

Eliminating Paper-based Procedures

By Bob Dowd

The Sonora Quest Laboratories data center in Phoenix handles 10,000 requisitions per day. We've been scanning requisitions for several years, but our billing department continued to work with paper documents. This was a significant impact on our productivity. In addition, employee satisfaction suffered because many problems required that employees leave their desks and search for paper copies of documents. We have scanned document images for archival purposes for several years, so we decided to see how to make use of those scanned images as part of our billing process. Freedom Imaging Systems (FIS), Ypsilanti, MI, has a Workflow application that does everything we need for a completely paperless billing solution.

We switched from microfiche to storing the actual paper requisitions about four years ago. By storing the paper requisitions, we incurred monthly storage costs and paid for any document retrievals. In May 1999, we switched to the FIS Requisition Image Capture and Retrieval System (RICAR). With RICAR, our requisitions are scanned and electronically indexed in one step. We were able to reduce the number of scanning stations to two, working a single shift.

When we first installed RICAR, we had more than 100,000 paper documents that had never been scanned. We've since eliminated that backlog, and added cytology, pathology and toxicology requisitions to the scanning workload. In addition, we added the FIS Computer Output to Laser Disk (COLD) module in August 1999. COLD lets us output computer-generated reports to CD storage without printing and scanning paper. One of the key features of COLD is that it can merge a scanned image of pre-printed paper forms with computer-generated output for viewing. We can view both scanned requisitions and COLD documents (computer-generated data on an image of its pre-printed form) with the FIS Viewer application.

Another major benefit of the system is that customer relations have improved. If a physician calls and wants to know why a particular test was run, our customer service employees can quickly display all documents relating to a particular patient. Problems get resolved while the physician is on the phone.

As time progressed, we realized that even with scanned images, we were still relying on paper in the billing process. In 2000, we began looking for a solution to enhance our billing process. We wanted an application that would allow our accounts receivable clerks to view requisitions on screen while performing data entry or resolving missing information issues. We also wanted to electronically route problem requisitions to the people who could solve the problems. FIS demonstrated their Workflow application and showed us how it could improve productivity and help us get our billing done faster.

FIS Workflow obtains scanned requisition images from RICAR. These documents start in an unsorted queue. A sorting operator looks at each requisition and decides where to route it. Routing is a simple matter of clicking an on-screen button.

At other billing stations, there are operators who specialize in BCBS or other types of billing. Those operators see only requisitions that apply to them. Operators look at documents in their queue on screen as they enter information in the billing system. When they've finished with the billing operations on the requisition, they simply click an on-screen "Done" button to move the requisition to the completed queue.

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image into a Web-based pathology report to aid clinician interaction (Clinicians in distributed networks will not have to come to pathology for a consultation over a double-headed scope, but can interact with a pathologist via a Web-based image enhanced report.)

Not all of these are important to all laboratories, but for larger labs (commercial, private or hospital-based) these benefits can amount to considerable savings and/or capturing of opportunity costs associated with nonproductive work. These imaging solutions must have an attractive value proposition to receive wide spread adoption.

The Future

There are two additional technologies that, when combined with large-scale imaging of entire microscope slides, will provide future benefits to laboratories that want to further leverage their most valuable possessions—tissue and knowledge.

The first of these technologies, image analysis, has received attention lately as several companies have developed successful platforms that capture images of and quantify tissue specimens mostly through threshold analysis of specially stained tissue. This colorimetric analysis is only the tip of the iceberg; others are already embarking on next-generation image analysis tools that discriminate pathological lesions based on architectural tissue changes and spectral signatures. There are several initiatives based on spectral and morphometric analysis of tissues to suggest that future pathology imaging systems may include real-time analysis capabilities to aid pathologists in workload prioritization and lesion identification.

The second technology, data mining, is more of a buzzword in today's digital pathology. The question for pathology, however, is how to mine the data that is generated from the daily operations of a pathology laboratory. The addition of high-volume image analysis to the massive and diagnostic information already captured by pathology labs, not to mention molecular data, will result in a valuable dataset. This dataset will need to be "mined for value," which can become a pathology product or service in and of itself. This concept is evidenced by the emerging interest in tissue banking by commercial entities and universities that are capitalizing on the trend from "random" to "rational" drug discovery by the pharmaceutical industry. Because of this, anatomic pathology laboratories can improve their strategic and economic standing by leveraging the data that they generate on a daily basis. Digital imaging and analysis can be valuable tools for this purpose.

Summary

Although not ready for whole sale adoption, the future of digital imaging in pathology is very bright. Due to several contributing factors, innovation is at its highest right now and will only go higher as competitive necessity and the pace of innovation in supporting technologies continue to fuel its rise.

One of the key drivers for its continued success will be the need for pathologists to embrace a paradigm shift away from what is familiar to what can help them compete as their working environments become more challenging. The goal of anyone in digital pathology imaging should be to strive to make this paradigm shift as compelling as possible. To do this, imaging systems must help pathologists cost-effectively streamline their daily workflow while providing more opportunities to service their customers. ■

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