***Obtainable & Sustainable*:**

Open Source Solutions for the Future of Public Health

Informatics Team

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Agenda

1. Open Source v. Commercial Software
2. Legacy & Open Source Solutions for Public Health
3. Impact of Meaningful Use & HIEs in Healthcare
4. Open source: Public Health's "Game Changer"
5. Public Health Informatics Workforce
6. Questions & Answers

Open Source v. Commercial Software

- Commercial Software Business Model

  - Code developed, owned and distributed by the Company
  - Primary financial return comes upfront from the software
  - Software is only ‘licensed’, - you have No ownership of code
  - Secondary financial return comes from additional implementation services, training and software update maintenance

Open Source v. Commercial Software

Linux

- Open Source Business Model

  - Emphasis on freedom - to build, use, own, modify, and distribute
  - Most all financial returns based on charges for services, training and ongoing support
  - Source code belongs to the user – as defined in License Model
  - Open source does not mean free
  - Overall, Open Source has a lower cost of ownership

http://www.centos.org/

Open Source Possible Challenges

- May lack in-depth and complete documentation
- No inherent developer risk but lost reputation associated with releasing product that is not production ready
- No support contract and the creator has no obligation to provide any support
- Requires mature business due diligence skills
- Requires a broad and solid technical skill set
- Possible longer learning curve

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Current Public Health Legacy Systems

