

LABORATORY INFORMATION SYSTEMS

LIS of today a far cry from its ancestors

When CAP TODAY magazine ran its first laboratory information systems product guide in the 1980s, an LIS was an LIS—nothing more and nothing less. Today, however, it's a lot more, and the black and white of it have swirled to gray.

The addition of niche functionality, such as voice recognition, scheduling, imaging, billing, and even anatomic pathology and molecular diagnostics capabilities, have muddled the original definition of a clinical lab information system. Adding to the stew is the classification of LISs that meet meaningful use criteria as EHR modules, as well as a blurring of the distinction between an LIS and a LIMS.

On the flipside, vendors of anatomic pathology systems, such as AP Easy Software Solutions, are adding clinical functionality to their software at the behest of customers. We assume a growing number of vendors are facing similar requests and challenges.

In addition to its LIS guide, CAP TODAY will continue to provide software listings for blood banking, billing, AP, laboratory-provider links, and, in the future, for molecular diagnostics testing and other niche markets. Our goal continues to be to list products in the guides that are most applicable based on the functionality provided in a particular system.

While we expect an increasing number of vendors will expand their product offerings with crossover functionality, particularly between AP and LIS, we'll do our best to put the square peg in the square hole in the interest of simplifying our readers' search for the right IT system for them.

On the following pages, CAP TODAY profiles 31 laboratory information systems from 30 companies. The data presented for each company are based on vendors' responses to a questionnaire. We encourage anyone interested in purchasing an LIS to verify the validity of the information presented, particularly a company's claims of offering innovative features, and to speak to the users of any system in which they are interested.

—Kim Carey, managing editor

Part 1 of 11

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Name of laboratory information system	PROLIS	Apex LIS
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	1999/August 2016	2008/August 2016
Last major release or update of featured LIS	August 2016 (version 5.5.0.1)	January 2016 (version 5.0)
Total No. of contracts for sites operating LIS	30	294
• Hospital/Independent lab contracts in U.S.	0/26	11/8
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	2/0	275/0
• Contracts for other U.S. sites/Contracts for foreign sites	0/2 (hospital, independent lab)	0/0
Percentage of contracts that are for sites where company has no other software installed	97%	100%
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	11 (0/10/1—public health lab)	4 (0/1/3—physician office lab)
Total No. of sites operating LIS/No. of those sites that are outside U.S.	27/2 (United Arab Emirates, Ghana)	294/0
No. of sites that went live between August 2015–August 2016	8	13
Percentage of high-volume** sites installed/Low-volume*** sites installed	73%/27%	1%/99%
Provide list of installed client sites to potential customers on request	yes (partial list of comparable sites with client permission)	yes (partial list of comparable sites)
Clients restricted from sharing their experience with company or LIS	no	no
No. of employees in entire company	8	10
• No. of employees dedicated to LIS development, installation, and support	5	9
Range in No. of user workstations in sites operating LIS	4–92 (average, 16)	1–10 (average, 2)
Central hardware or service type	IBM compatible	Dell server
How central server failure is handled	manual intervention necessary to restore operation	manual intervention necessary to restore operation
Programming language(s)	Visual Basic .Net	—
Operating system(s)	Windows	Windows
Databases and tools	SQL server	Microsoft SQL
System includes full transaction logging	yes	yes
Languages (other than English) offered on system	none	Spanish
Features/modules incorporated in product:		
• Chemistry and hematology/Bar-coded collection labels	installed/installed	installed/installed
• Microbiology/Public health microbiology	installed/installed	installed/not available
• Blood bank donor/Blood bank transfusion	under development/under development	not available/not available
• Surgical pathology/Cytology	installed/installed	—/installed
• Molecular pathology/Cytogenetics/Flow cytometry	installed/installed/installed	installed/installed/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	installed/installed
• EHR interface for packaging results into PDF format	installed	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	not available/not available	installed/installed
• Ad hoc reporting/Rules-based system	installed/installed	installed/installed
• Management and statistical reporting	installed	installed
• Connection to provider offices	installed	installed
• Commercial laboratory functionality	installed	installed
• Compliance checking/Billing and accounts receivable	installed/installed	installed/under development
• Materials management and inventory	not available	installed
• Test partition/Remote faxing or printing	installed/installed	installed/installed
• HIPAA-standard transaction formats	installed	installed
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	installed/installed
• Specimen management and tracking	installed	installed
• Compliance and quality assurance tools/Environmental health	installed/installed	installed/not available
• Business analytics	installed	installed
• Reference lab interface for orders, results return, status return	installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:		
• Microbiology data (culture and sensitivity)	yes	under development
• Other reportable diseases (blood, lead, immunology, etc.)	yes	under development
• Tumor diagnosis and case data to regional cancer registry*****	yes	under development
Other lab-related IT vendors' systems to which LIS has an interface	Sunquest, Orchard	Sunquest, Cerner, Epic
Lab automation systems or workcells to which LIS can interface	none (planned for future)	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Thermo Scientific, Olympus America, Roche, Abbott
LIS allows third-party updates of tables and rules	no	no
LIS allows for image capture, display, reporting	yes	yes
LIS provides indexed field in each test definition for LOINC code	yes	yes
Provide LOINC dictionary for each new installation	yes	no
LIS supports use of SNOMED CT	no	yes
Use third-party middleware for LIS/instrument interfaces	no (interface directly)	no (interface directly)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	—	0
Source code/User group that meets on established schedule	no/no	no/no
Methods by which users can tailor LIS in their own setting	ad hoc query tools, dictionary settings	wraparound programming
Standard software maintenance fee covers periodic updates to LIS	yes	yes
Cost for software modifications to comply with federal regulations and laws	standard (no charge)	standard (no charge)
LIS functionality available via ASP or cloud-based data center	no	no
Cost for smallest existing LIS install (includes hardware, software, install, training)	\$9,000 (annual maintenance fee, \$1,404)	\$16,000 (annual maintenance fee, \$3,200)
Cost for largest existing LIS install (includes hardware, software, install, training)	\$180,000 (annual maintenance fee, \$32,000)	\$75,000 (annual maintenance fee, \$15,000)
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> • single module for hematology/chemistry, microbiology, pathology, toxicology, and molecular testing • specimen-centric system for clinical, industrial, research, and environmental laboratories • integrated client, insurance, and patient billing (primary and secondary) with medical necessity tool and accounts receivable system 	<ul style="list-style-type: none"> • more than 200 workflow variables • custom reports at no extra charge • centralized management for multi-site customers
*any system or model		
**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		
****HL7 2.5.1, LOINC, SNOMED, etc.		
*****using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 4.0, April 2011 ed.		
Note: a dash in lieu of an answer means company did not answer question or question is not applicable		

