Health Informatics: Where are we now, and what’s next?

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THE SCOPE OF INFORMATICS IN CHANGING
Biomedical Informatics in Perspective

Basic Research

Applied Research And Practice

Bioinformatics

Imaging Informatics

Clinical Informatics

Public Health Informatics

Biomedical Informatics Methods, Techniques, and Theories
The Scope of Health Informatics

Bioinformatics
Translational Research
Clinical Research
Consumers
Clinical
Population Health
Public and Global Health

DNA
Small Molecules
Diseases
Patient
Practice
Population

Scope of Health Informatics

Public

10^9
10^6
10^3
10^0
10^3
10^6
10^9

10^9
10^6
10^3
10^0
10^3
10^6
10^9

Bioinformatics
Translational Research
Clinical Research
Consumers
Clinical
Population Health
Public and Global Health
INFORMATICS IS MATURING AS A FIELD
Elements of a Mature Profession

- Professional societies
- Code of Ethics
- Initial professional education
- Skills development/apprenticeship
- Accreditation
- Certification
- Licensing (if applicable)
- Professional development (continuing education)
ADVANCED HEALTH INFORMATICS CERTIFICATION
Advanced Health Informatics Certification

Accreditation

- Health Professional School Accreditation
- CAHIIM Masters Informatics Accreditation

Education

- Masters or Higher Degree in Primary Health Profession
- Masters or Higher Degree in Informatics

Experience

- Experiential training

Certification

- Advanced Health Informatics Certification
SO WHERE ARE WE?
WHAT’S NEXT? WHAT’S MISSING
MEANINGFUL USE HAS HAD A PROFOUND IMPACT ON ELECTRONIC RECORDS
US Physician EHR Adoption

*EHR = any EHR with basic or advanced capabilities*
WHAT WE LEARNED IN THE LAST 10 YEARS? (IN 5 EASY STEPS)
FRAMING MATTERS:
HEALTH IT IS ONE ULTRA-LARGE SCALE SYSTEM
Ultra-Large-Scale Systems
The Software Challenge of the Future
It’s not architecture. It’s city planning

- Decentralized control
  - Federation and data sharing (via standards)
  - Patient will be the one common feature
- It’s a socio-technical system
  - People don’t just interact with the systems. They are PART of the system.
- Unknowable and diverse requirements
  - Iterative, incremental development, since we will learn as we go
- Continuous evolution and deployment
  - Tolerate differences in semantics, syntax, and sophistication
  - Path of least regret
- Normal failures
  - Security is important, recovery and restoration even more so
- Orchestration rather than command and control
  
  *Health IT and Informatics is not about architecture and engineering. It’s about city planning.*
STANDARDS AND INTEROPERABILITY: HARD IN THE CONCRETE, IMPOSSIBLE IN THE ABSTRACT
Interoperability only makes sense in the context of what you want to DO

Interoperability (IEEE)

• Ability of two or more systems to **exchange** information
• Ability of those systems to **use** the information that has been exchanged
FRAME THE SOLUTION IN TERMS OF THINGS THAT MATTER TO PEOPLE
The Triple Aim

- Health
- Healthcare
- Costs
WE NEED TO THINK ACROSS 4 SCALES OF ENGAGEMENT
The learning health system

- Consumer empowerment
- Electronic Health Record and Quality
- Big Data and population health
- Clinical and Translational Research

Informatics, standards, testing, business drivers, governance
FIVE TECHNICAL THINGS TO STANDARDIZE
# Technical stack

## Meaning
How should well-defined values be coded so that they are universally understood?

## Content Structure
How should the message be formatted so that it is computable?

## Transport
How does the message move from A to B?

## Security
How do we ensure that messages are secure and private?

## Services
Purpose-specific APIs and services that leverage the 4 other building blocks
THE FUTURE OF INFORMATICS
EHRS WILL NOT BE THE MOST IMPORTANT HEALTH IT
The Physician's Automobile

Its Advantages and Disadvantages.

