Lab Manager MAGAZINE — Run Your Lab Like a Business

LAB MANAGER'S INDEPENDENT GUIDE TO PURCHASING A LIMS

START HERE

INTRODUCTION:

Most modern laboratories rely on some form of integrated Laboratory Information Management System (LIMS) to improve efficiency and productivity in the lab. LIMS can help in all aspects of laboratory management by facilitating rapid login, calculating turnaround times, maximizing productivity and profitability, and improving QA/QC and regulatory compliance, as well as helping to meet accreditation requirements.

FORENSIC LABS

Forensic labs must manage ever-growing amounts of case information that comes in from police departments, pathology labs, drug rehabilitation centers, prisons, and even private customers. All case file information, data, test results, validation information, and much more needs to be managed meticulously, a task made easier by an efficient LIMS.

A Server-based
Server-based LIMS allow all data to be captured and manipulated locally.

- ThermoScientific INF-12000-FORENSICS

B Web-based
Web-based LIMS allow users to access stored information from any location.

- SQL SQL*LIMS
- Starlims STARLIMS Forensics LIMS
- Cores CCC

QUALITY CONTROL

LIMS software is ideally suited to the QC/QA environment in which multiple processes and considerable data must be coordinated and tracked.

A Server-based
Server-based LIMS allow all data to be captured and manipulated locally.

- ATL ScreenIT MQPS

B Web-based
Web-based LIMS allow users to access stored information from any location.

- ThermoScientific SampleManager
- Ruro LIMS 247

INDUSTRY/MANUFACTURING LABS

Industrial manufacturing labs require the coordination and management of multiple processes – LIMS software is ideal for this application.

A Chemical
LIMS is ideally suited to labs associated with chemical manufacturing, as the system can be used to control the large number of complex processes involved.

1 Server-based
Server-based LIMS allow all data to be captured and manipulated locally.

- LabLite LabLite process control

2 Web-based
Web-based LIMS allow users to access stored information from any location.

- ThermoScientific INF-11000-CHEMICALS MANUFACTURE
- Perkin Elmer LabWorks Process LIMS

B Food & drink
The manufacture of food and drink relies to an ever-increasing extent on LIMS, which helps to ensure quality standards are met and all regulations are followed meticulously.

1 Server-based
Server-based LIMS allow all data to be captured and manipulated locally.

- Core Food and Beverage LIMS

2 Web-based
Web-based LIMS allow users to access stored information from any location.

- ThermoScientific INF-12000-FOOD AND BEVERAGE
- Perkin Elmer Labworks Food LIMS

C Metals/minerals/mining
LIMS are essential in mining companies for quality, optimized efficiencies, throughput of continuous processes, and compliance with product and environmental safety standards while maintaining profitability.

1 Web-based
Web-based LIMS allow users to access stored information from any location.

- ThermoScientific INF-11000-METALSMINING
- Two Fold Quaioupe
- QSI WinLIMS.NET

D Oil/gas
LIMS software is increasingly required by oil and gas companies who have large amounts of data to coordinate and multiple samples to process.

1 Web-based
Web-based LIMS allow users to access stored information from any location.

- ThermoScientific INF-11000-OIL AND GAS

CLINICAL LABS

Clinical labs can involve manipulation of hundreds of samples in numerous processes. LIMS can be invaluable in controlling flow through a clinical lab.

A Bioanalysis
Bioanalysis involves efficient assay validation, bioanalysis of samples, instrument interfacing, sample tracking, and reporting of results. These processes can all benefit from an effective LIMS.

1 Server-based
Server-based LIMS allow all data to be captured and manipulated locally.

- ThermoScientific Galileo LIMS
- ThermoScientific Watson LIMS
- Biodata BioKM

2 Web-based
Web-based LIMS allow users to access stored information from any location.

- ThermoScientific INF-12000-BIOBANKING
- ThermoScientific Nautilus
- GenoLogics GenoLogics LIMS

C Pharmaceutical manufacturing
In the pharmaceutical industry, it is particularly important that manufacturing process and their own working practices adhere to the defined standards. Furthermore, the laboratory must work in such a way that it adds value to the manufacturing process and is not seen as a bottleneck within the manufacturing process.

