

Technology and Process Change in Healthcare

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HCIC



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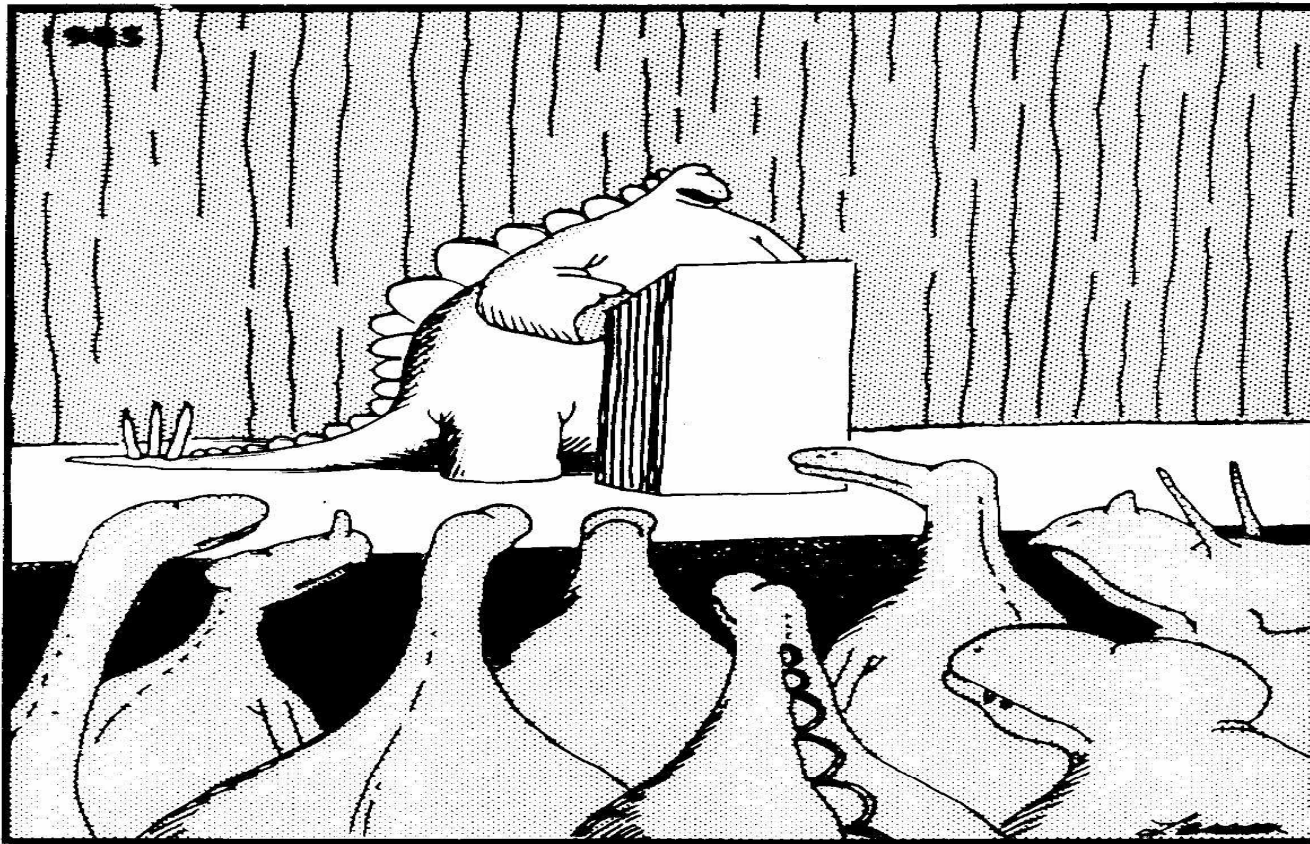
Overview

- Technology-Enabled Change
- Technology-Driven Change
- New Technologies
- Implications for the Organization

Premise:

Technology introduction in healthcare has supported process changes being introduced for other reasons. Technology "enabled" process change. In the future, key new technologies will not only enable change but will force changes in processes in healthcare. Technology itself will become a *driver* of process change.

