Introduction to HSPC (Logica)

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Why?

"To help people live the healthiest lives possible."


eyemax2
PREEMIE


FLIGHT


HAPPY BABY

Sir Cyril Chantler

Medicine used to be simple, ineffective, and relatively safe

Now it is complex, effective, and potentially dangerous.

Chantler, Cyril. The role and education of doctors in the delivery of health care. *Lancet* 1999; 353:1178-81.

Why does it matter?

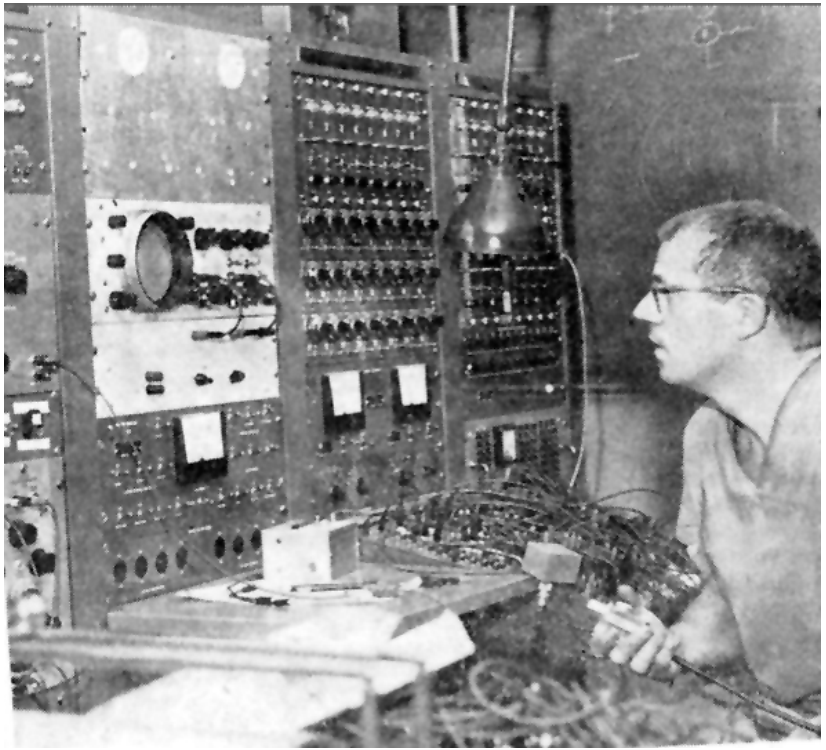
Deaths during inpatient admissions: ~251,454

Table

Table 1| **Studies on US death rates from medical error since the 1999 IOM report and point estimate from pooled results**

Study	Dates covered	Source of information	Patient admissions	Adverse event rate (%)	Lethal adverse event rate (%)	% of events deemed preventable	No of deaths due to preventable adverse event	% of admissions with a preventable lethal adverse event	Extrapolation to 2013 US admissions†
Health Grades[11]	2000-02	Medicare patients	37 000 000	3.1	0.7*	NR	389 576	0.71	251 454
Office of Inspector General[12]	2008	Medicare patients	838	13.5	1.4	44	12	0.62	219 579
Classen et al[13]	2004	3 tertiary care hospitals	795	33.2	1.1	100	9	1.13	400 201
Landrigan et al[14]	2002-07	10 hospitals in North Carolina	2341	18.1	0.6	63	14	0.38	134 581
Point estimate from all data	2000-08	—	—	—	—	—	—	0.71	251 454‡

Homer Warner and HELP



Dr. Homer Warner circa 1960

Intermountain can only provide the highest quality, lowest cost health care with the use of advanced clinical decision support systems integrated into frontline clinical workflow

Core Assumptions

‘The complexity of modern medicine exceeds the inherent limitations of the unaided human mind.’

~ David M. Eddy, MD, Ph.D.

‘... man is not perfectible. There are limits to man’s capabilities as an information processor that assure the occurrence of random errors in his activities.’

~ Clement J. McDonald, MD

Intermountain Decision Support Modules

- Antibiotic Assistant
- Ventilator weaning
- ARDS protocols
- Nosocomial infection monitoring
- MRSA monitoring and control
- Prevention of Deep Venous Thrombosis
- Infectious disease reporting to public health
- Diabetic care
- Pre-op antibiotics
- ICU glucose protocols
- Ventilator disconnect
- Infusion pump errors
- Lab alerts
- Blood ordering
- Order sets
- Patient worksheets
- Post MI discharge meds
- Occult sepsis in the ED

We can’t keep up!

- We have ~1,600 decision support rules or modules
- We have picked the low hanging fruit
- There is a need to have 10,000+ decision support rules or modules
- There is no path from 1,600 to get to 10,000 unless we fundamentally change the ecosystem
- There is no scalable path from the leading institutions to community hospitals

SMART on FHIR®© – Open Platform Architecture

Real Impact

- Occult sepsis
- Community Acquired Pneumonia
- Pulmonary Embolus
- ICU Glucose
- Ventilator management
- Public health reporting

HSPC (Logica)

Mission

Improve health by creating a vibrant, open ecosystem of interoperable applications, content, and services

Ecosystem Vision

We can share executable clinical knowledge as interoperable decision support applications

HSPC | healthcare services platform consortium™

THE HEALTHCARE INNOVATION ECOSYSTEM

Improve health by creating a vibrant, open ecosystem of semantically interoperable applications

