

## Laboratory information systems

Part 1 of 12	Antek Richard Jefferson rjefferson@labdaq.com 228 Business Center Drive Reisterstown, MD 21136 800-359-0911 www.antekhealthware.com	CCA (Creative Computer Applications Inc.) Chris Coleman sales@ccainc.com 26115-A Mureau Rd. Calabasas, CA 91302 800-437-9000 www.ccainc.com	Cerner Citation Tom Meyer tmeyer@cerner.com 2800 Rockcreek Parkway Kansas City, MO 64117 816-201-0054 www.cerner.com	Cerner Corp. Tom Meyer tmeyer@cerner.com 2800 Rockcreek Parkway Kansas City, MO 64117 816-201-0054 www.cerner.com
See accompanying article on page 54				
Name of system	LabDaq	CyberLab	LIS; CLab; CLab Plus	Millennium PathNet
No. of contracts for sites operating LIS	1,222	242	215	62
• Hospital/independent lab contracts in U.S.	156/1,066 <sup>†</sup>	111/64	—	50/1
• Clinic or group practice contracts in U.S.	—	52	—	3
• Other contracted U.S. sites/contracts for foreign sites	—	10/5	—	2/6
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	15 (2/13/0)	7 (1/0/6)	8	53 (50/2/1)
• Contracts signed during most recent calendar or fiscal year	156	23	—	—
No. of sites operating LIS	1,222	400+	235	124
First/most recent LIS installation	1990/2002	1982/2002	1979/2002	1982/2002
Staff to develop/install/support/other* in entire firm	—	12/4/19/38	—	802/1,867/762/1,229
Staff to develop/install/support/other* in LIS division	9/18 (installation and support)/12	6/4/13/38	86 total	62/66/36/31
No. of terminals/workstations in sites operating system (min.-max.)	1-80+	3-250	3-200+	7-600+
• Central hardware	Intel P4/AMD7	Compaq, IBM RS/6000	Compaq, Dell	IBM, Compaq
• Central hardware redundant/fault-tolerant?	yes	yes	yes	yes
• Terminals/workstations	Intel P4/AMD7	PC workstations	PCs	PCs
• Workstation set-up	only PC workstation supported	only PC workstation supported	only PC workstation supported	only PC workstation supported
• Software programming language(s)	Delphi	C, C++, Cobol, Java, HTML	C++, Visual Basic	Visual C++, Visual Basic, Java
• Operating system(s)	Microsoft XP/2000	Unix	Windows, Windows NT	AIX, OpenVMS, Windows, Windows NT
• Database system(s) used	Oracle, Ctrieve	ODBC compliant	Pervasive SQL, MS SQL	Oracle
• System includes full transaction logging?	yes	yes	yes	yes
Features (listed as a percentage of live installations, available but no installations, or not available)				
• Chemistry and hematology	100%	100%	100%	85%
• Bar-coded collection labels	25%	100%	90%	100%
• Handheld devices for bedside-positive patient ID	not available	15%	30%	2%
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	available but not installed	—	—
• Microbiology	100%	90%	85%	75%
• Blood bank donor center/transfusion service	not available	not available	not available	not available/25%
• Surgical pathology/cytology	not available	10%/90%	25%/10%	65%/50%
• HIS interface: A/D/I	20%	65%	95%	80%
• HIS interface: order entry	5%	55%	85%	60%
• HIS interface: result reporting	25%	55%	85%	60%
• Ad hoc reporting	100%	100%	100%	100%
• Rules-based system	not available	100%	90%	100%
• Utilization management	100%	100%	80%	15%
• Outreach and commercial laboratory	100%	100%	30%	15%
• Compliance checking	100%	100%	50%	5%
• Accounts receivable	5%	18%	not available	available but not installed
• Materials management and inventory	not available	not available	not available	available but not installed
• Test partition	5%	100%	100%	100%
• Remote faxing and printing	35%	100%	90%	100%
• Physician office outreach	15%	40%	30%	5%
• HIPAA standard transaction formats	100%	not applicable	not available	available but not installed
• Web-based remote inquiry of reports	5%	15%	not available	5%
• Web access for order entry	5%	15%	not available	5%
Complete LIS ASP solution?	no	no	no	yes
ASP for physician order entry/result reporting?	yes	—	—	yes
Method of charging for ASP service	fixed fee	—	—	fixed fee
Client software required	browser-based	—	—	browser-based, requires software be installed on client PC
ASP information conduit	operates over Internet	—	—	requires use of private, dedicated circuit
Client contracts supported from data center not operated by client	40	—	—	92
How data center is operated	by vendor	—	—	by vendor
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:				
• Microbiology data	not available	available but not installed	available but not installed	available but not installed
• Tumor diagnosis/registry data	not available	available but not installed	available but not installed	available but not installed
ASTM/HL7 interface?	yes	yes	yes	yes
Hospital/integrated health care systems interfaced	Siemens, Quest, LabCorp	McKesson, Meditech, IDX, Keane, CPSI, Quadramed, Siemens, others	major vendors	major vendors
Physician office management systems interfaced	Medical Manager, Misys, PMSI, PDS, CPSI, Pulse, Loigician, IDX, others	IDX, Medic, Medical Manager, Practice Partners, Atlas, others	Medical Manager, PCN, Epic, Experior, others	Medscape, Logician, IDX
Automated lab transportation systems interfaced	no	planned	Beckman Coulter IDS, Tecan	Beckman Coulter IDS
Software provides indexed field in each test definition for LOINC code?	no	yes	no	yes
Provide LOINC dictionary for each new installation?	no	no	no	no
LIS permits use of SNOMED II/SNOMED CT?	no/no	no/yes	yes/no	yes/yes
Market modules for other hospital departments?	no	yes	no	yes
• Percentage of LIS installations stand-alone	—	75%	—	40%
No. of different lab instruments interfaced with LIS	250+	500+	300+	250+
Source code?/User group?	escrow/no	escrow/yes	escrow/yes	escrow/yes
User can modify screens?	no	yes (and user-defined report writer provided)	no (but user-defined report writer provided)	yes (and user-defined report writer provided)
Query language to retrieve info. from LIS database	—	SQL	SQL	Discern Explorer
Smallest cost (hardware/software/monthly maintenance)	\$1.5k/\$8k/\$0.084k	\$20k/\$80k/\$1.5k	—	—
Largest cost (hardware/software/monthly maintenance)	\$30k/\$50k/\$0.5k	\$250k/\$900k/\$15k	—	—
Distinguishing features (supplied by vendor)	• affordable, fully featured 32-bit LIS • totally scalable; supports multi-site labs • outstanding customer support	• browser-based (GUI) • proven successful implementation methodology • excellent service references	• relational database management system • flexible reporting • feature-rich medical necessity compliance checking	• comprehensive, totally integrated solution • advanced decision support logic • proven scalability and connectivity
*other-sales, marketing, administration, and other company functions	<sup>†</sup> independent lab and clinic/group practice contracts combined			

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Survey editor: Raymond D. Aller, MD

