IT for Health

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Health IT: Better Care, Better Health, or Both?

1. Brief History of Health IT in US (2-13)
2. Has health IT realized its potential as a true enabler of value based care & population health? (13-20)
3. Usability & patient safety (21- 32)
4. Interoperability – what is it?
5. Positive and negative impact of federal policies
6. How care providers, policy makers, employers and payers might prepare for the next iteration of this important component of our care delivery infrastructure.

2

The Promise:

Technology will

Influence our trajectory toward improved population health.

3

A short review of the health IT industry's ~ 30 year history

4

Financial Management

- 60's Mainframes: IBM
- 70's Shared Systems: SMS
- 80's Minicomputers: HBO, Meditech, Eagle
- 90's Client/Server: SMS, Cerner, HBOC, TDS

5

Even back then …

6

9-20-89

Malvern company's software throws 100 hospitals for a loop

By John Burgess
Washington Post

WASHINGTON — About 100 hospitals around the country were forced yesterday to switch from computers to pen and paper for major bookkeeping functions because a software program from a Pennsylvania company could not figure out what day it was.

The incident affected hospitals that use software and services provided by Shared Medical Systems Corp. of Malvern, Pa. The company stores and processes information for hospitals on its own mainframe computers and provides software that can be used on IBM equipment.

Officials said data were not permanently lost and that patient treatment was not threatened. But the incident, apparently caused by a mistake in programming, demonstrates how institutions are accepting the risk that major disruptions might occur in the workplace as more and more functions are handed to computers.

Problems began to appear at numerous hospitals early yesterday morning. As call after call for help began arriving at Shared Medical headquarters, technicians there realized that a pattern was emerging and advised clients to shut down parts of their computer systems as the technicians searched for the cause.

The problem was traced hours later to a program that allows hospitals to automate the ordering and reporting of laboratory tests. Because of a fault in the aging software, the machines were unable to accept as valid the date Sept. 19, 1989, and went "into a loop," refusing to work, Shared Medical spokesman A. Scott Holmes said.

By day's end, computer services had been disrupted at about 100 of Shared Medical's 600 to 700 client hospitals.

One computer specialist described the problem as a "birth defect," an accidental fault put in a program in its early days that later threatened the system's health — in contrast to a "virus," a program that is written with the deliberate purpose of replicating itself and causing disruption.

Clinical Systems

60's paper
70's paper
80's paper
90's paper

8

Clinical Systems 1980s-1990's

1. Data GET
    1. Labs
    2. Transcribed notes
    3. Care Gaps: 1990's
2. Data PUT
    1. Transcription
    2. Rounding lists
3. Early EHRs
    1. Duke
    2. BI/MGH
4. Early CDS
    1. Iliad, QMR

9

Clinical Systems 2000 - 2010

1. EHRs
   1. Hospital systems
      1. Labs - get
      2. CPOE – put
      3. Notes – nope
   2. Practice Systems
      1. Built on top of PM (financial base)
      2. Physician Designed
      3. Crappy software
         1. Technical problems
         2. Design problems
         3. Usability problems