Soon to be "Logica"

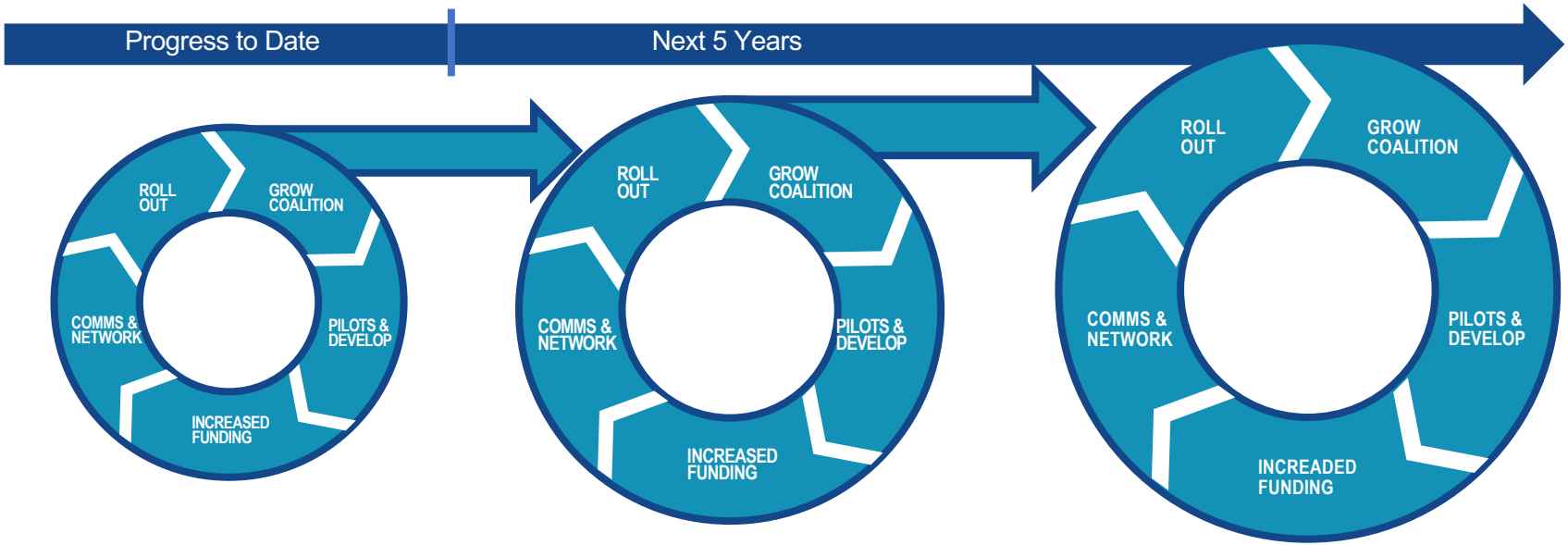
Provider Led Non-Profit Organization

- Consistent implementation and libraries for:
  - Terminology and Modeling
  - SMART on FHIR Profiling
  - SOA Platform Services
  - Knowledge Representation and Content Sharing

What does HSPC (Logica) actually do?

- Open shared repository of detailed clinical models – licensed free-for-use for everyone
  - Intermountain models (being converted to CIMI models and FHIR profiles)
    - http://www.opencem.org
  - CIMI and HSPC/CIIC repository
    - http://models.opencimi.org/ig/
- (Review and approval of models across all specialties and all of health and healthcare)
- HSPC Developer's Environment and Sandbox
  - https://sandbox.hspconsortium.org/dashboard
- Reference architecture
  - Specification of reference architecture
  - Reference implementation
- Meetings
  - Plenary meetings - information sharing, planning – twice a year
  - Special topic summits - PRN
- Projects

