Informatics and the School of Community Medicine

SCHOOL OF COMMUNITY MEDICINE

Ms. Smith

- 57 yo female with diabetes, heart dz, and family history of breast cancer
- Seen sporadically at Bedlam Clinic
- Multiple medications from several pharmacies
- Hospitalized several times at SJMC and HMC
  - Heart attack
  - Several imaging studies

Accident

- Ms. Jones suffers a car crash in front of SFH
- What information does the ER need?
- How can the information be used?
- How does the information find its way?
- What happens if it does not?

Topics

- What is informatics?
- Is this a fad?
- Why should I care?
- School of Community Medicine and Medical Informatics

Word origins

- "*Informatika*" – Russia 1968
  - "structure and properties of scientific information"
- "*informatique medicalè*" – France 1968
- Before this time, other names were used:
  - medical computer science
  - medical information science
  - computers in medicine

Definitions

- …the scientific field that deals with biomedical information, data, and knowledge – their storage, retrieval, and optimal use for problem solving and decision-making.

-Ted Shortliffe

Columbia University

Why?

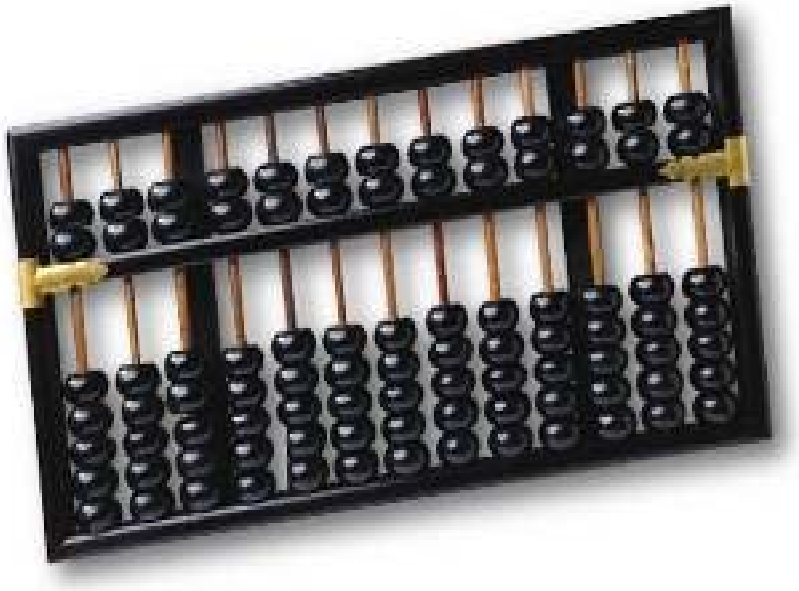
- The practice of medicine is inextricably entwined with the management of information
- Health care information is growing rapidly (doubling in less than 10 years)
- Human beings are exceedingly poor at managing information

Why do we care now?

- Costs of care
- Variance of care
- Poor quality of care
- Poor efficiency of care
- Consumerism

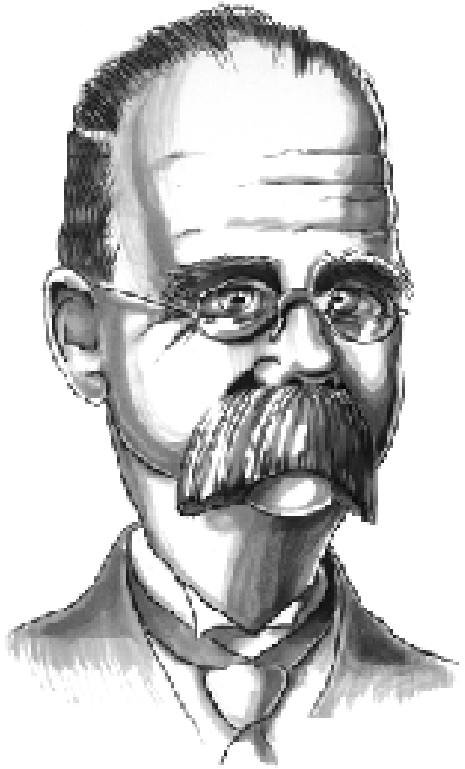
Informatics is a new field?