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Part 2 of 11	Aspyra LLC Gary Bennett gbenett@aspysra.com 7400 Baymeadows Way, Suite 101 Jacksonville, FL 32256 800-437-9000 ext. 671 www.aspysra.com	BtB Software LLC Bob Freeman info@btbsoftware.com P.O. Box 845 Bayside, CA 95524-0845 707-502-2821 www.btbsoftware.com	Cerner Jennifer Smith jennifer.smith@cerner.com 2800 Rockcreek Parkway Kansas City, MO 64117 816-201-3923 www.cerner.com
See captodayonline.com/productguides for an interactive version of guide			
Name of laboratory information system	CyberLAB	Public Health Laboratory	Cerner Millennium PathNet
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	1982/August 2016	1990/August 2016	1982/September 2016
Last major release or update of featured LIS	March 2016 (version 7.3.2)	July 2015 (version 5.4.1.nnn)	January 2015 (version 2015.01)
Total No. of contracts for sites operating LIS	66	2	tracked by domain, not contract
• Hospital/Independent lab contracts in U.S.	7/13	0/0	—
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	18/2	0/2	—
• Contracts for other U.S. sites/Contracts for foreign sites	22 (reference and specialty labs)/4 (independent labs)	0/0	—
Percentage of contracts that are for sites where company has no other software installed	60%	100%	20%
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	3 (0/3/0)	—	tracked by domain, not contract
Total No. of sites operating LIS/No. of those sites that are outside U.S.	296/33 (Malaysia, Singapore, Hong Kong, Vietnam, Cambodia, Myanmar, Jamaica)	2/0	tracked by domain, not site (installed in Australia, Brazil, Canada, Cayman Islands, Egypt, Malaysia, Qatar, Saudi Arabia, Singapore, U.K., United Arab Emirates)
No. of sites that went live between August 2015–August 2016	3	1	tracked by domain, not site
Percentage of high-volume** sites installed/Low-volume*** sites installed	38%/62%	0/100%	—
Provide list of installed client sites to potential customers on request	yes (partial list of comparable sites)	yes (complete list but prospective client must sign a nondisclosure agreement)	yes (partial list of comparable sites)
Clients restricted from sharing their experience with company or LIS	no	no	no
No. of employees in entire company	26	4	23,000+
• No. of employees dedicated to LIS development, installation, and support	14	2	300+
Range in No. of user workstations in sites operating LIS	2–148 (average, 70)	10 per site	not tracked
Central hardware or service type	on site or cloud hosted	Microsoft SQL server, any compatible hardware	client hosted (IBM, HP) or Cerner hosted
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	manual intervention necessary to restore operation	manual intervention necessary to restore operation or system continues uninterrupted (user's option)
Programming language(s)	C+, Visual Basic, HTML5, Cobol	Visual Studio	Java, Visual Basic, C++, C#, Visual C
Operating system(s)	Microsoft Windows, Red Hat Enterprise Linux	Windows 7 and higher	HP-UX, AIX, VMS
Databases and tools	Microsoft SQL	Microsoft SQL	Oracle
System includes full transaction logging	yes	yes	yes
Languages (other than English) offered on system	Chinese and Vietnamese (for results reporting only)	—	British-English, German, Spanish, French
Features/modules incorporated in product:			
• Chemistry and hematology/Bar-coded collection labels	installed/installed	available but not installed/installed	installed/installed
• Microbiology/Public health microbiology	installed/installed	installed/installed	installed/installed
• Blood bank donor/Blood bank transfusion	not available/not available	not available/not available	installed/installed
• Surgical pathology/Cytology	installed/installed	not available/not available	installed/installed
• Molecular pathology/Cytogenetics/Flow cytometry	installed/installed/installed	not available/not available/not available	installed/installed/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	not available	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	available but not installed/installed	installed/installed
• EHR interface for packaging results into PDF format	installed	installed	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	installed/installed	installed/not available	installed/installed
• Ad hoc reporting/Rules-based system	installed/installed	installed/installed	installed/installed
• Management and statistical reporting	installed	installed	installed
• Connection to provider offices	installed	installed	installed
• Commercial laboratory functionality	installed	installed	installed
• Compliance checking/Billing and accounts receivable	installed/not available	installed/installed	installed/installed
• Materials management and inventory	installed	available but not installed	installed
• Test partition/Remote faxing or printing	installed/installed	installed/installed	installed/installed
• HIPAA-standard transaction formats	installed	installed	installed
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	available but not installed/available but not installed	installed/installed
• Specimen management and tracking	installed	installed	installed
• Compliance and quality assurance tools/Environmental health	installed/available but not installed	installed/installed	installed/installed
• Business analytics	under development	installed	installed
• Reference lab interface for orders, results return, status return	installed	installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:			
• Microbiology data (culture and sensitivity)	yes	yes	yes
• Other reportable diseases (blood, lead, immunology, etc.)	yes	yes	yes
• Tumor diagnosis and case data to regional cancer registry*****	yes	no	yes
Other lab-related IT vendors' systems to which LIS has an interface	Allscripts, Healthland, Greenway, CPSI, NextGen, Keane, GE, Epic, McKesson, Cerner, Meditech, Siemens, others	—	EMR lab outbound interfaces with McKesson, Siemens, Epic, Allscripts, Meditech, others
Lab automation systems or workcells to which LIS can interface	Beckman Coulter, Siemens, Ortho, Labotix Automation, Thermo Scientific, Olympus, Roche, Abbott	none	Beckman Coulter, Siemens, Labotix Automation, Olympus America, Roche Diagnostics, Abbott, BD, Copan Diagnostics
LIS allows third-party updates of tables and rules	no	—	no
LIS allows for image capture, display, reporting	yes	yes	yes
LIS provides indexed field in each test definition for LOINC code	yes	yes	yes
Provide LOINC dictionary for each new installation	yes	yes	yes
LIS supports use of SNOMED CT	yes	yes	yes
Use third-party middleware for LIS/instrument interfaces	yes (use a combination of direct interfaces and third-party middleware)	yes (use a combination of direct interfaces and third-party middleware)	no (interface directly)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	0	0	—
Source code/User group that meets on established schedule	optional/yes (meets via webinar and conference call)	escrow/yes (meets via webinar)	no/yes (meets in person and via webinar)
Methods by which users can tailor LIS in their own setting	ad hoc query tools, user-defined interfaces, dictionary settings, Microsoft SQL Reporting Services	ad hoc query tools, user-defined interfaces, dictionary settings	wraparound programming, ad hoc query tools, user-defined interfaces, dictionary settings, others
Standard software maintenance fee covers periodic updates to LIS	yes	yes	yes
Cost for software modifications to comply with federal regulations and laws	optional (extra cost)	standard (no charge)	standard (no charge)
LIS functionality available via ASP or cloud-based data center	available as either a standalone product or ASP or cloud-based product (client's option); 3-year min. commitment for cloud/ASP offering plus install/training fees	available as a standalone product or ASP or cloud-based product (client's option); for the latter, core module \$50,000, other modules \$5,000–\$20,000	available as either a standalone product or an ASP or cloud-based product (client's option)
Cost for smallest existing LIS install (includes hardware, software, install, training)	\$40,000 (annual maintenance fee, \$5,000)	\$52,000 (annual maintenance fee, \$9,600)	—
Cost for largest existing LIS install (includes hardware, software, install, training)	\$750,000 (annual maintenance fee, \$85,000)	\$153,000 (annual maintenance fee, \$28,000)	—
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> • full-service laboratory solution dedicated to driving productivity, reporting, patient safety, and revenue • strong multi-site capability with remote instrument interface options • CyberLAB Essentials for 1 to 15 user labs at under \$20,000 upfront, then pay by accession or subscription 	<ul style="list-style-type: none"> • all public health, including dairy, rabies • CalRedie (HL7) reportable diseases • user customization for all fields 	<ul style="list-style-type: none"> • driving innovations to connect laboratories, customers, and devices, allowing organizations to grow their business • best-of-breed LIS with a large standalone and enterprisewide client base • innovating for personalized medicine
*any system or model			
**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			
****HL7 2.5.1, LOINC, SNOMED, etc.			
*****using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 4.0, April 2011 ed.			
Note: a dash in lieu of an answer means company did not answer question or question is not applicable			

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Part 3 of 11	Clinical Information Systems A. Woolley cissupport@aol.com 18805 Willamette Drive West Linn, OR 62218 503-699-9745 www.cislab.com	Clinical Software Solutions Emily Brester info@clin1.com P.O. Box 529 Queen Creek, AZ 85142 800-570-0474 www.clin1.net	Clinlab Allen Wilson awilson@clinlabinc.com 116 Treemont Drive Orange City, FL 32763 800-487-5227 www.clinlabinc.com
See captodayonline.com/productguides for an interactive version of guide			
Name of laboratory information system	CISLAB	CLIN1 Laboratory†	Clinlab LIS
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	1981/September 2016	1987/August 2016	1987/June 2016
Last major release or update of featured LIS	—	July 2016 (version 11.5)	June 2016 (version 8.003)
Total No. of contracts for sites operating LIS	25	60	21
• Hospital/Independent lab contracts in U.S.	0/19	10/32	2/6
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	0/1	10/0	12/1
• Contracts for other U.S. sites/Contracts for foreign sites	0/5	5/3	0/0
Percentage of contracts that are for sites where company has no other software installed	100%	—	100%
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	—	1 (0/0/1—clinic)	1 (0/0/1—public health)
Total No. of sites operating LIS/No. of those sites that are outside U.S.	25/5 (Saipan, FSM)	60/3 (Canada, U.K., New Zealand)	21/0
No. of sites that went live between August 2015–August 2016	2	4	4
Percentage of high-volume** sites installed/Low-volume*** sites installed	0/100%	10%/90%	55%/45%
Provide list of installed client sites to potential customers on request	no (information is confidential)	yes (partial list of comparable sites)	yes (partial list of comparable sites)
Clients restricted from sharing their experience with company or LIS	no	no	no
No. of employees in entire company	8	12	7
• No. of employees dedicated to LIS development, installation, and support	8	6	7
Range in No. of user workstations in sites operating LIS	3–100 (average, 55)	3–150 (average, 10)	3–100 (average, 5)
Central hardware or service type	—	client/server	Dell
How central server failure is handled	—	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	manual intervention necessary to restore operation
Programming language(s)	Delphi, Visual Basic, Cobol	4GL	C#
Operating system(s)	Window, SCO Unix	Windows	Microsoft Windows
Databases and tools	Microsoft SQL	SQL	Sybase
System includes full transaction logging	no	yes	no
Languages (other than English) offered on system	Chinese for reporting	—	—
Features/modules incorporated in product:			
• Chemistry and hematology/Bar-coded collection labels	installed/installed	installed/installed	installed/installed
• Microbiology/Public health microbiology	installed/installed	installed/available but not installed	installed/installed
• Blood bank donor/Blood bank transfusion	installed/installed	available but not installed/available but not installed	not available/not available
• Surgical pathology/Cytology	installed/installed	installed/installed	not available/not available
• Molecular pathology/Cytogenetics/Flow cytometry	under development/not available/under development	installed/installed/available but not installed	installed/installed/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	installed	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	installed/installed	installed/installed
• EHR interface for packaging results into PDF format	installed	installed	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	installed/installed	installed/installed	under development/under development
• Ad hoc reporting/Rules-based system	available but not installed/installed	installed/installed	installed/installed
• Management and statistical reporting	installed	installed	installed
• Connection to provider offices	installed	installed	installed
• Commercial laboratory functionality	installed	installed	installed
• Compliance checking/Billing and accounts receivable	installed/installed	installed/installed	not available/not available
• Materials management and inventory	installed	installed	not available
• Test partition/Remote faxing or printing	installed/installed	installed/installed	installed/installed
• HIPAA-standard transaction formats	installed	installed	installed
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	installed/installed	installed/installed
• Specimen management and tracking	installed	installed	installed
• Compliance and quality assurance tools/Environmental health	installed/installed	installed/available but not installed	installed/installed
• Business analytics	installed	installed	installed
• Reference lab interface for orders, results return, status return	installed	installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:			
• Microbiology data (culture and sensitivity)	yes	yes	under development
• Other reportable diseases (blood, lead, immunology, etc.)	yes	yes	under development
• Tumor diagnosis and case data to regional cancer registry*****	yes	under development	no
Other lab-related IT vendors' systems to which LIS has an interface	—	Allscripts, GE Healthcare, Greenway, Healthland, NextGen, McKesson, Siemens, others	—
Lab automation systems or workcells to which LIS can interface	planned for future to Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Thermo Scientific, Olympus America, Roche Diagnostics, Abbott Diagnostics	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Labotix Automation, Thermo Scientific, Olympus America, Roche Diagnostics, Abbott Diagnostics	Beckman Coulter, Siemens, Olympus America, Roche Diagnostics
LIS allows third-party updates of tables and rules	no	no	no
LIS allows for image capture, display, reporting	yes	yes	no
LIS provides indexed field in each test definition for LOINC code	yes	yes	yes
Provide LOINC dictionary for each new installation	no	no	yes
LIS supports use of SNOMED CT	yes	yes	no
Use third-party middleware for LIS/instrument interfaces	no (interface directly)	no (interface directly)	yes (use a combination of direct interfaces and third-party middleware)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	100% (all use Clinical Information Systems' PPID software)	100% (all use Clinical Software Solutions' PPID software)	—
Source code/User group that meets on established schedule	no/no	no/yes (meets via webinar and conference call)	no/no
Methods by which users can tailor LIS in their own setting	dictionary settings	ad hoc query tools, dictionary settings	ad hoc query tools, dictionary settings
Standard software maintenance fee covers periodic updates to LIS	yes	yes	yes
Cost for software modifications to comply with federal regulations and laws	depends on contract	standard (no charge)	standard (no charge)
LIS functionality available via ASP or cloud-based data center	available as either a standalone product or an ASP or cloud-based product (client's option)	available as either a standalone product or an ASP or cloud-based product (client's option)	no
Cost for smallest existing LIS install (includes hardware, software, install, training)	—	\$15,000 (annual maintenance fee, \$3,000)	\$10,000 (annual maintenance fee, \$1,500)
Cost for largest existing LIS install (includes hardware, software, install, training)	—	\$350,000 (annual maintenance fee, \$75,000)	\$100,000 (annual maintenance fee, \$15,000)
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> • user friendly • company will write custom programs • low cost 	<ul style="list-style-type: none"> • interfacing with other vendors' systems (EHR/EMR, reference labs, public health) simplified and cost effective • custom programming available • document scanning built in for gels, graphs, consent forms, chain of custody, etc. 	<ul style="list-style-type: none"> • small basis and footprint • easy user interface • real-time interfaces
*any system or model			
**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			
****HL7 2.5.1, LOINC, SNOMED, etc.			
*****using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 4.0, April 2011 ed.			
Note: a dash in lieu of an answer means company did not answer question or question is not applicable			
		†formerly CSSWin LIS	

