Bridging the Chasm

W. Ed Hammond, Ph.D., FACMI, FAIMBE
Director, Duke Center for Health Informatics
Professor, Department of Community and Family Medicine
Professor, Department of Biomedical Engineering
Adjunct Professor, Fuqua School of Business

Duke Center for Health Informatics

Exploring the Chasm

- Patient records, even electronic, are fragmented.
- Existing electronic health records mimic paper systems with the same constraints.
- Current systems are designed by technically-orient persons assuming what the clinical community really requires.
- Systems are frequently used to document what was done after the fact mostly for legal, regulatory, and billing purposes.
- Solutions to bridge the chasm are siloed and don’t provide the bridge.

Requirements

- Comprehensive data on patients' conditions, treatments and outcomes that will lead to safe, high quality, less expensive, and more efficient health care
- Cognitive support for health care professionals & patients to help integrate
  - Patient-specific data
  - Evidence-based practice guidelines & research results
- Accommodation of growing heterogeneity of locales for provision of care
- Empowerment of patients and their families in effective management of health care decisions and their implementations

The clinical community …

- Has not engaged with the technical community
- Has not accepted the value of IT in the delivery of care
- Has not taken ownership in new and innovative thinking for the use of IT in health care
- Has resisted change - “that’s not the way we do it here”
- Has not been open to accepting data from other sources
- Has not been willing to share data

The technical community …

- Has not created systems that have usability (human factors)
- Has not addressed major problems including terminology
- Has not solve the data capture problem
- Has not created clear and obvious choices
- Still lives in a world of legacy systems. We don't know how to get where we want to be from where we are.
- Has not properly integrated biomedical devices
- Has depended on propriety systems and competition rather than collaboration and open source approaches
- Has not created a believable business case
- Present solutions looking for problems

Requires paradigm shifts by stakeholders

- Technologists – more appropriate use of technology; understanding the problems that need to be solved; better coupling with the clinical community
- Clinical community – recognize what technology can do to significantly enhance health care; become the drivers for the use of eHealth; understand value of team approach that includes the patient
- Patient – Accept responsibility for one's own health; become engaged in decision-making related to one's own health; enhanced awareness of personal risk factors; practice prevention

Creative use of HIT

- Rather than using technology to identify medical errors, use technology to prevent medical errors.
- Real time analysis of data to direct safe and quality care.
  - Dashboard displays at each level to focus on priority interventions.
  - Stop errors before they happen
  - Order timely and effective testing for disease
- Proactive presentation of data with understanding of next event.
- Not just show but inform.

Focus of Meaningful Use

- Improving quality, safety, efficiency, and reducing health disparities
- Engaging patients and their families
- Improving care coordination
- Ensuring adequate privacy and security precautions for personal health information
- Improving population and public health

EHR – The Centerpiece of HIT

Real-time integration of knowledge to direct and control collection of data.

Includes the service functions: HIS, CPOE, CDS, ePrescribing, billing

Proactive interpretation of data to direct behavior to enable quality care.

Data Creation

- We need to focus on clinical semantic interoperability as an extension of semantic interoperability
- The lack of a universal single standard for terminology is the greatest barrier to interoperability.
- Proposal: The clinical community, working within each clinical specialty, create a universal repository of unique data elements at the finest level of granularity using a common process. One clinical specialty will have stewardship of each data element.
- The set of attributes associated with each data element will be defined by a small set of experts; decision is by experts, not consensus.
- Submission of a data element may be made by anyone.

Data Elements

- Each data element would be identified by a unique code with permanent persistence.
- Attributes would include: **CODE**

Definition	Name	Category	Units
Data type	Synonyms	**Classification**	Purpose
Steward	Value Set	Links	Language
Authority	Status	Date	Validation

Data Capture

- Data capture is expensive in terms of time and effort.
- We need to capture **ALL** data that is required to need our needs – whatever source or form.
- We capture data using an automated process whenever possible and engage humans only when the source is human (thinking, judgments, sensing).
- Patients are a good source of data.

