Newsbytes

Building a lab or modernizing? Don't forget the following

March 2019—*Building a new pathology lab or revamping an existing one gives laboratory decision-makers an opportunity to rethink information technology infrastructure and address persistent problems, plan for new technology, and improve processes. Some enhancements, such as incorporating barcoding and tracking systems, may be obvious, while others may be overlooked.* CAP TODAY *writer Jan Bowers asked four pathology informatics leaders what IT-related infrastructure or accommodations should be included in forward-looking plans for a new or refurbished lab. Here is some of what they had to say.*

Alexis Carter, MD, physician informaticist, pathology and laboratory medicine, Children's Healthcare of Atlanta: In labs I've worked in, there have been problems with where servers are located, specifically middleware servers for chemistry and hematology. Those servers tend to be in the laboratories themselves because the instruments often have to be connected to the servers directly or via a box that will translate an analog signal to TCP/IP.

Dr. Carter

Often servers are placed in locations that aren't optimal. For example, if you put one of these middleware servers right behind a big analyzer that's generating a lot of heat, it's not good for the server. In addition, the server can make it difficult for an instrument maintenance technician to get in and maintain your instruments and vice versa; it can cause a problem with an IT analyst being able to maintain the server. On top of that, you've got cords and cables running in and out of the server—anybody can knock into the server or trip over the cords. And when you have one instrument go down, that's one thing, but when you have the entire connection network for 10 to 20 of your instruments going into a single server, that is a very different downtime issue. These types of failures don't happen very often, but when they do, they can be devastating.

For a new hospital we're planning, our team has requested to have a server closet in the lab that will be accessible to all of our instruments via overhead cabling. A server closet can provide a good cooling system, which servers need, and fire protection. In addition, server closets are locked and their access more controlled, improving general security.

I've also found in various laboratories I've worked in that they don't always have a test server. In my opinion, anytime you have a server hooked up to multiple things—especially if it's middleware that's handling somewhere between 50 to 75 percent of your laboratory data—it's really important not just to have a production server for your live data but also a test server that allows you to test changes to the middleware prior to putting them into production. The test server can also serve as a backup to the hardware. In the event that your production middleware server crashes, a test server, if you've configured it properly, could very quickly be brought back up as a production server. Small to midsize labs sometimes don't think about using a test server because of the cost associated with it. That can be a disincentive. But the advantages of having it, in my opinion, outweigh the disadvantages. A test server can help you troubleshoot and when you're testing things to make sure you are doing them in a safe way.

Matthew G. Hanna, MD, clinical instructor in breast pathology and informatics, Memorial Sloan Kettering Cancer Center: Laboratories need to think about having adequate network access control, as well as

bandwidth, to support emerging technologies such as digital pathology and molecular bioinformatics. They need to look at how much bandwidth the lab currently uses and make projections for the future so they're not limiting themselves. Another consideration is planning for adequate digital file storage—again, this is speaking from the aspect of digital pathology or bioinformatics, where the file types are probably the largest in medicine.

Dr. Hanna

I think some people may be waiting for digital pathology systems to become FDA approved or validated, but I think it's truly worth investing in now. If you're rebuilding the lab and you really want to scale prospective whole slide image clinical scanning for primary diagnosis, you want to look at placing those scanners in the lab. For surgical pathology, tissue should go into the scanner right after it is stained. Therefore, the architect planning the operational laboratory blueprints should not create siloed scanning space. If the scanners are in disparate locations, this will create a lot of inefficiency in bringing glass slides back and forth. Efficiency may not be as much of a factor if you're using digital pathology for research. But for large-scale archival or prospective clinical scanning, improper hardware locations can create significant bottlenecks. Therefore, for clinical scanning, the best-case scenario is having the scanners in the lab. As vendors continue to create modular hardware, the glass slides may never need to leave the lab before moving to storage. You would then view the digital slides on your computer workstation as opposed to filling out a paper or electronic request for somebody to retrieve the glass slides.

Somak Roy, MD, assistant professor and director of molecular informatics and genetics services, Division of Molecular and Genomic Pathology, University of Pittsburgh Medical Center: Make sure you can securely archive sequencing or imaging data off site from the lab space to prevent permanent data loss in the event of a leaking water pipe near the servers, for example, or a massive power surge that affects the entire lab building. "Off site" means in a location that, typically, is a managed data center. It's tightly controlled in terms of temperature and moisture, redundant power sources, how the servers are connected, the amount of backup that the servers are subjected to, who has access, all in a HIPAA-compliant environment. The data center could be anywhere—next door, or two blocks away, or miles away.

Dr. Roy

Data transfer over networks is another very critical thing to consider, and I often think people realize the hard way that it should have been done. We're talking about data transfers from any kind of high-throughput sequencing or digital analysis platforms. One of the most common activities that involves handling these large data sets is backup, just moving the data, say, from the lab to an off-site data center. Most hospital systems have low-medium bandwidth network connections (10/100 Mbps), which are adequate for standard network communications like email exchanges and routine communications between EHRs and laboratory information systems. But when we start to move these very large amounts of data on a standard network connection—say, someone is trying to move a sequence (BAM) file from the sequencer to the server that will do the processing—it quickly overwhelms the bandwidth, creating a network traffic jam. It interferes with critical communications and can really impact patient

care. As lab directors are preparing to launch their NGS assays or whole slide imaging setups, specific network requirements should be discussed with the IT team. Make sure the discussion includes consideration of a dedicated, high-bandwidth network: 1 Gb per second to 10 Gb per second, depending on the institution's resources. The idea is to isolate the high-bandwidth network from the regular network.