How we're doing this:
3 phases x 5 steps



- **PHASE 1:**
- Pilots with select societies & systems

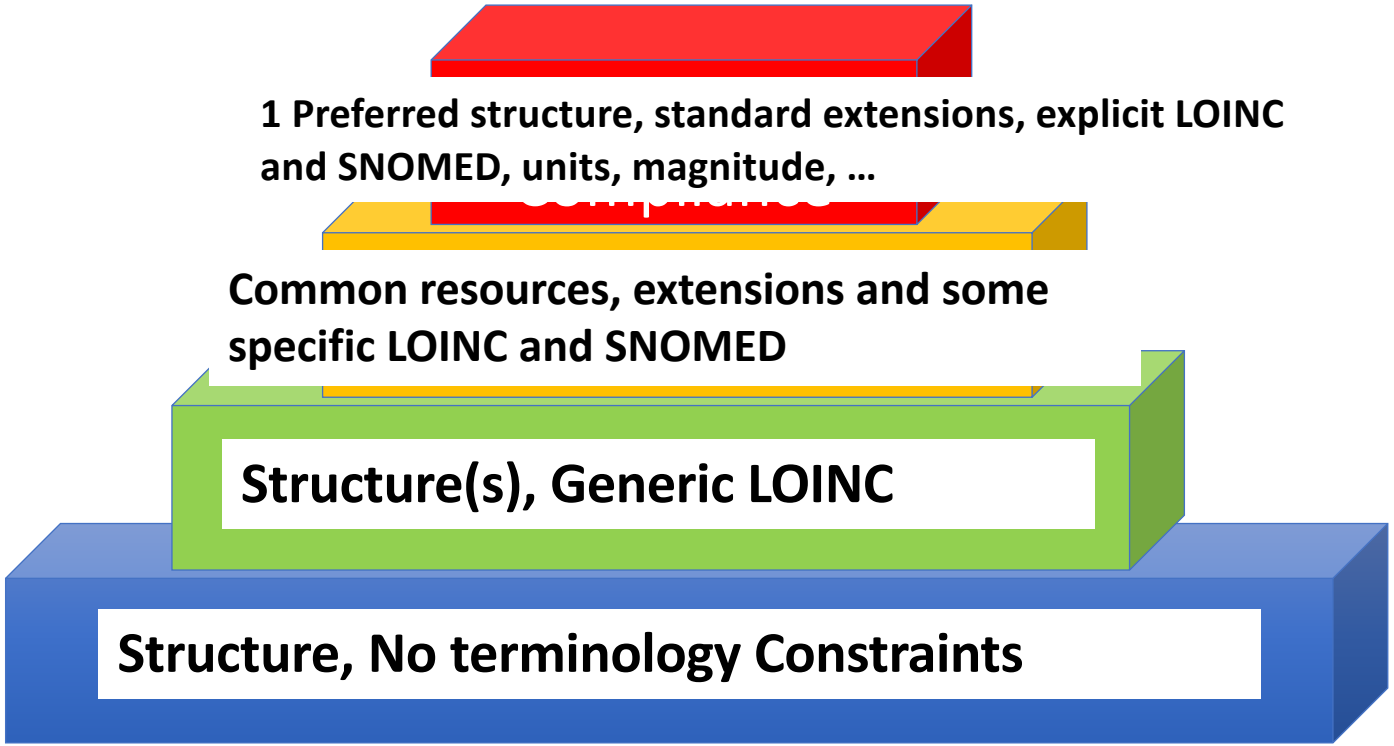
PHASE 2:

Pilots with more societies, systems & apps

PHASE 3:

Pilots with major federal agency & foundations

The Compliance Pyramid



How does HSPC (Logica) relate to other interoperability activities?

- HL7
  - FHIR – the approved API for sharing patient data
  - CIMI – clinical models for interoperability
- Argonauts
  - We build on Argonauts profiles
- Sequoia
  - We depend on Sequoia for the network of networks, trust agreements, and data exchange infrastructure
  - Goal: work together on FHIR implementation
- SMART
  - We depend on SMART to integrate apps into EHRs
- OMG
  - We use BPMN, DMN, CMMN, BPM+
  - We use OMG standards for SOA
- Federal Health Information Model (FHIM)
  - We use FHIM classes as the pattern for CIMI models
- SOLOR (SNOMED, LOINC, RxNorm) – VA Keith Campbell
  - SOLOR is the source of coded concepts used in CIMI models
- NLM Value Set Authority Center (VSAC)
  - We are aligning and placing SOLOR refsets into VSAC
- Center for Medical Interoperability
  - Initial focus is on device interoperability
  - Goal: work together when they get to FHIR implementation
- AMA Integrated Health Model Initiative (IHMI)
  - Not sure – possible overlap with clinician engagement
- OMOP (OHDSI)
  - Analytic database versus real time sharing
- openEHR,
  - Thomas Beale participation in CIMI
  - We use BMM and ADL
- USCDI
  - Guides Logica terminology choices