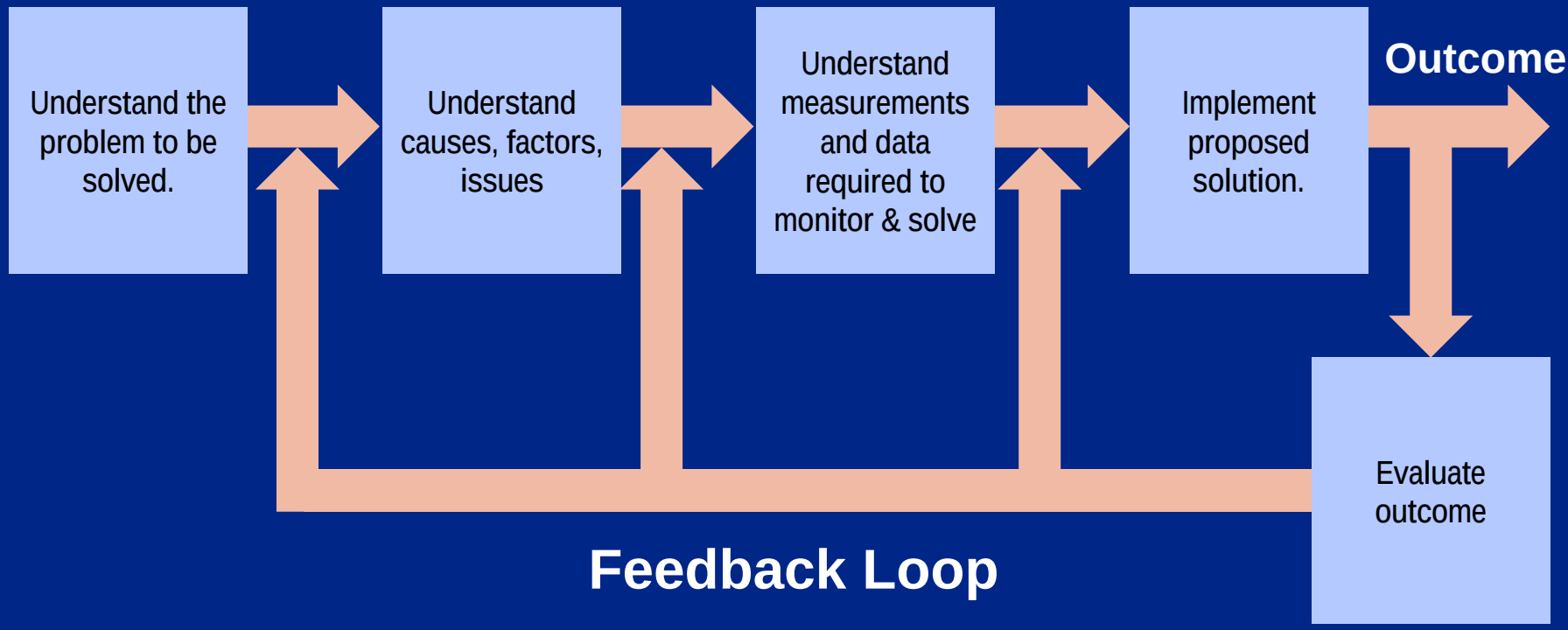
Data Capture

- We can often infer data.
  - From what is ordered
  - From what is charted
  - From the treatment
- We need to be open to all forms of data – text, images, waveforms, videos, sound, geocodes, genetics.
- We must insure timeliness, integrity, and unambiguity of data.
- We must insure appropriate level of granularity. We need to capture the lowest level in which the data exists.