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Part 4 of 11	CLTECH International Corp. Javier Marrero jmarrero@cltech.net 11098 Biscayne Blvd., Suite 401-7 Miami, FL 33161 305-915-8799 www.cltech.net	Common Cents Systems Carl Barringer carl.barringer@apollolims.com P.O. Box 110514 Nashville, TN 37222 800-805-9278 www.apollolims.com	Comp Pro Med Jeff Fisher sales@comppromed.com 3418 Mendocino Ave. Santa Rosa, CA 95403 800-276-4522 www.comppromed.com
See captodayonline.com/productguides for an interactive version of guide			
Name of laboratory information system	ECLIPSE	ApolloLIMS [†]	Polytech
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	2001/August 2016	1987/August 2016	1981/August 2016
Last major release or update of featured LIS	May 2016 (version 2.5)	May 2016 (version 8.0.0.4)	May 2015 (version 8.5.6)
Total No. of contracts for sites operating LIS	606	60	152
• Hospital/Independent lab contracts in U.S.	0/32	1/41	28/14
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	4/0	2/16	34/0
• Contracts for other U.S. sites/Contracts for foreign sites	0/570 (hospitals, independent labs)	0/0	7 (veterinary, teaching, research)/69 (national and regional hospital labs, government labs)
Percentage of contracts that are for sites where company has no other software installed	—	100%	100%
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	8 (0/8/0)	2 (0/2/0)	10 (2/2/6—regional clinics)
Total No. of sites operating LIS/No. of those sites that are outside U.S.	606/570 (Latin America)	58/0	152/69
No. of sites that went live between August 2015–August 2016	94	6	8
Percentage of high-volume** sites installed/Low-volume*** sites installed	30%/70%	40%/60%	20%/80%
Provide list of installed client sites to potential customers on request	yes (complete list but prospective client must sign a nondisclosure agreement)	dependent on type of lab	no (information is confidential)
Clients restricted from sharing their experience with company or LIS	no	no	yes
No. of employees in entire company	60	18	13
• No. of employees dedicated to LIS development, installation, and support	49	14	8
Range in No. of user workstations in sites operating LIS	2–180+ (average, 15)	4–60 (average, 12)	2–200 (average, 20)
Central hardware or service type	Intel Java	Microsoft server	any (client supported)
How central server failure is handled	manual intervention necessary to restore operation	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	system continues uninterrupted; Edge Computing Topology
Programming language(s)	Java, GWT	Delphi, SQL	C++
Operating system(s)	Windows, Macintosh	Microsoft server	Windows XP, Vista, 7, 8, 10
Databases and tools	Microsoft SQL server	InterSystems Caché, Microsoft SQL	Pervasive
System includes full transaction logging	yes	yes	yes
Languages (other than English) offered on system	Spanish	—	all languages supported by Microsoft OS
Features/modules incorporated in product:			
• Chemistry and hematology/Bar-coded collection labels	installed/installed	installed/installed	installed/installed
• Microbiology/Public health microbiology	installed/available but not installed	installed/installed	installed/installed
• Blood bank donor/Blood bank transfusion	installed/installed	not available/not available	under development/under development
• Surgical pathology/Cytology	installed/installed	not available/not available	installed/installed
• Molecular pathology/Cytogenetics/Flow cytometry	available but not installed/under development/under development	not available/not available/not available	installed/installed/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	installed	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	installed/installed	installed/installed
• EHR interface for packaging results into PDF format	installed	installed	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	under development/under development	installed/not available	installed/installed
• Ad hoc reporting/Rules-based system	installed/installed	installed/installed	installed/installed
• Management and statistical reporting	installed	installed	installed
• Connection to provider offices	installed	installed	installed
• Commercial laboratory functionality	installed	installed	installed
• Compliance checking/Billing and accounts receivable	installed/installed	installed/installed	installed/installed
• Materials management and inventory	installed	installed	under development
• Test partition/Remote faxing or printing	installed/installed	installed/installed	installed/installed
• HIPAA-standard transaction formats	installed	installed	installed
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	installed/installed	installed/installed
• Specimen management and tracking	installed	installed	installed
• Compliance and quality assurance tools/Environmental health	installed/under development	installed/installed	installed/under development
• Business analytics	installed	installed	installed
• Reference lab interface for orders, results return, status return	installed	installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:			
• Microbiology data (culture and sensitivity)	yes	yes	yes
• Other reportable diseases (blood, lead, immunology, etc.)	yes	yes	yes
• Tumor diagnosis and case data to regional cancer registry*****	no	no	yes
Other lab-related IT vendors' systems to which LIS has an interface	—	Siemens, Allscripts, Meditech, Sunquest	GE, eClinicalWorks, Siemens, Allscripts, others
Lab automation systems or workcells to which LIS can interface	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Thermo Scientific, Olympus America, Roche, Abbott	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Thermo Scientific, Olympus America, Roche, Abbott	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Thermo Scientific, Olympus America, Roche, Abbott
LIS allows third-party updates of tables and rules	yes (from CodeMap, Quest)	no	yes (from Regenstrief Institute, CMS, others)
LIS allows for image capture, display, reporting	yes	yes	yes
LIS provides indexed field in each test definition for LOINC code	yes	yes	yes
Provide LOINC dictionary for each new installation	no	yes	yes
LIS supports use of SNOMED CT	no	yes	yes
Use third-party middleware for LIS/instrument interfaces	no (interface directly)	no (interface directly)	no (interface directly)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	—	—	100% (90% of total use Comp Pro Med's PPID software/10% of total use third-party PPID software via interface)
Source code/User group that meets on established schedule	no/yes (meets via conference call)	escrow/yes (meets via conference call)	no/no
Methods by which users can tailor LIS in their own setting	ad hoc query tools	wraparound programming, ad hoc query tools, user-defined interfaces, dictionary settings	wraparound programming, ad hoc query tools, user-defined interfaces, dictionary settings
Standard software maintenance fee covers periodic updates to LIS	yes	yes	yes
Cost for software modifications to comply with federal regulations and laws	standard (no charge)	standard (no charge)	standard (no charge)
LIS functionality available via ASP or cloud-based data center	no	available as either a standalone product or an ASP or cloud-based product (client's option); the latter based on implementation fee and monthly usage fee	no
Cost for smallest existing LIS install (includes hardware, software, install, training)	\$8,500 (annual maintenance fee, \$1,125)	\$64,000 (annual maintenance fee, \$9,720)	—
Cost for largest existing LIS install (includes hardware, software, install, training)	\$350,000 (annual maintenance fee, \$53,000)	\$666,000 (annual maintenance fee, \$112,000)	—
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> configurable to work for a small lab or a larger laboratory system with multiple branches can be interfaced bidirectionally with any EMR/EHR system and any instrument using HL7 and ASTM protocols a billing module can be added at any time, affordably, speeding up invoicing and maximizing laboratory reimbursements 	<ul style="list-style-type: none"> flexible, rules-based, highly efficient database structure combined with a rules-based architecture intuitive user interface—assists with rapid training and deployment fully integrated—all lab disciplines; QC; imaging; instrument and EMR interfaces; QA; more 	<ul style="list-style-type: none"> highly customizable; feature rich; intuitive GUI; easy-to-use; toxicology/pathology/EMR; ICD-10/HL7 over 35 years of industry expertise; outstanding system engineer support team; user requests receive priority implementation plug-and-play; seamless direct analyzer/application interfaces; comprehensive reporting; no scope creep; no hidden costs
*any system or model			
**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			
****HL7 2.5.1, LOINC, SNOMED, etc.			
*****using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 4.0, April 2011 ed.			
Note: a dash in lieu of an answer means company did not answer question or question is not applicable			