These demands require an efficient and appropriate LIMS.

1 Server-based
Server-based LIMS allow all data to be captured and manipulated locally.

- ThermoScientific INF-11007-PHARM-MAN
- ThermoScientific Darwin LIMS

2 Web-based
Web-based LIMS allow users to access stored information from any location.

- QSI WinLIMS.NET™
- Novatek International Novo-LIMS

B Drug discovery
Drug discovery labs are high throughput environments that benefit from effective data management solutions.

1 Server-based
Server-based LIMS allow all data to be captured and manipulated locally.

- ThermoScientific INF-20000-CRO
- ThermoScientific INF-12000-DRUG DISCOVERY

D Patient care
There are many aspects of patient care information that have to be organized, including patient vital statistics, patient specimens, specimen sources, testing procedures ordered, analytical data, and results. All of this information is highly important and must be kept confidential and safe from corruption.

An appropriate and efficient LIMS is essential to the management of a clinical lab.

1 Web-based
Web-based LIMS allow users to access stored information from any location.

- ATL NooMate

CHEMICAL LABS

Process chemical labs can improve efficiency lost through providing highly sensitive or customized products by implementing LIMS.

A Server-based
Server-based LIMS allow all data to be captured and manipulated locally.

- ATL Titan
- ATL Sample Master 9.0
- Core Chemical LIMS

B Web-based
Web-based LIMS allow users to access stored information from any location.

- LabWare Labware ELN

MULTIDISCIPLINARY PRODUCTS

While some LIMS are tailored to individual applications or industries, others can be modified and adapted to suit the user's own requirements. These systems can be used in a whole range of applications depending on the needs of the user.

A Server-based
Server-based LIMS allow all data to be captured and manipulated locally.

- Starlims Starlims
- ATL LabsIQ
- LabLynx Elab LIMS
- Autoscribe Matrix Gemini
- Labsoft Labsoft LIMS
- LabLite LabLite Stability Tracker
- LabWare Labware LIMS
- SapioSciences Exemplar LIMS

B Web-based
Web-based LIMS allow users to access stored information from any location.

- LabCollector LabCollector
- LabLynx Web LIMS
- Blaze Systems BlazeLIMS
- LabWare Labware LIMS
- LabVantage LabVantage LIMS
- Two Fold Software Quaioupe LIMS
- Autoscribe Matrix Gemini

ENVIRONMENTAL LABS

Environmental laboratories need a LIMS that can rapidly respond to changing needs while maintaining the efficient management of their product, i.e., the data and information they provide to their customers.

A Server-based
Server-based LIMS allow all data to be captured and manipulated locally.

- ThermoScientific INF-11000-ENVIROLAB
- ThermoScientific INF-11000-WATER
- Perkin Elmer Labworks waterLIMS
- Starlims STARLIMS environmental solutions
- Core Environmental LIMS

B Web-based
Web-based LIMS allow users to access stored information from any location.

- Perkin Elmer Labworks green LIMS
- QSI WinLIMS
- Khemia Omega TT LIMS

Author: John Buie

IT'S NOT ALL ABOUT SIZE

by Angelo DePalma, Ph.D.

Whether your business is pharmaceuticals, mining, paints, or foods, you are probably working with smaller particles than you were a decade ago. "For characterizing these particles, analysts want equipment that's reasonably priced and that takes measurements rapidly, with a high degree of resolution and reproducibility," says Tony Thornton, director of product integrity at Micromeritics (Norcross, GA).

Micromeritics specializes in particle characterization from nanometer to millimeter sizes, using orthogonal techniques such as x-ray monitored gravity sedimentation, static and dynamic laser light scattering, electrical sensing zones, and air permeability. For particle shape, they use dynamic image analysis.

> "Although particle sizing is a mature technology, ... methods based on ultrasound and light scattering have been evolving slowly."

Although particle sizing is a mature technology—think sieving and microscopy as the founding techniques—methods based on ultrasound and light scattering have been evolving slowly toward the characterization of ever-smaller particles, well into the nanometer size domain. Scanning electron microscopy (SEM) and transmission electron microscopy (TEM) remain the gold standards for both sizing and characterization, but these methods are too expensive for most labs and require a high degree of operator expertise.

