

EHR Configuration Challenges and Opportunities

Dr. Dean Sittig

A Socio-technical Model for Safe and Effective HIT Implementation & Use

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Watch

Read

Attend

Participate

About

Joe Smith:

How to use a paper towel

TEDxConcordiaUPortland · 4:31 · **Filmed Mar 2012**

Subtitles available in 39 languages

 [View interactive transcript](#)

An EHR is not an ATM

The screenshot displays a complex medical EHR interface. At the top, it shows patient information for 'IMAGPatient, One' with a photo and various identifiers. Below this, there are sections for 'Lab Results' and 'Laboratory Results'. A table of lab results is visible, with columns for Date/Time, Specimen, HCT, HGB, MCV, PLT, and WBC. A line graph below the table plots Hct (Blood) over time, with a legend indicating 'Hct (Blood)', 'Ret Low #1', and 'Ret High #1'. The interface is cluttered with many buttons and menus, typical of a professional medical software application.

≠

The screenshot shows an ATM transaction screen with a blue background. At the top, it says 'SELECT A TRANSACTION'. There are several buttons for transaction amounts: '\$20', '\$50', '\$100', '\$200', '\$1000', and 'WITHDRAW'. There are also buttons for 'MY ATM', 'FUND TRANSFER', and 'MORE SERVICES'. At the bottom, a green button shows 'BALANCE \$100,000.21' and a red button says 'CANCEL'.

SHARP-c Clinical Summarization

- Started with a grand plan
- Quickly realized that there were many obstacles in our path...
 - Data availability and interpretability issues
 - Gaps in computer-readable knowledge bases
 - Limitations of current EHR interfaces
 - No clear agreement on what summarization even meant!
- Didn't even have the tools – theories or frameworks – to address these sorts of complex, socio-technical problems

Modern healthcare system is a complex adaptive system

- Non-linear and dynamic: does not reach a steady state
- Composed of independent agents whose behavior based on physical, psychological or social rules
- Independent agents are not the same

Modern healthcare system is a complex adaptive system

- Agents are intelligent
- Adaption and change leads to self-organizing behaviors
- Result in systems which are unpredictable and uncontrollable

HIT can improve safety and effectiveness of healthcare

AMERICAN JOURNAL OF

Respiratory and Critical Care Medicine.



ATS.

We help the world breathe
PUBLISHED BY THE AMERICAN THORACIC SOCIETY

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www.thoracic.org

Randomized clinical trial of pressure-controlled inverse ratio ventilation and extracorporeal CO₂ removal for adult respiratory distress syndrome.

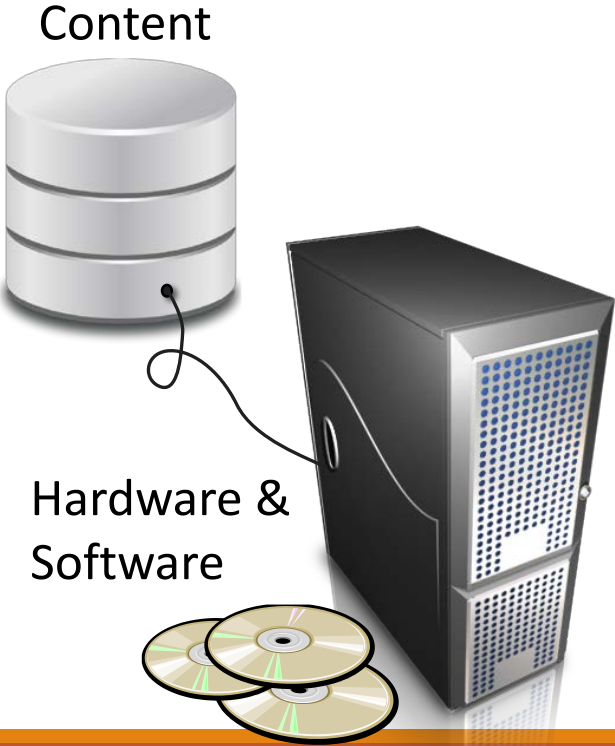
A H Morris, C J Wallace, R L Menlove, T P Clemmer, J F Orme, Jr, L K Weaver, N C Dean, F Thomas, T D East, N L Pace, M R Suchyta, E Beck, M Bombino, D F Sittig, S Böhm, B Hoffmann, H Becks, S Butler, J Pearl, and B Rasmusson

