Exchange

**Jennifer McGehee, MS, MA**

Public Health Surveillance and Informatics Program  
Office

Office of Surveillance, Epidemiology and Laboratory  
Services

Centers for Disease Control and Prevention



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**A horse of a different color:  
incorporating HL7 into LRN data  
exchange**



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# The LRN in a Nutshell

- Laboratory Response Network (LRN) 160+ laboratories worldwide encompassing a coordinated network of state and local public health, federal, military, veterinary, agriculture, and international laboratories
- Equipped to respond to bioterrorism, chemical terrorism, emerging infectious diseases, and other public health threats and emergencies

# LRN Data Exchange in a Nutshell

Two approaches:

## **1. Custom software: LRN Results Messenger**

- Immediately fulfill the data exchange needs of the LRN by providing the LRN labs with software –

## **2. Integrated solution: LIMS Integration (LIMSi)**

- Long-term plan of enabling LRN labs to fulfill this need with Health Level 7 (HL7) messaging from their own laboratory information management systems (LIMS)



Login Name

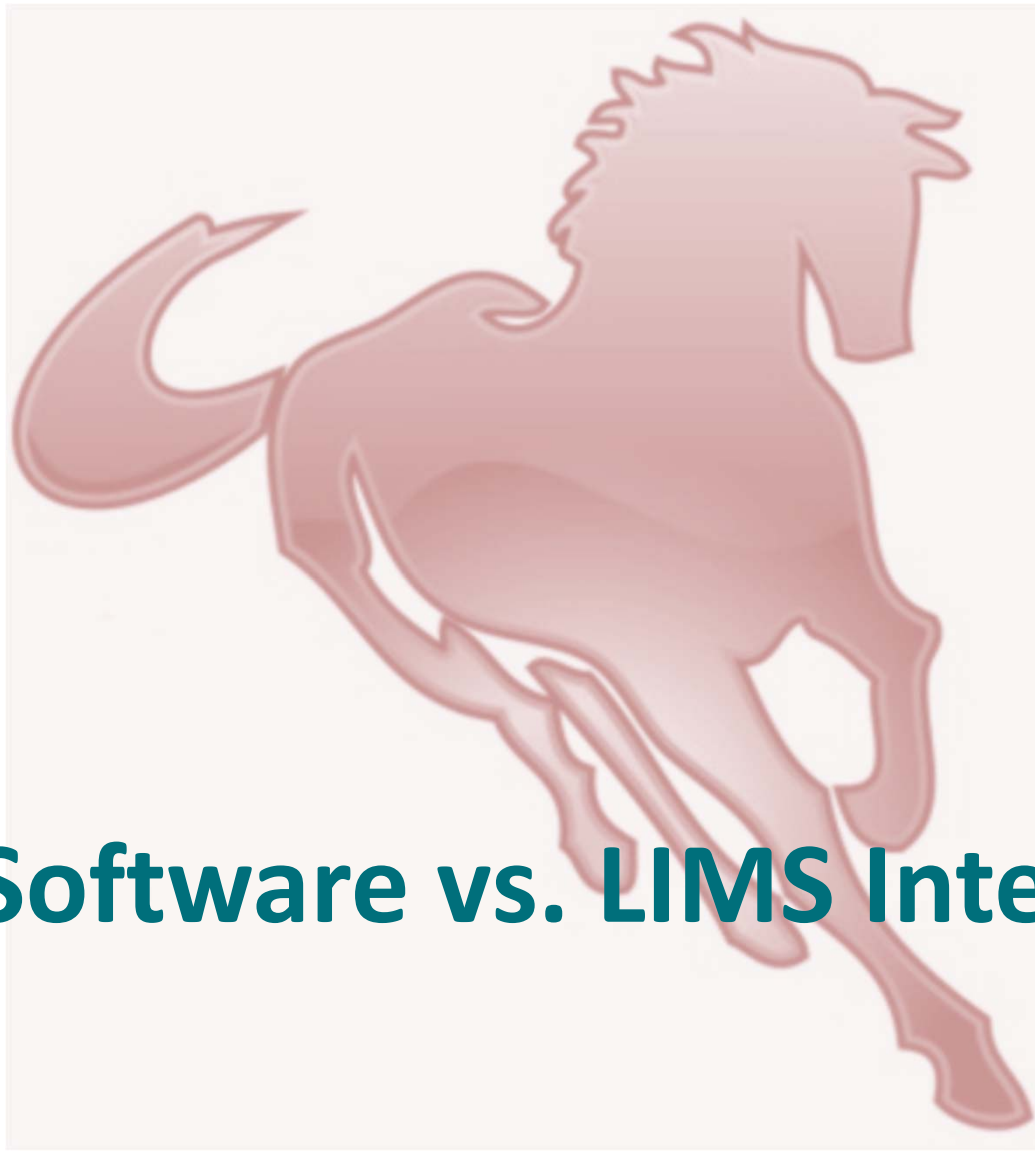
Password

Submit



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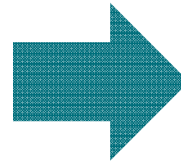


# Software vs. LIMS Integration

# Resources shift

## Results Messenger

Software developers,  
software  
development life  
cycle, “traditional” IT  
resources



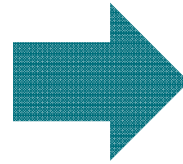
## LIMS Integration

Laboratory SMEs,  
vocabulary  
experts, integration  
specialists,  
manage funding

# Scope of control

## Results Messenger

Tightly controlled,  
changes relatively  
manageable and  
straightforward,  
relatively low  
maintenance



## LIMS Integration

Potentially 50+  
environments, varying  
data can be submitted,  
change management  
challenges, ongoing  
maintenance