How to Get Involved

- HL7
  - www.HL7.org
  - CIMI
  - Clinicians on FHIR

- HSPC (Logica)
  - www.hspconsortium.org

How to Get Involved

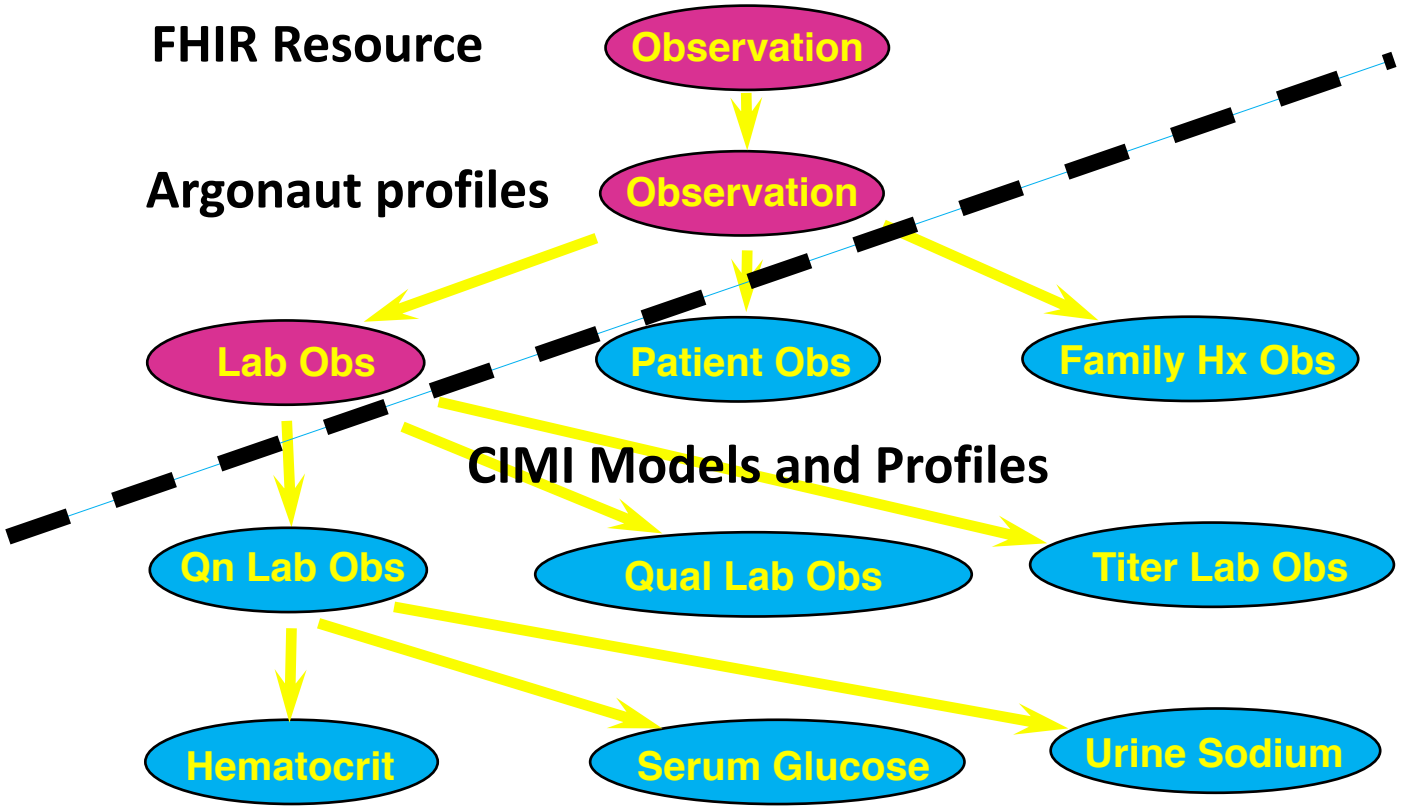
- Ask (require?) your vendors to support and use Logica approved standards
- Visit the web/wiki sites
- Call into calls of interest
- Introduce yourself
- Participate on the calls!
- Attend F2F meetings
- Participate in public comment opportunities

And if we don’t, who will?

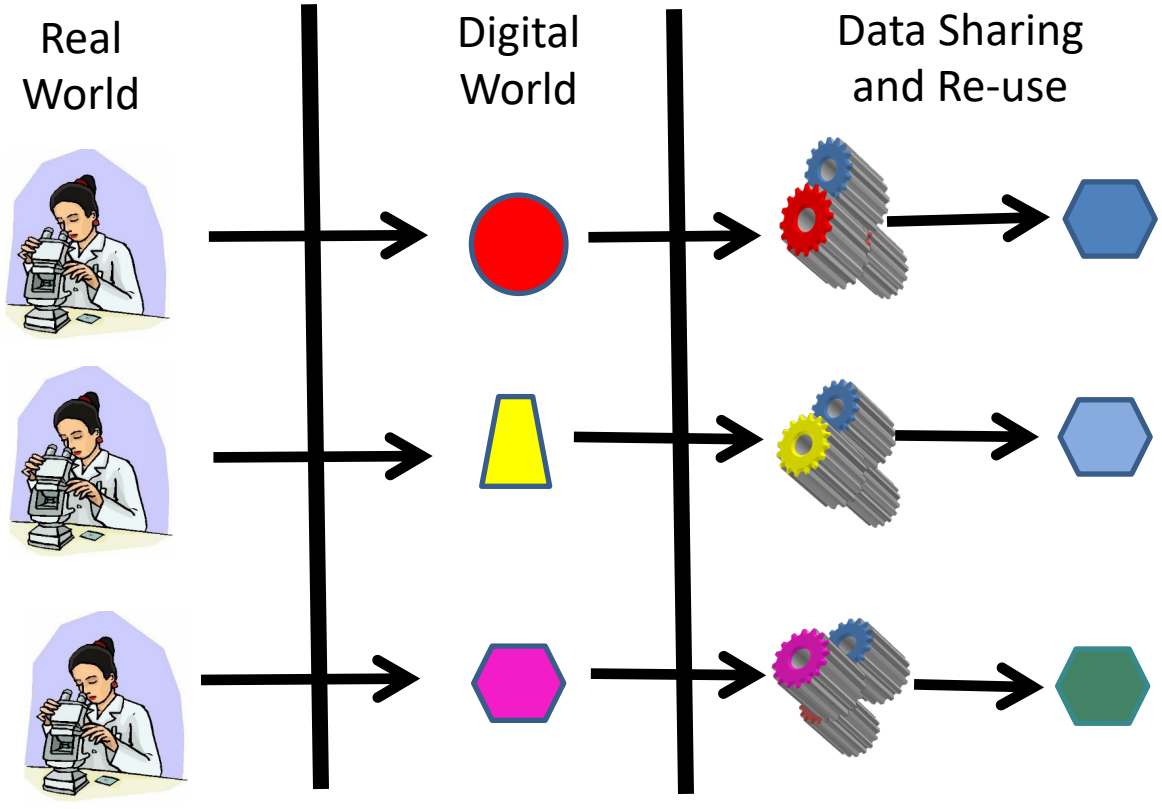
Questions?

