

LABWORKS LIMS Solutions

Food & Beverage



LIMS Provides Wine Producer with Faster Results for Efficient Scheduling

Implementation of a new Laboratory Information Management System (LIMS) speeds sample logging, analysis and results distribution for a large wine producer, saving time and enabling more efficient scheduling. The custom LIMS used in the past was basically an electronic version of the company's previous paper-based system, requiring manual data entry at nearly every stage of the analysis cycle. The company made the decision to move to a more advanced system and selected a PC-based LIMS that can be configured to handle all common laboratory operations

without the custom programming required by more traditional systems. The new LIMS also automates work order generation, records operations simply by scanning a barcode, electronically collects test data, automates calculations and delivers results to approvers and internal customers. "It used to take 8 to 24 hours from the time that the tests were completed for the results to move through our review system, be printed and delivered to the winemaker who was waiting for them," said a chemist for the California winery. "Now, the data is available electronically as soon as the tests are completed. Getting the information sooner means that bottlers are able to schedule production much more efficiently."

Key Features

- LW Process Scheduler
- Instrument Interfaces
- LW Explorer
- Barcoding
- SQC
- QA/QC
- Report Designer

This winery is leading the industry in determining the best places for growing grapes, the best ways to grow them and the best ways to make wine. The company's dedication to continuous improvement in quality -combined with decades of personal experience growing grapes and making wine - has resulted in it being the choice of many consumers throughout the world. The company's quality assurance department provides on-going support and measurement of quality at every stage of the production process. The principle measurements that are performed include alcohol, sugar, volatile acids, titratable acids, pH and reducing sugars. These measurements are performed on automatic spectrophotometers and other sophisticated instruments. About 20 years ago, the winery developed a custom software package based on a RMS database that recorded test results. When a winemaker brought a sample to the lab, information about the sample was logged into the system. When a technician tested the sample, he would type the results into the system. Then, the test results were printed out, delivered to the person who had to approve them, then printed again and delivered to the winemaker.

Software selection process

"We were looking for a way to improve the speed at which test results move through our laboratory in order to improve service to our internal customers, including winemakers and managers," the chemist said. "Our primary requirements were for a Windows-based system that would be relatively simple and painless to install, customize and train our users to operate. We first surveyed many of the systems on the market, narrowed the field down to six, then selected three for detailed investigation. We selected LABWORKS from PerkinElmer, Shelton, Connecticut, first of all, because of their extensive experience with Oracle, which is our standard database. We also liked the fact that the software could be configured to store the information we need, perform

our calculations and generate reports in the format that we were looking for without requiring any programming." LABWORKS was one of the first PC-based LIMS and continues to consistently rank at the top of industry surveys. The software package supports Windows 95, 98, NT, 2000 and XP operating systems and Microsoft Access, SQL Server, SyBase, DB2, Oracle and a native database with the same user interface and add-on applications. The software was installed in four different facilities in the company and configured so that a single database at headquarters stores all results to simplify maintenance and company-wide reporting.

New automated workflow

The company took advantage of the flexibility of the software to configure a new workflow that automates many aspects of the quality control process. Now work orders for the majority of tests, which are repeated daily or hourly or at other intervals, are automatically generated by the LABWORKS Process Scheduler module. In addition, the LIMS interfaces to the wine producer's process ordering system so winemakers and other users can create electronic work orders for analysis. Both types of work orders are automatically added to the LABWORKS Process Scheduler. The work orders are initially queued as "not ready to collect" status. When a worker in the plant updates the status of the order to "ready to collect", labels are automatically printed for each container that is needed for analytical testing. The worker collects the samples and simply scans the barcode to update their status as collected. Laboratory personnel pick up samples from the plant each hour and scan the barcodes to change their status to "in-transit." When the samples arrive at the laboratory login counter, they are updated with yet another barcode scan to "waiting analysis." This saves the time that was previously required at each step of the analysis process to query the database for the correct sample and manually update its status.

