## Laboratory information systems

# Change—the biggest constant in the LIS marketplace

**Hal Weiner**

It has been forty years since Donald A.B. Lindberg, MD, PhD, developed a computerized clinical laboratory system at the University of Missouri. Within a few years, several companies had begun offering commercially available LISs, among them Berkeley Scientific Laboratories, Meditech, T&T Technology, LCI, BD Spears, and Honeywell.

Of these, only Meditech is still actively marketing an LIS. Over the past 30 years, however, more than 100 vendors have attempted to market an LIS—some went out of business and some have been acquired.

Yet longevity is just one factor that should be evaluated when shopping for an LIS. User satisfaction is equally, if not more, important. The company that gets rave reviews today may score poorly tomorrow due to a shift in management, cutbacks, or product upgrades that do anything but upgrade the product. In the most recent LIS vendor performance report released by the professional services research firm KLAS Enterprises, LLC, the vendor that was in first place two years ago is now in last place, as determined by information technology executives and other health care professionals.

When migrating to a new LIS, choose a vendor that can convert all data, ensure accurate patient identification, including managing duplicate numbers, and maintain prior years' statistical data. Vendors should also be able to provide detailed, objective return-on-investment analyses to justify why you should purchase their product.

According to the health care consulting firm R.L. Johnson & Associates, over 6,000 LISs are installed, and more than 1,500 of these systems are at least 10 years old and due to be replaced. As noted in the article "For some, newer and slicker means trouble quicker," page 18, replacing an LIS can be more complex than a first-time installation, so do your homework before making a purchasing decision.

Featured on pages 24–50 are 37 laboratory information systems from 34 vendors. The data presented is based entirely on vendors' responses to a questionnaire. We urge readers to verify the information provided before purchasing a system, particularly the number of installed sites and claims of offering innovative features.

Ask prospective vendors to provide you with a complete list of contracts. If companies provide only a partial list of clients, are you to assume that they have omitted their dissatisfied customers? If a vendor is not comfortable using all of its installed sites as a reference, you may want to consider another vendor. Recognize, however, that every vendor probably has a few clients who are unhappy, so don't dismiss a company based solely on a few negative comments.                                  □

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# Laboratory information systems

| Part 1 of 13 | Antek Inc.<br>Paul Taylor ptaylor@antekhealthware.com<br>228 Business Center Drive<br>Reisterstown, MD 21136<br>410-517-0330/800-359-0911<br>www.antekhealthware.com/www.labdaq.com | CCA (Creative Computer Applications Inc.)<br>Chris C. Coleman sales@ccainc.com<br>26115 Mureau Rd.<br>Calabasas, CA 91302<br>818-880-6700/800-437-9000<br>www.ccainc.com | Cerner Corp.<br>Angela Betts abetts@cerner.com<br>2800 Rockcreek Parkway<br>Kansas City, MO 64117<br>816-201-2771<br>www.cerner.com | Cerner Corp.<br>Angela Betts abetts@cerner.com<br>2800 Rockcreek Parkway<br>Kansas City, MO 64117<br>816-201-2771<br>www.cerner.com |
|---|---|---|---|---|
| *See accompanying articles on pages 18, 22* | | | | |
| Name of system | LabDaq[3] | CyberLab | Cerner Millennium PathNet | PathNet HNA Classic |
| First ever LIS install/latest install (for current release) | 1990/2004 | 1982/2004 | 1982/2004 | 1982/2003 |
| No. of contracts for sites operating LIS | 1,567 | 256 | 113 | 326 |
| • Hospital/independent lab contracts in U.S. | 190/1,375† | 116/65 | 103/2 | 269/8 |
| • Clinic or group practice contracts in U.S. | —† | 60 | 3 | 0 |
| • Other contracted U.S. sites/contracts for foreign sites | —/2 | 10/5 | 0/5 | 0/49 |
| Contracts signed but LIS not yet operational (hospitals/independent labs/other sites) | 15 (2/13/0) | 4 (2/0/2) | 38 (38/0/0) | — |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | 15 | — | 36 | — |
| No. of sites operating LIS | 1,567 | 400+ | 212 | 600 |
| Staff to develop/install/support/other* in entire firm | 10/27/23 | 15/26/40 | 800+/2,700+/1,300+ | 800+/2,700+/1,300+ |
| Staff to develop/install/support/other* in LIS division | 9/22/21 | 9/21/40 | 73/75/43 | 73/75/43 |
| No. of terminals/workstations in sites operating system | 1–80+ (ave. 4–5) | 3–250 (ave. 50) | 7–600 | 7–600+ |
| • Central hardware or service type | Intel | HP, IBM | HP Compaq, IBM RS/6000 | HP Compaq, IBM RS/6000 |
| • Central hardware redundant/fault-tolerant? | yes | yes | yes | yes |
| • Terminals/workstations or PC platform | — | PC workstations, thin clients | Intel Pentium PCs | Intel Pentium PCs, VTs |
| **Software**<br>• Programming language(s) | Delphi | C, C++, Cobol, Java, HTML | Visual C++, Visual Basic, Java | Cobol, C++ |
| • Operating system(s) | Microsoft Windows XP Pro, 2000 | Unix/AIX | OpenVMS, AIX, Windows, Windows NT | OpenVMS |
| • Databases and tools used | Oracle Advantage | ODBC compliant (Oracle to be added in 2005) | Oracle | proprietary |
| • System includes full transaction logging? | yes | yes | yes | yes |
| **Features (listed as a percentage of live installations or based on availability)**<br>• Chemistry and hematology | 100% | 100% | 100% | 100% |
| • Bar-coded collection labels | 30% | 50% | 100% | 100% |
| • Handheld devices for bedside-positive patient ID | not available | 4% | 5% | 5% |
| • NCCLS POCT-1A standard interface for POCT devices | not available | 4% | available | — |
| • Microbiology | 100% | 100% | 90% | 90% |
| • Surgical pathology | not available | 10% | 65% | 65% |
| • Cytology | not available | 90% | 50% | 50% |
| • HIS interface: A/D/T | 20% | 65% | 80% | 98% |
| • HIS interface: order entry | 5% | 55% | 60% | 90% |
| • HIS interface: results reporting | 30% | 55% | 60% | 90% |
| • Ad hoc reporting | 100% | 100% | 100% | 100% |
| • Rules-based system | 100% | 100% | 100% | 100% |
| • Utilization management | 100% | 100% | 10% | 10% |
| • Outreach and commercial laboratory | 100% | 100% | 25% | 25% |
| • Compliance checking | 100% | 100% | 15% | 15% |
| • Billing/accounts receivable | 5% | 0 | available | available |
| • Materials management and inventory | not available | not available | available | available |
| • Test partition | 25% | 100% | 100% | 100% |
| • Remote faxing and printing | 35% | 100% | 100% | 100% |
| • Physician office outreach | 15% | 45% | 5% | 5% |
| • HIPAA-standard transaction formats | 100% | not applicable | available | available via third-party translator |
| • Web-based remote inquiry of reports | 15% | 30% | 5% | 5% |
| • Web access for order entry | 5% | 25% | 5% | 5% |
| Complete LIS ASP solution? | no | no | yes | yes |
| ASP for physician order entry/results reporting? | yes | no | 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 | — | 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 | 67 | — | 100+ | 100+ |
| How data center is operated | by vendor | — | by vendor | by vendor |
| **LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard****<br>• Microbiology data | not available | available but not installed | 100% | not available |
| • Other reportable diseases | not available | available but not installed | — | not available |
| • Tumor diagnosis/registry data | not available | available but not installed | — | not available |
| System provides standard HL7 interface? | yes | yes | yes | yes |
| Hospital/integrated health care systems interfaced | Quest, LabCorp, IDX, Misys, CPSI, Dairyland, McKesson | McKesson, IDX, Keane, Siemens, QuadraMed, CPSI, Meditech, others | — | — |
| Physician office management systems interfaced | Medical Manager, PMSI, Pulse, Loigician, Versys, VitalWorks, PDS, others | VitalWorks, Medical Manager, Medic, Practice Partners, Atlas, others | — | — |
| Automated lab transportation systems interfaced | planned | planned | Lab-InterLink, Beckman Coulter, Sysmex, others | Lab-InterLink, Beckman Coulter, Sysmex, others |
| Validation/testing tools provided? | yes | no | yes | yes |
| LIS allows for third-party updates of tables/rules? | no | yes (via HL7 interface) | yes | yes |
| LIS permits use of voice input technology? | no | yes (for CyberPath module) | yes | yes |
| LIS allows for image capture and display? | yes | yes (for CyberPath module) | yes | yes |
| Software provides indexed field in each test definition for LOINC code? | yes | yes | yes | yes |
| Provide LOINC dictionary for each new installation? | no | no | no | no |
| LIS supports use of SNOMED CT? | yes | yes (for CyberPath module) | no | — |
| Market modules for other hospital departments? | no | yes | yes | yes |
| • Percentage of LIS installations stand-alone | — | 80% | 60% | 60% |
| No. of different lab instruments interfaced with LIS | 300 | 500+ | 400+ | 400+ |
| Source code?/User group? | escrow/no (coming in 2005) | escrow/yes | escrow/yes (meets online as well) | escrow/yes (meets online as well) |
| User can modify screens? | no (but offer custom programming) | yes (also user-def. report writer/custom prog.) | yes (also user-def. report writer/custom prog.) | yes (also user-def. report writer/custom prog.) |
| Query language to retrieve info. from LIS database | n/a | SQL | SQL, Discern Explorer | Discern Explorer |
| Smallest cost (hardware/software/monthly maintenance) | $1.7k/$9k/$0.096k | — | — | — |
| Largest cost (hardware/software/monthly maintenance) | $37k/$98k/$0.55k | — | — | — |
| Distinguishing features (supplied by vendor)<br><br>*other=sales, marketing, administration, and other company functions<br>**via a computer-to-computer interface | • intuitive<br>• flexible and scalable to grow with the lab<br>• outstanding customer support<br>† *independent lab and clinic/group practice contracts combined* | • browser based using native browser<br>• outreach as well as multi-site management and reporting<br>• over 25 years in the LIS industry<br>*See our ad on page 20* | • comprehensive, totally integrated solution<br>• more than 25 years in the LIS industry<br>• continued innovations in LIS, including molecular diagnostics and synoptic reporting | • comprehensive, totally integrated solution<br>• more than 25 years in the LIS industry<br>• continued innovations in LIS, including molecular diagnostics and synoptic reporting |

