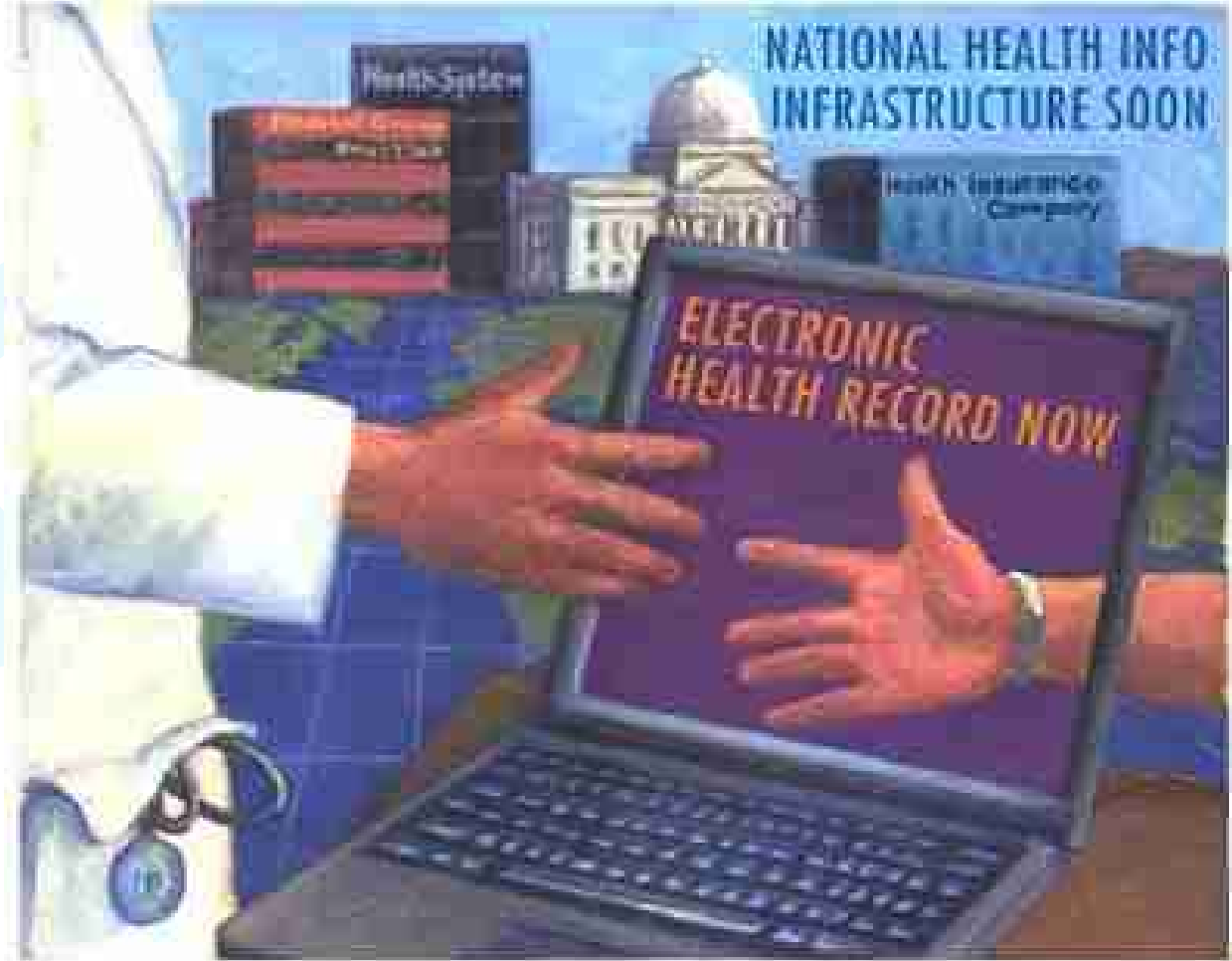


THE HEALTH INFORMATION TECHNOLOGY SUMMIT



2.05

Community-Based Collaborations:
Developing Your Technical Strategy
for Mobilizing Healthcare Data

