Only time will tell, but LIS experts offer a forecast

With the new year fast approaching, CAP TODAY *asked laboratory information systems experts: What should LIS users and purchasers be concerned about in 2006, and what should they ask their vendors? Here's what they had to say.*

Dennis Winsten, president, Dennis Winsten & Associates Inc., health care systems consultants, Tucson, Ariz.: As the LIS survey that appears on the following pages indicates, many companies offer an LIS, but only a small subset of these systems will meet your laboratory's objectives and constraints. The LIS evaluation and selection process often gets bogged down in trying to evaluate a multitude of vendors.

A useful model to screen and quickly select a manageable number of qualified vendor candidates for more extensive evaluation is the 7 Fs model. This model can be used in conjunction with CAP TODAY's LIS survey data. Vendors should be evaluated early in the screening process based on their ability to meet your laboratory's requirements in the following domains:

✦ *Function.* What does the system do? Does the scope of the applications meet your needs? Are blood bank and anatomic pathology integrated applications? Are extensive outreach applications available?

✦ *Features.* How does the LIS perform functions? What special or unique characteristics does the LIS possess—for example, multiple, variable reporting formats, rules-based logic, ad hoc query, Internet access?

✦ *Fit.* How well does the LIS fit with other existing or planned information systems? Is it compatible with organizational standards for hardware, operating systems, databases, and existing interfaces to your systems and instrumentation?

✦ *Feel.* Is the system easy to use? Is it easy to learn? Does it offer easy-to-use graphical user interfaces and logical transaction process flow? This can only be determined by seeing an in-depth demonstration.

✦ *Followup.* What is the vendor's service and support reputation? How smooth and timely are installations? How quickly are critical problems resolved? How rapidly are requested changes implemented? How active and influential is the user group? Reference checks against users whose operations are similar to those of your laboratory can provide honest answers.

✦ *Financials.* What is the real cost, relative value, and return-on-investment of the LIS? Does it fit your budget?

✦ *Future.* What are the future prospects for this vendor? Is the LIS new, mature, or over-the-hill? Is the vendor financially and managerially stable? Are the vendor's short- and long-term business strategies compatible with those of your institution?

Laboratory decisionmakers should also discuss lab outreach services with vendors. Will the vendor provide low-cost connectivity to laboratory outreach clients' practice management or electronic medical record systems? This is becoming more important than just providing Internet access for orders and results. My experience is that a growing number of physicians want to use their practice management or EMR system to order laboratory tests and to have the LIS automatically pass the results back into these systems. Users do not want to learn another methodology to access a lab-specific Internet portal.

Bruce A. Friedman, MD, professor of pathology and co-director, division of pathology informatics, department of pathology, University of Michigan Medical School, Ann Arbor, and a founder of the Association for Pathology Informatics and Lab InfoTech Summit: Some of the major changes occurring in the clinical laboratory software industry are:

✦ the emergence of in vitro diagnostics companies as purveyors of specialized clinical laboratory software that is often referred to as middleware. Some of these middleware packages support rules or algorithms that can be used to increase lab efficiency and quality or improve test utilization.

✦ the emergence of the electronic medical record as the key system for providing clinicians with an integrated view of clinical information in hospitals with the requirement that ancillary systems, such as those of laboratories, radiology, and pharmacy, accept orders from the EMR and replicate clinical data to it as components of an integrated clinical database.

✦ the emergence of multiple vendors of specialized lab software modules, such as Web portals for support of lab outreach, positive patient identification, quality control, and lab automation, that can supplement the functionality of a classic LIS but require integration with it. Such integration can be challenging because of the lack of system integrators specializing in the clinical laboratory domain.

✦ growing interest in and enthusiasm for the capture, storage, and integration of images—for example, in surgical pathology and cytopathology—into laboratory and pathology reports in addition to their use in teaching, clinical conferences, and research.

✦ growing interest in processes and systems to capture and communicate infectious disease information and epidemiologic data from hospital microbiology laboratories to local, regional, and state public health laboratories. This has been spurred by mandated reporting requirements and the burgeoning interest in bioterrorism.

The extent to which any of these topics should prompt discussion within a laboratory or with an LIS vendor depends on the business model of that laboratory, the vendors with which the lab has a relationship, the needs and desires of the lab's customers, and state infectious disease reporting requirements.

Hal Weiner, president, Weiner Consulting Services, health care systems consultants, Florence, Ore.: Over the next year, there is expected to be increasing pressure for federal standards to accelerate the adoption of electronic medical records. This, in turn, will require vendors to make modifications to their products to incorporate LOINC, SNOMED CT, and other open-system standards.

New technologies, such as molecular diagnostics, may also require vendors to upgrade their software. At the same time, the market for new laboratory information systems has slowed, placing increased pressure on the bottom line for some LIS vendors. Many LISs are mature products, and the revenue they provide vendors is primarily from support fees.

Several LISs were sunsetted in 2005, and more are expected to follow suit in 2006. LIS users should keep abreast of vendors' business operations so they can forecast the potential of a vendor going out of business or dropping support. Those who make purchasing decisions for laboratories should ask vendors:

✦ What plans do you have to embrace emerging health care information exchange standards?

✦ How many new systems did you sell last year, and how many do you plan to sell this year? Is your LIS business profitable? How long do you plan to support the software?

✦ What major new LIS enhancements are committed and budgeted? How long will you continue to provide major enhancements to the product? When is the next upgrade scheduled?

Raymond D. Aller, MD, director, bioterrorism preparedness and response, LA County Public Health Acute Communicable Disease Control, Los Angeles: When a laboratory chooses an LIS, it chooses a long-term business partner. This business partner must be able to help its customers adapt their LIS to meet their rapidly changing needs.

All LIS users would like an answer to the question, Will you be supporting and updating my LIS a year from now—or will I be stuck with an orphan (perhaps supported at a minimal level but with no prospect of future updates)? Many vendors cannot or will not answer this question.

Several mainstream, highly functional LISs have become orphans in recent years. This leads to such questions as, How am I protected if you stop supporting my LIS? Is support available from another source? Would it be feasible and legal for me to hire my own staff to support my LIS?

LIS users also need to address connectivity with other systems, organizations, and agencies. Does the vendor have software available for routine interfaces, such as hospital information system orders and results? Have these connections evolved to include full demographics, such as patient address, from the HIS to the LIS, and the same for reference lab order-entry interfaces? Has the vendor created interface software for sending disease reports to public health laboratories? Does the vendor regard interface software as a cash cow? Will interface software be placed under the lab's control, or will the laboratory have to go back to the vendor for every adjustment?

Laboratories should also assess their role, and that of their vendor, in promoting the use of standards for connecting systems, including HL7, SNOMED, and LOINC. □

LISexperts

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CAP TODAY's annual laboratory information systems line-up, pages 28–56

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Laboratory information systems

Part 1 of 14 *See accompanying article on page 24*	**Antek Inc.** **Paul Taylor** ptaylor@antekhealthware.com **228 Business Center Drive** **Reisterstown, MD 21136** **410-517-0330/800-359-0911** www.antekhealthware.com or www.labdaq.com	**CCA (Creative Computer Applications Inc.)** **Bill Blair** sales@ccainc.com **26115-A Mureau Rd.** **Calabasas, CA 91302** **800-437-9000** www.ccainc.com	**Cerner Corp.** **Julie Brookings** julie.brookings@cerner.com **2800 Rockcreek Parkway** **Kansas City, MO 64117** **816-201-6455** www.cerner.com
Name of system	**LabDaq**	**CyberLab**	**Cerner Millennium PathNet**
First ever LIS installation/most recent installation	1990/2005	1982/2005	1982/2005
No. of contracts for sites operating LIS	1,732	262	132
• Hospital/independent lab contracts in U.S.	204/225	120/65	115/3
• Clinic or group practice contracts in U.S.	1,296	62	4
• Other contracted U.S. sites/contracts for foreign sites	0/7	10/5	0/10
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	12 (1/0/11)	3 (1/0/2)	27
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	12	—	25
No. of sites operating LIS	1,772	425+	269
Staff to develop/install and support/other* in entire firm	10/30/23	15/26/40	1,360/2,940/2,200
Staff to develop/install and support/other* in LIS division	9/25/21	9/21/40	73/118/33
No. of terminals/workstations in sites operating system	1–80+ (ave., 5–6)	3–250 (ave., 50)	7–600
• Central hardware or service type	Intel	HP, IBM	HP Compaq, IBM RS/6000
• Central hardware redundant/fault-tolerant?	yes	yes	yes
• Terminals/workstations or PC platform	—	PC workstations, thin clients	Intel Pentium PCs
Software			
• Programming language(s)	Delphi	C, C++, Cobol, Java, HTML	Visual C++, Visual Basic, Java
• Operating system(s)	MS Windows 2000, XP Pro, 2003	Unix/AIX	OpenVMS, AIX, Windows, Windows NT
• Databases and tools used	Oracle, Advantage	ODBC compliant (Oracle to be added in 2005)	Oracle
• System includes full transaction logging?	yes	yes	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	100%	100%	100%
• Bar-coded collection labels	45%	80%	100%
• Handheld devices for bedside-positive patient ID	not available	5%	5%
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	5%	available
• Microbiology	10%	100%	90%
• Surgical pathology/cytology	not available	10%/90%	65%/50%
• HIS interface: A/D/T	20%	70%	80%
• HIS interface: order entry	10%	60%	60%
• HIS interface: results reporting	30%	70%	60%
• Ad hoc reporting	100%	100%	100%
• Rules-based system	100%	100%	100%
• Management and statistical reporting	100%	100%	10%
• Outreach and commercial laboratory	10%	100%	25%
• Compliance checking	15%	100%	15%
• Billing and accounts receivable	10%	0	available
• Materials management and inventory	not available	not available	available
• Test partition	25%	100%	100%
• Remote faxing and printing	35%	100%	100%
• Physician office outreach	15%	45%	5%
• HIPAA-standard transaction formats	100%	not available	available
• Web-based remote inquiry of reports	15%	40%	5%
• Web access for order entry	5%	30%	5%
• Decision support system	100%	100%	90%
• Specimen management and tracking	100%	available in 2006	90%
Complete LIS application service provider solution?	no	no	yes
ASP for physician order entry and results reporting?	no	no	yes
Method of charging for ASP service	—	n/a	fixed fee
Client software required	—	n/a	requires software be installed on a client PC
ASP information conduit	—	n/a	requires use of a private, dedicated circuit
Client contracts supported from data center not operated by client	—	n/a	100+
How data center is operated	—	n/a	by vendor
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	available but not installed	available but not installed	all sites
• Other reportable diseases	available but not installed	available but not installed	50+ sites
• Tumor diagnosis/registry data	available but not installed	available but not installed	1 site
Hospital/integrated health care systems interfaced	Quest, LabCorp, IDX, Misys, CPSI, McKesson, Dairyland, Cerner	McKesson, Misys, Meditech, IDX, Siemens, QuadraMed, CPSI, others	—
Physician office management systems interfaced	Medical Manager, Misys, PMSI, Pulse, Logician, Versys, VitalWorks, A4, NextGen, PDS, Allscripts	Allscripts, VitalWorks, NextGen, Telcor, Practice Partners, Medic, Atlas, Medical Manager, others	—
Automated lab transportation systems interfaced	planned	available but not yet operational to Tecan, Oasis	Lab-InterLink, Beckman Coulter, Sysmex, others
Validation/testing tools provided?	yes (proprietary)	yes	yes
LIS allows for third-party updates of tables/rules?	no	yes (via HL7 interface)	yes
LIS permits use of voice input technology?	no	yes (for CyberPath module)	yes
LIS allows for image capture and display?	yes	yes (for CyberPath module)	yes
Software provides indexed field in each test definition for LOINC code?	yes	yes	yes
Provide LOINC dictionary for each new installation?	no	no	no
LIS supports use of SNOMED CT?	yes	yes (for CyberPath module)	yes
Market modules for other hospital departments?	no	yes	yes
• Percentage of LIS installations stand-alone	—	80%	60%
No. of different lab instruments interfaced with LIS	300+	600+	400+
Source code?/User group?	escrow/no (coming in late 2005)	escrow/yes	escrow/yes (meets online as well)
User can modify screens?	no (offer custom programming)	yes (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query language to retrieve information from LIS database	SQL	SQL	SQL, Discern Explorer
Support open system standards?	yes (HL7, ASTM, ICD-9, CPT, LOINC, others)	yes (XML, HTML, TCP/IP, ISO)	yes
Smallest cost for hardware/software/monthly maintenance	$1.7k/$5.3k/$0.06k	—	—
Largest cost for hardware/software/monthly maintenance	$37k/$98k/$1k	—	—
Distinguishing features (supplied by vendor)	• intuitive • flexible and scalable to grow with lab • outstanding customer support	• browser based using native browser • proven Web-enabled outreach and multiple-site solution • comprehensive rules-based decision support	• comprehensive, totally integrated solution • over 25 years in the LIS industry • continued innovations in LIS, including genomics, molecular diagnostics, and synoptic reporting

*other=sales, marketing, administration, and other company functions
**via a computer-to-computer interface

Tabulation does not represent an endorsement by the College of American Pathologists.