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

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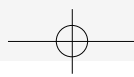
# Laboratory information systems

| Part 2 of 13 | Clinical Information Systems Inc.<br>V. Flaxbeard  cissupport@aol.com<br>18805 Willamette Drive<br>West Linn, OR 97068<br>800-869-0680<br>www.cislab.com | Clinical Software Solutions<br>sales@clinsoft.com<br>20940 E. Mewes Rd.<br>Queen Creek, AZ 85242<br>800-570-0474<br>www.clinsoft.com | ClinLab Inc.<br>Michael Selvaggi  sales@clinlabinc.com<br>2411 E. Graves Ave., Ste. 1<br>Orange City, FL 32763<br>386-774-0030<br>www.clinlabinc.com |
|---|---|---|---|
| *See accompanying articles on pages 18, 22* | | | |
| **Name of system** | Cislab | CSSWin | ClinLab LIS V6 |
| First ever LIS install/latest install (for current release) | 1981/2004 | 1987/2004 | 1987/2004 |
| No. of contracts for sites operating LIS | 109 | 200+ | 41 |
| • Hospital/independent lab contracts in U.S. | 7/95 | 50+/150+ | 5/10 |
| • Clinic or group practice contracts in U.S. | 3 | 10 | 18 |
| • Other contracted U.S. sites/contracts for foreign sites | 2/2 | 2/— | 8/0 |
| Contracts signed but LIS not yet operational (hospitals/independent labs/other sites) | 2 (1/1/0) | 4 (4/0/0) | 2 (0/2/0) |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | 2 | 4 | 2 |
| No. of sites operating LIS | 111 | 200+ | 41 |
| Staff to develop/install/support/other* in entire firm | 8 total | 2/2/2 | 4/6/0 |
| Staff to develop/install/support/other* in LIS division | — | 4 total | — |
| No. of terminals/workstations in sites operating system | 1–100 (ave. 10) | 1–45 (ave. 4) | 2–70 (ave. 10) |
| • Central hardware or service type | generic PCs, HP, Dell, Compaq | IBM compatible | IBM, Dell, Compaq |
| • Central hardware redundant/fault-tolerant? | yes | yes | yes |
| • Terminals/workstations or PC platform | PCs, Wyse, Link | IBM compatible | IBM, Dell, Compaq |
| **Software** | | | |
| • Programming language(s) | Cobol, C++, Delphi, Visual Basic | 4GL | Clipper, Visual FoxPro, Delphi |
| • Operating system(s) | Unix, NT, Windows 98, 2000 | Windows | Novell, Windows NT, 2000, 9x, XP |
| • Databases and tools used | Interbase, RDBMS, C-ISAM, MS SQL 7 | SQL | dBase, FoxPro, Advantage DB server |
| • System includes full transaction logging? | no | yes | no |
| **Features (listed as a percentage of live installations or based on availability)** | | | |
| • Chemistry and hematology | 95% | 95% | 100% |
| • Bar-coded collection labels | 90% | 50% | 100% |
| • Handheld devices for bedside-positive patient ID | 0 | 5% | available |
| • NCCLS POCT-1A standard interface for POCT devices | 0 | — | available |
| • Microbiology | 90% | 20% | 100% |
| • Surgical pathology | 15% | — | available |
| • Cytology | 15% | — | available |
| • HIS interface: A/D/T | 10% | 50% | 90% |
| • HIS interface: order entry | 10% | 50% | 70% |
| • HIS interface: results reporting | 10% | 50% | 70% |
| • Ad hoc reporting | 0 | 20% | 100% |
| • Rules-based system | 0 | 90% | 50% |
| • Utilization management | 1% | 10% | 100% |
| • Outreach and commercial laboratory | 10% | 10% | 40% |
| • Compliance checking | 90% | 50% | 100% |
| • Billing/accounts receivable | 90% | 10% | available |
| • Materials management and inventory | available | 5% | not available |
| • Test partition | 100% | 100% | 100% |
| • Remote faxing and printing | 95% | 45% | 100% |
| • Physician office outreach | 80% | 40% | 40% |
| • HIPAA-standard transaction formats | 100% | 100% | not available |
| • Web-based remote inquiry of reports | 50% | 10% | 40% |
| • Web access for order entry | 50% | 10% | 40% |
| Complete LIS ASP solution? | yes | no | yes |
| ASP for physician order entry/results 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 | 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 | operates over Internet |
| 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 | 4% | 3% | 4% |
| • Other reportable diseases | 4% | available but not installed | — |
| • Tumor diagnosis/registry data | 4% | available but not installed | 0 |
| System provides standard HL7 interface? | yes | yes | yes |
| Hospital/integrated health care systems interfaced | McKesson, Dairyland, PCS, ADT, Tower Systems, CPSI | Siemens, Dairyland, APS, Misys, LabCorp, Pearl, others | Meditech |
| Physician office management systems interfaced | Medical Manager, MediSoft/MediNotes | Medical Manager, Logician, other HL7/ASTM-compliant systems, others | Medical Manager, IDX, Medic, Nuesoft, Softaid, Softatic, Medstar, Misys |
| Automated lab transportation systems interfaced | planned | no | — |
| Validation/testing tools provided? | no | yes (validation performed before going live) | no |
| LIS allows for third-party updates of tables/rules? | no | no | no |
| LIS permits use of voice input technology? | yes (DragonSpeak) | no | no |
| LIS allows for image capture and display? | yes | yes | no |
| Software provides indexed field in each test definition for LOINC code? | yes | yes | no |
| Provide LOINC dictionary for each new installation? | no | no | no |
| LIS supports use of SNOMED CT? | yes | yes | no |
| Market modules for other hospital departments? | no | yes | no |
| • Percentage of LIS installations stand-alone | — | 25% | — |
| No. of different lab instruments interfaced with LIS | 200+ | 300+ | 150 |
| Source code?/User group? | escrow/no | no/no | escrow/no |
| User can modify screens? | no (but offer custom programming) | no (but offer user-def. report writer/custom programming) | no (but offer user-def. report writer/custom programming) |
| Query language to retrieve info. from LIS database | SQL | SQL, MS Access, Crystal Reports, others | — |
| Smallest cost (hardware/software/monthly maintenance) | $7.5k/$7.5k/$0.3k | —/$10k/percentage of total | $5k/$15k/$0.188k |
| Largest cost (hardware/software/monthly maintenance) | $100k/$160k/$0.4k | —/$100k/percentage of total | $40k/$170k/$2.125k |
| Distinguishing features (supplied by vendor)<br><br>*other=sales, marketing, administration, and other company functions<br>**via a computer-to-computer interface | • complete functionality<br>• willing to customize<br>• high-quality, economical purchase | • versatile for any size facility<br>• integrated with other departments, systems<br>• Web access, customization available<br><br>*See our ad on page 22* | • reputation among clients for exceptional service<br>• user friendly, versatile for all laboratories<br>• high-quality product at a conservative price<br><br>*See our ad on page 20* |

