OUT ON A LIMS (AND OTHER ARBOREAL FEATURES)

By Don Shirer

FITTINGLY, AS I AM TYPING THIS DURING AN AUTUMNAL LEAF-PEEPING CAMPING TRIP IN THE NORTH WOODS, MUCH OF THE NEWS THIS MONTH SEEMS TO BE TREE-RELATED. BESIDES barking up a few LIMS, we have dug up some colorful Acorn, Maple, and Palm factoids.

LIMS

For several years I have been searching unsuccessfully for someone to review laboratory information management systems (LIMS) for this column. After looking into the subject myself, I can better appreciate why. The topic is so important and complex that books could be written about it; indeed, they have been.[1]

Briefly, LIMS software helps laboratories schedule procedures, process and track samples and test results, collect analytical data, organize reports, and facilitate instrument checking and calibration. Modern LIMS can be enormous and almost impossible to review without a specific application in mind. Luckily, my correspondents tell me that a wealth of information is already available to prospective users. Instead of reviewing a particular vendor's offering as usual, I thus offer you a brief guide to more information on these essential systems.

Originally developed in-house by individual analytical laboratories, customized solutions were eventually supplanted by commercial LIMS products developed by commercial instrument makers—primarily to get users for their own analytical tools. These systems often ran on minicomputer controllers or mainframes, but general-purpose systems that ran on networked desktops and handheld entry stations that could be tailored to the needs of many users eventually became available. Two short summaries of LIMS development can be found online: Alan McLelland's "LIMS—Laboratory Toy or a Critical IT Component?" (www.users.waitrose.com/~dgporter/other/limsview.html), and Dan Bentley's "Analysis of a Laboratory Information Management System" (www.umsl.edu/~sauter/analysis/LIMS_example.html).

Modern LIMS products are extensive systems with linked databases that let researchers standardize data reporting methods and automatically collect data from instruments such as spectrometers and cromatographs. They also facilitate strengthened security by maintaining data validation, certification, audit trails, quality-control analysis, and record archiving. LIMS have become essential tools for many biological and chemical laboratories and manufacturing plants, as well as the pharmaceutical and petroleum industries and anyone else who needs to analyze and process massive amounts of test data.

Because setting up a new LIMS can involve considerable reorganization of a firm's procedures, you should not underestimate the time necessary for installing the system and training employees. In fact, it is probably a good idea to involve representatives from each department from the start to ensure that no unpleasant surprises result during the changeover. Several firms provide third-party analyses of your needs for a laboratory management system. You can find them with a Google search for "LIMS evaluation."

Further information on this important topic is available at www.limsource.com, which features a large collection of resources, including newsletters, calendars of conferences and industry events, and a list of LIMS software suppliers. They also offer a LIMS primer on CD-ROM (US$20), which should prove very helpful to prospective users. Another good source is the *LIMS Review* (www.zedquote.co.uk/limsmag.html), which is a publication sponsored by leading vendors and industry groups. The Web site will soon include electronic copies. Another industry newsletter is at www.limsletter.com. Happy hunting.

Maple

Having purchased several flagons of maple syrup in Canada for holiday presents, I was intrigued to discover that users of Waterloo Maple mathematical computational software can now make use of the Internet for scientific pedagogy. The company's recently released MapleNet allows users to create and deliver online interactive or dynamic self-paced

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exercises for on-campus or remote mathematics education using a standard Java-enabled Web browser.

MapleNet products include a mathematical server derived from the well-known Maple symbolic software engine and a system administration module that offers easy installation, maintenance, and security. Users can also create learning objects using the proprietary Maplets technology for math and science courses from high school through graduate level.

The client software runs on any recent Netscape or Explorer browser. The publisher system needs a Windows machine running Maple as well as a Java development environment. Additional Web development software is also recommended. The server machine should run Maple8, Java, and Web server software such as PearlServer, Apache, or Microsoft's Internet Information Services (IIS). You can find more information on this interesting product at www.maplesoft.com/maplenet, or by contacting the MapleNet Product Manager at Waterloo Maple, louisek@maplesoft.com.