Survey editor: Raymond D. Aller, MD

Laboratory information systems

Part 2 of 14

See accompanying article on page 24

Name of system	PathNet HNA Classic	CisLab	CSSWin
	Cerner Corp. Julie Brookings julie.brookings@cerner.com 2800 Rockcreek Parkway Kansas City, MO 64117 816-201-6455 www.cerner.com	Clinical Information Systems Inc. Angela cissupport@aol.com 18805 Willamette Drive West Linn, OR 97068 800-869-0680 www.cislab.com	Clinical Software Solutions sales@clinsoft.com 20940 E. Mewes Rd. Queen Creek, AZ 85242 800-570-0474 www.clinsoft.com
First ever LIS installation/most recent installation	1982/—	1981/2005	1987/2005
No. of contracts for sites operating LIS	296	51	200+
• Hospital/independent lab contracts in U.S.	260/7	6/38	50+/150+
• Clinic or group practice contracts in U.S.	0	4	10+
• Other contracted U.S. sites/contracts for foreign sites	0/29	1/2	3/0
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	—	3 (1/2/0)	5 (4/1/0)
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	—	3	9
No. of sites operating LIS	420	51	200+
Staff to develop/install and support/other* in entire firm	1,360/2,940/2,200	6 total	2/3/2
Staff to develop/install and support/other* in LIS division	73/118/33	—	—
No. of terminals/workstations in sites operating system	7–600+	1–100 (ave., 10)	1–45 (ave., 4)
• Central hardware or service type	HP Compaq, IBM RS/6000	generic PCs, HP, Dell, Compaq	Dell, IBM compatible
• Central hardware redundant/fault-tolerant?	yes	yes	yes
• Terminals/workstations or PC platform	Intel Pentium PCs	PCs, Wyse, Link	Dell, IBM compatible
Software			
• Programming language(s)	Cobol, C++	Cobol, C++, Delphi, Visual Basic	4GL
• Operating system(s)	OpenVMS	Unix, NT, Windows 98, 2000	Windows
• Databases and tools used	proprietary	Interbase, RDBMS, C-ISAM, MS SQL 7	SQL
• System includes full transaction logging?	yes	no	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	100%	95%	95%
• Bar-coded collection labels	100%	90%	50%
• Handheld devices for bedside-positive patient ID	5%	0	5%
• NCCLS POCT-1A standard interface for POCT devices	—	0	—
• Microbiology	90%	90%	50%
• Surgical pathology/cytology	65%/50%	15%/15%	—
• HIS interface: A/D/T	98%	10%	60%
• HIS interface: order entry	90%	10%	60%
• HIS interface: results reporting	90%	10%	60%
• Ad hoc reporting	100%	0	20%
• Rules-based system	100%	0	90%
• Management and statistical reporting	10%	1%	50%
• Outreach and commercial laboratory	25%	10%	20%
• Compliance checking	15%	90%	60%
• Billing and accounts receivable	available	90%	—
• Materials management and inventory	available	available but not installed	10%
• Test partition	100%	100%	100%
• Remote faxing and printing	100%	95%	50%
• Physician office outreach	5%	80%	40%
• HIPAA-standard transaction formats	available via third-party translator	100%	100%
• Web-based remote inquiry of reports	5%	50%	25%
• Web access for order entry	5%	50%	25%
• Decision support system	90%	0	—
• Specimen management and tracking	90%	0	90%
Complete LIS application service provider solution?	yes	yes	no
ASP for physician order entry and results reporting?	yes	yes	yes
Method of charging for ASP service	fixed fee	fixed fee	fixed fee
Client software required	requires software be installed on a client PC	browser based, requires software be installed on a client PC	browser based, requires software be installed on a client PC
ASP information conduit	requires use of a private, dedicated circuit	operates over Internet	operates over Internet, requires use of a private, dedicated circuit
Client contracts supported from data center not operated by client	100+	100%	0
How data center is operated	by vendor	by vendor	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	all sites	4 sites	3 sites
• Other reportable diseases	50+ sites	4 sites	available but not installed
• Tumor diagnosis/registry data	1 site	4 sites	available but not installed
Hospital/integrated health care systems interfaced	—	McKesson, Dairyland, PCS, ADT, Tower Systems, CPSI	Siemens, Dairyland, APS, Misys, LabCorp, Pearl, other HL7-compliant systems
Physician office management systems interfaced	—	Medical Manager, MediSoft/MediNotes	Medical Manager, Logician, other HL7/ASTM-compliant systems and/or ASCII import/export capable
Automated lab transportation systems interfaced	Lab-InterLink, Beckman Coulter, Sysmex, others	planned	no
Validation/testing tools provided?	—	yes (customized by lab)	yes (proprietary)
LIS allows for third-party updates of tables/rules?	yes	no	no
LIS permits use of voice input technology?	yes	yes (DragonSpeak)	no
LIS allows for image capture and display?	yes	yes	yes
Software provides indexed field in each test definition for LOINC code?	yes	yes	yes
Provide LOINC dictionary for each new installation?	no	no	no
LIS supports use of SNOMED CT?	no	yes	yes
Market modules for other hospital departments?	yes	no	yes
• Percentage of LIS installations stand-alone	60%	—	25%
No. of different lab instruments interfaced with LIS	400+	200+	300+
Source code?/User group?	escrow/yes (meets online as well)	escrow/no	no/no
User can modify screens?	yes (offer user-defined report writer, custom programming)	no (offer custom programming)	no (offer user-defined report writer, custom programming)
Query language to retrieve information from LIS database	Discern Explorer	SQL	SQL, MS Access, Crystal Reports, others†
Support open system standards?	yes	no	no
Smallest cost for hardware/software/monthly maintenance	—	$7.5k/$7.5k/$0.3k	—/$10k/percent of total
Largest cost for hardware/software/monthly maintenance	—	$100k/$150k/$0.5k	—/$100k+/percent of total
Distinguishing features (supplied by vendor)	• comprehensive, totally integrated solution • over 25 years in the LIS industry • continued innovations in LIS, including genomics, molecular diagnostics, and synoptic reporting	• completeness of functionality • willingness to customize • economical purchase of high quality	• versatile for any size facility, including multi-site facilities • fully integrated with other departments and systems • Web access and customization available

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**via a computer-to-computer interface

† *any ODBC-compliant reporting tool*

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Laboratory information systems

Part 3 of 14

See accompanying article on page 24

	ClinLab Inc. Rick Ballester sales@clinlabinc.com 2411 E. Graves Ave., Ste. 1 Orange City, FL 32763 800-487-5227 www.clinlabinc.com	Comp Pro Med Inc. Hal Petersen hpetersen@compromed.com 3430 Mendocino Ave. Santa Rosa, CA 95403 800-276-4522 www.compromed.com	Computer Service & Support Inc. James T. O'Neill jimjr@csslis.com 2106 New Rd., Bldg. E-6 Linwood, NJ 08221 800-336-4277 www.csslis.com
Name of system	ClinLab LIS V6	Polytech	CLS-2000
First ever LIS installation/most recent installation	1987/2005	1981/2005	1980/2005
No. of contracts for sites operating LIS	44	55	90
• Hospital/independent lab contracts in U.S.	5/12	15/33	—
• Clinic or group practice contracts in U.S.	18	7	—
• Other contracted U.S. sites/contracts for foreign sites	8/1	0	—
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	1 (1/0/0)	—	3
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	1	3	6
No. of sites operating LIS	44	60+	90
Staff to develop/install and support/other* in entire firm	4/6/0	3/3/1	6/8/5
Staff to develop/install and support/other* in LIS division	—	—	—
No. of terminals/workstations in sites operating system	2–70 (ave., 10)	1–16 (ave., 4)	4–65 (ave., 20)
• Central hardware or service type	IBM, Dell, Compaq	Dell, IBM, Compaq, HP	IBM RISC/6000
• Central hardware redundant/fault-tolerant?	yes	yes	yes
• Terminals/workstations or PC platform	IBM, Dell, Compaq	Dell, IBM, Compaq, HP	IBM, Dell, others
Software			
• Programming language(s)	Clipper, Visual FoxPro, Delphi	C++, C, Assembler	C++
• Operating system(s)	Novell, Windows NT, 2000, 9x, XP	Windows 98, ME, NT 4, 2000, XP	AIX 5.3
• Databases and tools used	dBase, FoxPro, Advantage DB server	SQL, Btrieve	—
• System includes full transaction logging?	no	yes	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	100%	100%	100%
• Bar-coded collection labels	100%	95%	100%
• Handheld devices for bedside-positive patient ID	available but not installed	not available	0
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	not available	0
• Microbiology	100%	12%	85%
• Surgical pathology/cytology	available but not installed	not available	20%/30%
• HIS interface: A/D/T	90%	60%	20%
• HIS interface: order entry	70%	30%	25%
• HIS interface: results reporting	70%	40%	30%
• Ad hoc reporting	100%	100%	75%
• Rules-based system	50%	100%	100%
• Management and statistical reporting	—	100%	100%
• Outreach and commercial laboratory	40%	15%	100%
• Compliance checking	100%	100%	100%
• Billing and accounts receivable	available but not installed	65%	80%
• Materials management and inventory	not available	not available	75%
• Test partition	100%	100%	25%
• Remote faxing and printing	100%	95%	100%
• Physician office outreach	40%	20%	40%
• HIPAA-standard transaction formats	not available	not available	100%
• Web-based remote inquiry of reports	40%	5%	40%
• Web access for order entry	40%	5%	40%
• Decision support system	—	90%	—
• Specimen management and tracking	—	20%	100%
Complete LIS application service provider solution?	no	no	no
ASP for physician order entry and results reporting?	yes	yes	yes
Method of charging for ASP service	fixed fee	fixed fee	fixed fee
Client software required	requires software be installed on a client PC	requires software be installed on a client PC	browser based
ASP information conduit	operates over Internet	operates over Internet	operates over Internet
Client contracts supported from data center not operated by client	0	—	20
How data center is operated	by vendor	—	by vendor
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	4 sites	—	0
• Other reportable diseases	—	—	0
• Tumor diagnosis/registry data	none	—	0
Hospital/integrated health care systems interfaced	Meditech	Siemens, CHC, Intermed, Dairyland	Advance Data Systems, CCA, IDX, McKesson, Misys, PCN, SCC, others
Physician office management systems interfaced	Medical Manager, IDX, Medic, Nuesoft, Softaid, Softatic, Medstar, Misys	Misys, Medical Manager, MedLogic, Cerner, VitalWorks	Advance Data Systems, CCA, IDX, McKesson, Medic, Misys, SCC, others
Automated lab transportation systems interfaced	planned	planned	Lab-InterLink, Beckman Coulter, Sysmex, Bayer, others
Validation/testing tools provided?	no	no	yes (Ingenix)
LIS allows for third-party updates of tables/rules?	no	no	yes
LIS permits use of voice input technology?	no	no	no
LIS allows for image capture and display?	no	no	no
Software provides indexed field in each test definition for LOINC code?	no	yes	yes
Provide LOINC dictionary for each new installation?	no	yes	no
LIS supports use of SNOMED CT?	no	no	no
Market modules for other hospital departments?	no	no	no
• Percentage of LIS installations stand-alone	—	—	—
No. of different lab instruments interfaced with LIS	150	200+	300
Source code?/User group?	escrow/no	escrow/no	yes/no
User can modify screens?	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)	no (offer custom programming)
Query language to retrieve information from LIS database	—	Pervasive, SQL, others	Access, Oracle
Support open system standards?	—	—	yes
Smallest cost for hardware/software/monthly maintenance	$5k/$15k/$0.188k	$1k/$15k/$0.233k	$7.5k/$15k/$0.3k
Largest cost for hardware/software/monthly maintenance	$40k/$170k/$2.125k	$15k/$150k/$0.9k	$50k/$200k/$5k
Distinguishing features (supplied by vendor)	• reputation among clients for exceptional service • user-friendly, versatile for all laboratories • high-quality product at a conservative price; on-site training	• more than 90% of lab work can be done from a single screen • full-featured LIS at a small cost • excellent support	• integrated laboratory and billing system • U.S. staffed and fully trained help desk department • 25 years in the LIS industry