CDC SOLUTIONS

NEDSS

National Electronic Disease Surveillance System

CDC

BioSense 1.0

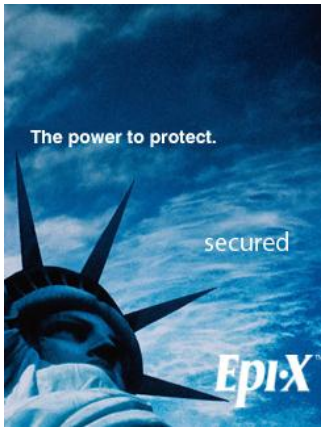
HIV/AIDS

ARIES

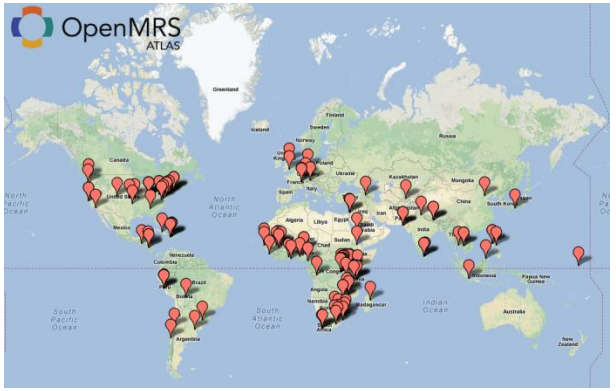
Epi·X The Epidemic Information Exchange

CDC

STD*MIS

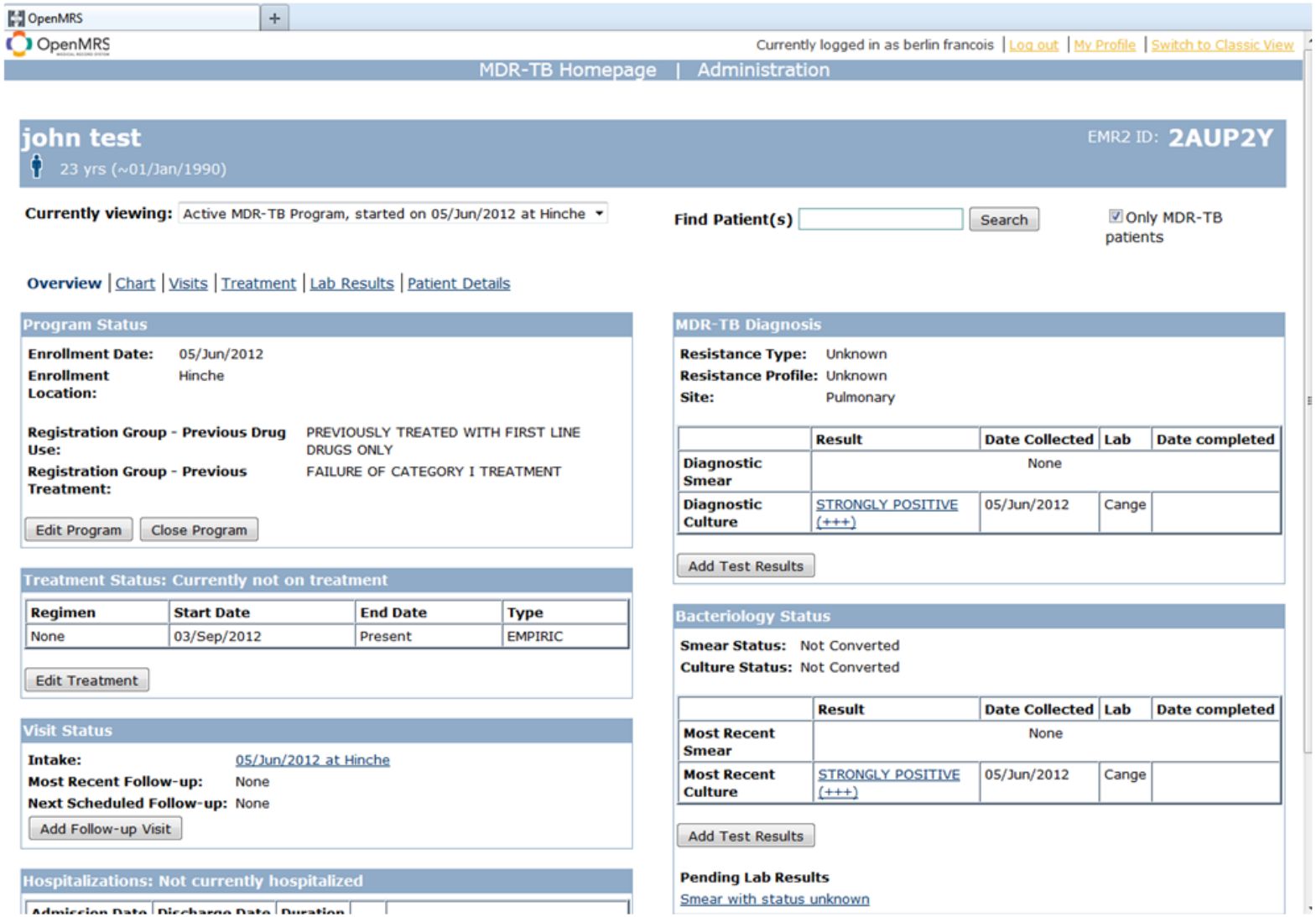


Global Public Health Open Source Forerunners



- **OpenMRS** is a multi-institution, non-profit collaborative led by:
- **Regenstrief Institute** a Indiana world-renowned leader in informatics research
- **Partners In Health Inc.** a Boston-based charitable organization focus on improving lives of the underprivileged worldwide, through health care service and advocacy.

OpenMRS Open Source System



Global Public Health Open Source Forerunners

InSTEDD
Innovative Support to Emergencies Diseases and Disasters

BABY MONITOR

Mission: improve global health, safety and sustainable development through:

- **Building Capacity** within communities to foster a local culture of innovation
- **Creating Collaboration Technologies** for social good
- **Collaborating with End Users** through a bottom up design
- **Ensuring Usefulness and Impact** through research and evaluation

http://instedd.org/

Global Public Health Open Source Forerunners

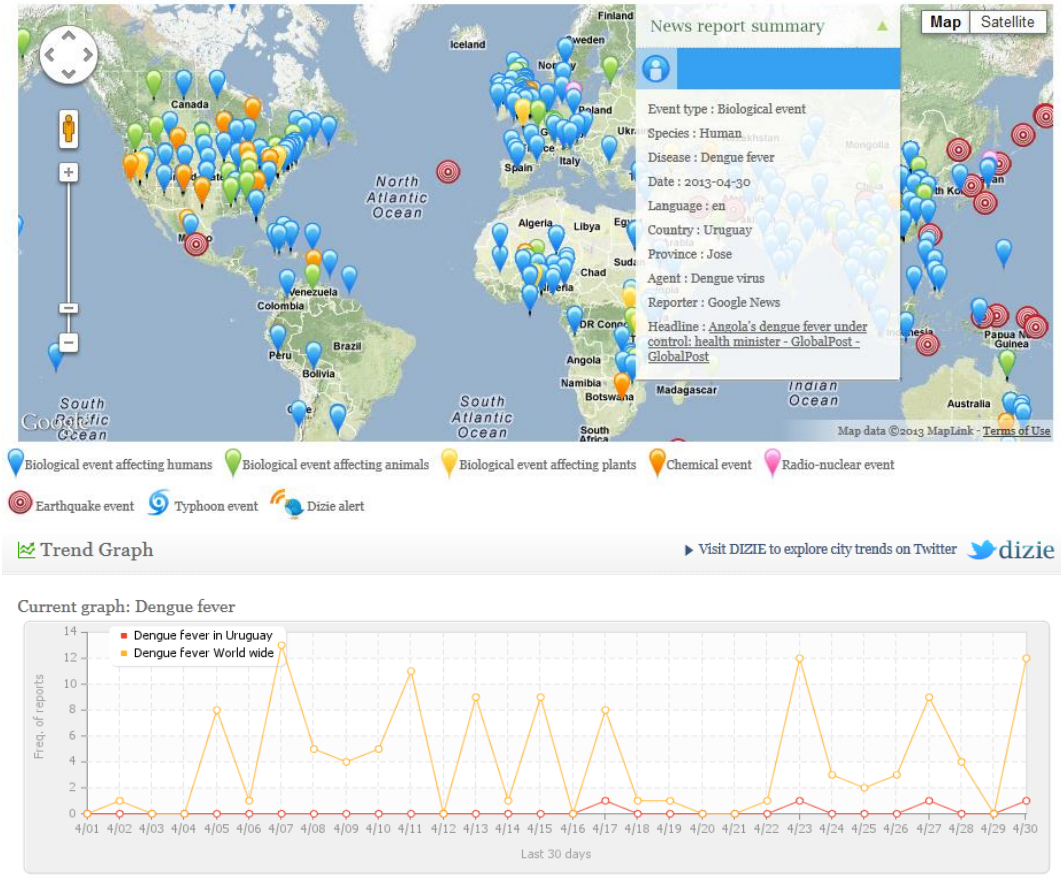
Biocaster
Global health Awareness

Developed and funded be National Institute of Informatics (NII) and the Japan Science and Technology Agency's PRESTO

Detection of early public health events

Detect and risk assess public health events in the grey literature at an early stage

Bridge the gap between the (multilingual) grey literature and existing standards in biomedicine;

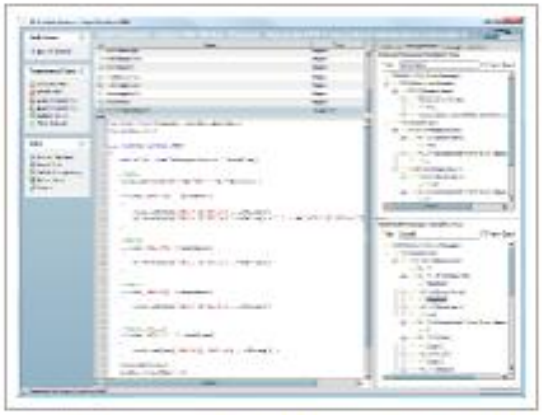


http://code.google.com/p/biocaster-ontology/downloads/list

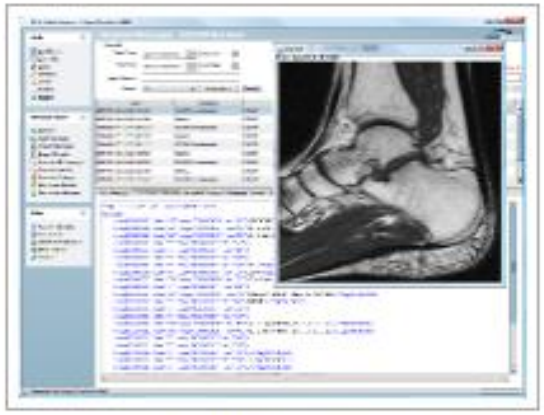
OpenEpi – Epidemiology Statistics for Public Health