Technology Challenges Go Way Back



“The picture’s pretty bleak, gentlemen. ... The world’s climates are changing, the mammals are taking over, and we all have a brain about the size of a walnut.”

Technology has been adopted when it improves an existing process.

- Examples:

- Clinical Order Entry/Results Reporting
- Time and Attendance System

- Faster

- Greater accuracy

Technology has enabled change driven by other factors.

- Factors Outside the Organization
 - HIPAA
 - Patient Safety
- Demand a timely and cost-effective response.

HIPAA

- Automation of Billing Transactions.
- Security
 - Protected Health Information
 - Fiduciary role

Patient Safety

- Medication Administration
 - Robotics
 - Bar coding
 - Point-of-care information systems.
- CPOE
 - Alerts
 - Decision Support



Technology-Enabled Change

- The need to change causes us to look at technology for a solution.
- We think we are *in control* over the introduction of the technology.
- Somewhat predictable.

Technology-Driven Change

Disruptive Technology: *n.* a new product or service that disrupts an industry and eventually wins most of the market share.

Disruptive Technology



Some technologies drive change in some industries, but not in others.

- Bar coding
- Forced competitive change in overnight delivery (UPS, FedEx)
- Transformed retail sales
- But minimally used in healthcare
 - Specimen tracking
 - Materials management

With some technologies, change happens before we realize it or are fully ready for it!

What two technologies of the late 20th century have been most disruptive and driven the most change?

Healthcare has experienced technology-driven change.

- Discovery of the X-ray in 1895.
- Technicon SMAC auto-analyzer in 1973
- First laparoscopic cholecystectomy in 1987



Technology-Driven Change in Healthcare Characteristics

- The technology caused a major change in clinical practice.
- None of the changes were driven by information.
- All had a dramatic impact on other processes within the hospital.

Information Technology-Driven Change is Happening

■ Why?

- Conscious recognition that healthcare is driven by information.
- Explosion in the volume of clinical knowledge
- Better understanding of processes in healthcare organization.

Technology-Driven Process Change: An Example

■ Radiology

- Early computer technology users (CT scanners)
- Early developers of image archiving and computer communication systems (PACS)
- In spite of all, still largely film-based

Disruptive Technology: Multi-Detector CT

- More images per rotation with same radiation dosage.
- Faster, greater patient comfort.
- Quicker diagnosis, better quality of care



Reaction of Radiology Departments

- Too many images to save to film!
 - Increased film costs!
 - Increased storage costs!
- Slower workflow
 - More images to be read by radiologist.
- PACS suddenly became attractive.
 - Film-less archiving.
 - Diagnostic workstations for reading.

Reaction of Radiologists

- More than 90% of all radiographic images are “normal”.
 - MD CT increased the amount of “normal” information to be read
 - Radiologists suffering information overload.
- Radiology was not “in front of” the changes.