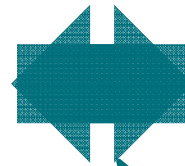
# Handling new requirements

## Results Messenger

Can accommodate  
almost any type of  
requirement

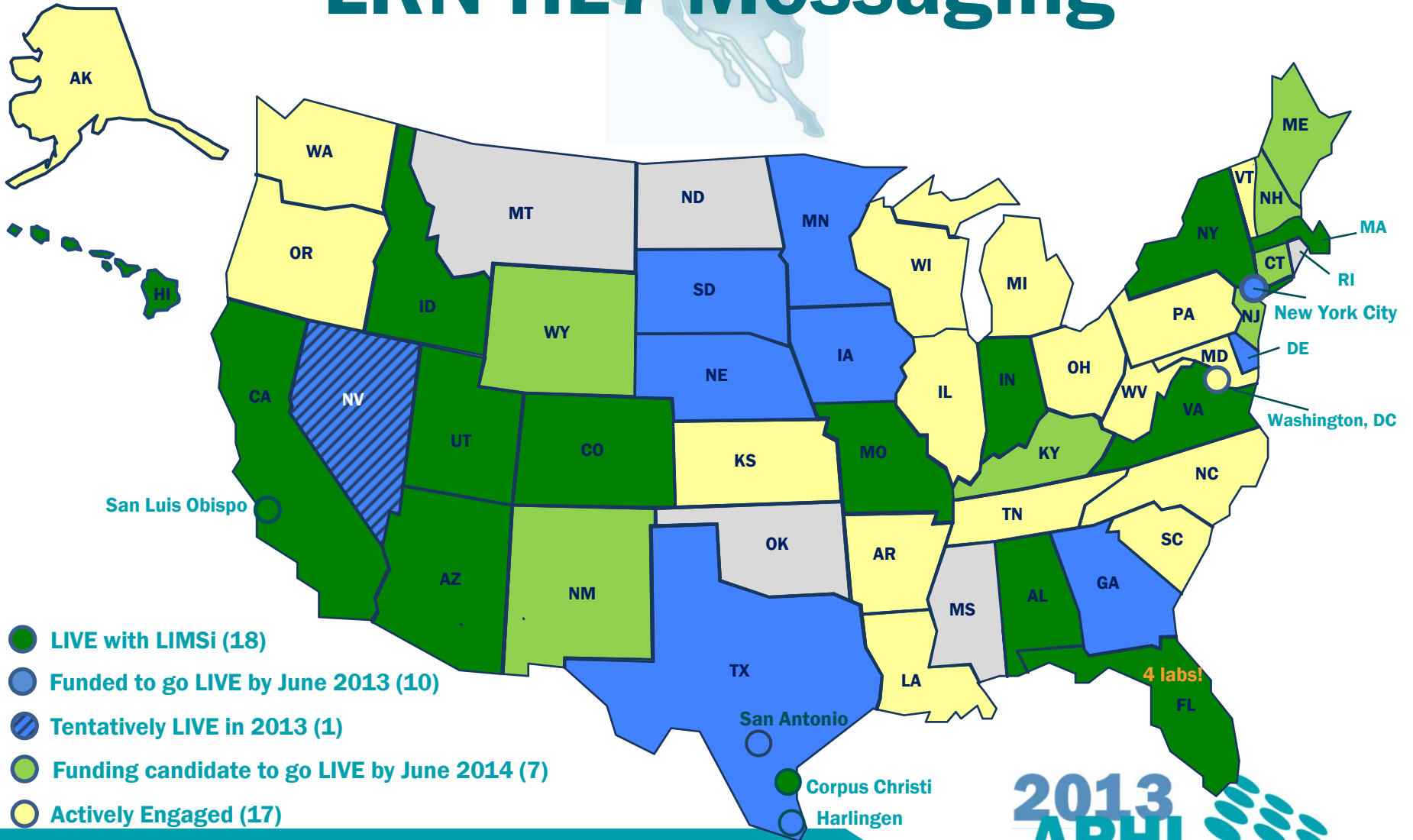
## LIMS Integration

HL7 and vocabulary  
capacity to handle  
changes must be  
considered first,  
discussions with  
Laboratory SMEs



Integrated  
solution now  
sets the  
direction!

# LRN HL7 Messaging



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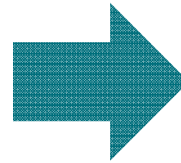
# LRN/Public health needs vs. Meaningful use

# Use-case

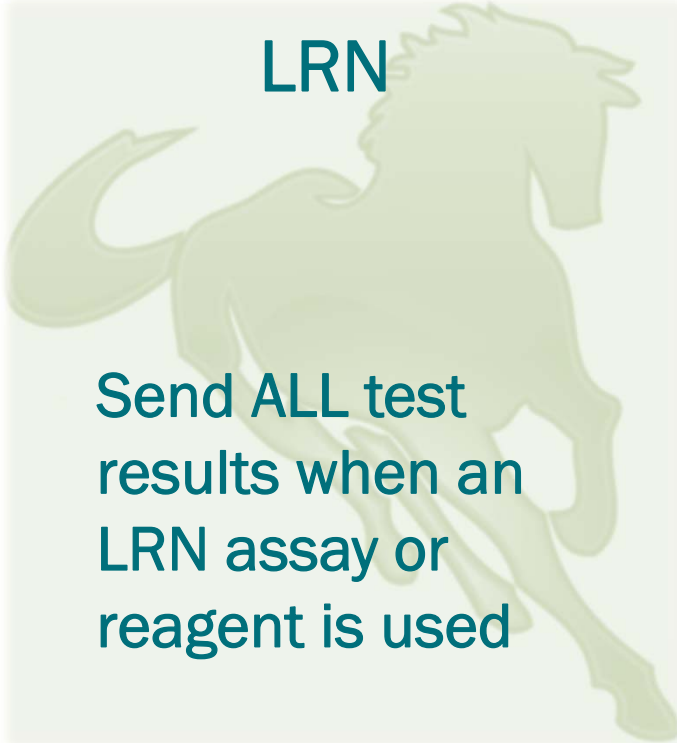
**Meaningful Use**



Primarily send positive results only



**LRN**



Send ALL test results when an LRN assay or reagent is used

# Actors

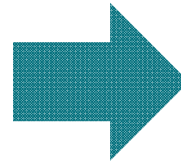




# Message Type

## Meaningful Use

HL7 2.5.1 ORU:  
Only  
accommodates  
clinical testing



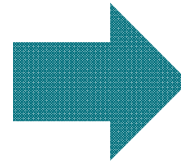
## LRN

HL7 2.5.1 OUL:  
Accommodates  
clinical,  
environmental, and  
animal sample  
types

# Terminology

## Meaningful Use

Mandated LOINC specifically, and SNOMED is mandated through the implementation profile



## LRN

LOINC, SNOMED, HL7, FIPS...