## Laboratory information systems

Part 2 of 12	Cerner Corp. Tom Meyer tmeyer@cerner.com 2800 Rockcreek Parkway Kansas City, MO 64117 816-201-0054 www.cerner.com	Clinical Information Systems Inc. V. Flaxbeard cissupport@aol.com 18805 Willamette Drive West Linn, OR 97068 503-699-9745 www.cislab.com	Clinical Software Solutions Elaine Nordhues sales@clinsoft.com 20940 E. Mewes Rd. Queen Creek, AZ 85242 800-570-0474 www.clinsoft.com	ClinLab Inc. Michael Salvaggi sales@clinlabinc.com 2411 E. Graves Ave., Ste. 1 Orange City, FL 32763 386-774-0030 www.clinlabinc.com
See accompanying article on page 54				
Name of system	PathNet HNA Classic	CISlab	CSSWin LIS	ClinLab LIS
No. of contracts for sites operating LIS	343	90	200+	31
• Hospital/independent lab contracts in U.S.	301/8	7/72	50+/150+	4/5
• Clinic or group practice contracts in U.S.	0	3	10	14
• Other contracted U.S. sites/contracts for foreign sites	0/34	5/3	2/0	8/0
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	9 (9/0/0)	2 (0/2/0)	2 (2/0/0)	2 (0/2/0)
• Contracts signed during most recent calendar or fiscal year	—	15	—	3
No. of sites operating LIS	600	95	200+	32
First/most recent LIS installation	1982/2002	1981/2002	1987/2002	1987/2002
Staff to develop/install/support/other* in entire firm	802/1,867/762/1,229	8 total	—	4/2/4/0
Staff to develop/install/support/other* in LIS division	—	—	—	—
No. of terminals/workstations in sites operating system (min.-max.)	7-600+	1-100	1-32	2-70
• Central hardware	Compaq	generic PCs, HP, Dell, Compaq	IBM compatible	IBM, Dell, Compaq servers
• Central hardware redundant/fault-tolerant?	yes	yes	yes	yes
• Terminals/workstations	VTS, PCs	PCs, Wyse, Link	IBM compatible	IBM, Dell, Compaq
• Workstation set-up	dumb terminal supported	dumb terminal supported, PC workstation supported	only PC workstation supported	only PC workstation supported
• Software programming language(s)	Cobol, C++	Cobol, C++, Delphi, VB	4GL	Clipper, Visual FoxPro, Delphi
• Operating system(s)	OpenVMS	Unix, NT, Windows 98, 2000	Windows	Novell, Windows NT, 2000, 9X
• Database system(s) used	proprietary	Interbase, RDBMS, C-ISAM, MS SQL 7	SQL	DBase, FoxPro, Advantage DBS
• System includes full transaction logging?	yes	no	yes	no
Features (listed as a percentage of live installations, available but no installations, or not available)				
• Chemistry and hematology	98%	95%	95%	100%
• Bar-coded collection labels	90%	90%	50%	100%
• Handheld devices for bedside-positive patient ID	5%	0	5%	not available
• NCCLS POCT-1A standard interface for POCT devices	—	0	—	not available
• Microbiology	90%	90%	20%	100%
• Blood bank donor center/transfusion service	15%/75%	1%/not available	5%/not available	not available
• Surgical pathology/cytology	60%/50%	10%/10%	not available	not available
• HIS interface: A/D/T	98%	10%	50%	90%
• HIS interface: order entry	90%	10%	50%	70%
• HIS interface: result reporting	90%	10%	50%	70%
• Ad hoc reporting	100%	0	20%	100%
• Rules-based system	80%	0	20%	50%
• Utilization management	10%	1%	10%	100%
• Outreach and commercial laboratory	25%	10%	10%	40%
• Compliance checking	15%	90%	50%	100%
• Accounts receivable	5%	90%	5%	not available
• Materials management and inventory	not available	available but not installed	5%	not available
• Test partition	100%	100%	100%	100%
• Remote faxing and printing	85%	95%	45%	20%
• Physician office outreach	5%	80%	40%	40%
• HIPAA standard transaction formats	—	90%	100%	not available
• Web-based remote inquiry of reports	5%	50%	available but not installed	available in 2003
• Web access for order entry	5%	50%	available but not installed	10%
Complete LIS ASP solution?	no	yes	no	yes
ASP for physician order entry/result reporting?	—	yes	yes	yes
Method of charging for ASP service	—	fixed fee	fixed fee	fixed fee
Client software required	—	browser-based, requires software be installed on client PC, uses dumb terminals	requires software be installed on client PC	requires software be installed on client PC
ASP information conduit	—	operates over Internet	requires use of private, dedicated circuit	requires use of private, dedicated circuit
Client contracts supported from data center not operated by client	—	100%	0	0
How data center is operated	—	by vendor	—	by vendor
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:				
• Microbiology data	22 sites (Cerner proprietary format)	4 sites	3 sites	4 sites
• Tumor diagnosis/registry data	—	3 sites	available but not installed	not available
ASTM/HL7 interface?	yes	yes	yes	yes
Hospital/integrated health care systems interfaced	major vendors	McKesson, Dairyland, PCS, ADT, Tower Systems	Siemens, Dairyland, LabCorp, Quest, Pearl, HL7-compliant systems	Meditech
Physician office management systems interfaced	major vendors	Medical Manager	Medical Manager, other HL7/ASTM-compliant systems with ASCII import/export capability	Medical Manager, IDX, Medic, Nuesoft, Softaid, Medstar, Softatic
Automated lab transportation systems interfaced	Lab InterLink/Labotix, Beckman Coulter IDS, Sysmex, Roche/BMC/Hitachi, Tecan	planned to Beckman Coulter IDS, Sysmex, Bayer, Roche/BMC/Hitachi	no	—
Software provides indexed field in each test definition for LOINC code?	yes	yes	yes	no
Provide LOINC dictionary for each new installation?	no	no	no	no
LIS permits use of SNOMED II/SNOMED CT?	yes/no	yes/yes	yes/yes	no/no
Market modules for other hospital departments?	yes	no	yes	no
• Percentage of LIS installations stand-alone	68%	—	25%	—
No. of different lab instruments interfaced with LIS	400+	200+	300+	125
Source code?/User group?	escrow/yes	escrow/no	no/no	escrow/no
User can modify screens?	no (but user-defined report writer provided)	no	no	yes (and user-defined report writer provided)
Query language to retrieve info. from LIS database	Discern Explorer	SQL	SQL, Microsoft Access, Crystal Reports	Report Writer, SQL, ODBC
Smallest cost (hardware/software/monthly maintenance)	—	\$7.5k/\$7.5k/\$0.2k	—/\$10k/percent of total	\$5k/\$15k/\$0.188k
Largest cost (hardware/software/monthly maintenance)	—	\$100k/\$100k/\$0.3k	—/\$100k/percent of total	\$40k/\$170k/\$2.125k
Distinguishing features (supplied by vendor)	• multi-facility logic • advanced decision support • interface experience	• completeness of functionality • willingness to customize • economical	• versatile for any size facility • integrates well with other departments/systems • customized programming available	• reputation among clients for exceptional support • user friendly, versatile for all labs • high quality at a conservative price; on-site training
*other—sales, marketing, administration, and other company functions				

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## Laboratory information systems

Part 3 of 12	Comp Pro Med Inc. Avarie Fisher afisher@compromed.com 3430 Mendocino Ave. Santa Rosa, CA 95403 707-578-0239 www.compromed.com	Computer Service & Support Inc. Jim T. O'Neill jimjr@csslis.com 2106 New Rd., Bldg. E-6 Linwood, NJ 08221 800-336-4277 www.csslis.com	CPSI James Bouchard james@cpsinet.com 6600 Wall St. Mobile, AL 36695 251-639-8100 www.cpsinet.com	Custom Software Systems Inc. George Widuch george@css-corporate.com DeWitt Rhaly dewitt@css-corporate.com 7012 Westbelt Dr., Nashville, TN 37209 800-344-8053 www.css-corporate.com
See accompanying article on page 54				
Name of system	Polytech for Windows	CLS-2000	CPSI system	StarLab
No. of contracts for sites operating LIS	24	86	213	21
• Hospital/independent lab contracts in U.S.	10/0	0/74	212/1	16/2
• Clinic or group practice contracts in U.S.	14	12	0	3
• Other contracted U.S. sites/contracts for foreign sites	0/0	0/0	0/0	0/0
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	2 (0/0/2)	5 (0/5/0)	8 (8/0/0)	1 (1/0/0)
• Contracts signed during most recent calendar or fiscal year	—	9	23	2
No. of sites operating LIS	24	86	213	30
First/most recent LIS installation	1990/2002	1980/2002	1986/2002	1984/2001
Staff to develop/install/support/other* in entire firm	9 total	6/4/4/5	52/127/380/54	8/4/5/12
Staff to develop/install/support/other* in LIS division	—	—	30/25/60/0	4/2/4/3
No. of terminals/workstations in sites operating system (min.-max.)	1-13	4-60	14-300	2-80
• Central hardware	Dell, IBM, HP	IBM RISC/6000	IBM X series 255	IBM X series
• Central hardware redundant/fault-tolerant?	—	yes	yes	—
• Terminals/workstations	Dell, IBM, HP	—	IBM compatible/thin-client devices	CSS network-ready workstation
• Workstation set-up	only PC workstation supported	dumb terminal supported	only PC workstation supported	dumb terminal supported
• Software programming language(s)	C, C++, Assembler	C	AcuCobol, C++	Cobol
• Operating system(s)	98 SE, ME, NT 4, NT 2000, XP	AIX	Open Unix 8, UnixWare 7, Windows 2000	Linux
• Database system(s) used	SQL, Btrieve	Lab Base	server proprietary	T-ISAM
• System includes full transaction logging?	yes	yes	no	yes
Features (listed as a percentage of live installations, available but no installations, or not available)				
• Chemistry and hematology	100%	100%	100%	100%
• Bar-coded collection labels	90%	95%	100%	80%
• Handheld devices for bedside-positive patient ID	not available	0	5%	—
• NCCLS POCT-1A standard interface for POCT devices	not available	0	1%	—
• Microbiology	12%	85%	100%	10%
• Blood bank donor center/transfusion service	not available	0/0	both available in fall 2003	—/—
• Surgical pathology/cytology	not available	20%/30%	both available in spring 2003	both available but not installed
• HIS interface: A/D/T	30%	20%	100%	80%
• HIS interface: order entry	30%	25%	100%	80%
• HIS interface: result reporting	30%	30%	100%	80%
• Ad hoc reporting	100%	60%	100%	45%
• Rules-based system	100%	100%	100%	not available
• Utilization management	100%	100%	100%	10%
• Outreach and commercial laboratory	15%	100%	100%	50%
• Compliance checking	100%	100%	100%	100%
• Accounts receivable	60%	80%	100%	10%
• Materials management and inventory	not available	75%	100%	not available
• Test partition	100%	20%	70%	not available
• Remote faxing and printing	95%	100%	100%	75%
• Physician office outreach	not available	30%	100%	20%
• HIPAA standard transaction formats	not available	20%	100%	available but not installed
• Web-based remote inquiry of reports	available but not installed	15%	22%	available but not installed
• Web access for order entry	available in November 2002	15%	22%	available but not installed
Complete LIS ASP solution?	no	no	yes	no
ASP for physician order entry/result reporting?	yes	yes	yes	no
Method of charging for ASP service	fixed fee, transaction-based	fixed fee	fixed fee	—
Client software required	requires software be installed on client PC	requires software be installed on client PC	requires software be installed on client PC	—
ASP information conduit	operates over Internet	operates over Internet	operates over Internet	—
Client contracts supported from data center not operated by client	n/a	—	—	—
How data center is operated	n/a	by a third-party (ProxyMed)	by vendor	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:				
• Microbiology data	available but not installed	—	not available	not available
• Tumor diagnosis/registry data	—	—	not available	not available
ASTM/HL7 interface?	yes	yes	yes	yes
Hospital/integrated health care systems interfaced	Siemens, CHC, Intermed, Tech Time, HDS, Dairyland, Antrim, others	McKesson, Medic, SCC, CCA, PCN, IPX, Advanced Data Systems	CPSI	Dairyland, Healthcare Management System, Siemens
Physician office management systems interfaced	MedicalLogic, Medical Manager, Vital Works, Misys, Trizetto, others	ADS, Medic, IDX, PCN, Medical Manager	n/a	Mega West, IDX
Automated lab transportation systems interfaced	planned to Lab InterLink/Labotix, Beckman Coulter IDS, Sysmex, Roche/BMC/Hitachi	—	no	planned
Software provides indexed field in each test definition for LOINC code?	yes	yes	no	yes
Provide LOINC dictionary for each new installation?	yes	—	no	no
LIS permits use of SNOMED II/SNOMED CT?	no/no	no/no	no/no	no/no
Market modules for other hospital departments?	no	no	yes	yes
• Percentage of LIS installations stand-alone	—	—	<1%	20%
No. of different lab instruments interfaced with LIS	200+	300	238	60+
Source code?/User group?	escrow/no	yes/no	escrow/yes	escrow/yes
User can modify screens?	yes (and user-defined report writer provided)	no (but user-defined report writer provided)	yes (and user-defined report writer provided)	no (but user-defined report writer provided)
Query language to retrieve info. from LIS database	Pervasive SQL	Access, Oracle	must use CPSI's ad hoc report writer	Intelligent Query (IQ), Microsoft Access, other PC-based tools
Smallest cost (hardware/software/monthly maintenance)	—	\$7.5k/\$15k/\$0.3k	\$61k/\$138k/\$2k	\$25k/\$35k/\$0.6k
Largest cost (hardware/software/monthly maintenance)	—	\$50k/\$250k/\$5k	\$186k/\$458k/\$8.5k	\$250k/\$350k/\$6k
Distinguishing features (supplied by vendor)	• large system features at a small system price • all day-to-day work done on one screen • simple to learn and use	• integrated laboratory financial system • remote order and result system • toxicology and clinical trial applications available	• fully integrated HIS • conversion, installation, training, and ongoing support services provided • single-source vendor supplying all necessary software and hardware	• standardized screens and functions • total system integration eliminates duplication of work effort • emphasis on results reporting and improved efficiency
*other—sales, marketing, administration, and other company functions				

