

Good Planning and Strong Leadership Are Critical to Efficient Laboratory Designs

By Nicholas Borgert



Before a hospital or health care system can determine how to optimize its laboratory design and assess opportunities available from automation, administrators need to understand four things, according to Kris A. Bailey, Executive MBA, BA, MLT, founder and operator of AiCon, a 6-year-old laboratory diagnostic consulting business based in Kitchener, Ontario, Canada:

- The lab's business needs. For example, why is the lab interested in automation? What business problems are they trying to solve?
- The lab profile. How many tests are run per day? How many specimens are handled per day, and what tasks need to be performed on the sample (for example, centrifuge, aliquot, and special handling)? How many specimens are in tubes vs non-tubes? What is the test-to-instrument ratio? How many full-time employees (FTEs) does the lab have? What is the workflow, and what are the issues related to processing?
- The status of the marketplace. What are the competitors doing? What is happening in the lab industry? This is where a political, economic, social, and technological (PEST+) analysis is performed.
- The lab itself. What are the lab's strengths, weaknesses, issues, and gaps? A SWOT analysis (strengths, weaknesses, opportunities, and threats) would be appropriate.

Developing a Strategic Plan

After these activities are completed, it is possible to develop a strategic plan for the lab. These strategies may involve activities related to the marketplace, automation, or facility-development plans.

There is a dichotomy between leadership, operations management, and project management, according to Bailey. As a specialist in project management, Bailey is skilled at resisting attempts by client leadership to give away their responsibilities to her or to be drawn into infighting over policy. "That's where strong leadership comes in," Bailey says.

Her views on the advisability of using a single automation vendor have evolved during her career. She discusses automating a lab in Toronto in 1992. "It was supposed to be plug and play; it sounded easy to do," she says. "But most equipment vendors had their own proprietary software; there was no standardization. Pulling it all together was really tough."

Today, she says, dealing with one equipment vendor who is skilled at systems integration is a smart choice for hospitals and lab operations. “I have found that going with one vendor actually increases your leverage with the vendor over issues of cost and service,” Bailey says. “Also, it’s beneficial to go with two vendors who are willing to work together.”

Laboratory operation, she says, is a very niche business—something many on the outside don’t fully appreciate. “It’s complicated because the lab is general and handles everything from genetics to mainstream testing, while other hospital departments focus on specific tasks,” she says. “Yet all labs use the same instruments and face the same problems. A lab I visit in the middle of Singapore is doing the same things as the lab in Idaho.”

In recent years, middleware—smart decision tools that run the laboratory system—have gained in popularity. Middleware is the layer of software between the analyzers and the laboratory information system (LIS). “An automation system is not built for smart decision-making,” Bailey says. “When I’m asked, ‘Should we automate?’ 50 percent of the time I say no. Too many people look at one thing. I look at the entire picture. Automating bad processes is the wrong approach. Often, process improvements can achieve the same things that automation can.”

According to Bailey, facilities with 5 million or more billable tests annually are ready for automation. Those with 3 to 5 million could be served by a platform enhancement or a targeted work cell. Facilities with fewer than 3 million billable tests should concentrate on improving their process design and laboratory information system (LIS) functionality, she believes.

“Again, leadership is so important. Automating is hard. If you’ve been operating with 17 FTEs and you’ll need only five in the future, you need leadership willing to make the tough decisions on staffing. Automation is not for the squeamish,” Bailey says. In fact, her straight talk and frank appraisals, she says, have cost her clients and ended contracts prematurely.

Creating Efficient Lab Layouts

Asked to name the most common lab design and operation shortcomings she encounters, Bailey says poor process design is number one. Some labs have not adopted information technology, and they remain paper-based. Some have ineffective managers who may be technically good but are not skilled in operations and change management. A final concern is that too much focus on cost often leads to bad decisions.

Bailey has observed that progressive hospital labs implement interdisciplinary automation and middleware in the high-volume, automated area, while the remainder of the laboratory follows the more traditional discipline design (such as genetics and microbiology). She favors designing by matrix and by process. This clusters like technologies and like processes together while retaining relationships that traditionally

exist within disciplines. She created her most innovative lab design while working at Kaiser Permanente NW in Oregon. Here's how it functions:

- High-volume, highly automated tests are performed in one area;
- All tests "in a tube"—either batched or requiring preanalytical processes—are performed in another area;
- All tests "not in a tube" are processed in real time in another area; and
- All microscopy activities are performed in the last area.