# Before I ride off into the sunset...

- LRN represents *one* public health use case – there are bound to be other “horses of a different color”
- Horses of a different color can be hitched to the same wagon and set out on the same trail
- Wrangling a horse (implementing technology) is often the easiest part – what is difficult is getting *the riders* (people) to agree to ride the same trail
- Often starts small with *two riders* agreeing to take the same trail and share the campfire

# Laura Conn's Introductory Slide

- Electronic Laboratory Reporting

# The “NEW” Breed of Interoperability – MU Compliant ELR

- Traditional interoperability trading partners
- PHL to PHA
- Contract Lab to PHA
- Various forms of ELR
  - Different for each “connection” and jurisdiction
  - No standardization
- Often standardized PHINMS Transport

# New Paradigm

- New Trading Partners
  - Health Information Exchanges (HIE's)
  - Hospitals
  - Large Commercial Labs

# New Paradigm – Continued

- New Message Formats - Standardized
  - HL7 – 2.3.1, 2.5.1, etc.
- New Vocabulary Standards
  - LOINC
  - SNOMED
- New Transport Protocols
  - SFTP
  - Web Services
  - SOAP
- New Integration Tools

# New Skills and Coordination

- Complex project management
- Vocabulary Specialists
- Integration Specialists
- Technical Architects and Developers



# Steps to Improve PHL Informatics Competencies

**John (Jack) Krueger, MS ChE**  
**Informatics Consultant, APHL**



# Outline

- 1. Why Is Informatics Competency Important?**
- 2. How to Advocate Effectively for Informatics Competency within the Local IT Infrastructure?**
- 3. What is the Maturity Level of Your Lab's Informatics Capability?**
- 4. Is your Staff Competent in Informatics?**

# Outline

## 1. Why Is Informatics Competency Important?

# Why is informatics Competency Relevant?



**Hint #1 Buried in data?**

**Hint #2 Too few resources to manage your data?**

**Hint #3 Who really manages your data in the new Era of Consolidated IT?**

**Hint #4 Trouble sending your data to your clients with multiple formats?**

**Hint #5 Does Nothing seem Standardized?**

**Hint #6 Everyone wants their data NOW?**



# Lack of Informatics Competencies Can Limit our Ability to Meet Our Partner Needs

**Our Health Partners are Moving Rapidly in the Field of Health Informatics**



## Health Informatics

# Outline

## **2. Informatics Competency within the Local IT Infrastructure. How to Advocate Effectively for?**

# What is the Working Landscape for Informatics at the Local IT Level?

## Three Models of IT Service Provision Summarize the Availability of Informatics Competency at the Local Level:

- (1) distributed, decentralized IT systems,
- (2) shared, 'hybrid,' systems and
- (3) centralized or consolidated systems



The National Association of State Chief Information Officers (NASCIO) reports that **consolidation of IT services is the number one priority for state chief information officers (CIOs) in 2011**, followed by cost control and healthcare IT solutions



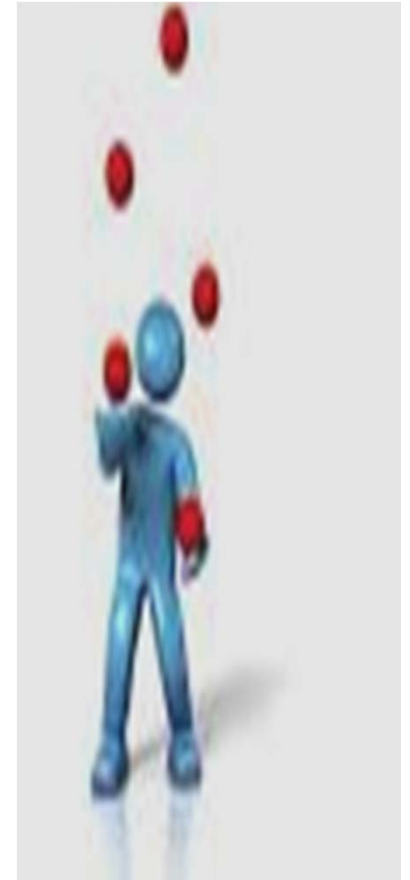


# IT Centralization May:

- **Increase efficiency in some areas**
- **Reduce costs**
- **Enable the laboratory to access equipment or services that were previously unaffordable.**

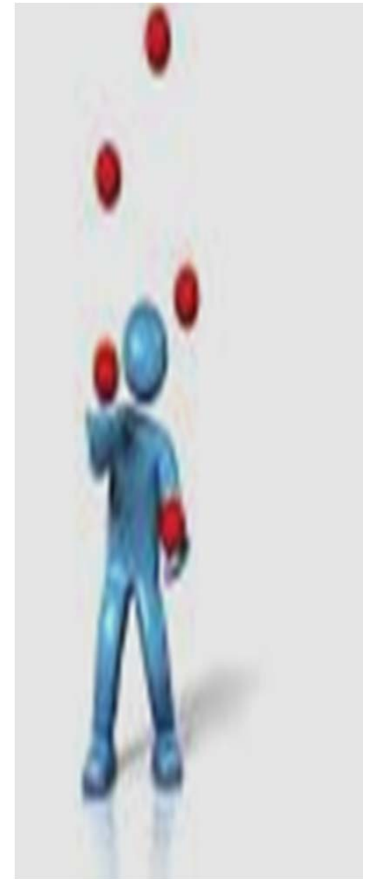
# What are Potential Risks of Centralized IT?