Developed by Emory University, and funder be the Bill and Melinda Gates Foundation

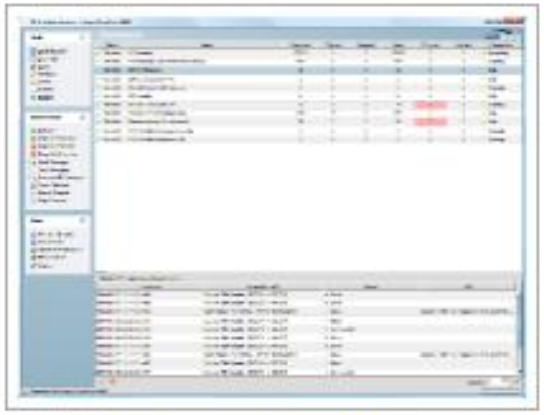
Mirth Corp HL7 Integration Engine



Develop complex interfaces with JavaScript.



View and reprocess messages.

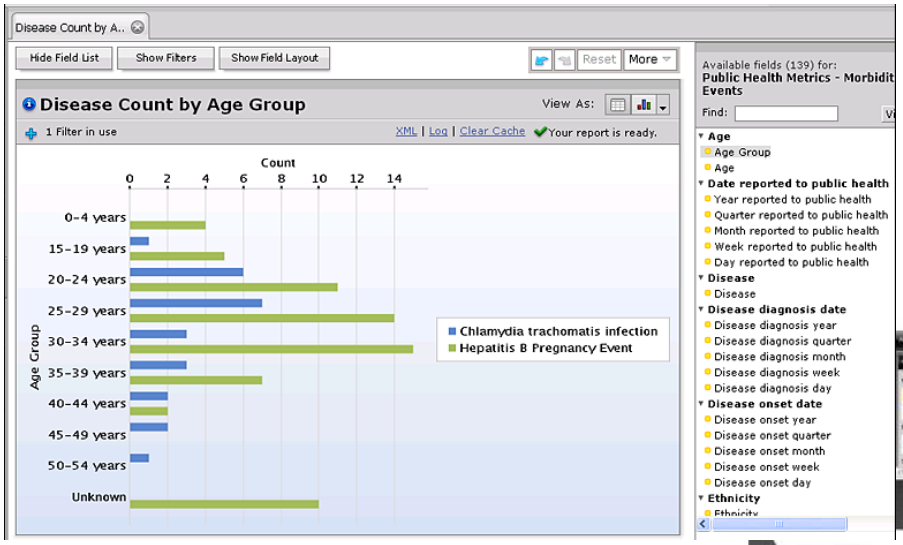


Monitor interface statistics and connections.

Case Management and BI Analytics

TriSano®
Collaborating for the Good of Global Public Health

Collaborative Software Initiative



pentaho

Used by state of Utah as a Replacement for NEDSS

Geographic Information Systems (GIS)

GeoServer

Used by:

- State of Massachusetts
- New York City IT Department
- World Bank
- National Mapping Agency of France

OpenLayers

Free Maps for the Web

Johns Hopkins University Applied Physics Laboratory

SAGES: an Open Source version of ESSENCE helps countries globally track disease

Mobile Apps - The Future

Download it free today on iOS, Android and Windows 8 tablets

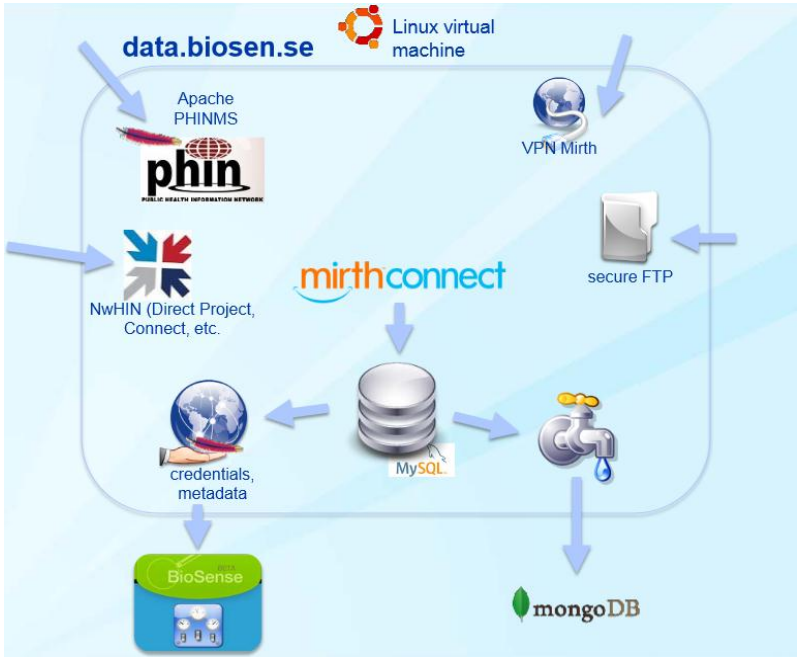
Health Information at Your Finger Tips · CDC 24/7

The CDC mobile application puts health information at your fingertips. It features important health articles, Disease of the Week, popular journals, prevention tips, and updates timed with important health concerns and events throughout the year. It also provides easy access to social media so you can share stories, links, podcasts, and videos with your friends and family. In an increasingly mobile world, you'll have 24/7 access to timely, vital health information so you can protect yourself and your loved ones.