LABORATORY INFORMATION SYSTEMS

Part 5 of 11	CompuGroup Medical Gene Williamson gene.williamson@cgm.com 10715 Red Run Blvd., Suite 101 Owings Mills, MD 21117 410-517-0330 www.cgmus.com	Computer Service & Support M. Burdimo m.burdimo@csslis.com 2106 New Rd., Suites E6 & 7 Linwood, NJ 08221 609-653-6444 www.csslis.com	Diamond Computing Jim Campbell jim@diamondcomputing.net 2345 Fourth St. Tucker, GA 30084 800-486-5980 www.diamondcomputing.net
See captodayonline.com/productguides for an interactive version of guide			
Name of laboratory information system	CGM LABDAQ†	Avalon	LabGEM
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	1991/August 2016	1980/September 2016	1984/July 2016
Last major release or update of featured LIS	February 2016 (version CGM LABDAQ 4.13)	June 2016 (version 2.1)	July 2015 (version 8.15.001)
Total No. of contracts for sites operating LIS	2,931	115	26
• Hospital/Independent lab contracts in U.S.	121/471	0/87	3/19
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	2,329/0	10/2	3/1
• Contracts for other U.S. sites/Contracts for foreign sites	0/10 (clinics, reference labs)	13 (toxicology, pain management)/3	0/0
Percentage of contracts that are for sites where company has no other software installed	100%	—	50%
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	28 (1/11/16—physician offices, clinics)	4	1 (0/1/0)
Total No. of sites operating LIS/No. of those sites that are outside U.S.	3,545/10 (Dubai, Abu Dhabi, Longawai, Malawi, Virgin Islands, Panama)	115/3 (United Arab Emirates, Canada)	26/0
No. of sites that went live between August 2015–August 2016	127	10	3
Percentage of high-volume** sites installed/Low-volume*** sites installed	not tracked	38%/62%	70%/30%
Provide list of installed client sites to potential customers on request	yes (partial list of comparable sites)	yes (partial list of comparable sites)	yes (complete list with no restrictions regarding its use)
Clients restricted from sharing their experience with company or LIS	no	no	no
No. of employees in entire company	250	14	7
• No. of employees dedicated to LIS development, installation, and support	77	14	7
Range in No. of user workstations in sites operating LIS	1–150+ (average, 5–10)	2–100+ (average, 18)	3–600 (average, 30)
Central hardware or service type	client/server (business grade)	IBM RS/6000 power servers	Intel/Dell
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	manual intervention necessary to restore operation or system continues uninterrupted (user's option)
Programming language(s)	.Net, C#, Delphi	Java, PHP, C++	Visual Basic, MUMPS, .Net
Operating system(s)	Windows Server 2012 R2, Windows 10 Professional	AIX, Linux	Windows
Databases and tools	Oracle	MySQL	Caché
System includes full transaction logging	yes	yes	yes
Languages (other than English) offered on system	none	—	none
Features/modules incorporated in product:			
• Chemistry and hematology/Bar-coded collection labels	installed/installed	installed/installed	installed/installed
• Microbiology/Public health microbiology	installed/installed	installed/under development	installed/installed
• Blood bank donor/Blood bank transfusion	not available/not available	not available/not available	not available/not available
• Surgical pathology/Cytology	installed/installed	installed/not available	installed/installed
• Molecular pathology/Cytogenetics/Flow cytometry	installed/not available/installed	not available/not available/not available	installed/installed/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	installed	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	installed/installed	installed/installed
• EHR interface for packaging results into PDF format	installed	installed	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	not available/not available	installed/installed	not available/not available
• Ad hoc reporting/Rules-based system	installed/installed	installed/installed	installed/installed
• Management and statistical reporting	installed	installed	installed
• Connection to provider offices	installed	installed	installed
• Commercial laboratory functionality	installed	installed	installed
• Compliance checking/Billing and accounts receivable	installed/not available	under development/installed	installed/installed
• Materials management and inventory	under development	installed	not available
• Test partition/Remote faxing or printing	installed/installed	installed/installed	installed/installed
• HIPAA-standard transaction formats	installed	installed	installed
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	installed/installed	installed/installed
• Specimen management and tracking	installed	installed	installed
• Compliance and quality assurance tools/Environmental health	installed/not available	installed/not available	installed/installed
• Business analytics	installed	installed	installed
• Reference lab interface for orders, results return, status return	installed	installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:			
• Microbiology data (culture and sensitivity)	yes	yes	yes
• Other reportable diseases (blood, lead, immunology, etc.)	yes	yes	yes
• Tumor diagnosis and case data to regional cancer registry*****	no	no	yes
Other lab-related IT vendors' systems to which LIS has an interface	Cerner, Sunquest, NovoPath, Healthland, McKesson, Meditech, Epic, Siemens, others	GE Healthcare, McKesson, Allscripts, SCC Soft Computer, eClinicalWorks, Orchard, NextGen, Epic, others	Cerner, McKesson, eClinicalWorks, Orchard, others
Lab automation systems or workcells to which LIS can interface	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Roche Diagnostics	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Labotix Automation, Thermo Scientific, Olympus America, Roche Diagnostics, Abbott Diagnostics	none
LIS allows third-party updates of tables and rules	yes (from CodeMap)	no	no
LIS allows for image capture, display, reporting	yes	yes	—
LIS provides indexed field in each test definition for LOINC code	yes	yes	yes
Provide LOINC dictionary for each new installation	no	no	yes
LIS supports use of SNOMED CT	yes	yes	yes
Use third-party middleware for LIS/instrument interfaces	no (interface directly)	no (interface directly)	no (interface directly)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	0	98%	—
Source code/User group that meets on established schedule	escrow/yes (meets in person)	escrow/no	escrow/no
Methods by which users can tailor LIS in their own setting	ad hoc query tools, user-configurable rules, user-defined fields for patient information, others	wraparound programming, ad hoc query tools, user-defined interfaces, dictionary settings, access to SQL database	ad hoc query tools, user-defined interfaces, dictionary settings
Standard software maintenance fee covers periodic updates to LIS	yes	yes	yes
Cost for software modifications to comply with federal regulations and laws	standard (no charge)	standard (no charge)	standard (no charge)
LIS functionality available via ASP or cloud-based data center	no	available as either a standalone product or an ASP or cloud-based product (client's option)	no
Cost for smallest existing LIS install (includes hardware, software, install, training)	\$12,000 (annual maintenance fee, \$1,440)	\$25,000 (annual maintenance fee, \$4,000)	—
Cost for largest existing LIS install (includes hardware, software, install, training)	\$700,000 (annual maintenance fee, \$91,000)	\$175,000 (annual maintenance fee, \$44,000)	—
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> advanced integration and connectivity capabilities with EHRs, billing, reference labs, and analyzers powerful user-defined rules and data queries to assist with decision support and data analytics experienced, responsive support staff, sales personnel, and system integration department for complete system support 	<ul style="list-style-type: none"> ease of use and training ease of integration with other products ease of access to database for internal use 	<ul style="list-style-type: none"> cost functionality service
*any system or model			
**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			
****HL7 2.5.1, LOINC, SNOMED, etc.			
*****using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 4.0, April 2011 ed.			
Note: a dash in lieu of an answer means company did not answer question or question is not applicable			
	†formerly marketed by Antek HealthWare as LabDAQ		

LABORATORY INFORMATION SYSTEMS

Part 6 of 11	Epic Melissa Hunter mhunter@epic.com 1979 Milky Way Verona, WI 53593 608-271-9000 www.epic.com	Evident Sales Department sales@evident.com 6600 Wall St. Mobile, AL 36695 800-711-2774 www.evident.com	HEX Laboratory Systems Susan Bollinger sbollinger@hexlab.com 1042B El Camino Real, Suite 308 Encinitas, CA 92024 800-729-2085 www.hexlab.com
See captodayonline.com/productguides for an interactive version of guide			
Name of laboratory information system	Beaker Laboratory Information System	Thrive EHR–LIS [†]	LAB/HEX
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	1980/September 2016	1986/September 2016	1981/June 2016
Last major release or update of featured LIS	June 2015 (version June 2015)	October 2014 (version 19)	April 2016 (version lh82a)
Total No. of contracts for sites operating LIS	91	518	156
• Hospital/Independent lab contracts in U.S.	88/0	517/1	10/83
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	0/1	0/0	41/2
• Contracts for other U.S. sites/Contracts for foreign sites	0/2	0/0	9 (veterinary, research)/11 (independent labs)
Percentage of contracts that are for sites where company has no other software installed	—	1%	100%
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	38 (38/0/0)	3 (3/0/0)	0
Total No. of sites operating LIS/No. of those sites that are outside U.S.	350/—	518/0	171/11 (Middle East)
No. of sites that went live between August 2015–August 2016	24	15	2
Percentage of high-volume** sites installed/Low-volume*** sites installed	40%/60%	1%/99%	56%/44%
Provide list of installed client sites to potential customers on request	yes (complete list with no restrictions regarding its use)	no (information is confidential)	yes (partial list of comparable sites)
Clients restricted from sharing their experience with company or LIS	no	no	no
No. of employees in entire company	10,000	1,983	13
• No. of employees dedicated to LIS development, installation, and support	250	351	13
Range in No. of user workstations in sites operating LIS	—	6–500 (average, 100)	3–64 (average, 24)
Central hardware or service type	HP 9000, HP Integrity, Sun Sparc, IBM p5 Series	IBM x3850	Intel RAID
How central server failure is handled	system continues uninterrupted	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	manual intervention necessary to restore operation or system continues uninterrupted (user's option)
Programming language(s)	Visual Basic, Caché, C#, ASP .NET, JavaScript	Visual C++	Thoroughbred
Operating system(s)	Unix, Windows	Linux	Linux
Databases and tools	Chronicles Extended Relational Database Management System	SQL	Thoroughbred Idol-IV
System includes full transaction logging	yes	yes	yes
Languages (other than English) offered on system	—	none	Spanish
Features/modules incorporated in product:			
• Chemistry and hematology/Bar-coded collection labels	installed/installed	installed/installed	installed/installed
• Microbiology/Public health microbiology	installed/installed	installed/not available	installed/installed
• Blood bank donor/Blood bank transfusion	not available/not available	installed/installed	not available/not available
• Surgical pathology/Cytology	installed/installed	installed/installed	installed/installed
• Molecular pathology/Cytogenetics/Flow cytometry	installed/installed/installed	not available/not available/not available	installed/installed/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	installed	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	installed/installed	installed/installed
• EHR interface for packaging results into PDF format	installed	installed	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	under development/under development	installed/installed	installed/installed
• Ad hoc reporting/Rules-based system	installed/installed	installed/installed	installed/installed
• Management and statistical reporting	installed	installed	installed
• Connection to provider offices	installed	installed	installed
• Commercial laboratory functionality	installed	installed	installed
• Compliance checking/Billing and accounts receivable	installed/installed	installed/installed	installed/installed
• Materials management and inventory	not available	installed	installed
• Test partition/Remote faxing or printing	installed/installed	installed/installed	installed/installed
• HIPAA-standard transaction formats	installed	installed	installed
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	installed/installed	installed/installed
• Specimen management and tracking	installed	not available	installed
• Compliance and quality assurance tools/Environmental health	installed/installed	installed/not available	installed/installed
• Business analytics	installed	under development	installed
• Reference lab interface for orders, results return, status return	installed	installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:			
• Microbiology data (culture and sensitivity)	yes	yes	yes
• Other reportable diseases (blood, lead, immunology, etc.)	yes	yes	yes
• Tumor diagnosis and case data to regional cancer registry*****	yes	yes	yes
Other lab-related IT vendors' systems to which LIS has an interface	Mediware, Haemonetics, Cerner, SCC Soft Computer, Sunquest, Meditech	Dawning Technologies	Cerner, Orchard, CompuGroup Medical, Allscripts, Emdeon, NextGen, Greenway, others
Lab automation systems or workcells to which LIS can interface	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Roche Diagnostics, Abbott Diagnostics	Beckman Coulter, Siemens, Ortho, Labotix Automation, Thermo Scientific, Olympus, Roche, Abbott	Beckman Coulter, Siemens, Roche Diagnostics, Abbott Diagnostics
LIS allows third-party updates of tables and rules	no	yes (from Micromedex)	yes (from CodeMap, others)
LIS allows for image capture, display, reporting	yes	yes	yes
LIS provides indexed field in each test definition for LOINC code	yes	yes	yes
Provide LOINC dictionary for each new installation	no	yes	no
LIS supports use of SNOMED CT	yes	yes	yes
Use third-party middleware for LIS/instrument interfaces	yes (for all instrument interfaces)	yes (for all instrument interfaces)	no (interface directly)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	70% (all of total use Epic's PPID software)	100% (80% of total use Evident's PPID software/ 20% of total use third-party PPID software via interface)	—
Source code/User group that meets on established schedule	yes/yes (meets via webinar, conference call, and in person)	escrow/yes (meets in person)	escrow/no
Methods by which users can tailor LIS in their own setting	wraparound programming, ad hoc query tools, user-defined interfaces, dictionary settings	ad hoc query tools, dictionary settings, table maintenance	wraparound programming, ad hoc query tools, user-defined interfaces, dictionary settings, flags, others
Standard software maintenance fee covers periodic updates to LIS	yes	yes	yes
Cost for software modifications to comply with federal regulations and laws	standard (no charge)	standard (no charge)	standard (no charge)
LIS functionality available via ASP or cloud-based data center	available as either a standalone product or an ASP or cloud-based product (client's option)	available as either a standalone product or an ASP or cloud-based product (client's option); pricing structure provided by TruBridge, a CPSI company	available as either a standalone product or an ASP or cloud-based product (client's option); the latter based on \$5,000 start-up cost plus monthly fees starting at \$500
Cost for smallest existing LIS install (includes hardware, software, install, training)	—	\$50,000 (annual maintenance fee, \$625)	\$19,000 (annual maintenance fee, \$3,600)
Cost for largest existing LIS install (includes hardware, software, install, training)	—	\$70,000 (annual maintenance fee, \$875)	\$125,000 (annual maintenance fee, \$15,000)
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> seamless native data transfer from LIS to EMR without need for interfaces or translation tables integrated PPID specimen collection with end-to-end specimen tracking from ordering to sample storage customer-driven development philosophy; customers guide design, as well as direction and prioritization of development 	<ul style="list-style-type: none"> fully integrated EHR and ONC-certified HIT company builds libraries and data dictionaries as a standard part of installation and conversion on-site training and support for all end users, not just train the trainer 	<ul style="list-style-type: none"> reasonable and flexible pricing for all size labs; stable, reliable, flexible system for all types of labs implementation and installation within weeks; 24/7 live U.S.-based support; on-site hardware support billing fully integrated or standalone; eliminates duplicate data entry; medical necessity check; electronic billing and remittance
*any system or model			
**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			
****HL7 2.5.1, LOINC, SNOMED, etc.			
*****using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 4.0, April 2011 ed.			
Note: a dash in lieu of an answer means company did not answer question or question is not applicable			
		[†] formerly CPSI System	