October 22

1:30 PM

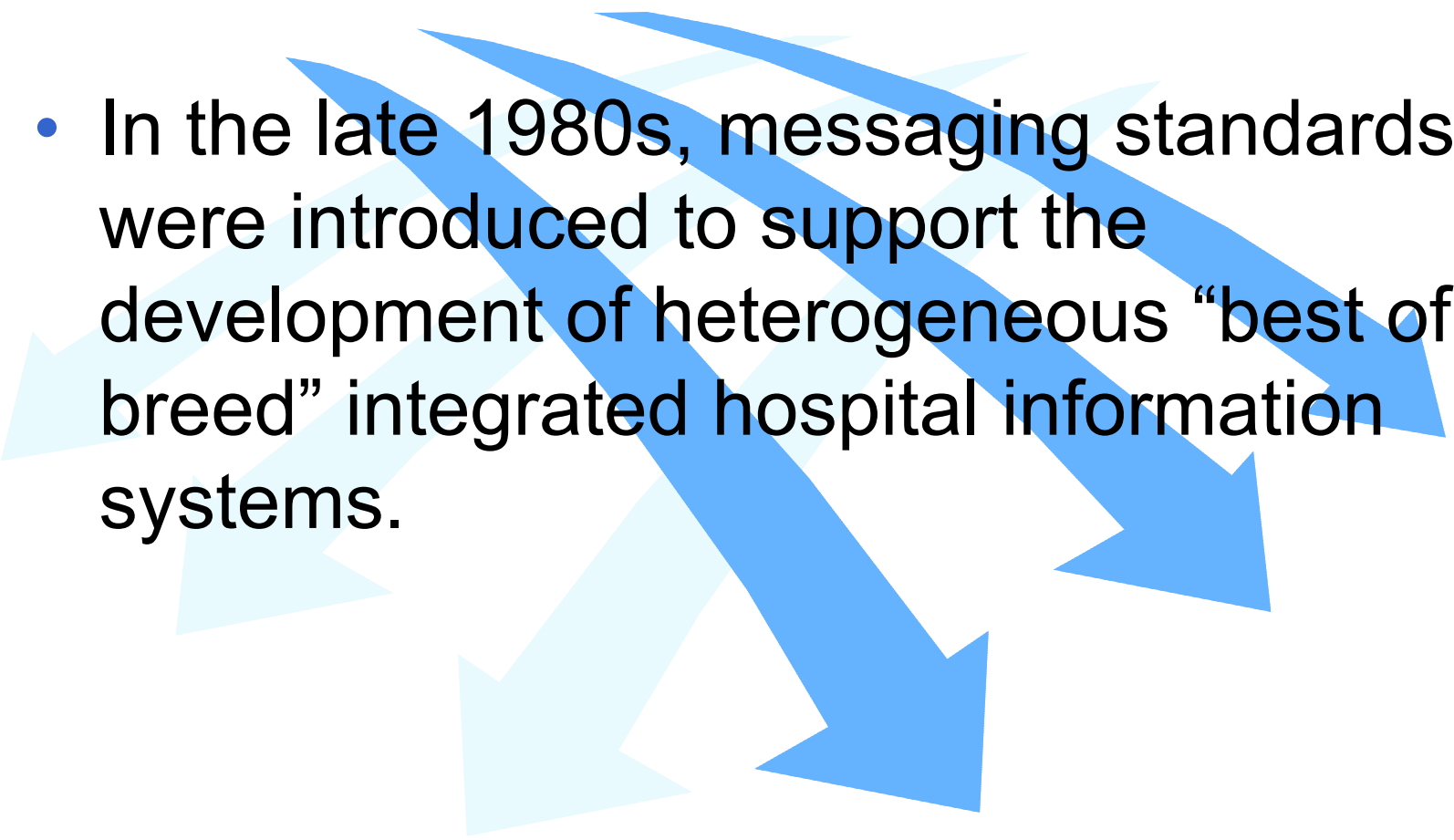
60 minutes

Wes, Hlamka and me

Clinical Data Standards

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Indiana Health Information Exchange
Regenstrief Institute
Indiana University School of Medicine

Why Standards?

- In the late 1980s, messaging standards were introduced to support the development of heterogeneous “best of breed” integrated hospital information systems.
- 

What standards are needed?

- Communication standards
 - ✓ Data interchange standards
 - Information model standards
 - Vocabulary standards
 - Security standards
- 

Data Interchange Standards

- Based on messages transmitted as a result of a real world event occurring
- The content of the message (**semantics**) may be defined as an abstract message
- The encoding rules for sending the message or the **syntax** varies among the different standards groups.

