Should Radiology IT be Owned by the Chief Information Officer?

David S. Channin,[1] George Bowers,[2,3] and Paul Nagy[4]

Considerable debate within the medical community has focused on the optimal location of information technology (IT) support groups on the organizational chart. The challenge has been to marry local accountability and physician acceptance of IT with the benefits gained by the economies of scale achieved by centralized knowledge and system best practices. In the picture archiving and communication systems (PACS) industry, a slight shift has recently occurred toward centralized control. Radiology departments, however, have begun to realize that no physicians in any other discipline are as dependent on IT as radiologists are on their PACS. The potential strengths and weaknesses of centralized control of the PACS is the topic of discussion for this month's Point/Counterpoint.

KEY WORDS: Hospital Information Systems (HIS), information management, PACS, PACS management, radiology department, hospital

CENTRAL IT SHOULD INCORPORATE RADIOLOGY IT AND PACS: GEORGE BOWERS, MBA

Opening Statement

The issue of who should have responsibility for PACS has been around for many years. In the early days of PACS in the 1990s, there were valid reasons supporting PACS management by the radiology department. In those days, PACS usually ran as standalone systems and were not widely used outside of the radiology department. Today, more compelling reasons support the treatment of PACS as a component of an enterprise strategy that appropriately falls under the chief information officer (CIO) and the IT organization.

The CIO is the executive who has responsibility for integrating information technology into the health care workplace. Over the past few years, the CIO's role has become more complex as public policy has encouraged the adoption of the electronic medical record (EMR). The total EMR, including computerized provider order entry (CPOE) and clinical documentation, is the strategic goals for most health care CIOs in the USA. Achieving this goal involves a process of fitting many pieces together. PACS is only one of the pieces that must be considered in the context of how it fits into and contributes to the EMR. Because it is the CIO's responsibility to deliver the EMR, it is appropriate that the selection, implementation, and operation of the system be under his or her authority.

A second compelling reason is that PACS is no longer a radiology-only asset. Diagnostic images are part of clinical information that clinicians outside of radiology expect to have readily available when viewing the EMR. Logging into a separate system to view images is unacceptable to them. Moreover, PACS technology is regularly used by many other areas, such as cardiology, anatomical pathology, ophthalmology, gastroenterology, and document image management. Many of the large EMR vendors have taken PACS architecture and

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expanded it to incorporate the potential for any nontextual clinical information. As PACS technology becomes more pervasive in the organization, it must be centrally managed to avoid duplication of costs and maintain consistency of service.

Another reason that PACS should be managed by the CIO is the technical complexity of today's IT environment. Health care organizations are moving away from an application-centric approach to an enterprise-wide approach in managing systems. This migration has been triggered by regulatory and economic requirements. Under the Health Insurance Portability and Accountability Act (HIPAA) Security Rule,[1] health care organizations have a fiduciary responsibility to safeguard protected health information. This includes network security, business interruption planning, and data integrity protection. HIPAA requirements are mirrored in the Joint Commission on Accreditation of Health Care Organizations information management standards, which are being updated for 2009.[2] Approaching these requirements on an application-by-application basis is too costly and too complex to ensure compliance. Accountability in the organization for meeting these regulatory requirements is usually with the CIO. When any information system is managed outside of the IT organization, it becomes difficult to ensure compliance, and the entire organization is at risk.

Another reason for having PACS managed by the CIO is data storage. PACS requires more storage capacity than any other single application.[3] PACS storage requirements will also increase more rapidly than other applications as more types of images are captured and stored. Despite the fact that data storage costs have been decreasing rapidly, storage is a significant cost element that requires careful management. Many organizations have begun to plan their storage requirements on an enterprise-wide basis rather than on an application-by-application basis. Organizations derive significant benefits by planning and managing data storage on an enterprise-wide basis, particularly in meeting system availability and data redundancy requirements.

The final reason why PACS should be managed by the CIO has to do with its importance to the EMR. Capital is always limited in health care organizations. PACS is a strategic component of the EMR and must be sold to the organization in that way. The CIO is more likely to get capital

support for PACS than if the organization sees PACS as a departmental system. The size of the CIO's budget enables greater leverage with vendors for better service and purchasing power. The CIO and the IT organization are structured to be service providers to the rest of the organization. They are more likely to have the resources necessary to support PACS and are better positioned to secure future funding. PACS is too important to the organization to be managed within a single department!

AGAINST THE PROPOSITION: DAVID S. CHANNIN, MD

Opening Statement

Radiology is too large, too complex, too valuable, and too dependant on IT to be treated as an ordinary IT customer. Radiologists and technical staff are advanced users of complex information systems. The hospital IT organization originated as billing systems under the control of the chief financial officer. While IT has grown up, the organizational culture is still predominantly corporate lacking clinical expertise. Without domain expertise and local accountability to radiology, the mission of the department can be threatened by inadvertent IT decisions. System requirements frequently lack exception reporting in workflow or adequate support response times to ensure the clinical mission. An IT organization without any accountability to radiology has a very hard time doing the necessary tailoring of technology to make it successful.

All radiology processes depend on IT. The information systems in imaging are not generic systems; they require specialty knowledge and maintenance skills. Central IT often operates in system silos. Radiology IT staff must be crosstrained in their systems. It is a fulltime job that does not end when the "go-live" date passes. The systems must be constantly monitored for correct use, upgrades, and optimization.

Radiology is crucial to the financial well being of a medical center. At a large academic medical center, such as Northwestern Memorial Hospital, more than 20% of patients are imaged. Revenue from the technical component of imaging procedures can approach 20–25% of net patient rev-

enues of the institution. Revenue in excess of expenses subsidizes many other areas of the institution and provides for a state-of-the-art imaging environment. Maintaining these revenue streams in the face of decreasing reimbursement and increasing costs means focusing on efficiency. Patient expectations and competition demand continuous quality improvement. In Six Sigma[4] parlance, this means defining, measuring, analyzing, improving, and controlling the improvement of every process in the department. IT needs to go beyond simple support but be an active participant in process redesign.