- Not new, but the tools have changed
- Tied to available technology
- Formal training in informatics has been available for ~40 years



Herman Hollerith (1860-1929)

- Invented a tabulation machine for the 1890 census
- Took advantage of punch card technology
- Created the Tabulation Machine Company eventually known as International Business Machines (IBM)



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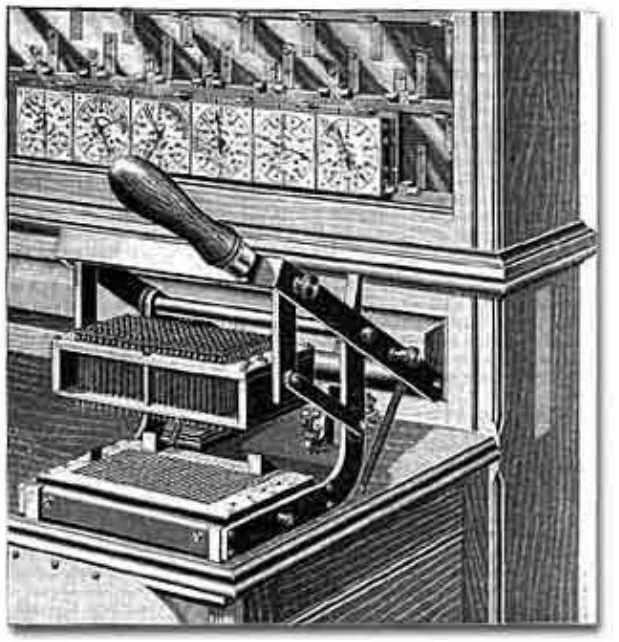
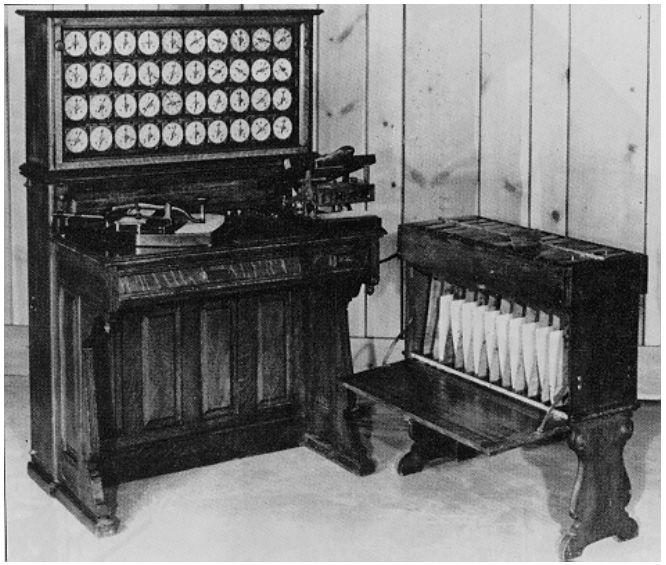
Census success

- 1880 census took 7 years to complete using 50,000 people
- 1890 census took just over 6 weeks despite a 40% increase in population
- Metal pins passed thru cards (if punched) to submerge in mercury and complete an electric circuit
- Saved the U.S. government $5 million