Appendix

Argonaut profiles and CIMI profiles

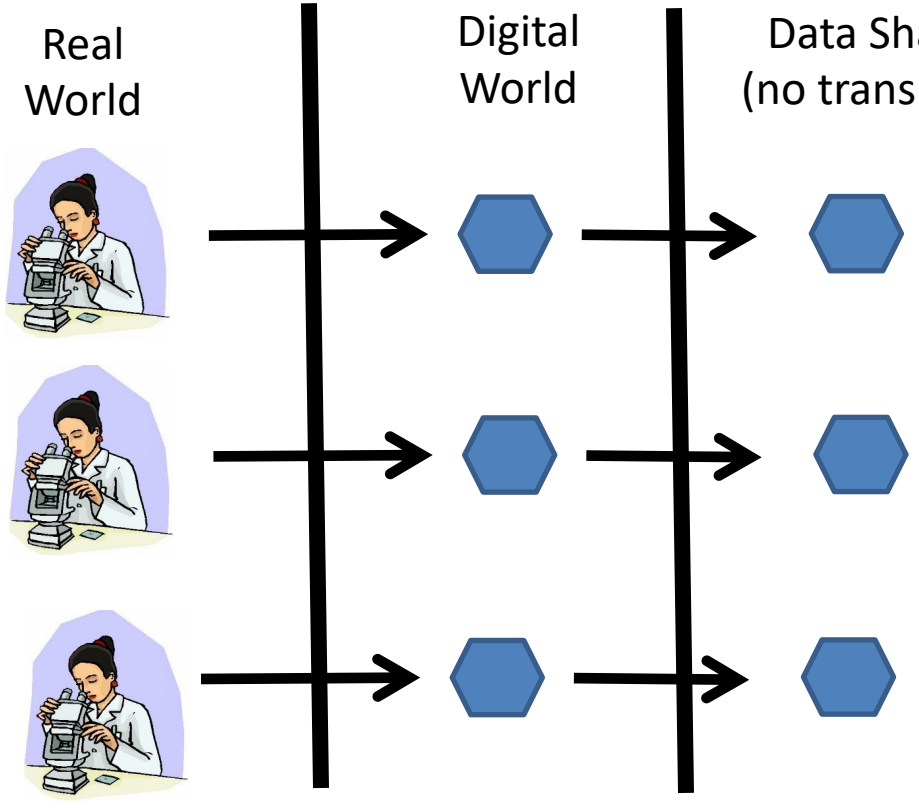


Interoperability Today



Legend:
shape = structure
color = terminology

Interoperability in the Future



Legend:
shape = structure
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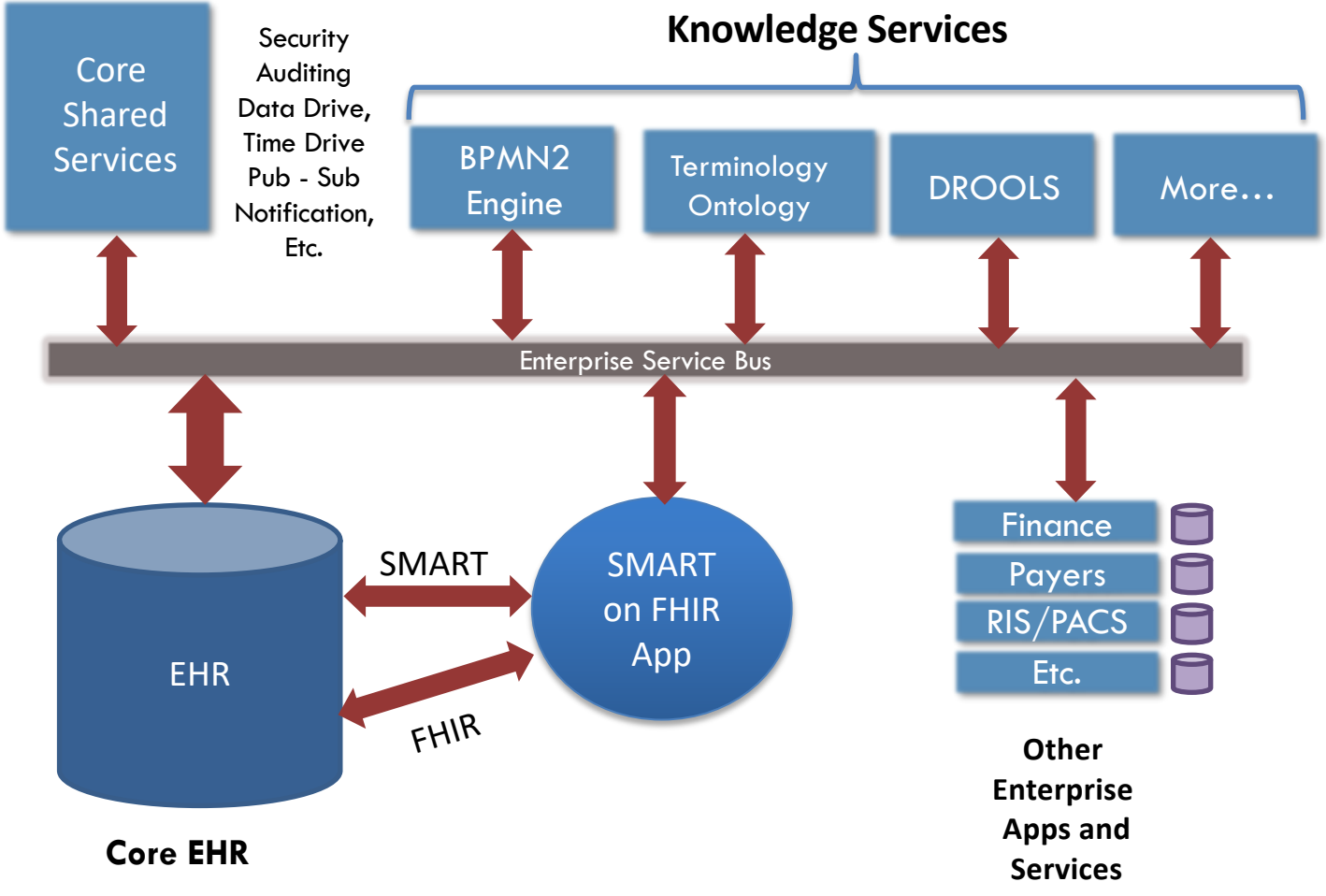
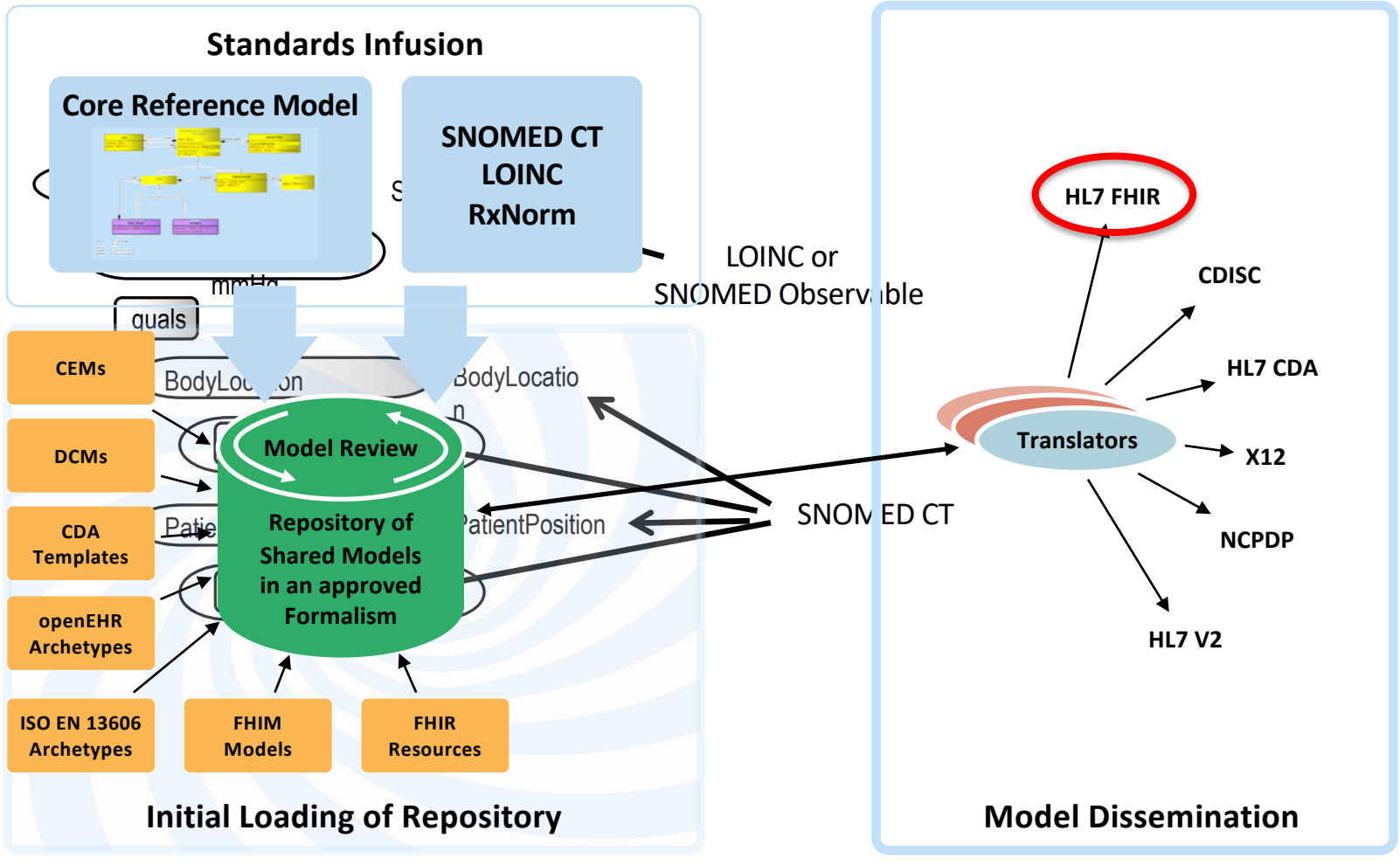
Tasks for Clinical Experts

- What data should be collected? (part of domain analysis)
  - It will be different for different situations
- How should the data be modelled?
  - Two fields or one (the degree of pre and post coordination)
- What does the data mean?
  - How do we make computable definitions for diabetes mellitus, myocardial infarction, heart failure, chronic renal failure, etc.

