

July 2002

Volume 31

Number 7

www.clpmag.com

CLP Clinical Lab Products®

By Louise Lazear

LabModel simulation software as an inexpensive way to predict site-specific efficiencies

Continuous process improvement (CPI), process innovation, and return on investment – these are terms that in the past many laboratorians reserved for case studies from business courses or continuing education seminars. Today, increasing workloads in the face of staffing shortages have compelled lab professionals to become management experts as they attempt to find efficiencies while reducing cost. Most agree that CPI is both labor and time intensive, and improvement can only be measured after changes are implemented. Because many process innovations are based on intuition and assumptions, real world results may not live up to expectations.

Olympus America, Inc. has developed a new service that takes the guesswork out of process innovation while providing objective information on ROI and bottom line improvements, especially when evaluating automation solutions. Called Olympus LabModel, this service uses fact-based computer simulation to evaluate current workflow and provide multiple options for appropriate instrument configuration to meet both short and long term needs.

“The healthcare industry is on the point of inflection, and those of us concerned with the clinical laboratory must dramatically change the way we do things to reach new levels of performance,” said Terry Giacomo, senior product manager at Olympus America, Inc. “CPI relies on observation to define ‘what is’. Because the lab involves complex, non-linear processes, we cannot predict outcomes simply by looking. With LabModel, managers can test process innovations in advance and experiment with different parameters. This way, we can move beyond ‘what is’ to predicting real change, and measure these changes in terms of time and money.”

According to Giacomo, Olympus developed this service because it recognizes the need for lab managers and hospital administrators to meet the requirements

of the medical staff while conforming to budget constraints. “We wanted to help laboratorians look at process innovation and to quantitate both clinical and financial outcomes without incurring large expense. We realized we could provide this solution by combining our expertise in the laboratory with a sophisticated simulation software that uses site-specific laboratory data, and



based on that data, allows the customer to experiment with different scenarios.”

To set-up the simulation, the LabModel team conducts an extensive on-site workflow analysis of laboratory processes from point of specimen receipt to results release. The team also interviews lab personnel, and excerpts data from the LIS to enter into the simulation program. This information is then used to perform an analysis of the current workflow scenario. At this point, several reports can be generated by the program: histograms of total and instrument-specific tests

by hour; STAT versus routine testing volume; turn-around times for both STAT and routine chemistries; staffing algorithms; and total and instrument-specific maintenance times.

The software also computes and reports lab processes in terms of activity-level building blocks, where each FTE activity is displayed in bar-chart format. This type of display allows managers to visually identify tasks that are "non-quality" activities and can help to determine resource consumption relationships. "When we observe the lab, we see a lot of 'wait' time between each activity, and many 'wait' steps that are inherent in the process. By using this report, managers can identify those activities, and reallocate FTE functions to improve resource utilization," said Giacomo. Because the LabModel uses this data as the basis for predictive modeling, lab personnel are asked to critique these reports and validate processes before moving to the next phase.

The next step in the process involves simulation of laboratory activities using "virtual models" of automation. LabModel includes an extensive database of performance specifications for major diagnostic system vendors derived from product literature and other industry-related resources. Using the site's workflow data and the internal database, the program simulates lab processes using various automation system configurations. At this point, performance data may be edited so that lab personnel can change system assumptions to reflect their interpretations of real-world scenarios. LabModel then produces reports that demonstrate the effects of various automation solutions on productivity, turn-around time, maintenance time, and mean time between failures.

According to Giacomo, with LabModel managers can essentially perform a side-by-side comparison of different automation systems to determine which product provides not only the best clinical outcome, but also the highest return on investment. "Very often, the biggest clinical impact occurs when we simulate implementa-

"We wanted to help laboratorians look at process innovation and to quantitate both clinical and financial outcomes without incurring large expense. We realized we could provide this solution by combining our expertise in the laboratory with a sophisticated simulation software that uses site-specific laboratory data ..."

— Terry Giacomo,
senior product manager
at Olympus America, Inc.

tion of pre-analytic automation. You may find that three different product offerings provide you with the same clinical impact. If the clinical impact is exactly the same, then managers can use the reports to evaluate the financial ramifications of each solution, in terms of both reducing labor costs and the cost of the owning and operating the system," she said. LabModel provides a complete financial metric analysis for each solution, including a breakeven analysis and ROI calculation.

LabModel takes process simulation one step further. Once the appropriate automation solution has been selected, lab personnel can run an optimization program that allows them to experiment with different variables to achieve different outcomes: for example, optimization of turn-around time while minimizing cost. This program can also be used to predict future processes, allowing managers to make decisions ahead of the curve. "The ultimate goal of LabModel is to innovate process through reallocation of resources. Keeping trained people is a huge concern for laboratory managers, and LabModel can be used to justify labor requirements," said Giacomo.

Currently, LabModel has been used as a process improvement tool for ten different laboratories, including the core laboratory at New York-Presbyterian Hospital, Columbia Presbyterian Medical Center. The program seems to have the most benefit when used in mid-to high-volume laboratories performing over one million chemistry tests per year. Olympus offers LabModel as part of their laboratory evaluation program for Olympus Lab Automation solutions.

Olympus recognizes the value of LabModel for evaluation of other types of processes, and is looking to develop modules for the endoscopy suite, surgery, and medical architecture. "We need to change the way we do things in the laboratory as well as throughout the healthcare continuum," said Giacomo. "This kind of modeling can be applied throughout the hospital to quantitate both clinical and financial outcomes of process innovation. The real beauty of this approach, however, is that it shows us in an objective way, things that we did not expect to see." **CLP**

Louise Lazear is a freelance writer in Charlotte, N.C.