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Using technology

- Not a new idea
- The tools have changed, but the ideas are similar

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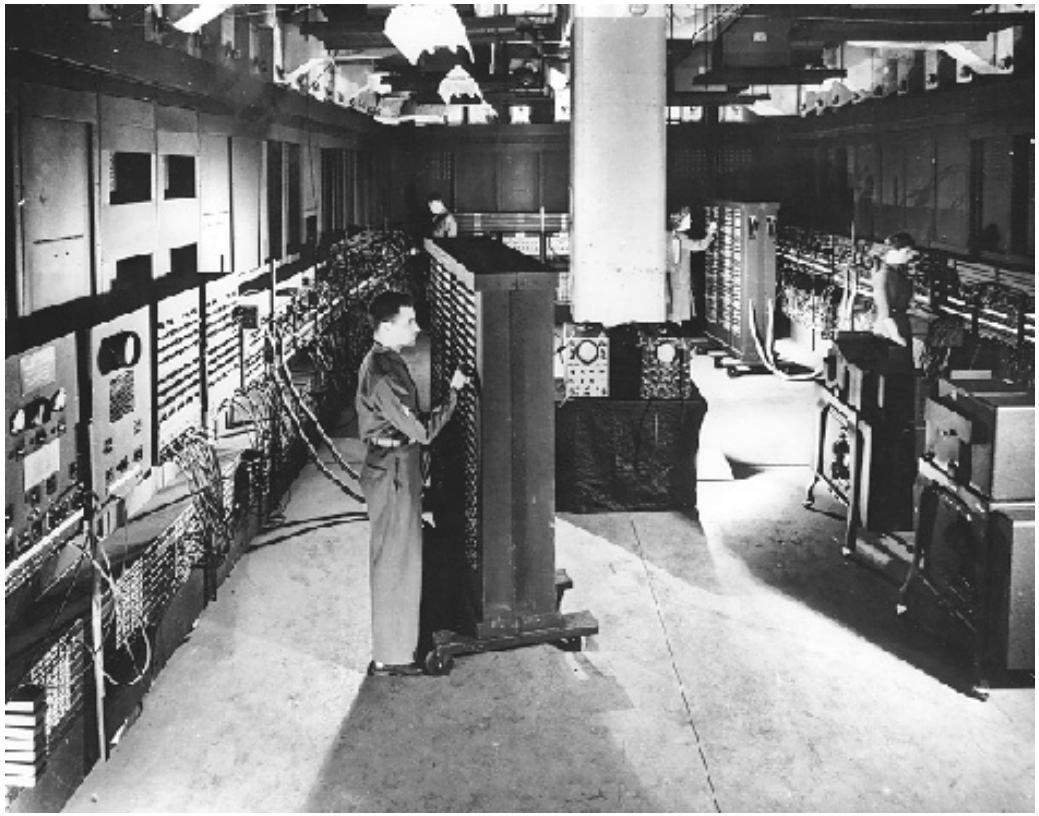
ENIAC (1946)

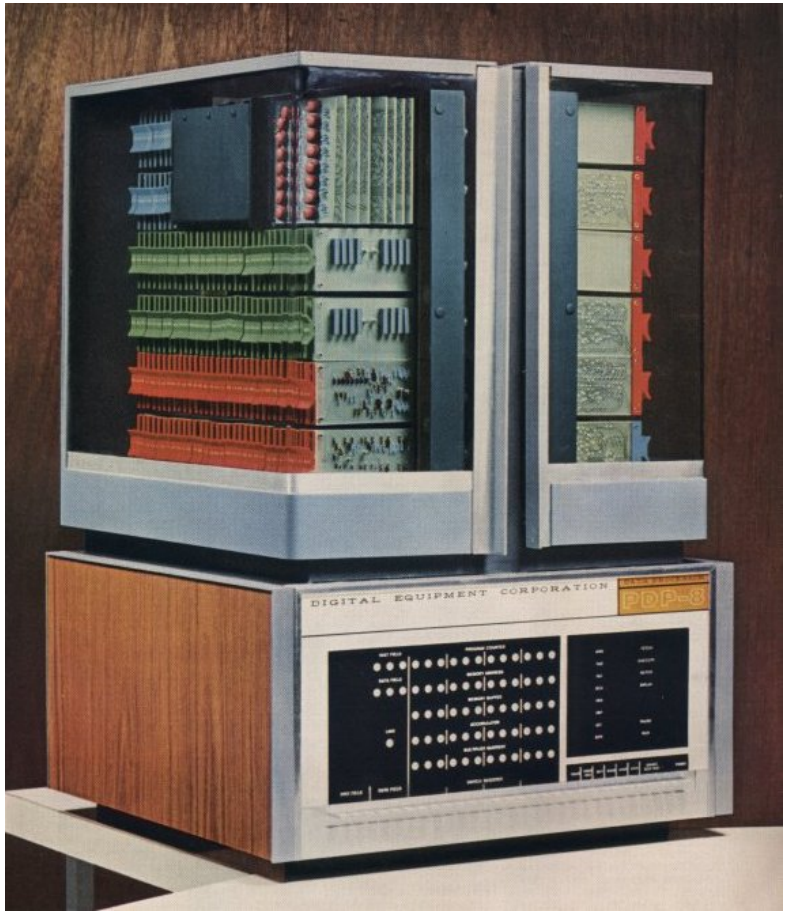
Electronic Numerical Integrator and Calculator