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

# *Laboratory information systems*

| Part 3 of 13 | Comp Pro Med Inc.<br>Hal Petersen  hpetersen@comppromed.com<br>3430 Mendocino Ave.<br>Santa Rosa, CA 95403<br>800-276-4522<br>www.comppromed.com | Computer Service & Support Inc.<br>Jim O'Neill  jimjr@csslis.com<br>2106 New Rd., Bldg. E-6<br>Linwood, NJ 08221<br>609-653-6444<br>www.csslis.com | CPSI<br>James Bouchard  sales@cpsinet.com<br>6600 Wall St.<br>Mobile, AL 36695<br>800-711-2774<br>www.cpsinet.com |
|---|---|---|---|
| *See accompanying articles on pages 18, 22* | | | |
| **Name of system** | **Polytech for Windows** | **CLS-2000** | **CPSI LIS** |
| First ever LIS install/latest install (for current release) | 1981/2004 | 1980/2004 | 1986/2004 |
| No. of contracts for sites operating LIS | 52 | 90 | 261 |
| • Hospital/independent lab contracts in U.S. | 13/33 | — | 261 |
| • Clinic or group practice contracts in U.S. | 6 | — | 0 |
| • Other contracted U.S. sites/contracts for foreign sites | 0 | — | 0 |
| Contracts signed but LIS not yet operational (hospitals/independent labs/other sites) | 1 (1/0/0) | 9 | 9 |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | 1 | 9 | 9 |
| No. of sites operating LIS | 60+ | 98 | 261 |
| Staff to develop/install/support/other* in entire firm | 3/2/1 | 6/8/5 | 20/534/98 |
| Staff to develop/install/support/other* in LIS division | — | — | — |
| No. of terminals/workstations in sites operating system | 1–16 (ave. 4) | 4–60 (ave. 20) | 16–1,200 (ave. 250) |
| • Central hardware or service type | Dell, IBM, HP | IBM RS/6000 | IBM  xSeries server |
| • Central hardware redundant/fault-tolerant? | yes | yes | yes |
| • Terminals/workstations or PC platform | Dell, IBM, HP | IBM, PC workstations | Windows |
| Software | | | |
| • Programming language(s) | C++, C, Assembler | C | Cobol, Visual Basic, C++ |
| • Operating system(s) | Windows 98, ME, NT 4, 2000, XP | IBM-AIX 5.2 | Unix, Windows |
| • Databases and tools used | SQL, Btrieve | LabBase | internal database |
| • System includes full transaction logging? | yes | yes | no |
| Features (listed as a percentage of live installations or based on availability) | | | |
| • Chemistry and hematology | 100% | 100% | 100% |
| • Bar-coded collection labels | 95% | 95% | 100% |
| • Handheld devices for bedside-positive patient ID | not available | 0 | 10% |
| • NCCLS POCT-1A standard interface for POCT devices | not available | 0 | 10% |
| • Microbiology | 12% | 85% | 100% |
| • Surgical pathology | not available | 20% | 20% |
| • Cytology | not available | 30% | 10% |
| • HIS interface: A/D/T | 60% | 20% | 100% |
| • HIS interface: order entry | 30% | 25% | 100% |
| • HIS interface: results reporting | 40% | 30% | 100% |
| • Ad hoc reporting | 100% | 60% | 100% |
| • Rules-based system | 100% | 100% | 100% |
| • Utilization management | 100% | 100% | 100% |
| • Outreach and commercial laboratory | 15% | 100% | 100% |
| • Compliance checking | 100% | 100% | 100% |
| • Billing/accounts receivable | 65% | 80% | 100% |
| • Materials management and inventory | not available | 75% | 95% |
| • Test partition | 100% | 20% | 100% |
| • Remote faxing and printing | 95% | 100% | 100% |
| • Physician office outreach | 20% | 30% | 90% |
| • HIPAA-standard transaction formats | not available | 100% | 100% |
| • Web-based remote inquiry of reports | 5% | 30% | 75% |
| • Web access for order entry | 5% | 30% | 25% |
| Complete LIS ASP solution? | no | — | yes |
| ASP for physician order entry/results reporting? | yes | yes | yes |
| Method of charging for ASP service | fixed fee | fixed fee, transaction based | fixed fee |
| Client software required | requires software be installed on client PC | browser based | browser based, requires software be installed on client PC |
| ASP information conduit | operates over Internet, can use private, dedicated circuit | operates over Internet | operates over Internet |
| Client contracts supported from data center not operated by client | — | 10 | 30 |
| 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 | 0 | 0 | not available |
| • Other reportable diseases | 0 | 0 | not available |
| • Tumor diagnosis/registry data | 0 | 0 | not available |
| System provides standard HL7 interface? | yes | yes | yes |
| Hospital/integrated health care systems interfaced | Siemens, CHC, Intermed, Dairyland | Misys, McKesson, Medic, SCC, PCN, IDX, Advanced Data Systems, CCA | CPSI |
| Physician office management systems interfaced | Misys, Medical Manager, MedicaLogic | Misys, Advanced Data Systems, Medic, IDX, PCN, Medical Manager | MedicaLogic, HL7-compatible systems |
| Automated lab transportation systems interfaced | planned | Beckman Coulter, Sysmex, Bayer, Roche/BMC/Hitachi | planned |
| Validation/testing tools provided? | no | yes | no (internally developed tools) |
| LIS allows for third-party updates of tables/rules? | no | yes (Ingenix) | yes (any medical necessity vendor and AMA) |
| LIS permits use of voice input technology? | no | no | yes (DragonSpeak, MS Windows XP) |
| LIS allows for image capture and display? | no | no | yes |
| Software provides indexed field in each test definition for LOINC code? | yes | no | yes |
| Provide LOINC dictionary for each new installation? | yes | no | no |
| LIS supports use of SNOMED CT? | no | no | yes |
| Market modules for other hospital departments? | no | no | yes |
| • Percentage of LIS installations stand-alone | — | — | >1% |
| No. of different lab instruments interfaced with LIS | 200+ | 300 | 500+ |
| Source code?/User group? | escrow/no | yes/no | escrow/yes |
| User can modify screens? | yes (also user-def. report writer/custom programming) | yes (also custom programming) | yes (also user-def. report writer/custom programming) |
| Query language to retrieve info. from LIS database | Pervasive, SQL, others | Access, Oracle | CPSI ad hoc report writer, ODBC-compliant query tools |
| Smallest cost (hardware/software/monthly maintenance) | $1k/$15k/$0.233k | $7.5k/$15k/$0.3k | — |
| Largest cost (hardware/software/monthly maintenance) | $15k/$150k/$0.9k | $50k/$250k/$5k | — |
| Distinguishing features (supplied by vendor)<br><br>*other=sales, marketing, administration, and other company functions<br>**via a computer-to-computer interface | • 90%+ of lab work can be done from a single screen<br>• full-featured LIS at a small cost<br>• excellent support | • Part A billing module<br>• remote order and result system<br>• toxicology and clinical trial applications<br><br>*See our ad on page 16* | • integrated health information system<br>• complete electronic medical record<br>• automated result verification and report distribution |

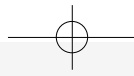Tabulation does not represent an endorsement by the College of American Pathologists.

SYSTEM REVIEW SERIES

# Laboratory information systems

| Part 4 of 13 | Custom Software Systems Inc.<br>George Widuch  george@css-corporate.com<br>DeWitt Rhaly  dewitt@css-corporate.com<br>7012 Westbelt Drive, Nashville, TN 37209<br>800-344-8053<br>www.css-corporate.com | Fletcher Flora Inc.<br>Ken Mitchell  ken@labpak.com<br>1580 Orangethorpe Way<br>Anaheim, CA 92801<br>800-777-1471<br>www.labpak.com | Hex Laboratory Systems<br>Susan Bollinger  sbollinger@hexlab.com<br>1042B El Camino Real, Ste. 308<br>Encinitas, CA 92024-1322<br>800-729-2085<br>www.hexlab.com |
|---|---|---|---|
| *See accompanying articles on pages 18, 22* | | | |
| Name of system | StarLab | Labpak | Lab/Hex |
| First ever LIS install/latest install (for current release) | 1984/2004 | 1980/2004 | 1981/2004 |
| No. of contracts for sites operating LIS | 22 | 1,275 | 129 |
| • Hospital/independent lab contracts in U.S. | 18/2 | 207/51 | 9/58 |
| • Clinic or group practice contracts in U.S. | 2 | 998 | 42 |
| • Other contracted U.S. sites/contracts for foreign sites | 0 | 11/8 | 10/10 |
| Contracts signed but LIS not yet operational<br>  (hospitals/independent labs/other sites) | 1 (1/0/0) | not available | 4 (0/4/0) |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | — | — | 4 |
| No. of sites operating LIS | 22 | 1,275 | 141 |
| Staff to develop/install/support/other* in entire firm | 8/9/12 | 9/19/19 | 4/7/3 |
| Staff to develop/install/support/other* in LIS division | 4/6/3 | — | — |
| No. of terminals/workstations in sites operating system | 2–80 | 1–40+ | 3–40+ (ave. 10) |
| • Central hardware or service type | IBM xSeries | Intel Pentium IV | Dell, Intel, Xeon |
| • Central hardware redundant/fault-tolerant? | — | yes | yes |
| • Terminals/workstations or PC platform | CSS network-ready workstations | PCs | Windows PCs |
| **Software**<br>• Programming language(s) | Cobol | C, C++, Visual Basic | Thoroughbred Basic |
| • Operating system(s) | Linux | Windows 98, 98 SE, NT, 2000, XP, XP Pro | Red Hat Linux |
| • Databases and tools used | T-ISAM | Pervasive | IDOL IV, 4GL, SQL |
| • System includes full transaction logging? | yes | no | yes |
| **Features** (listed as a percentage of live installations<br>  or based on availability)<br>• Chemistry and hematology | 100% | 100% | 100% |
| • Bar-coded collection labels | 80% | 35% | 100% |
| • Handheld devices for bedside-positive patient ID | — | not available | available |
| • NCCLS POCT-1A standard interface for POCT devices | — | not available | available |
| • Microbiology | 10% | 20% | 100% |
| • Surgical pathology | installed | not available | 50% |
| • Cytology | installed | not available | 100% |
| • HIS interface: A/D/T | 80% | 50% | 50% |
| • HIS interface: order entry | 80% | 20% | 25% |
| • HIS interface: results reporting | 80% | 75% | 25% |
| • Ad hoc reporting | 45% | 100% | 100% |
| • Rules-based system | available | 100% | 100% |
| • Utilization management | 10% | 100% | 100% |
| • Outreach and commercial laboratory | 50% | 30% | 60% |
| • Compliance checking | 100% | 90% | 100% |
| • Billing/accounts receivable | 10% | not available | 75% |
| • Materials management and inventory | available | 10% | 1% |
| • Test partition | available | 70% | 100% |
| • Remote faxing and printing | 75% | 100% | 100% |
| • Physician office outreach | 20% | 40% | 65% |
| • HIPAA-standard transaction formats | 10% | — | 100% |
| • Web-based remote inquiry of reports | available | 5% | 20% |
| • Web access for order entry | available | 5% | 10% |
| Complete LIS ASP solution? | no | no | yes |
| ASP for physician order entry/results 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<br>  center not operated by client | — | 0 | 0 |
| How data center is operated | — | — | — |
| LIS provides surveillance data to public health<br>  agencies using CDC/HL7/LOINC/SNOMED standard**<br>• Microbiology data | — | not available | available but not installed |
| • Other reportable diseases | — | — | available but not installed |
| • Tumor diagnosis/registry data | — | not available | available but not installed |
| System provides standard HL7 interface? | yes | yes | yes |
| Hospital/integrated health care systems interfaced | Dairyland, Healthcare Management Systems, Siemens | IDX, Dairyland, HSI, Experior, CPSI, QSI, Logician, others | McKesson, Cerner, Siemens, PSI, Misys, Experior, Logician, WebMD, Quest, others |
| Physician office management systems interfaced | Mega West, IDX | Medical Manager, GE, Millbrook, IDX, Misys, Mega West, McKesson, others | Medical Manager, Medic, IDX, PMS, Allscripts, MedicaLogic, MediPro, Millbrook, proprietary |
| Automated lab transportation systems interfaced | planned | planned | planned |
| Validation/testing tools provided? | no | — | yes (validation guideline) |
| LIS allows for third-party updates of tables/rules? | no | yes (Code Map) | yes (ICD-9, CPT tables, linkage rules from any vendor) |
| LIS permits use of voice input technology? | no | no | yes (Dragon Naturally Speaking) |
| LIS allows for image capture and display? | no | no | yes |
| Software provides indexed field in<br>  each test definition for LOINC code? | yes | no | yes |
| Provide LOINC dictionary for each new installation? | no | — | no |
| LIS supports use of SNOMED CT? | no | no | yes |
| Market modules for other hospital departments? | yes | no | no |
| • Percentage of LIS installations stand-alone | 20% | — | — |
| No. of different lab instruments interfaced with LIS | 60+ | 400+ | 250+ |
| Source code?/User group? | escrow/yes | no/no | escrow/no |
| User can modify screens? | no | yes (also user-def. report writer/ custom programming) | no (but offer user-def. report writer/custom programming) |
| Query language to retrieve info. from LIS database | Intelligent Query, Microsoft, Access, other PC-based tools | — | standard SQL |
| Smallest cost (hardware/software/monthly maintenance) | $25k/$35k/$0.6k | $6k (hardware & software)/$0.05k | $5k/$10k/$0.2k |
| Largest cost (hardware/software/monthly maintenance) | $250k/$350k/$6k | $75k/$200k/$2k | $100k/$180k/$2.8k |
| Distinguishing features (supplied by vendor)<br><br>*other=sales, marketing, administration,<br>  and other company functions<br>**via a computer-to-computer interface | • standardized screens and functions<br>• total system integration<br>• developed from the clinical perspective with an emphasis on results reporting | • ease of use<br>• scalability<br>• value<br>*See our ad on page 22* | • flexibility and reliability<br>• integrated billing, electronic billing, medical necessity<br>• extensive growth capabilities |

