

Moving to a new LIS? Let the headaches begin

Raymond D. Aller, MD

It may be trite but it's true—nothing lasts forever. So what do you do when your laboratory information system dies a natural death or is killed by market forces beyond your control? Well, you simply transfer the data to your new LIS—and yes, Virginia, there is a Santa Claus.

Regardless of why you are replacing your LIS—the hospital decided to install an integrated system that addresses everything from the lab to

the laundry; the LIS doesn't offer the capabilities the laboratory now needs; the vendor decided to replace the perfectly functional system with a more "modern" offering; or the vendor was acquired by another company that will not support the LIS—you must overcome the often overwhelming hurdle of how to continue accessing the data stored in that LIS.

More than one laboratorian has, through the years, asked the million-dollar question, "How will I look

up a result from three years ago once we move to a new LIS?"

In the 1960s and '70s, this question was often answered, "Print all the results from the old system, put them in binders, and store them in a large warehouse." There obviously were several disadvantages to this approach, not the least of which was "location, location, location."

By the 1980s, the answer to this question had morphed into, "Print all results onto microfiche." This was a step above the earlier approach because staff could

easily make multiple copies of results and store them in various, hopefully secure, places. A major drawback: The results could not be accessed via a computer.

Another answer, which has transcended time, is, "Keep the old system running and use it as an archive-retrieval tool." Many laboratories are forced to do this when they do not devise a strategy for mapping legacy data onto their new LIS. Using the old system as an archive obviously is contingent on the lab's ability to keep the old hardware and software running, which is less problematic today than it was in decades past. The lab must also be able to maintain access to the old system and train new staff on it.

In the 21st century, the answer to the question of how to access old lab results is more likely to be, "Make sure all results are imaged in the electronic medical record system." This makes the results immediately accessible to the clinician, if properly indexed, but relies on the EMR to provide an accurate rendition of complex laboratory reports. A pitfall is that EMRs typically don't have the capacity to store other supporting data maintained in an LIS, such as quality control and specimen-tracking data, management controls, and instrument logs.

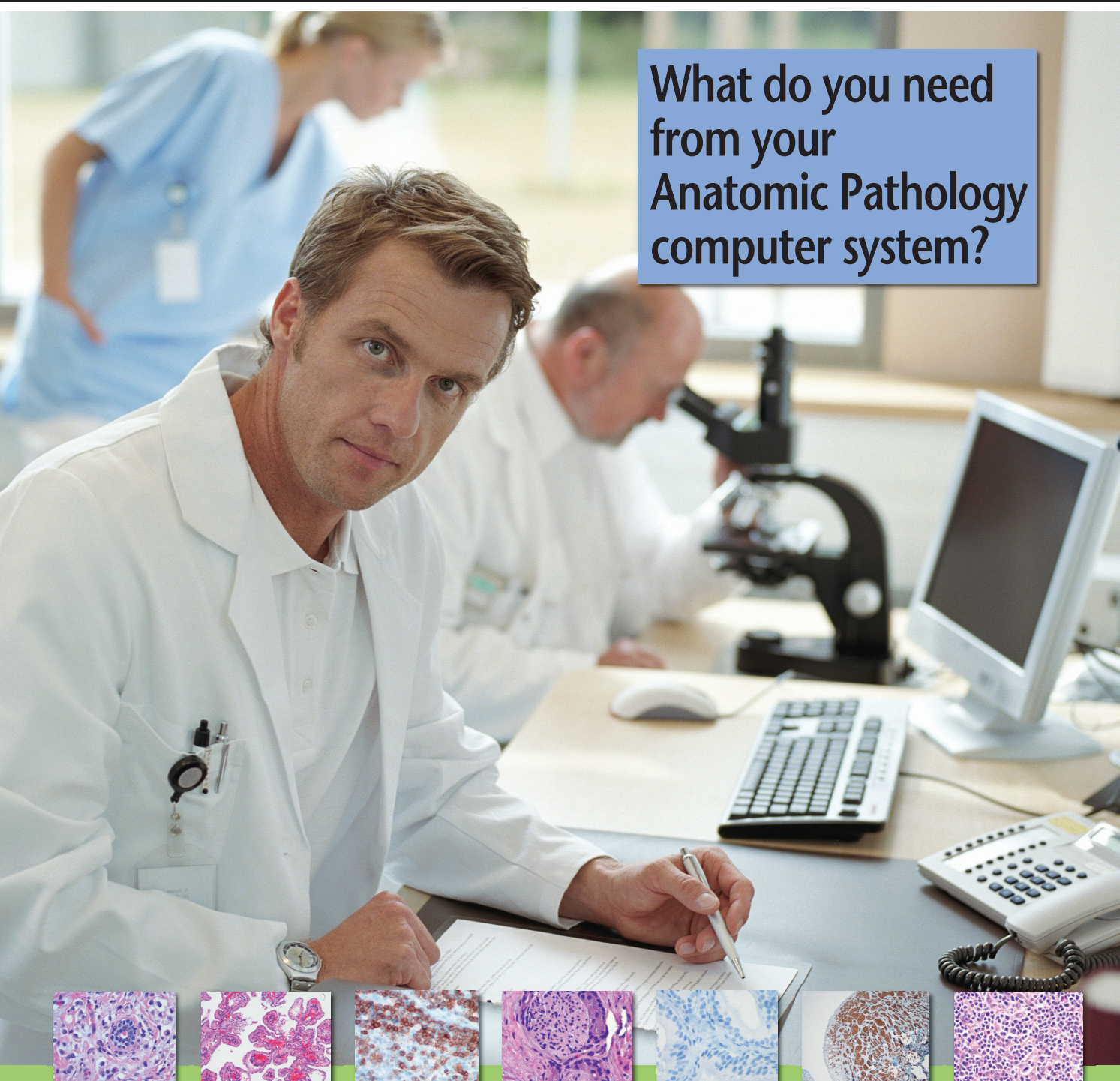
The ideal answer would appear to be, "Convert all results stored on the old LIS and load them into the new LIS." This seems like a slam-dunk—just copy the potassium of 3.5 from one database into another. In theory, this is the clear-cut solution. In practice, it's not. Here's why.

Information systems typically store far more than just a single field with a result value. They may have a separate field for comments or retain the reference range at the time of resulting. They should record the identification of the person entering the result, the date and time of the result, and other variables. One system, now being phased out, required 5,000 characters of storage to retain a single potassium result. Unfortunately, some newer systems may be even less efficient.

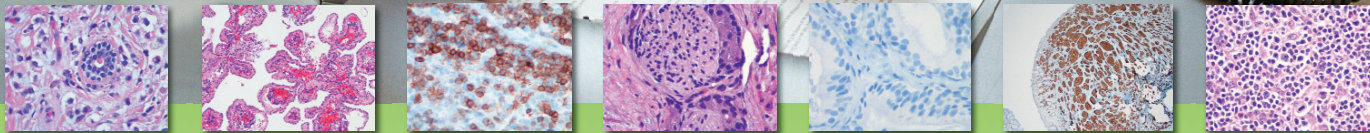
One challenge of data conversion is that the ancillary fields kept with a result differ from one system to the next. If an ancillary field, such as the reference range at the time of resulting, is absent from the old system and required in the new system, the lab's legacy-mapping scheme must explicitly deal with such data model mismatches. And not all are equipped to do so.

Also posing a challenge is the data itself. LISs vary in their ability to accept and store information. In some instances, if one tries to transfer data from the old system into the new

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New LIS

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system via a back door—that is, not going through the usual manual entry screens—then the data may not undergo the necessary edit checks. Later, when processing the data—for example, when producing cumulative patient reports—the new system may hiccup or crash when it encounters a special character, unexpected space, or other data condition that did not affect the old system.

Such data-content mismatches can be encountered even in interfaces between systems. One recent example involved a laboratory that decided to

use the ampersand character as part of select test names—for example, “Ova & Parasite Study.” While this did not pose a problem for the LIS, when the laboratory tried to send these reports to another system via an HL7 interface, the report was garbled. As it turns out, the ampersand character is a reserved delimiter within HL7.

When the parser encountered the ampersand within the test-name field, it thought the characters that followed were the next HL7 field rather than a continuation of the test-name field.

Another typical problem is that many of the ancillary fields that were automatically populated as part of the test-ordering and result-entry processes in the new system may be blank or otherwise useless for the legacy-loaded data. And the result field itself may contain surprises. Therefore, statistical and cumulative reports that attempt to include the

old ancillary data may fail or yield invalid conclusions.

A laboratory may expect, in switching from one company’s LIS to that of another firm, that it will encounter incompatibilities in data models, data edits, and ancillary fields, as well as other issues. Conversely, it may assume that it will encounter few such problems when upgrading to a new system from its current vendor. But at least one well-known vendor (company A) has proved that this is not the case.

Company A created, largely from scratch, a new LIS in the late ’90s. In the process, the design team, which had only limited experience with the earlier version of the vendor’s LIS, transferred very little design knowledge from the old platform to the new one. A prominent user site that had used the old model for two decades contracted to install the new system. A key require-

ment of the deal was that the new system be able to map 20 years of the lab’s legacy data into the new database. A few years into the transition, it became clear that it was going to take nearly a decade of computer-processing time to load the legacy data into the new database. The new system was so inefficient that even the newest generation of computer hardware could not load the old data in a reasonable time frame. Because of this, and for a myriad of other reasons, the user site cancelled the purchase and signed a contract with a different company.

While one would expect that the task of converting legacy data would fall to the vendor of the new LIS, there are exceptions. If the database on the previous system is locked, you may have to pay the vendor of the old LIS (sometimes a substantial fee) to transfer the old data into a machine-readable file that the new LIS company can access. And laboratories occasionally must hire third-party consultants to handle data mapping and conversion.

Yet the value of legacy data to patient care outweighs the problems inherent in transferring such information. A person’s medical history, particularly related to surgical pathology and cytology, blood banking, immunology, special endocrinology, as well as some routine assays, obviously can influence his or her treatment. But if physicians cannot easily retrieve past patient information from an LIS, they may choose to forgo the data.

So how do you address the challenges of legacy data when moving to a new LIS?

▲ Don’t expect to be able to use the legacy data for management and statistical reports. While result fields can be moved, management and statistical reports typically rely on well-formed ancillary fields, and the fields that are being moved may not be populated in a manner that is suitable for reports generated by the new system. In other words, the old and new systems may vary in their definition of “well formed.”

▲ Examine the data-edit rules of the old and new systems. If the previous system is more forgiving, then be sure the necessary data edits are built into the mapping rules of the data conversion engine. And have a clear definition of what happens to results or ancillary fields that fail the edit rules. Are they discarded? Is an error message provided? Is an approximation generated?

▲ Don’t assume that a company will be able to move legacy data between two different systems that it markets or supports. This may be because the company acquired one or both of the systems from a third party, or it may result from an explic-

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it decision or design oversight that renders the two systems incompatible in how they address and validate data.

▲ Ask the company with which you are considering doing business to provide you with the names of clients that have transferred legacy data from their old system to the LIS in which you are interested. Then call those laboratorians and ask them what challenges they faced and how they addressed them. If the vendor cannot or will not provide you with such contacts, then reconsider your purchasing options. □

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<i>See accompanying article on page 12</i>	
Name of laboratory information system	LabDaq
First ever/most recent LIS installation (based on September survey deadline)	1991/September 2008
Last major product release for featured LIS	March 2008
Total No. of contracts for sites operating LIS	2,208
• Hospital/independent lab contracts in U.S.	225/291
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	1,681/7
• Other contracted U.S. sites/contracts for foreign sites	0/4 (clinics)
• Contracts that went live between Sept. 2007–Sept. 2008	134
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	16 (1/2/13)
• No. of these contracts signed between Sept. 2007–Sept. 2008	16
Total No. of sites operating LIS (No. of these sites outside the U.S.)	2,476 (4—Bermuda, Malawi, Uganda, Virgin Islands)
Percentage of high-volume* sites installed/low-volume** sites installed	not tracked
Staff to develop/install & support/other*** in entire firm	16/45/28
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	12/33/25
No. of billed tests generated annually by LIS	not tracked
Range in No. of workstations in sites operating LIS	1–150+ (average, 8–9)
Central hardware or service type	Intel/AMD
How central server failure is handled	manual intervention necessary or system continues uninterrupted
Workstations or PC platform	Antek
Programming language(s)	Delphi, C++, ASP .Net
Operating system(s)	Microsoft Windows 2003, XP, Vista
Databases and tools used	Oracle
System includes full transaction logging?	yes
Languages (other than English) offered on system	—
Features (listed as a percentage of live installs or based on availability)	
• Chemistry and hematology	100%
• Bar-coded collection labels	65%
• Handheld devices for bedside-positive patient ID	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	available but not installed
• Microbiology/public health microbiology	15%/2%
• Blood bank donor and transfusion	not available
• Surgical pathology/cytology	installed/installed
• Molecular pathology/cytogenetics	not available/not available
• Flow cytometry	2%
• HIS or EMR interface: A/D/T	45%
• HIS or EMR interface: order entry/results reporting	25%/45%
• HIS or EMR interface: package results into PDF format	40%
• HIS or EMR interface: package results into CDA1 format/CDA2 format	available in 2009/available in 2009
• Ad hoc reporting/rules-based system	100%/100%
• Management and statistical reporting	100%
• Outreach and commercial laboratory	25%
• Compliance checking/billing and accounts receivable	95%/15%
• Materials management and inventory	not available
• Test partition/remote faxing and printing	20%/55%
• HIPAA-standard transaction formats	100%
• Web-based remote inquiry of reports/Web access for order entry	20%/15%
• Specimen management and tracking	100%
• Compliance and quality assurance tools	100%
• Environmental health/newborn screening	not available/installed
Complete LIS application service provider solution?	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 the Internet
Client contracts supported from data center not operated by client	198
How data center is operated	by vendor
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard	
• Microbiology data	available but not installed
• Other reportable diseases	12 sites
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	available but not installed
Hospital systems or integrated health care systems interfaced	Cerner, CPSI, Healthland, McKesson, Meditech, Siemens, Misys, GE, others
Physician office management systems interfaced	Allscripts, GE, eClinicalWorks, Greenway, IKnowMed, Medical Manager, NextGen, PyraMed, others
Automated lab transportation systems interfaced	Beckman Coulter, Roche, Siemens
LIS provides validation or testing tools?	yes (proprietary)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (Quest, CodeMap, LabCorp, others)/yes
Software provides indexed field in each test definition for LOINC code?	yes
Provide LOINC dictionary for each new installation?	no
LIS supports use of SNOMED CT?	yes
Market modules for other hospital departments? (percent of installs lab only)	no
No. of different lab instruments interfaced with LIS	450+
Source code/user group that meets regularly?	escrow/yes (meets via Internet; in person 3 to 4 times per year)
User can modify screens?	no (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	SQL
Smallest cost for LIS hardware/software/monthly maintenance	\$1.7k/\$6k/\$0.1k
Largest cost for LIS hardware/software/monthly maintenance	\$50k/\$300k/\$3k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • flexible, intuitive, and scalable LIS, which uses a secure Oracle database • rules can be created to eliminate errors and assist in decisionmaking through the entire testing process • experienced and responsive support staff; 98 percent of calls answered by support staff personnel
*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day	
**generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day	
***other=sales, marketing, administration, and other company functions	
Note: a dash in lieu of an answer means company did not answer question or question is not applicable	

