The value proposition of informatics for medical physicists

Paul Nagy, PhD
Assistant Professor of Radiology
University of Maryland School of Medicine
22 South Greene Street
Baltimore, MD 21201
pnagy@umm.edu

There exists today a vacuum in the knowledge to transform medicine with information technology (informatics). Many diagnostic physicists today get pulled into their institution's PACS implementation willingly or not and find themselves trying to provide informatics leadership. For those physicists who are interested, aiding a facility with informatics can be very rewarding. There is a strong affinity between the informatics skill set and the role of diagnostic physics in the way we bridge the worlds of science and technology with medicine. Many of the leaders of the Society of Imaging Informatics in Medicine (SIIM, formerly SCAR), are diagnostic physicists. There is an opportunity of growth for the profession to provide leadership in the changing face of medicine. A subcommittee on Imaging Informatics has been established by the AAPM to understand this opportunity. The views expressed in this talk are my own and do not necessarily reflect the opinions of the committee.

We will try and present a roadmap for those physicists who are being called in to fill the informatics roles of their department or are interested in expanding their clinical tool set to include informatics. Most physicists trained today have a solid grounding in computer science. In addition to a good comprehension in computer science, an informaticist needs to know about systems management, systems integration, and project management.

Systems management includes the information technology principles needed to ensure smooth operations of a large IT service such as PACS. This includes availability monitoring, change management, failure mode effects analysis, problem management, performance monitoring, disaster recovery, and continuity management to name a few. A physicist should not be a PACS administrator, but instead be the person to train the PACS administrators and provide the oversight and strategy to allow the facility take advantage of information technology. This is identical to our role in working closely and training technologists in image quality. The majority of PACS administrators are at the same educational level of imaging technologists.

Systems integration is a crucial part of any IT project implemented today. The need to understand the role and value of open standards based integration such as DICOM, HL7, and IHE is critical in helping to set the vision of how the facility will interoperate with the enterprise.

Project management and good communication skills are very useful in helping to coordinate large initiatives such as PACS that requires many parties to work in concert. This typically entails take the strategy view and keeping it on track at the tactical level.

Also discussed will be how some basic informatics skills can help you do your job better as a physicist. There are open source tools available that can enable you to setup DICOM research repositories as well as help you automate some of the quality control role of the department to monitor image quality and dose. There is an immense amount of data that can be mined from DICOM data with some basic tools. Film printer and monitor calibration data can also be remotely monitored and aggregated with simple network management protocol (SNMP) agents.

In conclusion the physicist is positioned to be a technology advocate for physicians, and extending this to include informatics can be very rewarding. There could even be some benefit to recognizing informatics in the curriculum of diagnostic physicists.

Learning objectives:

1. Understand the opportunity of imaging informatics for medical physicists
2. Discuss the overlap in the skill sets between informaticists and physicists
3. Discuss the pros and cons of being involved in clinical informatics projects like PACS
4. Discuss the benefits and problems of being a dual role diagnostic physicist.
5. Identify additional areas a physicist should pursue to play the role of an informaticist
    a. Principles of Systems Management
    b. Systems Interoperability and Data Integrity
    c. Project Management