10

Meaningful use

11

<u>Meaningful</u> use (a separate 3 hr talk)
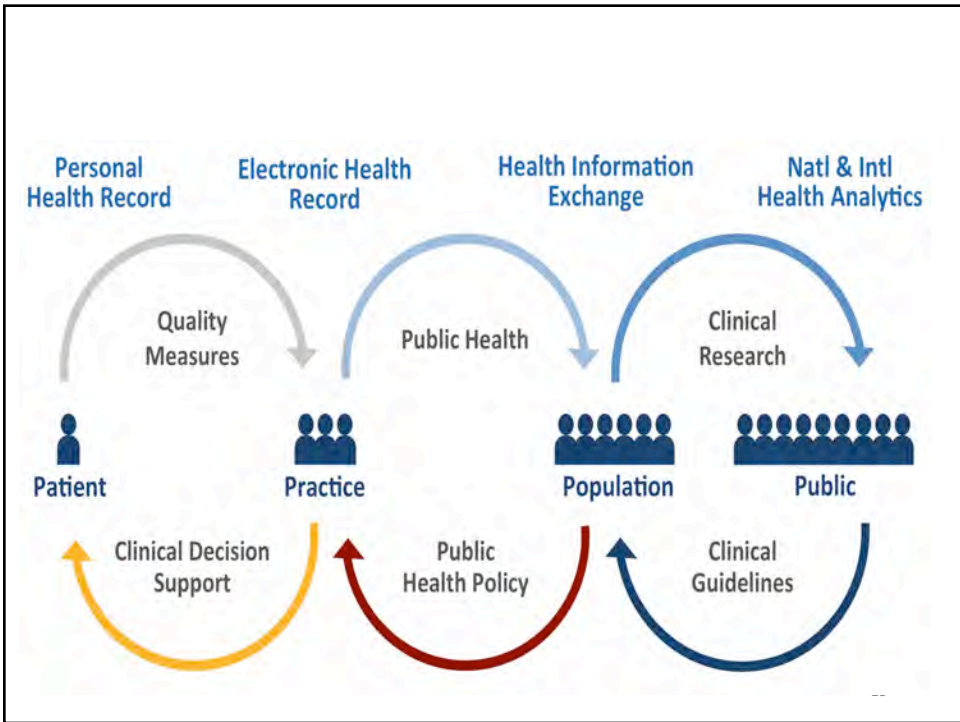
1. Adopt

2. Exchange

3. Improve

12

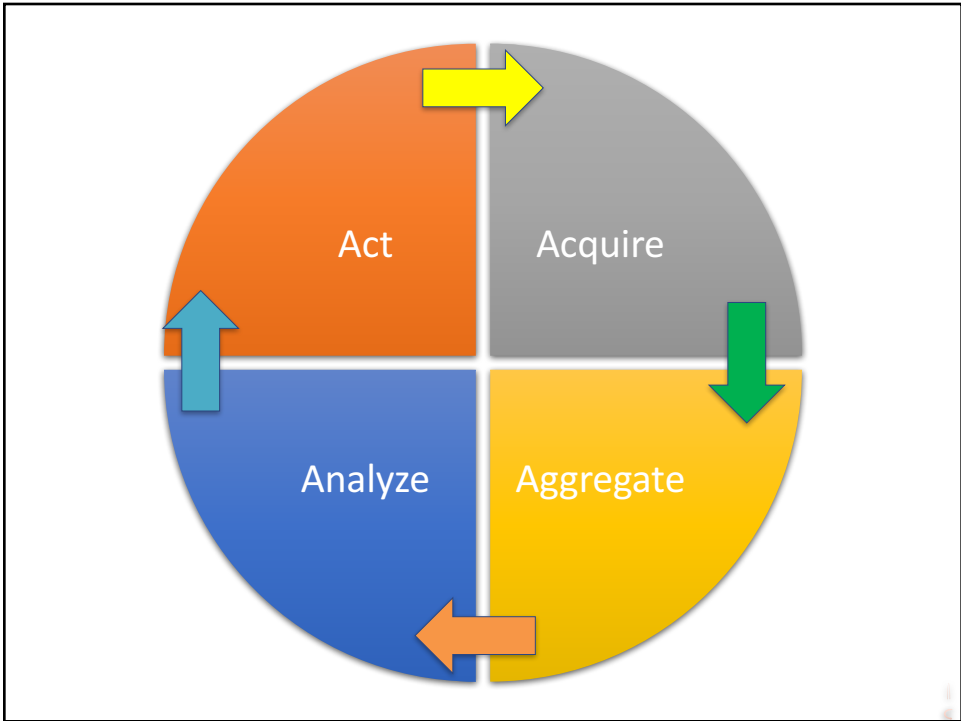Has health IT realized its potential as a true enabler of value based care & population health?
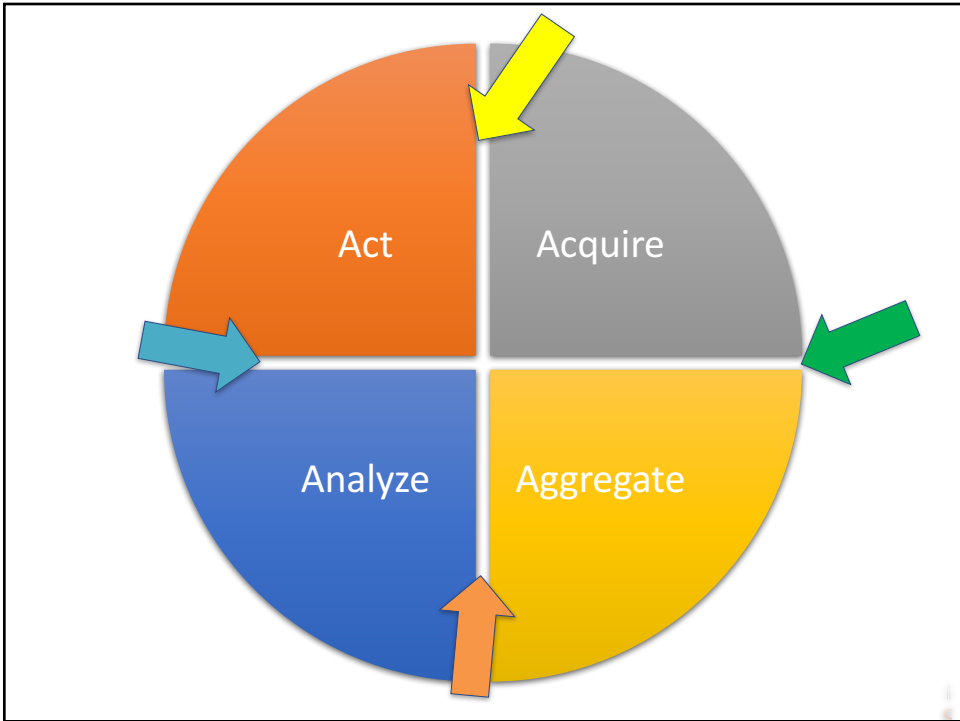
13

