

UNIVERSITY OF GUELPH

Survival of the Fittest: Implementing a LIMS Helps Laboratory Meet Customer Demand

Company Background



In the 1990's, the Canadian government streamlined a number of its operations and spun off many divisions into stand-alone entities that would need to be self-supporting to survive. Laboratory Services at the University of Guelph (Ontario, Canada) was one of those operations that not only survived the purge, but now provides a wide

range of analytical, research, regulatory testing and consultative services for the agriculture and agri-food industries.

Laboratory Services was the Ontario Government Laboratory until 1997 when they were spun off and eventually relocated to the University of Guelph campus. While affiliated with the University, they are not, however, an educational facility.

Since they still work closely with the Ontario Ministry of Agriculture and Food, they not only analyze products, they also perform research and method development for the Canadian government. Many of the tests the labs perform address regulatory requirements from nutritional and labeling claims to analyses for microbes, drug residues, and trace chemicals to ensure food safety.

In fact, since the spin off Laboratory Services has expanded; the last five years in particular have seen significant growth. For example, more food processing companies are using the labs to perform product analysis and issue a Certificate of Analysis (CoA) for export permits for products such as soy sauces destined for Japan. Customer demand is also being driven by an increase in the number of industry regulations, such as Hazard Analysis Critical Control Points (HACCP), and concerns about food safety

Specialized Laboratories

Laboratory Services is comprised of 30 specialized laboratories, from food, plant and soil testing labs to animal health labs for veterinary diagnostics. Their analytical services are varied. They include food and dairy chemistry, trace organics, pesticides and drug residues, functional foods, dairy composition, microbiology and food microbiology. In addition, Lab Services provides a DNA sequencing and synthesis service, forensic investigations and pest diagnostics. Managing such a wide scope of services presents some challenges.

"We are one of the top analytical labs in Canada for agricultural and agri-foods," states Lori Gray, business development manager at Laboratory Services. "We perform work for the government and for commercial and private organizations for every step in the process, from random sampling for pesticides in raw and processed foods to environmental testing of water used in milking barns. For instance, we perform salmonella testing at chicken barns, then test and track samples all the way to the QA/QC on the food processing line."

"Our customers determine the type and direction of our analyses," she continues. "For example, we have an extensive milk testing program that provides regular milk-testing functions for Ontario's 6,500

producers. We do compositional testing of raw milk -- including rapid infrared analysis for fat, protein, lactose and total solids as well as detection tests for food-borne microorganisms that include checking raw milk samples in our microbiology labs for bacteria, freezing point, and somatic cell content.”

Responding to Increased Workload

When their workload increased in response to the changing market dynamics, Laboratory Services took a hard look at their internal processes and determined to implement a Laboratory Information Management System (LIMS) to streamline sample and report processing for their clients.

The labs had been using not one but several ancient legacy in-house standalone systems. “There are 15 individual labs that came together 10 years ago into one building,” Gray recalls. “Some used manual log books and some used Excel spreadsheet solutions. One had an older LIMS and some had database systems. Everything, such as sample counts, was done differently!” When sample volume increased, the labs had difficulty handling the increased workload. In addition, with all the different systems, inefficiency and redundant activities also took their toll. A single information management system would break these bottlenecks and streamline the labs’ ability to handle the increased workload. To manage the project, a dedicated LIMS project team was organized.

Responding to Increased Workload

The dedicated LIMS Project Team at Laboratory Services was just that -- a core team of staff dedicated to the project for six months.

“We backfilled positions in order to have staff dedicated to the project,” Gray remarks. “We planned this a year in advance to ensure we could afford it and looked at it as a capital investment.” All the backfill personnel were hired as contract staff; many of them were straight from the University.

Gray became the full-time project manager. She is not a lab person, but a project person, who relied on the team members and the scientists to ensure success. Being Business Operations Manager made it easier to get the project going and to get it funded. Gray is one of five senior managers who report to the general manager; two of those senior managers are responsible for the labs. Gray knew that they wanted common reports and were receptive to the idea of electronic reporting as well as the elimination of manual lab books.