- **Excessive and excessively rigid bureaucracy.**
- **A lengthy decision-making process.**
- **Inadequate laboratory representation on decision-making bodies.**
- **Insufficient laboratory input into the design and management of laboratory data systems.**



# What are Potential Risks of Centralized IT (continued)?

- **High IT infrastructure and administration costs may not be recouped.**
- **Compromised ability to apply for grants if IT costs are excessively high.**
- **Shared services financial arrangements may impair the laboratory's ability to time expenditures.**



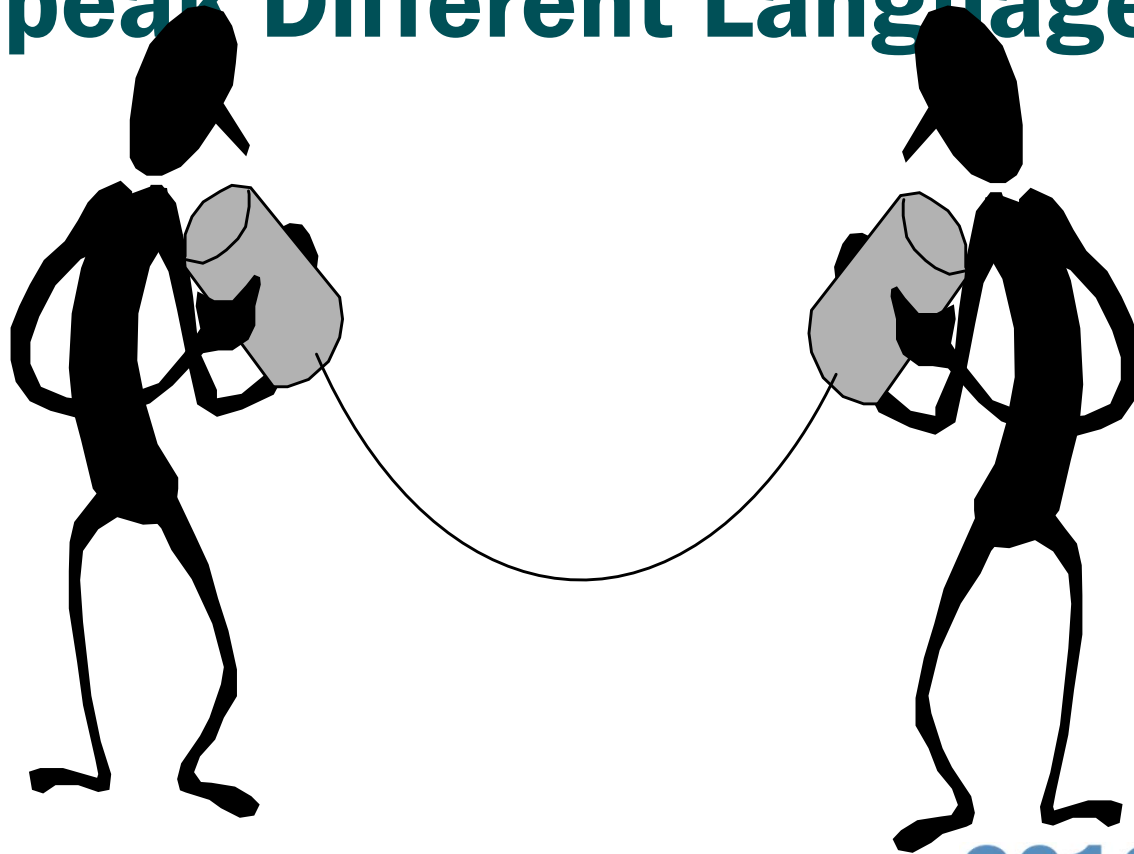
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as a  
download  
at  
APHL.ORG**

**THE BRAVE NEW WORLD  
OF CONSOLIDATED AND SHARED IT SERVICES:  
A Guide for Laboratories**



# Communication Guidance:

## CIOs and PHL Directors – Often Speak Different Languages



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This seems a bit stiff- but conventional



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This may be more like what we can expect- but it works!