Structured vs. Unstructured

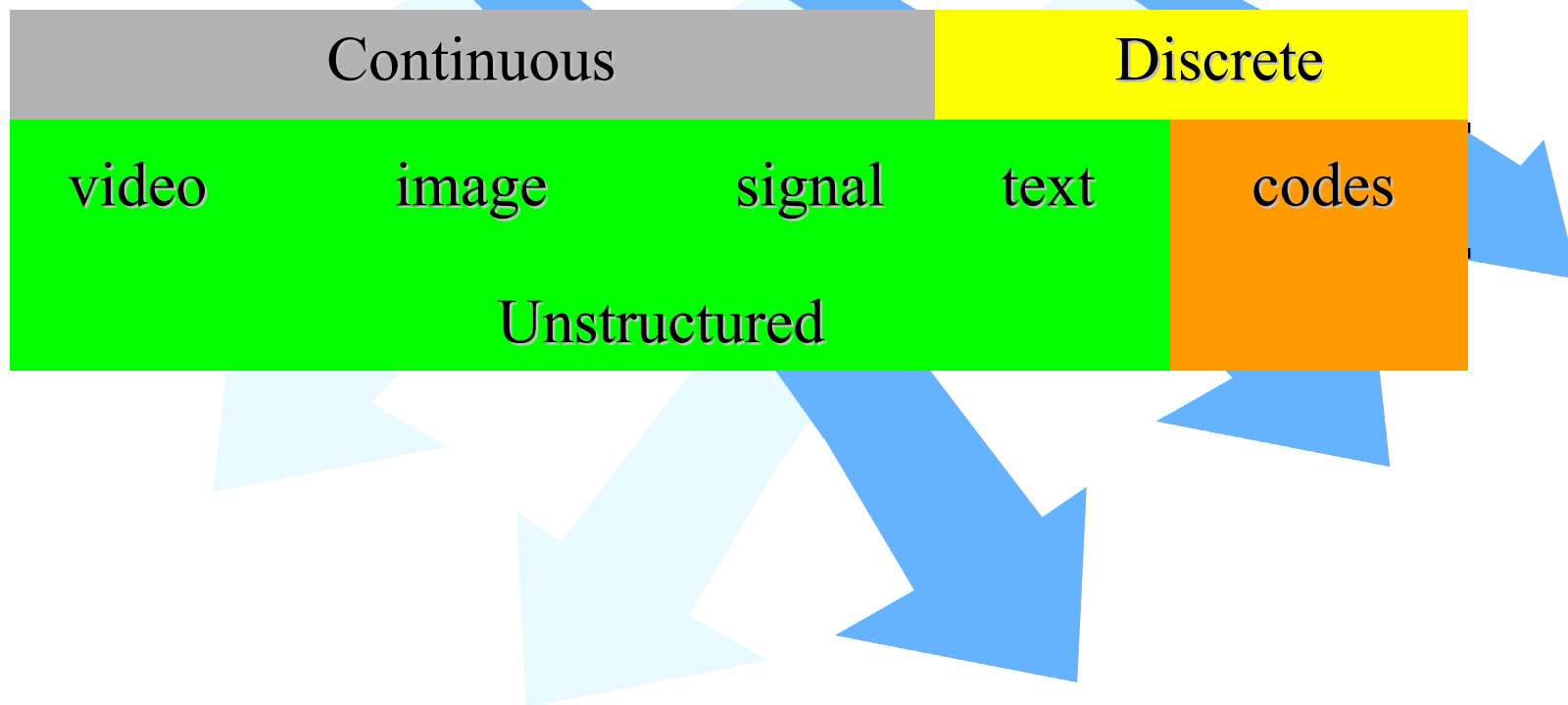
Structured

- Each slot or field has a specific meaning
- Usually encoded as a number or a code
- eg. superbill

Unstructured

- No formal organization
- Meanings to precisely defined
- eg. dictated office note or radiographic image

The Data Continuum



Data formats

Hx: pt is a 34 yo WF c/o 3d h/o N/V/D.
PMH: Pappy age 30. FH: M 82, lung CA.

HPI: Patient is a 38 year old white female complaining of a 3 day history of nausea, vomiting and diarrhea.
PMH: questionable appendectomy
FH: mother died at age 82 of lung