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## Laboratory information systems

Part 4 of 12	Diamond Computing James T. Campbell jim@diamondcomputing.net 2345 Fourth St. Tucker, GA 30084 770-496-0286	Fletcher-Flora Inc. Ken Mitchell ken@labpak.com 1580 Orangethorpe Way Anaheim, CA 92801 800-777-1471 ext. 231 www.labpak.com	Hex Laboratory Systems Susan Bollinger sbollinger@hexlab.com 10428 El Camino Real, Ste. 308 Encinitas, CA 92024-1322 800-729-2085 www.hexlab.com
See accompanying article on page 54			
Name of system	LabGem	LabPak	Lab/Hex
No. of contracts for sites operating LIS	48	972	124
• Hospital/independent lab contracts in U.S.	14/34	130/40	9/52
• Clinic or group practice contracts in U.S.	0	792	42
• Other contracted U.S. sites/contracts for foreign sites	0/0	0/10	11/10
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	2 (1/1/0)	n/a	6 (1/2/3)
• Contracts signed during most recent calendar or fiscal year	2	—	—
No. of sites operating LIS	48	972	134
First/most recent LIS installation	1984/2002	1980/2002	1981/2002
Staff to develop/install/support/other* in entire firm	—	n/a	5/5/5/3
Staff to develop/install/support/other* in LIS division	—	8/7/8/14	—
No. of terminals/workstations in sites operating system (min.-max.)	6-500	1-36	2-40+
• Central hardware	IBM RS/6000, DEC Alpha, Intel	Intel Pentium IV	any Intel Pentium
• Central hardware redundant/fault-tolerant?	yes	optional	yes
• Terminals/workstations	Wyse, Intel PCs	PCs	PCs, Wyse terminals, thin clients
• Workstation set-up	dumb terminal supported	only PC workstation supported	dumb terminal supported
• Software programming language(s)	M Caché	C, C++, Visual Basic	TBred Basic Business, Inquire IV
• Operating system(s)	AIX/Unix, Windows NT, MSM	Windows 98, 2000, NT	SCO Unix, Red Hat Linux, Windows 2000
• Database system(s) used	—	Pervasive	IDOL IV, 4GL, SQL
• System includes full transaction logging?	yes	no	yes
Features (listed as a percentage of live installations, available but no installations, or not available)			
• Chemistry and hematology	100%	100%	100%
• Bar-coded collection labels	100%	25%	100%
• Handheld devices for bedside-positive patient ID	10%	not available	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	—	not available	available but not installed
• Microbiology	80%	15%	100%
• Blood bank donor center/transfusion service	—	not available	partner with another company for both
• Surgical pathology/cytology	30%/50%	not available	50%/75%
• HIS interface: A/D/T	100%	30%	15%
• HIS interface: order entry	100%	20%	10%
• HIS interface: result reporting	100%	80%	15%
• Ad hoc reporting	90%	50%	100%
• Rules-based system	—	100%	100%
• Utilization management	80%	100%	100%
• Outreach and commercial laboratory	100%	30%	40%
• Compliance checking	100%	90%	90%
• Accounts receivable	50%	not available	65%
• Materials management and inventory	—	10%	partner with another company
• Test partition	—	70%	100%
• Remote faxing and printing	100%	90%	100%
• Physician office outreach	100%	35%	65%
• HIPAA standard transaction formats	—	0	100%
• Web-based remote inquiry of reports	—	—	5%
• Web access for order entry	—	—	5%
Complete LIS ASP solution?	—	no	yes
ASP for physician order entry/result reporting?	—	no	yes
Method of charging for ASP service	—	—	fixed fee
Client software required	—	—	browser-based
ASP information conduit	—	—	operates over Internet
Client contracts supported from data center not operated by client	—	—	5
How data center is operated	—	—	by a third-party (Dell)
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:			
• Microbiology data	—	not available	available but not installed
• Tumor diagnosis/registry data	—	not available	available but not installed
ASTM/HL7 interface?	yes	yes	yes
Hospital/integrated health care systems interfaced	McKesson, Cerner, Sunquest, IBAX, Meditech, others	IDX, Dairyland, HSI, Experior, Logician, QSI, CPSI	McKesson, Cerner, Siemens, PSI, Misys, Antrim, Experior, Logician, proprietary, others
Physician office management systems interfaced	Doctor Chart, Clinscan, Fiscal, Medical Manager, others	Medical Manager, Medic, IDX, Logician, Practice Partners, A <sup>4</sup> Health Systems, Praxis, others	Medical Manager, Medic, IDX, MedicalLogic, MediPro, Millbrook, PMS, proprietary
Automated lab transportation systems interfaced	available but not yet operational to MDS AutoLab	no	planned
Software provides indexed field in each test definition for LOINC code?	yes	yes	yes
Provide LOINC dictionary for each new installation?	yes	no	no
LIS permits use of SNOMED II/SNOMED CT?	yes/yes	no/no	yes/yes
Market modules for other hospital departments?	—	no	no
• Percentage of LIS installations stand-alone	—	—	—
No. of different lab instruments interfaced with LIS	—	350+	250+
Source code?/User group?	yes/—	no/no	escrow/no
User can modify screens?	— (user-defined report writer provided)	yes	no (but user-defined report writer provided)
Query language to retrieve info. from LIS database	—	n/a	SQL
Smallest cost (hardware/software/monthly maintenance)	—	\$6k (hardware & software)/\$0.5k per year	\$5k/\$15k/\$0.2k
Largest cost (hardware/software/monthly maintenance)	—	\$25k/\$100k/\$0.5k	\$100k/\$180k/\$2.8k
Distinguishing features (supplied by vendor)	• ease of use • user-defined system • modular system design	• ease of use • scalability • value	• extreme flexibility; readily available customizations • integrated billing, e-billing, medical necessity • reliable and stable with extensive growth potential
*other=sales, marketing, administration, and other company functions			

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## Laboratory information systems

Part 5 of 12	Impac Medical Systems† Gary Rex grex@impac.com 100 W. Evelyn Ave. Mountain View, CA 94041 800-711-5525 www.impac.com	Informatica Tesi de Italia, SA de CV Fernando Estrada comercial@tesicom.mx Bosques de los Cruces #168 Piso 8 Col. Bosques de las Lomas Mexico, DF 11700 52-55-5596-6616	Information Data Management Inc. Susan L. McBride info@idm.com 8701 W. Higgins Rd., Ste. 500 Rosemont, IL 60018 800-249-4276/847-825-2300 www.idm.com	Isys/Biovation Jeff Virgo jvirgo@isys.tv 6925 Lake Ellenor Drive, Ste. 135 Orlando, FL 32809 407-859-2681 www.isys.tv
See accompanying article on page 54				
Name of system	IntelliLab	WinLab	Surround	Messenger
No. of contracts for sites operating LIS	42	500+	4	5
• Hospital/independent lab contracts in U.S.	7/1	0/0	0/0	0/1
• Clinic or group practice contracts in U.S.	31	0	0	3
• Other contracted U.S. sites/contracts for foreign sites	3/0	0/500+	4/0	0/1
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	2 (0/2/0)	13 (5/8/0)	6 (0/0/6)	13 (7/1/5)
• Contracts signed during most recent calendar or fiscal year	—	—	—	1
No. of sites operating LIS	147	500+	4	7
First/most recent LIS installation	1988/2002	1981/2002	2000/2002	1985/2001
Staff to develop/install/support/other* in entire firm	102/103 (installation and support)/57	12/13/4/12	25/3/13/11	5/8/7/4
Staff to develop/install/support/other* in LIS division	—	8/13/4/12	—	—
No. of terminals/workstations in sites operating system (min.-max.)	3-1,300	1-35	3-40	3-75
• Central hardware	Dell, HP (Compaq)	Intel Pentium III server, Dell	Intel Pentium IV servers	platform-independent PCs
• Central hardware redundant/fault-tolerant?	yes	yes	yes	yes
• Terminals/workstations	any modern PC with Windows 9x or higher	Celeron, Intel Pentium III or IV PCs	PC workstation	platform-independent PCs
• Workstation set-up	PC, Citrix	only PC workstation supported	only PC workstation supported	only PC workstation supported
• Software programming language(s)	Visual Basic, C, InfoBasic	Visual Basic 6.0	Java	Delphi, C++
• Operating system(s)	Windows 9x, NT, 4.0, 2000, XP	Windows 95, 98, 2000, NT workstations, NT server, others	Microsoft Windows NT, 2000	Windows NT, 98, ME, 2000, XP-OS independent
• Database system(s) used	mvBase	MS SQL server 7.0, 2000	Oracle 8	DB independent, SQL server preferred
• System includes full transaction logging?	yes	yes	yes	yes
Features (listed as a percentage of live installations, available but no installations, or not available)				
• Chemistry and hematology	100%	80%	100%	100%
• Bar-coded collection labels	100%	50%	100%	100%
• Handheld devices for bedside-positive patient ID	available but not installed	available but not installed	not available	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	not yet available	—	not available	—
• Microbiology	60%	15%	not available	20%
• Blood bank donor center/transfusion service	not available	40%/20%	50%/not available	available/not available
• Surgical pathology/cytology	10%/available but not installed	not available	not available	both available but not installed
• HIS interface: A/D/T	40%	10%	not available	100%
• HIS interface: order entry	40%	5%	not available	100%
• HIS interface: result reporting	40%	10%	not available	100%
• Ad hoc reporting	100%	100%	not available	100%
• Rules-based system	100%	5%	not available	100%
• Utilization management	100%	available but not installed	not available	100%
• Outreach and commercial laboratory	100%	available but not installed	not available	100%
• Compliance checking	100%	10%	50%	100%
• Accounts receivable	available but not installed	5%	not available	not available
• Materials management and inventory	not available	5%	not available	available but not installed
• Test partition	100%	2%	100%	100%
• Remote faxing and printing	100%	25%	100%	100%
• Physician office outreach	100%	2%	not available	100%
• HIPAA standard transaction formats	100%	—	not available	—
• Web-based remote inquiry of reports	90%	—	—	—
• Web access for order entry	90%	—	—	—
Complete LIS ASP solution?	yes	no	yes	yes
ASP for physician order entry/result reporting?	yes	no	no	yes
Method of charging for ASP service	—	—	fixed fee	fixed fee, transaction-based
Client software required	browser with Citrix (otherwise requires client software be loaded)	—	requires software be installed on client PC	requires software be installed on client PC
ASP information conduit	operates over Internet or VPN	—	requires use of private, dedicated circuit	operates over Internet
Client contracts supported from data center not operated by client	0	—	0	0
How data center is operated	by vendor (or client if needed)	—	by vendor	by vendor
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:				
• Microbiology data	—	not available	not available	available but not installed
• Tumor diagnosis/registry data	—	not available	not available	available but not installed
ASTM/HL7 interface?	yes	no	no	yes
Hospital/integrated health care systems interfaced	Siemens, Dairyland, others	—	none	McKesson, Epic, ECHN, Medipac
Physician office management systems interfaced	Impac, Misys, Medical Manager, QMS, MedicalLogic, IDX, HealthWorks, others	—	none	Medical Manager, NextGen, PCIS, CMS
Automated lab transportation systems interfaced	planned	no	no	available but not yet operational
Software provides indexed field in each test definition for LOINC code?	in process	no	no	yes
Provide LOINC dictionary for each new installation?	in process	no	no	no
LIS permits use of SNOMED II/SNOMED CT?	yes/yes	no/no	no/no	yes/—
Market modules for other hospital departments?	yes	no	no	yes
• Percentage of LIS installations stand-alone	99%	—	—	100%
No. of different lab instruments interfaced with LIS	200+	200+	6	450+
Source code?/User group?	escrow/planned for 2003	no/no	escrow/planned for 2003	escrow/yes
User can modify screens?	yes (and user-defined report writer provided)	yes (and user-defined report writer provided)	no	—
Query language to retrieve info. from LIS database	Access, SQL	MS SQL	SQL	ANSI SQL 92
Smallest cost (hardware/software/monthly maintenance)	\$25k (hardware and software)/\$0.21k	\$2k/\$7k/\$0.2k†	n/a/\$125k/\$1.75k	\$30k/\$50k/\$1.2k
Largest cost (hardware/software/monthly maintenance)	\$250k (hardware and software)/\$2.9k	\$80k/\$50k/\$0.3k†	n/a/\$750k/\$21k	\$500k/\$1m/\$15k
Distinguishing features (supplied by vendor)	• fourth generation Medicare medical necessity • Web server-based LIS; adds security and scalability • PhD proactive support † formerly Intellidata	• easy to use • complete management of all lab activities • electronic work lists and auto-programming of instruments with auto-validation of results † listed as U.S. dollars	• over two decades of experience in regulated software • 24/7 customer support services • large customer base, financial stability, continual research and development	• 100% user definable; full HL7 messaging • interface engine and data repository • operating system, platform, database independent
*other—sales, marketing, administration, and other company functions				