Windows Store | Available on the App Store | ANDROID APP ON Google play

- Health Articles,
- *Vital Signs*
- *Preventing Chronic Disease and Emerging Infectious Disease (EID)* Journals
- Public Health Blogs
- Automatic Social Media and Newsroom feeds

BioSense 2.0 – Support Community



BioSense 2.0 - Leading Edge Stack

amazon

GovCloud
Scalable, Flexible, Powerful

NwHIN Direct
CONNECT

Linux OS

mirth™

php
PHP: Hypertext Preprocessor

CANONICAL
ubuntu

MySQL™ Connect

ORACLE

Java

BIG DATA

phpMyAdmin

R

mongoDB

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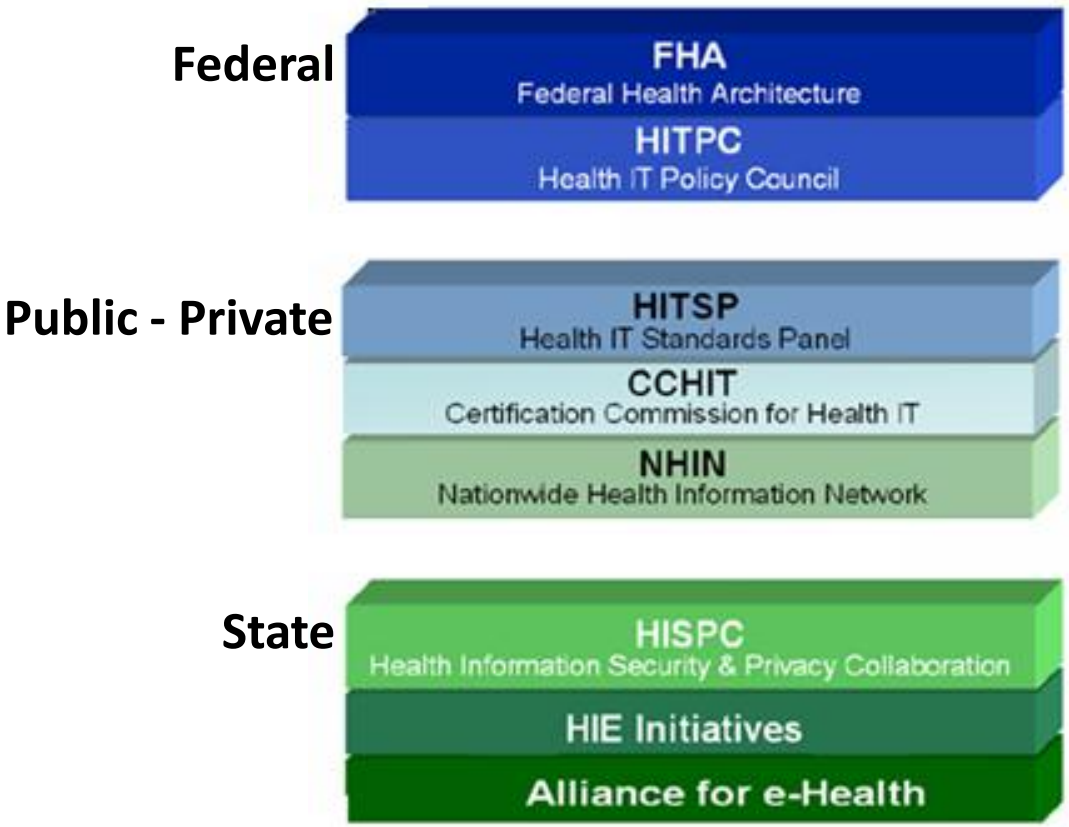
Meaningful Use - Driving Forces