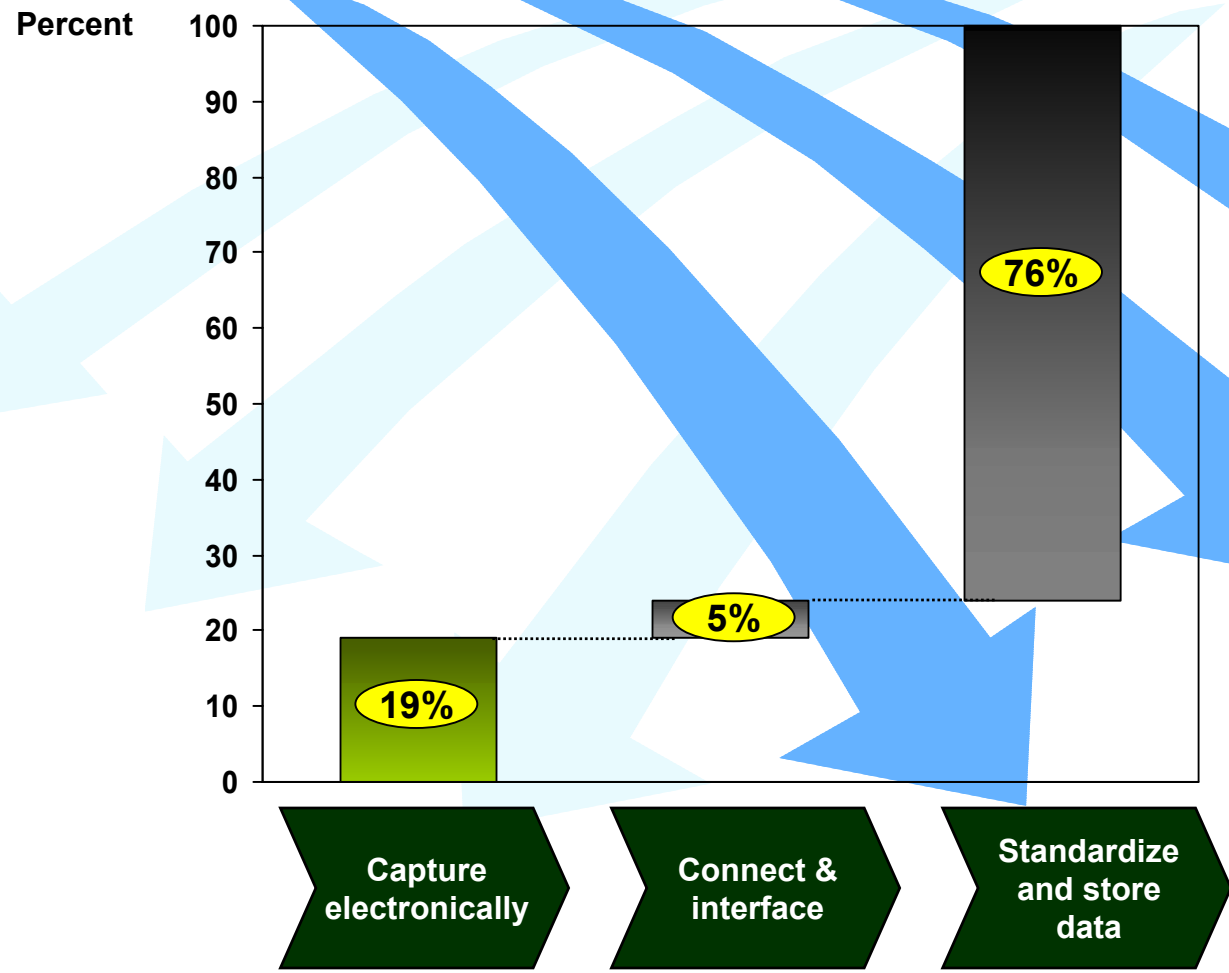
Vital Signs	Height: <input type="text" value="64"/> inches	Weight: <input type="text"/> pounds
	Temperature: <input type="text" value="98.6"/> degrees F	Temperature site: <input type="text"/>
Pulse: <input type="text" value="133"/>	Respirations: <input type="text" value="18"/>	Blood pressure: <input type="text" value="120"/> / <input type="text" value="80"/> mm Hg
<input type="button" value="OK"/> <input type="button" value="Cancel"/>		

- **Continuous**
(big, complete, easy, dumb)
- **Discrete -- text**
(small, partial, easy, +- smart)
- **Discrete -- codes**
(small, partial, hard, smart)

HIEI Taxonomy

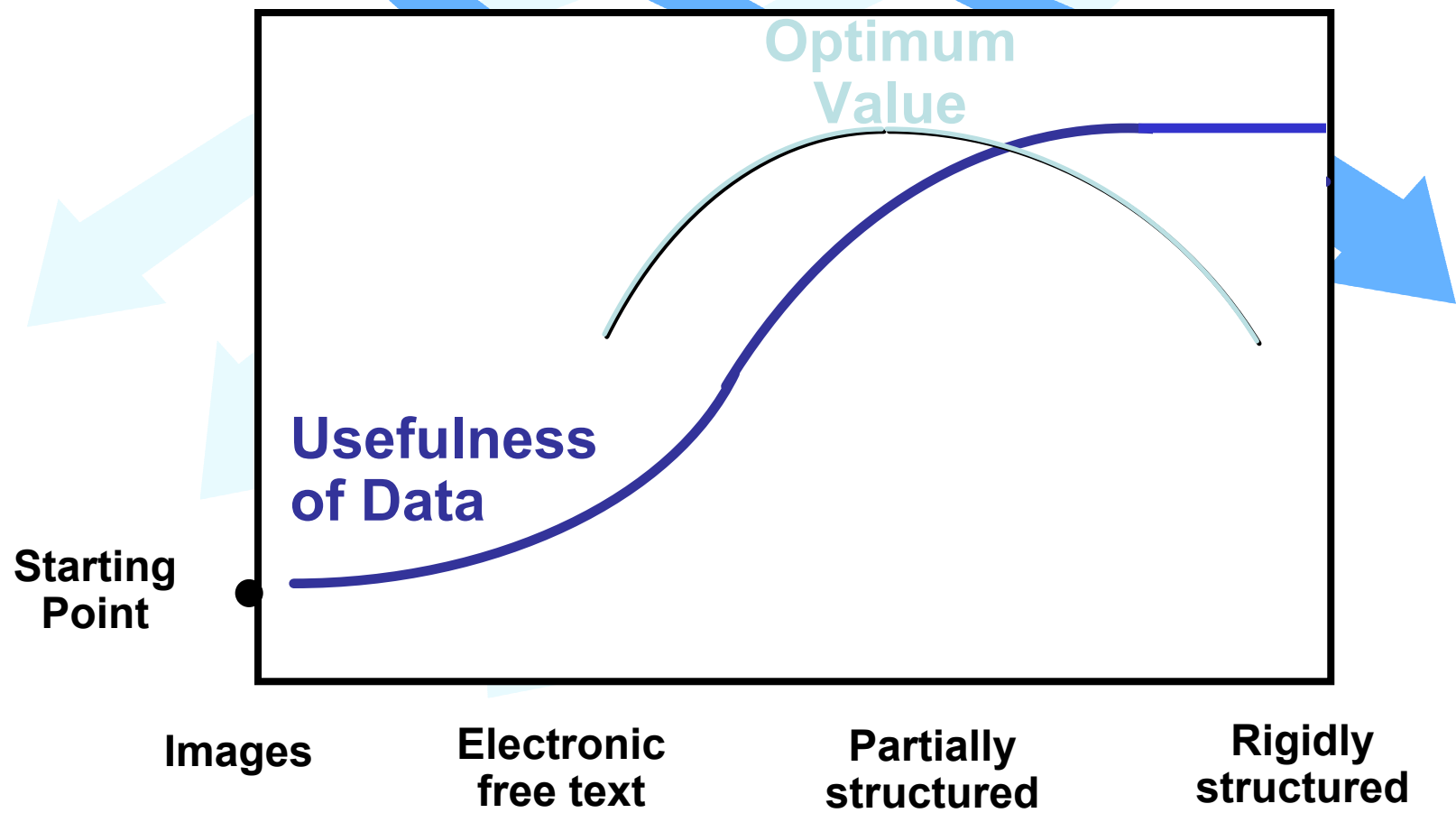
Level	Description	Examples
1	Non-electronic data	No PC/information technology
2	Machine-transportable data	Fax/Email
3	Machine-organizable data	Structured messages, non-standard content/data
4	Machine-interpretable data	Structured messages, standardized content/data