- 3 years to build
- 5000 operations/sec
- 1000 square feet



DEC PDP8 (1965)

- First commercially successful "microcomputer"
- $18,000 (IBM's version ran $90,000)
- Used in thousands of businesses, manufacturing plants and labs

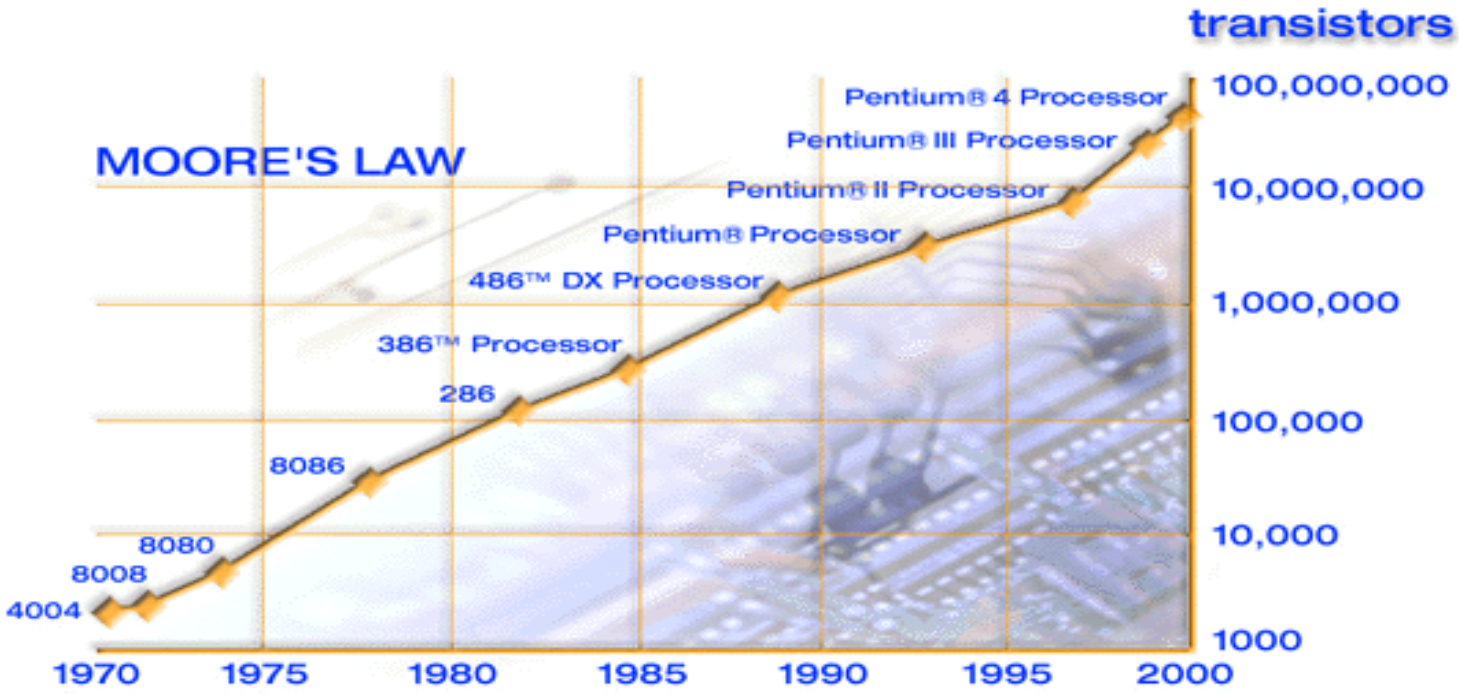


Personal Computer (1981)

- IBM introduces the PC for ~$1500
- Made from “off the shelf parts”
- Named Time magazine “Man of the Year”
- DOS “written” by Microsoft is the standard operating system

Moore's Law (1965)

- Transistors on processors will double every 18 months
- Size and cost will halve in the same time



Cultural challenges

- "*Protocol-based reminders, the quality of care and the non-perfectability of man*" - MacDonald, CJ
  - NEJM Dec 1976
  - Prospective reminders reduce errors that are due to man's limitations as a data processor rather than correctable human deficiencies

Computers and clinical care

- Computerization has been very slow to enter clinical fields
- Most hospitals have had billing and ADT computerized systems long before lab, clinical info or decision support

- But… clinical care is largely the management of clinical information

Limiting factors

- Clinical care involves complex organisms
  - If oversimplified its not useful
  - Requires sophisticated abstraction AND detail
- Reimbursement has not been linked to clinical information
  - Many administrative systems but few clinical

Back to Ms. Smith…

- What informatics tools are being used?
- Electronic information about Ms. Smith exists
  - Electronic medical records (EMR)
  - Pharmacy systems
  - Administrative systems
  - Laboratory systems
  - Imaging systems

What Ms. Smith needs

Access to data

Information moves with her

- Data standards
- Common vocabulary
- Health information exchange / RHIO
- Security

What Ms. Smith needs