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

# *Laboratory information systems*

| Part 5 of 13 | Impac Medical Systems Inc.<br>salesinfo@impac.com<br>100 W. Evelyn Ave.<br>Mountain View, CA 94041<br>888-464-6722<br>www.impac.com | Isys/Biovation<br>info@isys.tv<br>208 E. Second St.<br>Mineola, NY 11501<br>516-535-5600<br>www.isys.tv | Keane Inc.<br>Jose A. Benetti  jose_a_benetti@keane.com<br>6410 Southpoint Parkway, Ste. 300<br>Jacksonville, FL 32216<br>904-279-2710<br>www.keane.com/hsd | LabSoft Inc.<br>Steven Hawn  shawn@labsoftweb.com<br>8402 Laurel Fair Circle, Ste. 207<br>Tampa, FL 33610<br>800-767-3279<br>www.labsoftweb.com |
|---|---|---|---|---|
| *See accompanying articles on pages 18, 22* | | | | |
| Name of system | IntelliLab | Messenger | Keane LIS | LabNet |
| First ever LIS install/latest install (for current release) | 1988/2004 | 1985/2004 | 1989/2004 | 1992/2003 |
| No. of contracts for sites operating LIS | 50 | 10 | 36 | 211 |
| • Hospital/independent lab contracts in U.S. | 5/3 | 2/1 | 34/0 | 55/37 |
| • Clinic or group practice contracts in U.S. | 42 | 6 | 0 | 119 |
| • Other contracted U.S. sites/contracts for foreign sites | 0 | 0/1 | 0/2 | 0/0 |
| Contracts signed but LIS not yet operational (hospitals/independent labs/other sites) | 8 (0/0/8) | 1 (1/0/0) | 1 (1/0/0) | 0 |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | 8 | 0 | 1 | — |
| No. of sites operating LIS | 189 | 10 | 36 | 229 |
| Staff to develop/install/support/other* in entire firm | 102/63/122 | 4/4/5 | 145/233/104 | 3/3/2 |
| Staff to develop/install/support/other* in LIS division | 6/5/7 | 2/2/4 | 6/7/4 | — |
| No. of terminals/workstations in sites operating system | 3–1,300 (ave. 20) | 4–40 (ave. 20) | 8–60 (ave. 25–30) | 3–75 (ave. 12) |
| • Central hardware or service type | HP, Compaq | any MS or Linux server | IBM | Dell |
| • Central hardware redundant/fault-tolerant? | yes | yes | yes | yes |
| • Terminals/workstations or PC platform | Dell, HP, Compaq | any that supports a robust Web browser | IBM | Dell, PC platform |
| **Software** | | | | |
| • Programming language(s) | Visual Basic, C, Basic | Pascal, C++, Java | Progress | Delphi |
| • Operating system(s) | Windows 9x, NT, 4.0, 2000, XP | any that supports a robust Web browser | OS/400, Unix | Windows 2000 Pro, XP Pro, NT 4.0, 98 |
| • Databases and tools used | mvBase | Oracle, MS SQL server, others | Progress | MS SQL server |
| • System includes full transaction logging? | yes | yes | yes | yes |
| **Features** (listed as a percentage of live installations or based on availability) | | | | |
| • Chemistry and hematology | 100% | 100% | 100% | 100% |
| • Bar-coded collection labels | 100% | 100% | 100% | 100% |
| • Handheld devices for bedside-positive patient ID | — | 10% | 10% | installed |
| • NCCLS POCT-1A standard interface for POCT devices | — | 10% | available | installed |
| • Microbiology | 20% | 50% | 90% | installed |
| • Surgical pathology | 5% | available | 40% | available |
| • Cytology | — | available | 5% | not available |
| • HIS interface: A/D/T | 40% | 50% | 90% | installed |
| • HIS interface: order entry | 40% | 30% | 90% | installed |
| • HIS interface: results reporting | 40% | 50% | 90% | installed |
| • Ad hoc reporting | 100% | 100% | 100% | installed |
| • Rules-based system | 100% | 100% | 100% | installed |
| • Utilization management | 100% | 100% | 100% | installed |
| • Outreach and commercial laboratory | 100% | 50% | 30% | installed |
| • Compliance checking | 100% | 100% | installed | installed |
| • Billing/accounts receivable | 10% | 50% | installed | not available |
| • Materials management and inventory | not available | installed | not available | not available |
| • Test partition | 100% | 100% | 100% | not available |
| • Remote faxing and printing | 100% | installed | 100% | installed |
| • Physician office outreach | 100% | installed | 100% | installed |
| • HIPAA-standard transaction formats | 100% | installed | installed | not available |
| • Web-based remote inquiry of reports | 90% | installed | installed | installed |
| • Web access for order entry | 90% | installed | installed | installed |
| Complete LIS ASP solution? | yes | yes | no | no |
| ASP for physician order entry/results reporting? | yes | yes | no | no |
| Method of charging for ASP service | varies | fixed fee | — | — |
| Client software required | requires software be installed on client PC | 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 | — | — |
| 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 | — | available but not installed | available but not installed | not available |
| • Other reportable diseases | — | available but not installed | available but not installed | not available |
| • Tumor diagnosis/registry data | — | available but not installed | available but not installed | not available |
| System provides standard HL7 interface? | yes | yes | yes | yes |
| Hospital/integrated health care systems interfaced | Siemens, Dairyland | McKesson, Cerner, Siemens, Misys, GE | Keane, Imed, Meditech, Siemens, McKesson, LabCorp, Quest | CPSI, Dairyland, Meditech, Misys, IDX, Siemens, others |
| Physician office management systems interfaced | Impac, Misys, Medical Manager QSI, MedicaLogic, IDX, Healthworks, others | Medical Manager, MedicaLogic, HPS, Trizetto | — | Medical Manager, Micromed, Medic, NextGen, others |
| Automated lab transportation systems interfaced | planned | available but not yet operational to Lab-InterLink, Beckman Coulter, Sysmex, others | — | planned |
| Validation/testing tools provided? | no | yes | yes (test environments) | no |
| LIS allows for third-party updates of tables/rules? | yes (tables in correct format) | yes (Medicode, others) | yes (SNOMED, ICD-9, CPT codes) | yes |
| LIS permits use of voice input technology? | yes (any Microsoft compatible, others) | yes (IBM ViaVoice, Dragon Naturally Speaking) | no | no |
| LIS allows for image capture and display? | yes | yes | yes | yes |
| 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 |
| LIS supports use of SNOMED CT? | yes | yes | yes | no |
| Market modules for other hospital departments? | yes | yes | yes | no |
| • Percentage of LIS installations stand-alone | 90% | 90% | 25% | |
| No. of different lab instruments interfaced with LIS | 400+ | 140 | 100+ | 195 |
| Source code?/User group? | escrow/yes | escrow/no | no/yes (meets online as well) | escrow/no |
| User can modify screens? | yes (also user-def. report writer/custom prog.) | yes (also user-def. report writer/custom prog.) | yes (also user-def. report writer/custom prog.) | no (but offer user-defined report writer) |
| Query language to retrieve info. from LIS database | AQL, SQL with ODBC | ANSI SQL 4.2, HL7, DICOM | Progress, Cyberquery | MS SQL, ODBC-compatible languages |
| Smallest cost (hardware/software/monthly maintenance) | —/$20k/— | —/$60k/$0.85k | — | $10k/$25k/$0.204k |
| Largest cost (hardware/software/monthly maintenance) | incl./$250k/— | —/$450k/$6.75k | — | $30k/$150k/$0.992k |
| Distinguishing features (supplied by vendor)<br>*other=sales, marketing, administration, and other company functions<br>**via a computer-to-computer interface | • based entirely on Internet technology<br>• outreach program standard<br>• secure transmission of lab reports via e-mail | • flexible<br>• extensible<br>• reliable | • implementation and support by registered medical technologists<br>• flexible, user-defined system<br>• easy to use and cost effective | • exceptional customer service<br>• fully featured<br>• high value<br>*See our ad on page 16* |