8-dimension Socio-Technical Model of Safe & Effective EHR Use

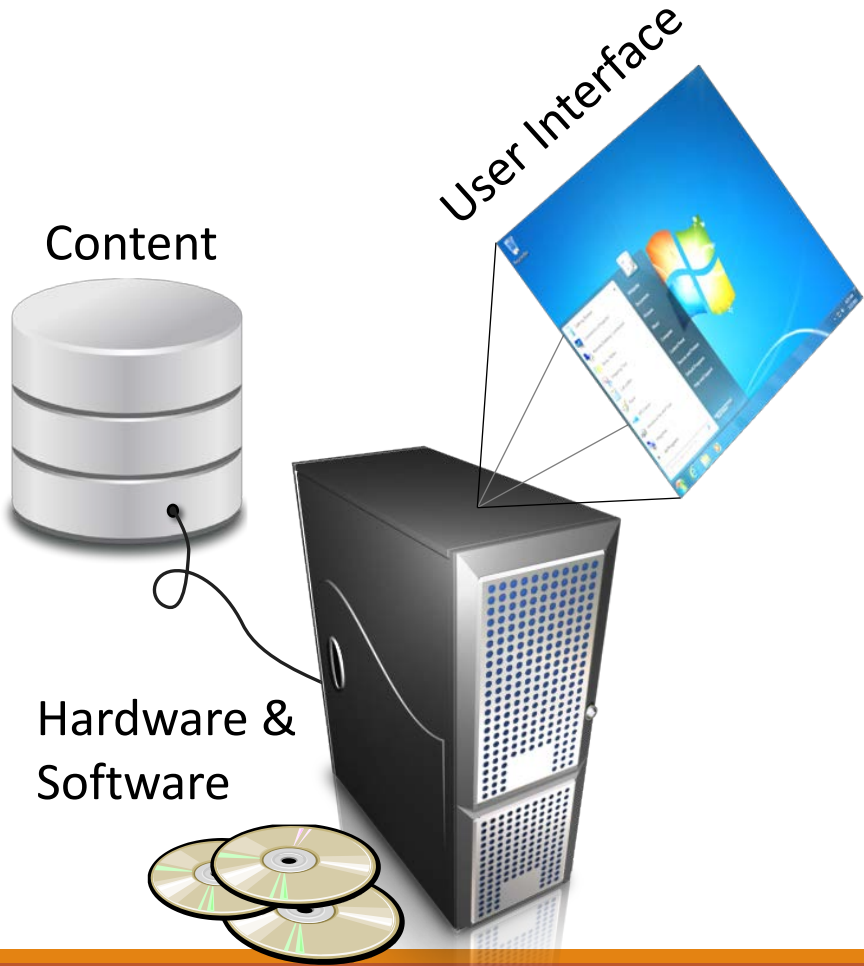
