



Institute for Laboratory Automation

Realizing the Potential of Automation & Information Technologies in Science

The Need for Education in Laboratory Automation & Computing

*Improvements in
lab productivity
depends upon
automation.*

*Success in lab
automation
depends upon:*

- *leadership*
- *training for
technology
planning &
project
management,
and*
- *people trained in
the use of
automated
systems*

Every day the scientists and technicians in your labs are working to produce the knowledge, information, and data [K / I / D] your company depends upon to meet its goals.

That K / I / D is recorded in notebooks and electronic systems. How well are those systems going to support your need for access today, tomorrow, or over the next 20+ years? This is the minimum most companies need guaranteed access to data.

The systems being put in place to manage laboratory K / I / D are complex. Most lab data management systems (Laboratory Information Management Systems -LIMS, Electronic Lab Notebooks - ELNs, and some instrument data systems) are a combination of four separate products: hardware, operating system, database management system, and the application you and your staff uses. Each from a different company, each with its own product life cycle.

Lab managers are usually trained in the sciences and personnel aspects of laboratory management. They are rarely trained in technology management and planning for laboratory robotics and informatics – the tools used today to get laboratory work done and manage the results. The consequences of inadequate planning can be significant:

“In January 2006, the FBI ended the LIMS project, and in March 2006 the FBI and [the vendor] agreed to terminate the contract for the convenience of the government. The FBI agreed to pay a settlement of \$523,932 to the company in addition to the money already spent on developing the system and obtaining hardware. Therefore, the FBI spent a total of \$1,380,151 on the project. With only the hardware usable, the FBI lost \$1,175,015 on the unsuccessful LIMS project.” OIG Audit Report 06-33

Other examples of problems in projects:

- A “2006 ALA Survey on Industrial Laboratory Automation” published in the August 2007 edition of the Journal of the Association for Laboratory Automation posed the following question: My Company / Organization’s Senior Management Feels its Investment in Laboratory Automation Has: Succeeded in delivering the expected benefits (56%), produced mixed results (43%), has not delivered the expected benefits (1%). *44% failed to fully realize expectations.*
- "As the statistics show that 60% of all LIMS projects have failed to have a 100% successful go-live.." and this is reported in:
http://www.scientific-computing.com/features/feature.php?feature_id=132.
- The Standish Report on project failures (looking at Enterprise Resource Planning [ERP] implementations – similar in scope to LIMS & Electronic Lab Notebooks) shows that over half will fail, 31.1% of projects will be canceled before they ever get completed. Further results indicate 52.7% of projects will cost over 189% of their original estimates.

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a non-profit organization

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One purpose of the Institute is to educate lab management, staff, and IT support in the realities of working in the informatics age.

We've received a number of emails discussing the results of improperly managing projects, all have requested that any identification be kept confidential. Among them are:

- A LIMS customer was given a precise fixed-price quote somewhere around \$90,000 and then got hit with several \$100,000 in extras after the contract was signed – contributed anonymously.
- “A major pharma company some years back that implemented a LIMS with a lot of customization that was generally considered to be successful, until it came time to upgrade. They couldn't do it, and went back to square one and purchased another system” – contributed anonymously.
- Reports of robotics system failures totaling over \$700,000.
- Examples where vendors are using customer sites as test-beds for software development.
- A set of 3 labs that were trying to use the same system [to reduce cost] for different types of labs with different requirements - \$500,000 spent before the project was cancelled.

In addition to those costs, there are the costs of missed opportunities, project delays, departmental & employee frustration, and the fact that the problems you wanted to solve are still sitting there.

The causes for failures are varied, but most include factors that could have been avoided by making sure those involved were properly trained:

- poor planning, unrealistic goals
- inadequate specifications, including regulatory compliance requirements
- project management problems
- scope creep
- lack of experienced resources

There are examples of successes:

- A Chemistry ELN project (Synthematrix Arthur Suite installed in 2004) was a stunning success. It hit all major project objectives and yielded a 20% increase in productivity with high levels of user satisfaction. - Asst. Director, Discovery Informatics at a pharmaceutical company
- Clinical applications of laboratory automation have shown considerable success. One report concerning the Pathology Department of a large hospital showed an almost 10-fold increase in test results with a substantial decrease in the cost per test (“*Automation and Expert Systems in a Core Clinical Chemistry Laboratory*”, George Streitberg et. al., JALA, April 2009, pg. 94).

Laboratory systems are no longer isolated from corporate systems. If you are to realize their full potential, they have to work cooperatively with other corporate and departmental systems. More frequently companies want to tie their LIMS and ELN projects to ERP systems to increase the potential productivity gains, increasing the complexity of systems implementation.

Leadership and training are the keys to the successful application of automation in your labs, just as they are in clinical applications (correspondence with G. Streiberg):

- leadership on the part of laboratory management,
- proper preparation that includes ensuring that the people responsible for the project are properly trained, that they understand the technologies they are working with, and,
- that those using automation systems are trained and experienced in their use.

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One purpose of the ILA is help educate lab management, staff, and IT support in the realities of working in the informatics age. Given the failure rates and costs noted above, training is well worth the investment.

Visit our web site, email us, or call for more information about our courses and how we can help your projects succeed.