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

Survey editors: Raymond D. Aller, MD, and Hal Weiner

Laboratory information systems

Part 2 of 18	Aspyra Michelle Del Guercio mdelguercio@aspyra.com 26115 Mureau Rd. Calabasas, CA 91302 818-880-6700/800-437-9000 www.aspyra.com	Cerner Corp. Brooke Spicer brooke.spicer@cerner.com 2800 Rockcreek Parkway Kansas City, MO 64117 816-201-1024 www.cerner.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	CyberLab (version 7.2)	Cerner Millennium PathNet
First ever/most recent LIS installation (based on September survey deadline)	1982/May 2008	1982/—
Last major product release for featured LIS	January 2008	2007
Total No. of contracts for sites operating LIS	152	266
• Hospital/independent lab contracts in U.S.	68/35	218/6
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	43/1	4/3
• Other contracted U.S. sites/contracts for foreign sites	0/5	0/35
• Contracts that went live between Sept. 2007–Sept. 2008	2	29
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	1 (0/1/0)	56
• No. of these contracts signed between Sept. 2007–Sept. 2008	1	37
Total No. of sites operating LIS (No. of these sites outside the U.S.)	425+ (5—Jamaica, Malaysia, Singapore)	476 (25)
Percentage of high-volume* sites installed/low-volume** sites installed	30%/70%	80%/20%
Staff to develop/install & support/other*** in entire firm	20/31/27	1,595/2,289/3,547
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	12/19/27	77/119/42
No. of billed tests generated annually by LIS	15,000–4,000,000 (average, 650,000)	500,000–20,000,000
Range in No. of workstations in sites operating LIS	3–250 (average, 50)	—
Central hardware or service type	HP, IBM	HP, Compaq, IBM RS/6000
How central server failure is handled	system continues uninterrupted	system continues uninterrupted
Workstations or PC platform	Windows-based PC workstation, thin client	Intel Pentium PC
Programming language(s)	C, C++, Cobol, HTML, Java	Visual C++, Visual Basic, Java
Operating system(s)	Windows, Linux, AIX	Open VMS, AIX, Windows
Databases and tools used	Microsoft SQL, Oracle	Oracle
System includes full transaction logging?	—	yes
Languages (other than English) offered on system	—	French, German, Spanish
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	installed
• Bar-coded collection labels	80%	installed
• Handheld devices for bedside-positive patient ID	5%	installed
• NCCLS POCT-1A standard interface for POCT devices	15%	installed
• Microbiology/public health microbiology	100%/2%	installed/installed
• Blood bank donor and transfusion	15% via interface to blood bank system	installed
• Surgical pathology/cytology	10%/90%	installed/installed
• Molecular pathology/cytogenetics	not available/not available	installed/installed
• Flow cytometry	80%	installed
• HIS or EMR interface: A/D/T	75%	installed
• HIS or EMR interface: order entry/results reporting	60%/70%	installed/installed
• HIS or EMR interface: package results into PDF format	5%	—
• HIS or EMR interface: package results into CDA1 format/CDA2 format	available but not installed/available but not installed	—
• Ad hoc reporting/rules-based system	100%/100%	installed/installed
• Management and statistical reporting	100%	installed
• Outreach and commercial laboratory	100%	installed
• Compliance checking/billing and accounts receivable	100%/25% via interface to billing system	installed/installed
• Materials management and inventory	not available	—
• Test partition/remote faxing and printing	100%/100%	installed/installed
• HIPAA-standard transaction formats	100%	installed
• Web-based remote inquiry of reports/Web access for order entry	50%/40%	installed/installed
• Specimen management and tracking	not available	installed
• Compliance and quality assurance tools	100%	installed
• Environmental health/newborn screening	2%/10%	—
Complete LIS application service provider solution?	no	no
ASP for physician order entry and results reporting?	no	yes
Method of charging for ASP service	—	transaction based
Client software required	—	browser based
ASP information conduit	—	operates over the Internet
Client contracts supported from data center not operated by client	—	70
How data center is operated	—	by vendor
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	available but not installed	—
• Other reportable diseases	3 sites	—
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	1 site	—
Hospital systems or integrated health care systems interfaced	McKesson, Siemens, QuadraMed, CPSI, Meditech, Cerner, Misys, others	McKesson, Siemens, GE, Eclipsys, Epic, Meditech, Misys, others
Physician office management systems interfaced	Allscripts, NextGen, VitalWorks, Telcor, Medic, Atlas, others	not tracked
Automated lab transportation systems interfaced	planned to Beckman Coulter, Sysmex, Ortho, Olympus America, Roche, Siemens	Beckman Coulter, Sysmex, Dade Behring, Ortho, Olympus America, Roche, Siemens, Abbott
LIS provides validation or testing tools?	yes (test environment, testing protocol)	yes
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (via interface)/yes	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? (percent of installs lab only)	yes (65%)	yes
No. of different lab instruments interfaced with LIS	500+	—
Source code/user group that meets regularly?	—/yes (meets in person every 1 to 2 years)	escrow/yes (meets via Internet once a month; in person annually)
User can modify screens?	yes (offer user-defined report writer, custom programming)	no (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	SQL	SQL, Discern Explorer
Smallest cost for LIS hardware/software/monthly maintenance	—	—
Largest cost for LIS hardware/software/monthly maintenance	—	—
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • platform and database independent • user-friendly and user-defined rules-based decision support tools • company experience in clinical laboratory industry exceeds 30 years 	<ul style="list-style-type: none"> • single database architecture representing patient-centric view of all clinical events with robust rules engine to optimize user-defined automation and workflow (SOA architecture is not required) • more than 25 years of experience in continuous innovation in the LIS market • user friendly; extensive flexibility; highly scalable
<small>*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day **generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day ***other=sales, marketing, administration, and other company functions Note: a dash in lieu of an answer means company did not answer question or question is not applicable</small>		

Laboratory information systems

Part 3 of 18	Clinical Information Systems A. Woolley cissupport@aol.com 18805 Willamette Drive West Linn, OR 97068 503-699-9745 www.cislab.com	Clinical Software Solutions Bill Eash sales@clin1.com 20940 E. Mewes Rd. Queen Creek, AZ 85242 800-570-0474 www.clin1.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	CIS Lab	CLIN1 Laboratory
First ever/most recent LIS installation (based on September survey deadline)	1981/August 2008	1988/August 2008
Last major product release for featured LIS	August 2008	August 2008
Total No. of contracts for sites operating LIS	59	200+
• Hospital/independent lab contracts in U.S.	7/49	50+/140+
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	—	10+/-
• Other contracted U.S. sites/contracts for foreign sites	2 (veterinary)/1 (government hospital lab)	3/-
• Contracts that went live between Sept. 2007–Sept. 2008	3	6
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	5 (1/4/0)	5 (5/0/0)
• No. of these contracts signed between Sept. 2007–Sept. 2008	5	5
Total No. of sites operating LIS (No. of these sites outside the U.S.)	— (1)	—
Percentage of high-volume* sites installed/low-volume** sites installed	99%/1%	10%/90%
Staff to develop/install & support/other*** in entire firm	8/8/1	3/5/3
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	—	3/5/3
No. of billed tests generated annually by LIS	100,000–500,000+ (average, 500,000+)	—
Range in No. of workstations in sites operating LIS	2–140+	1–50
Central hardware or service type	decided by lab	Dell
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted (lab's choice)	—
Workstations or PC platform	decided by lab	Windows
Programming language(s)	Cobol, C++, Delphi, Visual Basic .Net	4GL/PB
Operating system(s)	Windows, SCO Unix	Windows
Databases and tools used	SQL	SQL
System includes full transaction logging?	no	yes
Languages (other than English) offered on system	—	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	95%
• Bar-coded collection labels	100%	55%
• Handheld devices for bedside-positive patient ID	0	30%
• NCCLS POCT-1A standard interface for POCT devices	0	—
• Microbiology/public health microbiology	80%/80%	20%/-
• Blood bank donor and transfusion	0	—
• Surgical pathology/cytology	70%/70%	—
• Molecular pathology/cytogenetics	0/0	—
• Flow cytometry	10%	—
• HIS or EMR interface: A/D/T	0	75%
• HIS or EMR interface: order entry/results reporting	100%/100%	75%/100%
• HIS or EMR interface: package results into PDF format	1%	45%
• HIS or EMR interface: package results into CDA1 format/CDA2 format	75%/0	—
• Ad hoc reporting/rules-based system	0/100%	90%/90%
• Management and statistical reporting	100%	90%
• Outreach and commercial laboratory	50%	30%
• Compliance checking/billing and accounts receivable	80%/85%	75%/-
• Materials management and inventory	85%	15%
• Test partition/remote faxing and printing	20%/100%	100%/75%
• HIPAA-standard transaction formats	100%	100%
• Web-based remote inquiry of reports/Web access for order entry	95%/50%	30%/30%
• Specimen management and tracking	10%	90%
• Compliance and quality assurance tools	25%	100%
• Environmental health/newborn screening	0/0	—
Complete LIS application service provider solution?	yes	yes
ASP for physician order entry and results reporting?	yes	yes
Method of charging for ASP service	fixed fee, transaction based (offer both)	fixed fee
Client software required	browser based, requires that software be installed on a client PC (offer both)	browser based
ASP information conduit	operates over the Internet, requires use of a VPN or other dedicated connection (offer both)	operates over the Internet, requires use of a VPN or other dedicated connection
Client contracts supported from data center not operated by client	0	—
How data center is operated	—	by vendor
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	available but not installed	3 sites
• Other reportable diseases	1 site	available but not installed
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	available but not installed	available but not installed
Hospital systems or integrated health care systems interfaced	McKesson, GE, Healthland, Synergy, Sun Clinical	Siemens, Healthland, APS, Misys, others
Physician office management systems interfaced	Medical Manager, MediNotes, A4 HealthWire, WebMD, others	Medical Manager, eClinicalWorks, Logician, others
Automated lab transportation systems interfaced	planned to Beckman Coulter	none
LIS provides validation or testing tools?	—	yes (proprietary)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	no/optional	no/yes
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	yes
Market modules for other hospital departments? (percent of installs lab only)	no	yes (25%)
No. of different lab instruments interfaced with LIS	300+	300+
Source code/user group that meets regularly?	escrow/no	no/yes (meets in person annually)
User can modify screens?	no (offer custom programming)	no (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	proprietary	any ODBC-compliant reporting tool, including SQL, MS Access, Crystal Reports
Smallest cost for LIS hardware/software/monthly maintenance	—/\$7.5k/\$0.3k	—/\$10k/percent of total
Largest cost for LIS hardware/software/monthly maintenance	—/\$150k/\$1.5k	—/\$100k/percent of total
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • custom programming offered • best quality for price • user friendly 	<ul style="list-style-type: none"> • versatile for any size facility • fully integrated with other hospital departments and systems • Web access and customization available
<small>*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day **generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day ***other=sales, marketing, administration, and other company functions Note: a dash in lieu of an answer means company did not answer question or question is not applicable</small>		

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Laboratory information systems