Hardware &
Software



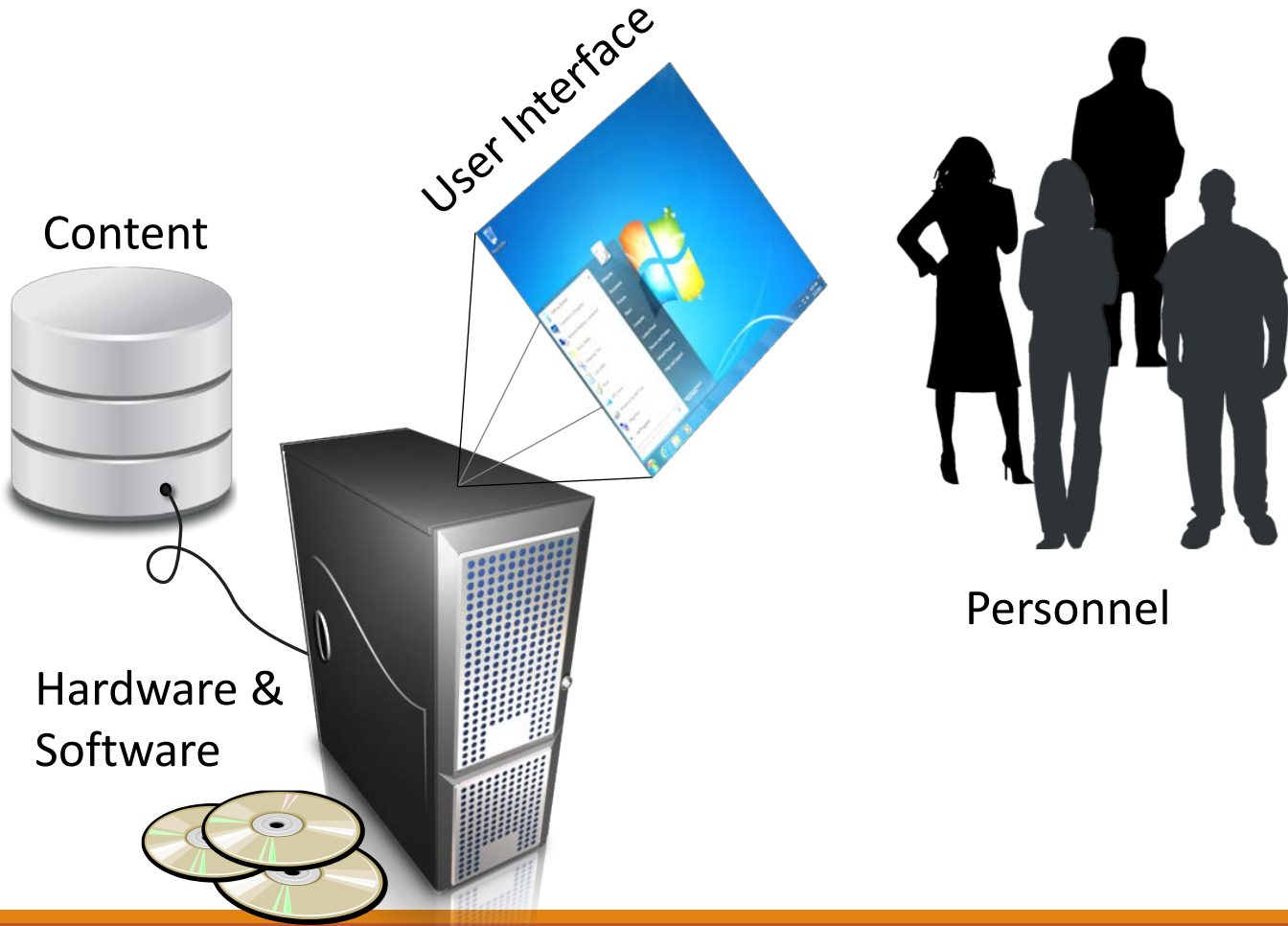