No

(not yet)

14

Personal Health Record · Electronic Health Record · Health Information Exchange · Natl & Intl Health Analytics

Quality Measures · Public Health · Clinical Research

Patient · Practice · Population · Public

Clinical Decision Support · Public Health Policy · Clinical Guidelines

The diagram shows a circle divided into four quadrants labeled: Act, Acquire, Analyze, Aggregate, with arrows between them forming a cycle.

Barriers to population health

17

Act Acquire

Analyze Aggregate

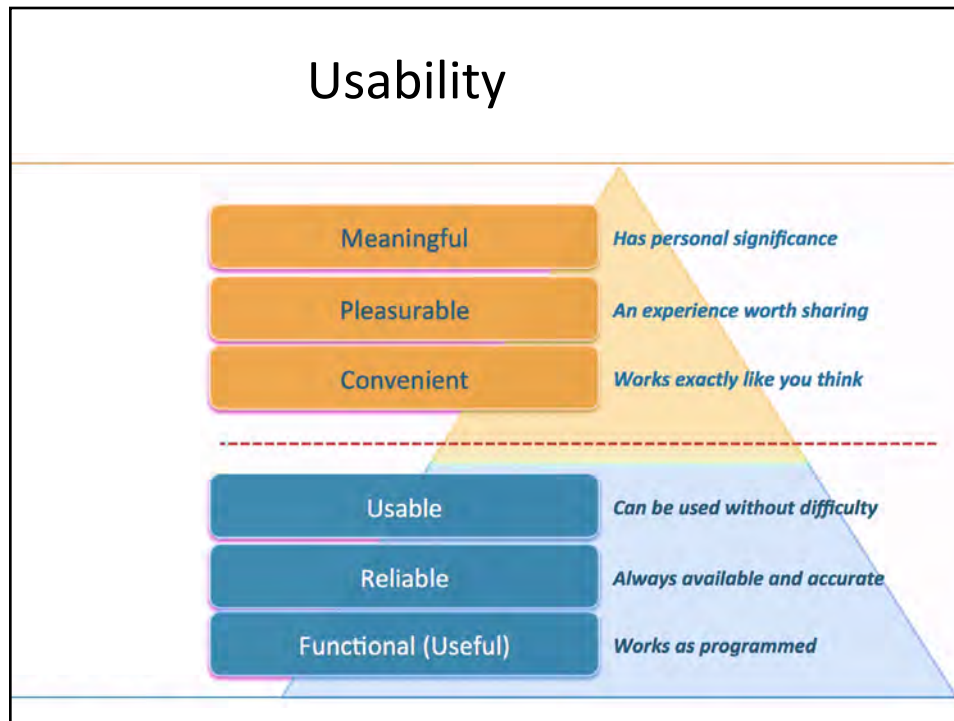Health IT: true enabler of value based care & population health?