# Operational Guidance:

*The totality of the IT infrastructure must be considered in any service negotiations*





# Laboratory IT is NOT JUST the LIMS

**LIMS**

**Instrument Interfaces**

**Desktops, Printers, Laptops,  
Mobile Devices**

**Authentication, Messaging Platforms**

**Web Services, Database Servers, Application  
Servers**

**Networking, Server Hardware**

# NEGOTIATION TOOLS

- **MOU-Memorandum of Understanding**
- **SLA-Service Level Agreement**



# Recommended MOU Provisions

- **LIMS is a core component of the laboratory infrastructure.**
- **The need for dedicated LIMS support**
- **24/7 on-site support**
- **Authority to manage vendors**
- **Security**
- **Partnerships with high visibility agencies.**
- **Emergency response activities.**
- **Project management at the laboratory level.**

# Outline

## **3. What is the Maturity Level of Your Lab's Informatics Capability?**

# How Mature Are Your PHL Informatics Capabilities?

The **LEI Informatics Self-Assessment (SA) Tool** can be used by laboratory professionals to :

1. Gain a comprehensive understanding of their current informatics capabilities
2. Identify any potential gaps in those capabilities
3. Prioritize the informatics capabilities that need improvement
4. Formulate a practical plan to acquire needed new capabilities, and
5. Put that plan into action



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Transforming to a Sustainable Public Health Laboratory System



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# Outline

## 4. Is your Staff Competent in Informatics?

# How Competent in Informatics is Your Laboratory Staff?

Another Recent LEI Activity:

## **The Public Health Laboratory Competencies Project**

Expands upon the APHL Workforce Development Committee (WDC) efforts with the Public Health, Environmental, and Agricultural Laboratory (PHEAL)



# In Addition: APHL's Informatics Committee Recognizes the Need for a Laboratory Informatician Classification

“The main barriers to LIMS sustainability are piecemeal funding streams and lack of in-house expertise in IT and informatics.”

Moving Toward Interoperability: Laboratory Information Management Systems and Meaningful Use of Laboratory Data, APHL Collaborative White Paper, December 2009



# Recommendations: The Laboratory Informatician

- **A new classification within the laboratory staff is an option**
- **A structured approach to upward advancement within a laboratory informatics hierarchical structure is suggested.**



# Informatics Requirements

## Functional Core Groups :

- 1. LIMS Administration**
- 2. Specific Hardware Support**
- 3. Specific Software Support Other Than LIMS**
- 4. Data Exchange**
- 5. IT Governance**

# Proposed Laboratory Informatics Classifications:

Laboratorian that performs significant Informatics functions in addition to Sample Analysis:

1. Informatics-Scientist I (<50% FTE)
2. Informatics-Scientist II (<50% FTE)

Laboratory Informatician dedicated to Informatics:

3. Informatics Specialists (>50% FTE)
4. Informatics Manager/Laboratory Informatician (>50% FTE)



# Summary-Steps to Improve Lab Informatics:

- ✓ **Work with internal IT leaders to lay out the laboratory business case and negotiate knowing IT services costs, risks and performance metrics.**
- ✓ **Document IT services agreements with a signed MOU and/or SLA .**
- ✓ **Assess the Maturity of your Informatics Capabilities-**
  - **LEI Self Assessment Tool**
- ✓ **Assess Bench Scientist Competencies**
  - **LEI Workforce Project**
- ✓ **Consider the lab-based new Classification Series**
  - **Laboratory Informatician**

# Opportunities to Optimize Informatics Efficiencies (OOIE!)

Jason Scott, BS, PMP

Informatics Consultant to CDC

J Michael Consulting



# The Dream



# The Dream... is over



# You may have pictured...



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# What PHLs can really afford...