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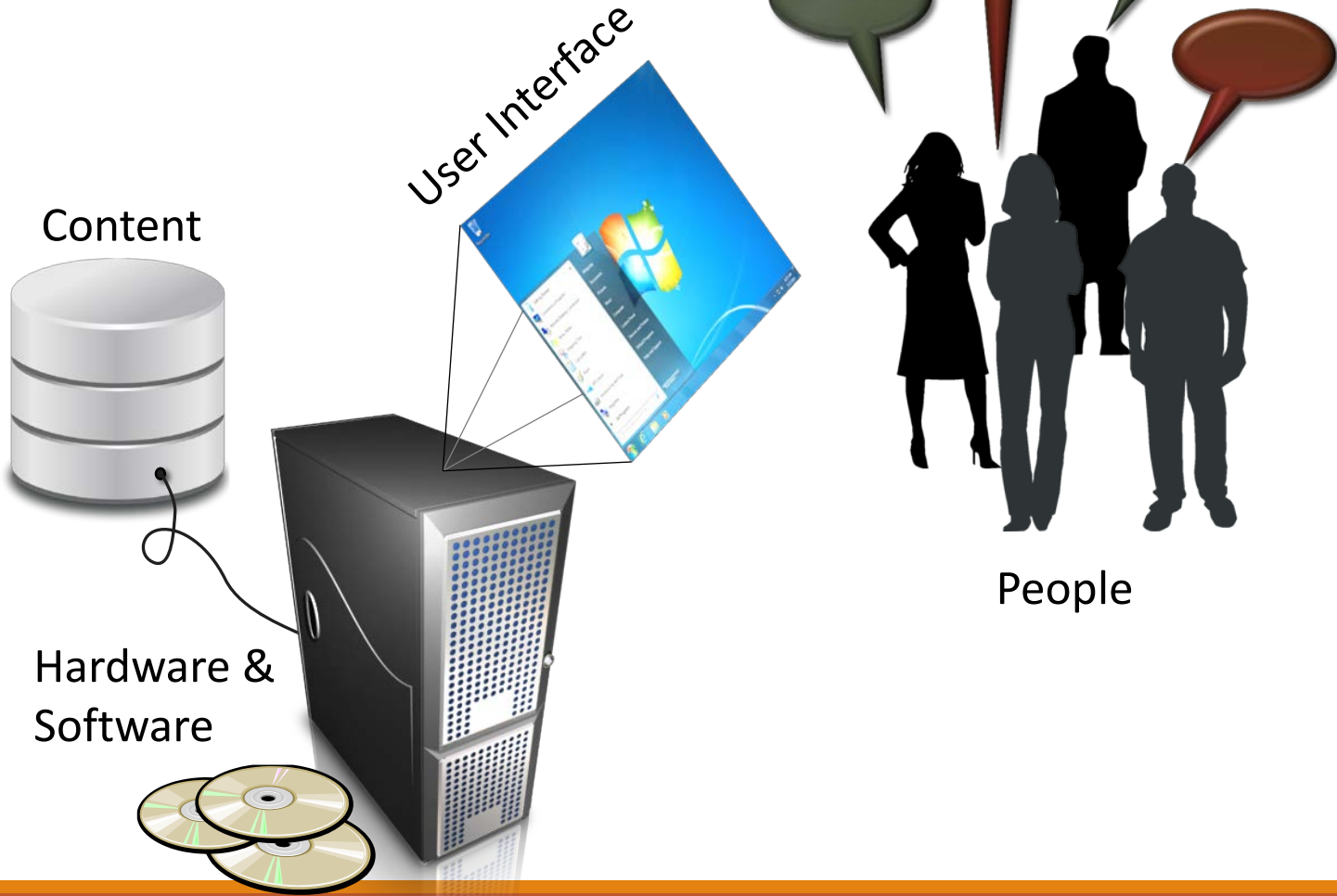