*other=sales, marketing, administration, and other company functions
**via a computer-to-computer interface

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Laboratory information systems

Part 4 of 14 *See accompanying article on page 24*	**CPSI (Computer Programs & Systems Inc.)** sales@cpsinet.com **6600 Wall St.** **Mobile, AL 36695** **800-711-2774** www.cpsinet.com	**Custom Software Systems Inc.** **George Widuch** george@css-corporate.com **DeWitt Rhaly** dewitt@css-corporate.com **7012 Westbelt Drive, Nashville, TN 37209** **800-344-8053** www.css-corporate.com
Name of system	CPSI System	StarLab
First ever LIS installation/most recent installation	1986/2005	1984/2005
No. of contracts for sites operating LIS	290	23
• Hospital/independent lab contracts in U.S.	289/1	19/2
• Clinic or group practice contracts in U.S.	0	2
• Other contracted U.S. sites/contracts for foreign sites	0	0
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	13 (13/0/0)	1 (1/0/0)
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	13	—
No. of sites operating LIS	290	23
Staff to develop/install and support/other* in entire firm	27/512/296	8/9/12
Staff to develop/install and support/other* in LIS division	12/111/0	4/6/3
No. of terminals/workstations in sites operating system	6–500 (ave., 100)	2–80
• Central hardware or service type	IBM x255 Series	IBM xSeries
• Central hardware redundant/fault-tolerant?	yes	—
• Terminals/workstations or PC platform	Windows 98 or above	CSS network-ready workstation
Software		
• Programming language(s)	AcuCobol	Cobol
• Operating system(s)	Unix operating system in a client/server configuration	Linux
• Databases and tools used	CPSI ad hoc reporting with optional ODBC database access	T-ISAM
• System includes full transaction logging?	no	yes
Features (listed as a percentage of live installations or based on availability)		
• Chemistry and hematology	100%	100%
• Bar-coded collection labels	100%	80%
• Handheld devices for bedside-positive patient ID	16%	—
• NCCLS POCT-1A standard interface for POCT devices	1%	—
• Microbiology	100%	10%
• Surgical pathology/cytology	1%/1%	installed
• HIS interface: A/D/T	100%	80%
• HIS interface: order entry	100%	80%
• HIS interface: results reporting	100%	80%
• Ad hoc reporting	100%	45%
• Rules-based system	100%	available but not installed
• Management and statistical reporting	100%	10%
• Outreach and commercial laboratory	100%	50%
• Compliance checking	100%	100%
• Billing and accounts receivable	100%	10%
• Materials management and inventory	100%	available but not installed
• Test partition	100%	available but not installed
• Remote faxing and printing	100%	75%
• Physician office outreach	100%	20%
• HIPAA-standard transaction formats	100%	10%
• Web-based remote inquiry of reports	40%	available but not installed
• Web access for order entry	10%	available but not installed
• Decision support system	100%	—
• Specimen management and tracking	not available	—
Complete LIS application service provider solution?	yes	no
ASP for physician order entry and results reporting?	yes	no
Method of charging for ASP service	fixed fee	—
Client software required	browser based, requires software be installed on a client PC	—
ASP information conduit	requires use of a private, dedicated circuit	—
Client contracts supported from data center not operated by client	21	—
How data center is operated	by vendor	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**		
• Microbiology data	not available	—
• Other reportable diseases	not available	—
• Tumor diagnosis/registry data	not available	—
Hospital/integrated health care systems interfaced	—	Dairyland, Healthcare Management Systems, Siemens
Physician office management systems interfaced	Medical Manager, MedicaLogic, Logician	Mega West, IDX
Automated lab transportation systems interfaced	planned	planned
Validation/testing tools provided?	no	no
LIS allows for third-party updates of tables/rules?	yes (Micromedex for medical necessity)	no
LIS permits use of voice input technology?	yes	no
LIS allows for image capture and display?	yes	no
Software provides indexed field in each test definition for LOINC code?	no	yes
Provide LOINC dictionary for each new installation?	no	no
LIS supports use of SNOMED CT?	yes	no
Market modules for other hospital departments?	yes	yes
• Percentage of LIS installations stand-alone	2%	20%
No. of different lab instruments interfaced with LIS	288	20
Source code?/User group?	escrow/yes (meets online as well)	escrow/yes
User can modify screens?	yes (offer user-defined report writer, custom programming)	no (offer custom programming)
Query language to retrieve information from LIS database	CPSI database, optional ODBC database access	MS Access, other PC-based tools
Support open system standards?	yes (HL7)	no
Smallest cost for hardware/software/monthly maintenance	$3.252k/$49.5k/$0.548k	$25k/$35k/$0.6k
Largest cost for hardware/software/monthly maintenance	$32.52k/$83.5k/$1.044k	$250k/$350k/$6k
Distinguishing features (supplied by vendor)	• fully integrated HIS/LIS • build libraries and data dictionaries as standard part of installation and conversion • on-site training and support for all end users (not train the trainer)	• standardized screens and functions make the system easy to use • total system integration eliminates duplication of work effort • developed from the clinical perspective with an emphasis on results

*other=sales, marketing, administration, and other company functions
**via a computer-to-computer interface

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Laboratory information systems

Part 5 of 14 *See accompanying article on page 24*	Fletcher Flora Health Care Systems Inc. (formerly Modulus Data Systems) Brian Mattson bmattson@labpak.com 1580 Orangethorpe Way Anaheim, CA 92801 818-865-1716 www.labpak.com	Fletcher Flora Health Care Systems Inc. Ken Mitchell ken@labpak.com 1580 Orangethorpe Way Anaheim, CA 92801 800-777-1471 www.labpak.com	GE Healthcare Information Technologies Larry Wimberly larry.wimberly@med.ge.com 3100 Steeles Ave. East, Ste. 900 Markham, Ontario, Canada L3R 8T3 905-305-0041 www.gehealthcare.com
Name of system	encaLaber	Labpak	Centricity Laboratory
First ever LIS installation/most recent installation	1972/2005	1980/2005	1991/2005
No. of contracts for sites operating LIS	7	1,379	70
• Hospital/independent lab contracts in U.S.	5/2	247/53	4/0
• Clinic or group practice contracts in U.S.	0	1,058	0
• Other contracted U.S. sites/contracts for foreign sites	0	9/12	1/65
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	1 (1/0/0)	n/a	3 (3/0/0)
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	1	n/a	2
No. of sites operating LIS	7	1,379	128
Staff to develop/install and support/other* in entire firm	16/22/15	16/22/15	42,500 total
Staff to develop/install and support/other* in LIS division	—	—	43/49/9
No. of terminals/workstations in sites operating system	15–200 (ave., 32)	1–40+	1–125 (ave., 10)
• Central hardware or service type	IBM, HP, Dell, client choice in brand of Window/Linux servers	Dell	hardware independent
• Central hardware redundant/fault-tolerant?	yes	—	yes
• Terminals/workstations or PC platform	client's choice of brand that supports thin client	Windows PCs	hardware independent
Software			
• Programming language(s)	Java	C, C++, Visual Basic	Visual Basic, Java
• Operating system(s)	Unix, Linux, Windows	Windows 98, 98 SE, XP, 2000	Windows 2000, XP, 2003, Novell Netware
• Databases and tools used	Unify, Oracle, MS Sequel, Crystal RAS	Pervasive	Advantage by Extended Systems
• System includes full transaction logging?	yes	no	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	100%	100%	95%
• Bar-coded collection labels	100%	50%	90%
• Handheld devices for bedside-positive patient ID	available but not installed	not available	not available
• NCCLS POCT-1A standard interface for POCT devices	—	not available	20%
• Microbiology	100%	20%	40%
• Surgical pathology/cytology	available but not installed/50%	not available	10%/5%
• HIS interface: A/D/T	100%	50%	80%
• HIS interface: order entry	100%	20%	20%
• HIS interface: results reporting	100%	75%	30%
• Ad hoc reporting	100%	100%	45%
• Rules-based system	100%	100%	available in 2006
• Management and statistical reporting	100%	100%	100%
• Outreach and commercial laboratory	30%	10%	20%
• Compliance checking	100%	90%	3%
• Billing and accounts receivable	100%	not available	20%
• Materials management and inventory	available but not installed	10%	5%
• Test partition	100%	70%	not available
• Remote faxing and printing	100%	100%	70%
• Physician office outreach	30%	40%	available but not installed
• HIPAA-standard transaction formats	100%	—	available but not installed
• Web-based remote inquiry of reports	100%	5%	available but not installed
• Web access for order entry	100%	5%	available but not installed
• Decision support system	100%	not available	not available
• Specimen management and tracking	100%	not available	not available
Complete LIS application service provider solution?	yes	no	no
ASP for physician order entry and results reporting?	yes	yes	no
Method of charging for ASP service	fixed fee	fixed fee	—
Client software required	browser based	browser based	—
ASP information conduit	operates over Internet	operates over Internet	—
Client contracts supported from data center not operated by client	0	5	—
How data center is operated	by vendor	by a third party	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	20%	not available	available but not installed
• Other reportable diseases	20%	not available	available but not installed
• Tumor diagnosis/registry data	—	not available	available but not installed
Hospital/integrated health care systems interfaced	Siemens, McKesson, Mednet, Keane, Dairyland, CPSI, QuadraMed, others	Tech Time, IDX, CPSI, Dairyland, QSI, Misys, Experior, Logician, others	Meditech, Cerner, McKesson, Siemens, MDS Labs, Hemocare, HealthVision, MediSolution, others
Physician office management systems interfaced	A4, Medical Manager, Experior, Millbrook, others	Medical Manager, GE, Millbrook, Misys, MegaWest, IDX, others	Jonoke, Clinicare, Health Screen
Automated lab transportation systems interfaced	Sysmex, Roche/BMC/Hitachi, Olympus	no	MDS Laboratory Services, Beckman Coulter
Validation/testing tools provided?	yes (self developed)	no	no
LIS allows for third-party updates of tables/rules?	yes (ICD-9, 3M, SNOMED, others)	no	no
LIS permits use of voice input technology?	no (in development)	no	yes (using third-party tools for MS Word)
LIS allows for image capture and display?	yes	no	no
Software provides indexed field in each test definition for LOINC code?	yes	no	yes
Provide LOINC dictionary for each new installation?	no	—	no
LIS supports use of SNOMED CT?	yes	no	no
Market modules for other hospital departments?	no	no	yes
• Percentage of LIS installations stand-alone	—	—	95%
No. of different lab instruments interfaced with LIS	400+	400+	250+
Source code?/User group?	escrow/yes (meets via Internet)	no/no	escrow/yes
User can modify screens?	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)	no (offer user-defined report writer, custom programming)
Query language to retrieve information from LIS database	SQL	—	Crystal Report Writer
Support open system standards?	yes (J2EE, Unix)	—	yes (HL7, Java, TCP/IP, XML)
Smallest cost for hardware/software/monthly maintenance	—†	$10k (hardware and software)/$0.090k	$10k/$20k/1.5% of total software
Largest cost for hardware/software/monthly maintenance	—†	$75k/$200k/$2k	$80k/$400k/1.5% of total software
Distinguishing features (supplied by vendor)	• over 30 years' experience developing, implementing LISs • total audit trail • accurate, up-to-the-minute patient results and billing information	• ease of use • scalability • value	• integrated LIS for lower-volume to mid-volume laboratories • short implementation timeframe of three to four months • scalable for stand-alone or regional deployment
*other=sales, marketing, administration, and other company functions **via a computer-to-computer interface	† *subscription-based price; software and maintenance included*		

