

How to ensure that mobile health data is accurate, secure?

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thermo-fisher

Mobile devices are an increasingly critical component of modern life, and that trend holds true for laboratories as well. In life sciences - and many other industries - the incredible (and constantly evolving) features on smartphones, tablets and other devices can enable technicians to easily capture new types of data more accurately and from more remote locations, but they also pose an interesting challenge.

How do laboratories ensure that all the data collected via mobile devices are accurate, secure and organized? The answer is a laboratory information management system (LIMS). Just as a LIMS enables an automated, paperless environment inside the lab, it can integrate with mobile devices to ensure that data collection, transmission and analysis are fully optimized.

New devices, new opportunities

The most straightforward benefit mobile devices bring to the lab is, quite simply, more data. The more data that life sciences labs have available, the more effective they can be, provided that the data is organized and accurate. That is where the LIMS comes in. A LIMS enables users to transmit information directly into the database from any location, eliminating error-prone manual transcription.

The ability to go completely paperless is no longer bound by the physical constraints of the laboratory itself. The LIMS ensures that location information, barcode readings, precise timing and any other data the technician collects are linked directly to the test results. In other words, combining mobile devices and a LIMS brings a sample management program's entire chain of custody under one secure umbrella. This enables improved regulatory compliance, traceability and auditing, of course, but it also makes for better management.

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One of the greatest advantages of mobile devices is that they are a two-way street. Not only can users submit data to the LIMS, they can also examine and look at data on a device without physically entering the lab. Modern LIMS offer connectivity

with mobile devices that allow lab personnel to visualize results from high-level trends down to granular details.

For life sciences labs performing extensive chromatography runs, for example, data must constantly be monitored to ensure results match up with reference data. Researchers aren't interested in general results alone, they want the ability to drill down to the level of individual components and peaks. A LIMS provides access to interactive data - not just a static image such as a jpeg or pdf - from a mobile device, allowing the lab to run far more efficiently. The same goes for automated alerts on sample runs: mobile devices linked to the LIMS allow users to make a decision from a remote location about whether an outlying result requires a retest or a full investigation, preventing unnecessary delays. Because of these visualization and connectivity advances, laboratory personnel are free to be far more creative as they design workflows. Data management is no longer a limiting factor in the laboratory; instead it is a driving force for innovation.

Another way mobile devices increase the amount of data available to lab managers as they create workflows is by enabling additional users to submit information to the LIMS. For example, someone in receiving can use a mobile device to scan barcodes on shipments of biological samples or other materials, then upload that data directly to the LIMS. This works especially well for correcting issues with suppliers, since shipments can be checked for missing items and compared to the shipping manifest at receiving without the need for a lab technician to get involved. A worker outside the laboratory can record photographic evidence and store it in the LIMS until the problem has been resolved.

The challenge of mobile devices

The benefits of mobile devices are undeniable, but new technologies also present new challenges for laboratories. Perhaps the most obvious of these is the 'bring your own device' (BYOD) trend: employees, from the C-Suite to individual technicians, now have preferred mobile devices. If a personal device has a certain capability that a user likes, why shouldn't it be used in the workplace?

As IT professionals know well, BYOD brings a host of issues, from information security and regulatory compliance (especially in regulated life sciences or healthcare environments) to software compatibility. But these concerns have done little to stem the oncoming tide of hybrid personal/professional devices. Once a CEO becomes accustomed to his or her home tablet, there is no turning back. Laboratories have so far typically avoided BYOD policies, especially in life sciences industries, due to sensitivities around intellectual property protection. In pharmaceutical labs, for example, the risks involving counterfeit drugs are too great - and the regulations too rigorous - to allow technicians to use personal mobile devices to submit or analyze sample data.

Technologies which address these concerns are becoming more widely available, allowing companies to segregate corporate data from personal data on mobile devices. All organizational activity occurs in a 'sandbox' over which the IT organization has full control and which they can wipe remotely if the device is lost or stolen or if an employee leaves the organization. This satisfies intellectual property and security concerns while allowing employees autonomy over their personal data. Enterprises are already using such technologies with company-issued devices, but it is clear that they have even greater applicability in BYOD scenarios.

Another challenge in integrating mobile devices with a LIMS is setting expectations. As anyone who has visited an app store can attest, devices are extremely well-suited to highly focused applications but not as strong when it comes to broad capabilities. Manual data entry, for example, is not an efficient use of a mobile device. That is why some LIMS offer streamlined connectivity to mobile devices. When users pull up a LIMS on their smart phones, the interface is noticeably different from what they would see on a desktop. Information, such as analytical charts and real-time results, is optimized for mobile devices. The key is to design application workflows that are well-suited to the mobile form factor and that take advantage of these devices' capabilities. With this approach, users quickly see the value in the right context.

Where Do Life Sciences Fit In?

While nearly all labs will integrate mobile devices with a LIMS in the future, some companies are still reticent. So which industries are early adopters? Process industries, such as water utilities and, oil and gas, which require remote sampling across large plants or geographies, have been among the first to get on board. Using mobile devices to scan bar codes or radio frequency identification tags and submit samples to the LIMS gives management access to more data in near-real time. This timely information allows a company to be far more nimble, while oftentimes producing superior products.

Regulation-saddled life sciences companies have begun using LIMS to integrate mobile technologies within the lab (albeit through company-supplied devices only) in both R&D and production environments. When samples are thawed in preclinical testing, for example, they lose some integrity, so pharmaceutical companies are now using mobile devices to scan barcodes each time a sample is removed from a freezer or replaced to be refrozen. While this could be done manually, as has been the

common practice, readings would not reach the LIMS automatically and freeze-thaw events would often be missed, providing an incorrect evaluation of the sample's condition.

Conclusion

The future importance of mobile devices in business is unquestioned. We have passed the tipping point for mobile device adoption - at least in our personal lives - and it is time for the revolution to move into the workplace. For laboratory employees, this will be an exciting transformation, bringing new levels of efficiency and innovation. Integrating mobile devices with the latest LIMS technology is merely the first step. But given how it promises to speed sampling, improve data accuracy and provide faster access to critical information enterprise-wide, it is an important first step that is worth taking right now.