



How to Improve Patient Care and Organizational Efficiency by Unifying Imaging Workflows Across Clinical Systems

Introduction

Radiology reimbursement continues to be under pressure, and efforts to tie reimbursement to clinical quality improvement continue. These forces require radiologists to reconsider conventional business models that have supported business success over the last twenty years. Hospitals and radiology groups are increasingly considering novel business ventures in their efforts to control costs, reduce risk, and increase the quality of services offered. Whether the effort involves merger, acquisition, or joint venture, realizing the benefits of a sound business strategy requires a flexible IT infrastructure. As healthcare practice leaders have learned to appreciate the critical role imaging plays in improving healthcare quality, we may have reached a tipping point in which isolated imaging IT solutions can no longer be tolerated.

The prevalence of isolated and disparate clinical IT systems, particularly PACS, across imaging departments and radiology practices is a workflow barrier which needs to be overcome. Industry changes exacerbate the current inability of departmental and enterprise systems to communicate between IT systems from varied vendors. Regardless of the physical location or the reading system where a radiologist performs services, he/she must be able to get new exams from any archive, including historical comparison studies from any manufacturer's IT system. While the adoption of Vendor Neutral Archives (VNA), Electronic Health Records (EHR), and Health Information Exchanges (HIE) may solve some of these workflow problems by improving communication among healthcare facilities, these systems also create the need for new and complex clinical and customer service-oriented workflows to support effective reading services.

Common Workflow Gaps

- Primary subspecialty reading – requiring prior exams to be retrieved from multiple archives
- Teleradiology reading – requiring prior exams from multiple archives to be married with new studies from multiple locations
- Radiology group and hospital department consolidation – forcing radiologists to read across multiple technical and clinical domains
- Modality sharing across disparate business entities – requiring both access to appropriate worklists and storage of studies to the appropriate archive
- Sites challenged with importing images into their technology domain – requiring application of local MPI patient information to those studies

While providing a radiologist with access to prior studies is broadly acknowledged as “just good medicine”, regulatory and practice guidelines increasingly advocate for and even require the comparison of current imaging studies to prior imaging studies. The Mammography Quality Standards Act (MQSA) has long mandated the inclusion of prior exams when reading new studies, and the American College of Radiology has also highlighted the importance of timely access to prior studies in their Technical Standard for the Electronic Practice of Medical Imaging. The increased focus on reducing unnecessary imaging and x-ray dosage provides additional incentive to provide access to historical imaging data.

Many organizations find themselves forced to use their PACS and IT support staff to manually identify and move imaging studies across disparate IT system environments. This is a significant hidden expense that increases support costs, affects clinical quality and reduces organizational productivity. We will review how these limitations can be overcome using commercially available enterprise imaging workflow solutions, and use examples to demonstrate how using such workflow solutions can benefit healthcare providers and patients.

Workflow Must Support Business Need

The variety of new business relationships among imaging providers and their customers have one thing in common: the need to overcome the conventional clinical and physical boundaries of each entity. This is a natural extension of a new trend in healthcare whereby patients no longer simply go to the closest facility for care; rather, patients seek out the best medical and

treatment options available. These changes in healthcare dynamics place increasing demands on imaging IT systems that are often ill-equipped to support such changes.

Private practices and teleradiology groups, which have historically pushed workflow boundaries in their pursuit of business opportunities, are not the only ones facing these challenges. Large, established Integrated Delivery Networks and medical centers looking to integrate care and expand services are often challenged by seemingly straightforward study ingestion and sharing. Michael Rancourt, Manager of Radiology Informatics Systems at Maine Medical Center, points out that their radiologists read from multiple different locations. While they have all but eliminated CD transfers, Mr. Rancourt points out, “Challenges identifying where outside studies originate impact my staff when trying to determine the root source of image transfer issues. This in turn impacts Radiologist productivity and ability to reduce turnaround time (TAT), and of course could also impact patient care.”