19

No

(not yet)

20

Contrast between the rapid advancement and improved usability
of consumer products vs. slow improvement of health IT.

21

Usability

Meaningful	Has personal significance
Pleasurable	An experience worth sharing
Convenient	Works exactly like you think
Usable	Can be used without difficulty
Reliable	Always available and accurate
Functional (Useful)	Works as programmed

Current state of health IT

- Literature has shown that health IT may lead to safer care and/or introduce new safety risks

- Magnitude of harm and impact of health IT on patient safety is not well known because:
  - Heterogeneous nature of health IT products
  - Diverse impact on different clinical environments and workflow
  - Legal barriers and vendor contracts
  - Inadequate and limited evidence in the literature

IOM: Health IT and Patient Safety: Building Safer Systems for Better Care November 10, 2011

24

Federal policies &
Regulations

25

Nat'l Highway Traffic Safety Admin., DOT   **§ 571.111**

§ 571.111 Standard No. 111; Rearview mirrors.

S1. *Scope.* This standard specifies requirements for the performance and location of rearview mirrors.

S2. *Purpose.* The purpose of this standard is to reduce the number of deaths and injuries that occur when the driver of a motor vehicle does not have a clear and reasonably unobstructed view to the rear.

S3. *Application.* This standard applies to passenger cars, multipurpose passenger vehicles, trucks, buses, schoolbuses and motorcycles.

S4. *Definitions.*

Convex mirror means a mirror having a curved reflective surface whose shape is the same as that of the exterior surface of a section of a sphere.

Effective mirror surface means the portions of a mirror that reflect images, excluding the mirror rim or mounting brackets.

Unit magnification mirror means a shall be those established in Motor Vehicle Safety Standard No. 104 (§ 571.104) or a nominal location appropriate for any 95th percentile male driver.

S5.1.2 *Mounting.* The mirror mounting shall provide a stable support for the mirror, and shall provide for mirror adjustment by tilting in both the horizontal and vertical directions. If the mirror is in the head impact area, the mounting shall deflect, collapse or break away without leaving sharp edges when the reflective surface of the mirror is subjected to a force of 400 N in any forward direction that is not more than 45° from the forward longitudinal direction.

S5.2 *Outside rearview mirror—driver's side.*

S5.2.1 *Field of view.* Each passenger car shall have an outside mirror of unit magnification. The mirror shall provide the driver a view of a level road surface extending to the horizon from a line perpendicular to a longitudinal

26

27

2015 Edition Base EHR Definition - Certification Criteria Required to Satisfy the Definition	
Base EHR Capabilities	**Certification Criteria**
Includes patient demographic and clinical health information, such as medical history and problem lists	Demographics § 170.315(a)(5) Problem List § 170.315(a)(6) Medication List § 170.315(a)(7) Medication Allergy List § 170.315(a)(8) Smoking Status § 170.315(a)(11) Implantable Device List § 170.315(a)(14)
Capacity to provide clinical decision support	Clinical Decision Support § 170.315(a)(9)
Capacity to support physician order entry	Computerized Provider Order Entry § 170.315(a)(1), (2) or (3)
Capacity to capture and query information relevant to health care quality	Clinical Quality Measures – Record and Export § 170.315(c)(1)
Capacity to exchange electronic health information with, and integrate such information from other sources	Transitions of Care § 170.315(b)(1) Data Export § 170.315(b)(6) Application Access – Patient Selection § 170.315(g)(7) Application Access – Data Category Request § 170.315(g)(8) Application Access – All Data Request § 170.315(g)(9) Direct Project § 170.315(h)(1) or Direct Project, Edge Protocol, and XDR/XDM § 170.315(h)(2)

Certification Requirements
This certification criterion was adopted at § 170.315(g)(3), and is required for all developers seeking certification to § 170.315(a)(1) through (9), (a)(14), (b)(2) or (b)(3). There are no associated required privacy and security criterion for this certification criterion.