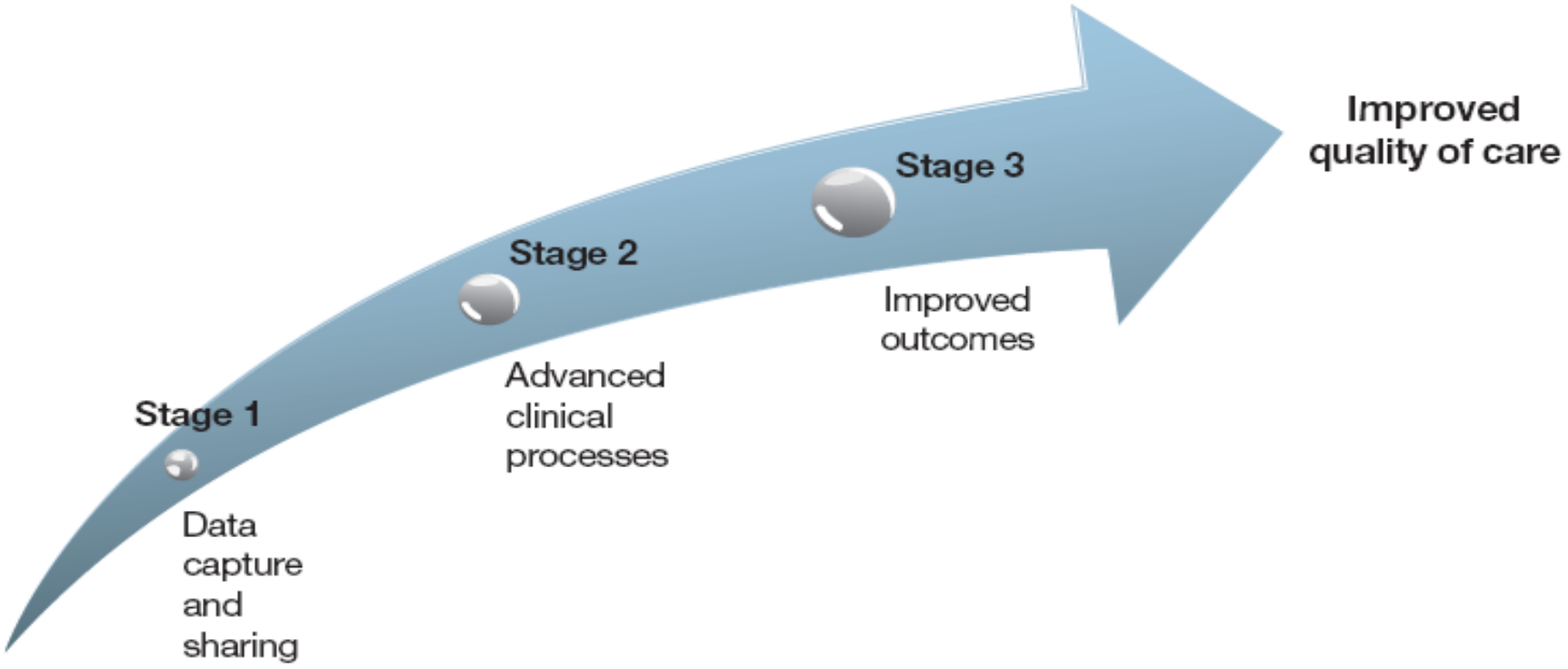
New Standards And Relationships



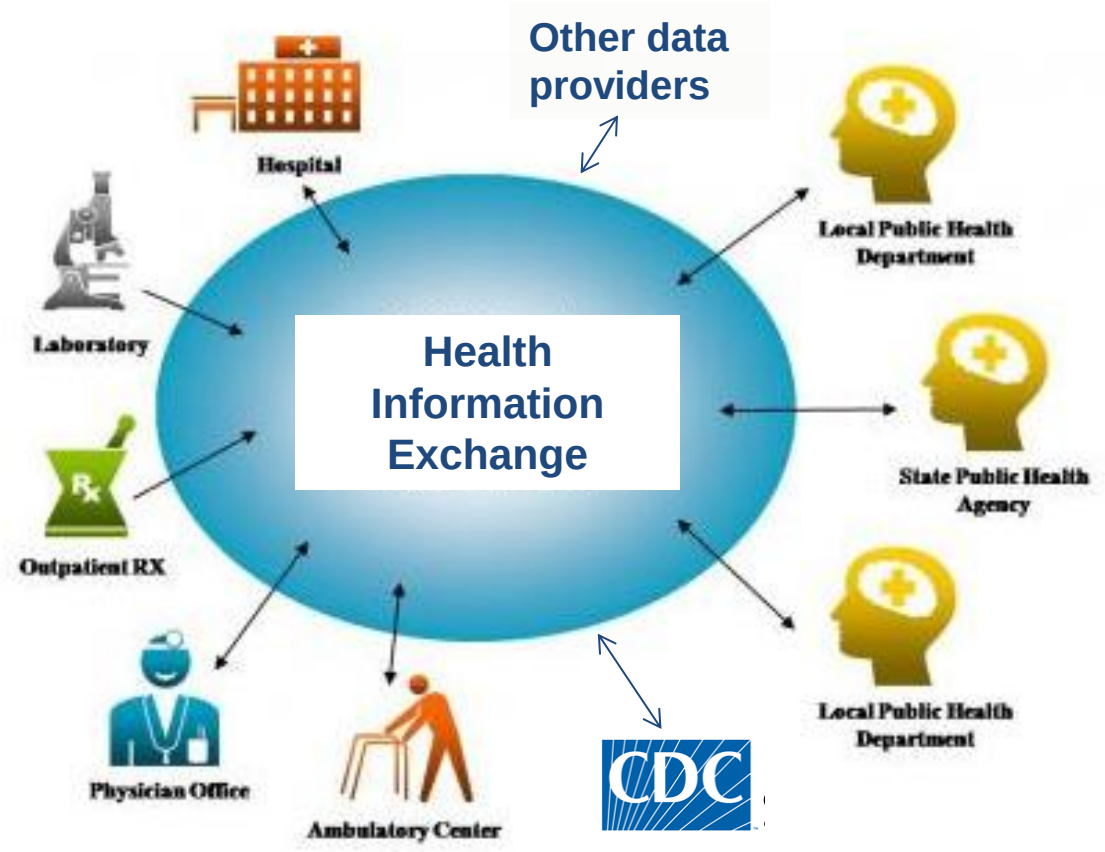
Meaningful Use (MU)

Eligible Professionals (EPs) and Eligible Hospitals (EHs) must purchase certified EHR technologies (CEHRT).

- ONC – Authorized Certifying Bodies (ONC-ACBs)
- Certified Health IT Product List (CHPL)



Health Information Exchanges



In HIEs, data flows in many directions & users can gather & use it in a variety of ways. HIEs can be the aggregators of hospital data for the surveillance systems public health manages.

Benefits of HIEs, standardization

Data Types

- Lab results
- Patient demographics
- Immunizations
- Clinical reports
- Encounter data
- Medication history