Another critical aspect is data security. Lab directors, or whoever is the appropriate designee, must fully review the details of data security for the servers. What kind of encryption protocol will be used to transfer the data? What are the service provider's policies for securing stored data and in the event of a data breach? This should be done at the institutional level. Multiple stakeholders are typically involved in assessing the potential risks, especially when sending the data outside the institution's firewall. It's important that lab directors are aware of the necessary questions to ask, or they delegate the task to personnel with expertise in this area.

James H. Harrison, MD, PhD, associate professor and director of clinical laboratory informatics, Department of Pathology, University of Virginia: Make sure you have enough network plugs, located correctly in your physical space, to plug everything in. If the new system supports tracking of histology workflow and you intend to use it, make sure you plan for device placement and network plugs in the histology lab to support the required data entry.

Dr. Harrison

If you plan to use Wi-Fi to connect lab devices, make sure security has been adequately considered. If the Wi-Fi signal will travel outside the secure workplace or be accessible to visitors, it should have secure login and encryption. Base stations should be installed in appropriate locations to cover all required devices.

If you would like to do your own analysis of operational and clinical data that goes beyond using simple Excel spreadsheets, consider setting up a secure server in the local network environment running Python or R. This will allow secure transfer of data extracted from the LIS, EHR, and local business systems. Analyses can be carried out securely on the server using remote desktop technology or a server-based analytic tool like JupyterLab.

Gestalt Diagnostics acquires Peak Medical

The digital pathology company Gestalt Diagnostics has purchased Peak Medical, a provider of laboratory integration services, to expand its market reach and laboratory solutions offerings.

The acquisition includes Peak Medical employees who bring to Gestalt "skills and experience for all types of connectivity, with direct expertise in supporting legacy and current LISs alike," said Dan Roark, chief executive officer of Gestalt Diagnostics, in a press statement.

The companies will be merged under the Gestalt Diagnostics name and brand.

Gestalt Diagnostics, 509-755-9433

CommonWell Health Alliance launches connectivity program

The nonprofit CommonWell Health Alliance has announced a new option for connecting health information technology vendors and health care practitioners to its nationwide interoperability network.

The alliance has developed the CommonWell Connector program, which allows CommonWell members that provide integration platforms and services to offer CommonWell services to their customers, including health care provider

organizations and electronic health record system and other IT vendors.

“With this new option, organizations interested in connecting to CommonWell, such as EHRs, can dramatically reduce the development effort required to connect to the CommonWell network and enable their clients to participate in and derive value from this data sharing,” said Jitin Asnaani, executive director of CommonWell Health Alliance, in a press statement.

Health information technology vendors that link to CommonWell via the Connector program will not be required to join the alliance or to certify their products on the CommonWell network. The member organization serving as the CommonWell Connector, which has a certified CommonWell Connected product, will act as the intermediary for the connection.

CommonWell Connectors can promote CommonWell services and network connectivity as part of their client offerings.

Proscia introduces digital pathology system for commercial research

Proscia has released a new edition of Concentriq, the company’s flagship digital pathology platform.

The new Concentriq Commercial Research Edition is a comprehensive image-management solution designed to help life sciences organizations more readily incorporate pathology data into research, discovery, and clinical trials.

This latest edition seamlessly integrates with leading laboratory information systems, scanners, clinical trial management systems, and image-analysis solutions. Other features include highly configurable hierarchical image and data management; split-screen viewing and navigation of multiple images in the same window, including fluorescent and brightfield images; and tissue microarray management, which automates the segmentation of whole TMA images into individual core images, with same-core and multiple stain viewing simultaneously.

The system supports collaboration among departments, geographies, and organizations and controls data access with configurable role- and user-based permissions. It can be deployed in the cloud, on the premises, or as hybrid configurations.

“Having a comprehensive digital pathology solution specifically designed for the needs of scientists and pathologists allows them to focus on research and discovery instead of wasting valuable time on tedious image management and data gathering,” said Nathan Buchbinder, chief product officer for Proscia, in a company press release.

The Concentriq digital pathology platform also includes the Concentriq Clinical Enterprise Edition and Concentriq Academic Research and Education Edition. Concentriq is not intended for use in primary diagnosis.

Proscia, 877-255-1341

HL7 releases clinical genomics use cases

The standards development organization Health Level Seven International has published “HL7 Domain Analysis Model: Clinical Genomics,” a series of use cases suited to clinical settings.

“The document is part of an ongoing effort by the HL7 Clinical Genomics Work Group to identify common workflows and use cases to facilitate scalable and interoperable data standards for the breadth of clinical genomics scenarios,” according to an HL7 International blog post. The model offers use cases in a variety of areas, including preimplantation genetic diagnosis, whole exome sequencing, RNA sequencing, and proteomics.

“The ‘Domain Analysis Model: Clinical Genomics’ builds on the DAM clinical sequencing work that is already being used to design precision medicine workflows at hospitals across the country,” said Gil Alterovitz, PhD, HL7 Clinical Genomics Work Group co-chair and director of the Biomedical Cybernetics Laboratory at Harvard Medical School, in the blog post.

The DAM document provides narrative context and workflow diagrams to guide users through each stage of the use cases and describes steps involving the various stakeholders, including laboratorians, geneticists, clinicians, and patients. “This contextual knowledge aids in the development and implementation of software designed to interpret and communicate the relevant results in a clinical computer system, especially a patient’s electronic health record,” according to the blog.

HL7 will explore additional use cases based on stakeholder input and other feedback.

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