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# Laboratory information systems

| Part 6 of 13 | M/MGMT Systems Inc.<br>Robert Mann  mlab@mmgmt.com<br>2335 American River Drive, Ste. 402<br>Sacramento, CA 95825<br>916-648-9010<br>www.mmgmt.com | McKesson Provider Technologies<br>Stacy Block  stacy.block@mckesson.com<br>5995 Windward Parkway<br>Alpharetta, GA 30005<br>303-926-2041<br>www.infosolutions.mckesson.com | Medcom Information Systems Inc.<br>David Baird  dbaird@emirj.com<br>2117 Stonington Ave.<br>Hoffman Estates, IL 60195<br>847-885-1553<br>www.emirj.com | MediSolution<br>Anne Gin  anne.gin@medisolution.com<br>2999 N. 44th St., Ste. 308<br>Phoenix, AZ 85018<br>602-269-8373<br>www.medisolution.com |
|---|---|---|---|---|
| *See accompanying articles on pages 18, 22* | | | | |
| Name of system | M/Lab | Horizon Lab | Medcom Lab Manager | MediLab |
| First ever LIS install/latest install (for current release) | 1987/2004 | 1999†/2004 | 1992/2004 | 1972/2004 |
| No. of contracts for sites operating LIS | 21 | 48 | 450 | 700+ |
| • Hospital/independent lab contracts in U.S. | 0/0 | 45/1 | 17/62 | 2/3 |
| • Clinic or group practice contracts in U.S. | 0 | 1 | 371 | 0 |
| • Other contracted U.S. sites/contracts for foreign sites | 21 (public health)/0 | 0/1 | 0/0 | 0/700+ |
| Contracts signed but LIS not yet operational (hospitals/independent labs/other sites) | 0 | 19 (18/1/0) | 4 (0/4/0) | 5 (3/2/0) |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | — | 16 | — | 5 |
| No. of sites operating LIS | — | 94 | 450 | 700+ |
| Staff to develop/install/support/other* in entire firm | 6/5/2 | — | 4/10/7 | 380 total |
| Staff to develop/install/support/other* in LIS division | — | — | 3/10/5 | 79/23/4 |
| No. of terminals/workstations in sites operating system | 8–64 (ave. 16–24) | 10–300+ (ave. 75) | 1–11 (ave. 2–3) | 1–700 (ave. 35) |
| • Central hardware or service type | Intel based server | HP, IBM | Medcom IBM-compatible PC | Sun, Unix, Linux, Windows, IBM, HP |
| • Central hardware redundant/fault-tolerant? | yes | yes | yes | yes |
| • Terminals/workstations or PC platform | Intel based | PC | Medcom IBM-compatible PC | IBM-compatible PCs |
| **Software** | | | | |
| • Programming language(s) | Caché | Delphi, ANSI, Standard C | C++ | C++ (80%), Java |
| • Operating system(s) | Windows NT, 2000, XP | Unix, Windows 9x, NT, 2000, XP (for client) | DOS, Windows 9x, NT | Sun OS, Windows XP, 2000, 2003, Unix, Linux |
| • Databases and tools 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 or based on availability) | | | | |
| • Chemistry and hematology | 40% | 100% | 100% | 100% |
| • Bar-coded collection labels | 50% | 100% | 70% | 100% |
| • Handheld devices for bedside-positive patient ID | not available | 10% | — | 1% |
| • NCCLS POCT-1A standard interface for POCT devices | not available | 50% | — | 3% |
| • Microbiology | 100% | 100% | 5% | 95% |
| • Surgical pathology | available | — | — | 40% |
| • Cytology | available | — | — | 35% |
| • HIS interface: A/D/T | not available | 100% | 3% | 100% |
| • HIS interface: order entry | 70% | 100% | 2% | 20% |
| • HIS interface: results reporting | 60% | 100% | 4% | 45% |
| • 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% | installed |
| • Billing/accounts receivable | 80% | available in 2005 | — | 40% |
| • Materials management and inventory | not available | 0 | — | 30% |
| • Test partition | 100% | 100% | — | 100% |
| • Remote faxing and printing | 70% | 100% | 5% | 100% |
| • Physician office outreach | not available | 100% | — | 50% |
| • HIPAA-standard transaction formats | available | not available | — | 100% |
| • Web-based remote inquiry of reports | available | 20% | 1% | 35% |
| • Web access for order entry | available | 10% | 1% | 35% |
| Complete LIS ASP solution? | in development | yes | yes | yes |
| ASP for physician order entry/results reporting? | in development | no | yes | no |
| Method of charging for ASP service | — | fixed fee | fixed fee | fixed fee |
| 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 Internet | operates over Internet |
| Client contracts supported from data center not operated by client | — | 1 | none | 2 |
| How data center is operated | — | by vendor | by a third party (YNC) | by a third party (Superior Consultant Co.) |
| LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard** | | | | |
| • Microbiology data | 80% | 100% | not available | available but not installed |
| • Other reportable diseases | 20% | not available | not available | available but not installed |
| • Tumor diagnosis/registry data | not available | not available | — | 3% |
| System provides standard HL7 interface? | yes | yes | yes | yes |
| Hospital/integrated health care systems interfaced | Siemens, Meditech, Mitchell & McCormick, homegrown, any HL7 | McKesson, Siemens, IDX, Meditech, Cerner, homegrown | — | Meditech, GE Medical, Misys, MediSolution, SCC, Keane, self developed, others |
| Physician office management systems interfaced | — | connectivity to any practice system supported with McKesson's Pre-Services Manager | Medical Manager, MedicaLogic, AMS, Edimis, Wismer Martin, IDX, Versys | MediSolution, Purkinge, others |
| Automated lab transportation systems interfaced | no | Lab-InterLink, Beckman Coulter, Sysmex, Bayer, Roche/BMC/Hitachi, homegrown | no | Lab-InterLink, Beckman Coulter, Sysmex, Bayer, Tecan, Roche/BMC/Hitachi |
| Validation/testing tools provided? | yes | yes | yes (Alpha II Code Wizard, Code Map) | yes (self developed) |
| LIS allows for third-party updates of tables/rules? | yes | no | yes (Alpha II, Code Map) | yes (Info-X, NCCLS, SNOMED) |
| LIS permits use of voice input technology? | no | yes | no | yes (IBM Voice, other Windows compatible) |
| LIS allows for image capture and display? | yes | no | no | yes |
| Software provides indexed field in each test definition for LOINC code? | yes | yes | no | yes |
| Provide LOINC dictionary for each new installation? | no | yes | no | no |
| LIS supports use of SNOMED CT? | yes | yes | no | yes |
| Market modules for other hospital departments? | no | yes | no | yes |
| • Percentage of LIS installations stand-alone | — | 20% | — | 80% |
| No. of different lab instruments interfaced with LIS | 18 | 200+ | hundreds | 350+ |
| Source code?/User group? | yes/yes | escrow/yes (meets online as well) | no/no | escrow/yes |
| User can modify screens? | no (but offer user-def. report writer/cust. prog.) | yes (also user-def. report writer/custom prog.) | no (but offer custom programming) | yes (also user-def. report writer/custom prog.) |
| Query language to retrieve info. from LIS database | SQL, ODBC | any query software pkg., e.g., Crystal Reports | — | any SQL compatible |
| Smallest cost (hardware/software/monthly maintenance) | —/$64k/$1k | $50k–$75k/$100k–$150k/$1k–$3k | $2k/$7k/$0.1k per month | $6k/$30k/$6k |
| Largest cost (hardware/software/monthly maintenance) | —/$560k/$8.4k | $200k+/$200k–$500k/$3.5k–$5k | $35k/$70k/$0.75k per month | $300k/$2m/$33k |
| Distinguishing features (supplied by vendor)<br><br>*other=sales, marketing, administration, and other company functions<br>**via a computer-to-computer interface | • public health laboratory-specific design<br>• clinical/environmental/bioterrorism/newborn screening<br>• historical electronic medical record | • patient safety solution with point-of-care wireless for medication safety and positive patient ID<br>• outreach solution<br>*†year that McKesson acquired HBOC product line* | • cost-effective interfacing for data exchange with other software<br>• interfaces available for reference labs, billing systems, and EMRs | • comprehensive rules-based functionality<br>• total audit trail<br>• proactive management tools<br><br>*See our ad on page 16* |