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Laboratory information systems

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See accompanying article on page 24

	GE Healthcare Information Technologies **Larry Wimberly** larry.wimberly@med.ge.com 3100 Steeles Ave. East, Ste. 900 Markham, Ontario, Canada L3R 8T3 905-305-0041 www.gehealthcare.com	Hex Laboratory Systems **Susan Bollinger** sbollinger@hexlab.com 1042B El Camino Real, Ste. 308 Encinitas, CA 92024 800-729-2085 www.hexlab.com	Impac Medical Systems Inc. salesinfo@impac.com 100 W. Evelyn Ave. Mountain View, CA 94041 888-464-6722 www.impac.com
Name of system	Centricity Ultra Laboratory	Lab/Hex	IntelliLab
First ever LIS installation/most recent installation	1990/2004	1981/2005	1988/2005
No. of contracts for sites operating LIS	45	132	60
• Hospital/independent lab contracts in U.S.	12/6	9/61	5/3
• Clinic or group practice contracts in U.S.	0	42	52
• Other contracted U.S. sites/contracts for foreign sites	0/27	10/10	0
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	3 (3/0/0)	2 (0/2/0)	7 (0/0/7)
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	2	2	9
No. of sites operating LIS	295	144	209
Staff to develop/install and support/other* in entire firm	42,500 total	4/7/3	150/150/200
Staff to develop/install and support/other* in LIS division	43/49/9	—	6/9/7
No. of terminals/workstations in sites operating system	20–500+ (ave., 200)	3–48+ (ave., 16)	3–1,300 (ave., 20)
• Central hardware or service type	IBM RS/6000, Sun, HP-UX (Unix operating system)	Dell, Intel, Xeon	HP, Compaq
• Central hardware redundant/fault-tolerant?	yes	yes	yes
• Terminals/workstations or PC platform	open hardware for peripherals	any Windows PC	Dell, HP, Compaq
Software			
• Programming language(s)	C, 4GL	Thoroughbred Basic	Visual Basic, C, Basic
• Operating system(s)	Unix	Linux	Windows 2000, 2003, NT
• Databases and tools used	Unify Dataserver	SQL, 4GL, IDOL 4	mvBase
• System includes full transaction logging?	yes	yes	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	100%	100%	100%
• Bar-coded collection labels	100%	100%	100%
• Handheld devices for bedside-positive patient ID	1%	2%	not available
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	2%	not available
• Microbiology	80%	100%	20%
• Surgical pathology/cytology	40%/40%	50%/100%	5%/not available
• HIS interface: A/D/T	50%	75%	40%
• HIS interface: order entry	50%	75%	40%
• HIS interface: results reporting	50%	75%	40%
• Ad hoc reporting	75%	100%	100%
• Rules-based system	75%	100%	100%
• Management and statistical reporting	100%	100%	100%
• Outreach and commercial laboratory	75%	60%	100%
• Compliance checking	10%	100%	100%
• Billing and accounts receivable	80%	75%	10%
• Materials management and inventory	not available	1%	not available
• Test partition	100%	100%	100%
• Remote faxing and printing	100%	100%	100%
• Physician office outreach	10%	65%	100%
• HIPAA-standard transaction formats	100%	100%	100%
• Web-based remote inquiry of reports	10%	25%	100%
• Web access for order entry	available but not installed	25%	100%
• Decision support system	not available	not available	10%
• Specimen management and tracking	75%	available but not installed	not available
Complete LIS application service provider solution?	no	yes	yes
ASP for physician order entry and results reporting?	no	yes	yes
Method of charging for ASP service	—	fixed fee	varies
Client software required	—	browser based	requires software be installed on a client PC
ASP information conduit	—	operates over Internet	operates over Internet
Client contracts supported from data center not operated by client	—	10	—
How data center is operated	—	by a third party (Nethosters Inc.)	by vendor
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	available but not installed	available but not installed	available but not installed
• Other reportable diseases	available but not installed	available but not installed	available but not installed
• Tumor diagnosis/registry data	available but not installed	available but not installed	~4 sites
Hospital/integrated health care systems interfaced	Affinity, Epic, McKesson, IDX, MediSolution, Meditech, Siemens, Specialty Labs, others	McKesson, Cerner, Misys, PSI, Siemens, Experior, Logician, WebMD, Quest, LabCorp, others	Siemens, Dairyland
Physician office management systems interfaced	Dr. Chart, LabWorks, Data Passport, MedicaLogic	Medical Manager, Medic, Misys, IDX, PMS, Allscripts, Practice Partners, MedicaLogic, MediPro, Millbrook	Impac, Misys, Medical Manager, NextGen, Allscripts, QSI, MedicaLogic, HealthWorks
Automated lab transportation systems interfaced	Lab-InterLink, MDS Laboratory Services, others	planned	planned
Validation/testing tools provided?	no	yes (Hex)	no
LIS allows for third-party updates of tables/rules?	yes (most vendors)	yes (any vendor)	yes (only tables in correct format)
LIS permits use of voice input technology?	yes (Philips SpeechMagic)	yes (Dragon Naturally Speaking or any Windows product)	yes (Microsoft compatible, others)
LIS allows for image capture and display?	yes	yes	yes
Software provides indexed field in each test definition for LOINC code?	yes	yes	no
Provide LOINC dictionary for each new installation?	no	no	no
LIS supports use of SNOMED CT?	yes	yes	no
Market modules for other hospital departments?	yes	no	yes
• Percentage of LIS installations stand-alone	100%	—	85%
No. of different lab instruments interfaced with LIS	250+	250+	400+
Source code?/User group?	escrow/yes (meets online as well)	escrow/no	escrow/yes
User can modify screens?	yes (offer user-defined report writer, custom programming)	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query language to retrieve information from LIS database	SQL, ODBC tools	standard SQL	AQL, SQL with ODBC
Support open system standards?	yes (TCP/IP, SQL, HL7, XML, Java, others)	yes (SQL)	yes (HL7)
Smallest cost for hardware/software/monthly maintenance	$100k/$150k/$2k	$5k/$10k/$0.2k	—/$20k/—
Largest cost for hardware/software/monthly maintenance	$1m/$1.5m/$28k	$100k/$180k/$2.8k	—/$250k/—
Distinguishing features (supplied by vendor)	• outreach leader • proven in high volumes using unmodified RDBMS • all modules fully integrated on single, relational database	• extreme flexibility; handle unique needs • integrated billing, electronic billing, medical necessity • extensive growth capabilities	• provides automated e-mail, fax, and printing of lab reports • completely Internet based • fully integrated with oncology-based information systems

*other=sales, marketing, administration, and other company functions
**via a computer-to-computer interface

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Laboratory information systems