Achieving full value requires structured data

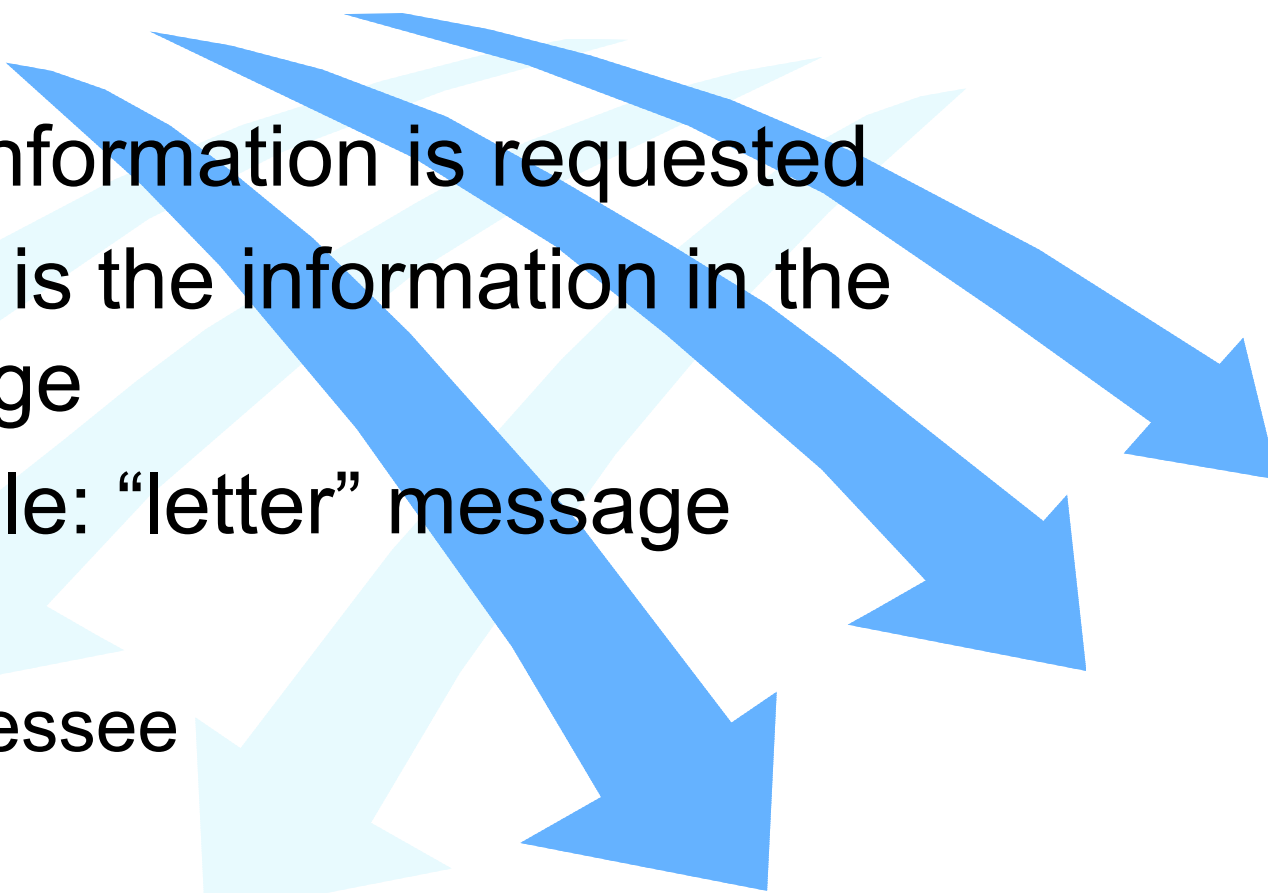


Source: Center for Information Technology Leadership, IHIE calculations

Structuring Data Costs!



Messaging Standards

- What information is requested
 - Where is the information in the message
 - Example: “letter” message
 - Date
 - Addressee
 - Body
 - Sender
- 