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# Laboratory information systems

| Part 7 of 13 | Meditech Paul Berthiaume info@meditech.com Meditech Circle Westwood, MA 02090 781-821-3000 www.meditech.com | Meditech Paul Berthiaume info@meditech.com Meditech Circle Westwood, MA 02090 781-821-3000 www.meditech.com | Misys Healthcare Systems Liddy West liddy.west@misyshealthcare.com 4801 E. Broadway Blvd. Tucson, AZ 85710 800-748-9658/520-570-2000 www.misyshealthcare.com | Misys Healthcare Systems Liddy West liddy.west@misyshealthcare.com 4801 E. Broadway Blvd. Tucson, AZ 85710 800-748-9658/520-570-2000 www.misyshealthcare.com |
|---|---|---|---|---|
| *See accompanying articles on pages 18, 22* | | | | |
| Name of system | Meditech LIS client/server | Meditech LIS–Magic | Misys Commercial Laboratory | Misys Laboratory |
| First ever LIS install/latest install (for current release) | 1969/2004 | 1969/2004 | 1979/2004 | 1979/2004 |
| No. of contracts for sites operating LIS | 238 | 926 | 53 | 464 |
| • Hospital/independent lab contracts in U.S. | — | — | 8/44 | 433/10 |
| • 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) | 11 | 9 | 2 (0/2/0) | 13 (13/0/0) |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | — | — | 2 | 7 |
| No. of sites operating LIS | — | — | 213 | 1,018 |
| Staff to develop/install/support/other* in entire firm | 2,057 total | 2,057 total | 655/1,233/550 | 655/1,233/550 |
| Staff to develop/install/support/other* in LIS division | 120 total | 120 total | 119/59/73 | 119/59/73 |
| No. of terminals/workstations in sites operating system | — | — | 10–1,000+ (ave. 50) | 4–500+ (ave. 20–50) |
| • Central hardware or service type | EMC, IBM, HP (Compaq), Dell | EMC, IBM, HP (Compaq), Dell | IBM RS/6000, HP (Compaq), Alpha | HP Alpha, IBM RS/6000 |
| • Central hardware redundant/fault-tolerant? | yes | yes | yes | on request |
| • Terminals/workstations or PC platform | — | — | Dell, Compaq, DEC VT 420, others | Dell, HP (Compaq) |
| **Software** | | | | |
| • Programming language(s) | Magic | Magic | Caché | Caché, C, C++ |
| • Operating system(s) | Windows 98, ME, 2000 Professional, XP | Magic OS, OSAL on Windows 2000 server | VMS, Unix | HP Unix, OpenVMS, AIX |
| • Databases and tools used | Magic | Magic | Open M, Caché | Caché |
| • System includes full transaction logging? | yes | yes | yes | yes |
| **Features (listed as a percentage of live installations or based on availability)** | | | | |
| • Chemistry and hematology | 100% | 100% | 100% | 100% |
| • Bar-coded collection labels | 100% | 100% | 100% | 100% |
| • Handheld devices for bedside-positive patient ID | 15% | 15% | not available | <10% |
| • NCCLS POCT-1A standard interface for POCT devices | 20% | 20% | available | 20% |
| • Microbiology | 100% | 100% | 100% | 100% |
| • Surgical pathology | 93% | 93% | 30% | 70% |
| • Cytology | installed | installed | 30% | 70% |
| • HIS interface: A/D/T | 25% | 25% | 80% | 99% |
| • HIS interface: order entry | 25% | not available | 80% | 99% |
| • HIS interface: results reporting | 25% | not available | 80% | 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 | installed | installed | 100% | 75% |
| • Compliance checking | installed | installed | installed | 30% |
| • Billing/accounts receivable | 97% | 97% | 90% | 10% |
| • Materials management and inventory | 80% | 80% | 0 | 20% |
| • Test partition | 100% | 100% | 100% | 100% |
| • Remote faxing and printing | 100% | 100% | 100% | 90% |
| • Physician office outreach | installed | installed | installed | 20% |
| • HIPAA-standard transaction formats | 100% | 100% | 100% | 100% |
| • Web-based remote inquiry of reports | available in 2005 | available in 2005 | available | 2% |
| • Web access for order entry | available in 2005 | available in 2005 | available | 2% |
| Complete LIS ASP solution? | no | no | no | no |
| ASP for physician order entry/results reporting? | — | — | no | no |
| Method of charging for ASP service | — | — | — | — |
| Client software required | — | — | — | — |
| ASP information conduit | — | — | — | — |
| Client contracts supported from data center not operated by client | — | — | — | — |
| How data center is operated | — | — | — | — |
| **LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard**** | | | | |
| • Microbiology data | not available | not available | available but not installed | available but not installed |
| • Other reportable diseases | not available | not available | available but not installed | available but not installed |
| • Tumor diagnosis/registry data | not available | not available | available but not installed | 10% |
| System provides standard HL7 interface? | yes | yes | yes | yes |
| Hospital/integrated health care systems interfaced | Cerner, McKesson, Siemens, others | Cerner, McKesson, Siemens, others | McKesson, Cerner, Siemens, Meditech, others | McKesson, Cerner, Siemens, IDX, Epic, Eclypsis, others |
| Physician office management systems interfaced | — | | Logician, Clinscan, Dr. Chart, others | PowerChart, Dr. Chart, others |
| Automated lab transportation systems interfaced | MDS Laboratory Services, Beckman Coulter, Sysmex, Bayer, Roche/BMC/Hitachi | Lab-InterLink, MDS, Beckman Coulter, Sysmex, Bayer, Roche/BMC/Hitachi | Beckman Coulter, Roche/BMC/Hitachi | Lab-InterLink, Beckman Coulter, Sysmex, Bayer, Tecan, Roche/BMC/Hitachi |
| Validation/testing tools provided? | yes (proprietary) | yes (proprietary) | no | yes (from Misys Healthcare Consulting) |
| LIS allows for third-party updates of tables/rules? | yes (Info-X, SNOMED) | yes (Info-X, SNOMED) | yes (Info-X) | yes (ICD-9, Info-X) |
| LIS permits use of voice input technology? | yes (Dragon Systems-ScanSoft Naturally Speaking) | yes (Dragon Systems-ScanSoft Naturally Speaking) | no | yes (Dragon Medically Speaking for AP only) |
| LIS allows for image capture and display? | yes | yes | no | yes |
| Software provides indexed field in each test definition for LOINC code? | no | no | no | no |
| Provide LOINC dictionary for each new installation? | no | no | no | no |
| LIS supports use of SNOMED CT? | yes | yes | no | yes |
| Market modules for other hospital departments? | yes | yes | yes | yes |
| • Percentage of LIS installations stand-alone | 25% | 25% | 90% | 90% |
| No. of different lab instruments interfaced with LIS | hundreds | hundreds | 300+ | >200 |
| Source code?/User group? | yes/yes (meets online as well) | yes/yes (meets online as well) | yes/yes (meets online as well) | escrow (on request)/yes (meets online as well) |
| User can modify screens? | yes (also user-def. report writer/custom prog.) | yes (also user-def. report writer/custom prog.) | no (but offer user-def. report writer/cust. prog.) | no (but offer user-def. report writer/cust. prog.) |
| Query language to retrieve info. from LIS database | SQL based and Meditech Report Writer | SQL based and Meditech Report Writer | SQL | SQL |
| Smallest cost (hardware/software/monthly maintenance) | — | — | $50k/$100k/1.5% of license fee per month | $100k/$250k/1.5% |
| Largest cost (hardware/software/monthly maintenance) | — | — | $500k+/$3m+/1.5% of license fee per month | $500k/$1m+/— |
| Distinguishing features (supplied by vendor)  *other=sales, marketing, administration, and other company functions  **via a computer-to-computer interface | • 35 years' experience developing and implementing lab systems • seamless support for labs in an IDN • accurate, up-to-the-minute patient data and charge information | • 35 years' experience developing and implementing lab systems • seamless support for labs in an IDN • 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 *See our ad on page 100* | • company commitment to support and service • connectivity to POC, LAS, instruments, CPR, HIS, financials • multi-facility and outreach support |