Part 4 of 18	Clinlab Allen Wilson sales@clinlabinc.com 2411 E. Graves Ave., Suite 1 Orange City, FL 32763 800-487-5227 www.clinlabinc.com	Comp Pro Med Ken Beerman kbeerman@comppromed.com 3418 Mendocino Ave. Santa Rosa, CA 95403 800-276-4522 www.comppromed.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	ClinLab LIS	Polytech
First ever/most recent LIS installation (based on September survey deadline)	1987/August 2008	1981/August 2008
Last major product release for featured LIS	August 2008	February 2008
Total No. of contracts for sites operating LIS	52	83
• Hospital/independent lab contracts in U.S.	5/15	26/5
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	19/1	36/0
• Other contracted U.S. sites/contracts for foreign sites	11/1 (hospital)	1 (veterinary)/15 (national, regional, hospital labs)
• Contracts that went live between Sept. 2007–Sept. 2008	3	8
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	1 (0/1/0)	3 (0/3/0)
• No. of these contracts signed between Sept. 2007–Sept. 2008	—	—
Total No. of sites operating LIS (No. of these sites outside the U.S.)	51 (1—Saudi Arabia)	109 (19—Eritria, Ethiopia, Philippines, Bhutan, Jamaica)
Percentage of high-volume* sites installed/low-volume** sites installed	10%/90%	13%/87%
Staff to develop/install & support/other*** in entire firm	4/4/2	3/3/5
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	—	—
No. of billed tests generated annually by LIS	10,000–260,000	30,000–110,000 (average, 275,000)
Range in No. of workstations in sites operating LIS	2–100	1–38 (average, 8)
Central hardware or service type	Dell	any (user supplied)
How central server failure is handled	manual intervention necessary to restore operation	system continues uninterrupted
Workstations or PC platform	PC platform	—
Programming language(s)	C++ .Net, Delphi, xHarbour	C++
Operating system(s)	Windows 2000, XP, Vista, others	Windows Vista, XP, NT, 2000, 98
Databases and tools used	Sybase Advantage, Microsoft SQL	Pervasive
System includes full transaction logging?	no	yes
Languages (other than English) offered on system	—	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	100%
• Bar-coded collection labels	100%	100%
• Handheld devices for bedside-positive patient ID	not available	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	not available	available but not installed
• Microbiology/public health microbiology	90%/10%	13%/available but not installed
• Blood bank donor and transfusion	not available	not available
• Surgical pathology/cytology	available but not installed/available but not installed	not available/not available
• Molecular pathology/cytogenetics	not available/not available	not available/not available
• Flow cytometry	installed	not available
• HIS or EMR interface: A/D/T	80%	63%
• HIS or EMR interface: order entry/results reporting	100%/100%	38%/47%
• HIS or EMR interface: package results into PDF format	30%	not available
• HIS or EMR interface: package results into CDA1 format/CDA2 format	30%/not available	not available/not available
• Ad hoc reporting/rules-based system	100%/100%	100%/100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	55%	22%
• Compliance checking/billing and accounts receivable	100%/not available	100%/67%
• Materials management and inventory	not available	not available
• Test partition/remote faxing and printing	installed/50%	100%/95%
• HIPAA-standard transaction formats	100%	not available
• Web-based remote inquiry of reports/Web access for order entry	50%/50%	installed/27%
• Specimen management and tracking	10%	not available
• Compliance and quality assurance tools	installed	100%
• Environmental health/newborn screening	installed/not available	not available/not available
Complete LIS application service provider solution?	yes	no
ASP for physician order entry and results reporting?	yes	yes
Method of charging for ASP service	fixed fee, transaction based	fixed fee
Client software required	browser based	requires that software be installed on a client PC
ASP information conduit	operates over the Internet	operates over the Internet
Client contracts supported from data center not operated by client	0	0
How data center is operated	by lab	—
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	available but not installed	not available
• Other reportable diseases	not available	not available
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	not available	not available
Hospital systems or integrated health care systems interfaced	Meditech, SAAD HIS, custom	GE, Siemens, InterMed, Healthland, eClinicalWorks, others
Physician office management systems interfaced	Medical Manager, Touchworks, CareEvolve, Softaid, GE, any HL7	Misys, Medlogix, Medical Manager, Cerner, VitalWorks, GE, eClinicalWorks
Automated lab transportation systems interfaced	Beckman Coulter, Sysmex, Dade Behring, Roche, Siemens, Abbott	none
LIS provides validation or testing tools?	no	no
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	no/yes	yes (LabCorp, Quest, OML)/no
Software provides indexed field in each test definition for LOINC code?	yes	yes
Provide LOINC dictionary for each new installation?	no	yes
LIS supports use of SNOMED CT?	yes	no
Market modules for other hospital departments? (percent of installs lab only)	no	no
No. of different lab instruments interfaced with LIS	300+	230+
Source code/user group that meets regularly?	escrow/no	escrow/no
User can modify screens?	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	SQL	SQL, Pervasive, ODBC, built-in query capability
Smallest cost for LIS hardware/software/monthly maintenance	\$2k/\$20k/\$0.167k	0/\$15k/\$0.15k
Largest cost for LIS hardware/software/monthly maintenance	\$500k/—/—	0/\$145k/\$1.29k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • reputation among client base for exceptional service • user friendly and versatile for all types of laboratories • flawless interfacing between various systems 	<ul style="list-style-type: none"> • extensive rules-based capabilities allow customization of system functionality • standard HL-7-based interfacing capabilities to other systems • requires little to no IT department support; low network bandwidth requirements
<small>*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day **generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day ***other=sales, marketing, administration, and other company functions Note: a dash in lieu of an answer means company did not answer question or question is not applicable</small>		

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Laboratory information systems

Part 5 of 18	Computer Service & Support James O'Neill Jr. jimjr@csslis.com 2106 New Rd., E6 Linwood, NJ 08221 609-653-6444 www.csslis.com	CPSI (Computer Programs & Systems) Sales Department sales@cpsinet.com 6600 Wall St. Mobile, AL 36695 800-711-2774 www.cpsinet.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	CLS2000	CPSI System
First ever/most recent LIS installation (based on September survey deadline)	1980/July 2008	1986/September 2008
Last major product release for featured LIS	January 2008	October 2007
Total No. of contracts for sites operating LIS	90	385
• Hospital/independent lab contracts in U.S.	0/74	384/1
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	12/2	0/0
• Other contracted U.S. sites/contracts for foreign sites	1/1	0/0
• Contracts that went live between Sept. 2007–Sept. 2008	9	20
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	6 (0/6/0)	7
• No. of these contracts signed between Sept. 2007–Sept. 2008	6	—
Total No. of sites operating LIS (No. of these sites outside the U.S.)	90 (1—Canada)	378 (0)
Percentage of high-volume* sites installed/low-volume** sites installed	40%/60%	1%/99%
Staff to develop/install & support/other*** in entire firm	6/8/5	67/717/94
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	6/8/5	12/115/0
No. of billed tests generated annually by LIS	20,000–3,000,000 (average, 750,000)	148,000–665,000 (average, 310,000)
Range in No. of workstations in sites operating LIS	2–50 (average, 15)	6–500 (average, 100)
Central hardware or service type	IBM RISC/6000	IBM X3650
How central server failure is handled	system continues uninterrupted	system continues uninterrupted
Workstations or PC platform	IBM, Dell	Windows 2000 or above
Programming language(s)	C++	AcuCobol
Operating system(s)	AIX 6.1	Red Hat Linux
Databases and tools used	SQL server, MySQL, Lab Base	Acucorp
System includes full transaction logging?	yes	no
Languages (other than English) offered on system	—	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	100%
• Bar-coded collection labels	100%	100%
• Handheld devices for bedside-positive patient ID	—	16%
• NCCLS POCT-1A standard interface for POCT devices	—	1%
• Microbiology/public health microbiology	85%/—	100%/0
• Blood bank donor and transfusion	—	0
• Surgical pathology/cytology	20%/30%	1%/1%
• Molecular pathology/cytogenetics	—	0/0
• Flow cytometry	—	0
• HIS or EMR interface: A/D/T	20%	100%
• HIS or EMR interface: order entry/results reporting	100%/100%	100%/100%
• HIS or EMR interface: package results into PDF format	60%	100%
• HIS or EMR interface: package results into CDA1 format/CDA2 format	40%/—	100%/100%
• Ad hoc reporting/rules-based system	75%/100%	100%/100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	100%	100%
• Compliance checking/billing and accounts receivable	100%/80%	100%/100%
• Materials management and inventory	75%	100%
• Test partition/remote faxing and printing	25%/100%	100%/100%
• HIPAA-standard transaction formats	100%	100%
• Web-based remote inquiry of reports/Web access for order entry	60%/10%	40%/10%
• Specimen management and tracking	100%	—
• Compliance and quality assurance tools	—	100%
• Environmental health/newborn screening	—	0/0
Complete LIS application service provider solution?	no	yes
ASP for physician order entry and results reporting?	yes	yes
Method of charging for ASP service	fixed fee	fixed fee
Client software required	browser based	browser based, requires that software be installed on a client PC
ASP information conduit	operates over the Internet	requires use of a VPN or other dedicated connection
Client contracts supported from data center not operated by client	20	26
How data center is operated	by vendor	by vendor
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	—	not available
• Other reportable diseases	—	not available
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	—	not available
Hospital systems or integrated health care systems interfaced	Aspyra, GE, McKesson, Medic, Misys, SCC Soft Computer, others	—
Physician office management systems interfaced	Aspyra, GE, McKesson, Medic, Misys, SCC Soft Computer, others	Medical Manager, MedicaLogic, Logician
Automated lab transportation systems interfaced	Beckman Coulter, Sysmex, Dade Behring, Olympus America, Roche, Siemens, Abbott	planned to Beckman Coulter, Sysmex, Dade Behring, A&T Corp., Roche
LIS provides validation or testing tools?	yes (Ingenix)	no
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (Ingenix, CSS)/no	yes (Micromedex, 3M NEBO, Caremedics)/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?	no	yes
Market modules for other hospital departments? (percent of installs lab only)	no	yes (2%)
No. of different lab instruments interfaced with LIS	350	357 (Dawning Technologies for interface)
Source code/user group that meets regularly?	yes/no	escrow/yes (8 regional meetings and 1 national meeting per year)
User can modify screens?	yes (offer custom programming)	yes (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	Access, Oracle, SQL	CPSI ad hoc reports, optional ODBC database
Smallest cost for LIS hardware/software/monthly maintenance	\$7.5k/\$15k/\$0.3k	\$3.252k/\$49.5k/\$0.548k
Largest cost for LIS hardware/software/monthly maintenance	\$50k/\$200k/\$5k	\$32.52k/\$83.5k/\$1.044k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • Web browser-based lab orders with electronic test compendium and secure results retrieval • fully integrated, HMS Medicare-certified Part B billing with electronic claims (ANSI version 4010 ready) and EMC transmission to over 2,100 commercial insurance carriers • over 27 years in the LIS industry 	<ul style="list-style-type: none"> • fully integrated HIS/LIS • build libraries and data dictionaries as a standard part of installation and conversion • on-site training and support for all end users (not train the trainer)
<p>*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day **generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day ***other=sales, marketing, administration, and other company functions Note: a dash in lieu of an answer means company did not answer question or question is not applicable</p>		

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Laboratory information systems

Part 6 of 18	Custom Software Systems DeWitt Rhaly dewitt@css-corporate.com 7012 Westbelt Drive Nashville, TN 37209 615-350-8111 www.css-corporate.com	Epic Systems Corp. Conan Noronha conan@epicsys.com 1979 Milky Way Verona, WI 53593 608-271-9000 www.epicsystems.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	StarLab	EpicLab Clinical Laboratory Information System
First ever/most recent LIS installation (based on September survey deadline)	1984/April 2005	2006/September 2008
Last major product release for featured LIS	—	April 2008
Total No. of contracts for sites operating LIS	19	3
• Hospital/independent lab contracts in U.S.	17/1	2/0
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	1/0	1/0
• Other contracted U.S. sites/contracts for foreign sites	0/0	0/0
• Contracts that went live between Sept. 2007–Sept. 2008	—	2
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	1 (1/0/0)	45 (45/0/0)
• No. of these contracts signed between Sept. 2007–Sept. 2008	—	11
Total No. of sites operating LIS (No. of these sites outside the U.S.)	19	27 (0)
Percentage of high-volume* sites installed/low-volume** sites installed	—	4%/96%
Staff to develop/install & support/other*** in entire firm	8/9/12	1,439/1,714/86
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	4/6/3	24/15/0
No. of billed tests generated annually by LIS	—	55,000–730,000
Range in No. of workstations in sites operating LIS	2–80	1–21
Central hardware or service type	IBM xSeries	HP 9000, HP Integrity, Sun Sparc, IBM p5 Series
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted	system continues uninterrupted
Workstations or PC platform	CSS network-ready workstation	Windows XP, 2000 (SP3), XP Professional SP2, Vista
Programming language(s)	Cobol	.Net, Visual Basic 6, InterSystems Caché ObjectScript, others
Operating system(s)	Linux	HP-UX, Solaris, AIX, others
Databases and tools used	T-ISAM	Chronicles Extended Relational Database Management System
System includes full transaction logging?	yes	yes
Languages (other than English) offered on system	—	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	100%
• Bar-coded collection labels	80%	100%
• Handheld devices for bedside-positive patient ID	—	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	—	available but not installed
• Microbiology/public health microbiology	10%/—	100%/available in 2009
• Blood bank donor and transfusion	not available	not available
• Surgical pathology/cytology	installed/installed	available in 2009/available in 2009
• Molecular pathology/cytogenetics	—	not available/not available
• Flow cytometry	—	not available
• HIS or EMR interface: A/D/T	80%	66%
• HIS or EMR interface: order entry/results reporting	80%/80%	100%/100%
• HIS or EMR interface: package results into PDF format	installed	installed
• HIS or EMR interface: package results into CDA1 format/CDA2 format	20%/—	installed/installed
• Ad hoc reporting/rules-based system	45%/available but not installed	100%/100%
• Management and statistical reporting	10%	100%
• Outreach and commercial laboratory	50%	available but not installed
• Compliance checking/billing and accounts receivable	100%/10%	installed/available but not installed
• Materials management and inventory	available but not installed	not available
• Test partition/remote faxing and printing	available but not installed/75%	100%/100%
• HIPAA-standard transaction formats	10%	100%
• Web-based remote inquiry of reports/Web access for order entry	available but not installed/available but not installed	100%/100%
• Specimen management and tracking	—	100%
• Compliance and quality assurance tools	—	100%
• Environmental health/newborn screening	—	not available/not available
Complete LIS application service provider solution?	no	no
ASP for physician order entry and results reporting?	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 via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	—	not available
• Other reportable diseases	—	not available
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	—	not available
Hospital systems or integrated health care systems interfaced	Healthland, Healthcare Management Systems, Siemens, Integrated Healthcare Solutions	EpicCare inpatient clinical system, EpicCare ambulatory EMR, Siemens
Physician office management systems interfaced	—	Epic products
Automated lab transportation systems interfaced	planned	planned
LIS provides validation or testing tools?	no	yes (Data Integrity)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	no/no	no/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?	no	yes
Market modules for other hospital departments? (percent of installs lab only)	yes (20%)	yes (0)
No. of different lab instruments interfaced with LIS	42 (Dawning Technologies for interface)	15 (Data Innovations for interface)
Source code/user group that meets regularly?	escrow/no	yes/yes (meets in person annually)
User can modify screens?	no (offer custom programming)	yes (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	Microsoft Access, other PC-based tools	Reporting Workbench, SQL Report Writer, ODBC Open Access
Smallest cost for LIS hardware/software/monthly maintenance	\$25k/\$35k/\$0.6k	—
Largest cost for LIS hardware/software/monthly maintenance	\$250k/\$350k/\$6k	—
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> standardized screens and functions make system easy to use total system integration eliminates duplication of work effort developed from the clinical perspective with an emphasis on results reporting to improve efficiency 	<ul style="list-style-type: none"> shares the same data repository as other Epic applications and was developed on the same architecture offers a mobile module designed for phlebotomists, as well as reference laboratory testing and billing services customer base can contribute to the design and direction of the application
*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day		
**generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day		
***other=sales, marketing, administration, and other company functions		
<i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i>		