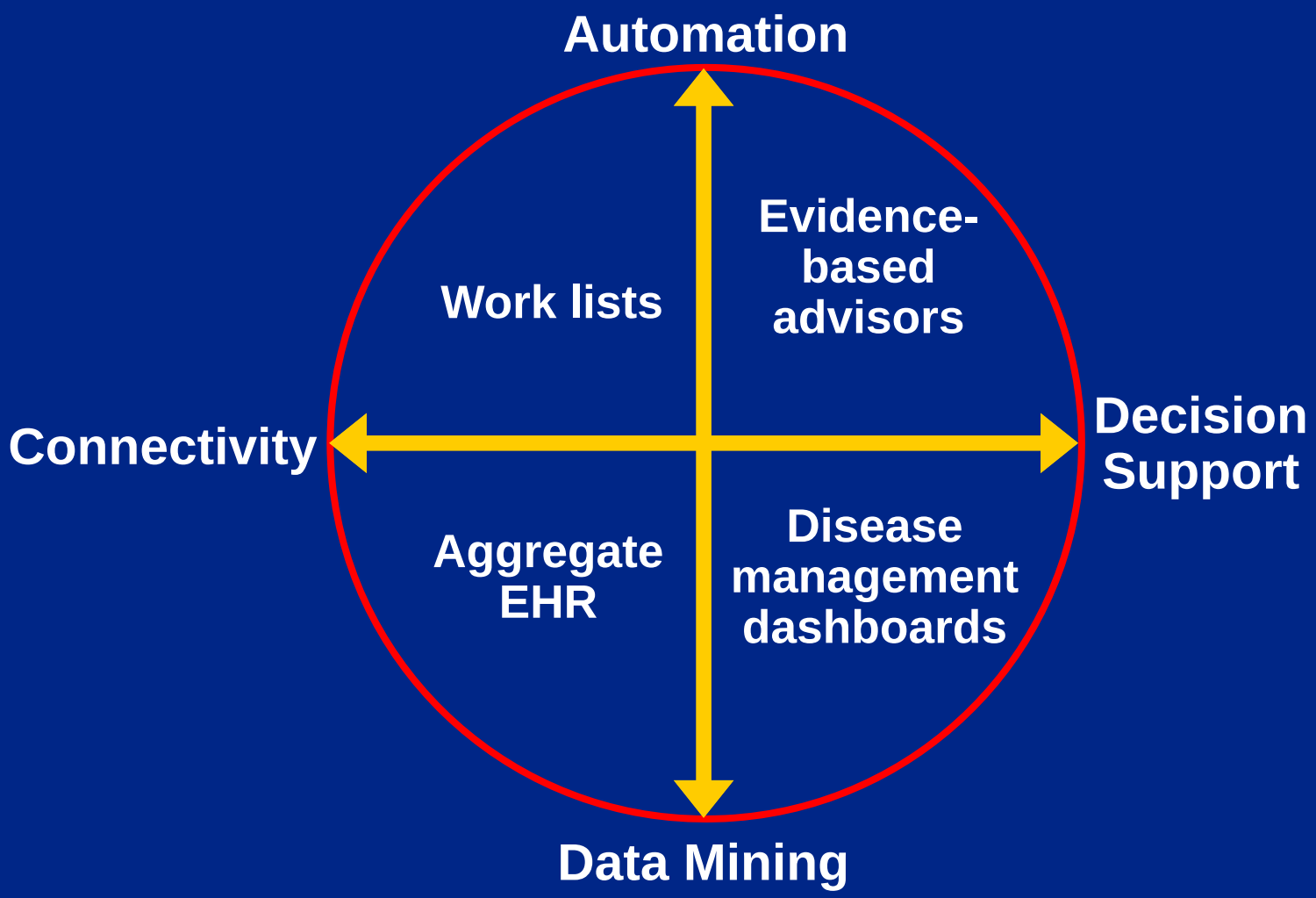
Interpreting the data

- Understand how the data relates to the problem.
- Move beyond discrete data to patterns within the data; move to new dimensions.
- Assume we have the technology to solve any problem.
- If you could get an answer to any question you asked related to health-acquired infections , how good would you be?