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

# *Laboratory information systems*

| Part 8 of 13 | Modulus Data Systems Inc. | Multidata Computer Systems Inc. | Netlims NJ LLC |
|---|---|---|---|
| | George Liviakis | Michael Slater   mrslater@mul.com | Brian Davis   brian@netlims.com |
| | george@modulusdatasystems.com | 330 Seventh Ave. | 96 Engle St. |
| | 2700 Augustine Drive, 299A | New York, NY 10001 | Englewood, NJ 07631 |
| | Santa Clara, CA 95054 | 212-967-6700 | 201-894-5300 |
| *See accompanying articles on pages 18, 22* | 408-567-9333www.modulusdatasystems.com | www.mul.com | www.netlims.com |
| **Name of system** | Modu-LIS III | MultiTech LIS | AutoLims |
| **First ever LIS install/latest install (for current release)** | 1972/2003 | 1983/2003 | 1996/2004 |
| **No. of contracts for sites operating LIS** | 12 | 41 | 33 |
| • Hospital/independent lab contracts in U.S. | 9/3 | 7/33 | 3/2 |
| • Clinic or group practice contracts in U.S. | 0 | 1 | 0 |
| • Other contracted U.S. sites/contracts for foreign sites | 0/0 | 0/0 | 0/28 |
| **Contracts signed but LIS not yet operational** (hospitals/independent labs/other sites) | 1 (1/0/0) | 0 | 10 (9/1/0) |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | 1 | — | 3 |
| **No. of sites operating LIS** | 12 | 41 | 51 |
| **Staff to develop/install/support/other\* in entire firm** | 6/2/2 | 4/5/2 | 56/42/18 |
| **Staff to develop/install/support/other\* in LIS division** | — | — | — |
| **No. of terminals/workstations in sites operating system** | 15–200 (ave. 32) | 4–100 (ave. 30) | 16–568 (ave. 65) |
| • **Central hardware or service type** | IBM, HP, NCR, Dell | Intel x86 compatible, most Unix/RISC, DEC Alpha | HP, Dell, IBM, Sun |
| • **Central hardware redundant/fault-tolerant?** | yes | optional | yes |
| • **Terminals/workstations or PC platform** | Dell PC, ADDS, others | PC with VT emulation, DEC VT or compatible | any Windows compatible |
| **Software** | | | |
| • Programming language(s) | Java, C | Caché (M), Visual Basic, HTML | C++, Java, Visual Basic |
| • Operating system(s) | Linux | Windows 2000, 2003, Unix, Linux, DEC VMS | Windows XP, 2000, 2003, Linux, Unix |
| • Databases and tools used | Unify Dataserver, Oracle | Caché (M) | Oracle, SQL server |
| • System includes full transaction logging? | yes | optional | yes |
| **Features** (listed as a percentage of live installations or based on availability) | | | |
| • Chemistry and hematology | 100% | 90% | 90% |
| • Bar-coded collection labels | 100% | 90% | 100% |
| • Handheld devices for bedside-positive patient ID | 30% | — | installed |
| • NCCLS POCT-1A standard interface for POCT devices | — | — | installed |
| • Microbiology | 90% | 80% | 90% |
| • Surgical pathology | 25% | 10% | 40% |
| • Cytology | 25% | 40% | 75% |
| • HIS interface: A/D/T | 100% | 20% | 75% |
| • HIS interface: order entry | 100% | 20% | 60% |
| • HIS interface: results reporting | 100% | 10% | 100% |
| • Ad hoc reporting | 100% | 40% | installed |
| • Rules-based system | 100% | 90% | 100% |
| • Utilization management | 70% | 20% | 90% |
| • Outreach and commercial laboratory | 60% | 90% | 80% |
| • Compliance checking | 50% | 80% | installed |
| • Billing/accounts receivable | 10% | 90% | 40% |
| • Materials management and inventory | 20% | 20% | installed |
| • Test partition | 100% | 100% | 100% |
| • Remote faxing and printing | 90% | 80% | 100% |
| • Physician office outreach | 30% | 80% | 80% |
| • HIPAA-standard transaction formats | 100% | 90% | installed |
| • Web-based remote inquiry of reports | 70% | 10% | 80% |
| • Web access for order entry | 70% | available | installed |
| **Complete LIS ASP solution?** | yes | no | no |
| **ASP for physician order entry/results reporting?** | yes | no | — |
| **Method of charging for ASP service** | fixed fee | — | — |
| **Client software required** | browser based | — | — |
| **ASP information conduit** | operates over Internet | — | — |
| **Client contracts supported from data center not operated by client** | 1 | — | — |
| **How data center is operated** | by vendor | — | — |
| **LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard\*\*** | | | |
| • Microbiology data | 20% | not available | available but not installed |
| • Other reportable diseases | 20% | 20% | available but not installed |
| • Tumor diagnosis/registry data | not available | not available | available but not installed |
| **System provides standard HL7 interface?** | yes | yes | yes |
| **Hospital/integrated health care systems interfaced** | McKesson, Siemens, SDS, Hemocare, others | Siemens, CSM, Cerner | SCC, Misys, McKesson, Eclipsys |
| **Physician office management systems interfaced** | — | Medical Manager, VitalWorks | Advantex, Medic, MediSoft, PMS, MD Base, Medical Manager |
| **Automated lab transportation systems interfaced** | Sysmex, Roche/BMC/Hitachi, Olympus | Bayer | Beckman Coulter, Roche/BMC/Hitachi |
| **Validation/testing tools provided?** | — | no | no |
| **LIS allows for third-party updates of tables/rules?** | yes | yes (PMIC) | yes (any HL7, Excel, ASCII format) |
| **LIS permits use of voice input technology?** | no | no | yes (Dragon Naturally Speaking) |
| **LIS allows for image capture and display?** | in development | optional | yes |
| **Software provides indexed field in each test definition for LOINC code?** | yes | yes | yes |
| **Provide LOINC dictionary for each new installation?** | no | on request | yes |
| **LIS supports use of SNOMED CT?** | no | no | yes |
| **Market modules for other hospital departments?** | no | no | no |
| • Percentage of LIS installations stand-alone | — | — | — |
| **No. of different lab instruments interfaced with LIS** | 200+ | 125+ | 300+ |
| **Source code?/User group?** | yes/Internet-based user group | escrow/no | escrow/Internet-based user group |
| **User can modify screens?** | yes (also user-def. report writer/custom programming) | no (but offer user-def. report writer/custom programming) | yes (also user-defined report writer/custom programming) |
| **Query language to retrieve info. from LIS database** | SQL | any ODBC compliant, e.g., Crystal Reports, SQL, Access | SQL |
| **Smallest cost (hardware/software/monthly maintenance)** | $60k/$60k/$1.5k | $20k/$50k/$0.75k | $65k/$110k/$2.5k |
| **Largest cost (hardware/software/monthly maintenance)** | $600k/$1m/$10k | $250k/$400k/$6k | $700k/$2.8m/$55k |
| **Distinguishing features** (supplied by vendor) | • dynamically selected report formats/comprehensive rules-based capabilities | • complete billing, A/R, management reporting for commercial labs and hospital outreach | • integration—single database for all modules |
| | • Web-based design—results and ordering at physicians' fingertips | • integrated document management system for imaging/retrieval of requisitions and related paper documents | • standardized—hardware, operating system, database interfaces |
| \*other=sales, marketing, administration, and other company functions | • more than 32 years in LIS industry | | |
| \*\*via a computer-to-computer interface | | | |

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# Laboratory information systems

| Part 9 of 13 | Northern Software Inc.<br>Bob Hamen  bob@northernsoft.com<br>P.O. Box 309<br>Ironwood, MI 49938<br>906-932-9990<br>www.northernsoft.com | Opus Healthcare Solutions Inc.<br>Caroline Pritchard<br>cpritchard@opushealthcare.com<br>12301 Research Blvd., Bldg. IV, Ste. 200<br>Austin, TX 78729<br>800-676-3371  www.opushealthcare.com | Orchard Software<br>Kevin Dudley  sales@orchardsoft.com<br>701 Congressional Blvd., Ste. 360<br>Carmel, IN 46032<br>800-856-1948<br>www.orchardsoft.com |
|---|---|---|---|
| *See accompanying articles on pages 18, 22* | | | |
| Name of system | elab.Sys | OpusLab | Orchard Harvest LIS |
| First ever LIS install/latest install (for current release) | 1984/2004 | 1985/2004 | 1993/2004 |
| No. of contracts for sites operating LIS | 31 | 46 | 464 |
| • Hospital/independent lab contracts in U.S. | 6/2 | 35/4 | 118/52 |
| • Clinic or group practice contracts in U.S. | 21 | 2 | 261 |
| • Other contracted U.S. sites/contracts for foreign sites | 0/2 | 4/1 | 33/0 |
| Contracts signed but LIS not yet operational (hospitals/independent labs/other sites) | 2 (0/0/2) | 1 (1/0/0) | 8 (4/1/3) |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | 2 | 1 | 8 |
| No. of sites operating LIS | 31 | 46 | 509 |
| Staff to develop/install/support/other* in entire firm | 2 total | 26/25/39 | 15/38/24 |
| Staff to develop/install/support/other* in LIS division | — | 8/21/5 | — |
| No. of terminals/workstations in sites operating system | 1–60 (ave. 5) | 5–40 (ave. 15) | 1–150+ (ave. 21) |
| • Central hardware or service type | Dell servers, Acer Open servers | HP 9000 | HP Business Class, Pentium compatible |
| • Central hardware redundant/fault-tolerant? | yes | yes | yes |
| • Terminals/workstations or PC platform | Dell Optiplex, Acer Open custom PCs | Windows PC workstations supported | HP Business Class, Pentium compatible |
| Software | | | |
| • Programming language(s) | C++, Visual Basic, others | C, Java, Perl | 4D, C++, Java, HTML |
| • Operating system(s) | Windows 95, 98, 2000, XP | Unix, Linux | Windows 2000, XP, Internet Explorer, Netscape |
| • Databases and tools used | Sybase SQL, MS SQL 7, 2000, 2002 | Postgre SQL, Mason, Opus DBMS, others | 4D client/server, MS SQL, Oracle, MySQL |
| • System includes full transaction logging? | yes | yes | yes |
| Features (listed as a percentage of live installations or based on availability) | | | |
| • Chemistry and hematology | 100% | 100% | 100% |
| • Bar-coded collection labels | 90% | 100% | 100% |
| • Handheld devices for bedside-positive patient ID | not available | available in December 2004 | available |
| • NCCLS POCT-1A standard interface for POCT devices | not available | available | available |
| • Microbiology | 15% | 80% | 40% |
| • Surgical pathology | not available | 20% | 10% |
| • Cytology | not available | 15% | 20% |
| • HIS interface: A/D/T | 50% | 80% | 65% |
| • HIS interface: order entry | 100% | 75% | 65% |
| • HIS interface: results reporting | 100% | 75% | 65% |
| • Ad hoc reporting | 10% | 100% | 100% |
| • Rules-based system | 100% | 100% | 100% |
| • Utilization management | 100% | 100% | 100% |
| • Outreach and commercial laboratory | 50% | 75% | 70% |
| • Compliance checking | 100% | 2% | 90% |
| • Billing/accounts receivable | not available | not available | — |
| • Materials management and inventory | not available | not available | 10% |
| • Test partition | 100% | 75% | 25% |
| • Remote faxing and printing | 100% | 100% | 90% |
| • Physician office outreach | available | 10% | 80% |
| • HIPAA-standard transaction formats | — | — | 100% |
| • Web-based remote inquiry of reports | available in early 2005 | 10% | 60% |
| • Web access for order entry | available in early 2005 | available in 2005 | 60% |
| Complete LIS ASP solution? | no | yes | no |
| ASP for physician order entry/results reporting? | — | yes | yes |
| Method of charging for ASP service | — | fixed fee | monthly subscription |
| Client software required | — | requires software be installed on client PC | — |
| ASP information conduit | — | requires use of private, dedicated circuit | — |
| Client contracts supported from data center not operated by client | — | 1 | 5 |
| 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 | 1% |
| • Other reportable diseases | not available | available but not installed | unknown |
| • Tumor diagnosis/registry data | not available | available but not installed | unknown |
| System provides standard HL7 interface? | yes | yes | yes |
| Hospital/integrated health care systems interfaced | Dairyland | McKesson, Siemens, Cerner, Epic, Quest, LabCorp, Hemocare | McKesson, Misys, IDX, Experior, Siemens, Cerner, Dairyland, QuadraMed, Meditech, others |
| Physician office management systems interfaced | Medical Manager, ChartLogic | not available | Misys, HealthPac, Millbrook, NextGen, Epic, Clinitek, Medical Manager, Medgate, IDX, others |
| Automated lab transportation systems interfaced | planned | Beckman Coulter | planned |
| Validation/testing tools provided? | yes (duplicate result entry, QC Westgaard rules) | yes (complete testing environment) | yes (proprietary) |
| LIS allows for third-party updates of tables/rules? | yes (ChartLogic) | no | yes (AMA, LabCorp, Quest) |
| LIS permits use of voice input technology? | no | no | no |
| LIS allows for image capture and display? | no | no | yes |
| Software provides indexed field in each test definition for LOINC code? | yes | no | yes |
| Provide LOINC dictionary for each new installation? | no | no | no |
| LIS supports use of SNOMED CT? | yes | no | yes |
| Market modules for other hospital departments? | no | yes | no |
| • Percentage of LIS installations stand-alone | — | 50% | — |
| No. of different lab instruments interfaced with LIS | 200+ | 200+ | 250+ |
| Source code?/User group? | no/no | escrow/yes | escrow/yes (meets online as well) |
| User can modify screens? | yes (also offer custom programming) | yes (also user-def. report writer/custom programming) | yes (also user-def. report writer/custom programming) |
| Query language to retrieve info. from LIS database | ODBC, SQL | SQL, Crystal Report Writer | ODBC-compliant query languages |
| Smallest cost (hardware/software/monthly maintenance) | $1k/$2k/$0.03k | $30k/$100k/$1k | $9k/$19k/$0.3k |
| Largest cost (hardware/software/monthly maintenance) | $25k/$50k/$0.6k | $250k/$600k/$6k | $100k/$350k/$5k |
| Distinguishing features (supplied by vendor)<br><br>*other=sales, marketing, administration, and other company functions<br>**via a computer-to-computer interface | • fully integrated with ChartLogic EMR<br>• lab up and running at end of installation<br>• uni- and bi-directional interfaces with LabCorp, Quest, AML, Dynacare | • comprehensive solution for multi-site facilities<br>• standalone or integrated with Opus' clinical suite of products<br>• customer support is hallmark of company operations | • rules-based advanced decision support logic<br>• interfacing and integration with other systems, departments, reference labs<br>• industry leader in service and support |