Clinical Application

Real-time information use

- CPOE
- Decision Support
  - Use of best evidence
  - Prompting/alerting
- Error checking
  - Medication interactions
  - Allergies

What Ms. Smith needs

Care coordination

Enabling care team to be on the same page

- Accessibility of information
- Telemedicine
- Patient portal
- Care management

Who trains in informatics?

- Health professionals
  - MD, DO, DVM, DDS, PharmD, RN, PT, etc
- Computer Scientists
- Biologists
- Geneticists
- Medical librarians

Where to train?

- 18 NLM sponsored training sites across the US
- Many training sites in Europe
- Most sites have a unique focus and special expertise

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Informatics and medical training

- Tomorrow's physicians will need new skills to meet the healthcare needs of the community
- Informatics training integrated into curriculum starting on first day.
- Focus on skills that impact individual and community perspectives.

Specialization

- Development of programs for those interested in pursuing advanced training
  - Medical student and resident electives
  - Fellowship programs
  - Masters program
  - PhD program

What do informaticists do?

- Depends on what background/interest is brought to the table
  - Most with a professional healthcare degree will find a niche or balance of responsibilities
  - Research and development
  - Education
  - Quality improvement
  - Consulting
  - Management – director, CIO, CMO, etc.
  - Data analysis
  - Epidemiology

OU Tulsa Informatics

- Unique opportunities for the SOCM
  - Clinical application
    - EHR, patient portal, physician portal…
  - Data access
    - Integration of systems (internal)
    - Information exchange (RHIO / HIE)
  - Educational support systems
  - Research support systems