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## Laboratory information systems

Part 6 of 12	Keane Inc. Leslie Johnson leslie_r_johnson@keane.com 290 Broadhollow Rd. Melville, NY 11747 800-699-6773 www.keane.com/hsd	LabSoft Inc. Tina Zaffuto tzaffuto@labsoftlls.com 8402 Laurel Fair Circle, Ste. 207 Tampa, FL 33610 800-767-3279 www.labsoftlls.com	LabSoft Inc. Tina Zaffuto tzaffuto@labsoftlls.com 8402 Laurel Fair Circle, Ste. 207 Tampa, FL 33610 800-767-3279 www.labsoftlls.com
See accompanying article on page 54			
Name of system	LabFusion	Beethoven II	LabNet LIS
No. of contracts for sites operating LIS	33	155	123
• Hospital/independent lab contracts in U.S.	—	33/10	40/19
• Clinic or group practice contracts in U.S.	—	108	64
• Other contracted U.S. sites/contracts for foreign sites	—	4/0	0/0
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	1 (1/0/0)	1 (0/0/1)	2 (0/1/1)
• Contracts signed during most recent calendar or fiscal year	3	5	12
No. of sites operating LIS	33	155	182
First/most recent LIS installation	1989/2002	1992/2002	1992/2002
Staff to develop/install/support/other* in entire firm	145/123/107/104	2/3/5/3	2/3/5/3
Staff to develop/install/support/other* in LIS division	6/1/2/0	—	—
No. of terminals/workstations in sites operating system (min.–max.)	6–50	1	3–75
• Central hardware	IBM RS/6000, IBM AS/400	Compaq, Dell	Compaq, Dell
• Central hardware redundant/fault-tolerant?	yes	yes	yes
• Terminals/workstations	PCs	Compaq, Dell	Compaq, Dell
• Workstation set-up	dumb terminal supported	only PC workstation supported	only PC workstation supported
• Software programming language(s)	Progress	Visual C++, Delphi	Visual C++, Delphi
• Operating system(s)	Unix, OS/400	Windows 2000 Professional, NT4	Windows 2000 Professional, ME, NT4, 98
• Database system(s) used	Progress	MS SQL server	MS SQL server
• System includes full transaction logging?	yes	yes	yes
Features (listed as a percentage of live installations, available but no installations, or not available)			
• Chemistry and hematology	100%	100%	100%
• Bar-coded collection labels	100%	90%	100%
• Handheld devices for bedside-positive patient ID	5%	available but not installed	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	—	available but not installed	available but not installed
• Microbiology	80%	available but not installed	25%
• Blood bank donor center/transfusion service	0/0	not available	not available
• Surgical pathology/cytology	5%/5%	not available	not available
• HIS interface: A/D/I	90%	50%	70%
• HIS interface: order entry	80%	50%	50%
• HIS interface: result reporting	80%	50%	50%
• Ad hoc reporting	100%	50%	100%
• Rules-based system	100%	50%	100%
• Utilization management	100%	100%	100%
• Outreach and commercial laboratory	10%	30%	50%
• Compliance checking	20%	100%	100%
• Accounts receivable	10%	not available	not available
• Materials management and inventory	not available	not available	not available
• Test partition	100%	available but not installed	not available
• Remote faxing and printing	70%	65%	100%
• Physician office outreach	10%	not available	60%
• HIPAA standard transaction formats	—	not available	not available
• Web-based remote inquiry of reports	—	available but not installed	3%
• Web access for order entry	—	available but not installed	3%
Complete LIS ASP solution?	no	yes	yes
ASP for physician order entry/result reporting?	no	yes	yes
Method of charging for ASP service	—	fixed fee	fixed fee
Client software required	—	browser-based	browser-based
ASP information conduit	—	operates over Internet	operates over Internet
Client contracts supported from data center not operated by client	—	0	0
How data center is operated	—	by a third-party (client)	by a third-party (client)
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:			
• Microbiology data	not available	available but not installed	available but not installed
• Tumor diagnosis/registry data	not available	not available	not available
ASTM/HL7 interface?	yes	yes	yes
Hospital/integrated health care systems interfaced	McKesson, Siemens, IMN, Meditech	McKesson, Siemens, Dairyland, Epic, custom	Siemens, Dairyland, Epic, customized
Physician office management systems interfaced	—	Medical Manager, STC, Physix, Epicare, IDX, NextGen, Impac, Medic, MS4, MicroMed, custom	Medical Manager, STC, Physix, Epicare, IDX, NextGen, Impac, Medic, MicroMed, custom
Automated lab transportation systems interfaced	no	planned	planned
Software provides indexed field in each test definition for LOINC code?	no	yes	yes
Provide LOINC dictionary for each new installation?	—	no	yes
LIS permits use of SNOMED II/SNOMED CT?	yes/no	yes/yes	yes/yes
Market modules for other hospital departments?	yes	no	no
• Percentage of LIS installations stand-alone	25%	—	—
No. of different lab instruments interfaced with LIS	100	100+	165
Source code?/User group?	no/yes	escrow/no	escrow/no
User can modify screens?	—	no	no (but user-defined report writer provided)
Query language to retrieve info. from LIS database	Progress, Cyberquery	any ODBC-compatible language	ODBC-compatible languages
Smallest cost (hardware/software/monthly maintenance)	—	\$2.5k/\$6k/\$0.025k	\$0/\$24k/\$0.1k
Largest cost (hardware/software/monthly maintenance)	—	\$6k/\$25k/\$0.25k	—
Distinguishing features (supplied by vendor)	• user-defined system can meet specific facility needs • implementation and support by registered medical technologists • numerous data delivery options to meet provider expectations	• flexible • easy to use • unrivaled support	• Velocity Web module • unrivaled support • ease of use
*other—sales, marketing, administration, and other company functions			

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## Laboratory information systems