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	Informatica Tesi de Italia, S.A. de C.V. Edgar de la Mora Lopez comercial@tesi.com.mx Bosques de Ciruelos No. 168 Piso 8 Col. Bosques de las Lomas, Mexico, D.F., C.P. 11700 52-55-5596-6616 www.tesi.mi.it	Isys/Biovation LLC Kimberley Schneider kschneider@isys.tv 13170B Central Ave. SE Albuquerque, NM 87123 516-535-5600 ext. 8111 www.isys.tv	Keane Inc. Jose A. Benetti jose_a_benetti@keane.com 6410 Southpoint Parkway, Ste. 300 Jacksonville, FL 32216 904-279-2700 www.keane.com/hsd
Name of system	WinLab	Messenger	Keane LIS
First ever LIS installation/most recent installation	1982/2005	1988/2004	1989/2005
No. of contracts for sites operating LIS	500+	11	37
• Hospital/independent lab contracts in U.S.	—	1/0	35/0
• Clinic or group practice contracts in U.S.	—	6	0
• Other contracted U.S. sites/contracts for foreign sites	—	3/1	0/2
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	5 (2/3/0)	1 (0/0/1)	1 (1/0/0)
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	5	0	1
No. of sites operating LIS	328	11	37
Staff to develop/install and support/other* in entire firm	15/26/14	1/1/3	145/233/104
Staff to develop/install and support/other* in LIS division	8/13/0	—	6/7/4
No. of terminals/workstations in sites operating system	1–120 (ave., 10)	1–10 (ave., 6)	8–60 (ave., 25–30)
• Central hardware or service type	Dell, HP, Fujitsu-Siemens	hardware independent	IBM
• Central hardware redundant/fault-tolerant?	yes	user's discretion	yes
• Terminals/workstations or PC platform	Dell, HP, Fujitsu-Siemens	platform independent	IBM
Software			
• Programming language(s)	Visual Basic 6, Microsoft .Net, C	Delphi	Progress
• Operating system(s)	Windows 95, 98, 2000 Pro, XP Pro, NT server, 2000/2003 server	operating system independent	OS/400, Unix
• Databases and tools used	MS SQL server	database independent	Progress
• System includes full transaction logging?	no	yes	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	85%	100%	100%
• Bar-coded collection labels	90%	100%	100%
• Handheld devices for bedside-positive patient ID	0	available but not installed	15%
• NCCLS POCT-1A standard interface for POCT devices	not available	not available	available but not installed
• Microbiology	40%	available but not installed	90%
• Surgical pathology/cytology	not available	not available	40%/10%
• HIS interface: A/D/T	10%	25%	90%
• HIS interface: order entry	5%	100%	90%
• HIS interface: results reporting	10%	100%	90%
• Ad hoc reporting	0	100%	100%
• Rules-based system	installed	100%	100%
• Management and statistical reporting	100%	100%	100%
• Outreach and commercial laboratory	installed	1%	30%
• Compliance checking	not available	available but not installed	installed
• Billing and accounts receivable	25%	available but not installed	installed
• Materials management and inventory	15%	available but not installed	not available
• Test partition	installed	100%	100%
• Remote faxing and printing	15%	100%	100%
• Physician office outreach	3%	installed	100%
• HIPAA-standard transaction formats	not available	installed	installed
• Web-based remote inquiry of reports	5%	available in December 2005	installed
• Web access for order entry	3%	available in December 2005	installed
• Decision support system	not available	100%	installed
• Specimen management and tracking	not available	100%	installed
Complete LIS application service provider solution?	yes	yes	no
ASP for physician order entry and results reporting?	yes	yes	no
Method of charging for ASP service	fixed fee	—	—
Client software required	browser based	requires software be installed on a client PC	—
ASP information conduit	operates over Internet	operates over Internet	—
Client contracts supported from data center not operated by client	15	0	—
How data center is operated	in hosting at Fasteweb Internet provider	—	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	not available	available but not installed	available but not installed
• Other reportable diseases	not available	available but not installed	available but not installed
• Tumor diagnosis/registry data	not available	available but not installed	available but not installed
Hospital/integrated health care systems interfaced	Santer, Dedalus, Medtrack	n/a	Keane, Imed
Physician office management systems interfaced	—	NextGen, PCIS	Siemens, Meditech, LabCorp, Quest
Automated lab transportation systems interfaced	Roche/BMC/Hitachi, Johnson & Johnson, Ortho	instrument interfaces provided by a third party	planned
Validation/testing tools provided?	yes (user-defined congruence rules)	yes	yes (test environments)
LIS allows for third-party updates of tables/rules?	no	yes (any vendor)	yes (SNOMED, ICD-9, CPT)
LIS permits use of voice input technology?	no	yes (products compatible with platform running on workstation)	no
LIS allows for image capture and display?	yes	yes	yes
Software provides indexed field in each test definition for LOINC code?	yes	yes	no
Provide LOINC dictionary for each new installation?	no	no	—
LIS supports use of SNOMED CT?	no	yes	yes
Market modules for other hospital departments?	yes	no	yes
• Percentage of LIS installations stand-alone	10%	—	25%
No. of different lab instruments interfaced with LIS	240+	500+	100+
Source code?/User group?	no/no	escrow or request/no	no/yes
User can modify screens?	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query language to retrieve information from LIS database	SQL	SQL, HL7	Progress, Cyberquery, IBM, others
Support open system standards?	no	yes (any using Isys' interface definition tools)	no
Smallest cost for hardware/software/monthly maintenance	$2k/$4k/$0.05k†	$25k (hardware and software)/$2.5k	—
Largest cost for hardware/software/monthly maintenance	$80k/$55k/$0.35k†	$1m (hardware and software)/$15k	—
Distinguishing features (supplied by vendor)	• performance • flexible and easy to use • price/performance ratio	• user definability • platform and database independent • client/server architecture	• easy to use • cost effective • user defined
*other=sales, marketing, administration, and other company functions			
**via a computer-to-computer interface	† *U.S. dollars*		

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Laboratory information systems

Part 8 of 14

See accompanying article on page 24

	LabSoft Inc.	M/MGMT Systems Inc.	McKesson Provider Technologies
	Steven Hawn shawn@labsoftweb.com	Robert Mann mlab@mmgmt.com	Stacy Block stacy.block@mckesson.com
	8402 Laurel Fair Circle, Ste. 207	2335 American River Drive, Ste. 402	5995 Windward Parkway
	Tampa, FL 33610	Sacramento, CA 95825	Alpharetta, GA 30005
	800-767-3279	916-648-9010	800-981-8601
	www.labsoftweb.com	www.mmgmt.com	http://infosolutions.mckesson.com
Name of system	LabNet	M/Lab Enterprise Edition	Horizon Lab
First ever LIS installation/most recent installation	1992/2005	1987/2005	1972/2005
No. of contracts for sites operating LIS	237	21	55
• Hospital/independent lab contracts in U.S.	—	0	—
• Clinic or group practice contracts in U.S.	—	0	—
• Other contracted U.S. sites/contracts for foreign sites	—	21 (public health)/0	—
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	—	0	35
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	—	0	—
No. of sites operating LIS	237	21	95
Staff to develop/install and support/other* in entire firm	3/3/2	6/5/2	6,000 total
Staff to develop/install and support/other* in LIS division	—	—	—
No. of terminals/workstations in sites operating system	3–75 (ave., 12)	8–64 (ave., 16–24)	10–300+ (ave., 75)
• Central hardware or service type	Dell	Intel-based server	HP, IBM
• Central hardware redundant/fault-tolerant?	yes	yes	yes
• Terminals/workstations or PC platform	Dell PC platform	Intel based	PC
Software			
• Programming language(s)	Delphi	Caché	Delphi, ANSI, Standard C
• Operating system(s)	Windows 2000, Pro, XP Pro, NT, 2004, 98	Windows NT, 2000, XP	Linux, Windows 9x, NT, 2000, XP (for client), HP-UX, AIX
• Databases and tools used	MS SQL server	Caché	Oracle
• System includes full transaction logging?	yes	yes	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	100%	40%	100%
• Bar-coded collection labels	100%	50%	100%
• Handheld devices for bedside-positive patient ID	installed	not available	15%
• NCCLS POCT-1A standard interface for POCT devices	installed	not available	50%
• Microbiology	installed	100%	100%
• Surgical pathology/cytology	available but not installed/not available	available but not installed	—
• HIS interface: A/D/T	installed	not available	100%
• HIS interface: order entry	installed	70%	100%
• HIS interface: results reporting	installed	60%	100%
• Ad hoc reporting	installed	100%	100%
• Rules-based system	installed	70%	100%
• Management and statistical reporting	installed	100%	100%
• Outreach and commercial laboratory	installed	not available	30%
• Compliance checking	installed	not available	100%
• Billing and accounts receivable	not available	80%	available in 2005
• Materials management and inventory	not available	not available	through other McKesson products
• Test partition	not available	100%	100%
• Remote faxing and printing	available but not installed	70%	100%
• Physician office outreach	available but not installed	not available	100%
• HIPAA-standard transaction formats	available but not installed	available but not installed	not available
• Web-based remote inquiry of reports	available but not installed	available but not installed	25%
• Web access for order entry	available but not installed	available but not installed	30%
• Decision support system	available but not installed	100%	100%
• Specimen management and tracking	available but not installed	100%	100%
Complete LIS application service provider solution?	no	no	yes
ASP for physician order entry and results reporting?	yes	no	no
Method of charging for ASP service	—	—	—
Client software required	—	—	—
ASP information conduit	—	—	—
Client contracts supported from data center not operated by client	—	—	—
How data center is operated	—	—	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	not available	80%	25%
• Other reportable diseases	not available	20%	not available
• Tumor diagnosis/registry data	not available	not available	not available
Hospital/integrated health care systems interfaced	—	Siemens, Meditech, Mitchell & McCormick, homegrown, any HL7	McKesson, Siemens, IDX, Meditech, homegrown
Physician office management systems interfaced	—	n/a	connectivity offered through outreach application
Automated lab transportation systems interfaced	planned	no	Beckman Coulter, homegrown
Validation/testing tools provided?	no	yes	yes
LIS allows for third-party updates of tables/rules?	yes	yes	no
LIS permits use of voice input technology?	no	no	yes (any vendor)
LIS allows for image capture and display?	yes	yes	—
Software provides indexed field in each test definition for LOINC code?	yes	yes	yes
Provide LOINC dictionary for each new installation?	no	no	yes
LIS supports use of SNOMED CT?	no	yes	—
Market modules for other hospital departments?	no	no	yes
• Percentage of LIS installations stand-alone	—	—	—
No. of different lab instruments interfaced with LIS	200	18	200+
Source code?/User group?	escrow/no	yes/yes	escrow/yes (meets online as well)
User can modify screens?	no (offer user-defined report writer)	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query language to retrieve information from LIS database	MS SQL, ODBC-compatible languages	any query package, SQL compatible	any ODBC software package, e.g. Crystal Reports
Support open system standards?	yes	yes (ODBC)	—
Smallest cost for hardware/software/monthly maintenance	$10k/$25k/$0.204k	—/$64k/$1k	—
Largest cost for hardware/software/monthly maintenance	$30k/$150k/$0.992k	—/$560k/$8.4k	—
Distinguishing features (supplied by vendor)	• exceptional customer service • fully featured, rich LIS products • high-value products	• public health laboratory-specific design • clinical, environmental, bioterrorism, and newborn screening • historical electronic medical record	• supports all lab business models—hospital, reference, hybrid, single- and multi-site • integrated lab solutions • adaptable expert workflow

*other=sales, marketing, administration, and other company functions
**via a computer-to-computer interface

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Laboratory information systems