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Laboratory information systems

Part 7 of 18	eTeleNext Joseph Nollar sales@etelenext.com 28570 Marguerite Parkway, Suite 222 Mission Viejo, CA 92692 949-365-0952 www.etelenext.com	Fletcher-Flora Healthcare Systems Terry Watson terryw@fletcher-flora.com 1580 Orangethorpe Way Anaheim, CA 92801 800-777-1471 www.fletcher-flora.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	eTeleNext LIS	FFlex eSuite LIS
First ever/most recent LIS installation (based on September survey deadline)	2004/July 2008	1972/2008
Last major product release for featured LIS	September 2007	September 2008
Total No. of contracts for sites operating LIS	12	56
• Hospital/independent lab contracts in U.S.	0/12	8/4
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	0/0	41/0
• Other contracted U.S. sites/contracts for foreign sites	0/0	2/1 (clinic in Bahamas)
• Contracts that went live between Sept. 2007–Sept. 2008	3	50
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	2 (0/2/0)	6 (0/1/5)
• No. of these contracts signed between Sept. 2007–Sept. 2008	2	6
Total No. of sites operating LIS (No. of these sites outside the U.S.)	12 (0)	150+ (0)
Percentage of high-volume* sites installed/low-volume** sites installed	30%/70%	10%/90%
Staff to develop/install & support/other*** in entire firm	9/3/3	11.5/14.5/19
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	9/3/3	—
No. of billed tests generated annually by LIS	13,486–110,145 (average, 61,816)	10,000–5,000,000
Range in No. of workstations in sites operating LIS	40–175 (average, 107.5)	5–75
Central hardware or service type	IBM, Dell, others	Dell
How central server failure is handled	system continues uninterrupted	manual intervention necessary to restore operation
Workstations or PC platform	IBM, Dell, others	Windows XP, Pro, Vista
Programming language(s)	C++ .Net	Java
Operating system(s)	Windows 2003 server	Linux, Windows
Databases and tools used	SQL	Microsoft SQL server, Microsoft SQL Express, MySQL, Unify, Oracle
System includes full transaction logging?	yes	yes
Languages (other than English) offered on system	—	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	100%
• Bar-coded collection labels	100%	100%
• Handheld devices for bedside-positive patient ID	not available	not available
• NCCLS POCT-1A standard interface for POCT devices	not available	not available
• Microbiology/public health microbiology	30%/10%	10%/not available
• Blood bank donor and transfusion	10%	not available
• Surgical pathology/cytology	95%/85%	not available/not available
• Molecular pathology/cytogenetics	95%/95%	not available/available but not installed
• Flow cytometry	90%	not available
• HIS or EMR interface: A/D/T	available but not installed	30%
• HIS or EMR interface: order entry/results reporting	60%/75%	25%/50%
• HIS or EMR interface: package results into PDF format	100%	100%
• HIS or EMR interface: package results into CDA1 format/CDA2 format	15%/available but not installed	not available/not available
• Ad hoc reporting/rules-based system	10%/100%	10%/100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	55%	75%
• Compliance checking/billing and accounts receivable	100%/20%	20%/10%
• Materials management and inventory	not available	not available
• Test partition/remote faxing and printing	75%/100%	75%/95%
• HIPAA-standard transaction formats	100%	100%
• Web-based remote inquiry of reports/Web access for order entry	100%/ 50%	85%/100%
• Specimen management and tracking	100%	50%
• Compliance and quality assurance tools	100%	100%
• Environmental health/newborn screening	not available/not available	not available/not available
Complete LIS application service provider solution?	yes	no
ASP for physician order entry and results reporting?	yes	yes
Method of charging for ASP service	fixed fee	fixed fee
Client software required	browser based	browser based, requires that software be installed on a client PC
ASP information conduit	operates over the Internet	operates over the Internet
Client contracts supported from data center not operated by client	2	0
How data center is operated	by a third party	—
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	available but not installed	not available
• Other reportable diseases	available but not installed	not available
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	2 sites	not available
Hospital systems or integrated health care systems interfaced	Cortex, GE, Misys, Meditech, Cerner	McKesson, Cerner, Misys, GE, Epic, iMedica, LabCorp, others
Physician office management systems interfaced	Medical Manager, Dr. Chart	eClinicalWorks, Medical Manager, NextGen, others
Automated lab transportation systems interfaced	Beckman Coulter, Sysmex, Olympus America, Roche, Siemens, ACIS, Ventana, Aperio, Trestle, FCS Express	Roche
LIS provides validation or testing tools?	yes (proprietary)	yes (internally developed)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	no/yes	yes (Yost Engineering, CodeMap)/no
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? (percent of installs lab only)	no	no
No. of different lab instruments interfaced with LIS	24 (Dawning and Data Innovations for interface)	500
Source code/user group that meets regularly?	escrow/yes (meets via Internet biannually; in person biannually)	escrow/no
User can modify screens?	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	SQL, ODBC, XML, HL7	SQL
Smallest cost for LIS hardware/software/monthly maintenance	0/\$50k/\$0.5k	\$1.2k/\$6.5k/\$0.109k
Largest cost for LIS hardware/software/monthly maintenance	0/\$299k/\$2k	—/\$200k/\$1.533k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • advanced Web-based technology • customized, user-defined reporting solution • proven outreach solution 	<ul style="list-style-type: none"> • many optional Web-based modules to choose from; integrates multiple sites, systems, and devices seamlessly, securely, and in real-time • 30 years in LIS industry with more than 1,500 LIS customers and more than 60 host system vendor partners • proven Web-based technology that can be scaled from small POLs to the largest independent labs
<p>*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day **generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day ***other=sales, marketing, administration, and other company functions Note: a dash in lieu of an answer means company did not answer question or question is not applicable</p>		

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Laboratory information systems

Part 8 of 18	Fletcher-Flora Healthcare Systems Terry Watson terryw@fletcher-flora.com 1580 Orangethorpe Way Anaheim, CA 92801 800-777-1471 www.fletcher-flora.com	GE Healthcare Janet Landsberg janet.landsberg@med.ge.com 3100 Steeles Ave. E, Suite 900 Markham, Ontario L3R 8T3 Canada 905-413-9032 www.gehealthcare.com/user/hit/products/departmentals/lab.html
<i>See accompanying article on page 12</i>		
Name of laboratory information system	LabPak LIS	Centricity Laboratory
First ever/most recent LIS installation (based on September survey deadline)	1972/May 2008	1990/2008
Last major product release for featured LIS	spring 2008	2008
Total No. of contracts for sites operating LIS	1,460	41
• Hospital/independent lab contracts in U.S.	230/36	14/3
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	1,124/0	1/0
• Other contracted U.S. sites/contracts for foreign sites	40/30 (hospitals, physician office labs)	0/23
• Contracts that went live between Sept. 2007–Sept. 2008	10	1
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	2 (0/0/2)	1 (1/0/0)
• No. of these contracts signed between Sept. 2007–Sept. 2008	2	1
Total No. of sites operating LIS (No. of these sites outside the U.S.)	1,500+ (30—Canada, Bahamas)	220 (sites in Australia, New Zealand, U.K., Canada, India, Hong Kong, Singapore, South Africa, Malaysia, Qatar)
Percentage of high-volume* sites installed/low-volume** sites installed	0/100%	75%/25%
Staff to develop/install & support/other*** in entire firm	11.5/14.5/19	45,000 total
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	—	32/46/6
No. of billed tests generated annually by LIS	2,000–3,000,000	not tracked
Range in No. of workstations in sites operating LIS	5–40	20–500+ (average, 200)
Central hardware or service type	Dell	IBM RS/6000, Sun Solaris
How central server failure is handled	manual intervention necessary to restore operation	manual intervention necessary or system continues uninterrupted
Workstations or PC platform	Windows XP, Pro	Windows 2000, XP platform; hardware platform variable
Programming language(s)	C++, Java	C, C++, 4GL
Operating system(s)	Windows	Unix
Databases and tools used	Pervasive	Unify Dataserver
System includes full transaction logging?	no	yes
Languages (other than English) offered on system	—	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	95%
• Bar-coded collection labels	60%	100%
• Handheld devices for bedside-positive patient ID	not available	installed
• NCCLS POCT-1A standard interface for POCT devices	not available	installed
• Microbiology/public health microbiology	30%/not available	80%/installed
• Blood bank donor and transfusion	—	10%
• Surgical pathology/cytology	not available/installed	40%/40%
• Molecular pathology/cytogenetics	not available/available but not installed	installed/installed
• Flow cytometry	not available	installed
• HIS or EMR interface: A/D/T	50%	installed
• HIS or EMR interface: order entry/results reporting	30%/75%	installed/installed
• HIS or EMR interface: package results into PDF format	100%	installed
• HIS or EMR interface: package results into CDA1 format/CDA2 format	not available/not available	not available/not available
• Ad hoc reporting/rules-based system	100%/100%	100%/100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	10%	installed
• Compliance checking/billing and accounts receivable	100%/50%	installed/installed
• Materials management and inventory	0	not available
• Test partition/remote faxing and printing	20%/100%	100%/installed
• HIPAA-standard transaction formats	0	100%
• Web-based remote inquiry of reports/Web access for order entry	20%/20%	installed/not available
• Specimen management and tracking	0	100%
• Compliance and quality assurance tools	100%	installed
• Environmental health/newborn screening	not available/not available	installed/not available
Complete LIS application service provider solution?	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, requires that software be installed on a client PC	—
ASP information conduit	operates over the Internet	—
Client contracts supported from data center not operated by client	0	—
How data center is operated	—	—
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	not available	installed (HL7 2.3, 2.4, 2.5 in operation) [†]
• Other reportable diseases	not available	installed (HL7 2.3, 2.4, 2.5 in operation) [†]
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	not available	installed (HL7 2.3, 2.4, 2.5 in operation) [†]
Hospital systems or integrated health care systems interfaced	GE, CPSI, Healthland, QSI, Experior, iMedica, others	Affinity, Epic, McKesson, GE, MediSolution, Meditech, Siemens, others
Physician office management systems interfaced	eClinicalWorks, Medical Manager, NextGen, GE, Millbrook, Emdeon, Pyramed, others	Allscripts, GE, MedicaLogic, Dr. Chart, Labtest.com, Sysmex, LabWorks, Data Passport, eClinics
Automated lab transportation systems interfaced	no	Dade Behring, Ortho, Roche, Abbott, Labtronics, Bayer
LIS provides validation or testing tools?	no	no
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	no/no	yes (from any vendor that can provide data in GE-specified format)/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	no
Market modules for other hospital departments? (percent of installs lab only)	no	yes (80%)
No. of different lab instruments interfaced with LIS	500+	265+ (Data Innovations and GE for interface)
Source code/user group that meets regularly?	no/no	escrow/yes (meets in person annually in North America, U.K., Australia)
User can modify screens?	yes (offer user-defined report writer, custom programming)	yes (offer custom programming)
Query languages to retrieve information from LIS database	—	SQL, ODBC-compliant query tools and languages
Smallest cost for LIS hardware/software/monthly maintenance	—	\$100k/\$250k/\$5k
Largest cost for LIS hardware/software/monthly maintenance	—	\$250k/\$1.5m/\$37k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • comprehensive, feature-rich system at a reasonable cost • 30 years in LIS industry with more than 1,500 LIS customers and more than 60 host system vendor partners • intuitive, easy-to-use screens simplify training and facilitate daily operation 	<ul style="list-style-type: none"> • proven high-volume processing for multi-site and single lab operations • integration with GE and other Enterprise systems • commercially available relational database and associated benefits
*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day		
**generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day		
***other=sales, marketing, administration, and other company functions		
Note: a dash in lieu of an answer means company did not answer question or question is not applicable		[†] don't track No. of sites installed

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Laboratory information systems