LABORATORY INFORMATION SYSTEMS

Part 7 of 11	LabSoft Steven Hawn sales@labsoftweb.com 2202 N. Westshore Blvd., Suite 115 Tampa, FL 33607-5749 800-767-3279 www.labsoftweb.com	LabWare Mike Kelly kelly@labware.com 3 Mill Rd., Suite 102 Wilmington, DE 19806 302-658-8444 www.labware.com	LigoLab Information Systems Suren Avunjian suren@ligolab.com 500 N. Central Ave., Suite 930 Glendale, CA 91203 800-544-6522/818-230-1307 www.ligolab.com
See captodayonline.com/productguides for an interactive version of guide			
Name of laboratory information system	LabNet	LabWare	LigoLab AP/LIS 4.0 [†]
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	1992/August 2016	1999/August 2016	2006/August 2016
Last major release or update of featured LIS	—	February 2015 (version 7)	August 2016 (version 3.7)
Total No. of contracts for sites operating LIS	300+	136	34
• Hospital/Independent lab contracts in U.S.	62/52	4/7	0/34
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	189/3	0/8	0/0
• Contracts for other U.S. sites/Contracts for foreign sites	3 (research)/0	16 (biobank, veterinary, gov., pharma, biotech)/101 (hospital, genetics, reference labs, public health, others)	0/0
Percentage of contracts that are for sites where company has no other software installed	75%	100%	—
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	0	24 (1/6/17—genetics, research pathology)	6 (0/6/0)
Total No. of sites operating LIS/No. of those sites that are outside U.S.	300+/0	232/181 (U.K., India, Portugal, Columbia, Singapore, China, Switzerland, South Africa, Kenya, many others)	41/0
No. of sites that went live between August 2015–August 2016	3	9	—
Percentage of high-volume** sites installed/Low-volume*** sites installed	15%/85%	20%/80%	75%/25%
Provide list of installed client sites to potential customers on request	yes (partial list of comparable sites)	yes (partial list of comparable sites)	yes (complete list but prospective client must sign a nondisclosure agreement)
Clients restricted from sharing their experience with company or LIS	no	no	no
No. of employees in entire company	8	645	28
• No. of employees dedicated to LIS development, installation, and support	5	65	22
Range in No. of user workstations in sites operating LIS	1–85 (average, 3)	5–600 (average, 35)	15–325 (average, 53)
Central hardware or service type	Dell, Hewlett-Packard	database server: Sun, Unix, Linux, Windows, others; application server: Windows 2008, 2012	ASP or hosted on site
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	system continues uninterrupted	manual intervention necessary to restore operation or system continues uninterrupted (user's option)
Programming language(s)	Delphi	Java, .Net, Smalltalk	Java, C++
Operating system(s)	Windows	Windows	Windows, Linux, Macintosh, iOS, Android
Databases and tools	SQL	Oracle, SQL server, PostgreSQL, DB2	Microsoft SQL, Oracle
System includes full transaction logging	no	yes	yes
Languages (other than English) offered on system	none	German, Spanish, Swedish, Chinese, many others	—
Features/modules incorporated in product:			
• Chemistry and hematology/Bar-coded collection labels	installed/installed	installed/installed	installed/installed
• Microbiology/Public health microbiology	installed/installed	installed/installed	installed/installed
• Blood bank donor/Blood bank transfusion	not available/not available	not available/not available	under development/under development
• Surgical pathology/Cytology	not available/not available	installed/installed	installed/installed
• Molecular pathology/Cytogenetics/Flow cytometry	not available/not available/not available	installed/installed/installed	installed/installed/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	installed	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	installed/installed	installed/installed
• EHR interface for packaging results into PDF format	installed	installed	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	not available/—	available but not installed/available but not installed	installed/installed
• Ad hoc reporting/Rules-based system	installed/installed	installed/installed	installed/installed
• Management and statistical reporting	installed	installed	installed
• Connection to provider offices	installed	installed	installed
• Commercial laboratory functionality	installed	installed	installed
• Compliance checking/Billing and accounts receivable	installed/not available	installed/installed	installed/installed
• Materials management and inventory	not available	installed	installed
• Test partition/Remote faxing or printing	installed/installed	installed/installed	installed/installed
• HIPAA-standard transaction formats	—	installed	installed
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	installed/installed	installed/installed
• Specimen management and tracking	installed	installed	installed
• Compliance and quality assurance tools/Environmental health	installed/not available	installed/installed	installed/not available
• Business analytics	not available	installed	installed
• Reference lab interface for orders, results return, status return	installed	installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:			
• Microbiology data (culture and sensitivity)	yes	yes	yes
• Other reportable diseases (blood, lead, immunology, etc.)	yes	yes	yes
• Tumor diagnosis and case data to regional cancer registry*****	yes	yes	yes
Other lab-related IT vendors' systems to which LIS has an interface	GE, Epic, Cerner, Meditech, Siemens, SCC, others	Meditech, Cerner, SCC Soft Computer, Epic, others	Schuyler House, CIS, Meditech, Psyche, Cortex, others
Lab automation systems or workcells to which LIS can interface	Beckman Coulter, Siemens, Olympus America, Roche Diagnostics	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Olympus America, Roche Diagnostics, Abbott	Beckman Coulter, Siemens, Ortho, Labotix Automation, Thermo Scientific, Olympus, Roche, Abbott, m-u-t America
LIS allows third-party updates of tables and rules	no	yes (from Bio-Rad, SNOMED [IHTSDO], others)	no
LIS allows for image capture, display, reporting	—	yes	yes
LIS provides indexed field in each test definition for LOINC code	yes	yes	yes
Provide LOINC dictionary for each new installation	no	no	yes
LIS supports use of SNOMED CT	yes	yes	yes
Use third-party middleware for LIS/instrument interfaces	no (interface directly)	no (interface directly)	no (interface directly)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	0	2% (all use third-party PPID software via interface)	—
Source code/User group that meets on established schedule	no/no	optional/yes (meets via webinar and in person)	escrow/yes (meets via webinar, conference call, and in person)
Methods by which users can tailor LIS in their own setting	—	ad hoc query tools, user-defined interfaces, dictionary settings, rules engine, workflow configuration tools, others	ad hoc query tools, user-defined interfaces, dictionary settings, rules engine, others
Standard software maintenance fee covers periodic updates to LIS	yes	yes	yes
Cost for software modifications to comply with federal regulations and laws	standard (no charge)	standard (no charge)	standard (no charge)
LIS functionality available via ASP or cloud-based data center	no	no (ASP model under development)	available as a standalone product or ASP or cloud-based product (client's option); for the latter, no upfront licensing fee—per case pricing based on case type
Cost for smallest existing LIS install (includes hardware, software, install, training)	\$10,000 (annual maintenance fee, \$1,000)	\$85,000 (annual maintenance fee, \$6,000)	—
Cost for largest existing LIS install (includes hardware, software, install, training)	\$150,000 (annual maintenance fee, \$18,000)	\$5,000,000 (annual maintenance fee, \$450,000)	—
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> intuitive; easy to learn and use flexible; user definable high value and reliable quality 	<ul style="list-style-type: none"> standard user license includes integrated tools for molecular, histopathology, cytogenetics, more powerful workflow-management tools that improve customer service and streamline lab operations user-friendly configuration tools; customers empowered to quickly address new business and technology requirements 	<ul style="list-style-type: none"> includes all modules and interfaces a modern anatomic or clinical pathology laboratory requires no up-front capital investment; pay per case new features deployed to current customers on a quarterly basis at no additional cost
*any system or model			
**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			
****HL7 2.5.1, LOINC, SNOMED, etc.			
*****using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 4.0, April 2011 ed.			
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.