Radiologists Fight Back

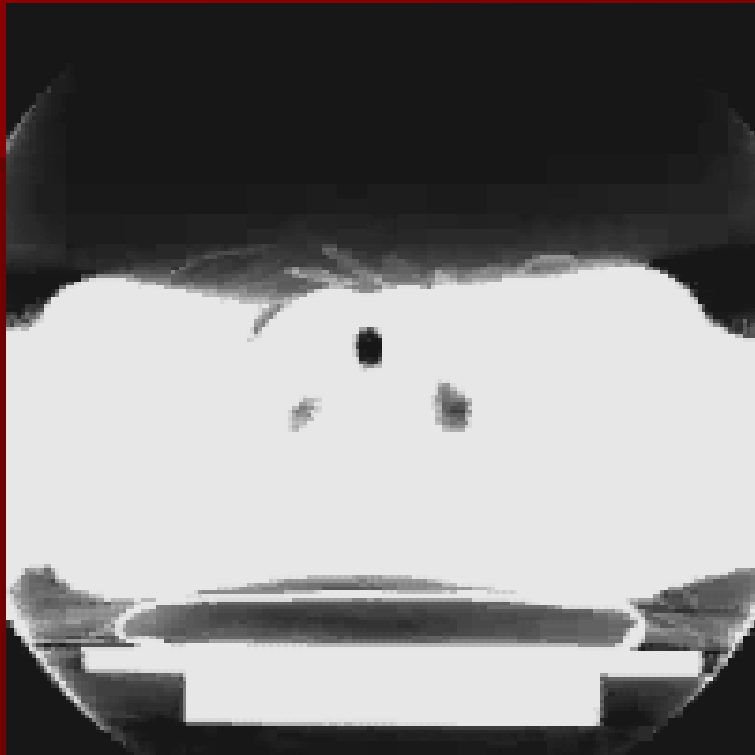
- Recognition that the old way of reading CT must change.
- Technology is driving change and radiology must manage the change.
- Creation of the "TRIP*" initiative by the Society of Computer Applications in Radiology.

(*Transforming the Radiological Interpretation Process)



T.R.I.P.

- Looking for new ways to manage information overload
 - Volumetric image navigation (multi-planar reconstruction using powerful workstations).
 - 3D reconstruction.
 - Computer assisted diagnostic tools
 - And more. . .