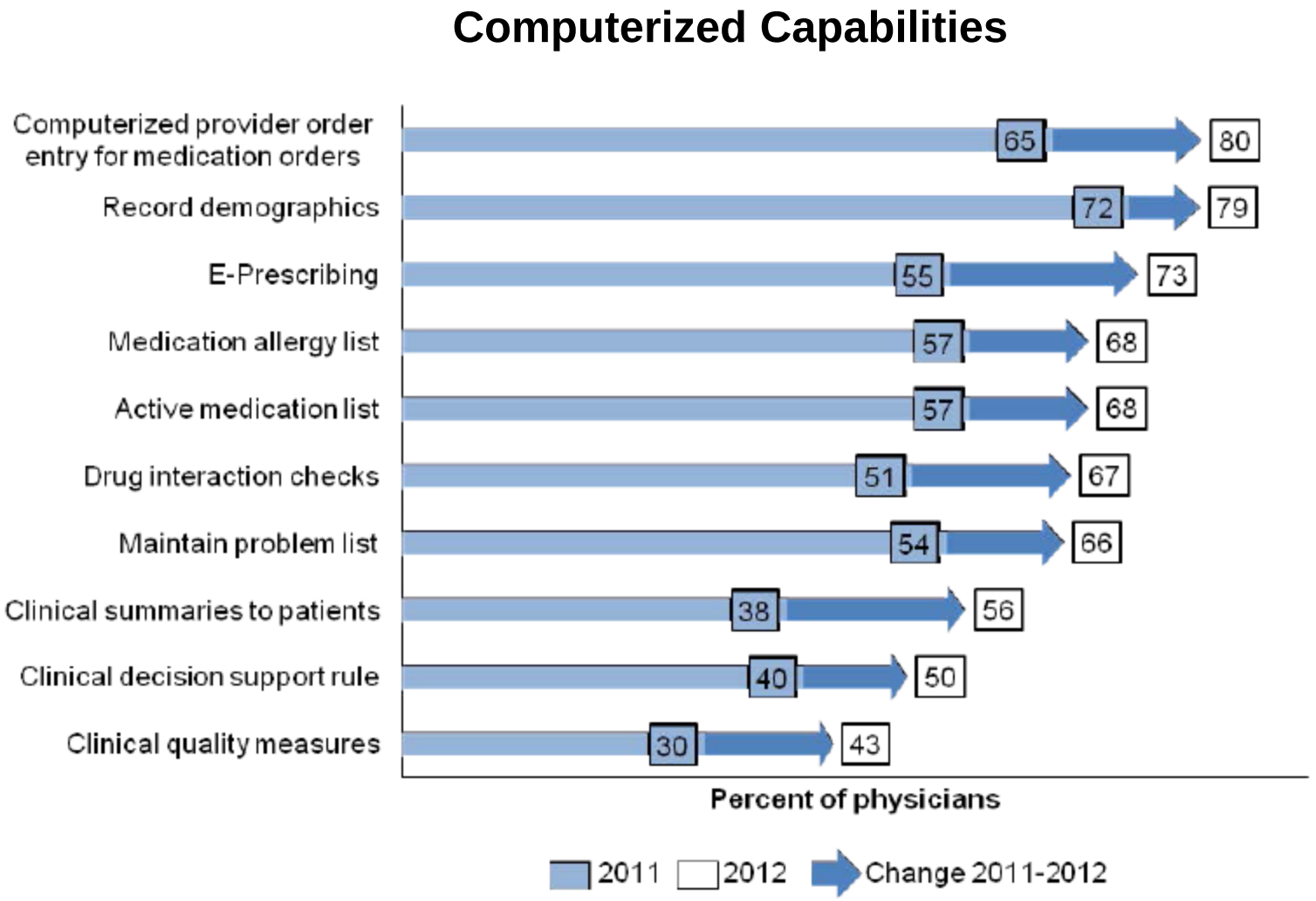
Benefits of Data Exchange

- Clinical, real-time data availability at Point of Care (POC)
- Support diverse data needs of community health programs
- Feed each other & provide gateways to regional HIEs
- Help in identifying patient groups and populations
- Support research initiatives

Four key areas where HIEs are valuable

1. **Healthcare reform**
   - Public health reporting
   - Care registries
   - Quality reporting
2. **Informatics and analytics**
   - Community reports
   - Robust analytics capabilities
   - Predictive modeling
3. **Point of care coordination**
   - Supplementary patient data at POC
   - Prescription/pharmacy and lab data
   - Can increase quality, efficiency of care
4. **Ongoing care management**
   - Case management, navigation, tracking, sharing

Meaningful Use In Motion



Source:
ONC data brief
No 7, 12-12

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Possible Public Health Game Changer

National Public Health Cloud based
Open Source Development Services Consortium

Public Health Informatics Institute

astho™

CDC

Local, State and Federal Public Health Consortium

ISDS
INTERNATIONAL SOCIETY

NACCHO
National Association of County & City Health Officials

CSTE
Council of State and Territorial Epidemiologists

Power of Collaboration

Public Health Collaborative “Consortium”

Federal – State - Local

Certified Applications

- CDC Program reporting
- Chronic Disease Registry
- Syndromic Surveillance
- Infectious Disease
- Immunization Registry
- Lab Information System

Core Services

- Database Tools
- MPI Tools
- Interoperability Tools PHINMS Direct MIRTH etc.
- Query Tools
- Software Development Support Tools