8-dimension Socio-Technical Model of Safe & Effective EHR Use



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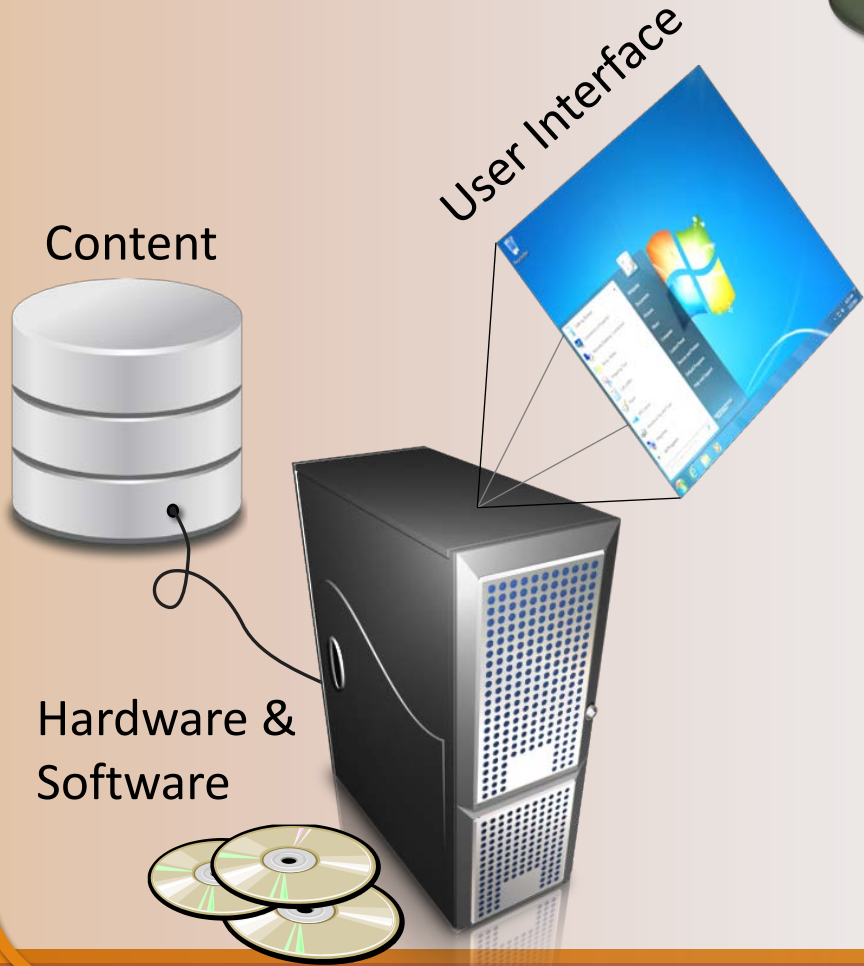
Workflow & Communication



8-dimension Socio-Technical Model of Safe & Effective EHR Use

Organizational Policies,
Procedures, & Culture

Workflow & Communication



People

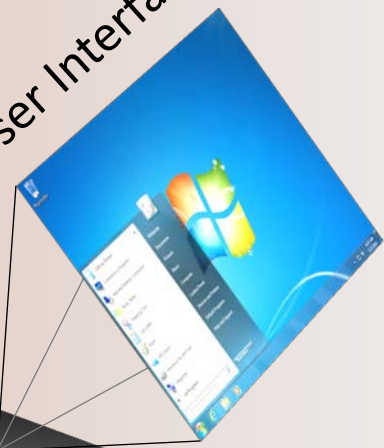
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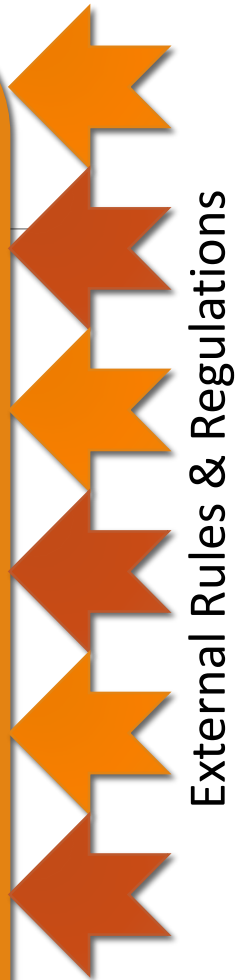
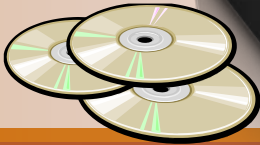
User Interface