Content Standards

A common, agreed-upon, detailed vocabulary for all medical terminology

Without a standard:

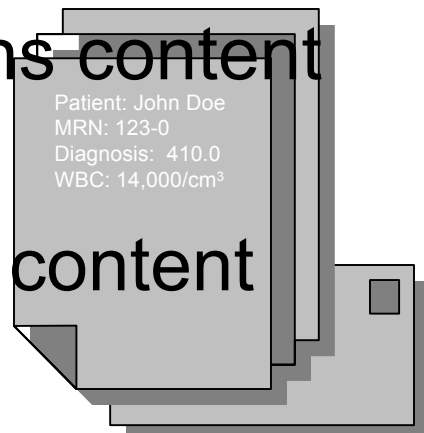
- “high blood pressure”
- “elevated blood pressure”
- “hypertension”

With a standard

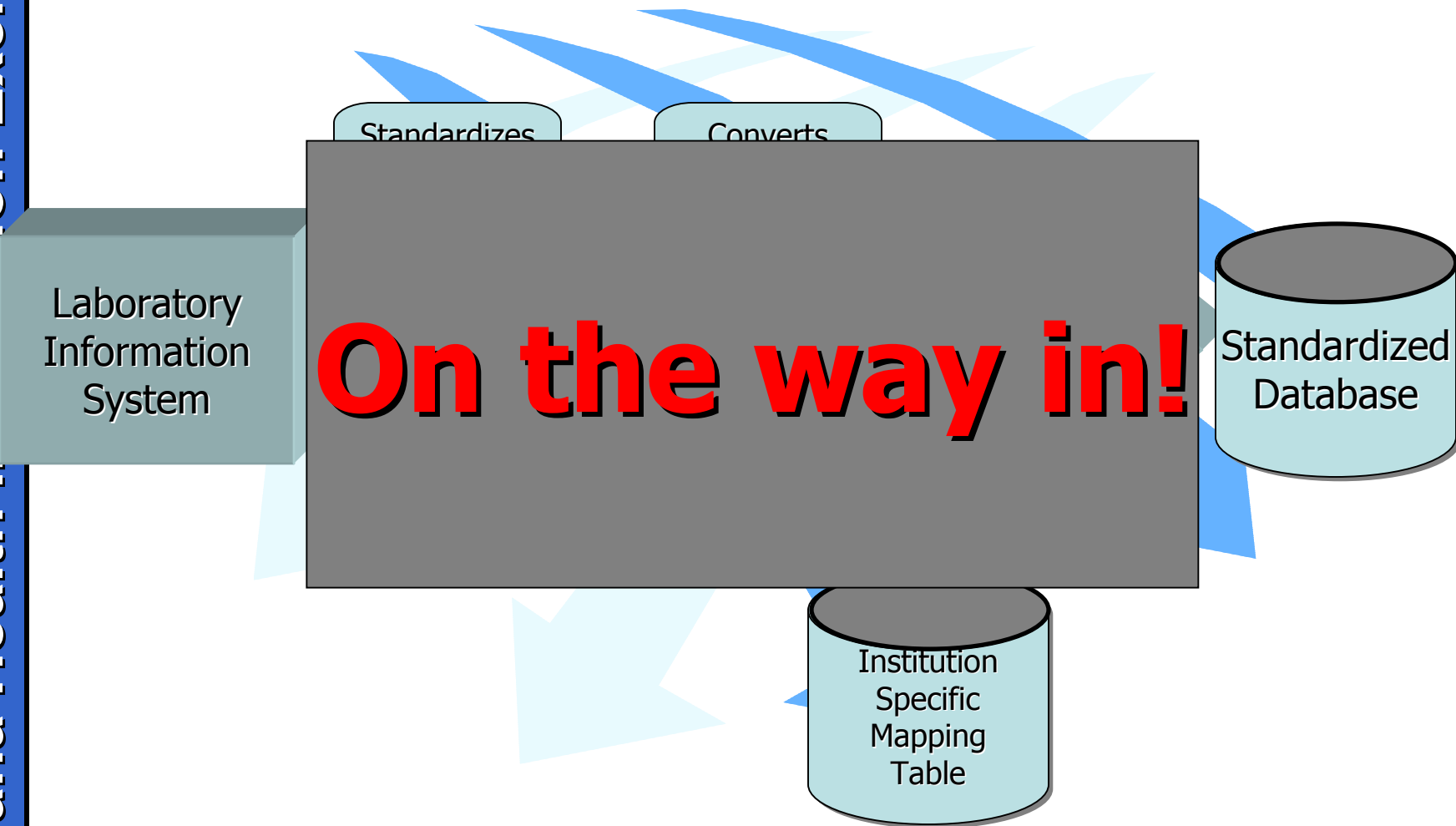
- SNOMED, C487231, hypertension
- Unambiguous meaning for both sender and receiver