“Since our Radiologists read by subspecialty and across facilities, they rely on the integrity of our PACS system for access to all available patient images and also to ensure their final report gets to the appropriate referring physician in a timely fashion.”

Michael Rancourt
*Manager, Radiology Informatics
Maine Medical Center*

Troubleshooting these types of problems not only slows down radiologists, but also burdens

the IT help desk with multiple calls each night. Implementing a workflow solution that reliably automates study ingestion and source identification across the enterprise eliminates these calls, freeing IT to solve other problems, while enhancing the quality of clinical service.

While seemingly innocuous, study ingestion can be accompanied by many challenges, including ensuring proper study source identification, ensuring workflow audit trails, reliable process automation, and handling of duplicate studies. The US Dept. of Veterans Affairs (VA) faces many of these common challenges, plus those related to unique federal mandates that govern their operations. It is a significant challenge to ensure that all studies originating from the many locations within each VA region are ultimately stored on the VA's VistA Imaging PACS. An automated workflow solution recently implemented in VA Region 3 provides full control over this effort while ensuring data quality. Region 3 leadership has found it "reduces after-hours support calls that save almost one man-year of support costs annually and enables the radiologic technologists to focus more energy on their patients."

"The speed and reliability of this study-sharing process has ensured the success of our stroke services, enabled our technologist to focus on clinical quality, and saved us thousands of dollars annually."

Eric Dittmar
Systems Engineer
Freeport Health Network (FHN)

Development of new clinical services that rely upon imaging can also require novel workflow

solutions to minimize their impact on clinical staff and ensure critical timelines are met. Such has been the case at FHN (Freeport Health Network) in Freeport, IL as they added a teleneurology service to support their FHN stroke team. As Eric Dittmar, Systems Engineer at FHN explains, "to support the stroke-service protocol, we need to quickly send out two copies of the head CT scan that each possible stroke patient receives. Automating the study distribution process to our local radiologists and teleneurologists has saved our emergency department technologists over 30 minutes per day, 7 days per week."

Eliminate Hidden Costs

Often, the costs of new clinical workflows are not well understood. In other cases, they are simply accepted as a cost of doing business. Organizations commonly leverage existing personnel resources to manually enable new workflow processes in order to avoid the upfront cost of acquiring new technology to automate the new workflow. In the long run, this is often much more costly and error-prone, as manual intervention and monitoring of workflow processes prevents the optimal use of human capital. Over time, the cost of manually supporting complex workflows can escalate as study volumes increase. IT help desk costs, the effect on customer satisfaction, and the impact on quality-of-care must also be taken into consideration. Ultimately, business inefficiencies can have a cascading effect on the broader organization. Now that patients and their physicians feel increasingly empowered to take their healthcare business to where it is most convenient, provider organizations must address these needs to remain competitive. Teleradiology practices can have their own unique set of workflow challenges. Consolidating

studies from various remote acquisition sites that may not be owned by the teleradiology group, can be difficult at best. Pressure to hold down costs while increasing clinical quality is forcing these organizations to identify novel means to ensure rapid report turnaround. The cost of manual intervention to ensure new and existing studies quickly get routed to the right location is not sustainable. And, importantly, the need for reliable, automated performance that helps these organizations meet their service-level agreements, is essential.

Radiologists at American Radiology Associates of Dallas, Texas are confronting these challenges head-on. Their need to read PET/CT studies from multiple sites on specialty PET/CT fusion workstations initially required technologists at the sending sites to prepend the patient Medical Record Number (MRN) and Accession Number to each study before sending it to American Radiology. According to Josh Hammond, Director of Information Technology, American Radiology also had an employee manually transferring historical PET/CT comparison studies from their PACS to the specialty workstations, to enable reading of the new studies.

“Once we automated this process we freed up 50-70% of an FTE, saving us \$50 - 70K annually. It also enabled us to better meet the service-level turnaround time agreements we have with our customers.”