The laboratory then performs the analytical testing. The instruments used for the vast majority of tests, including spectrophotometers, analytical balances, titrators and turbidimeters, have been interfaced to the LIMS through RS232 communications ports. The analyst scans the barcode on the sample vial and the instrument determines the analyses that are required, performs them, and posts the results to the LIMS database. Automating the entry of the test results saves time for the highly-skilled analysts and eliminates the possibility of data entry errors. The LIMS also automates the calculations that are required for some tests. For example, regardless of the actual proof of brandy, its test results have to be normalized as if it were 100 proof. In the past, these calculations had to be performed by hand, which took time and raised the potential for errors. Now, test results are sent to an Excel spreadsheet where calculations are performed and logic operations carried out and the results are returned to LABWORKS. While the process is automated, users can easily access the spreadsheet to view the calculations. If the test results need to be approved by a supervisor, they are automatically routed to that person who can call up a list of all items waiting their attention and quickly approve them or send them back for further work.

Increasing scheduling efficiency

"An important advantage of the new LIMS is that internal customers can view the data as soon as it is collected and validated," the chemist said. "This is the crush season right now so our winemakers need to keep a close watch on tanks that are actively fermenting. Typically they order up tests on an hourly basis in order to keep an eye on the process. Staying in touch with the laboratory used to be very time-consuming. I would get continuous phone or radio calls from the winemakers asking if their results were ready yet. The new LIMS has automated the process to the point that results can automatically be emailed to the people that are wait-

ing for them. Winemakers and other clients can log in at any time to determine the status of any work order and view the results of tests that have been completed." The use of LABWORKS Explorer, a browser-based interface, allows test results and other data to be viewed without the need to install or learn the client application. Viewing privileges can be limited by sample ownership status and age. Users can view reports, view exceptions and generate statistical quality control charts from viewed data.

"The biggest advantage of the new LIMS is time savings that extend throughout the analysis process," the chemist concluded. "It used to take between 8 and 24 hours for a work order to proceed through the system and be delivered to the internal customer. The current process, which updates the status with a bar code scan, electronically transfers data from instruments to the LIMS and automatically delivers the results to customers, has reduced that to under an hour in most cases. Getting results so much faster means that the bottling room can schedule production more efficiently. Nearly everyone involved in the process, including the customers, analysts and supervisors, also saves a considerable amount of time due to the automation of the process, although there's no way to determine exactly how much. Finally, the near elimination of manual data entry gives us much more confidence in the validity of the results because we don't have to worry about transcription errors."

Optional Applications for the Food & Beverage Industry	
Option	Description
Process Scheduler	Plant wide ad-hoc sample scheduling/monitoring. The simple user interface makes it easy for non-LIMS users to add a sample request and assign tests, priority and collection status. Laboratory and sample collection personnel can prioritize sample collection, laboratory analyses and print labels. Color-coded statuses make sample tracking simple.
Barcode	LABWORKS offers a variety of different barcode readers and barcode label printers based on customer needs.
Instrument Interfaces	PerkinElmer provides over 100 instrument interfaces to LABWORKS. Most any standard laboratory instrument can be interfaced.
LWExplorer	Explorer is a browser-based interface to LABWORKS that permits read-only data to be viewed in a Windows explorer format familiar to non-LIMS users. Views are limited by sample ownership, status and age. Users can print reports, view exceptions and generate SQC charts from viewed data. COA's, invoices and management reports such as backlogs, progress and sample summaries are included.
QA/QC	Customized statistical quality control charting and analysis that allows the LIMS to search and sort the database, write properly delimited data files, header files and batch processing files for NWA Quality Analyst® for Windows software. Allows graphic display and printing of charts such as standard Shewhart charts with related X-Bar & Range. Statistical Reports may be printed as well.
Report Designer	The LW Report Designer package includes a fully integrated report writing tool using the market-leading Crystal Reports technology. All functionality is internally integrated into LABWORKS ES and allows users to begin building their Crystal reports right away. Additional Crystal utilities can be added that allow users to publish reports to a web site – internally or externally – for your organization or customers to view via their web browser. The package also comes bundled with 15 fully functional and ready-to-use example reports that include sample receipts, analysis turn-around reports, charts and graphs, etc.

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