Governance based - Core Development Management Services

Public Health governed, supported Systems and Application Tool Factory

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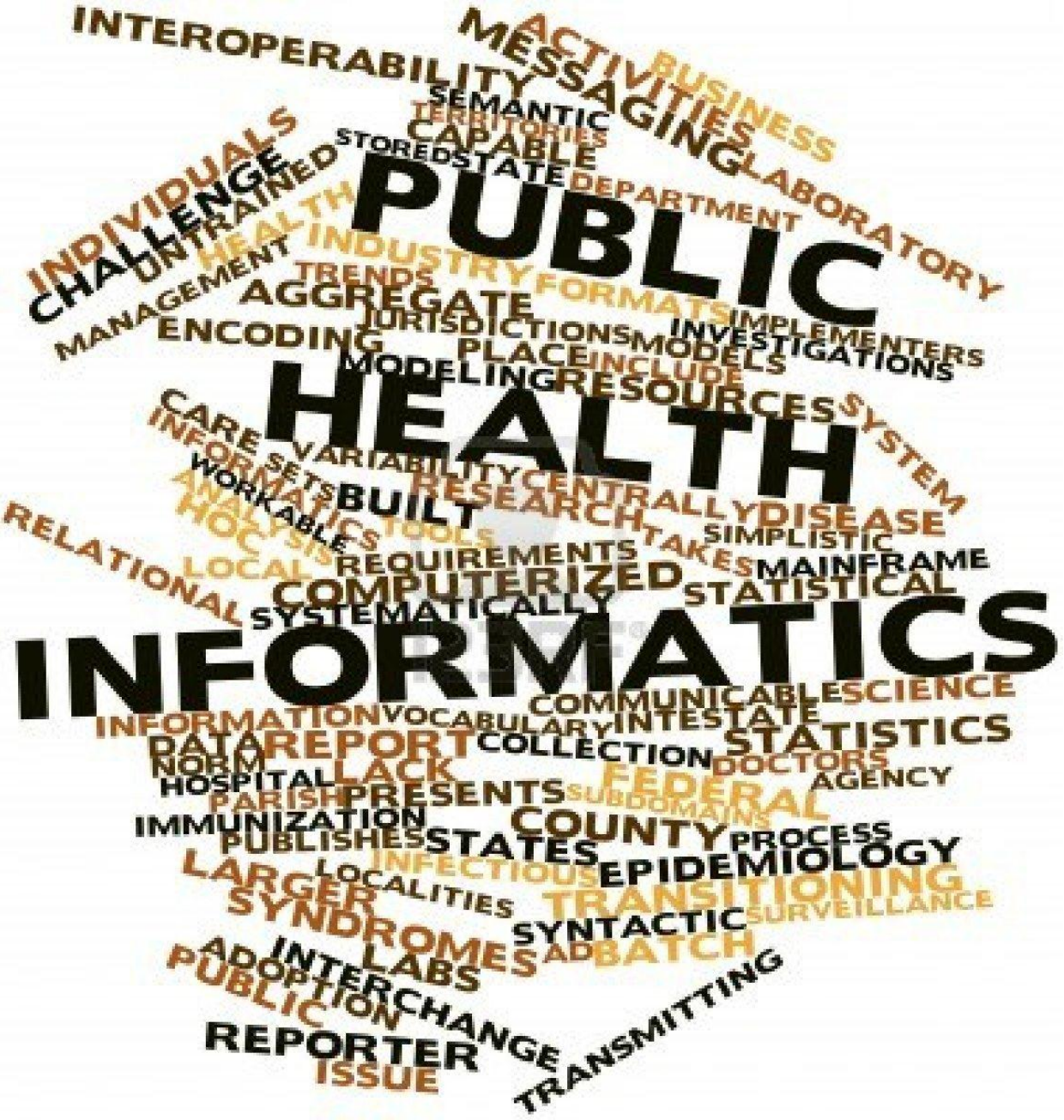
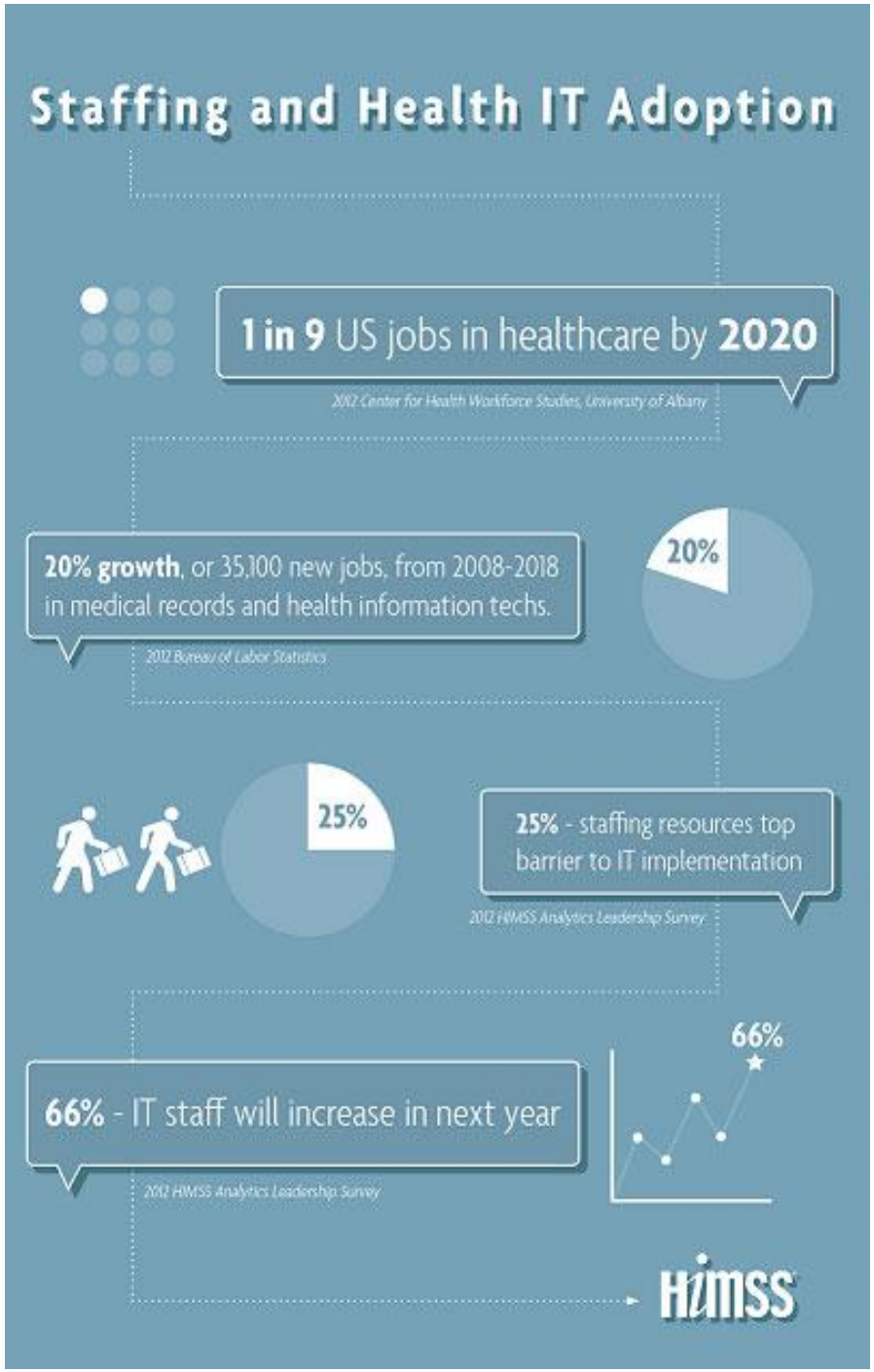
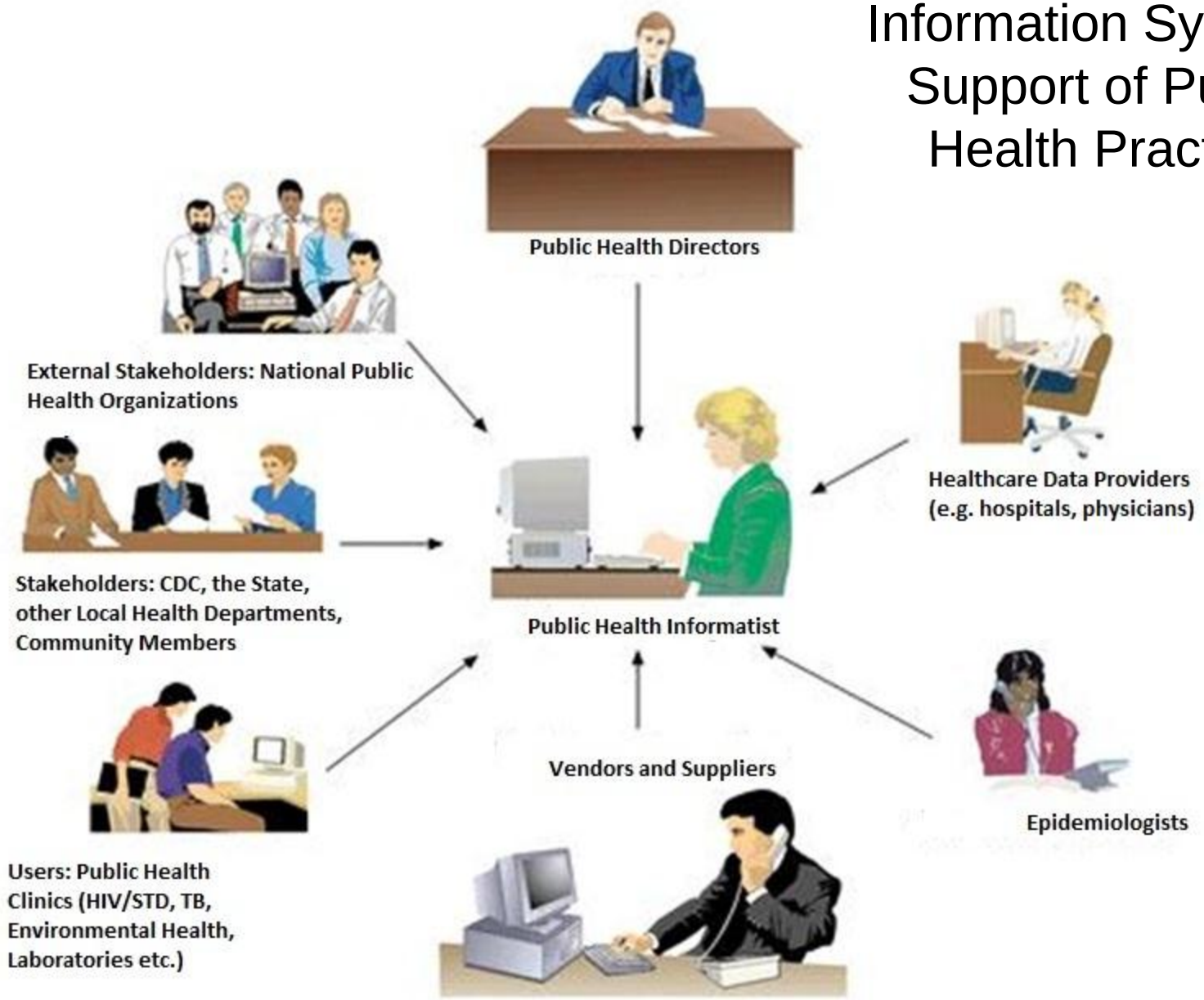

