The State of Medical Imaging

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With thanks to . . .

• Our hosts and organizers
• Harry Solomon
But it’s *always* a time of change for healthcare
1993 was also a time of change, reflected in, and driven by, the (then new) DICOM Standard
DICOM continues to respond to the changing needs of the medical imaging community
Old modalities – new protocols for characterization of anatomy and disease

- CT multi-energy material decomposition
- MR functional, diffusion, quantitative
- NM/PET radiopharmaceutical tracers
- US elastography

Dynamic imaging (4D)

Higher resolution everywhere
Industry is rolling out new imaging capabilities faster than the necessary standards
• And then slow to implement the standards when they are ready

Need strong voices on professional side demanding standardization
• “Can I view your wonderful <xyz> images on my <competitor> PACS? Will you adhere to the DICOM Standard for <xyz> images?”
• Get a date – in writing, from the product manager’s boss
“The technology revolution in image acquisition instrumentation now far outstrips the human observers’ ability to view and interpret medical images by using traditional methods, and a paradigm shift may be required.”

Andriole, et al. Optimizing analysis, visualization, and navigation of large image data sets: one 5000-section CT scan can ruin your whole day. *Radiology*, May 2011
Changes for Imaging Professionals

More data to be seen
• Helps radiologists see more

Visualization
• 3D / 4D
• Multi-modality

Assistive technology
• CAD
• Analytic results
Challenges

Integration of advanced visualization into PACS
Post-processing pipelines need intermediate results in standard formats
Evolving needs for advanced collaboration tools (multi-disciplinary teams)
Documentation of evidence and actionable findings
That’s all *internal* stuff within our imaging domain

But wait, there’s more!
Patient-centered care requires:

- Access to data from multiple institutions, anywhere
- Consistent access to all types of data, including images

New players and systems

- Non-imaging-specialist caregivers
- EMRs – in-patient, ambulatory, long term care
- PHRs and Portals
A time of change for healthcare

Mobile technology changes access methods

• Smart phones / tablets, not fixed workstations
• Web services for data distribution

New software development environments and developers

• Unfamiliar with imaging processes and systems
Applications ecosystem breaks system models

• Cloud based apps from multiple vendors
• Dynamic configuration

Separation of app development, app deployment, financial models from classical radiology systems development
Strategic Goals

DICOM and DICOMweb

- Reach a wider audience
  - Leverage cross-industry web protocols and web developer training
- Maintain the investment in systems and image data
  - Enhance capability incrementally, not by wholesale replacement
- Keep aligned with other healthcare web services (HL7 FHIR)
- Deal with the entire imaging domain in the enterprise
  - Including unscheduled images (e.g. dermatology)
Summary

- It is a time of change
- Challenges for DICOM to keep up with changes in technology, and changes in the expanding environment of new stakeholders
- Challenges for old line and new line developers
- Challenges for imaging professionals to keep up with the data

- You are invited to join the DICOM efforts!