Part 7 of 12	M/MGMT Systems Inc. Bob Mann mlab@mmgmt.com 2335 American River Drive, Ste. 402 Sacramento, CA 95825 916-648-9010 www.mmgmt.com	McKesson J. Watson jeff.watson@mcckesson.com 5995 Windward Parkway Alpharetta, GA 30005 404-338-3092 www.mckesson.com	Medcom Information Systems Inc. David Baird dbaird@emirj.com 2117 Stonington Ave. Hoffman Estates, IL 60195 847-885-1553 www.emirj.com	MediSolution USA Inc. marketing@medisolutionusa.com 2639 N. 33rd Ave. Phoenix, AZ 85009-1427 602-269-8373 www.medisolutionusa.com
See accompanying article on page 54				
Name of system	M/Lab	Horizon Lab	Medcom Lab Manager	MediLab
No. of contracts for sites operating LIS	20	45	425	596
• Hospital/independent lab contracts in U.S.	0/19	41/0	17/62	1/0
• Clinic or group practice contracts in U.S.	1	2	346	0
• Other contracted U.S. sites/contracts for foreign sites	0/0	0/2	0/0	1/>550
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	1 (0/1/0)	13 (13/0/0)	4 (0/4/0)	3 (2/0/1)
• Contracts signed during most recent calendar or fiscal year	1	5	—	4
No. of sites operating LIS	20	32	450	>550
First/most recent LIS installation	1987/2002	1999/2002	1992/2002	1972/2002
Staff to develop/install/support/other* in entire firm	3/3/5/2	6,082 total	4/6/4/7	—
Staff to develop/install/support/other* in LIS division	3/4/6/2	—	3/6/4/5	76/15/6/2
No. of terminals/workstations in sites operating system (min.-max.)	8-64	10-300+	1-11	4-300
• Central hardware	Intel-based server	HP	Medcom IBM-compatible PC	Sun, DG, Unix, IBM, HP
• Central hardware redundant/fault-tolerant?	yes	yes	yes	yes
• Terminals/workstations	Intel based	PCs	Medcom IBM-compatible PC	IBM-compatible PCs
• Workstation set-up	only PC workstation supported	only PC workstation supported	only PC workstation supported	only PC workstation supported
• Software programming language(s)	Caché, Open M	Delphi, ANSI Standard C	C++	C++, Java
• Operating system(s)	Windows NT, 2000	Unix, Windows 9X, NT, 2000, XP (for client applications)	DOS/Windows 9X, NT	Sun-OS, Windows XT, NT, 2000, 98, 95, Unix, AFX
• Database system(s) used	Caché	Oracle	DBase compatible	SQL server, Oracle
• System includes full transaction logging?	yes	yes	yes	yes
Features (listed as a percentage of live installations, available but no installations, or not available)				
• Chemistry and hematology	40%	100%	100%	95%
• Bar-coded collection labels	50%	100%	70%	100%
• Handheld devices for bedside-positive patient ID	not available	5%	—	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	not available	50%	—	2%
• Microbiology	100%	90%	5%	100%
• Blood bank donor center/transfusion service	not available	both through vendor partner	—	not available/15%
• Surgical pathology/cytology	not available/available but not installed	both through vendor partner	—	25%/22%
• HIS interface: A/D/T	not available	not available	3%	100%
• HIS interface: order entry	70%	100%	2%	20%
• HIS interface: result reporting	50%	100%	4%	100%
• Ad hoc reporting	100%	100%	100%	100%
• Rules-based system	70%	100%	—	100%
• Utilization management	100%	100%	—	100%
• Outreach and commercial laboratory	not available	100%	—	50%
• Compliance checking	not available	100%	5%	not available
• Accounts receivable	80%	0	—	100%
• Materials management and inventory	not available	0	—	not available
• Test partition	100%	100%	100%	100%
• Remote faxing and printing	60%	100%	8%	100%
• Physician office outreach	not available	100%	—	30%
• HIPAA standard transaction formats	available but not installed	not available	—	not available
• Web-based remote inquiry of reports	available in December 2002	10%	1%	30%
• Web access for order entry	available in December 2002	10%	1%	30%
Complete LIS ASP solution?	no	no	yes	no
ASP for physician order entry/result reporting?	no	no	yes	no
Method of charging for ASP service	—	—	fixed fee	—
Client software required	—	—	browser-based	—
ASP information conduit	—	—	operates over Internet	—
Client contracts supported from data center not operated by client	—	—	none	—
How data center is operated	—	—	by a third-party (YNC)	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:				
• Microbiology data	14 sites	15% of sites	not available	available but not installed
• Tumor diagnosis/registry data	not available	not available	not available	3 sites
ASTM/HL7 interface?	yes	yes	yes	yes
Hospital/integrated health care systems interfaced	any HL7	McKesson, Siemens, IDX, Meditech, home-grown	—	Meditech, Triple G, Sunquest, MediSolution, others
Physician office management systems interfaced	any HL7	McKesson, IDX, Cliniscan	Medical Manager, MedicaLogic, AMS, Edimis, Wismer Martin, IDX, others	MediSolution USA
Automated lab transportation systems interfaced	no	Beckman Coulter IDS, Roche/BMC/Hitachi, homegrown	no	Beckman Coulter IDS, Sysmex, Bayer, Roche/BMC/Hitachi, Tecan Genesis
Software provides indexed field in each test definition for LOINC code?	yes	yes	no	yes
Provide LOINC dictionary for each new installation?	—	yes	no	no
LIS permits use of SNOMED II/SNOMED CT?	in development	not available	no/no	yes/yes
Market modules for other hospital departments?	no	yes	no	yes
• Percentage of LIS installations stand-alone	—	20%	—	95%
No. of different lab instruments interfaced with LIS	18	200+	200+	320+
Source code?/User group?	yes/yes	escrow/yes (also a user group Web site)	escrow/no	escrow/yes
User can modify screens?	no (but user-defined report writer provided)	yes (and user-defined report writer provided)	—	yes (and user-defined report writer provided)
Query language to retrieve info. from LIS database	SQL, ODBC	any ODBC software pkg., e.g., Crystal Reports	language supported by SQL server	SQL
Smallest cost (hardware/software/monthly maintenance)	—/\$64k/\$1k	—	\$2k/\$7k/\$0.10k	\$6k/\$30k/\$0.5k
Largest cost (hardware/software/monthly maintenance)	—/\$560k/\$8.4k	—	\$35k/\$70k/\$0.75k	\$300k/\$2m/\$33k
Distinguishing features (supplied by vendor)	• public health laboratory-specific design • clinical/environmental/bioterrorism/newborn screening • historical electronic medical record	• fully supports hospital, hybrid, or reference labs • integral expert technology to automate and streamline operations throughout the lab • phlebotomy workstation ensures positive patient identification	• cost-effective interfacing for data exchange with other software • software support includes updates, upgrades, modem support, phone help • interfaces available for reference labs, billing systems, EMRs	• multi-lingual—nine languages • modular applications—all modules can stand alone • client/server with relational database
*other—sales, marketing, administration, and other company functions				† Technidata employees

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## Laboratory information systems

<b>Part 8 of 12</b>	<b>Meditech</b> Paul Berthiaume info@meditech.com Meditech Circle Westwood, MA 02090 781-821-3000 www.meditech.com	<b>Meditech</b> Paul Berthiaume info@meditech.com Meditech Circle Westwood, MA 02090 781-821-3000 www.meditech.com	<b>Misys Healthcare Systems</b> Ken Kark ken.kark@misyshealthcare.com 4801 E. Broadway Blvd. Tucson, AZ 85710 800-748-9658 www.misyshealthcare.com	<b>Misys Healthcare Systems</b> Ken Kark ken.kark@misyshealthcare.com 4801 E. Broadway Blvd. Tucson, AZ 85710 800-748-9658 www.misyshealthcare.com
See accompanying article on page 54				
<b>Name of system</b>	Meditech client/server LIS	Meditech Magic LIS	Misys Commercial Lab	Misys Laboratory
<b>No. of contracts for sites operating LIS</b>	144 (through 2001)	1,129 (through 2001)	47	685
• Hospital/independent lab contracts in U.S.	—	—	8/38	654/10
• Clinic or group practice contracts in U.S.	—	—	1	0
• Other contracted U.S. sites/contracts for foreign sites	—	—	0/0	0/21
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	13	26	2 (1/1/0)	24 (22/1/1)
• Contracts signed during most recent calendar or fiscal year	13	26	1	30
<b>No. of sites operating LIS</b>	144 (through 2001)	1,129 (through 2001)	89	1,200
First/most recent LIS installation	1969/2002	1969/2002	1979/2002	1979/2002
<b>Staff to develop/install/support/other* in entire firm</b>	2,024 total	2,024 total	200/170/243/195	200/170/243/195
Staff to develop/install/support/other* in LIS division	—	—	166/130/230/180	166/130/230/180
<b>No. of terminals/workstations in sites operating system (min.-max.)</b>	—	—	10-1,000+	32-1,000+
• Central hardware	EMC, IBM, HP (Compaq), Dell	EMC, HP (Compaq)	IBM RS/6000, Compaq Alpha	IBM RS/6000, Compaq Alpha
• Central hardware redundant/fault-tolerant?	yes	yes	yes	yes
• Terminals/workstations	—	—	Compaq, DEC VT 480 or compatible	Dell, Compaq
• Workstation set-up	only PC workstation supported	dumb terminal supported	dumb terminal supported	dumb terminal supported
• Software programming language(s)	Magic, client/server	Magic	Caché	Caché
• Operating system(s)	Windows 2000, ME	Magic	VMS, Unix	AIX, OpenVMS
• Database system(s) used	Magic	Magic	Open M, Caché	Caché
• System includes full transaction logging?	yes	yes	yes	yes
<b>Features (listed as a percentage of live installations, available but no installations, or not available)</b>				
• Chemistry and hematology	100%	100%	100%	100%
• Bar-coded collection labels	100%	100%	100%	100%
• Handheld devices for bedside-positive patient ID	10%	10%	not available	<10%
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	10%	available but not installed	15%
• Microbiology	100%	100%	100%	100%
• Blood bank donor center/transfusion service	15%/100%	15%/100%	not available	6%/70%
• Surgical pathology/cytology	100%/100%	100%/100%	40%/40%	70%/70%
• HIS interface: A/D/T	25%	25%	100%	99%
• HIS interface: order entry	25%	—	100%	99%
• HIS interface: result reporting	25%	—	100%	99%
• Ad hoc reporting	100%	100%	100%	90%
• Rules-based system	100%	100%	100%	100%
• Utilization management	100%	100%	100%	100%
• Outreach and commercial laboratory	25%	25%	100%	75%
• Compliance checking	40%	40%	100%	30%
• Accounts receivable	100%	100%	90%	10%
• Materials management and inventory	100%	100%	0	20%
• Test partition	100%	100%	100%	100%
• Remote faxing and printing	100%	100%	100%	90%
• Physician office outreach	25%	25%	<10%	20%
• HIPAA standard transaction formats	100%	100%	30%	100%
• Web-based remote inquiry of reports	2%	2%	available 2nd quarter 2003	<10%
• Web access for order entry	2%	—	available in 2003	available 1st quarter 2003
Complete LIS ASP solution?	no	no	no	no
ASP for physician order entry/result reporting?	no	—	no	no
Method of charging for ASP service	—	—	—	—
Client software required	—	—	—	—
ASP information conduit	—	—	—	—
Client contracts supported from data center not operated by client	—	—	—	—
How data center is operated	—	—	—	—
<b>LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:</b>				
• Microbiology data	not available	not available	available but not installed	1,200 sites
• Tumor diagnosis/registry data	not available	not available	available but not installed	available but not installed
<b>ASTM/HL7 interface?</b>	yes	yes	yes	yes
Hospital/integrated health care systems interfaced	Cerner, McKesson, Siemens, others	Cerner, McKesson, Siemens, others	Cerner, Siemens, IBAX, Specialty Labs, Meditech, IDX, others	McKesson, Epic, Siemens, Cerner, IDX, Eclypsis, others
Physician office management systems interfaced	—	—	—	Powerchart, Doctor Chart, others
Automated lab transportation systems interfaced	MDS AutoLab	Lab InterLink/Labotix, MDS AutoLab	Roche/BMC/Hitachi	Lab InterLink/Labotix, Beckman Coulter IDS, Bayer, Roche/BMC/Hitachi, Tecan
<b>Software provides indexed field in each test definition for LOINC code?</b>	no	no	no	no
Provide LOINC dictionary for each new installation?	—	no	no	no
<b>LIS permits use of SNOMED II/SNOMED CT?</b>	yes/yes	yes/yes	yes/yes	yes/no
<b>Market modules for other hospital departments?</b>	yes	yes	no	yes
• Percentage of LIS installations stand-alone	25%	25%	—	80%
<b>No. of different lab instruments interfaced with LIS</b>	hundreds	—	300+	660
Source code?/User group?	yes/yes (also meets via Internet)	yes/yes (also meets via Internet)	yes/yes (also meets via Internet)	no/yes (also meets via Internet)
User can modify screens?	yes (and user-defined report writer provided)	yes (and user-defined report writer provided)	no (but user-defined report writer provided)	no (but user-defined report writer provided)
Query language to retrieve info. from LIS database	SQL, Meditech Report Writer	SQL, Meditech Report Writer	SQL	SQL
<b>Smallest cost (hardware/software/monthly maintenance)</b>	—	—	\$50k/\$100k/1.5%	\$100k/\$250k/1.5%
<b>Largest cost (hardware/software/monthly maintenance)</b>	—	—	\$500k/\$3m+/1.5%	\$500k/\$1m+/1.5%
<b>Distinguishing features (supplied by vendor)</b>	• more than 30 years' experience developing and implementing lab systems • seamless support for labs in an integrated delivery network • accurate, up-to-the-minute patient data and charge information	• more than 30 years' experience developing and implementing lab systems • seamless support for labs in an integrated delivery network • accurate, up-to-the-minute patient data and charge information	• proven high-volume processing and extensive outreach capability • streamlined workflow • integration with Misys suite of products	• company commitment to support and service • connectivity to POC, LAS, HIS, instruments, CPR, etc. • multi-facility and outreach support
<b>*other—sales, marketing, administration, and other company functions</b>				