For Bailey, knowing a laboratory's numbers is crucial to determining ways to create an efficient lab layout. Among the markers she considers:

- Cost per test—high volume, automated tests and ALL tests;
- Total automated tests / FTE worked / diem and ALL tests;
- Total automated tests / FTE paid / diem; and ALL tests;
- Total costs / FTE / diem;
- Percentage of STATs ordered as a ratio to ALL tests;
- Number of billable tests per square foot;
- Specimen arrival time (SAT);
- Specimen distribution study (SDS);
- FTE allocation to specimen arrival time (FAT); and
- Workflow analysis in each area.

Implementing Laboratory Automation Systems

Attention to both technology and training is essential to the creation of an efficiently implemented LIS, Bailey said. She sees four critical tasks as the prelude to any lab creation:

- Finding the right technical solution to meet business requirements;
- The ability to reduce intervention by ensuring that middleware and LIS connectivity is seamless;
- Ensuring the proper training of staff by a commercial vendor; and
- Putting into place appropriate problem-solving mechanisms and risk management before going live.

"I absolutely believe that comprehensive business planning and technology decision-making are critical to success," Bailey says. "I have seen far too many failures because too much attention has been paid to technology choices, without due diligence on the relationship between business needs, current state data, issues and gaps, and future needs."

Bailey talks about the major elements decision-makers should keep in mind as they develop a lab-automation strategy for their own facilities. She believes that everyone has wisdom to offer, and wisdom is needed to obtain the wisest results. That is followed by the belief that there are no wrong answers, and that everyone involved will be heard and will hear the contributions of others. She also says that the whole is greater than the sum of its parts. Change, she says, occurs as a result of inspiration or desperation. To do nothing is every man's power, and action taken without vision becomes a nightmare.

Kris A. Bailey, MBA, BA, MLT, is the founder and operator of AiCon, a 6-year-old laboratory diagnostic consulting business based in Kitchener, Ontario, Canada. Bailey is incorporating AiCon later this year.



Bailey's career has spanned 25 years and includes extensive experience in senior lab management, diagnostic industry marketing and strategic planning, lab process design, program design for new labs, the consolidation and realignment of lab systems, and the orderly integration of information technology.

She has worked as a contract project director for many organizations, including Stanford University Medical Center, Kaiser Permanente's Colorado Regional Laboratory, St Charles Medical Center in Oregon, and other facilities and organizations in Canada and Australia.

A former senior consultant on strategic planning at Bayer Diagnostics, she frequently speaks to audiences of her peers, government health officials, and care providers.

Bailey operates AiCon free of any affiliation with commercial hardware and software vendors. "I know them all and have worked with most," she says. "While there are no ties, it is important to maintain relationships with vendors to keep up on the automation changes and developments."

The Role of Leadership

According to Bailey, it is the role of leadership to solidify the vision and the plan. Other responsibilities include communicating to stakeholders, achieving "buy-in," cementing the required changes the strategy demands of the organizational culture, and constantly challenging the organization to strive for success.

Consider executive behavior modeling. Bailey addresses the importance of the role leaders play and the need to convey priorities. "Leaders should never assume that everyone automatically knows what is most important," Bailey says. "Seize the future."

Good management, Bailey says, begins with a focus on excellence and the ways to deliver it day to day. To achieve excellence, it is important to determine objectives, actions, procedures, programs, data, milestones, and, when needed, discipline.

"Operations executes the plan," Bailey says. "It plays a dual role in providing expertise and implementing a project. Apart from general management, successful managers of individual projects should reflect other capabilities, according to Bailey.

"A successful project manager is one who intuitively understands and demonstrates the attitude, behavior, and commitment of project management," Bailey says. These involve awareness on several key issues: that projects reflect reality; that they reflect a high degree of teamwork; that sponsorship of a project can, under some circumstances, deteriorate rapidly; and that the success of a project is interdependent and based on a systems approach to project management.

The most effective lab organizations, she says, demonstrate a grasp of important factors, and then use those factors to build on their success. "They recruit, train, and develop those who will extend the practice, research, and education in laboratory medicine," she says. They foster a support staff with well-designed systems and technologies. They also understand that they can advance and learn from failure. "Successful organizations possess a tolerance

for making and learning from their mistakes. They accept experimentation, and they excel at continual improvement,” Bailey says.

Effectiveness comes from making sure they nurture the skills to take knowledge and turn it into action. “Effective leaders overcome the professional power struggles and apathy that lead to inaction,” Bailey says. “They network and brand with the purpose of building strong and lasting relationships.”

This article is based on a presentation by Kris A. Bailey of AiCon at the Dark Report’s 2005 Executive War College, held earlier this year in New Orleans.

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