More than just the EHR



Logical Model Development Lifecycle



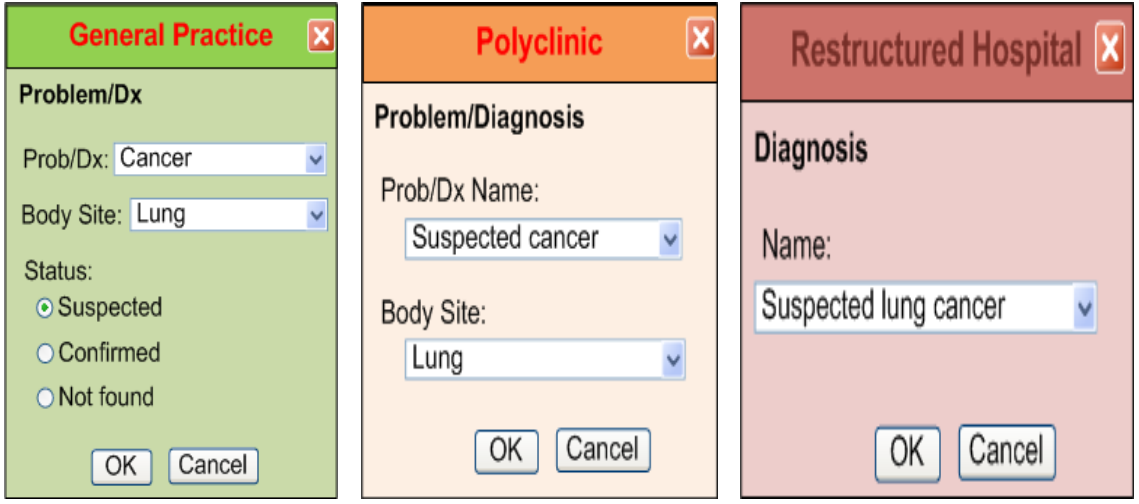
The ultimate value of detailed information models

- Software is developed much faster
  - Clinical knowledge is contained in the models
  - Much easier for software engineers
- The data used in the applications is completely conformant to standards leading to semantic interoperability
- If you follow the SMART on FHIR development strategy, your software can be shared with any system that supports the approved standards

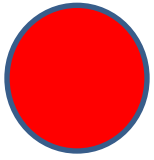
IsoSemantic Models – Example of Problem

(from Dr. Linda Bird)

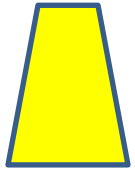
e.g. "Suspected Lung Cancer"



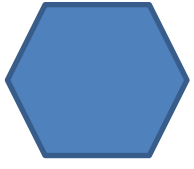
Data Comes in Different Shapes and Colors