[†]formerly LigoLab AP/LIS 3.5

LABORATORY INFORMATION SYSTEMS

Part 8 of 11	McKesson Susan Eben susan.eben@mckesson.com 5995 Windward Parkway Alpharetta, GA 30005 404-426-8361 www.mckesson.com/laboratory	NetLIMS Chen Yurista chen.y@netlims.com 65 Challenger Rd. Ridgefield Park, NJ 07660 201-894-5300 www.netlims.com
See captodayonline.com/productguides for an interactive version of guide		
Name of laboratory information system	McKesson Lab†	LabOS†
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	1972/August 2016	1996/August 2016
Last major release or update of featured LIS	July 2015 (version 15)	June 2016 (version 3.3.7)
Total No. of contracts for sites operating LIS	100	23
• Hospital/Independent lab contracts in U.S.	94/2	0/9
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	1/0	0/0
• Contracts for other U.S. sites/Contracts for foreign sites	0/3 (hospitals)	0/14 (hospital, public health, HMO, others)
Percentage of contracts that are for sites where company has no other software installed	25%	100%
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	4 (4/0/0)	—
Total No. of sites operating LIS/No. of those sites that are outside U.S.	230/3 (Canada, Saudi Arabia)	38/29 (Israel, India)
No. of sites that went live between August 2015–August 2016	2	—
Percentage of high-volume** sites installed/Low-volume*** sites installed	85%/15%	95%/5%
Provide list of installed client sites to potential customers on request	yes (partial list of comparable sites)	yes (complete list but prospective client must sign a nondisclosure agreement)
Clients restricted from sharing their experience with company or LIS	no	no
No. of employees in entire company	~85,000	125
• No. of employees dedicated to LIS development, installation, and support	50	115
Range in No. of user workstations in sites operating LIS	10–500 (average, 60)	16–600 (average, 120)
Central hardware or service type	Hewlett-Packard, IBM, Dell	IBM, Dell, Hewlett-Packard, others
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	system continues uninterrupted
Programming language(s)	Object Pascal, C, C#, Java, Perl	C++, JavaScript
Operating system(s)	Windows, Red Hat Enterprise Linux, Oracle Linux	Windows Server 2003 and higher
Databases and tools	Oracle	Microsoft SQL 2005 and higher, Oracle 10 and higher, MySQL
System includes full transaction logging	yes	yes
Languages (other than English) offered on system	none	Hebrew, Arabic, Spanish, French
Features/modules incorporated in product:		
• Chemistry and hematology/Bar-coded collection labels	installed/installed	installed/installed
• Microbiology/Public health microbiology	installed/installed	installed/installed
• Blood bank donor/Blood bank transfusion	not available/not available	installed/installed
• Surgical pathology/Cytology	not available/not available	installed/installed
• Molecular pathology/Cytogenetics/Flow cytometry	not available/not available/not available	installed/installed/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	installed/installed
• EHR interface for packaging results into PDF format	under development	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	not available/not available	available but not installed/available but not installed
• Ad hoc reporting/Rules-based system	installed/installed	installed/installed
• Management and statistical reporting	installed	installed
• Connection to provider offices	installed	installed
• Commercial laboratory functionality	installed	installed
• Compliance checking/Billing and accounts receivable	not available/not available	installed/installed
• Materials management and inventory	not available	available but not installed
• Test partition/Remote faxing or printing	installed/installed	installed/installed
• HIPAA-standard transaction formats	installed	installed
• Web-based remote inquiry of reports/Web access for order entry	not available/not available	installed/installed
• Specimen management and tracking	installed	installed
• Compliance and quality assurance tools/Environmental health	installed/installed	installed/installed
• Business analytics	not available	installed
• Reference lab interface for orders, results return, status return	installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:		
• Microbiology data (culture and sensitivity)	yes	yes
• Other reportable diseases (blood, lead, immunology, etc.)	yes	yes
• Tumor diagnosis and case data to regional cancer registry*****	no	yes
Other lab-related IT vendors' systems to which LIS has an interface	Sunquest, Cerner, Meditech, SCC Soft Computer, Epic, NovoPath	Allscripts, GE Healthcare, SCC Soft Computer, Siemens, Sunquest, Orchard, NovoPath, Cerner, others
Lab automation systems or workcells to which LIS can interface	Beckman Coulter, Siemens, Ortho, Labotix Automation, Thermo Scientific, Olympus, Roche, Abbott, Sarstedt, Yaskawa, others	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Olympus America, Roche, Abbott, Bayer, Sysmex
LIS allows third-party updates of tables and rules	yes (from AMA, CMS, Regenstrief Institute, others)	yes (from Info X, AMA, SNOMED, CodeMap, others)
LIS allows for image capture, display, reporting	no	yes
LIS provides indexed field in each test definition for LOINC code	yes	yes
Provide LOINC dictionary for each new installation	yes	no
LIS supports use of SNOMED CT	yes	yes
Use third-party middleware for LIS/instrument interfaces	yes (for all instrument interfaces)	yes (use a combination of direct interfaces and third-party middleware)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	65% (all use McKesson's PPID software)	70% (75% of total use NetLims' PPID software/25% of total use third-party PPID software via interface)
Source code/User group that meets on established schedule	escrow/yes (meets via webinar, conference call, and in person)	escrow/yes (meets via webinar)
Methods by which users can tailor LIS in their own setting	ad hoc query tools, dictionary settings, others	wraparound programming, ad hoc query tools, user-defined interfaces, dictionary settings, others
Standard software maintenance fee covers periodic updates to LIS	yes	yes
Cost for software modifications to comply with federal regulations and laws	potential charges for implementation services, interfaces, new modules provided with upgrades	usually no charge; in extreme cases, cost split among clients affected by change
LIS functionality available via ASP or cloud-based data center	—	available as a standalone product or ASP or cloud-based product (client's option); for the latter, professional services charged hourly, usage fee based on volume per type of lab
Cost for smallest existing LIS install (includes hardware, software, install, training)	—	\$125,000 (annual maintenance fee, \$25,000)
Cost for largest existing LIS install (includes hardware, software, install, training)	—	\$6,000,000 (annual maintenance fee, \$1,200,000)
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> fits well in most organizations—extremely scalable, flexible, and customizable outstanding support and services organization substantially decreased total cost of ownership with availability of Linux platform 	<ul style="list-style-type: none"> unparalleled flexibility and adaptability to users' workflow utilizing user-controlled tools and rules elastic design architecture offers scalable, easy-to-manage solution that can be hosted on any cloud all lab modules reside on a single database; single set of definitions; minimum number of "moving parts"
*any system or model		
**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		
****HL7 2.5.1, LOINC, SNOMED, etc.		
*****using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 4.0, April 2011 ed.		
Note: a dash in lieu of an answer means company did not answer question or question is not applicable	†formerly Horizon Lab	†formerly marketed by NetLims as AutoLims

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receivable systemsBlood bank
information systems

Laboratory information systems

Laboratory-provider
links softwarePositive patient
identification productsAP automation: tissue processors,
embedders, microtomes, stainers

Automated immunoassay

Automated molecular platforms

Bedside glucose testing systems

Chemistry analyzers

Coagulation analyzers

Hematology analyzers

In vitro blood gas analyzers

Laboratory automation
systems and workcells

Next-generation sequencing

Urinalysis

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LABORATORY INFORMATION SYSTEMS