Clinical Data Standards

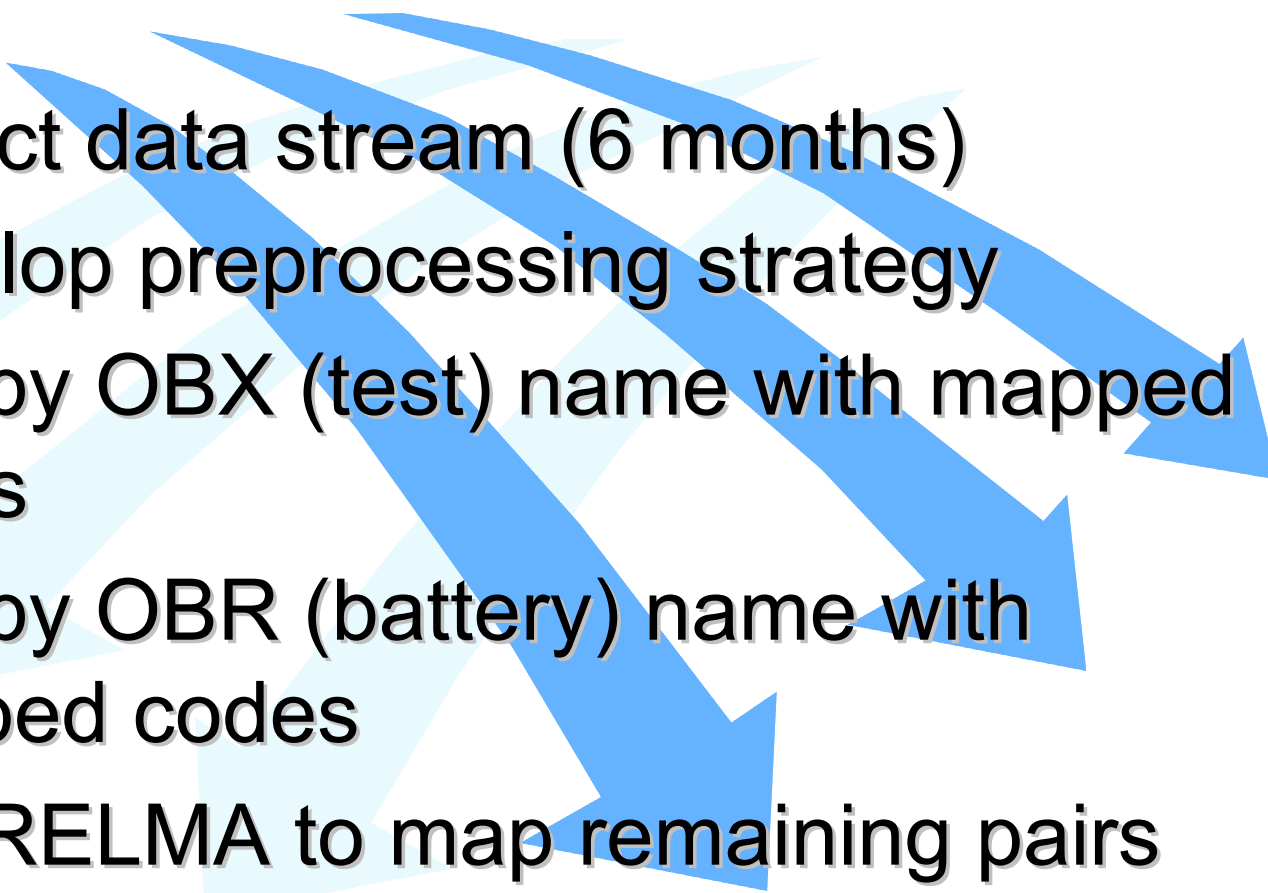
- Current
 - HL7 messages for most
 - DICOM messages for images
 - LOINC for laboratory results content
 - CPT-4 for procedures content
 - ICD-9 for diagnoses content
 - NDC and RxNorm for medications content
- Anticipated
 - SNOMED/CUIs for microbiology content



Where in the flow to standardize?