Part 9 of 14 *See accompanying article on page 24*	Medcom Information Systems Inc. **David Baird** dbaird@emirj.com 2117 Stonington Ave. Hoffman Estates, IL 60195 847-885-1553 www.emirj.com	Medical Information Technology Inc. (Meditech) **Paul Berthiaume** pberthiaume@meditech.com Meditech Circle Westwood, MA 02090 781-821-3000 www.meditech.com	Medical Information Technology Inc. (Meditech) **Paul Berthiaume** pberthiaume@meditech.com Meditech Circle Westwood, MA 02090 781-821-3000 www.meditech.com
Name of system	Medcom Lab Manager	Meditech LIS–client/server	Meditech LIS–Magic
First ever LIS installation/most recent installation	1992/2005	1969/2005	1969/2005
No. of contracts for sites operating LIS	455	237	953
• Hospital/independent lab contracts in U.S.	20/70	—	—
• Clinic or group practice contracts in U.S.	365	—	—
• Other contracted U.S. sites/contracts for foreign sites	0	—	—
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	4 (0/4/0)	31	17
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	8	—	—
No. of sites operating LIS	455	—	—
Staff to develop/install and support/other* in entire firm	4/10/7	466/1,303/432	466/1,303/432
Staff to develop/install and support/other* in LIS division	3/10/5	125 total	125 total
No. of terminals/workstations in sites operating system	1–11 (ave., 2–3)	—	—
• Central hardware or service type	Medcom IBM-compatible PC	HP, Dell, EMC, IBM	HP, Dell, EMC, IBM
• Central hardware redundant/fault-tolerant?	yes	yes	yes
• Terminals/workstations or PC platform	Medcom IBM-compatible PC	HP, Dell, EMC, IBM	HP, Dell, EMC, IBM
Software			
• Programming language(s)	C++	Windows NT	Magic
• Operating system(s)	DOS, Windows 9x, NT	Windows NT	Magic
• Databases and tools used	dBase compatible	SQL server, ODBC tools	Magic
• System includes full transaction logging?	yes	yes	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	100%	100%	100%
• Bar-coded collection labels	70%	100%	100%
• Handheld devices for bedside-positive patient ID	—	20%	20%
• NCCLS POCT-1A standard interface for POCT devices	—	20%	20%
• Microbiology	5%	100%	100%
• Surgical pathology/cytology	—	93%/installed	93%/installed
• HIS interface: A/D/T	3%	25%	25%
• HIS interface: order entry	2%	25%	25%
• HIS interface: results reporting	4%	25%	25%
• Ad hoc reporting	100%	100%	100%
• Rules-based system	—	100%	100%
• Management and statistical reporting	—	100%	100%
• Outreach and commercial laboratory	—	installed	installed
• Compliance checking	5%	installed	installed
• Billing and accounts receivable	—	97%	97%
• Materials management and inventory	—	80%	80%
• Test partition	—	100%	100%
• Remote faxing and printing	5%	100%	100%
• Physician office outreach	—	installed	installed
• HIPAA-standard transaction formats	—	100%	100%
• Web-based remote inquiry of reports	1%	available in 2005	available in late 2005
• Web access for order entry	1%	available in 2005	available in late 2005
• Decision support system	—	installed	installed
• Specimen management and tracking	—	100%	100%
Complete LIS application service provider solution?	yes	no	no
ASP for physician order entry and results reporting?	yes	—	—
Method of charging for ASP service	fixed fee	—	—
Client software required	browser based	—	—
ASP information conduit	operates over Internet	—	—
Client contracts supported from data center not operated by client	0	—	—
How data center is operated	by a third party (YNC)	—	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	not available	not available	not available
• Other reportable diseases	not available	not available	not available
• Tumor diagnosis/registry data	—	not available	not available
Hospital/integrated health care systems interfaced	—	Cerner, McKesson, Siemens, others	Cerner, McKesson, Siemens, others
Physician office management systems interfaced	—	—	—
Automated lab transportation systems interfaced	no	Bayer, Roche/BMC/Hitachi, MDS Laboratory Services, Beckman Coulter, Sysmex	Lab-InterLink, MDS Laboratory Services, Beckman Coulter, Sysmex, Bayer, Roche/BMC/Hitachi
Validation/testing tools provided?	yes (Alpha II Code Wizard, Code Map)	yes (proprietary)	yes (proprietary)
LIS allows for third-party updates of tables/rules?	yes (Alpha II, Code Map)	yes (Info-X, SNOMED)	yes (Info-X, SNOMED)
LIS permits use of voice input technology?	no	yes (ScanSoft Dragon Naturally Speaking)	yes (ScanSoft Dragon Naturally Speaking)
LIS allows for image capture and display?	no	yes	yes
Software provides indexed field in each test definition for LOINC code?	no	no	no
Provide LOINC dictionary for each new installation?	no	no	no
LIS supports use of SNOMED CT?	no	yes	yes
Market modules for other hospital departments?	no	yes	yes
• Percentage of LIS installations stand-alone	—	25%	25%
No. of different lab instruments interfaced with LIS	hundreds	hundreds	hundreds
Source code?/User group?	no/no	yes/yes (meets online as well)	yes/yes (meets online as well)
User can modify screens?	no (offer custom programming)	yes (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query language to retrieve information from LIS database	—	SQL based, Meditech Report Writer	SQL based, Meditech Report Writer
Support open system standards?	yes (HL7)	yes (HL7)	yes (HL7)
Smallest cost for hardware/software/monthly maintenance	$2k/$7k/$0.1k per month	—	—
Largest cost for hardware/software/monthly maintenance	$35k/$70k/$0.75k per month	—	—
Distinguishing features (supplied by vendor)	• cost-effective interfacing for data exchange with other software • software support includes updates, upgrades, modem support, phone help • interfaces available for reference labs, billing systems, and EMRs	• 36 years' experience developing and implementing lab systems • seamless support for labs in an integrated delivery network • accurate, up-to-the-minute patient data and charge information	• 36 years' experience developing and implementing lab systems • seamless support for labs in an integrated delivery network • accurate, up-to-the-minute patient data and charge information

*other=sales, marketing, administration, and other company functions
**via a computer-to-computer interface

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Laboratory information systems

Part 10 of 14 *See accompanying article on page 24*	MediSolution Inc. Soraya Comeau soraya.comeau@medisolution.com 2999 N. 44th St., Ste. 308 Phoenix, AZ 85018 866-467-4636 www.medisolution.com	Misys Healthcare Systems Sales Development 8529 Six Forks Rd. Raleigh, NC 27615 866-647-9787 www.misyshealthcare.com	Misys Healthcare Systems Sales Development 8529 Six Forks Rd. Raleigh, NC 27615 866-647-9787 www.misyshealthcare.com
Name of system	MediLab	Misys Commercial Laboratory	Misys Laboratory
First ever LIS installation/most recent installation	1972/2005	1979/2005	1979/2005
No. of contracts for sites operating LIS	700+	—	—
• Hospital/independent lab contracts in U.S.	3/4	—	—
• Clinic or group practice contracts in U.S.	0	—	—
• Other contracted U.S. sites/contracts for foreign sites	0/700+	—	—
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	5 (2/3/0)	—	—
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	6	—	—
No. of sites operating LIS	700+	—	—
Staff to develop/install and support/other* in entire firm	375 total	700/1,400/600	700/1,400/600
Staff to develop/install and support/other* in LIS division	79/24/6	90/40/70	90/40/70
No. of terminals/workstations in sites operating system	1–700 (ave., 38)	10–1,000+ (ave., 50)	4–500+ (ave., 20–100)
• Central hardware or service type	Sun, Unix, Linux, Windows, IBM, HP	IBM, HP	IBM, HP
• Central hardware redundant/fault-tolerant?	—	yes	yes
• Terminals/workstations or PC platform	IBM-compatible PC	Dell, HP (Compaq)	Dell, HP (Compaq)
Software			
• Programming language(s)	C++, Java	Caché	M, Caché script, Standard C, C++, Visual Basic, others
• Operating system(s)	Sun OS, Windows XP, 2000, 2003, Unix, Linux	IBM AIX, HP-UX	IBM AIX, HP-UX, OpenVMS
• Databases and tools used	SQL server, Oracle	Caché	Caché
• System includes full transaction logging?	yes	yes	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	95%	100%	100%
• Bar-coded collection labels	100%	100%	100%
• Handheld devices for bedside-positive patient ID	3%	not available	<10%
• NCCLS POCT-1A standard interface for POCT devices	3%	available but not installed	20%
• Microbiology	95%	100%	100%
• Surgical pathology/cytology	40%/35%	30%/30%	70%/70%
• HIS interface: A/D/T	100%	80%	99%
• HIS interface: order entry	20%	80%	99%
• HIS interface: results reporting	45%	80%	99%
• Ad hoc reporting	100%	100%	90%
• Rules-based system	100%	100%	100%
• Management and statistical reporting	100%	100%	100%
• Outreach and commercial laboratory	60%	100%	75%
• Compliance checking	installed	installed	30%
• Billing and accounts receivable	50%	90%	10%
• Materials management and inventory	3%	0	20%
• Test partition	100%	100%	100%
• Remote faxing and printing	100%	100%	90%
• Physician office outreach	50%	installed	20%
• HIPAA-standard transaction formats	100%	100%	100%
• Web-based remote inquiry of reports	35%	available but not installed	5%
• Web access for order entry	35%	available but not installed	5%
• Decision support system	—	available but not installed	available but not installed
• Specimen management and tracking	10%	100%	100%
Complete LIS application service provider solution?	yes	no	no
ASP for physician order entry and results reporting?	no	no	no
Method of charging for ASP service	fixed fee	—	—
Client software required	requires software be installed on a client PC	—	—
ASP information conduit	requires use of a private, dedicated circuit	—	—
Client contracts supported from data center not operated by client	2	—	—
How data center is operated	by a third party (Superior Consulting Co.)	—	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	available but not installed	available but not installed	5%
• Other reportable diseases	available but not installed	available but not installed	5%
• Tumor diagnosis/registry data	3%	available but not installed	10%
Hospital/integrated health care systems interfaced	MediSolution, SCC, Keane, self developed, McKesson, Misys, GE Medical, Meditech, others	McKesson, Cerner, Siemens, Meditech, others	McKesson, Cerner, Siemens, IDX, Epic, Eclypsis, others
Physician office management systems interfaced	MediSolution, Purkinge, others	Logician, Clinscan, Dr. Chart, others	PowerChart, Dr. Chart, Misys EMR, others
Automated lab transportation systems interfaced	Sysmex, Bayer, Tecan, Roche/BMC/Hitachi, Lab-InterLink, MDS Laboratory Services, Beckman Coulter	Beckman Coulter, Roche/BMC/Hitachi	Beckman Coulter, Sysmex, Bayer, Tecan, Roche/BMC/Hitachi
Validation/testing tools provided?	yes (self developed)	yes	yes
LIS allows for third-party updates of tables/rules?	yes (Info-X, NCCLS, SNOMED)	yes (Info-X)	yes (Info-X, ICD-9)
LIS permits use of voice input technology?	yes (IBM Voice, Dragon Naturally Speaking, others)	no	yes (Dragon Medically Speaking for AP only)
LIS allows for image capture and display?	yes	no	yes
Software provides indexed field in each test definition for LOINC code?	yes	no	no
Provide LOINC dictionary for each new installation?	no	no	no
LIS supports use of SNOMED CT?	yes	no	yes
Market modules for other hospital departments?	yes	yes	yes
• Percentage of LIS installations stand-alone	80%	90%	90%
No. of different lab instruments interfaced with LIS	425+	300+	200+
Source code?/User group?	escrow/yes	yes/yes (meets online as well)	yes/yes (meets online as well)
User can modify screens?	yes (offer user-defined report writer, custom programming)	no (offer user-defined report writer, custom programming)	no (offer user-defined report writer, custom programming)
Query language to retrieve information from LIS database	SQL, Access, Crystal Reports, Excel	SQL	SQL
Support open system standards?	yes (Oracle, SQL)	yes (HL7, ODBC)	yes (HL7, ODBC)
Smallest cost for hardware/software/monthly maintenance	$6k/$30k/$6k	$50k/$100k/1.5% of license fee per month	$100k/$250k/1.5% of license fee per month
Largest cost for hardware/software/monthly maintenance	$300k/$2m/$33k	$500k+/$3m/1.5% of license fee per month	$500k/$1m/—
Distinguishing features (supplied by vendor)	• patient safety module; wireless positive patient ID • proactive management tools • multi-lingual—21 different languages	• proven high-volume processing and extensive outreach capability • streamlined workflow • integration with Misys suite of products	• company commitment to support and service • connectivity to POC, LAS, instruments, CPR, HIS, financials • multi-facility and outreach support

*other=sales, marketing, administration, and other company functions
**via a computer-to-computer interface

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Laboratory information systems