Another challenge to an independent IT organization structure is the allure of using a single vendor over best of breed solutions. No single system from a single vendor can provide all of the IT functionality necessary for an imaging department of any significant size. Yet, central IT cannot resist the appearing simplicity of synergies and lower costs from a single vendor at the expense of end user functionality and satisfaction. If a group is not cognizant of their users' needs and how things really work in practice, it is difficult to differentiate vendors on factors other than cost.

Although some of the processes found in medical imaging are common business activities, such as human resource and supply chain management, other processes, such as the Integrating the Health Care Enterprise (IHE) radiology integration profiles[5] are unique and complex. Mastering the analysis of these processes requires in-depth knowledge of the imaging environment. IT staff must be embedded in departmental operations, often arising from the rank-in-file.

The information systems in radiology are truly mission critical. It is somewhat surprising that many enterprise IT organizations do not use industry best practices in business continuity and fault tolerance. This can be understood in part because the vast majority of enterprise IT systems are not defined as mission critical. What is the response time to a PACS failure in the operating room? Detailed fallback and what-if plans must be in place throughout the department. Executing these plans in a specific situation requires dedicated IT resources with detailed knowledge of the environment and personnel. Understanding the appropriate response model is hard to appreciate for a corporate IT group which is frequently based outside of the hospital.

Most hospital IT tools have an interface team for interoperability between information systems. The only standard they are experienced with is the HL7 Version 3 messaging interface standard. There is little knowledge of the Digital Imaging and Communications in Medicine (DICOM) standard, the predominant standard in radiology.

Lastly, radiology as a specialty has been a rapid adopter of disruptive technology such as multidetector computed tomography scanners. Radiology IT continues to evolve rapidly with new modalities, procedures, and processing. DICOM and IHE provide living evolving standards and frameworks. It takes a more diligent awareness of new technology and its impact upon architecture than traditional areas in the health care enterprise.

REBUTTAL: GEORGE BOWERS, MBA

The points made by Dr. Channin illustrate the traditional perspective of silos of care. From the perspective of the Radiology Department, each of his points has some merit. He is absolutely right that the priorities of the Radiology Department, and IT will probably never be the same. The radiology department is focused on one thing—radiology. But radiology is only one component in delivering care to the patient. Coordinating the care of a patient among all of the diagnostic and treatment options in the most efficient and cost-effective manner must be the priority of our health care delivery system. Processes that affect patient care may flow between and among many departments. IT has been charged with delivering the EMR, which focuses on the patient—not the hospital department. The patient must be the priority, even if this means compromises elsewhere in the delivery system. What is best for the patient may not necessarily be the best or most efficient for individual departments.

An IT organization that is truly responsive to the needs of the organization will be embedded within each department and will have domain expertise. It will also have service-level agreements with its customers. An enlightened CIO is not threatened by IT innovation within departments but will try to find ways to work with departments to develop solutions. In the end, however, everything must go back to the number one priority: the patient.

REBUTTAL: DAVID S. CHANNIN, MD

Although it may be true that the CIO has ultimate responsibility for any IT activity within the institution, the role of the CIO is clearly strategic not tactical. Glaser and Williams wrote, "The CIO is a critical contributor to the development of the organization's strategy; a valued member of the 'C' suite; a leader of and manager of a high-performance IT staff; able to lead and support major change in organizational processes; an astute judge of the potential of new technologies; effective in managing the organization's IT suppliers....".[6]

No leader operating at that level, regardless of technical expertise and background, can hope to understand the detailed requirements and technology of the myriad clinical and support entities. The CIO must lead in the support of standards, interoperability, compliance with policies, procedures, and regulations. He or she should supply intellectual and financial nourishment to let a garden of innovation grow.

I concur that the enterprise is a key user of a PACS system. I contend that radiology understands the requirements and needs better than a centralized IT organization. Enterprise health care providers are our customers. Health care providers need to view and manipulate images as well as be assisted by the work product of the radiologists. The radiology community has developed a number of technical frameworks that serve as an example of how clinically centric IT can be developed and managed locally.

Radiology can and does also serve as a technology exemplar for the other -ologies. Nowhere is this more evident than in the evolution of IHE. Similarly, within an institution, we can share our best practices and our infrastructure with our colleagues. If it makes sense for pathology images to be in PACS, great; if it makes sense for them to be in pathology, all the better. Standards and interoperability will push them where they need to be, just in time, for clinical decision support. Central IT has no role in managing a department's evolution, and certainly making them evolve in lockstep would be disruptive.

My argument that the technical complexity of radiology mandates local IT ownership stands.

That regulatory complexity is increasing is a fact of life with which every organizational unit must contend. The role of the CIO is, again, to provide leadership and guidance and to monitor compliance. The vice president of safety and facilities does not come to our department to lecture on the Chicago Fire Code. "All staff shall be versed in fire response procedures" (a Joint Commission requirement); we make it so.

Capital in health care is limited. Senior management, including the CIO, need to make prioritization decisions that leverage its resources wisely. Once those decisions on resources are made, however, only the department has the knowledge to make contracting decisions and plan, deploy, and manage the technology required to meet those metrics. Direction, guidance, and oversight: these are the roles of management.

I agree that the IT organization should be a service provider. They can provide network, storage, security, and identity services to departments. We do not plumb our own water lines, generate our own electricity, or smith our locks. Service-level agreements and costs must be negotiated and respected. Specific detailed operations and complex devices, however, are not commodities and cannot be treated as such.

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