Part 9 of 11	Orchard Software Corp. Kerry Foster kfoster@orchardsoft.com 701 Congressional Blvd., Suite 360 Carmel, IN 46032 800-856-1948 www.orchardsoft.com	Orchard Software Corp. Kerry Foster kfoster@orchardsoft.com 701 Congressional Blvd., Suite 360 Carmel, IN 46032 800-856-1948 www.orchardsoft.com	Pathagility Mark McCuin mark@pathagility.com 10810 Executive Center Drive, Suite 100 Little Rock, AR 72211 888-222-2792 www.pathagility.com
See captodayonline.com/productguides for an interactive version of guide			
Name of laboratory information system	Orchard Harvest LIS	Orchard Sequoia	WorkPath
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	1993/August 2016	1993/— (new product)	2008/August 2016
Last major release or update of featured LIS	September 2016 (version 11)	— (new product; version 1.0)	August 2016 (version 9.1.0)
Total No. of contracts for sites operating LIS	1,516	0	30
• Hospital/Independent lab contracts in U.S.	280/240	0/0	2/20
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	848/28	0/0	8/0
• Contracts for other U.S. sites/Contracts for foreign sites	120 (nursing home, correctional facility, toxicology, pain management, research lab, others)/0	0/0	0/0
Percentage of contracts that are for sites where company has no other software installed	not tracked	0	20%
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	61 (8/21/32—physician office lab, health network, student health centers, public health department)	2 (1/0/1—health care network)	0
Total No. of sites operating LIS/No. of those sites that are outside U.S.	1,953/0	0/0	7/0
No. of sites that went live between August 2015–August 2016	63	0	2
Percentage of high-volume** sites installed/Low-volume*** sites installed	40%/60%	—	20%/80%
Provide list of installed client sites to potential customers on request	yes (partial list of comparable sites)	yes (will provide partial list of comparable sites)	yes (partial list of comparable sites)
Clients restricted from sharing their experience with company or LIS	no	no	no
No. of employees in entire company	253	253	—
• No. of employees dedicated to LIS development, installation, and support	162	162	—
Range in No. of user workstations in sites operating LIS	1–500 (average, 30)	—	2–500 (average, 50)
Central hardware or service type	HP Business Class in a client/server environment	HP Business Class	Amazon Web Services
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	system continues uninterrupted
Programming language(s)	4D with portions in C, C++, HTML; some modules in Java	SQL, Java	Python, Java
Operating system(s)	Windows 7+, Windows Server 2008+	Windows	agnostic—Linux, Windows, Mac, BSD, Solaris, others
Databases and tools	4D	Microsoft SQL	agnostic—MySQL, PostgreSQL, SQLite, Oracle
System includes full transaction logging	yes	yes	yes
Languages (other than English) offered on system	—	—	—
Features/modules incorporated in product:			
• Chemistry and hematology/Bar-coded collection labels	installed/installed	under development/under development	installed/installed
• Microbiology/Public health microbiology	installed/installed	under development/under development	installed/available but not installed
• Blood bank donor/Blood bank transfusion	not available/not available	not available/not available	available but not installed/available but not installed
• Surgical pathology/Cytology	installed/installed	under development/under development	installed/installed
• Molecular pathology/Cytogenetics/Flow cytometry	installed/installed/installed	under development (all)	installed/installed/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	available but not installed	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	available but not installed/available but not installed	installed/installed
• EHR interface for packaging results into PDF format	installed	available but not installed	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	installed/installed	available but not installed/available but not installed	installed/installed
• Ad hoc reporting/Rules-based system	installed/installed	available but not installed/available but not installed	installed/installed
• Management and statistical reporting	installed	available but not installed	installed
• Connection to provider offices	installed	available but not installed	installed
• Commercial laboratory functionality	installed	available but not installed	installed
• Compliance checking/Billing and accounts receivable	installed/not available	available but not installed/not available	installed/not available
• Materials management and inventory	installed	available but not installed	not available
• Test partition/Remote faxing or printing	installed/installed	available but not installed/available but not installed	installed/installed
• HIPAA-standard transaction formats	installed	available but not installed	installed
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	available but not installed/available but not installed	installed/installed
• Specimen management and tracking	installed	available but not installed	installed
• Compliance and quality assurance tools/Environmental health	installed/installed	available but not installed/under development	installed/available but not installed
• Business analytics	installed	available but not installed	installed
• Reference lab interface for orders, results return, status return	installed	available but not installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:			
• Microbiology data (culture and sensitivity)	yes	yes	yes
• Other reportable diseases (blood, lead, immunology, etc.)	yes	yes	yes
• Tumor diagnosis and case data to regional cancer registry*****	yes	yes	yes
Other lab-related IT vendors' systems to which LIS has an interface	Allscripts, Aprima, Meditech, Healthland, Sunquest, Telcor, CPSI, Epic, GE, Greenway, many others	none (TBD; new product)	Sunquest, custom-developed systems, others
Lab automation systems or workcells to which LIS can interface	Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Thermo Scientific, Olympus America, Roche, Abbott	available, but not yet operational, to Beckman Coulter, Siemens, Ortho Clinical Diagnostics, Labotix Automation, Thermo Scientific, Roche, Abbott	none (planned for future)
LIS allows third-party updates of tables and rules	no	no	no
LIS allows for image capture, display, reporting	yes	yes	yes
LIS provides indexed field in each test definition for LOINC code	yes	yes	no
Provide LOINC dictionary for each new installation	no	no	no
LIS supports use of SNOMED CT	yes	yes	yes
Use third-party middleware for LIS/instrument interfaces	no (interface directly)	no (interface directly)	no (interface directly)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	25% (1% of total use Orchard's PPID software/99% of total use third-party PPID software via interface)	—	20% (all use third-party PPID software via interface)
Source code/User group that meets on established schedule	escrow/yes (meets via webinar and in person)	escrow/yes (will meet via webinar and in person)	no/yes (meets via conference call)
Methods by which users can tailor LIS in their own setting	ad hoc query tools, dictionary settings, custom programming, user-defined security, rules, others	wraparound programming, ad hoc query tools, user-defined interfaces, dictionary settings, others	ad hoc query tools, case type property tools
Standard software maintenance fee covers periodic updates to LIS	yes	yes	yes
Cost for software modifications to comply with federal regulations and laws	standard (no charge)	standard (no charge)	standard (no charge)
LIS functionality available via ASP or cloud-based data center	no	available as either a standalone product or an ASP or cloud-based product (client's option)	yes (only option); based on implementation fee and monthly or annual volume-based subscription fee
Cost for smallest existing LIS install (includes hardware, software, install, training)	\$32,000 (annual maintenance fee, \$4,000)	\$500,000 (annual maintenance fee, \$125,000)	—
Cost for largest existing LIS install (includes hardware, software, install, training)	\$1,400,000 (annual maintenance fee, \$168,000)	\$4,000,000+ (annual maintenance fee, TBD)	—
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> expert interfacing and integration capabilities with instruments, EMR systems, host systems, more robust rules-based decision support logic and data-mining technology for data analytics an industry leader in product development, training, service, and support 	<ul style="list-style-type: none"> new enterprise-class LIS scalable to address needs of large-volume laboratories uses Microsoft SQL to provide a high-volume, high-velocity solution for large data requirements business process logic rules for decision support 	<ul style="list-style-type: none"> support any testing type—software-as-a-service; fast implementations; low total cost of ownership full menu of integrated connectivity and distribution options for laboratories and other providers dynamic system for reference lab relationships
*any system or model			
**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			
****HL7 2.5.1, LOINC, SNOMED, etc.			
*****using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 4.0, April 2011 ed.			
Note: a dash in lieu of an answer means company did not answer question or question is not applicable			

LABORATORY INFORMATION SYSTEMS

Part 10 of 11	Quality Software Systems Jeff Caspari jcaspari@labhealth.com 252 Old Nyack Turnpike Spring Valley, NY 10977 845-352-4313 www.labhealth.com	SCC Soft Computer Ellie Vahman ellie@softcomputer.com 5400 Tech Data Drive Clearwater, FL 33760 800-763-8352 www.softcomputer.com	Schuyler House Janet Chennault info@schuylerhouse.com 27821 Fremont Court, Suite 8 Valencia, CA 91355 800-706-0266 www.schuylab.com
See captodayonline.com/productguides for an interactive version of guide			
Name of laboratory information system	LabHealth	SoftLab	SchuyLab
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	1984/2016	1985/September 2016	1994/September 2016
Last major release or update of featured LIS	2016 (version 5.2)	August 2016 (version 4.0.8)	September 2016 (version 3.2.5)
Total No. of contracts for sites operating LIS	68	328	1,014
• Hospital/Independent lab contracts in U.S.	1/56	258/18	131/291
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	11/0	5/3	494/0
• Contracts for other U.S. sites/Contracts for foreign sites	0/0	0/44 (universities, hospitals, regional/public health authorities, commercial labs)	50 (veterinary, schools, vendors)/48 (hospitals, physician office labs, reference labs)
Percentage of contracts that are for sites where company has no other software installed	30%	100%	100%
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	2 (0/2/0)	18 (16/2/0)	4 (0/1/3—veterinary, vendor, schools)
Total No. of sites operating LIS/No. of those sites that are outside U.S.	68/0	1,093/231 (Belgium, Brazil, Canada, France, Hong Kong, Jamaica, Malaysia, Singapore, Switzerland)	1,014/142 (Guam, Caribbean, Canada, Africa, Pacific Rim, South East Asia)
No. of sites that went live between August 2015–August 2016	11	7	38
Percentage of high-volume** sites installed/Low-volume*** sites installed	70%/30%	60%/40%	30%/70%
Provide list of installed client sites to potential customers on request	no (information is confidential)	yes (partial list of comparable sites)	yes (list of sites with client permission)
Clients restricted from sharing their experience with company or LIS	no	no	no
No. of employees in entire company	12	2,000	30
• No. of employees dedicated to LIS development, installation, and support	11	1,900	20
Range in No. of user workstations in sites operating LIS	4–95	10–4,000+ (average, 80)	1–75 (average, 3)
Central hardware or service type	Dell servers	IBM System p (AIX/Unix)	any PC (Dell recommended)
How central server failure is handled	manual intervention necessary to restore operation or system continues uninterrupted (user's option)	system continues uninterrupted	manual intervention necessary to restore operation
Programming language(s)	Visual Basic .Net	C, C++, C#, Java	C
Operating system(s)	Windows	AIX (Unix), Windows	Windows XP, Vista, 7, 8, 10
Databases and tools	SQL	Oracle, OAS, Tomcat, WebLogic, JBoss, ServiceMix	FairCom C-Tree, Pervasive Btrieve
System includes full transaction logging	yes	yes	no
Languages (other than English) offered on system	—	French, Portuguese	ABN forms available in Spanish
Features/modules incorporated in product:			
• Chemistry and hematology/Bar-coded collection labels	installed/installed	installed/installed	installed/installed
• Microbiology/Public health microbiology	installed/installed	installed/installed	installed/not available
• Blood bank donor/Blood bank transfusion	under development/under development	installed/installed	not available in U.S./not available in U.S.
• Surgical pathology/Cytology	under development/available but not installed	installed/installed	installed/installed
• Molecular pathology/Cytogenetics/Flow cytometry	under development (all)	installed/installed/installed	under development/under development/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	installed	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	installed/installed	installed/installed
• EHR interface for packaging results into PDF format	installed	installed	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	installed/installed	not available/not available	under development/under development
• Ad hoc reporting/Rules-based system	installed/installed	installed/installed	installed/available but not installed
• Management and statistical reporting	installed	installed	installed
• Connection to provider offices	installed	installed	installed
• Commercial laboratory functionality	installed	installed	installed
• Compliance checking/Billing and accounts receivable	installed/installed	installed/installed	installed/installed
• Materials management and inventory	available but not installed	available but not installed	under development
• Test partition/Remote faxing or printing	installed/installed	installed/installed	under development/installed
• HIPAA-standard transaction formats	installed	installed	installed
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	installed/installed	installed/installed
• Specimen management and tracking	available but not installed	installed	under development
• Compliance and quality assurance tools/Environmental health	installed/under development	installed/installed	under development/under development
• Business analytics	installed	installed	under development
• Reference lab interface for orders, results return, status return	installed	installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:			
• Microbiology data (culture and sensitivity)	yes	yes	yes
• Other reportable diseases (blood, lead, immunology, etc.)	yes	yes	yes
• Tumor diagnosis and case data to regional cancer registry*****	no	yes	no
Other lab-related IT vendors' systems to which LIS has an interface	Cerner, Allscripts, Eclipsys, others	4Medica, Allscripts, Atlas, Cerner, Healthland, Eclipsys, Emdeon, GE, Meditech, McKesson, Xifin, others	Healthland, eClinicalWorks, GE, Greenway, McKesson, Allscripts, Emdeon, many others
Lab automation systems or workcells to which LIS can interface	available, but not yet operational, to Beckman Coulter, Siemens, Ortho, Thermo Scientific, Olympus, Roche, Abbott	Beckman Coulter, Siemens, Ortho, Labotix Automation, Thermo Scientific, Olympus, Roche, Abbott, Tecan	Roche Diagnostics, Bayer
LIS allows third-party updates of tables and rules	no	yes (from 3M/InfoX, Regenstrief Institute, CAP, others)	yes (from CodeMap, others)
LIS allows for image capture, display, reporting	yes	yes	yes
LIS provides indexed field in each test definition for LOINC code	yes	yes	yes
Provide LOINC dictionary for each new installation	yes	yes	no
LIS supports use of SNOMED CT	yes	yes	yes
Use third-party middleware for LIS/instrument interfaces	no (interface directly)	no (interface directly)	no (interface directly)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	25% (50% of total use Quality Software Systems' PPID software/50% of total use third-party PPID software via interface)	32% (93% of total use SCC Soft Computer's PPID software/7% of total use third-party PPID software via interface)	0
Source code/User group that meets on established schedule	no/no	escrow/yes (meets in person)	escrow/yes (meets via conference call)
Methods by which users can tailor LIS in their own setting	wraparound programming, ad hoc query tools, dictionary settings	ad hoc query tools, dictionary settings, highly configurable fields, rules engine, workflow engine, others	user-defined interfaces
Standard software maintenance fee covers periodic updates to LIS	yes	yes	yes
Cost for software modifications to comply with federal regulations and laws	optional (extra cost)	standard (no charge)	standard (no charge)
LIS functionality available via ASP or cloud-based data center	available as either a standalone product or an ASP or cloud-based product (client's option)	available as either a standalone product or an ASP or cloud-based product (client's option)	no
Cost for smallest existing LIS install (includes hardware, software, install, training)	\$20,000 (annual maintenance fee, \$6,000)	—	free (annual maintenance fee, \$120)
Cost for largest existing LIS install (includes hardware, software, install, training)	\$95,000 (annual maintenance fee, \$30,000)	—	\$170,000 (annual maintenance fee, \$20,000)
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> • true browser-based LIS with comprehensive lab and billing modules • complete toxicology and pain-management module totally integrated • unparalleled ability to customize software 	<ul style="list-style-type: none"> • integrated single patient record and visit/encounter across CP, AP, and genetics with full specimen chain of custody • compliant with Auto12-A specimen label standard; certified as an EHR module by the CCHIT • multi-site, multi-time zone with master patient index; definable workflow protocols and rules across all sites 	<ul style="list-style-type: none"> • easy-to-use, comprehensive LIS, including electronic billing; integrates lab results with other systems • optional modules that can be added any time • free SchuyBase LIS, a streamlined version of SchuyLab, with upgradeable modules
*any system or model			
**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			
****HL7 2.5.1, LOINC, SNOMED, etc.			
*****using NAACCR Pathology Laboratory Electronic Reporting, vol. V, version 4.0, April 2011 ed.			
Note: a dash in lieu of an answer means company did not answer question or question is not applicable			