Part 11 of 14 *See accompanying article on page 24*	**Multidata Computer Systems Inc.** **Michael Slater** mrslater@mul.com **55 Broad St., 10th floor** **New York, NY 10004** **212-967-6700** www.mul.com	**Netlims NJ LLC** **Avi Allerhand** avi@netlims.com **96 Engle St.** **Englewood, NJ 07631** **201-894-5300** www.netlims.com	**Northern Software Inc.** **Bob Hamen** bob@northernsoft.com **P.O. Box 309** **Ironwood, MI 49938** **906-932-9990** www.northernsoft.com
Name of system	**MultiTech**	**AutoLims**	**eLab.Sys**
First ever LIS installation/most recent installation	1983/2003	1996/2005	1984/2005
No. of contracts for sites operating LIS	41	35	32
• Hospital/independent lab contracts in U.S.	7/33	3/3	6/3
• Clinic or group practice contracts in U.S.	1	0	21
• Other contracted U.S. sites/contracts for foreign sites	0	0/29	0/2
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	0	2 (1/1/0)	0
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	0	1	—
No. of sites operating LIS	41	50+	32
Staff to develop/install and support/other* in entire firm	4/5/2	52/30/16	2 total
Staff to develop/install and support/other* in LIS division	—	—	—
No. of terminals/workstations in sites operating system	4–120+ (ave., 30)	16–550 (ave., 60)	1–60 (ave., 5)
• Central hardware or service type	Intel x86 compatible, most Unix RISC, DEC Alpha	IBM, HP, Dell	Dell servers, Acer Open servers
• Central hardware redundant/fault-tolerant?	optional	yes	yes
• Terminals/workstations or PC platform	PC with VT emulation, DEC VT or compatible	Windows PCs	Dell Optiplex
Software			
• Programming language(s)	Caché (M), Visual Basic, HTML	C++, Java, Visual Basic	C++, Visual Basic, .Net
• Operating system(s)	Windows 2003, Unix, Linux, DEC VMS	Windows 2000, 2003, XP, Linux, Unix	Windows 95, 98, 2000, XP
• Databases and tools used	Caché (M)	Oracle, SQL, Caché	Sybase SQL, MS SQL 7, 2000, 2002
• System includes full transaction logging?	optional	yes	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	90%	90%	100%
• Bar-coded collection labels	90%	100%	90%
• Handheld devices for bedside-positive patient ID	—	installed	not available
• NCCLS POCT-1A standard interface for POCT devices	—	not available	not available
• Microbiology	80%	80%	15%
• Surgical pathology/cytology	10%/40%	30%/50%	not available
• HIS interface: A/D/T	20%	80%	50%
• HIS interface: order entry	20%	60%	100%
• HIS interface: results reporting	10%	40%	100%
• Ad hoc reporting	40%	100%	10%
• Rules-based system	90%	100%	100%
• Management and statistical reporting	100%	100%	100%
• Outreach and commercial laboratory	90%	100%	50%
• Compliance checking	80%	50%	100%
• Billing and accounts receivable	90%	30%	not available
• Materials management and inventory	20%	installed	not available
• Test partition	100%	100%	100%
• Remote faxing and printing	80%	100%	100%
• Physician office outreach	80%	75%	available but not installed
• HIPAA-standard transaction formats	90%	100%	—
• Web-based remote inquiry of reports	10%	60%	—
• Web access for order entry	10%	available second quarter 2006	available but not installed
• Decision support system	—	not available	—
• Specimen management and tracking	10%	60%	100%
Complete LIS application service provider solution?	no	no	no
ASP for physician order entry and results reporting?	yes	—	no
Method of charging for ASP service	fixed fee	—	—
Client software required	browser based	—	—
ASP information conduit	operates over Internet	—	—
Client contracts supported from data center not operated by client	1	—	—
How data center is operated	by vendor	—	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	available but not installed	available but not installed	not available
• Other reportable diseases	20 sites	available but not installed	not available
• Tumor diagnosis/registry data	—	available but not installed	not available
Hospital/integrated health care systems interfaced	Siemens, CSM, Cerner	Siemens, Cerner, Misys, IDX, SCC Soft Computer	Dairyland
Physician office management systems interfaced	Medical Manager, VitalWorks	—	Medical Manager, ChartLogic
Automated lab transportation systems interfaced	Bayer, Tecan	Beckman Coulter, Bayer, Olympus	planned
Validation/testing tools provided?	no	no	yes (duplicate result entry, QC rules)
LIS allows for third-party updates of tables/rules?	yes (PMIC, CMS)	yes (any HL7, Excel, ASCII format)	yes (ChartLogic)
LIS permits use of voice input technology?	no	yes (Dragon Naturally Speaking)	no
LIS allows for image capture and display?	optional	yes	no
Software provides indexed field in each test definition for LOINC code?	yes	yes	yes
Provide LOINC dictionary for each new installation?	on request	no	no
LIS supports use of SNOMED CT?	no	yes	yes
Market modules for other hospital departments?	no	no	no
• Percentage of LIS installations stand-alone	—	—	—
No. of different lab instruments interfaced with LIS	125+	100+	200+
Source code?/User group?	escrow/no	escrow/yes (outside the U.S.)	no/no
User can modify screens?	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)	yes (offer custom programming)
Query language to retrieve information from LIS database	any ODBC compliant, e.g. Crystal Reports, SQL, Access	SQL	ODBC, SQL
Support open system standards?	yes (ODBC)	—	no
Smallest cost for hardware/software/monthly maintenance	$20k/$50k/$0.75k	$12k/$60k/$1k	$1k/$2k/$0.03k
Largest cost for hardware/software/monthly maintenance	$250k/$400k/$6k	$700k/$2.8m/$55k	$25k/$50k/$0.6k
Distinguishing features (supplied by vendor)	• complete billing, A/R, management reporting for commercial labs and hospital outreach • integrated document management system for imaging/retrieval of requisitions and related documents • flexible design and customization capabilities for special operations	• easily tailored for any environment or work procedure • advanced technology—Windows; free choice of database; Web technology • personalized service—experienced personnel; fast response; close relations with all clients	• bi-directional interfaces with Quest, LabCorp, AML, and Dynacare • fully integrated with ChartLogic EMR

*other=sales, marketing, administration, and other company functions
**via a computer-to-computer interface

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	Omnitech Labs	Opus Healthcare Solutions Inc.	Orchard Software
	John Fitzgibbon jfitz@omnitechlabs.net	Caroline Pritchard cpritchard@opushealthcare.com	Kerry Foster kfoster@orchardsoft.com
	9 Lilly Court	12301 Research Blvd., Bldg. IV, Ste. 200	701 Congressional Blvd., Ste. 360
	Manorville, NY 11949	Austin, TX 78759	Carmel, IN 46032
	877-336-6664, ext. 366	800-676-3371	800-856-1948
	www.omnitechlabs.net	www.opushealthcare.com	www.orchardsoft.com
Name of system	OmniLab	Opus Lab	Orchard Harvest LIS
First ever LIS installation/most recent installation	1994/2005	1985/2005	1993/2005
No. of contracts for sites operating LIS	75	46	521
• Hospital/independent lab contracts in U.S.	2/0	35/4	127/62
• Clinic or group practice contracts in U.S.	0	2	294
• Other contracted U.S. sites/contracts for foreign sites	0/73	4/1	38/0
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	4 (3/1/0)	1 (1/0/0)	22 (5/2/15)
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	7	1	22
No. of sites operating LIS	100	46	567
Staff to develop/install and support/other* in entire firm	28/15/11	69/34/24	22/45/29
Staff to develop/install and support/other* in LIS division	26/14/10	8/21/5	n/a
No. of terminals/workstations in sites operating system	4–300 (ave., 50)	5–40 (ave., 15)	1–150+ (ave., 20)
• Central hardware or service type	Windows 2003 (Dell)	HP 9000	HP Business Class, Pentium compatible
• Central hardware redundant/fault-tolerant?	yes	yes	yes
• Terminals/workstations or PC platform	Windows PC, thin client, Web browser	Windows PC workstation supported	HP Business Class, Pentium compatible
Software			
• Programming language(s)	Visual Basic 6, Visual Basic .Net	C, Java, Perl	4D, C++, Java, HTML
• Operating system(s)	Windows 2003	Unix, Linux	Windows 200, XP, Internet Explorer, Netscape
• Databases and tools used	MS SQL Server 2000	Postgre, SQL, Mason, Opus DBMS, others	4D client/server, MS SQL, Oracle
• System includes full transaction logging?	yes	yes	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	93%	100%	100%
• Bar-coded collection labels	100%	100%	100%
• Handheld devices for bedside-positive patient ID	available but not installed	available but not installed	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	available but not installed	available but not installed
• Microbiology	55%	80%	50%
• Surgical pathology/cytology	20%/15%	20%/15%	10%/20%
• HIS interface: A/D/T	52%	80%	65%
• HIS interface: order entry	52%	75%	65%
• HIS interface: results reporting	52%	75%	65%
• Ad hoc reporting	100%	100%	100%
• Rules-based system	100%	100%	100%
• Management and statistical reporting	100%	100%	100%
• Outreach and commercial laboratory	12%	75%	70%
• Compliance checking	available but not installed	2%	90%
• Billing and accounts receivable	6%	—	—
• Materials management and inventory	not available	not available	20%
• Test partition	100%	75%	25%
• Remote faxing and printing	100%	100%	90%
• Physician office outreach	15%	10%	80%
• HIPAA-standard transaction formats	available but not installed	—	100%
• Web-based remote inquiry of reports	7%	10%	60%
• Web access for order entry	7%	10%	60%
• Decision support system	100%	—	100%
• Specimen management and tracking	100%	—	100%
Complete LIS application service provider solution?	yes	yes	no
ASP for physician order entry and results reporting?	yes	yes	yes
Method of charging for ASP service	transaction based	fixed fee	fixed fee
Client software required	browser based	requires software be installed on a client PC	browser based
ASP information conduit	operates over Internet	requires use of a private, dedicated circuit	operates over Internet
Client contracts supported from data center not operated by client	40	2	5
How data center is operated	by a third party (province of Quebec, Canada)	by vendor	by vendor
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	available but not installed	available but not installed	1%
• Other reportable diseases	available but not installed	available but not installed	unknown
• Tumor diagnosis/registry data	available but not installed	available but not installed	unknown
Hospital/integrated health care systems interfaced	MediSolution, Momentum, Per Sé, Sphere, Mardon, McKesson	McKesson, Siemens, Cerner, Epic, Quest, LabCorp, Hemocare	McKesson, Misys, IDX, Experior, Siemens, Cerner, Dairyland, QuadraMed, Meditech, GE, others
Physician office management systems interfaced	Purinje, Yorkmed, Omni-Med	n/a	Misys, HealthPac, IDX, Millbrook, Epic, NextGen, Clinitek, Medical Manager, Medgate, GE, others
Automated lab transportation systems interfaced	planned	Beckman Coulter	planned
Validation/testing tools provided?	yes (self developed)	yes (complete testing environment)	yes (proprietary)
LIS allows for third-party updates of tables/rules?	yes	no	yes (AMA, LabCorp, Quest, Specialty, OML, others)
LIS permits use of voice input technology?	yes (any Windows compatible)	no	no
LIS allows for image capture and display?	yes	no	yes
Software provides indexed field in each test definition for LOINC code?	yes	no	yes
Provide LOINC dictionary for each new installation?	no	no	no
LIS supports use of SNOMED CT?	yes	no	yes
Market modules for other hospital departments?	yes	yes	no
• Percentage of LIS installations stand-alone	97%	50%	—
No. of different lab instruments interfaced with LIS	250	200+	350+
Source code?/User group?	escrow/no	escrow/yes (meets online as well)	escrow/yes (meets online as well)
User can modify screens?	yes (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query language to retrieve information from LIS database	SQL, any ODBC	SQL, Crystal Report Writer	ODBC-compliant query languages
Support open system standards?	yes (Microsoft, ODBC)	yes (Linux)	no
Smallest cost for hardware/software/monthly maintenance	$10k/$100k/$1.5k	$30k/$100k/$1k	$10k/$20k/$0.25k
Largest cost for hardware/software/monthly maintenance	$200k/$1m+/$15k	$250k/$600k/$6k	$100k/$500k/$6k
Distinguishing features (supplied by vendor)	• complete and actual integration • scalable from smaller to very large deployments • outstanding service and support—LIS focus	• comprehensive solution for multi-site facilities • stand-alone or integrated with Opus' clinical suite of products • customer support is hallmark of company operations	• rules-based advanced decision support logic • interfacing and integration with other systems, departments, and reference labs • industry leader in service and support

*other=sales, marketing, administration, and other company functions
**via a computer-to-computer interface