“I sold them on the business side of implementing a LIMS. Plus the timing was right,” she points out. “The existing situation was taking time away from senior scientists who had to do manual counts -- not a good use of staff time.”

Initially, a team of 15 people was chosen which included Information Technology (IT) staff as well as lab technicians. “Hence, the project was directed more from the ground up. It was not just a management decision,” Gray emphasizes. “The worker bees got to determine what to do.”

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“We chose lab technicians for the design teams,” she adds. “The technicians are the real users of the system. Even so, the scientists signed off on everything.”

“We did things up front and brought people in from all the labs to be part of the team,” Gray continues. “A technician from each lab helped with testing and validation and product selection. This enabled more buy-in from the start.”

Selecting the LIMS

Key team members were chosen to attend the International LIMS Conference and take a couple of the conference short courses. Armed with their new knowledge, the project team realized that there were a lot of changes to make. “We had to take 25 reports and make them into five,” reminisces Gray. “And, we had to take 20 sample submission forms and make them into three.”

There was much more. “We had to capture information in a common way and streamline the process. We wanted an Enterprise solution -- not an ERP -- one with a Web interface, auto-faxing, and emailing to keep up with technology and to automate our processes as much as possible.”

“We went through project planning first,” she recalls. “Then, we looked at the system and put together a Request for Proposal (RFP) and contacted vendors that we had initially screened at the LIMS Conference and made our selection. The project team saw all seven vendors who presented their products. It got a lot of lunch room conversations going.”

“...LABVANTAGE allows us to record communications, so anyone can see the history, changes, etc., associated with samples or batches of samples...”

Laboratory Services purchased LABVANTAGE in February 2001. “LABVANTAGE can do what we need, from chemical analysis to microbiological analysis to plant diagnostics,” Gray remarks. “We were looking for a LIMS that could be very flexible and could accommodate lots of data as well as a solution that would last a long time.”

“Some of our business requires barcoding for massive amounts of samples, but, in general, about 60 percent of our business is one-off samples. LABVANTAGE allows us to record communications, so anyone can see the history, changes, etc., associated with samples or batches of samples,” she adds.

Once the LIMS was selected, the project team was condensed to the six people from the six labs that went online first. The first phase was replacing the lab books and manual tracking system. They were also tasked with populating data into the database and coming up with a common language and interfaces. Their efforts were successful; the system went live two weeks early in September 2001.

Lessons Learned

When asked if Laboratory Services would manage the project again the same way, Gray emphatically agrees. With an implementation time of just six months between selection and installation, Laboratory

Services not only successfully orchestrated a potentially difficult project, they also enjoyed additional benefits as a result of the way the project was organized. For instance, after the LIMS was installed, both IT and lab staff returned to their regular responsibilities. Because attrition had opened up new positions, these openings could be filled by the backfill contract staff.

Not only were the backfill contract staff trained and available for other positions in the labs, but “we developed a lot of skills in project team staff who learned how to negotiate difficult areas to come to a conclusion,” Gray states. “Team members learned project management, Gantt charts, and the importance of deadlines. They walked away with a different skill set than before.”

Another plus was that Laboratory Services did not have to increase IT in order to maintain the LIMS.

Summary

Implementing a LIMS has enabled the University of Guelph’s Laboratory Services to meet their goals of streamlining processes to better meet customer demand. But it’s just the beginning. “We want to continue automating,” Gray observes. “Interfacing with our financial system is this year’s priority as well as implementing high volume tests. Future goals include electronic access via the Internet and more barcoding. We are also exploring electronic submissions.”

Interestingly, now that the LIMS is in place, Laboratory Services staff say that it hasn’t changed a thing. “But the LIMS is making things consistent,” she points out, “and it enables staff to know what’s going on. It is helping with the scheduling by allocating workloads and turnaround times, and thus has increased client satisfaction.”

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CASE STUDY: UNIVERSITY OF GUELPH

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