What's more important is that SEM and TEM sample preparation is arduous, and statistical significance is limited by the number of particles within the field that a user or camera can count. So while these methods are superb for analyzing a single or small number of particles, they don't cut it in high-throughput industrial settings.

"Users want to measure more quickly, and have a high level of confidence in their data," Dr. Thornton adds.

The ability to characterize ever-smaller particles is a direct response to discoveries in nanotechnology and nanomaterials, from which numerous products have arisen. The approval of next-generation drugs will depend to a large degree on our ability to size and characterize nanoparticles. Standards are beginning to emerge from ASTM and ISO on nanotech metrology as well as related environmental health issues. Dr. Thornton belongs to an ASTM committee on nanotech, which has a liaison relationship with ISO.

What's in a name?

Curiously, the most significant problem facing nanotechnology is semantic. "The world hasn't yet decided on the definition of a nanoparticle," Dr. Thornton admits. Regulators appear to be seeking a simple description based on size, whereas engineering and scientific disciplines would like to incorporate activity or reactivity.

Whatever the definition of "nano," instrument makers are focusing on higher resolution and throughput for particles below 100 nm in diameter. "Traditionally, this has only been possible using dynamic light scattering or electron microscopy," says Matthew N. Rhyner, Ph.D., technical product manager at Beckman Coulter (Brea, CA). "But DLS is an inherently low-resolution technique because it is an ensemble method—it analyzes a large number of particles at once, rather than individual particles." EM has its problems as well, as mentioned earlier.

frequently used today as a means of documenting outages and alarms, to prevent service calls in some cases, and to maintain the life of the machine and reduce downtime.

"The choice also depends on building design and [how much users need to] minimize the consumption of water and electric utilities," says Mr. Henley. Washers take up space that could be occupied by more critical equipment, whereas glassware washing is a support activity that in some cases could be consolidated to save space as well as electricity and water.

> "Hand washing might make economic sense for very 'clean' workflows that include foods and beverages, but it too has drawbacks."

"It depends on the application as well. Some glassware needs to be treated in a special manner. For example, when a caustic or acidic rinse is needed to remove detergent residues and neutralize the glass surface." In many such cases, Mr. Henley notes that before purchasing a washer, customers will send LANCER a load of glassware for a test clean, just to be sure the beakers and flasks come back clean and residue-free.

Miele, the German parent company of Miele USA (Princeton, NJ) is known in its native country principally as a manufacturer of home appliances. In competing within this marketplace, the company has instituted numerous "green" initiatives, both in the manufacture of its goods and in its operations. Miele regularly publishes a sustainability report on its operations and has won awards for its efforts.

The same philosophy applies to its laboratory glassware washers. "We live in a disposable world, but these days, with restricted budgets, people are taking a much harder look at products like washers," says Thomas Hoerner of Miele Professional (Princeton, NJ). "The current sentiment is that if we're going to spend the money, and if we really need it, we'd better make sure the equipment fits all our organization's criteria."

This sentiment holds for all business expenses, Mr. Hoerner explains, from major capital expenditures to cars, computers, and lab equipment. For washers, a typical wish list might include a long service life, recyclability, and operating sustainability in terms of water usage, water wastage, detergent use, and energy-efficient drying.

A washer's water usage is a particularly critical factor in selecting a lab model. Many municipalities monitor sewage, or apply a charge for it based on water intake. For some industries, effluent must meet strict criteria for release into waterways or even waste treatment plants. A well-designed lab washer can potentially save hundreds or thousands of dollars a year in electricity and water, generating a full ROI in five years.

Mr. Hoerner uses a consumer analogy to make his point. "A top-loading washing machine uses 50 gallons of water and a cup of detergent vs. six gallons and two tablespoons of detergent for a front-loader. The same type of design considerations are occurring in the laboratory market."

Angelo DePalma holds a Ph.D. in organic chemistry and has worked in the pharmaceutical industry. You can reach him at angelo@adepalma.com.

FOR ADDITIONAL RESOURCES ON LAB WASHERS, INCLUDING USEFUL ARTICLES AND A LIST OF MANUFACTURERS, VISIT WWW.LABMANAGER.COM/WASHERS.