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## Laboratory information systems

Part 9 of 12	<b>Multidata Computer Systems Inc.</b> Michael Slater mslater@mul.com 330 Seventh Ave. New York, NY 10001 212-967-6700 www.mul.com	<b>Northern Software Inc.</b> Bob Hamen P.O. Box 309 Ironwood, MI 49938 906-932-9990 www.northernsoft.com	<b>Opus Healthcare Solutions Inc.</b> Jerry Michaud mail@opushealthcare.com 10713 N. Ranch Rd. 620, Ste. 400 Austin, TX 78726 800-676-3371 www.opushealthcare.com	<b>Orchard Software Corp.</b> Kevin Dudley sales@orchardsoft.com 701 Congressional Blvd., Ste. 360 Carmel, IN 46032 800-856-1948 www.orchardsoft.com
See accompanying article on page 54				
Name of system	MultiTech LIS	eLab.Sys	OpusLab	Orchard Harvest CT
No. of contracts for sites operating LIS	40	27	45	2
• Hospital/independent lab contracts in U.S.	7/32	9/2	38/2	0/0
• Clinic or group practice contracts in U.S.	1	14	2	2
• Other contracted U.S. sites/contracts for foreign sites	0/0	0/2	3/0	0/0
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	0	6 (0/0/6)	—	0
• Contracts signed during most recent calendar or fiscal year	1	—	—	2
No. of sites operating LIS	40	27	45	2
First/most recent LIS installation	1983/2002	1988/2002	1987/2002	1993/2002
Staff to develop/install/support/other* in entire firm	4/2/3/2	2 total	55 total	11/13/14/15
Staff to develop/install/support/other* in LIS division	—	—	—	—
No. of terminals/workstations in sites operating system 4--100 (min.--max.)		1-50	3-200	1-150+
• Central hardware	Intel Pentium compatible, most Unix RISC, DEC Alpha	Dell servers, AOpen servers	HP 9000 (L Series)	HP Business Class, Pentium compatible
• Central hardware redundant/fault-tolerant?	optional	yes	yes	yes
• Terminals/workstations	PC with WRQ Reflection software, DEC VT series or compatible	Dell Optiplex, AOpen custom PC	Windows PC workstations supported	HP Business Class, Pentium compatible
• Workstation set-up	dumb terminal supported	only PC workstation supported	dumb terminal & PC workstation supported	only PC workstation supported
• Software programming language(s)	Caché (M), Visual Basic, HTML	C++, Visual Basic	C, Java, Perl	4D, C++
• Operating system(s)	Windows 2000, NT, Unix, Linux, DEC VMS	Windows 95, 98, 2000, XP	Unix	Windows NT, 2000, XP, Mac OS 8.0 and higher
• Database system(s) used	Caché (M)	Sybase SQL, MS SQL 7, SQL 2000	Opus DBMS, Postgre SQL	4D client/server, MS SQL, Oracle
• System includes full transaction logging?	optional	yes	yes	yes
Features (listed as a percentage of live installations, available but no installations, or not available)				
• Chemistry and hematology	90%	100%	100%	100%
• Bar-coded collection labels	80%	61%	100%	100%
• Handheld devices for bedside-positive patient ID	—	0	—	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	—	0	—	available but not installed
• Microbiology	80%	15%	80%	15%
• Blood bank donor center/transfusion service	—	not available	not available	not available
• Surgical pathology/cytology	10%/40%	not available/available 2nd quarter 2003	30%/20%	not available
• HIS interface: A/D/T	20%	15%	80%	65%
• HIS interface: order entry	20%	15%	75%	65%
• HIS interface: result reporting	10%	15%	75%	35%
• Ad hoc reporting	40%	100%	100%	100%
• Rules-based system	90%	100%	100%	75%
• Utilization management	20%	100%	100%	95%
• Outreach and commercial laboratory	90%	5%	75%	70%
• Compliance checking	70%	100%	25%	90%
• Accounts receivable	90%	not available	not available	not available
• Materials management and inventory	20%	available 2nd quarter 2003	not available	not available
• Test partition	100%	100%	75%	25%
• Remote faxing and printing	80%	100%	100%	90%
• Physician office outreach	80%	—	70%	80%
• HIPAA standard transaction formats	available 1st quarter 2003	—	—	100%
• Web-based remote inquiry of reports	available but not installed	not available	—	40%
• Web access for order entry	—	not available	—	40%
Complete LIS ASP solution?	no	no	yes	no
ASP for physician order entry/result reporting?	no	—	yes	no
Method of charging for ASP service	—	—	fixed fee	—
Client software required	—	—	browser-based	—
ASP information conduit	—	—	operates over Internet	—
Client contracts supported from data center not operated by client	—	—	1	—
How data center is operated	—	—	by vendor	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:				
• Microbiology data	not available	not available	available but not installed	not available
• Tumor diagnosis/registry data	not available	not available	available but not installed	not available
ASTM/HL7 interface?	yes	yes	yes	yes
Hospital/integrated health care systems interfaced	Siemens, CSM, custom	Siemens, Dairyland	Siemens, Cycare, First Coast, Western Star, McKesson, Hemocare	McKesson, Siemens, Dairyland, Meditech, Cerner, A* Health Systems, CPSI, others
Physician office management systems interfaced	Medical Manager, custom	Medical Manager	—	Medical Manager, Clinitek, IDX, MedicalLogic, NextGen, Millbrook, Medgate, Misys, Healthpac
Automated lab transportation systems interfaced	planned	planned to Beckman Coulter IDS	planned	planned
Software provides indexed field in each test definition for LOINC code?	yes	yes	yes	yes
Provide LOINC dictionary for each new installation?	on request	no	no	no
LIS permits use of SNOMED II/SNOMED CT?	no/no	no/no	yes/yes	no/no
Market modules for other hospital departments?	no	no	yes	no
• Percentage of LIS installations stand-alone	—	—	50%	—
No. of different lab instruments interfaced with LIS	125+	>200	200+	200+
Source code?/User group?	escrow/no	escrow/no	escrow/yes	escrow/yes (also meets via Internet)
User can modify screens?	no (but user-defined report writer provided)	no	yes (and user-defined report writer provided)	yes (and user-defined report writer provided)
Query language to retrieve info. from LIS database	any ODBC compliant, e.g., Access, SQL, etc.	SQL, ODBC	SQL, Crystal Report Writer	ODBC-compliant query languages
Smallest cost (hardware/software/monthly maintenance)	\$15k/\$40k/\$0.75k	\$1k/\$1k/\$0.03k	\$30k/\$100k/\$1k	\$15k/\$50k/\$0.7k
Largest cost (hardware/software/monthly maintenance)	\$250k/\$400k/\$6k	\$25k/\$3k/\$0.6k	\$200k/\$600k/\$6k	\$50k/\$250k/\$3k
Distinguishing features (supplied by vendor)	• complete billing, A/R, and mgmt. reporting for commercial labs and hospital outreach • special functionality for dialysis and toxicology labs • scheduling system with medical necessity for house calls, nursing homes, etc.	• fully integrated EMR, billing, practice management options • lab will be up and running, including interfaces, at end of installation • all users are part of development team	• Web browser-based technology • stand-alone or integrated with Opus' clinical suite of products • customer support is hallmark of company operations	• enterprise-wide lab solutions • Web-enabled outreach and connectivity • flexible integration and data storage
*other--sales, marketing, administration, and other company functions				