Part 9 of 18	Healthvision Allison Kelso info@healthvision.com 6330 Commerce, Suite 100 Irving, TX 75063 972-819-4801 www.healthvision.com	Hex Laboratory Systems Susan Bollinger sbollinger@hexlab.com 1042B El Camino Real, Suite 308 Encinitas, CA 92024 800-720-2085 www.hexlab.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	TD-Synergy [†]	Lab/Hex
First ever/most recent LIS installation (based on September survey deadline)	1972/July 2008	1981/February 2008
Last major product release for featured LIS	August 2008	August 2008
Total No. of contracts for sites operating LIS	710+	136
• Hospital/independent lab contracts in U.S.	6/2	9/65
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	0/1	42/1
• Other contracted U.S. sites/contracts for foreign sites	1/700+ (hospitals, independent labs, public health, clinical research)	9 (research, veterinary)/10
• Contracts that went live between Sept. 2007–Sept. 2008	4	2
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	3 (3/0/0)	—
• No. of these contracts signed between Sept. 2007–Sept. 2008	1	—
Total No. of sites operating LIS (No. of these sites outside the U.S.)	710+ (700+—Canada, France, Holland, Italy, Asia, Philippines, Germany, Taiwan, U.K., Belgium)	149 (10—Egypt, Middle East)
Percentage of high-volume* sites installed/low-volume** sites installed	90%/10%	50%/50%
Staff to develop/install & support/other*** in entire firm	130/201/113	4/7/3
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	60/19/27	—
No. of billed tests generated annually by LIS	100,000–11,000,000 (average, 1,000,000)	250,000–18,000,000 (average, 3,500,000)
Range in No. of workstations in sites operating LIS	6–375 (average, 30)	3–64 (average, 24)
Central hardware or service type	Sun, Unix, Windows, IBM, HP	Dell PowerEdge
How central server failure is handled	system continues uninterrupted	manual intervention necessary to restore operation or system continues uninterrupted
Workstations or PC platform	IBM-compatible PC	Windows PC
Programming language(s)	C++, C Sharp, Java	Thoroughbred Basic
Operating system(s)	Sun, C Sharp, Windows XP, 2000, 2003, Unix, Linux	Linux
Databases and tools used	SQL server, Oracle	IDOL 4, 4GL, SQL
System includes full transaction logging?	yes	yes
Languages (other than English) offered on system	French, Spanish, Italian, German, 17 other languages	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	95%	100%
• Bar-coded collection labels	100%	100%
• Handheld devices for bedside-positive patient ID	3%	2%
• NCCLS POCT-1A standard interface for POCT devices	5%	2%
• Microbiology/public health microbiology	80%/3%	100%/1%
• Blood bank donor and transfusion	not available	not available
• Surgical pathology/cytology	40%/35%	50%/100%
• Molecular pathology/cytogenetics	available in 2010/2%	1%/1%
• Flow cytometry	30%	1%
• HIS or EMR interface: A/D/T	85%	50%
• HIS or EMR interface: order entry/results reporting	25%/55%	75%/75%
• HIS or EMR interface: package results into PDF format	3%	90%
• HIS or EMR interface: package results into CDA1 format/CDA2 format	0/0	50%/50%
• Ad hoc reporting/rules-based system	100%/100%	100%/100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	60%	60%
• Compliance checking/billing and accounts receivable	available but not installed/50%	100%/75%
• Materials management and inventory	not available	1%
• Test partition/remote faxing and printing	100%/100%	100%/100%
• HIPAA-standard transaction formats	100%	100%
• Web-based remote inquiry of reports/Web access for order entry	40%/35%	75%/75%
• Specimen management and tracking	35%	10%
• Compliance and quality assurance tools	100%	100%
• Environmental health/newborn screening	3%/2%	available but not installed/available but not installed
Complete LIS application service provider solution?	no	no
ASP for physician order entry and results reporting?	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 via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	—	available but not installed
• Other reportable diseases	—	available but not installed
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	—	available but not installed
Hospital systems or integrated health care systems interfaced	MediSolution, SCC Soft Computer, Keane, self developed, McKesson, Misys, GE, Meditech, others	McKesson, Cerner, Sunquest, PSI, Siemens, Experior, Hearts, WebMD, Quest, LabCorp, others
Physician office management systems interfaced	Purkinje, others	Millbrook, Practice Partners, MediPro, Allscripts, GE, MedicaLogic, Medical Manager, Medical Informatics Engineering, others
Automated lab transportation systems interfaced	Beckman Coulter, Sysmex, Ortho, Roche, Siemens, Abbott	Roche
LIS provides validation or testing tools?	no	yes (Hex)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (Info-X, NCCLS, SNOMED)/yes	yes (Medicare, CodeMap, others)/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? (percent of installs lab only)	yes (80%)	no
No. of different lab instruments interfaced with LIS	430+	250+
Source code/user group that meets regularly?	escrow/yes (meets in person annually)	escrow/no
User can modify screens?	yes (offer user-defined report writer, custom programming)	no (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	SQL, Oracle, Crystal Reports, Excel, Access	SQL
Smallest cost for LIS hardware/software/monthly maintenance	\$6k/\$30k/\$6k	\$5k/\$10k/\$0.35k
Largest cost for LIS hardware/software/monthly maintenance	\$250k/\$3m/—	\$50k/\$180k/\$2.5k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • enterprise-wide integration tools • real-time patient safety alerting system • context-sensitive document management 	<ul style="list-style-type: none"> • flexible and user definable • integrated or stand-alone billing with e-billing, e-remittance, and financial and management reports • stable, reliable system with excellent customer service and support
*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day		
**generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day		
***other=sales, marketing, administration, and other company functions		
Note: a dash in lieu of an answer means company did not answer question or question is not applicable	[†] formerly marketed under MediSolution	

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Laboratory information systems

Part 10 of 18	Impac Medical Systems sales@impac.com 100 Mathilda Place, Fifth Floor Sunnyvale, CA 94086 408-830-8000 www.impac.com	LabSoft Steven Hawn steven@labssoftweb.com 9104 Shenandoah Run Wesley Chapel, FL 33544-5455 800-767-3279 www.labssoftweb.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	IntelliLab	LabNet
First ever/most recent LIS installation (based on September survey deadline)	1988/September 2008	1992/2008
Last major product release for featured LIS	September 2008	2007
Total No. of contracts for sites operating LIS	63	300+
• Hospital/independent lab contracts in U.S.	1/2	61/44
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	58/1	177/3
• Other contracted U.S. sites/contracts for foreign sites	0/1 (educational)	25/1 (hospital)
• Contracts that went live between Sept. 2007–Sept. 2008	4	7
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	4 (0/0/4)	0
• No. of these contracts signed between Sept. 2007–Sept. 2008	4	0
Total No. of sites operating LIS (No. of these sites outside the U.S.)	175 (5—Canada)	311 (1—Trinidad)
Percentage of high-volume* sites installed/low-volume** sites installed	30%/70%	30%/70%
Staff to develop/install & support/other*** in entire firm	150/150/200	3/2/2
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	5/6/6	3/2/2
No. of billed tests generated annually by LIS	20,000–500,000	1,000–1,000,000
Range in No. of workstations in sites operating LIS	3–50 (average, 15)	1–77
Central hardware or service type	Dell, HP	Dell
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted	manual intervention necessary to restore operation
Workstations or PC platform	Windows XP	Dell
Programming language(s)	Visual Basic, C, Basic	Delphi
Operating system(s)	Windows 2000, 2003, XP, Vista	Windows
Databases and tools used	mvBase	Microsoft SQL
System includes full transaction logging?	yes	—
Languages (other than English) offered on system	—	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	100%
• Bar-coded collection labels	100%	100%
• Handheld devices for bedside-positive patient ID	not available	not available
• NCCLS POCT-1A standard interface for POCT devices	available in December 2008	30%
• Microbiology/public health microbiology	20%/not available	20%/2%
• Blood bank donor and transfusion	not available	not available
• Surgical pathology/cytology	not available/not available	2%/not available
• Molecular pathology/cytogenetics	not available/not available	not available/not available
• Flow cytometry	not available	not available
• HIS or EMR interface: A/D/T	40%	90%
• HIS or EMR interface: order entry/results reporting	100%/100%	70%/70%
• HIS or EMR interface: package results into PDF format	installed	20%
• HIS or EMR interface: package results into CDA1 format/CDA2 format	not available/not available	0/0
• Ad hoc reporting/rules-based system	100%/100%	30%/50%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	100%	25%
• Compliance checking/billing and accounts receivable	100%/10%	70%/100%
• Materials management and inventory	not available	not available
• Test partition/remote faxing and printing	100%/100%	100%/50%
• HIPAA-standard transaction formats	100%	not available
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	30%/30%
• Specimen management and tracking	not available	60%
• Compliance and quality assurance tools	not available	not available
• Environmental health/newborn screening	not available/not available	not available/not available
Complete LIS application service provider solution?	no	no
ASP for physician order entry and results reporting?	no	yes
Method of charging for ASP service	—	fixed fee
Client software required	—	—
ASP information conduit	—	operates over the Internet
Client contracts supported from data center not operated by client	—	3
How data center is operated	—	by a third party
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	available but not installed	not available
• Other reportable diseases	available but not installed	not available
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	not available	not available
Hospital systems or integrated health care systems interfaced	Siemens, Healthland	GE, Epic, McKesson, Cerner, Meditech, Misys, Siemens, SCC Soft Computer, others
Physician office management systems interfaced	Impac, Misys, Medical Manager, NextGen, GE, Allscripts, QSI, MedicaLogic, HealthWorks, Varian	GE, Impac, Emdeon, NextGen, Practice Partners, Medic, Misys, CPSI, others
Automated lab transportation systems interfaced	no	Roche, Siemens
LIS provides validation or testing tools?	no	no
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	no/yes	yes (CodeMap)/no
Software provides indexed field in each test definition for LOINC code?	no	no
Provide LOINC dictionary for each new installation?	no	no
LIS supports use of SNOMED CT?	no	no
Market modules for other hospital departments? (percent of installs lab only)	no	no
No. of different lab instruments interfaced with LIS	400 (Dawning and Data Innovations for interface)	200+
Source code/user group that meets regularly?	escrow/yes (meets in person annually)	escrow/no
User can modify screens?	no (offer user-defined report writer)	no (offer custom programming)
Query languages to retrieve information from LIS database	AQL, SQL with ODBC	—
Smallest cost for LIS hardware/software/monthly maintenance	~\$10k/\$25k/—	\$3.5k/\$6k/\$0.1
Largest cost for LIS hardware/software/monthly maintenance	\$30k/\$200k/—	\$30k/\$150k/\$1k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • fully integrated with Impac medical oncology information system • reflex rules engine • quality control module 	<ul style="list-style-type: none"> • intuitive; easy to learn and use • flexible; customizable to user and lab • high value and reliable
*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day		
**generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day		
***other=sales, marketing, administration, and other company functions		
<i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i>		

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Laboratory information systems

Part 11 of 18	McKesson Joseph R. Stabile joseph.stabile@mckesson.com 5995 Windward Parkway Alpharetta, GA 30005 404-338-6000 www.mckesson.com/laboratory	Meditech (Medical Information Technology) Paul Berthiaume pberthiaume@meditech.com Meditech Circle Westwood, MA 02090 781-821-3000 www.meditech.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	Horizon Lab	Meditech LIS—Client/Server
First ever/most recent LIS installation (based on September survey deadline)	1972/August 2008	1970/July 2008
Last major product release for featured LIS	May 2008	October 2007
Total No. of contracts for sites operating LIS	106	do not track
• Hospital/independent lab contracts in U.S.	102/1	—
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	0/0	—
• Other contracted U.S. sites/contracts for foreign sites	0/3 (hospitals)	—
• Contracts that went live between Sept. 2007–Sept. 2008	9	41 (sites)
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	18 (17/1/0)	31 (sites)
• No. of these contracts signed between Sept. 2007–Sept. 2008	13	do not track
Total No. of sites operating LIS (No. of these sites outside the U.S.)	169 (3—Canada, Saudi Arabia)	346
Percentage of high-volume* sites installed/low-volume** sites installed	85%/15%	—
Staff to develop/install & support/other*** in entire firm	32,000 total	659/1,571/525
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	80 total	18/115/6
No. of billed tests generated annually by LIS	not tracked	do not track
Range in No. of workstations in sites operating LIS	10–400 (average, 35)	do not track
Central hardware or service type	HP, IBM, Dell	JJWild, Dell, IBM, EMC, HP, others
How central server failure is handled	system continues uninterrupted	manual intervention necessary to restore operation or system continues uninterrupted
Workstations or PC platform	—	any Microsoft Windows
Programming language(s)	Delphi, C, Java	Magic
Operating system(s)	Windows, Red Hat Enterprise Linux, HP-UX, AIX	client: Windows 2000, XP, Vista; server: Windows 2000, 2003
Databases and tools used	Oracle	Meditech hierarchical database
System includes full transaction logging?	yes	yes
Languages (other than English) offered on system	—	Spanish in development
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	installed	100%
• Bar-coded collection labels	installed	100%
• Handheld devices for bedside-positive patient ID	installed	installed
• NCCLS POCT-1A standard interface for POCT devices	installed	installed
• Microbiology/public health microbiology	installed/installed	100%/installed
• Blood bank donor and transfusion	installed (transfusion)	installed
• Surgical pathology/cytology	through Horizon AP product/through Horizon AP product	installed/installed
• Molecular pathology/cytogenetics	through Horizon AP product/not available	not available/not available
• Flow cytometry	installed	not available
• HIS or EMR interface: A/D/T	installed	25%
• HIS or EMR interface: order entry/results reporting	installed/installed	25%/25%
• HIS or EMR interface: package results into PDF format	through Horizon AP product	25%
• HIS or EMR interface: package results into CDA1 format/CDA2 format	not available/not available	not available/not available
• Ad hoc reporting/rules-based system	installed/installed	100%/100%
• Management and statistical reporting	installed	100%
• Outreach and commercial laboratory	through Horizon Outreach for Lab product	installed
• Compliance checking/billing and accounts receivable	installed/through Horizon Lab Financials product	installed/97%
• Materials management and inventory	not available	80%
• Test partition/remote faxing and printing	installed/installed	100%/100%
• HIPAA-standard transaction formats	installed	100%
• Web-based remote inquiry of reports/Web access for order entry	through Horizon Outreach for Lab/through Horizon Outreach for Lab	installed/installed
• Specimen management and tracking	installed	100%
• Compliance and quality assurance tools	installed	installed
• Environmental health/newborn screening	not available/not available	installed/installed
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	—
ASP information conduit	operates over the 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 via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5./LOINC/SNOMED standard		
• Microbiology data	9 sites (HL7 2.3 in operation)	—
• Other reportable diseases	9 sites (HL7 2.3 in operation)	—
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	not available	—
Hospital systems or integrated health care systems interfaced	McKesson, Siemens, GE, Meditech, Cerner, Epic, homegrown, others	Cerner, Siemens, McKesson, others
Physician office management systems interfaced	any EMR using EMR connectivity tools with Horizon Lab interface engine or via Data Innovations	—
Automated lab transportation systems interfaced	interfaces to lab automation systems available through Data Innovations	Beckman Coulter, Sysmex, Roche, Bayer
LIS provides validation or testing tools?	yes (internal McKesson tools)	yes (proprietary)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (CMS, ICD-9, CPT, others)/no	yes (Info-X, SNOMED)/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? (percent of installs lab only)	yes (60%)	yes (5 labs)
No. of different lab instruments interfaced with LIS	300+ (Data Innovations for interface)	1,000+
Source code/user group that meets regularly?	escrow/yes (meets in person annually)	escrow/yes (meets via Internet; in person as needed)
User can modify screens?	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer)
Query languages to retrieve information from LIS database	any ODBC software package	Magic
Smallest cost for LIS hardware/software/monthly maintenance	—	—
Largest cost for LIS hardware/software/monthly maintenance	—	—
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • advanced bi-directional pharmacy integration with McKesson's pharmacy information solution • excellent support organization—support center practices (SCP) certified for seven consecutive years • substantially decreased total cost of ownership with availability of Linux platform 	<ul style="list-style-type: none"> • 39+ years of experience developing and implementing LISs • offers seamless exchange of data across departments and facilities regardless of care setting • software is 100% developed by in-house staff
*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day		
**generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day		
***other=sales, marketing, administration, and other company functions		
<i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i>		