INTEROPERABILITY
MESSAGING
ACTIVITIES
BUSINESS
LABORATORY
SEMANTIC
TERRITORIES
CAPABLE
STOREDSTATE
DEPARTMENT
INDIVIDUALS
CHALLENGE
UNTRAINED
HEALTH
INDUSTRY
PUBLIC
MANAGEMENT
TRENDS
AGGREGATE
FORMATS
IMPLEMENTERS
JURISDICTIONS
INVESTIGATIONS
ENCODING
MODELS
PLACE
INCLUDE
MODELING
RESOURCES
HEALTH
SYSTEM
CARE
INFORMATION
SETS
VARIABILITY
CENTRALLY
RESEARCH
DISEASE
WORKABLE
BUILT
ANALYTICS
TOOLS
SIMPLISTIC
RELATIONAL
LOCAL
REQUIREMENTS
TAKES
MAINFRAME
COMPUTERIZED
STATISTICAL
SYSTEMATICALLY
INFORMATICS
COMMUNICABLE
SCIENCE
INFORMATION
VOCABULARY
INTESTATE
STATISTICS
DATA
REPORT
COLLECTION
DOCTORS
NORM
LACK
HOSPITAL
FEDERAL
AGENCY
PARISH
PRESENTS
SUBDOMAINS
IMMUNIZATION
COUNTY
PROCESS
PUBLISHES
STATES
EPIDEMIOLOGY
INFECTIOUS
LARGER
LOCALITIES
TRANSITIONING
SURVEILLANCE
SYNDROMES
SYNTACTIC
ADOPTION
LABS
BATCH
INTERCHANGE
REPORTER
TRANSMITTING
ISSUE


Staffing and Health IT Adoption
1 in 9 US jobs in healthcare by 2020
2012 Center for Health Workforce Studies, University of Albany
20% growth, or 35,100 new jobs, from 2008-2018 in medical records and health information techs.
2012 Bureau of Labor Statistics
20%
25%
25% - staffing resources top barrier to IT implementation
2012 HIMSS Analytics Leadership Survey
66%
66% - IT staff will increase in next year
2012 HIMSS Analytics Leadership Survey
HIMSS

Information Systems Support of Public Health Practice



The Informatist

The following diagram shows some of the skills required:

Diagram created by Lynden Crawford

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ISDS
INTERNATIONAL SOCIETY FOR DISEASE SURVEILLANCE

Questions?

Thank you!

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