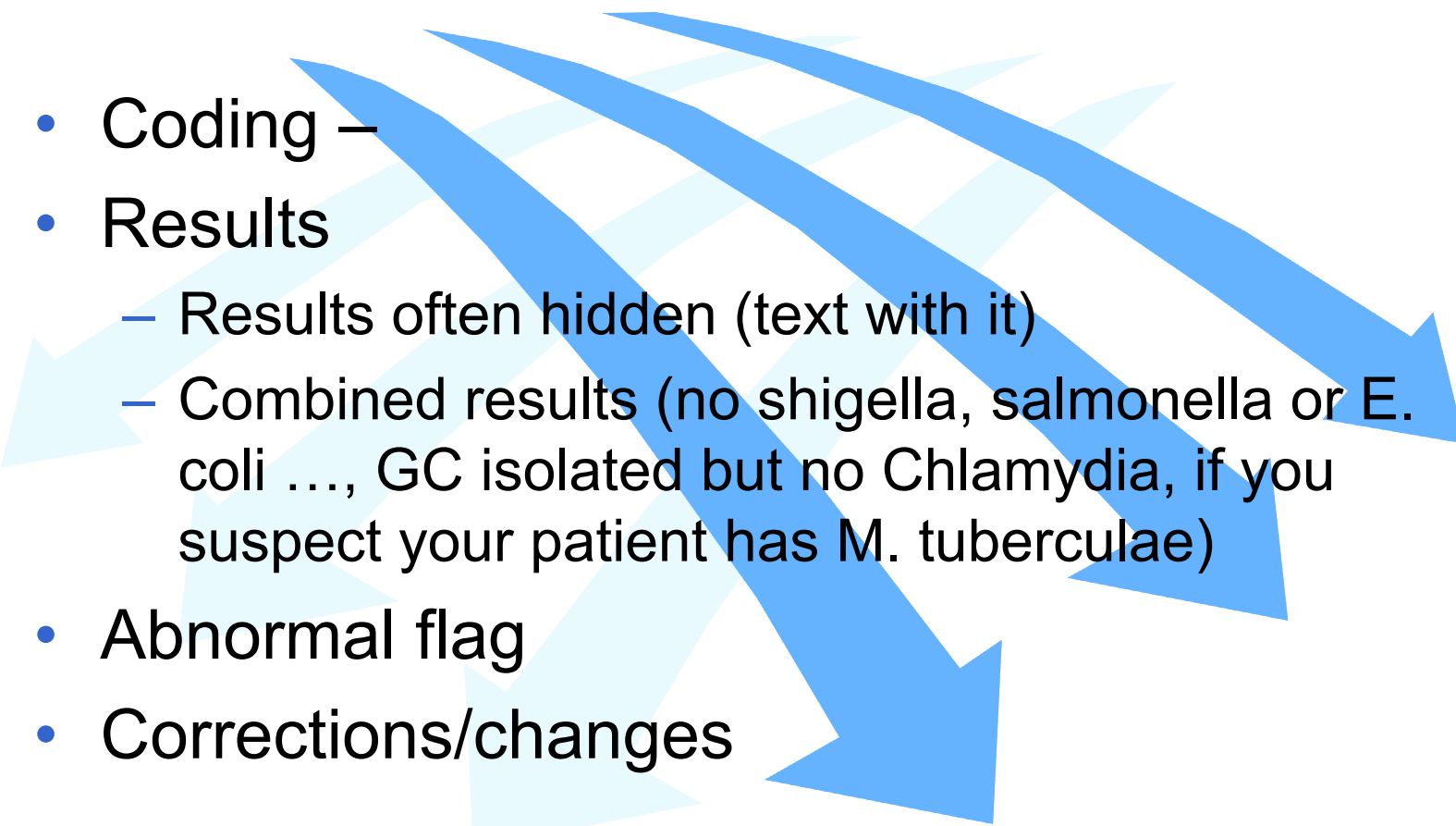
Mapping strategy

- Collect data stream (6 months)
 - Develop preprocessing strategy
 - Sort by OBX (test) name with mapped codes
 - Sort by OBR (battery) name with mapped codes
 - Use RELMA to map remaining pairs
 - Keep original codes with result
- 

Result conversions

- When units are scaled differently (factors of 10)
- When units are different
- Unit synonyms
- Units in message are not always units for results (eg 3L FiO2 versus a %)

HL7 message issues

- Coding –
 - Results
 - Results often hidden (text with it)
 - Combined results (no shigella, salmonella or E. coli ..., GC isolated but no Chlamydia, if you suspect your patient has M. tuberculosis)
 - Abnormal flag
 - Corrections/changes
- 

Example bad messages

- Value, units, normal ranges, flags, and performance site put ALL in OBX-5
- Value and units both jammed into OBX-5
- OBX-5 says “see comment” - everything jammed into following NTE
- Whole report (many test results) jammed into single OBX-5