Acorns and Iyonix

Users of the Acorn RISC operating system are a small (and primarily European) minority who have largely been at the mercy of that English computer firm with its quirky production and advertising policies—until now. There is, accordingly, considerable interest among these enthusiasts (I'm resisting the temptation to call them Acorn nuts) in Castle Technology's recent announcement about the upcoming Iyonix computer (www.castle.uk.co).

Iyonix will be based on an Intel Xscale 32-bit processor running the new Acorn RISC OS, version 5, which eliminates the 26-bit limitations of the previous system's address registers. The new tower machine will support up to 1-Gbyte double-speed RAM and industry-standard graphics controller and I/O options.

The company will offer an updated development suite for converting older applications, and many Acorn developers are reportedly updating their software to run in 32-bit mode. As of November, the announcement site (www.iyonix.com) contained only a chance to win a free computer in exchange for your mailing address, but fuller details should be out soon.

STIX

Just as trees are made of sticks, fonts are composed of characters. Special characters have always been the bugaboo of electronic scientific publishing. Stopgap solutions such as using PDF or GIF images for mathematical equations have always been unsatisfactory, and more recent efforts with XML, MathML, and TeX have languished at the mercy of browser makers and font designers. But this summer a consortium of six technical organizations—the American Institute of Physics (AIP), American Chemical Society (ACS), American Mathematical Society (AMS), IEEE, American Physical Society (APS), and Elsevier Scientific—embarked on a project to create a single character font that includes not only a Times-like alphabet, but every character needed for an article in any kind of scientific, technical, or medical discipline.

The Scientific and Technical Information Exchange (STIX) project aims to produce PostScript I, OpenType, and TeX implementations of the fonts by third quarter 2003. The group plans to make them available on a royalty-free basis to publishers and the general public in hopes that STIX will become the standard for all scientific publishers, browsers, and technical software.

Developers have already completed more than half of the 7,700 proposed characters, and several hundred more are being finished each month. Just hunting through such a rich lode might be a daunting task, but the STIX people are also working on ways to make choosing the correct character set

easier on Windows, Mac, and Unix–Linux computers—somewhat like using the Symbol font in a word processor. Users will be able to modify the characters if they wish, but must save the altered fonts under a different name so that the original set remains uncorrupted. More information on this promising project can be found at www.stixfonts.org.

Palm

The final stop in our arboreal tour is a case where last is, if not least, at least smallest. The Palm people have developed a new operating system, Palm OS 5, which runs on much faster chips than their previous products and promises a spate of new handheld gadgets. So far, only only two organizers have been announced, but both include nice color displays and lots of features.

The Palm Tungsten T (US$500) looks tiny (3 × 4 × 0.6 inches), but it has a collapsible writing surface, a bright 320 × 320 pixel screen and can be operated with one hand in a pinch. Besides the usual date and address book, calculator, and notepad features, it has a built-in microphone and speaker for voice messages and a headphone jack for listening to your favorite music tracks. Built-in infrared and Bluetooth capabilities let users link to nearby computers, cell phones, or other palm devices without wires. For further specs and a detailed demo, check out www.palm.com/products/handhelds/tungsten-t.

The Sony Clié PEG-NX70V (US$600) is slightly faster than the Tungsten T, with a 320 × 480 display and many more gimmicks. It has both voice and (surprise!) video recording and playback features (MP3 playback as well), with a built-in digital camera with VGA resolution and a mini camcorder. Just the thing for recording details for an inspection trip or a site survey! You can also use the Clié to browse the Web via infrared and Wi-Fi wireless LAN connections. For more information, see the handheld products section at www.sony.com.

A large fraction of existing Palm-compatible applications will supposedly work with the new OS—and it is a good bet that manufacturers will soon rush to fill the vacuum with even more impressive pocket apps and portable information hubs—but you'll probably want to make sure that your favorite programs work with the new OS before purchasing one of these latest organizers.

Sign off

As the fall colors fade away, so does this author. Retirement years are bringing new interests and opportunities, so I am reluctantly passing to others the joy of discovering and evaluating new technical hardware and software. Contributing to this column has been a privilege (and lots of fun), and I thank the editors of both *CiP* and its worthy successor *CiSE* for their many years of invaluable assistance along the way.

Reference

1. M. Hinton, *Laboratory Information Management Systems, Development and Implementation for a Quality Assurance Laboratory*, Marcel Dekker Press, 1994.