

TODAY'S

Chemist

A T W O R K

Sample Prep
Analysis
Data Handling

www.tcawonline.org

NOVEMBER 2004

As
printed in
Today's
Chemist at
Work

FOOD SCIENCE

NIST "STANDARDIZES"
CHOCOLATE

FARMING
PHARMACEUTICALS

Instruments & Applications
Ion Mobility Spectrometry

Chemistry Chronicles
The Bhopal Tragedy

Technology & Tools
MS for Isotope Ratios

Product Profile
Labware Washers

Published by the
American Chemical Society

LIMS Goes Global

Standardization and its effect on reducing the total cost of ownership

Jim Neville

Laboratory scientists are encountering increasing pressures to meet tightening time-to-market requirements and higher quality standards. In an effort to achieve these objectives, companies have relied on laboratory information management systems (LIMS) to play a major role in improving efficiencies in their laboratories. Over the past few years, labs have benefited from significant technological advances in LIMS, including industry-specific functionality, enhanced security options, and client-server architectures that have considerably improved throughput and laboratory productivity.

Some multi-lab organizations continue to use a range of different LIMS solutions resulting from independent, lab-driven purchasing decisions and corporate-led merger and acquisition activities. Unfortunately, companies using this approach to LIMS procurement and management miss out on the opportunity to gain organizational, enterprise-wide efficiencies.

In the absence of a uniform LIMS strategy, local processes and decision-making criteria dominate, and the ability to harmonize processes across the organization is nearly impossible. In addition, incompatible file formats significantly hamper activities such as reporting and information sharing, and may even impair decision-making regarding production, product quality, resource allocation and process optimization. In short, while LIMS have improved efficiency at the lab level, an uncoordinated LIMS strategy often causes these gains to be lost in an evaluation of overall company-wide efficiency.

An audit of the many LIMS in place across an organization, whether commercial or homegrown, will most likely reveal that they were developed to meet the

specific functional requirements of individual labs and the specific instruments contained in each. As a result, in addition to limiting business efficiency, these

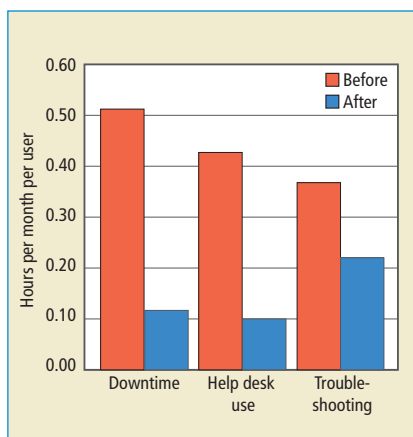


Figure 1. Reductions in nonproductive hours by users through LIMS standardization.

disparate LIMS present a potential drain on IT resources. Activities such as upgrading, validating, and developing instrument interfaces are much more difficult and time-consuming with multiple LIMS in place. Consequently, end users face slow response times from an IT department burdened by administering and supporting multiple LIMS across the organization.

A Global Approach

Recognizing the potential inefficiencies of multiple LIMS, many companies now view LIMS as an essential component of their enterprise IT strategies.

Implementing a standardized LIMS strategy, however, involves far more than simply selecting a standard solution that can be rolled out repeatedly to multiple sites. Instead, many initial challenges need to be overcome, including the development of consistent procedures, processes, and methodologies.

Scientists may resist process harmonization and centrally dictated policies, thinking these could stifle innovation and limit creativity. It can therefore be difficult to convince these individuals of the benefits of sharing best practices across the organization and developing more consistent processes at the expense of giving up localized, established processes. To address this problem, it is important to involve a representative group of end users as early as possible in the process and to ensure they fully understand the potential benefits of a standardized solution. In addition, good project management, with local champions and a dedicated project manager, is critical to ensuring the implementation process runs smoothly and efficiently. Selling select end users on a one-LIMS concept in advance will result in distributed proponents who can help convince any dissenters at the local lab level of the project's merits. End-user involvement will also ensure that the final result reflects the needs and requirements of the broader organization.

Benefits of a Global LIMS

Despite the challenges associated with a global LIMS, the trend toward standardization is anticipated to grow as the industry considers the financial and operational benefits of such a strategy.

Standardizing on one LIMS has the potential to not only reduce hardware and software costs but also simplify activities such as internal support, training, upgrades, and administration—key drivers in reducing the total cost of ownership (TCO) of a LIMS. Moreover, a universal LIMS strategy enables a consistent validation approach, enabling companies to assure compliance inspectors that LIMS implementations company-wide conform to the same processes and controls.

One integrated LIMS also reduces

downtime and increases productivity for the end user. With one solution, IT departments can develop more knowledge of a particular LIMS and identify and solve problems faster, even anticipating them before they occur. Standardization also streamlines vendor relationships, improves purchasing power, and frees up IT staff to focus on other activities.