Finding – Suspected Lung Cancer

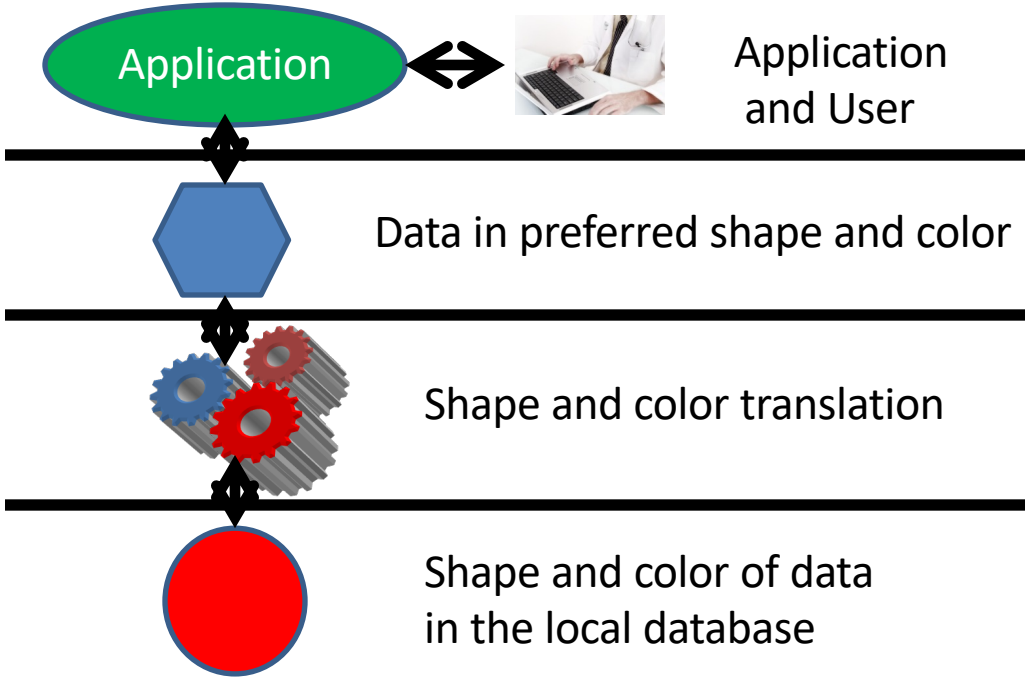


Finding – Suspected Cancer
Location – Lung

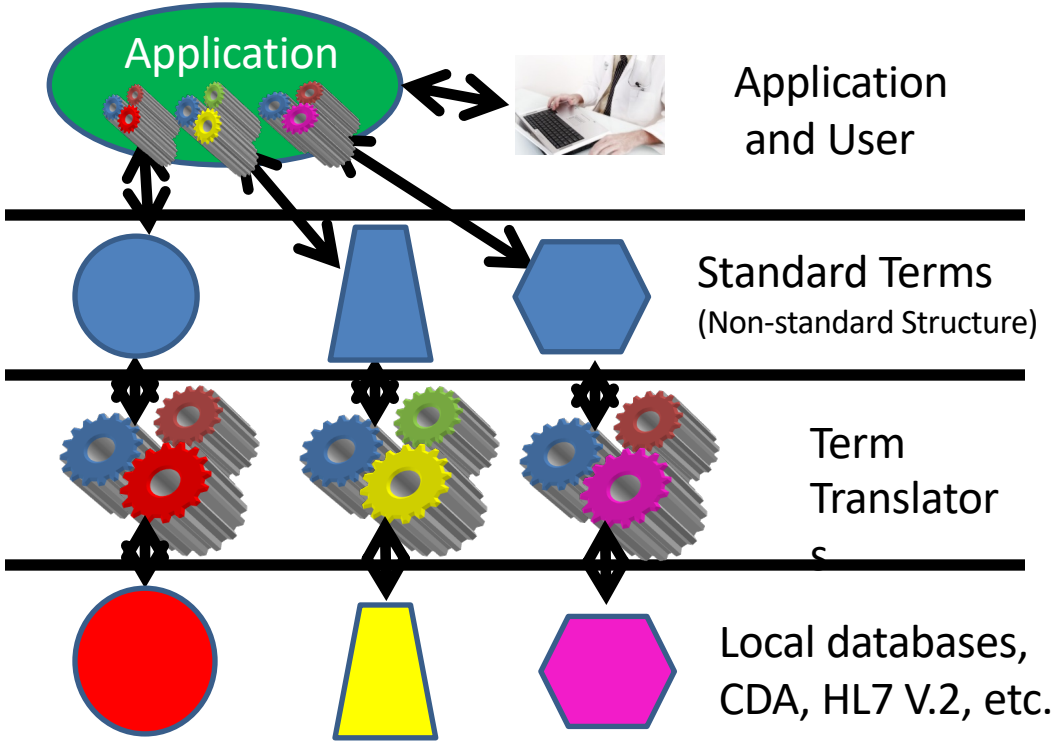


Finding – Cancer
Location – Lung
Certainty – Suspected
(Let's say this is the preferred shape)

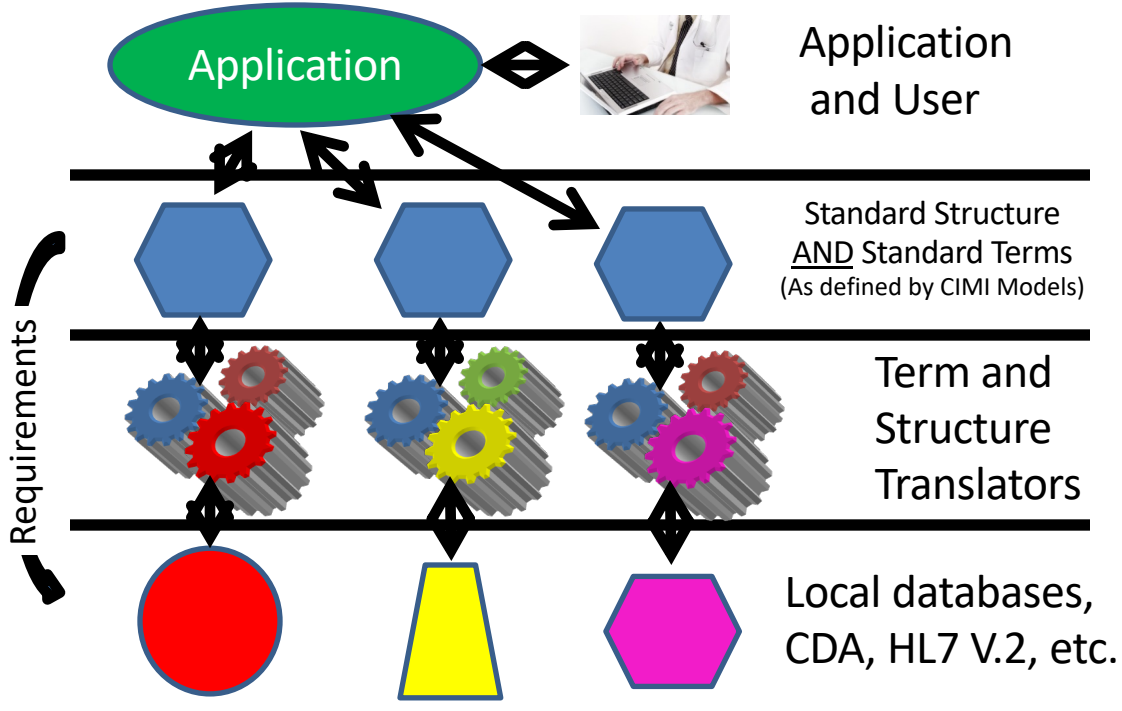
Data Standardized in the Service



Partial Interoperability



Preferred Strategy – Full Interoperability



Reasons to do it on the server side

- Person writing the translation is most likely to understand the meaning of the data in their own database.
- The person writing the translation only has to understand their own data and the preferred model.
  - They can optimize query execution for their own system
- The query for the data is simpler. If the application has to write a query that will work for all shapes, the query will be inefficient to process by every system.