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## Laboratory information systems

Part 10 of 12	Orchard Software Corp. Kevin Dudley sales@orchardsoft.com 701 Congressional Blvd., Ste. 360 Carmel, IN 46032 800-856-1948 www.orchardsoft.com	Premier Laboratory Systems Inc. Chris Jennrich orion@premierlabsystems.com 16582 Gothard St., Ste. P Huntington Beach, CA 92647 714-903-0299	Psyche Systems Corp. Patricia Salem patty@psychesystems.com 321 Fortune Blvd. Milford, MA 01757 800-345-1514 www.psychesystems.com
See accompanying article on page 54			
Name of system	Orchard Harvest LIS	Orion	LabWeb
No. of contracts for sites operating LIS	360	59	24
• Hospital/independent lab contracts in U.S.	95/33	10/23	14/4
• Clinic or group practice contracts in U.S.	213	21	2
• Other contracted U.S. sites/contracts for foreign sites	19/0	5/0	0/4
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	14 (3/3/8)	14 (1/9/4)	1 (1/0/0)
• Contracts signed during most recent calendar or fiscal year	56	56	2
No. of sites operating LIS	396	59	29
First/most recent LIS installation	1993/2002	1999/2002	1976/2002
Staff to develop/install/support/other* in entire firm	11/13/14/15	—	9/8/4/12
Staff to develop/install/support/other* in LIS division	—	4/5/4/8	7/3/3/6
No. of terminals/workstations in sites operating system (min.–max.)	1–150+	1–6	5–110
• Central hardware	HP Business Class, Pentium compatible	HP Business Class server	HP
• Central hardware redundant/fault-tolerant?	yes	yes	yes
• Terminals/workstations	HP Business Class, Pentium compatible	Cybernet Elite II—zero footprint	
• Workstation set-up	only PC workstation supported	dumb terminal supported	dumb terminal supported
• Software programming language(s)	4D, C++	MS Visual Studio	Visual Basic, Fortran
• Operating system(s)	Windows NT, 2000, XP, Mac OS 8.0 and higher	Windows 2000, XP Pro	OpenVMS, Windows NT, 2000
• Database system(s) used	4D client/server, MS SQL, Oracle, others	MS Access, MS SQL	SQL server, Oracle RDB
• System includes full transaction logging?	yes	yes	yes
Features (listed as a percentage of live installations, available but no installations, or not available)			
• Chemistry and hematology	100%	90%	100%
• Bar-coded collection labels	100%	15%	100%
• Handheld devices for bedside-positive patient ID	available but not installed	not available	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	available but not installed	not available	not available
• Microbiology	25%	available in April 2003	33%
• Blood bank donor center/transfusion service	not available	not available	not available/33%
• Surgical pathology/cytology	not available	not available	33%/33%
• HIS interface: A/D/T	65%	12%	90%
• HIS interface: order entry	65%	12%	50%
• HIS interface: result reporting	35%	12%	50%
• Ad hoc reporting	100%	100%	100%
• Rules-based system	75%	100%	10%
• Utilization management	95%	100%	100%
• Outreach and commercial laboratory	70%	available but not installed	100%
• Compliance checking	90%	95%	10%
• Accounts receivable	not available	available but not installed	not available
• Materials management and inventory	not available	available but not installed	not available
• Test partition	25%	not available	100%
• Remote faxing and printing	90%	35%	100%
• Physician office outreach	80%	available but not installed	100%
• HIPAA standard transaction formats	100%	4%	100%
• Web-based remote inquiry of reports	40%	available but not installed	available in June 2003
• Web access for order entry	40%	not available	available in June 2003
Complete LIS ASP solution?	no	yes	yes
ASP for physician order entry/result reporting?	no	yes (result reporting)	yes
Method of charging for ASP service	—	transaction-based	fixed fee
Client software required	—	browser-based	requires software be installed on client PC
ASP information conduit	—	operates over Internet	operates over Internet, requires use of private, dedicated circuit
Client contracts supported from data center not operated by client	—	0	—
How data center is operated	—	by a third-party (Data Matrix)	by vendor
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:			
• Microbiology data	not available	not available	—
• Tumor diagnosis/registry data	not available	not available	—
ASTM/HL7 interface?	yes	yes	yes
Hospital/integrated health care systems interfaced	McKesson, Siemens, Dairyland, Meditech, Cerner, A <sup>4</sup> Health Systems, CPSI, Experior, IDX, others	Cerner, Siemens	various HL7, Keane, McKesson, Siemens, Meditech, home-grown, others
Physician office management systems interfaced	Medical Manager, Clinitek, Misys, IDX, MedicalLogic, NextGen, Millbrook, Medgate, Healthpac	NDC, QRS, Medimanager	Medical Manager, other HL7-compliant systems
Automated lab transportation systems interfaced	planned	planned	planned to Beckman power processor
Software provides indexed field in each test definition for LOINC code?	yes	yes	yes
Provide LOINC dictionary for each new installation?	no	—	no
LIS permits use of SNOMED II/SNOMED CT?	no/no	no/no	yes/yes
Market modules for other hospital departments?	no	no	yes (radiology)
• Percentage of LIS installations stand-alone	—	—	99%
No. of different lab instruments interfaced with LIS	200+	75+	>100
Source code?/User group?	escrow/yes (also meets via Internet)	escrow/no	yes/yes
User can modify screens?	yes (and user-defined report writer provided)	yes (and user-defined report writer provided)	yes (and user-defined report writer provided)
Query language to retrieve info. from LIS database	ODBC-compliant query languages	SQL	SQL
Smallest cost (hardware/software/monthly maintenance)	\$7.5k/\$15k/\$0.2k	\$1k/\$4k/\$0.05k	\$6k/\$8k/\$0.3k
Largest cost (hardware/software/monthly maintenance)	\$50k/\$170k+/\$1.5k	\$12k/\$30k/\$0.425k	\$200k/\$30k/\$6.5k
Distinguishing features (supplied by vendor)	• advanced medical necessity screening with automated ABN generation • HIPAA-compliant, Web-enabled outreach • cost-effective LIS	• modular design for scalability • powerful yet easy to use • affordable	• corporate focus on LabWeb LIS and WindoPath AP ASP series • three levels of ASP service to accommodate different service level needs • browser capabilities to customize lab environments
*other—sales, marketing, administration, and other company functions			

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## Laboratory information systems

Part 11 of 12	SCC Soft Computer Ellie Vahman sales@softcomputer.com 34350 U.S. Highway 19 North Palm Harbor, FL 34684 727-789-0100 www.softcomputer.com	Schuyler House Kevin Mountain kevin@schuylerhouse.com 14635 Titus St. Panorama City, CA 91402 800-706-0266 www.schuylerhouse.com	SIA (a Sysmex company) Bill Blair blairb@sysmex.com 5210 E. Williams Circle Tucson, AZ 85711 520-790-4624 www.sia-molis.com
See accompanying article on page 54			
Name of system	SoftLab	SchuyLab	Molis
No. of contracts for sites operating LIS	264	453	156
• Hospital/independent lab contracts in U.S.	228/5	65/175	2/2
• Clinic or group practice contracts in U.S.	4	176	0
• Other contracted U.S. sites/contracts for foreign sites	0/27	33/4	1/151
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	20 (16/4/0)	4 (1/3/0)	6 (4/2/0)
• Contracts signed during most recent calendar or fiscal year	23	65	14
No. of sites operating LIS	375	453	158
First/most recent LIS installation	1985/2002	1992/2002	1989/2002
Staff to develop/install/support/other* in entire firm	384/81/177/98	5/4/9/4	320/215/420/300
Staff to develop/install/support/other* in LIS division	203/64/123/55	—	50/42/30/45
No. of terminals/workstations in sites operating system (min.–max.)	3–220	1–40	5–300
• Central hardware	IBM pSeries (RS/6000), HP 9000 series	Dell Pentium PCs	HP, IBM
• Central hardware redundant/fault-tolerant?	yes	no	yes
• Terminals/workstations	PCs or ASCII terminals	Dell Pentium PCs	Windows-based PCs
• Workstation set-up	dumb terminal supported	only PC workstation supported	only PC workstation supported
• Software programming language(s)	C++, Visual C++, Java	C	Compuware Uniface
• Operating system(s)	AIX/Unix, Windows	Windows NT, 95, 98, 2000, ME, Novell	NT, NT 2000, AIX, HP-UX, Solaris
• Database system(s) used	RDM++, Oracle	Pervasive (Btrieve)	Oracle
• System includes full transaction logging?	yes	no	yes
Features (listed as a percentage of live installations, available but no installations, or not available)			
• Chemistry and hematology	100%	100%	100%
• Bar-coded collection labels	100%	20%	100%
• Handheld devices for bedside-positive patient ID	5%	not available	10%
• NCCLS POCT-1A standard interface for POCT devices	2%	not available	0
• Microbiology	98%	70%	75%
• Blood bank donor center/transfusion service	2 beta sites/52%	not available	both through Wyndgate
• Surgical pathology/cytology	53%/53%	not available	10%/10%
• HIS interface: A/D/T	98%	5%	75%
• HIS interface: order entry	80%	5%	55%
• HIS interface: result reporting	80%	10%	55%
• Ad hoc reporting	100%	10%	100%
• Rules-based system	100%	not available	100%
• Utilization management	100%	100%	100%
• Outreach and commercial laboratory	—	20%	90%
• Compliance checking	100%	20%	available but not installed
• Accounts receivable	17%	not available	90%
• Materials management and inventory	not available	not available	0
• Test partition	100%	not available	100%
• Remote faxing and printing	100%	30%	100%
• Physician office outreach	90%	5%	45%
• HIPAA standard transaction formats	—	100%	available but not installed
• Web-based remote inquiry of reports	—	available in 2003	5%
• Web access for order entry	—	not available	5%
Complete LIS ASP solution?	yes	no	yes
ASP for physician order entry/result reporting?	yes	no	yes
Method of charging for ASP service	transaction-based	—	transaction-based
Client software required	requires software be installed on client PC	—	browser-based, requires software be installed on client PC
ASP information conduit	requires use of private, dedicated circuit	—	operates over intranet
Client contracts supported from data center not operated by client	1	0	0
How data center is operated	by vendor	—	by vendor
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:			
• Microbiology data	30+ sites	not available	available but not installed
• Tumor diagnosis/registry data	30+ sites	not available	available but not installed
ASTM/HL7 interface?	yes	yes	yes
Hospital/integrated health care systems interfaced	IDX, Quadramed, Siemens, McKesson, Keane, Perot, CPSI, custom, others	Quadramed, Gold	Siemens, PerSé, BHIS, SAP, Cepage, LaLisa, Sandra
Physician office management systems interfaced	Medical Manager, HealthWorks, Alliance-Plus, MedicalLogic, Trizetto, others	Medical Manager, Wismer Martin, Apex, QSI, PCN, Hamid, Soapware, Logician, others	MCS, Medistar, Healthone
Automated lab transportation systems interfaced	Lab InterLink/Labotix, Beckman Coulter IDS, Sysmex, Bayer, Roche/BMC/Hitachi	Bayer	Sysmex, Roche/BMC/Hitachi, PUT, StreamLine
Software provides indexed field in each test definition for LOINC code?	yes	yes	yes
Provide LOINC dictionary for each new installation?	no	no	no
LIS permits use of SNOMED II/SNOMED CT?	yes/no	no/no	yes/yes
Market modules for other hospital departments?	yes	no	no
• Percentage of LIS installations stand-alone	90%	—	—
No. of different lab instruments interfaced with LIS	300+	200+	200+
Source code?/User group?	no/yes (also meets via Internet)	escrow/no	escrow/no
User can modify screens?	yes (and user-defined report writer provided)	yes (and user-defined report writer provided)	yes (and user-defined report writer provided)
Query language to retrieve info. from LIS database	SQL, ODBC, CORBA	HL7, DBase, ASTM, ASCII	ODBC compliant, such as Crystal, Cognos
Smallest cost (hardware/software/monthly maintenance)	\$30k/\$60k/1.5%	\$1.6k/\$5k/\$0.2k	\$50k/\$350k/\$5.25k
Largest cost (hardware/software/monthly maintenance)	\$600k/\$3m/1.5%	\$32k/\$55k/\$1.5k	\$1m/\$3m/\$45k+
Distinguishing features (supplied by vendor)	• advanced thin client/server architecture, object-oriented database independence, CORBA, Oracle, obsolescence resistant • integrated LIS suite developed in-house • a leading LIS company with large install base	• true 32-bit state-of-the-art system • 24/7 toll-free technical support • Internet and secure e-mail modules available	• functional enhancements without waiting for next release • high volume workflow management from OCR of requisition to specimen storage • integrated billing
*other=sales, marketing, administration, and other company functions			