Josh Hammond

*Director of Information Technology
American Radiology Associates*

Mr. Hammond noted that some of the sites serviced were not equipped with a Radiology

Information System (RIS) at all. “We realized that we needed a solution that enabled us to build a site-specific worklist to drive report delivery to our customers. We ended up building a client portal that speeds and simplifies report delivery and further enhanced the level of customer service we are able to provide.”

Hidden Cost of Broken Workflows

- Organizational inefficiency
- Higher help desk support costs
- Poor customer service
- Reduced radiologist productivity
- Diminished clinical confidence

Technology solutions can also have hidden costs if they require manual intervention and oversight. Often times even reliable systems have been designed to simplify but not automate tasks that require advanced logic. Sites using such older technology can significantly reduce costs and improve business productivity by upgrading to new enterprise imaging workflow solutions that are fully automated and require no manual intervention or oversight.

Interoperability Is Essential

Arguably, many of the complex, cross-domain workflow challenges impacting healthcare systems should be addressable through the development of, and adherence to, connectivity standards such as DICOM and HL7, but this is often not the case. Fortunately, there are enterprise-level imaging workflow solutions that can be easily customized to reliably address current and future business and imaging workflow needs.

Reading of mammography studies, whether screening or diagnostic, is very demanding clinically and operationally. The US federal MSQA act of 1992 dictates strict requirements for accredited providers to ensure that historical comparison studies are available and that new studies are reported as soon as possible. Austin Radiological Association in Austin, Texas is one such provider with responsibility for reading mammography studies performed at a number of their locations. Before implementing a fully automated process to deliver prior exams to mammography reading workstations across their enterprise, Austin Radiological was required to monitor several patient worklists and then to manually push the prior exams. With numerous women's centers and mammography reading workstations, this workflow solution required the efforts of a full-time resource. By adopting a newer, fully automated enterprise imaging workflow solution, Austin Radiological Association was able to reallocate a support resource that was spending almost six hours/day performing manual study lookups and transfers.

Benefits of Resolving Lingering Enterprise Imaging Workflow Issues

- Reduced costs
- Increased clinical quality
- Improved customer service and competitiveness
- Reduced risk

Brandon Hughes, PACS Analyst at Austin Radiological Association recommends the following process when evaluating an enterprise imaging workflow solution: "Determine whether or not any manual processes in place for daily operations can be automated. If so, outline those processes and determine if they can be

removed or reworked in a way that can leverage your current IT systems. If not, then investigate all available workflow solutions that can solve your needs. Ask for a proof-of-concept and go with the one that works. If they all work, take a closer look at the company with the most flexible solution and a support team that truly listens."

Workflow Evolution

The need for healthcare providers to participate in novel business relationships that require new and more complex workflows is unlikely to abate. In fact, the need is likely to increase as providers not only seek to consolidate resources, but also look to avoid wholesale replacement of major IT assets. The need for stringent enterprise imaging standards is clearly acute, but solving today's workflow problems require more: it requires a detailed understanding of the organization's clinical workflow needs and a commitment on the behalf of healthcare IT vendors to support them to providing improved solutions. Even as healthcare standards improve, creative business leaders will always be required to solve their own unique workflow issues.

The financial benefits of resolving enterprise imaging workflow-related issues can be significant. Merely eliminating 30% of an FTE and unburdening IT and clinical staff can offset the cost of an IT workflow solution in year one. The benefits to organizational efficiency can be greater, enabling a significant competitive advantage which contributes to long-term success.

Laurel Bridge Software has helped solve the complex enterprise imaging workflow needs for many healthcare providers and organizations. The Compass™ and Navigator™ workflow solutions by Laurel Bridge Software were used to address the workflow needs of the organizations discussed in this document.

To learn more about how Laurel Bridge Software can deliver a customized workflow solution for your organization, please direct inquiries to info@LaurelBridge.com.



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