Regulation Text
Safety-enhanced design.
(i) User-centered design processes must be applied to each capability technology includes that is specified in the following certification criteria: paragraphs (a)(1) through (9) and (14), (b)(2) and (3) of this section.
(ii) Number of test participants. A minimum of 10 test participants must be used for the testing of each capability identified in paragraph (g)(3)(i) of this section.
(iii) One of the following must be submitted on the user-centered design processed used:
  (A) Name, description and citation (URL and/or publication citation) for an industry or federal government standard.
  (B) Name the process(es), provide an outline of the process(es), a short description of the process(es), and an explanation of the reason(s) why use of any of the existing user-centered design standards was impractical.
(iv) The following information/sections from NISTIR 7742 must be submitted for each capability to which user-centered design processes were applied:
  (A) Name and product version; date and location of the test; test environment; description of the intended users; and total number of participants;
  (B) Description of participants, including: sex; age; education; occupation/role; professional experience; computer experience; and product experience;
  (C) Description of the user tasks that were tested and association of each task to corresponding certification criteria;
  (D) The specific metrics captured during the testing of each user task performed in (g)(3)(iv)(C) of this section, which must include: task success (%); task failures (%); task standard deviations (%); task performance time; and user satisfaction rating (based on a scale with 1 as very difficult and 5 as very easy) or an alternative acceptable user satisfaction measure;
  (E) Test results for each task using the metrics identified above in paragraph (g)(3)(iv)(D) of this section; and
  (F) Results and data analysis narrative, including: major test finding; effectiveness; efficiency; satisfaction; and areas for improvement.
(v) Submit test scenarios used in summative usability testing.

29

http://chpl.healthit.gov

▼ Additional Information

Usability Report

https://icsalabs.s3.amazonaws.com/TRS/2015-HITM228012-2016-1014-03.pdf

SED Intended User Description

The EpicCare Ambulatory Suite is designed to accommodate physician and nurse specialists, therapists, and other specialized care providers in addition to primary care providers, in an outpatient setting.