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	Psyche Systems Corp. Patricia Salem info@psychesystems.com 321 Fortune Blvd. Milford, MA 01757 800-345-1514 www.psychesystems.com	QuadraMed Ruth Weed rweed@quadramed.com 12110 Sunset Hills Rd., Ste. 600 Reston, VA 20190 703-904-5611 www.quadramed.com
Name of system	LabWeb	Affinity Laboratory
First ever LIS installation/most recent installation	1976/2005	1984/2004
No. of contracts for sites operating LIS	24	17
• Hospital/independent lab contracts in U.S.	14/3	0
• Clinic or group practice contracts in U.S.	3	0
• Other contracted U.S. sites/contracts for foreign sites	0/4	0/17
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	0	1 (1/0/0)
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	2	1
No. of sites operating LIS	41	31
Staff to develop/install and support/other* in entire firm	12/17/6	251/213/327
Staff to develop/install and support/other* in LIS division	8/9/6	10/13/9
No. of terminals/workstations in sites operating system	5–120 (ave., 20)	4–3,000 (ave., 64)
• Central hardware or service type	HP, Pentium compatible	open
• Central hardware redundant/fault-tolerant?	yes	yes
• Terminals/workstations or PC platform	HP, Pentium compatible	any brand of PC
Software		
• Programming language(s)	Visual Basic. Net, Visual Basic, C/Fortran	InterSystems Caché, Visual Basic 6
• Operating system(s)	Windows XP, NT, 2000, OpenVMS	Windows, 2003, NT, Unix
• Databases and tools used	MS SQL, Oracle, BrioQuery, Crystal Reports	Caché, Visual Basic 6 .Net, XML, Java, J2EE
• System includes full transaction logging?	yes	yes
Features (listed as a percentage of live installations or based on availability)		
• Chemistry and hematology	100%	100%
• Bar-coded collection labels	100%	installed
• Handheld devices for bedside-positive patient ID	available but not installed	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	available but not installed
• Microbiology	33%	100%
• Surgical pathology/cytology	33%/33%	90%/90%
• HIS interface: A/D/T	90%	80%
• HIS interface: order entry	50%	10%
• HIS interface: results reporting	50%	100%
• Ad hoc reporting	100%	100%
• Rules-based system	25%	100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	100%	20%
• Compliance checking	15%	10%
• Billing and accounts receivable	not available	50%
• Materials management and inventory	not available	10%
• Test partition	100%	100%
• Remote faxing and printing	200%	100%
• Physician office outreach	100%	80%
• HIPAA-standard transaction formats	100%	not available
• Web-based remote inquiry of reports	5%	50%
• Web access for order entry	5%	available in April 2006
• Decision support system	not available	not available
• Specimen management and tracking	not available	100%
Complete LIS application service provider solution?	yes	yes
ASP for physician order entry and results reporting?	yes	no
Method of charging for ASP service	fixed fee	fixed fee
Client software required	browser based, requires software be installed on a client PC	requires software be installed on a client PC
ASP information conduit	operates over Internet	requires use of a private, dedicated circuit
Client contracts supported from data center not operated by client	6	0
How data center is operated	by vendor	n/a
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**		
• Microbiology data	6 sites	8 sites
• Other reportable diseases	—	24 sites
• Tumor diagnosis/registry data	42 sites	—
Hospital/integrated health care systems interfaced	Meditech, McKesson, CPSI, Siemens, QuadraMed, Cerner, Misys, Keane, Syscor, Tenet, any HL7	iSoft, Cerner, Siemens, IBA, EDS, McKesson, Health Solutions
Physician office management systems interfaced	IDX, AcerMed, any HL7	Medical Director
Automated lab transportation systems interfaced	Lab-InterLink, Beckman Coulter	Beckman Coulter, Sysmex, Bayer, Roche/BMC/Hitachi
Validation/testing tools provided?	yes (QC Westgaard)	no
LIS allows for third-party updates of tables/rules?	yes (Code Map)	no
LIS permits use of voice input technology?	yes (Dragon, proprietary)	yes (Philips SpeechMagic, IBM ViaVoice, Dragon Dictate)
LIS allows for image capture and display?	yes	yes
Software provides indexed field in each test definition for LOINC code?	yes	yes
Provide LOINC dictionary for each new installation?	no	no
LIS supports use of SNOMED CT?	yes	yes
Market modules for other hospital departments?	no	yes
• Percentage of LIS installations stand-alone	—	90%
No. of different lab instruments interfaced with LIS	200+	167
Source code?/User group?	escrow/yes (meets online as well)	escrow/yes
User can modify screens?	yes (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query language to retrieve information from LIS database	MS SQL, ODBC compliant	SQL, ODBC-compliant products
Support open system standards?	yes (HL7, FTP)	yes (ODBC)
Smallest cost for hardware/software/monthly maintenance	$4k/$20k/$0.5k	n/a/$50k/$0.5k
Largest cost for hardware/software/monthly maintenance	$100k/$400k/$6k	n/a/$1.75m/$24k
Distinguishing features (supplied by vendor)	• leader in hosted laboratory information systems • delivers full, integrated laboratory suite • offers advanced, rules-based Web outreach package	• single design concept for all disciplines • specialist modules: molecular genetics, neonatal screening • multi-site regional model in a single database

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	SCC Soft Computer	Schuyler House	Siemens Medical Solutions
	Ellie Vahman ellie@softcomputer.com	Janet Chennault jan@schuylerhouse.com	Donna Roth donna.roth@siemens.com
	34350 U.S. Highway 19N	26027 Huntington Lane, Unit F	51 Valley Stream Parkway
	Palm Harbor, FL 34684	Valencia, CA 91355	Malvern PA, 19355
	727-789-0100	800-706-0266	610-219-3156
	www.softcomputer.com	www.shuylab.com	www.usa.siemens.com/medical
Name of system	SoftLab	SchuyLab	Novius Lab
First ever LIS installation/most recent installation	1985/2005	1992/2005	1983/2005
No. of contracts for sites operating LIS	277	578	58
• Hospital/independent lab contracts in U.S.	195/28	97/210	56/0
• Clinic or group practice contracts in U.S.	9	203	0
• Other contracted U.S. sites/contracts for foreign sites	0/45	60/8	0/2
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	22 (17/4/1)	1	12
• Contracts signed between Sept. 1, 2004–Aug. 31, 2005	24	46	10
No. of sites operating LIS	559	577	58
Staff to develop/install and support/other* in entire firm	603/257/170	6/10/7	—
Staff to develop/install and support/other* in LIS division	440/187/124	—	—
No. of terminals/workstations in sites operating system	30–450 (ave., 80)	1–40 (ave., 4)	8–250 (ave., 70)
• Central hardware or service type	IBM pSeries (RS/6000)	Dell	HP Alpha, IBM pSeries
• Central hardware redundant/fault-tolerant?	yes	no	yes
• Terminals/workstations or PC platform	PCs or ASCII terminals (all brands of PCs)	Dell	Windows-based PC
Software			
• Programming language(s)	C, C++, Java, .Net	C language	C, C++
• Operating system(s)	server: IBM-AIX; client: Windows 2000, XP	Windows NT, 95, 98, 2000, ME, XP Pro	Unix, Windows NT, 2000, XP
• Databases and tools used	RDM++, Oracle	Pervasive (Btrieve)	Sybase
• System includes full transaction logging?	yes	no	yes
Features (listed as a percentage of live installations or based on availability)			
• Chemistry and hematology	100%	100%	100%
• Bar-coded collection labels	100%	40%	100%
• Handheld devices for bedside-positive patient ID	5%-10%	not available	interface available in 2005
• NCCLS POCT-1A standard interface for POCT devices	6%	not available	10%
• Microbiology	95%	70%	98%
• Surgical pathology/cytology	57%/57%	10%/10%	through Impac
• HIS interface: A/D/T	89%	15%	89%
• HIS interface: order entry	82%	15%	98%
• HIS interface: results reporting	81%	15%	90%
• Ad hoc reporting	100%	10%	100%
• Rules-based system	100%	not available	100%
• Management and statistical reporting	90%	100%	100%
• Outreach and commercial laboratory	installed	25%	through Telcor
• Compliance checking	20%	40%	installed
• Billing and accounts receivable	16%	20%	through Telcor
• Materials management and inventory	not available	not available	not available
• Test partition	100%	not available	100%
• Remote faxing and printing	100%	40%	100%
• Physician office outreach	10%	10%	through Telcor
• HIPAA-standard transaction formats	available	100%	90%
• Web-based remote inquiry of reports	10%	5%	20%
• Web access for order entry	10%	5%	—
• Decision support system	installed	—	—
• Specimen management and tracking	20%	—	10%
Complete LIS application service provider solution?	yes	no	no
ASP for physician order entry and results reporting?	yes	—	yes
Method of charging for ASP service	fixed fee	—	transaction based
Client software required	requires software be installed on a client PC	—	browser based
ASP information conduit	operates over Internet	—	operates over Internet
Client contracts supported from data center not operated by client	2	—	—
How data center is operated	by vendor	—	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**			
• Microbiology data	2 sites	—	not available
• Other reportable diseases	2 sites	—	not available
• Tumor diagnosis/registry data	1%	—	provided by Impac
Hospital/integrated health care systems interfaced	IDX, QuadraMed, McKesson, Keane, Perot, CPSI, custom, Siemens, Epic, Misys, Cerner, Eclipsys	QuadraMed, Gold, Logician, Siemens, Cardinal, HealthBridge, McKesson, others	McKesson
Physician office management systems interfaced	Medical Manager, HealthWorks, Alliance-Plus, MedicaLogic, Trizetto, Epic, Misys	Medical Manager, Renal Link, PMSI, Allscripts, Apex, PCN, others	—
Automated lab transportation systems interfaced	Lab-InterLink, Beckman Coulter, Sysmex, Bayer, Tecan, Roche/BMC/Hitachi, Dade Behring	Bayer	Beckman Coulter, Bayer, Tecan
Validation/testing tools provided?	yes (Modelsoft, Camtasia)	no	yes (built in)
LIS allows for third-party updates of tables/rules?	yes (Quadax, Vitek, Microscan, Phoenix)	no	no
LIS permits use of voice input technology?	yes (Dragon)	planned	no
LIS allows for image capture and display?	yes	no	no
Software provides indexed field in each test definition for LOINC code?	yes	yes	no
Provide LOINC dictionary for each new installation?	no	no	no
LIS supports use of SNOMED CT?	yes	no	no
Market modules for other hospital departments?	yes	no	yes
• Percentage of LIS installations stand-alone	95%	—	—
No. of different lab instruments interfaced with LIS	500+	250+	300+
Source code?/User group?	escrow/yes (meets online as well)	escrow/meets via Internet	escrow/yes
User can modify screens?	yes (offer user-defined report writer, custom programming)	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer)
Query language to retrieve information from LIS database	SQL, ODBC, XML	HL7, dBase, ASTM, ASCII	ODBC
Support open system standards?	yes	—	yes
Smallest cost for hardware/software/monthly maintenance	$30k/$50k/18% of list price per year	$1.2k/$6k/$0.2k	—
Largest cost for hardware/software/monthly maintenance	$1m/$3m/$18% of list price per year	$45k/$80k/$2k	—
Distinguishing features (supplied by vendor)	• accommodate hospital, commercial, hybrid, and core labs • proven ROI for multi-site consolidation • parallel processing (fault tolerance) and artificial intelligence (rules-based engine)	• Internet, bar coding, electronic billing available • 24/7 toll-free technical support • free instrument interface trade-outs	• flexibility and reliability • excellent support services • workflow efficiency features: search sets, document links, and turnaround time monitor

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