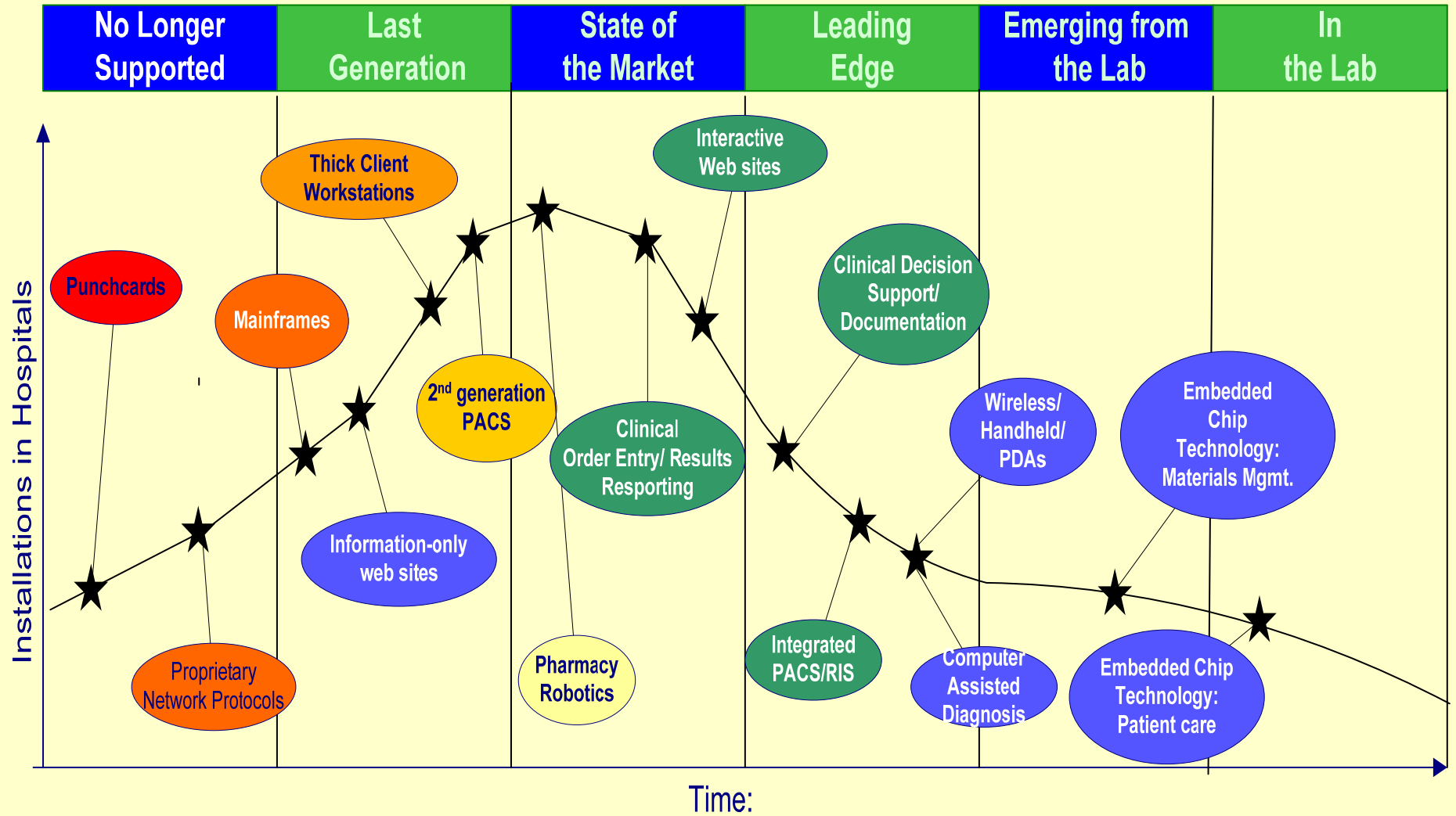


Radiology Lesson

- *Get out in front!*
- *Attempt to manage it!*
- *Employ some radical thinkers!*

The Future!

Technology Curve



Technology Curve

- Time for a technology to “emerge from the lab” to become “state of the art”
 - 1980’s: Decade
 - 1990’s: Years
 - 2000’s: Months

Some Technologies that are Driving Change

- Internet
- Wireless Networks
- PDA's
- Web-based Applications
- Speech recognition
- Rules Technology
- Knowledge Bases
- RF Chips

Internet



Internet Example: The Children's Hospital of Philadelphia



Wireless Networks

- 802.11 Standard
- Internet access at Starbucks
- Has not taken off as a moneymaker
- Practical alternative to a wired network.

PDA's

- Personal digital assistants
- Computing power of the desktop in the palm of your hand.
- Combine with wireless network connectivity. . . .
- Practical point of care device.

Web-based Applications

- http://--Hyper Text Transfer Protocol
- Html – Hyper Text Mark-up Language
- XML –Extendible Markup Language
- Platform independent
- Ability to link diverse sources of information.

Speech Recognition

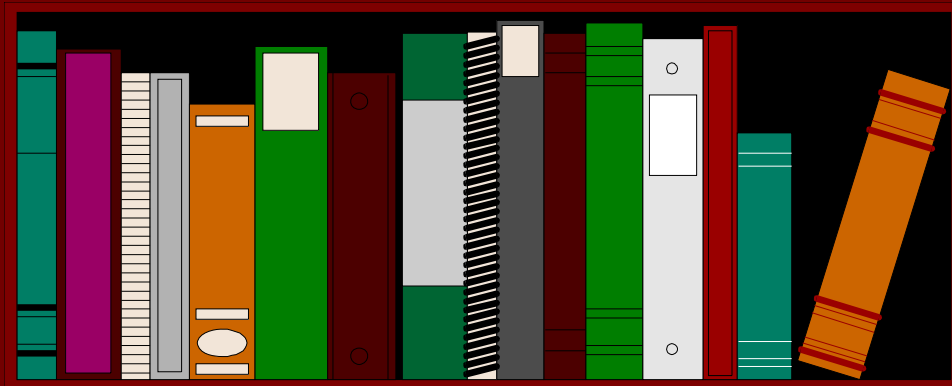
- Tried in medicine for a number of years
 - Private practitioners using Dragon
 - Radiology:
- Limited acceptance because 95% is not good enough.
- Poised for take-off.