30

Interoperability

31
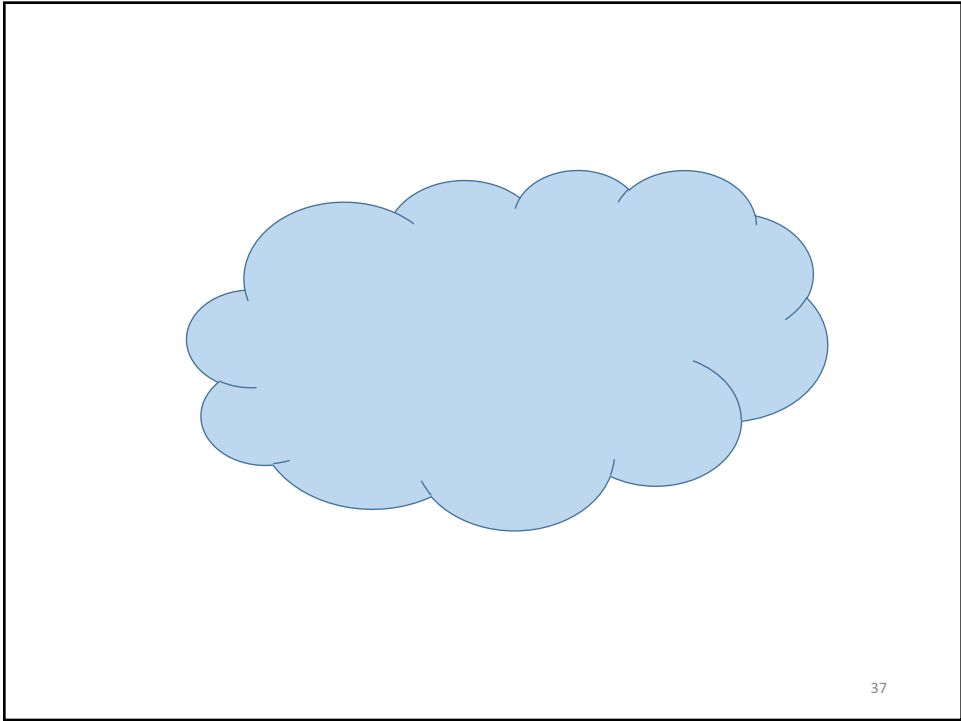
Technical Interoperability
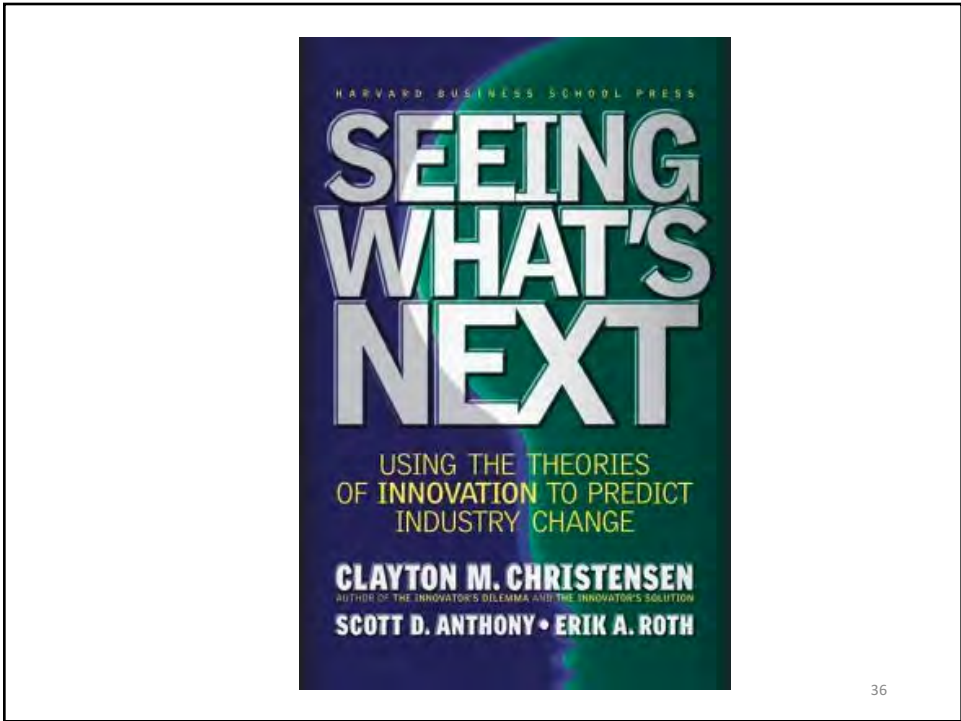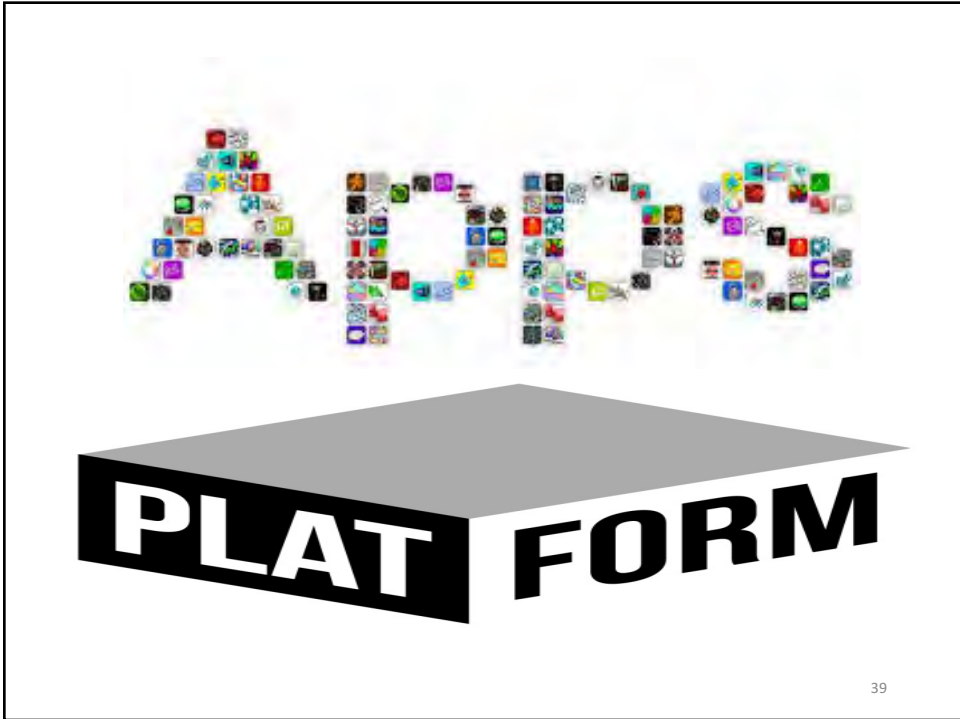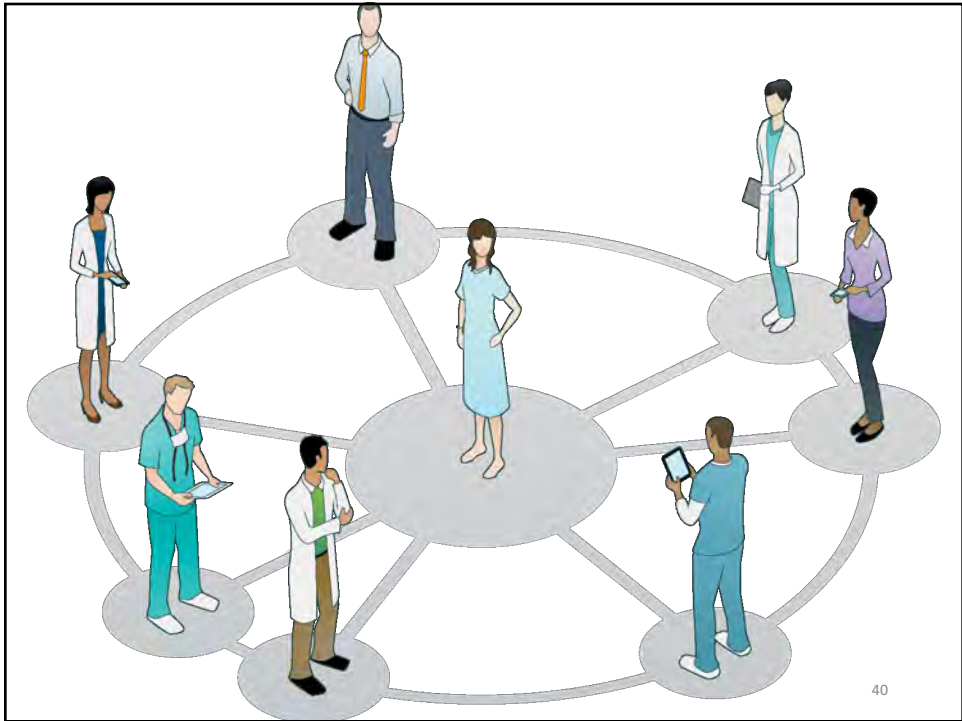

32

Semantic Interoperability

33

The ability of systems to **exchange** and **use** electronic health information from other systems without special effort on the part of the user.
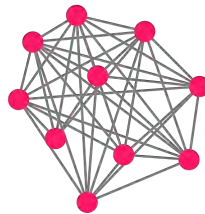
34

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36

37

38

39

40

THE PRECISION MEDICINE INITIATIVE

41

Blockchain

Decentralized   Distributed

43

Now the fun part ..

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45