LABORATORY INFORMATION SYSTEMS

Part 11 of 11	SimpleLIMS Kannan info@simplelims.com 600 B St., 2020 San Diego, CA 92101 619-354-1009 www.simplelims.com	Sunquest Information Systems Stephanie Clohessy stephanie.clohessy@sunquestinfo.com 3300 E. Sunrise Drive Tucson, AZ 85718 520-570-2000 www.sunquestinfo.com	Xifin Conor Ward cward@xifin.com 12225 El Camino Real San Diego, CA 92130 858-436-2995 www.xifin.com
See captodayonline.com/productguides for an interactive version of guide			
Name of laboratory information system	SimpleLims	Sunquest Laboratory	Xifin LIS Anywhere [†]
First ever*/Most recent LIS installation (based on September 2016 survey deadline)	2012/July 2016	1979/August 2015	2004/September 2016
Last major release or update of featured LIS	July 2016 (version 7-2016)	May 2016 (version 8.0)	August 2016 (version 2.14)
Total No. of contracts for sites operating LIS	21	312	—
• Hospital/Independent lab contracts in U.S.	0/15	302/0	—/27
• Clinic or group practice contracts in U.S./Public health lab contracts in U.S.	0/0	0/0	20/—
• Contracts for other U.S. sites/Contracts for foreign sites	0/6	0/10	—/2 (private anatomic pathology and molecular labs)
Percentage of contracts that are for sites where company has no other software installed	—	35%	72%
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	2 (0/2/0)	2 (2/0/0)	2 (0/2/0)
Total No. of sites operating LIS/No. of those sites that are outside U.S.	21/6 (India, Lithuania, Netherlands)	—	47/2 (China, Holland)
No. of sites that went live between August 2015–August 2016	3	1	3
Percentage of high-volume** sites installed/Low-volume*** sites installed	40%/60%	—	20%/80%
Provide list of installed client sites to potential customers on request	yes (complete list but prospective client must sign a nondisclosure agreement)	yes (partial list of comparable sites)	yes (partial list of comparable sites)
Clients restricted from sharing their experience with company or LIS	no	no	no
No. of employees in entire company	20	650+	316
• No. of employees dedicated to LIS development, installation, and support	8	650+	30
Range in No. of user workstations in sites operating LIS	100–10,000	4–500 (average, 300)	2–80 (average, 40)
Central hardware or service type	cloud, ASP	Hewlett-Packard, IBM	ASP (hardware independent)
How central server failure is handled	system continues uninterrupted	manual intervention necessary to restore operation	system continues uninterrupted
Programming language(s)	JavaScript, Python, PHP	Caché, Caché Script, Standard C/C++, Visual Basic, Visual C++, Active X, HTML with dynamic HTML content	C#, .Net
Operating system(s)	browser-based client, Linux servers	AIX, HP-UX, OpenVMS, Linux, Windows XP	Windows
Databases and tools	SQL, NoSQL	InterSystems Caché	SQL
System includes full transaction logging	yes	yes	yes
Languages (other than English) offered on system	—	—	Chinese
Features/modules incorporated in product:			
• Chemistry and hematology/Bar-coded collection labels	installed/installed	installed/installed	installed/installed
• Microbiology/Public health microbiology	installed/—	installed/installed	installed/installed
• Blood bank donor/Blood bank transfusion	—	installed/installed	installed/installed
• Surgical pathology/Cytology	installed/installed	installed/installed	installed/installed
• Molecular pathology/Cytogenetics/Flow cytometry	installed/installed/installed	installed/installed/installed	installed/installed/installed
• EHR interface for admission/discharge/transfer (ADT)	installed	installed	installed
• EHR interface for order entry/EHR interface for results reporting	installed/installed	installed/installed	installed/installed
• EHR interface for packaging results into PDF format	installed	installed	installed
• EHR interface for packaging results into CDA1 format/CDA2 format	installed/available but not installed	installed/installed	available but not installed/available but not installed
• Ad hoc reporting/Rules-based system	installed/installed	installed/installed	installed/installed
• Management and statistical reporting	installed	installed	installed
• Connection to provider offices	installed	installed	installed
• Commercial laboratory functionality	installed	installed	installed
• Compliance checking/Billing and accounts receivable	available but not installed/installed	installed/installed	installed/installed
• Materials management and inventory	installed	installed	installed
• Test partition/Remote faxing or printing	—/installed	installed/installed	installed/installed
• HIPAA-standard transaction formats	installed	installed	installed
• Web-based remote inquiry of reports/Web access for order entry	installed/installed	installed/installed	installed/installed
• Specimen management and tracking	installed	installed	installed
• Compliance and quality assurance tools/Environmental health	installed/—	installed/installed	installed/under development
• Business analytics	installed	installed	installed
• Reference lab interface for orders, results return, status return	installed	installed	installed
LIS can report lab data that is focus of meaningful use guidelines to public health agencies via automated electronic transmission using specified formats**** for:			
• Microbiology data (culture and sensitivity)	yes	yes	yes
• Other reportable diseases (blood, lead, immunology, etc.)	yes	yes	under development
• Tumor diagnosis and case data to regional cancer registry*****	yes	yes	yes
Other lab-related IT vendors' systems to which LIS has an interface	Cerner, McKesson Beckman Coulter, Siemens, Thermo Scientific, Olympus America, Roche Diagnostics, Abbott, Sysmex	Cerner, McKesson, Siemens, Epic, GE Healthcare Beckman Coulter, Siemens, Ortho, Labotix Automation, Olympus, Roche, Abbott, PVT LabSystems	McKesson, Epic, Cerner, Allscripts, eClinicalWorks, GE, others none (planned for future)
Lab automation systems or workcells to which LIS can interface			
LIS allows third-party updates of tables and rules	no	yes (from 3M, CAP, AMA)	yes (API allows for updates of tables and rules from almost any source)
LIS allows for image capture, display, reporting	yes	yes	yes
LIS provides indexed field in each test definition for LOINC code	yes	yes	yes
Provide LOINC dictionary for each new installation	yes	yes	yes
LIS supports use of SNOMED CT	yes	yes	yes
Use third-party middleware for LIS/instrument interfaces	yes (use a combination of direct interfaces and third-party middleware)	yes (for all instrument interfaces)	yes (use a combination of direct interfaces and third-party middleware)
Percentage of LIS clients that use positive patient ID systems to identify patients and blood specimens collected at bedside	100% (all use SimpleLIMS' PPID software)	65% (65% of total use Sunquest's PPID software/35% of total use third-party PPID software via interface)	5% (all use third-party PPID software via interface)
Source code/User group that meets on established schedule	escrow/yes (meets via webinar)	escrow/yes (meets via webinar, conference call, and in person)	escrow/yes (meets via webinar)
Methods by which users can tailor LIS in their own setting	— (vendor provides free customization)	ad hoc query tools, user-defined interfaces, dictionary settings, rules, logic, dashboards	wraparound programming, ad hoc query tools, user-defined interfaces
Standard software maintenance fee covers periodic updates to LIS	yes	—	yes
Cost for software modifications to comply with federal regulations and laws	standard (no charge)	standard (no charge)	standard (no charge)
LIS functionality available via ASP or cloud-based data center	yes (only option); \$10,000 per month to \$25,000 per month	available as either a standalone product or an ASP or cloud-based product (client's option)	yes (only option); \$20,000–\$150,000 installation fee and \$350 per named user, per month subscription fee
Cost for smallest existing LIS install (includes hardware, software, install, training)	—	—	—
Cost for largest existing LIS install (includes hardware, software, install, training)	—	—	—
Distinguishing features (supplied by company)	<ul style="list-style-type: none"> • 100% Web based—no server installation fees or setup fees • includes services of software developers, designers, and lab tech support • instrument interfaces are included; separate middleware is not necessary 	<ul style="list-style-type: none"> • streamlines end user functions to decrease specimen-handling time and improve productivity and turnaround time • multi-facility LIS with 2,000+ application interfaces and 11,000+ instrument interfaces • automates and drives workflow of clinical lab from sample collection at the point of care through results 	<ul style="list-style-type: none"> • integrated suite of products, including LIS, revenue cycle management, and business intelligence • cost-effective, Web-based SaaS solution; no major hardware or software purchases or upgrade fees • CP, AP, and molecular testing on a single platform
*any system or model			
**generate >500,000 billed tests annually, or >200 bed hospitals, or >500 requisitions per day			
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[†]formerly PathCentral AP Anywhere, eTeleNext AP Anywhere