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Laboratory information systems

Part 12 of 18	Meditech (Medical Information Technology) Paul Berthiaume pberthiaume@meditech.com Meditech Circle Westwood, MA 02090 781-821-3000 www.meditech.com	M/MGMT Systems Tara Herfurth mlab@mngmt.com 2335 American River Drive, Suite 402 Sacramento, CA 95825 916-648-9010 www.mngmt.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	Meditech LIS—Magic	M/Lab Enterprise Edition
First ever/most recent LIS installation (based on September survey deadline)	1970/July 2008	1987/August 2008
Last major product release for featured LIS	July 2008	August 2006
Total No. of contracts for sites operating LIS	do not track	16
• Hospital/independent lab contracts in U.S.	—	0/0
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	—	0/16
• Other contracted U.S. sites/contracts for foreign sites	—	0/0
• Contracts that went live between Sept. 2007–Sept. 2008	5 (sites)	2
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	7 (sites)	2 (0/0/2)
• No. of these contracts signed between Sept. 2007–Sept. 2008	do not track	2
Total No. of sites operating LIS (No. of these sites outside the U.S.)	813	16 (0)
Percentage of high-volume* sites installed/low-volume** sites installed	—	10%/90%
Staff to develop/install & support/other*** in entire firm	659/1,571/525	5/4/2
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	18/115/6	—
No. of billed tests generated annually by LIS	do not track	10,000–3,500,000
Range in No. of workstations in sites operating LIS	do not track	5–64 (average, 16)
Central hardware or service type	JJWild, Dell, IBM, EMC, HP, others	Microsoft 2003 server
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted	manual intervention necessary to restore operation
Workstations or PC platform	any Microsoft Windows	any Microsoft
Programming language(s)	Magic	Delphi, SQL
Operating system(s)	Windows 2000 Professional, XP, Vista	Microsoft 2003 server
Databases and tools used	Meditech hierarchical database	SQL server, Oracle, Caché
System includes full transaction logging?	no	yes
Languages (other than English) offered on system	—	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	20%
• Bar-coded collection labels	100%	70%
• Handheld devices for bedside-positive patient ID	installed	not available
• NCCLS POCT-1A standard interface for POCT devices	installed	not available
• Microbiology/public health microbiology	100%/installed	100%/100%
• Blood bank donor and transfusion	installed	not available
• Surgical pathology/cytology	installed/installed	available but not installed/available but not installed
• Molecular pathology/cytogenetics	not available/not available	available but not installed/available but not installed
• Flow cytometry	not available	available but not installed
• HIS or EMR interface: A/D/T	installed	50%
• HIS or EMR interface: order entry/results reporting	installed/installed	100%/100%
• HIS or EMR interface: package results into PDF format	installed	100%
• HIS or EMR interface: package results into CDA1 format/CDA2 format	not available/not available	available but not installed/available but not installed
• Ad hoc reporting/rules-based system	100%/100%	100%/100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	installed	available but not installed
• Compliance checking/billing and accounts receivable	installed/installed	70%/70%
• Materials management and inventory	installed	10%
• Test partition/remote faxing and printing	100%/100%	100%/35%
• HIPAA-standard transaction formats	100%	100%
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	12.5%/available but not installed
• Specimen management and tracking	100%	100%
• Compliance and quality assurance tools	installed	25%
• Environmental health/newborn screening	installed/installed	20%/5%
Complete LIS application service provider solution?	no	no
ASP for physician order entry and results reporting?	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 via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	—	100% of sites
• Other reportable diseases	—	80% of sites
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	—	available but not installed
Hospital systems or integrated health care systems interfaced	Cerner, Siemens, McKesson, others	Siemens, Misys, Meditech
Physician office management systems interfaced	—	—
Automated lab transportation systems interfaced	Beckman Coulter, Sysmex, Roche, Bayer	Beckman Coulter, Dade Behring, Olympus America, Roche, Abbott
LIS provides validation or testing tools?	yes (proprietary)	yes (in-house validation tools)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (Info-X, SNOMED)/yes	yes (ODBC access with appropriate security)/yes
Software provides indexed field in each test definition for LOINC code?	yes	yes
Provide LOINC dictionary for each new installation?	no	yes
LIS supports use of SNOMED CT?	yes	yes
Market modules for other hospital departments? (percent of installs lab only)	yes (9 labs)	no
No. of different lab instruments interfaced with LIS	1,000+	150+
Source code/user group that meets regularly?	escrow/yes (meets via Internet; in person as needed)	escrow/yes (meets in person annually)
User can modify screens?	yes (offer user-defined report writer)	yes (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	Magic	SQL
Smallest cost for LIS hardware/software/monthly maintenance	—	\$10k/\$54k/\$0.975k
Largest cost for LIS hardware/software/monthly maintenance	—	\$35k/\$625k/\$9.375k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • 39+ years of experience developing and implementing LISs • offers seamless exchange of data across departments and facilities regardless of care setting • software is 100% developed by in-house staff 	<ul style="list-style-type: none"> • highly efficient database structures • written specifically for public health • flexible rules-based algorithm
*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day		
**generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day		
***other=sales, marketing, administration, and other company functions		
<i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i>		

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Laboratory information systems

Part 13 of 18	Multidata Computer Systems Michael Slater mrslater@mul.com 160 Broadway, Suite 1010 New York, NY 10038 212-967-6700 www.mul.com	NetLims Avi Allerhand avi@netlims.com 111 Town Square Place, Suite 700 Jersey City, NJ 07310 201-894-5300 www.netlims.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	MultiTech LIS	AutoLims
First ever/most recent LIS installation (based on September survey deadline)	1983/2005	1996/January 2008
Last major product release for featured LIS	2007	June 2008
Total No. of contracts for sites operating LIS	41	15
• Hospital/independent lab contracts in U.S.	7/33	3/7
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	1/0	0/0
• Other contracted U.S. sites/contracts for foreign sites	0/0	0/5 (hospitals)
• Contracts that went live between Sept. 2007–Sept. 2008	0	3
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	0	0
• No. of these contracts signed between Sept. 2007–Sept. 2008	0	0
Total No. of sites operating LIS (No. of these sites outside the U.S.)	41	44 (33—Israel, India)
Percentage of high-volume* sites installed/low-volume** sites installed	40%/60%	90%/10%
Staff to develop/install & support/other*** in entire firm	4/5/2	55/37/12
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	—	—
No. of billed tests generated annually by LIS	50,000–5,000,000	400,000–10,000,000 (average, 1,500,000)
Range in No. of workstations in sites operating LIS	4–120+ (average, 30)	15–550 (average, 50)
Central hardware or service type	Intel x86 compatible, most Unix RISC, HP Alpha	IBM, Dell, HP
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted (optional)	system continues uninterrupted
Workstations or PC platform	PC with VT emulation, DEC VT or compatible	any Windows PC
Programming language(s)	Caché (M), Visual Basic, HTML, Java, Javascript	C++, Visual Basic, Java, .Net
Operating system(s)	Windows, Linux	Windows 2000, 2003, XP, Linux, Unix
Databases and tools used	Caché (M)	Oracle, Microsoft SQL 2000, 2005, Caché
System includes full transaction logging?	optional	yes
Languages (other than English) offered on system	—	Hebrew
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	90%	95%
• Bar-coded collection labels	90%	100%
• Handheld devices for bedside-positive patient ID	—	installed
• NCCLS POCT-1A standard interface for POCT devices	—	not available
• Microbiology/public health microbiology	80%/—	85%/not available
• Blood bank donor and transfusion	—	40%
• Surgical pathology/cytology	15%/40%	50%/70%
• Molecular pathology/cytogenetics	20%/—	70%/15%
• Flow cytometry	25%	20%
• HIS or EMR interface: A/D/T	25%	85%
• HIS or EMR interface: order entry/results reporting	25%/30%	100%/100%
• HIS or EMR interface: package results into PDF format	10%	installed
• HIS or EMR interface: package results into CDA1 format/CDA2 format	—	95%/not available
• Ad hoc reporting/rules-based system	40%/90%	100%/100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	90%	100%
• Compliance checking/billing and accounts receivable	80%/90%	60%/40%
• Materials management and inventory	20%	available but not installed
• Test partition/remote faxing and printing	100%/80%	100%/100%
• HIPAA-standard transaction formats	90%	100%
• Web-based remote inquiry of reports/Web access for order entry	30%/15%	60%/50%
• Specimen management and tracking	10%	70%
• Compliance and quality assurance tools	50%	75%
• Environmental health/newborn screening	—	10%/not available
Complete LIS application service provider solution?	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 the Internet	—
Client contracts supported from data center not operated by client	4	—
How data center is operated	by vendor	—
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	1 site	2 sites (HL7 2.3.1 in operation)
• Other reportable diseases	20 sites	4 sites (HL7 2.3.1 in operation)
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	—	available but not installed
Hospital systems or integrated health care systems interfaced	Siemens, Netsmart, Cerner	Eclipsys, GE, Siemens, Misys, Cerner, Eagle
Physician office management systems interfaced	Epic, GE, Medical Manager, Cerner, eClinicalWorks	—
Automated lab transportation systems interfaced	Siemens	Beckman Coulter, Sysmex, Olympus America, Roche, Bayer
LIS provides validation or testing tools?	no	yes (test environment)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (PMIC, CMS)/optional	yes (Info-X, AMA, Quest, Specialty, SNOMED, CodeMap)/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?	no	yes
Market modules for other hospital departments? (percent of installs lab only)	no	no
No. of different lab instruments interfaced with LIS	125+	150+
Source code/user group that meets regularly?	escrow/no	escrow/no
User can modify screens?	no (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	any ODBC compliant, e.g. Crystal Reports, SQL, Access	SQL
Smallest cost for LIS hardware/software/monthly maintenance	\$20k/\$50k/\$0.75k	\$30k/\$80k/\$1k
Largest cost for LIS hardware/software/monthly maintenance	\$250k/\$400k/\$6k	\$700k/\$2.8m/\$55k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • extensive capabilities for integrating commercial labs with large-scale and networked primary care organizations • complete billing, A/R, and management reporting for commercial labs and hospital outreach • integrated document-management system for imaging/retrieval of requisitions and related documents 	<ul style="list-style-type: none"> • advanced technology—Windows-based system, Web interface, mobile interface, HTML output options, suitable for any database type, advanced reporting tools, lab's robotics management • highly customizable—tailored to any environment and work procedure; sophisticated rules engine; configurative worksheets • fully integrated—all lab disciplines, blood banking, quality control module, and billing in one database
<small>*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day **generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day ***other=sales, marketing, administration, and other company functions Note: a dash in lieu of an answer means company did not answer question or question is not applicable</small>		

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Laboratory information systems