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## Laboratory information systems

Part 12 of 12	Siemens Medical Solutions Health Services M. Kaytrosh maryellen.kaytrosh@smed.com 51 Valley Stream Parkway Malvern, PA 19355 610-219-6300 www.smed.com	Sysware Healthcare Systems Mayank Trivedi mayank@sysware1.com 26677 W. 12 Mile Rd. Southfield, MI 48034 248-888-7701 www.sysware1.com	Triple G Systems Group Inc. Tona Bennett tona.bennett@tripleg.com 3100 Steeles Ave. East, Ste. 600 Markham, Ontario, L3R 8T3, Canada 905-305-0041 www.tripleg.com	Triple G Systems Group Inc. Angelica Lau angelica.lau@tripleg.com 3100 Steeles Ave. East, Ste. 600 Markham, Ontario, L3R 8T3, Canada 905-305-0041 www.tripleg.com
See accompanying article on page 54				
Name of system	Novius Lab	PowerLab	TriWin	Ultra
No. of contracts for sites operating LIS	67	29	75	47
• Hospital/independent lab contracts in U.S.	63/3	1/23	2/1	10/6
• Clinic or group practice contracts in U.S.	0	1	0	0
• Other contracted U.S. sites/contracts for foreign sites	0/1	1/3	0/72	0/31
Contracts signed but LIS not yet operational (hospitals/independent labs/other sites)	22 (20/2/0)	4 (0/3/1)	2 (2/0/0)	5 (3/2/0)
• Contracts signed during most recent calendar or fiscal year	13	5	2	5
No. of sites operating LIS	70	43	140	300
First/most recent LIS installation	1996/2002	1989/2002	1990/2002	1990/2002
Staff to develop/install/support/other* in entire firm	1,300/1,400/900/2,000+	28/8/9/7	64/34/18/13	64/34/18/13
Staff to develop/install/support/other* in LIS division	36/27/36/10	—	60/30/16/8	60/30/16/8
No. of terminals/workstations in sites operating system (min.–max.)	15–250+	5–200	1–125	21–500+
• Central hardware	HP Alpha, IBM RS/6000	Dell Power Edge	hardware independent	Unix server (IBM RS/6000, HP 9000/400, Sun)
• Central hardware redundant/fault-tolerant?	yes	yes	yes	yes
• Terminals/workstations	Windows-based PCs, Citrix terminal server	Dell Optiplex, other PCs	hardware independent	Windows XP, NT, 2000, 98
• Workstation set-up	dumb terminal supported	dumb terminal supported, PC workstation supported, thin client supported	only PC workstation supported	dumb terminal supported
• Software programming language(s)	C, C++	C++, Java, Clarion	Visual Basic	C, 4GL
• Operating system(s)	Unix, Windows NT, 2000	all Windows platforms	Windows NT, 2000, XP, Novell Netware	Unix
• Database system(s) used	Sybase	Pervasive, SQL	Advantage	Unify Dataserver, Oracle
• System includes full transaction logging?	yes	yes	yes	yes
Features (listed as a percentage of live installations, available but no installations, or not available)				
• Chemistry and hematology	100%	100%	85%	100%
• Bar-coded collection labels	100%	100%	80%	100%
• Handheld devices for bedside-positive patient ID	—	available but not installed	not available	available but not installed
• NCCLS POCT-1A standard interface for POCT devices	20%	—	not available	available but not installed
• Microbiology	99%	40%	40%	80%
• Blood bank donor center/transfusion service	both through Wyndgate/Hemocare	both available but not installed	not available/25%	not available/20% (foreign installs)
• Surgical pathology/cytology	both through Tamtron	5%/10%	9%/5%	40%/40%
• HIS interface: A/D/I	98%	10%	80%	50%
• HIS interface: order entry	98%	10%	7%	50%
• HIS interface: result reporting	90%	10%	11%	50%
• Ad hoc reporting	100%	100%	45%	75%
• Rules-based system	100%	100%	available but not installed	75%
• Utilization management	100%	100%	10%	75%
• Outreach and commercial laboratory	60%	80%	20%	75%
• Compliance checking	40%	50%	available but not installed	10%
• Accounts receivable	100%	40%	20%	80%
• Materials management and inventory	—	available but not installed	5%	not available
• Test partition	100%	100%	not available	100%
• Remote faxing and printing	100%	100%	70%	100%
• Physician office outreach	20%	20%	available but not installed	available but not installed
• HIPAA standard transaction formats	60%	20%	available in 2003	100%
• Web-based remote inquiry of reports	50%	10%	not available	available but not installed
• Web access for order entry	10%	5%	not available	not available
Complete LIS ASP solution?	no	yes	no	no
ASP for physician order entry/result reporting?	yes	yes	no	no
Method of charging for ASP service	transaction-based	fixed fee	—	—
Client software required	browser-based	browser-based, requires software be installed on client PC	—	—
ASP information conduit	operates over Internet	operates over Internet	—	—
Client contracts supported from data center not operated by client	0	3	—	—
How data center is operated	—	by vendor	—	—
LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard:				
• Microbiology data	not available	2 sites	available but not installed	available but not installed
• Tumor diagnosis/registry data	not available	available but not installed	available but not installed	available but not installed
ASTM/HL7 interface?	yes	yes	yes	yes
Hospital/integrated health care systems interfaced	McKesson	Cerner, Phoenix, McKesson, Keane	Meditech, Cerner, McKesson, Siemens, MDS Labs, Hemocare, Health Vision, others	Meditech, Compucare, Ulticare/HDS, Siemens, McKesson, Epic, IDX, others
Physician office management systems interfaced	—	A <sup>4</sup> Health Systems, Medical Manager, PMSI	Jonoke, Clinicare, Health Screen	Doctor Chart, Lab Works, Data Transport
Automated lab transportation systems interfaced	Beckman Coulter IDS	available but not yet operational	MDS AutoLab	Lab InterLink/Labotix, MDS AutoLab, Beckman Coulter IDS, Sysmex
Software provides indexed field in each test definition for LOINC code?	yes	yes	yes	yes
Provide LOINC dictionary for each new installation?	no	yes	no	no
LIS permits use of SNOMED II/SNOMED CT?	no/no	yes/yes	no/no	yes/yes
Market modules for other hospital departments?	yes	available but not installed	no	no
• Percentage of LIS installations stand-alone	2%	—	—	—
No. of different lab instruments interfaced with LIS	150+	200	250+	200+
Source code?/User group?	yes/yes	escrow/yes (meets via Internet)	escrow/yes	escrow/yes (also meets via Internet)
User can modify screens?	— (user-defined report writer provided)	yes (and user-defined report writer provided)	no (but user-defined report writer provided)	yes (and user-defined report writer provided)
Query language to retrieve info. from LIS database	ODBC	SQL, HL7, XML	Crystal Report Writer	SQL, ODBC
Smallest cost (hardware/software/monthly maintenance)	—	\$15k/\$50k/\$1.5k	\$10k/\$20k/1.3% of total software	\$100k/\$150k/\$2k
Largest cost (hardware/software/monthly maintenance)	—	\$500k/\$1.2m/\$24k	\$80k/\$400k/1.3% of total software	\$100m/\$1.5m/\$28k
Distinguishing features (supplied by vendor)	• features and functions that enhance workflow • connectivity to point-of-care and lab automation systems • integrated clinical systems and multi-entity functionality	• 100% standards based • seamless solution from a totally integrated single database • easy to learn and use	• integrated LIS • short implementation time frames • superior price and performance	• an outreach leader • proven in high volumes using an unmodified relational database • all modules fully integrated, single database
*other—sales, marketing, administration, and other company functions				

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