A DISCUSSION OF CARS, TIRES, MOTORS, ROADS, CHAUFFEURS, AND REPAIRS.

PROFITING BY THE OTHER MAN'S EXPERIENCE.

ROLANDUS G. WALKER, M.D.
DENVER.

BUY a car proved good by others’ experiences. Do not buy a machine that was worn out by a previous owner, or one that was built to sell cheaper than a good, substantial automobile can be sold. My car has proved a great satisfaction to me. It is a well-made, four-cylinder runabout (102*), 20 h. p., easy access to all working parts, plenty of space for satchels, rides easily and is operated economically.

Advantages of Automobiles.

The advantages of automobiles as compared with all other vehicles are, in brief, their speed, absence of fatigue, ease of control in not running away, in not starting unbidden, in being safely left untended, in excellence of brakes, economy in requiring less stable room, less immediate attention on return from a journey, and less lengthy attention before starting on one, the access they give to beautiful scenery, the access to a large circle of friends when living in the country, and the access to the country when in town, the health they bring with fresh air, all united with an absorbing pursuit, distraction from work, ease of traveling, and perfect harmlessness in the streets.

The horse and buggy can not be compared with an automobile for genuine pleasure, health and excitement. For the broadening, we commend an auto trip. Not a cut-and-dried affair, where the details have been arranged in advance, but a go-as-you-please, with no definite route in view. Just go when and where the spirit moves you. Don't hurry. Take things easy, and if you come to a broken bridge, don't swear, just consider it one of the experiences, back up and find another way around. It is these unexpected things that bring the best recreation. Let down the top and give the sun and air a chance to get at you. They are both great gifts and ought not to be shut out. Stop at every town, talk with its people, compliment them if you see anything worthy, and carry home with you added knowledge of human nature and a sense of satisfaction that will do you good.

The Auto a Time Saver.

The automobile is a great time saver, which is an item of great importance to the physician. The auto enables the physician to spend more time in his office, which can be profitably employed in reading and studying or recreation, the value of which can not be computed in dollars and cents. The saving of time, the fresh air, the forgetting of little annoyances, the absorption in the car in motion, and the possessing of a hobby which one enjoys while actually doing his work, bring the doctor home at night fresh and ready for his reading.

Study Your Car.

Study and understand your car as you do the human body. Learn to diagnose your trouble when it arises, understand the physiology of your engine, its parts, their condition and replacement, its effect on your health, its flavor on your pocket book, and in general its place in health.
Patients will be first order participants in health, healthcare and research

- PCORI
- Precision Medicine
- Consumer devices
- Information-empowered Patients
Non-health data will become bigger than health data

- Anything Device
- Anytime, any context
- Any play, anywhere
- Any network
- Any service any business
- Anyone anybody
Payment reform will increase the need for informatics skills and data analytics
A PATH OF LEAST REGRET: THREE THINGS WE NEED
BUILD DOCUMENTS FROM DATA, NOT THE OTHER WAY AROUND
What is needed: A common format for granular data

- Quality Measures
- Clinical Decision Support
- Registries
- Common data formats for
  - Text data
  - Categorical data
  - Numerical data
  - More...
FULL EXPORT OF THE PATIENT RECORD (AND NARRATIVE)
Restore the importance of the narrative and unstructured text

- Move patient between vendor “ecosystems”
- Precision medicine
- Restore the balance of power for access to data
- Maintain the importance of the narrative in the medical record
TEST BOTH SIDES OF EXCHANGE
Postel’s principle

• When you send, conform to the standard
  – Pick a set of options and make sure it conforms to a valid instance of the standard

• When you receive, accept ANY version that conforms to the standard
  – Any variation that is valid

• Create the conditions of interoperability when you create the standard, rather than when you implement it
WE NEED TO TELL OUR STORY: IT ISN’T JUST WHAT WE KNOW. IT’S WHAT WE DO.
Knowing is not enough; we must apply.
Willing is not enough; we must do.

-Goethe

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