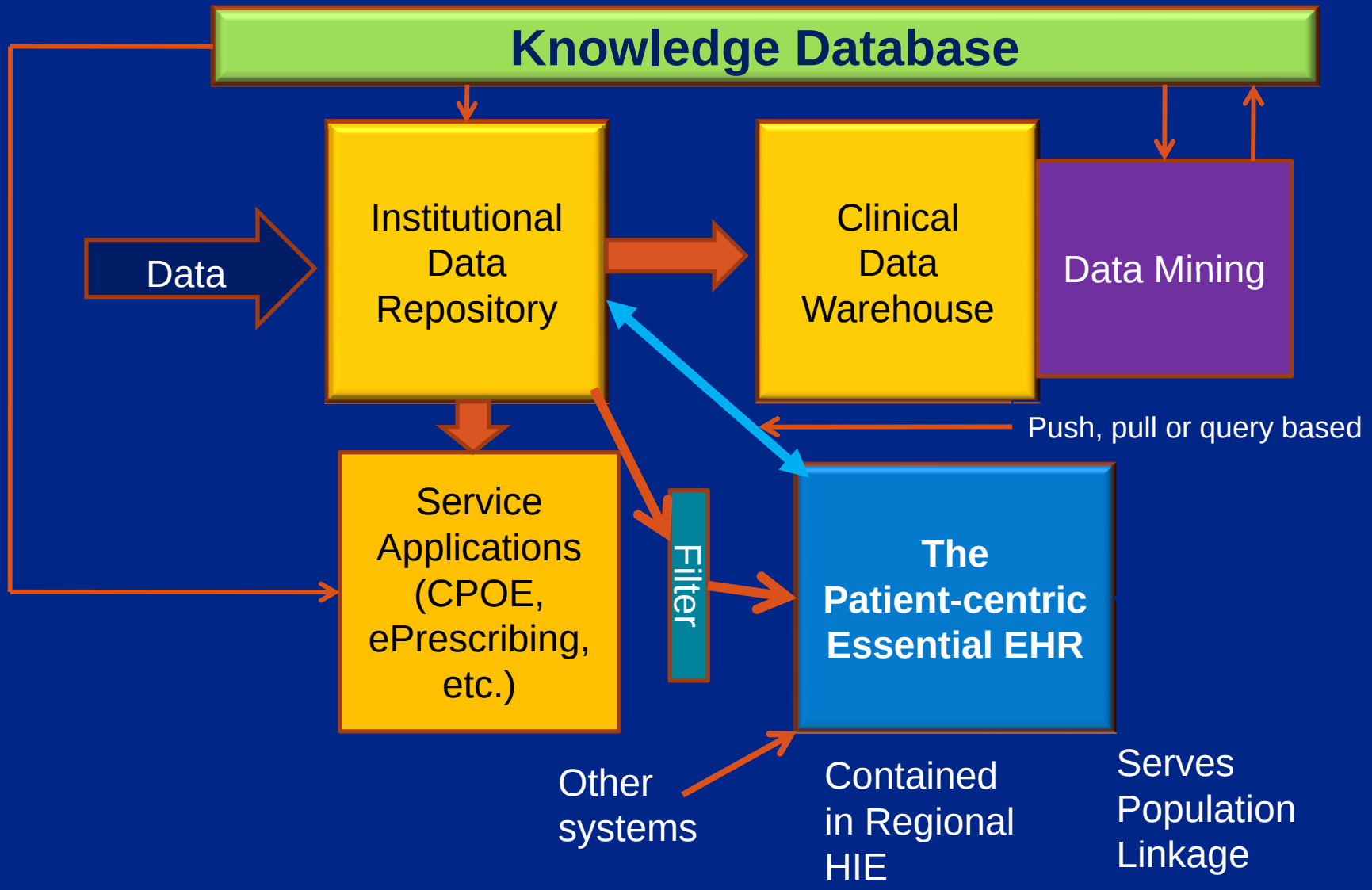
Application of HIT



Match Computational Approach to Complexity of Data



Possible Scenario



Bridging the Chasm

- Multiple use vs secondary use
- Interoperability is more than data. It is people, systems, purpose, …
- Clinical community takes ownership.
- Clinical specialties define the data elements; define data flows; define work flows; define triggers and data exchanges.
- Technical community provides required technology.
- Patients accept ownership in their own care.
- In the final analysis, however, unless what is done by both the clinical and technical community has value to the patient, it has no value. I want a high quality of life and then a long life.