# Our Story of Standardization

- LRN LIMS<sup>i</sup> technical requirements cover implementations “from soup to nuts”
  - Data elements
  - Test configurations
  - Standard vocabulary
  - HL7 message structure
- EVERY LRN lab does it the same way EVERY time
- **Clear opportunity for standardization**

# It all started with a seed...

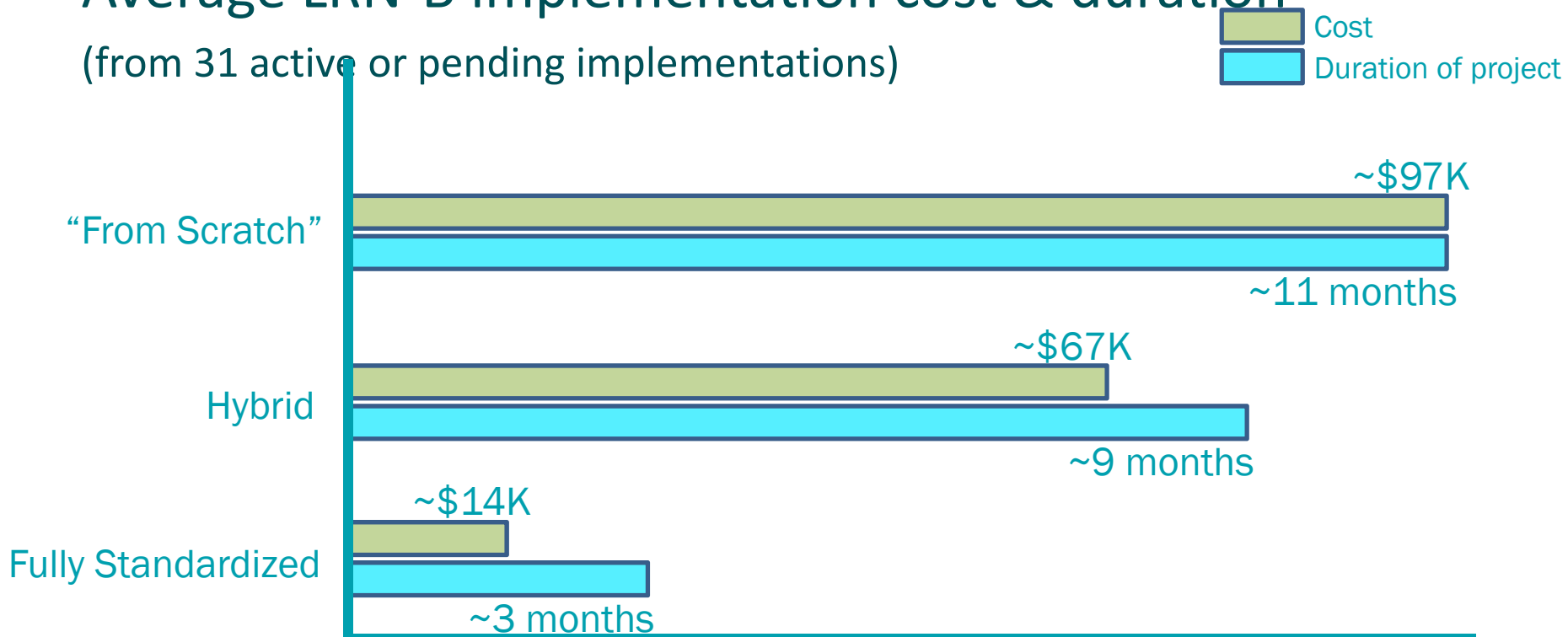
- 2012 First “standard” implementation project completed for LRN by pilot LIMS provider
- 2012 Three additional LIMS providers adopt standardized approach for LRN implementations
  - Plans in action for centralized change management at the LIMS provider level
- 2013 - 14 labs implemented or implementing standard LRN configurations
  - 23 additional candidates identified for future implementation



# Early results

## Average LRN-B implementation cost & duration

(from 31 active or pending implementations)



# Other “opportunities to optimize”



Publish standard set of fundamental LIMS requirements



Standardize laboratory protocols & practices



Build tools to enable sharing of standardized configurations



Centralize resource repository (library)

Centralize change management

# Other “opportunities to optimize”



Advocate for more re-use of message profiles



Standardize message transformation in Broker systems



Standardize message validation across various tools/platforms



Advocate for the consistent application of standards (e.g. multiple specimen value sets)



Impact jurisdictional policy change

# Keys to Success

- Champions (small waves)
- Relationships (bigger waves)
- Collaborative governance (currents)
- Unified voice (forces of nature)

# Ultimate Goal

- Consensus that leads to measurable results

“collective compromise”



# Something like this, perhaps?



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# Not a reasonable goal



# A more feasible goal



# Our Nirvana



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Also within your grasp...



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# Our destiny is in OUR hands...



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# THANK YOU!!!!



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