Part 14 of 18	Omnitech Sylvain Fontaine s.fontaine@omnitechlabs.net 38800 Ash Rd. Waltz, MI 48164 877-336-6664, ext. 265 www.omnitechlabs.net	Orchard Software Kerry Foster kfoster@orchardsoft.com 701 Congressional Blvd., Suite 360 Carmel, IN 46032 800-856-1948 www.orchardsoft.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	Omnilab	Orchard Harvest LIS
First ever/most recent LIS installation (based on September survey deadline)	1994/2008	1993/September 2008
Last major product release for featured LIS	2007	June 2008
Total No. of contracts for sites operating LIS	91	842
• Hospital/independent lab contracts in U.S.	4/0	192/91
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	1/0	488/17
• Other contracted U.S. sites/contracts for foreign sites	0/86	54 (universities, student health centers, research)/0
• Contracts that went live between Sept. 2007–Sept. 2008	5	96
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	6 (2/4/0)	36 (10/2/24)
• No. of these contracts signed between Sept. 2007–Sept. 2008	6	36
Total No. of sites operating LIS (No. of these sites outside the U.S.)	145 (140—Canada)	1,017
Percentage of high-volume* sites installed/low-volume** sites installed	35%/65%	40%/60%
Staff to develop/install & support/other*** in entire firm	30/16/10	26/69/40
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	28/14/10	—
No. of billed tests generated annually by LIS	20,000–10,000,000 (average, 150,000)	unknown
Range in No. of workstations in sites operating LIS	4–300 (average, 50)	1–500 (average, 30)
Central hardware or service type	Dell, IBM, HP	HP Business Class
How central server failure is handled	system continues uninterrupted	manual intervention necessary to restore operation
Workstations or PC platform	Windows PC, thin client, Web browser	HP Business Class PC
Programming language(s)	Visual Basic 6, Visual Basic .Net	4D, C++, Java, HTML
Operating system(s)	Windows 2003	Windows 2000, XP Professional, Vista, Windows Server 2003 standard edition
Databases and tools used	Microsoft SQL server	4D, SQL
System includes full transaction logging?	yes	yes
Languages (other than English) offered on system	French, Spanish, Portuguese	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	94%	100%
• Bar-coded collection labels	100%	100%
• Handheld devices for bedside-positive patient ID	available but not installed	not available
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	1%
• Microbiology/public health microbiology	75%/available but not installed	40%/1%
• Blood bank donor and transfusion	available but not installed	not available
• Surgical pathology/cytology	20%/14%	10%/20%
• Molecular pathology/cytogenetics	available but not installed/available but not installed	1%/1%
• Flow cytometry	not available	2%
• HIS or EMR interface: A/D/T	49%	90%
• HIS or EMR interface: order entry/results reporting	24%/62%	60%/65%
• HIS or EMR interface: package results into PDF format	100%	15%
• HIS or EMR interface: package results into CDA1 format/CDA2 format	available but not installed/available but not installed	not available/not available
• Ad hoc reporting/rules-based system	100%/100%	100%/100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	13%	20%
• Compliance checking/billing and accounts receivable	20%/8%	100%/not available
• Materials management and inventory	not available	20%
• Test partition/remote faxing and printing	100%/100%	25%/100%
• HIPAA-standard transaction formats	installed	100%
• Web-based remote inquiry of reports/Web access for order entry	8%/8%	65%/60%
• Specimen management and tracking	100%	100%
• Compliance and quality assurance tools	10%	100%
• Environmental health/newborn screening	not available/not available	1%/2%
Complete LIS application service provider solution?	yes	no
ASP for physician order entry and results reporting?	yes	yes
Method of charging for ASP service	transaction based	fixed fee
Client software required	browser based	browser based
ASP information conduit	operates over the Internet	operates over the Internet
Client contracts supported from data center not operated by client	40	1
How data center is operated	by a third party	by vendor
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	available but not installed	5 sites
• Other reportable diseases	available but not installed	5 sites
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	available but not installed	available but not installed
Hospital systems or integrated health care systems interfaced	McKesson, MediSolution, Momentum Healthware, Per Sé, Sphere Health, Mardon Healthcare, Siemens	A4 Confidence, CHS, Clarus, CPSI, Healthland, HealthQuest, Keane, NetSolutions, Meditech, Misys, Paragon, QuadraMed, Spectron Series, Spirit Enterprise, others
Physician office management systems interfaced	Purkinje, YorkMed, Omni Med, Healthscreen	Misys, GE, Impac, Medisoft, Allscripts, NextGen, WebMD, Telcor, others
Automated lab transportation systems interfaced	Beckman Coulter	Beckman Coulter, Ortho, Olympus America, Roche
LIS provides validation or testing tools?	yes (self developed)	yes (proprietary)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes/yes	no/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? (percent of installs lab only)	yes (97%)	no
No. of different lab instruments interfaced with LIS	300+ (Data Innovations for interface)	400+
Source code/user group that meets regularly?	escrow/yes (meets in person annually)	escrow/yes (meets via Internet unlimited; in person 14 times per year)
User can modify screens?	yes (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	SQL, ODBC	ODBC-compliant query languages
Smallest cost for LIS hardware/software/monthly maintenance	\$10k/\$75k/\$1.125k	\$12k/\$20k/\$0.25k
Largest cost for LIS hardware/software/monthly maintenance	\$200k/\$1m/\$15k	\$100k/\$800k/\$6k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • hybrid design to support hospital, commercial, and esoteric labs • functional leader in the industry • industry standard-setter for implementation and support 	<ul style="list-style-type: none"> • rules-based advanced decision support logic • interfacing and integration with other host systems, departments, and reference labs • industry leader in service and support
<p>*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day **generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day ***other=sales, marketing, administration, and other company functions Note: a dash in lieu of an answer means company did not answer question or question is not applicable</p>		

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Laboratory information systems

Part 15 of 18	Psyche Systems Corp. Lisa-Jean Clifford lj@psychesystems.com 321 Fortune Blvd. Milford, MA 01757 800-345-1514 www.psychesystems.com	Quality Software Systems Jeff Caspari jcaspari@labhealth.com 252 Old Nyack Turnpike Spring Valley, NY 10977 845-352-4313, ext.14 www.labhealth.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	LabWeb	LabHealth
First ever/most recent LIS installation (based on September survey deadline)	1976/2008	1984/2008
Last major product release for featured LIS	2006	2008
Total No. of contracts for sites operating LIS	18	43
• Hospital/independent lab contracts in U.S.	14/2	3/23
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	0/2	17/0
• Other contracted U.S. sites/contracts for foreign sites	0/0	0/0
• Contracts that went live between Sept. 2007–Sept. 2008	2	3
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	1 (1/0/0)	—
• No. of these contracts signed between Sept. 2007–Sept. 2008	1	—
Total No. of sites operating LIS (No. of these sites outside the U.S.)	18 (0)	—
Percentage of high-volume* sites installed/low-volume** sites installed	22%/78%	—
Staff to develop/install & support/other*** in entire firm	14/20/8	4/4/0
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	9/9/7	—
No. of billed tests generated annually by LIS	—	1,000,000–10,000,000
Range in No. of workstations in sites operating LIS	1–120 (average, 20)	5–150
Central hardware or service type	HP, Pentium compatible	Dell
How central server failure is handled	manual intervention necessary to restore operation	system continues uninterrupted
Workstations or PC platform	HP, Pentium compatible	Dell
Programming language(s)	Visual Basic .Net, Visual Basic, C/Fortran	ASP .Net
Operating system(s)	Windows Vista, XP, NT, 2000, Open VMS	Windows
Databases and tools used	Microsoft SQL, Oracle, BrioQuery, Crystal Reports	IBM
System includes full transaction logging?	yes	yes
Languages (other than English) offered on system	—	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	95%
• Bar-coded collection labels	100%	95%
• Handheld devices for bedside-positive patient ID	available but not installed	50%
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	25%
• Microbiology/public health microbiology	33%/—	80%/75%
• Blood bank donor and transfusion	40%	—
• Surgical pathology/cytology	33%/33%	35%/40%
• Molecular pathology/cytogenetics	5%/5%	—
• Flow cytometry	5%	—
• HIS or EMR interface: A/D/T	90%	60%
• HIS or EMR interface: order entry/results reporting	60%/60%	100%/100%
• HIS or EMR interface: package results into PDF format	20%	80%
• HIS or EMR interface: package results into CDA1 format/CDA2 format	20%/—	90%/—
• Ad hoc reporting/rules-based system	100%/20%	100%/80%
• Management and statistical reporting	100%	90%
• Outreach and commercial laboratory	100%	90%
• Compliance checking/billing and accounts receivable	15%/not available	100%/90%
• Materials management and inventory	not available	80%
• Test partition/remote faxing and printing	100%/100%	100%/100%
• HIPAA-standard transaction formats	100%	100%
• Web-based remote inquiry of reports/Web access for order entry	20%/10%	80%/90%
• Specimen management and tracking	available but not installed	80%
• Compliance and quality assurance tools	not available	75%
• Environmental health/newborn screening	not available/not available	—
Complete LIS application service provider solution?	yes	yes
ASP for physician order entry and results reporting?	yes	yes
Method of charging for ASP service	fixed fee	fixed fee
Client software required	browser based, requires that software be installed on a client PC	browser based
ASP information conduit	operates over the Internet	operates over the Internet
Client contracts supported from data center not operated by client	—	35
How data center is operated	by vendor	by vendor
LIS provides surveillance data to public health agencies via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	available but not installed	—
• Other reportable diseases	available but not installed	—
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	2 sites	—
Hospital systems or integrated health care systems interfaced	Meditech, McKesson, CPSI, Siemens, QuadraMed, Cerner, Misys, Keane, Syscore, Tenet, any HL7	—
Physician office management systems interfaced	GE, AcerMed, Allscripts, any HL7	—
Automated lab transportation systems interfaced	Beckman Coulter, Sysmex, Ortho, Roche	Beckman Coulter, Sysmex, Dade Behring, Ortho, Olympus America, Roche, Siemens, Abbott
LIS provides validation or testing tools?	yes (proprietary and blood bank guidelines)	—
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (CodeMap)/yes	—/yes
Software provides indexed field in each test definition for LOINC code?	yes	yes
Provide LOINC dictionary for each new installation?	yes	yes
LIS supports use of SNOMED CT?	yes	yes
Market modules for other hospital departments? (percent of installs lab only)	yes (43%)	no
No. of different lab instruments interfaced with LIS	200	—
Source code/user group that meets regularly?	escrow/yes (meets via Internet quarterly; in person biannually)	yes/no
User can modify screens?	yes (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	Microsoft SQL, ODBC compliant	Access
Smallest cost for LIS hardware/software/monthly maintenance	\$4k/\$20k/0	\$5k/\$10k/\$0.5k
Largest cost for LIS hardware/software/monthly maintenance	\$100k/\$400k/\$6k	\$25k/\$150k/\$4k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • leader in laboratory solutions for cost-conscious laboratories • provide full anatomic pathology and clinical lab systems that are fully integrated with other systems, including billing and instrument interfaces • ability to extend the life and functionality of your existing LIS through outreach, EMR, customized reporting, and more 	<ul style="list-style-type: none"> • extraordinary support and response time • custom programming • consulting to maximize profits and reduce expenses
<small>*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day **generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day ***other=sales, marketing, administration, and other company functions Note: a dash in lieu of an answer means company did not answer question or question is not applicable</small>		

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Laboratory information systems

Part 16 of 18	SCC Soft Computer Ellie Vahman ellie@softcomputer.com 5400 Tech Data Drive Clearwater, FL 33760 727-789-0100 www.softcomputer.com	Schuyler House Janet Chennault jan@schuylerhouse.com 26027 Huntington Lane, Unit F Valencia, CA 91355 800-706-0266 www.schuylab.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	SoftLab	SchuyLab
First ever/most recent LIS installation (based on September survey deadline)	1985/September 2008	1994/August 2008
Last major product release for featured LIS	September 2008	August 2008
Total No. of contracts for sites operating LIS	329	703
• Hospital/independent lab contracts in U.S.	261/28	115/231
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	9/2	303/0
• Other contracted U.S. sites/contracts for foreign sites	0/29	34/20 (hospitals, physician office labs)
• Contracts that went live between Sept. 2007–Sept. 2008	15	33
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	22 (21/1/0)	—
• No. of these contracts signed between Sept. 2007–Sept. 2008	17	—
Total No. of sites operating LIS (No. of these sites outside the U.S.)	671 (60—Canada, Brazil)	728 (20—Caribbean, Guam)
Percentage of high-volume* sites installed/low-volume** sites installed	56%/44%	5%/95%
Staff to develop/install & support/other*** in entire firm	770/415/257	3/14/8
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	625/248/98	2/8/2
No. of billed tests generated annually by LIS	150,000–20,000,000+	5,000–7,000,000 (average, 5,000)
Range in No. of workstations in sites operating LIS	10–4,000 (average, 75)	1–50 (average, 3)
Central hardware or service type	IBM pSeries	any PC (Dell recommended)
How central server failure is handled	system continues uninterrupted	manual intervention necessary to restore operation
Workstations or PC platform	Microsoft Windows workstations	any PC (Dell recommended)
Programming language(s)	C, C++, Java, .Net	C Language
Operating system(s)	server: IBM AIX; workstation: Microsoft Windows 2000, 2003, XP	Windows XP, Vista
Databases and tools used	Oracle, RDM++	Pervasive, Btrieve
System includes full transaction logging?	yes	no
Languages (other than English) offered on system	French, ABN forms available in Spanish	ABN in Spanish
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	100%
• Bar-coded collection labels	100%	40%
• Handheld devices for bedside-positive patient ID	12%	available in 2008
• NCCLS POCT-1A standard interface for POCT devices	10%–15%	available in 2008
• Microbiology/public health microbiology	95%/5%	70%/available in 2008
• Blood bank donor and transfusion	54% blood bank; 3% donor	not available
• Surgical pathology/cytology	45%/45%	10%/10%
• Molecular pathology/cytogenetics	2%/2%	not available/not available
• Flow cytometry	15%	1%
• HIS or EMR interface: A/D/T	91%	15%
• HIS or EMR interface: order entry/results reporting	83%/86%	15%/15%
• HIS or EMR interface: package results into PDF format	installed	available in 2008
• HIS or EMR interface: package results into CDA1 format/CDA2 format	installed/—	—
• Ad hoc reporting/rules-based system	100%/100%	100%/installed
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	100%	30%
• Compliance checking/billing and accounts receivable	29%/21%	40%/30%
• Materials management and inventory	not available	not available
• Test partition/remote faxing and printing	100%/100%	not available/40%
• HIPAA-standard transaction formats	available	100%
• Web-based remote inquiry of reports/Web access for order entry	12%/12%	5%/5%
• Specimen management and tracking	100%	not available
• Compliance and quality assurance tools	25%	not available
• Environmental health/newborn screening	0/80%	not available/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	Web portal	—
ASP information conduit	operates over the 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 via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	4 states live	not available
• Other reportable diseases	4 states live	not available
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	8 sites	not available
Hospital systems or integrated health care systems interfaced	Cerner, McKesson, Eclipsys, Epic, Siemens, GE, QuadraMed, Meditech, Keane, HMS, CPSI, Stockell Insite CS, custom	QuadraMed, Logician, Siemens, McKesson, A4, Atlas, MedGenix, GE, eClinicalWorks, Varian, others
Physician office management systems interfaced	Medical Manager, HealthWorks, Alliance-Plus, MedicalLogic, Epic, Misys, GE, NextGen, Allscripts, others	Medical Manager, PMSI, Allscripts, NextGen, e-Medsys, Healthpac, Medent, PCN, Apex, Renal Link, others
Automated lab transportation systems interfaced	Beckman Coulter, Sysmex, Dade Behring, Ortho, Olympus America, Roche, Siemens, Abbott, Tecan	Roche, Bayer
LIS provides validation or testing tools?	yes (Model Soft, Camtasia)	no
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (ICD-9 codes, Quadax, Vitek, Microscan, Info-X)/yes	yes (CodeMap)/no
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	no
Market modules for other hospital departments? (percent of installs lab only)	yes (97%)	yes (100%)
No. of different lab instruments interfaced with LIS	520	250+
Source code/user group that meets regularly?	escrow/yes (meets in person annually)	escrow/no
User can modify screens?	yes (offer user-defined report writer, custom programming)	yes (offer user-defined report writer)
Query languages to retrieve information from LIS database	ODBC, SQL, XML	—
Smallest cost for LIS hardware/software/monthly maintenance	\$30k/\$75k/\$1.5k	\$1k/\$1.5k/\$0.08k
Largest cost for LIS hardware/software/monthly maintenance	\$1m/\$8m/\$150k	\$40k/\$30k/\$3.5k
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • innovative, comprehensive, and integrated suite of genetics modules for molecular, cytogenetics, HLA/immunogenetics, and flow cytometry • powerful set of integrated laboratory-specific outreach tools • core lab multi-site and specimen-tracking module to track across multiple testing locations and perform workstation redirection when necessary 	<ul style="list-style-type: none"> • comprehensive system at a reasonable price • ease of use—training in minutes • integrates lab results with other systems; secure Internet access
*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day		
**generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day		
***other=sales, marketing, administration, and other company functions		
<i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i>		