Rules Technology

- Fuzzy logic and neural nets.
- Context specific decision support.
- Linking more sources of knowledge than simple rules engines.
- “Knowledge Coupling”

Knowledge Bases

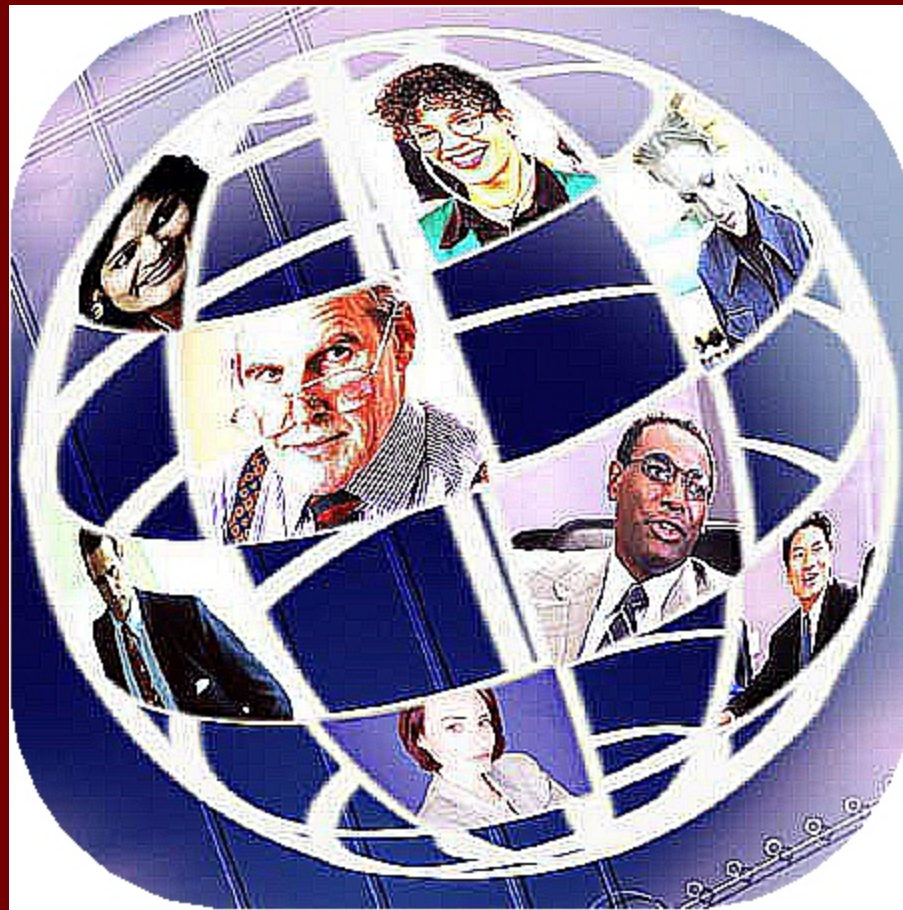
- Who do you trust?
- Poison,
pharmaceuticals,
- Clinical indications
- Linkages back to
the literature.



RF Chip Technology

- Tiny device capable of being a detailed repository of information.
- Materials management and asset location.
- Patient and Patient care applications.
- Significant potential privacy issues.

What does this mean
for the Organization?



Implications for the Organization

- Staying out in front of technology-driven change.
 - Change will happen.
 - Organization must structure itself for change.
 - IS must have resources that are focused on identifying and evaluating new technologies.

Implications for the Organization

- IT must structure itself to drive process change.
 - Take the lead.
 - Facilitate
 - Be the change agent.

Implications for the Organization

- IT must have the resources it needs.
- If the organization wants to see financial return from technology, it must be willing to take some risk.
- IT projects must clearly be aligned with the organization's strategic imperatives.

Summary

Whether technology *enables* change or *drives* change, the successful organization will integrate technology into process improvement.