Selecting a Global LIMS as a Standard

Standardizing on one LIMS represents a significant investment of time and money, and without careful selection and proper planning, it can carry considerable risk.

Key requirements for a global standard include the ability to become an integral

part of a company's IT infrastructure and to provide easy access to data through Web service architecture and XML processing capabilities. The solution must also be highly scalable for a large number of users and capable of operating in multiple languages. Access logs and electronic signatures are also critical features needed to accommodate users operating across multiple time zones.

Selecting a vendor capable of implementing a global standard is potentially more important than selecting the appropriate technical solution. Companies seeking a LIMS standard need to select a vendor experienced in LIMS standardizations who can track project milestones, communicate progress reports, and enforce regular project reviews for the long-term viability of an enterprise deployment. In addition, the ability to offer local support on a worldwide basis is a necessity.

Vendors must be able to serve as a global partner and be prepared to accommodate any local considerations as they arise. They must be equipped to involve and engage key decision-makers, users, and subject-matter experts from across the customer's business during the entire planning and implementation phases. With the level of investment at stake, and the high potential for encountering pitfalls, the importance of choosing the right vendor cannot be underestimated.

Summary

Changing economic conditions are driving life and analytical science organizations to curb expenses, and at the same time improve product quality. These companies are closely examining their LIMS strategies and exploring opportunities for harmonizing processes and standardizing on one LIMS in an effort to reduce the TCO of LIMS and improve efficiency. By deploying one integrated LIMS instead of many disparate applications, companies can reduce costs, IT departments can gain productivity, and end users can become more efficient. With independent research to confirm the value of LIMS standardization, companies can now make the decision to standardize on one LIMS with confidence.

Jim Neville is the director of marketing and business development for Informatics & Services, Thermo Electron Corp., in Woburn, MA. ♦

Evaluating the Impact of LIMS Standardization on TCO

Despite the growing trend of implementing LIMS as a corporate standard, and the many benefits standardization offers, implementing a global LIMS is potentially expensive and risky. The financial benefits of standardizing on one LIMS have been largely anecdotal and, to date, there has been no independent study to measure the economic impact of LIMS standardization.

However, a new study conducted by IDC, a Framingham, MA-based research and consulting firm, entitled *Standardizing on LIMS: TCO and ROI for the Multi-Lab Setting*, is the first to examine the financial implications of LIMS standardization in depth. Sponsored by Thermo Electron, the study includes interviews with senior LIMS and IT managers at leading companies in industries such as pharmaceuticals, chemicals, food and beverage, and oil and gas that either have standardized or are in the process of standardizing on one LIMS solution.

TCO provides a useful means of estimating total costs incurred throughout the life cycle of a particular IT asset, from original acquisition through retirement. Since TCO analysis extends beyond procurement costs and incorporates ongoing support and IT management cost implications, it also offers a meaningful metric for evaluating the benefits of standardization.

In terms of TCO, the companies included in the study realized benefits of approximately \$300,000 per lab annually from implementing a standardized LIMS. Companies derived benefits from three areas: a reduction in LIMS-associated costs, increased IT productivity, and enhanced LIMS user productivity.

1. Reduction of LIMS costs. The IDC study showed that companies that standardized on one LIMS derived significant savings from equipment purchase avoidance, improvements in IT staff efficiency, and a reduction in training expenses. On average, among the participating companies, every dollar spent

on deploying a standardized LIMS was offset by \$1.50 in savings on hardware and software. In addition, by standardizing, companies lowered the cost of support per user and were able to reduce their IT staff supporting LIMS by 57% on average. Standardization also saved companies the cost of IT and user training for multiple LIMS, estimated at up to \$250 per user per year. In large organizations with multiple labs, this could represent savings of more than \$100,000.

2. Increased IT productivity. Through standardization, companies also experienced reductions in the amount of downtime and the level of IT activities required to resolve problems related to LIMS. User support activities, applications management and validation, time devoted to troubleshooting activities, and data management were typically reduced by more than 50%, and in some cases as much as 90%.

3. Increased LIMS user productivity. LIMS users, as well as those outside the lab who required access to data, benefited the most from standardization. These individuals were able to build reports dynamically and conduct analysis more efficiently, dramatically impacting their productivity. In fact, over half the participating companies in the study credited LIMS standardization with reducing their time-to-market, while 77% thought that a standardized LIMS improved product quality, which freed up, on average, 6.3 hours of productive time to each LIMS user per month. This number becomes particularly significant when multiplied by the few hundred LIMS users a large global company would typically license.

Within the first year of implementing a standardized LIMS, companies also saw their LIMS systems, applications, and network downtime drop 77% (see Figure 1). Users also devoted less time to troubleshooting and contacting the help desk to resolve problems.