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Laboratory information systems

Part 17 of 18	Seacoast Laboratory Data Systems Jim Whitehurst jim@sldsi.com 195 New Hampshire Ave., Suite 140 Portsmouth, NH 03801 603-431-4114, ext. 20 www.sldsi.com	Siemens Medical Theresa McGillvray-Dodd theresa.mcgillvray-dodd@siemens.com 18724 66th Ave., NE Kenmore, WA 98028 425-487-0179 www.usa.siemens.com/medical
<i>See accompanying article on page 12</i>		
Name of laboratory information system	SurroundLab Plus	Novius Lab
First ever/most recent LIS installation (based on September survey deadline)	—/August 2008	1983/2008
Last major product release for featured LIS	June 2008	2008
Total No. of contracts for sites operating LIS	20	70
• Hospital/independent lab contracts in U.S.	0/20	68/0
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	0/0	0/1
• Other contracted U.S. sites/contracts for foreign sites	0/0	0/1
• Contracts that went live between Sept. 2007–Sept. 2008	3	4
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	2 (0/2/0)	8 (7/1/0)
• No. of these contracts signed between Sept. 2007–Sept. 2008	2	7
Total No. of sites operating LIS (No. of these sites outside the U.S.)	20 (0)	92 (1—Canada)
Percentage of high-volume* sites installed/low-volume** sites installed	95%/5%	45%/55%
Staff to develop/install & support/other*** in entire firm	15/25/10	—
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	7/10/5	—
No. of billed tests generated annually by LIS	300,000–3,000,000 (average, 1,500,000)	80,000–3,000,000 (average, 650,000)
Range in No. of workstations in sites operating LIS	3–90 (average, 20)	6–75 (average, 20)
Central hardware or service type	HP, Dell	IBM pSeries, IBM xSeries
How central server failure is handled	system continues uninterrupted	manual intervention necessary to restore operation
Workstations or PC platform	any	any
Programming language(s)	Caché, M-21	C++
Operating system(s)	Windows, Linux	Linux, AIX, Unix
Databases and tools used	Caché, SST	Sybase
System includes full transaction logging?	yes	yes
Languages (other than English) offered on system	—	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	100%	100%
• Bar-coded collection labels	100%	100%
• Handheld devices for bedside-positive patient ID	not available	5%
• NCCLS POCT-1A standard interface for POCT devices	not available	50%
• Microbiology/public health microbiology	75%/not available	98%/5%
• Blood bank donor and transfusion	not available	not available
• Surgical pathology/cytology	not available/15%	not available/not available
• Molecular pathology/cytogenetics	10%/not available	not available/not available
• Flow cytometry	not available	not available
• HIS or EMR interface: A/D/T	100%	100%
• HIS or EMR interface: order entry/results reporting	100%/100%	95%/95%
• HIS or EMR interface: package results into PDF format	30%	not available
• HIS or EMR interface: package results into CDA1 format/CDA2 format	installed/installed	not available/not available
• Ad hoc reporting/rules-based system	100%/100%	100%/100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	100%	installed
• Compliance checking/billing and accounts receivable	100%/100%	installed/installed
• Materials management and inventory	not available	not available
• Test partition/remote faxing and printing	—/100%	100%/98%
• HIPAA-standard transaction formats	100%	installed
• Web-based remote inquiry of reports/Web access for order entry	60%/15%	installed/not available
• Specimen management and tracking	100%	installed
• Compliance and quality assurance tools	60%	installed
• Environmental health/newborn screening	not available/not available	not available/not available
Complete LIS application service provider solution?	no	no
ASP for physician order entry and results reporting?	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 via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	3 sites	not available
• Other reportable diseases	2 sites	not available
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	not available	not available
Hospital systems or integrated health care systems interfaced	Misys, Meditech, SCC Soft Computer, McKesson	McKesson
Physician office management systems interfaced	Medical Manager, eClinical, Greenway, others	Telcor, NextGen, Dr. Chart, Atlas
Automated lab transportation systems interfaced	Beckman Coulter, Sysmex, Dade Behring, Olympus America, Roche, Abbott	Beckman Coulter, Dade Behring, Siemens, Tecan
LIS provides validation or testing tools?	yes (developed in-house)	yes (proprietary)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (CodeMap)/yes	no/no
Software provides indexed field in each test definition for LOINC code?	yes	no
Provide LOINC dictionary for each new installation?	no	no
LIS supports use of SNOMED CT?	no	no
Market modules for other hospital departments? (percent of installs lab only)	no	yes (5%)
No. of different lab instruments interfaced with LIS	200	300 (Siemens OpenLink, Data Innovations for interface)
Source code/user group that meets regularly?	escrow/no	no/yes (meets in person annually)
User can modify screens?	no (offer custom programming)	yes (offer user-defined report writer)
Query languages to retrieve information from LIS database	SQL	SQL, ODBC
Smallest cost for LIS hardware/software/monthly maintenance	\$10k/\$50k/\$1.1k	—
Largest cost for LIS hardware/software/monthly maintenance	\$50k/\$300k/\$5k	—
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> • commercial laboratory specific • infinitely scalable • complete multi-site capabilities 	<ul style="list-style-type: none"> • workflow efficiency: turnaround time alerts, paperless operations with robust online searches, rules-based automation and knowledge, critical call management, document links • excellent service with six-month implementation cycle • proven performance and reliability
<p>*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day **generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day ***other=sales, marketing, administration, and other company functions Note: a dash in lieu of an answer means company did not answer question or question is not applicable</p>		

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Laboratory information systems

Part 18 of 18	Starlims Ed Krasovec sales@starlims.com 4000 Hollywood Blvd., Suite 515S Hollywood, FL 33021 954-964-8663 www.starlims.com	Sunquest Information Systems Elinore Craig elinore.craig@sunquestinfo.com 250 S. Williams Blvd. Tucson, AZ 85711 877-239-6337 www.sunquestinfo.com
<i>See accompanying article on page 12</i>		
Name of laboratory information system	Starlims	Sunquest Laboratory
First ever/most recent LIS installation (based on September survey deadline)	2001/July 2008	1979/2008
Last major product release for featured LIS	2006	July 2007
Total No. of contracts for sites operating LIS	27	418
• Hospital/independent lab contracts in U.S.	1/5	355/40
• Clinic or group practice contracts in U.S./public health lab contracts in U.S.	0/12	0/0
• Other contracted U.S. sites/contracts for foreign sites	0/9 (hospitals, public health, research)	0/23 (hospitals)
• Contracts that went live between Sept. 2007–Sept. 2008	7	6
Contracts signed but LIS not yet operational (hospitals/independent labs/others)	26 (9/3/14)	21 (21/0/0)
• No. of these contracts signed between Sept. 2007–Sept. 2008	7	15
Total No. of sites operating LIS (No. of these sites outside the U.S.)	31 (10—U.K., China, Malaysia, Romania, Jamaica, Singapore)	990+ (60+—Canada, U.K., Western Europe, Middle East)
Percentage of high-volume* sites installed/low-volume** sites installed	35%/65%	65%/35%
Staff to develop/install & support/other*** in entire firm	38/96/34	371/245/84
Staff to develop/install & support/other*** in LIS div. (if company markets more than LISs)	9/30/8	290/243/107
No. of billed tests generated annually by LIS	unknown	<500,000–17,000,000 (average, 8,500,000)
Range in No. of workstations in sites operating LIS	3–1,000 (average, 100)	4–500
Central hardware or service type	varies	HP, IBM
How central server failure is handled	system continues uninterrupted	manual intervention necessary to restore operation or system continues uninterrupted
Workstations or PC platform	varies	Dell, HP
Programming language(s)	C++, .Net	ANSI Standard M, Caché Script, Standard C/C++, Visual Basic, others
Operating system(s)	Windows	AIX, HP-UX, OpenVMS, Linux, Windows XP
Databases and tools used	Microsoft SQL, Oracle	InterSystems Caché
System includes full transaction logging?	yes	yes
Languages (other than English) offered on system	French, Spanish, Chinese, Czech, Polish, Russian, Dutch, Korean, others	—
Features (listed as a percentage of live installs or based on availability)		
• Chemistry and hematology	30%	100%
• Bar-coded collection labels	90%	100%
• Handheld devices for bedside-positive patient ID	available but not installed	20%
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	20%
• Microbiology/public health microbiology	20%/35%	100%/1%
• Blood bank donor and transfusion	3%	80%
• Surgical pathology/cytology	7%/7%	60%/50%
• Molecular pathology/cytogenetics	8%/available fourth quarter 2008	5%/3%
• Flow cytometry	12%	10%
• HIS or EMR interface: A/D/T	5%	99%
• HIS or EMR interface: order entry/results reporting	95%/95%	99%/99%
• HIS or EMR interface: package results into PDF format	60%	—
• HIS or EMR interface: package results into CDA1 format/CDA2 format	available but not installed/available but not installed	—
• Ad hoc reporting/rules-based system	95%/100%	90%/100%
• Management and statistical reporting	100%	100%
• Outreach and commercial laboratory	65%	75%
• Compliance checking/billing and accounts receivable	available but not installed/45%	30%/10%
• Materials management and inventory	95%	—
• Test partition/remote faxing and printing	installed/25%	100%/90%
• HIPAA-standard transaction formats	installed	100%
• Web-based remote inquiry of reports/Web access for order entry	85%/100%	15%/15%
• Specimen management and tracking	100%	100%
• Compliance and quality assurance tools	92%	100%
• Environmental health/newborn screening	22%/4%	—
Complete LIS application service provider solution?	no	no
ASP for physician order entry and results reporting?	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 via computer-to-computer interface using CDC/HL7 2.3.1, 2.3.z, or 2.5.1/LOINC/SNOMED standard		
• Microbiology data	available but not installed	5% of sites
• Other reportable diseases	available but not installed	5% of sites
• Tumor diagnosis or registry data (using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 2.1, May 2008 edition)	available but not installed	10% of sites
Hospital systems or integrated health care systems interfaced	Heron PAS, PIMS, Oracle	McKesson, Cerner, Siemens, GE, Epic, Eclipsys, others
Physician office management systems interfaced	NetSuite	Allscripts, eClinical, Logician, WebMD, Atlas, GE, McKesson, A4, NextGen, Misys, others
Automated lab transportation systems interfaced	Beckman Coulter, Sysmex, Dade Behring, Ortho, Olympus America, others	Beckman Coulter, Dade Behring, Olympus America, Roche, Abbott, others
LIS provides validation or testing tools?	yes	yes (Sunquest specific)
LIS allows third-party updates of tables and rules/image capture, display, and reporting?	yes (via Web services for ICD, CPT, others)/yes	yes (3M, ICD-9)/no
Software provides indexed field in each test definition for LOINC code?	yes	no
Provide LOINC dictionary for each new installation?	yes	no
LIS supports use of SNOMED CT?	yes	yes
Market modules for other hospital departments? (percent of installs lab only)	no	yes (95%)
No. of different lab instruments interfaced with LIS	230+ (native tools, Data Innovations and Instrument Manager for interface)	800
Source code/user group that meets regularly?	escrow/yes (meets via Internet; in person every 12 to 18 months)	escrow/yes (meets via Internet monthly; in person annually or more)
User can modify screens?	yes (offer user-defined report writer, custom programming)	yes (offer user-defined report writer, custom programming)
Query languages to retrieve information from LIS database	SQL	SQL
Smallest cost for LIS hardware/software/monthly maintenance	\$5k/\$195k/\$1.2k	\$100k/\$250k/18% for software (hardware varies)
Largest cost for LIS hardware/software/monthly maintenance	\$100k/\$3m/\$20k	\$500k/\$1m+/ 18% for software (hardware varies)
Distinguishing features (supplied by vendor)	<ul style="list-style-type: none"> integrated LIMS, scientific data-management and electronic lab notebook provide unique lab automation capability powerful customer-configurable workflow tools allow labs to automate processes and enforce local business rules easy to use, highly intuitive, browser-based dashboard and proactive reminder system 	<ul style="list-style-type: none"> awarded “Best in KLAS” for laboratory 2004–2007 reliable uptime, interface leader (over 2,300 live enterprise interfaces, over 11,000 live instrument interfaces, and most states with DOH interfaces) scalable systems support single hospital laboratories up to high-volume multi-site customers
*generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day		
**generate <500,000 billed tests annually, or <200 bed hospitals, or <500 requisitions per day		
***other=sales, marketing, administration, and other company functions		
Note: a dash in lieu of an answer means company did not answer question or question is not applicable		

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