Content



People

Hardware &
Software



External Rules & Regulations

8-dimension Socio-Technical Model of Safe & Effective EHR Use

Organizational Policies, Procedures, & Culture

Workflow & Communication

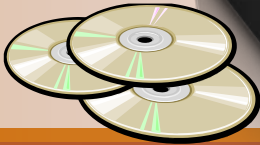
User Interface

Content



People

Hardware & Software



External Rules & Regulations

Measurement & Monitoring



JAMA 2009; 302(10):1111-3

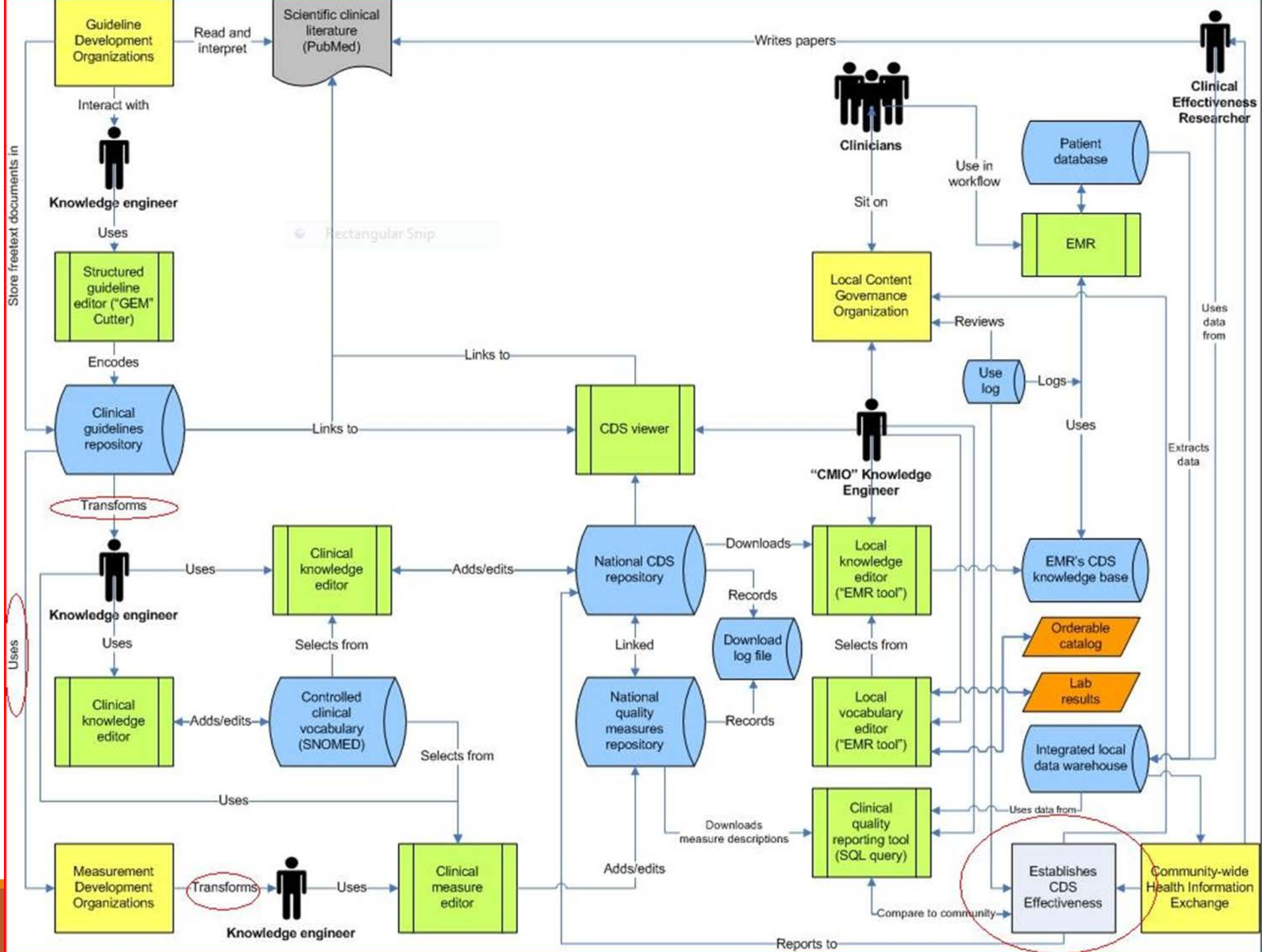
Quality & Safety in Healthcare 2010; 3:i68-74

Clinical Summarization

- A key unaddressed Grand Challenge in clinical informatics
- Requires multiple steps, each with major socio-technical obstacles:
 - **Aggregate** – data interchange standards / HIPAA / organizational resistance

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 - **Interpret** – clinical knowledge / FDA regulations?
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- Failure to address this challenge is NOT an option
- Require long-term commitment using a socio-technical approach

J Am Med Inform Assoc 1994; 1(5):412-413

J Biomed Inform. 2008 Apr;41(2):387-92

J Biomed Inform. 2011 Aug;44(4):688-99

Thank You!

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