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## *Laboratory information systems*

| Part 10 of 13 | Psyche Systems Corp.<br>Patricia Salem  pattys@psychesystems.com<br>321 Fortune Blvd.<br>Milford, MA 01757<br>800-345-1514<br>www.psychesystems.com | Schuyler House<br>Jan Chennault  jan@schuylerhouse.com<br>26027 Huntington Lane, Ste. F<br>Valencia, CA 91355<br>800-706-0266<br>www.schuylab.com |
|---|---|---|
| *See accompanying articles on pages 18, 22* | | |
| **Name of system** | Lab Web | SchuyLab |
| First ever LIS install/latest install (for current release) | 1976/2003 | 1992/2004 |
| No. of contracts for sites operating LIS | 24 | 534 |
| • Hospital/independent lab contracts in U.S. | 14/4 | 84/195 |
| • Clinic or group practice contracts in U.S. | 2 | 194 |
| • Other contracted U.S. sites/contracts for foreign sites | 0/4 | 55/6 |
| Contracts signed but LIS not yet operational<br>  (hospitals/independent labs/other sites) | 1 (1/0/0) | 4 |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | 1 | 4 |
| No. of sites operating LIS | 24 | 473 |
| Staff to develop/install/support/other* in entire firm | 9/12/12 | 6/10/5 |
| Staff to develop/install/support/other* in LIS division | 7/6/6 | — |
| No. of terminals/workstations in sites operating system | 5–120 (ave. 20) | 1–40 (ave. 4) |
| • Central hardware or service type | HP | Dell computers |
| • Central hardware redundant/fault-tolerant? | yes | no |
| • Terminals/workstations or PC platform | HP | Dell computers |
| Software | | |
| • Programming language(s) | VB.Net, Visual Basic, some C/Fortran | C language |
| • Operating system(s) | Windows XP, NT, OpenVMS | Windows NT, 95, 98, 2000, ME, XP Pro |
| • Databases and tools used | MS SQL, Oracle, BrioQuery, Crystal | Pervasive (Btrieve) |
| • System includes full transaction logging? | yes | no |
| Features (listed as a percentage of live installations<br>  or based on availability) | | |
| • Chemistry and hematology | 100% | 100% |
| • Bar-coded collection labels | 100% | 40% |
| • Handheld devices for bedside-positive patient ID | available | not available |
| • NCCLS POCT-1A standard interface for POCT devices | available | not available |
| • Microbiology | 33% | 70% |
| • Surgical pathology | 33% | 10% |
| • Cytology | 33% | 10% |
| • HIS interface: A/D/T | 90% | 15% |
| • HIS interface: order entry | 50% | 15% |
| • HIS interface: results reporting | 50% | 15% |
| • Ad hoc reporting | 100% | 10% |
| • Rules-based system | 20% | not available |
| • Utilization management | 100% | 100% |
| • Outreach and commercial laboratory | 100% | 25% |
| • Compliance checking | 10% | 40% |
| • Billing/accounts receivable | not available | 15% |
| • Materials management and inventory | not available | not available |
| • Test partition | 100% | not available |
| • Remote faxing and printing | 100% | 40% |
| • Physician office outreach | 100% | 10% |
| • HIPAA-standard transaction formats | 100% | 100% |
| • Web-based remote inquiry of reports | available | 5% |
| • Web access for order entry | available | 5% |
| Complete LIS ASP solution? | yes | no |
| ASP for physician order entry/results reporting? | yes | — |
| Method of charging for ASP service | fixed fee | — |
| Client software required | browser based | — |
| ASP information conduit | operates over Internet | — |
| Client contracts supported from data<br>  center not operated by client | 4 | — |
| How data center is operated | by vendor | — |
| LIS provides surveillance data to public health<br>  agencies using CDC/HL7/LOINC/SNOMED standard** | | |
| • Microbiology data | 5% | — |
| • Other reportable diseases | — | — |
| • Tumor diagnosis/registry data | 42% | — |
| System provides standard HL7 interface? | yes | yes |
| Hospital/integrated health care systems interfaced | Meditech, McKesson, Siemens, QuadraMed Affinity, Keane, various HL7 | QuadraMed, Gold, Logician, Siemens, Cardinal, HealthBridge, McKesson, others |
| Physician office management systems interfaced | IDX | Medical Manager, Renal Link, PMSI, Allscripts, Apex, PCN, others |
| Automated lab transportation systems interfaced | Beckman Coulter | Bayer |
| Validation/testing tools provided? | no | no |
| LIS allows for third-party updates of tables/rules? | yes (Code Map) | no |
| LIS permits use of voice input technology? | yes (Dragon, proprietary) | planned |
| LIS allows for image capture and display? | yes | no |
| Software provides indexed field in<br>  each test definition for LOINC code? | yes | yes |
| Provide LOINC dictionary for each new installation? | no | no |
| LIS supports use of SNOMED CT? | yes | no |
| Market modules for other hospital departments? | no | no |
| • Percentage of LIS installations stand-alone | — | — |
| No. of different lab instruments interfaced with LIS | 100+ | 250+ |
| Source code?/User group? | escrow/yes | escrow/Internet-based user group going live |
| User can modify screens? | yes (also user-defined report writer/custom programming) | no (but offer user-defined report writer) |
| Query language to retrieve info. from LIS database | MS SQL | HL7, dBase, ASTM, ASCII |
| Smallest cost (hardware/software/monthly maintenance) | $4k/$20k/$0.5k | $1.2k/$6k/$0.2k |
| Largest cost (hardware/software/monthly maintenance) | $100k/$400k/$6k | $45k/$80k/$2k |
| Distinguishing features (supplied by vendor) | • a leader in hosted systems technology<br>• delivering LISs for more than 28 years<br>• extremely flexible, customizable system | • Internet, bar coding, electronic billing available<br>• 24/7 toll-free technical support<br>• free instrument interface trade outs |
| *other=sales, marketing, administration,<br>  and other company functions<br>**via a computer-to-computer interface | | *See our ad on page 18* |

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## Laboratory information systems

*Part 11 of 13*

*See accompanying articles on pages 18, 22*

SCC Soft Computer
Ellie Vahman  ellie@softcomputer.com
34350 U.S. Highway 19 North
Palm Harbor, FL 34684
727-789-0100
www.softcomputer.com

Siemens Medical Solutions
Carol Franklin  carol.franklin@siemens.com
51 Valley Stream Parkway
Malvern, PA 19355-1406
706-517-8100
www.siemens.com

| Name of system | SoftLab | Novius Lab |
|---|---|---|
| First ever LIS install/latest install (for current release) | 1985/2004 | 1996/2004 |
| No. of contracts for sites operating LIS | 269 | 68 |
| • Hospital/independent lab contracts in U.S. | 192/25 | 64/2 |
| • Clinic or group practice contracts in U.S. | 10 | 0 |
| • Other contracted U.S. sites/contracts for foreign sites | 0/42 | 0/2 |
| Contracts signed but LIS not yet operational (hospitals/independent labs/other sites) | 21 | 9 |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | 14 | 5 |
| No. of sites operating LIS | 547 | 51 |
| Staff to develop/install/support/other* in entire firm | 573/249/139 | 1,300/2,300/2,000 |
| Staff to develop/install/support/other* in LIS division | 401/174/97 | 40/90/10 |
| No. of terminals/workstations in sites operating system | 3–450 (ave. 60) | 15–250+ (ave. 60) |
| • Central hardware or service type | IBM pSeries (RS/6000), HP 9000 series | HP Alpha, IBM pSeries |
| • Central hardware redundant/fault-tolerant? | yes | yes |
| • Terminals/workstations or PC platform | PCs or ASCII terminals, all brands of PCs | Windows-based PCs |
| **Software** | | |
| • Programming language(s) | C, C++, Java, .NET | C, C++ |
| • Operating system(s) | server: IBM-AIX, HP-UX; client: Windows 2000, XP | Unix, Windows NT, 2000, XP |
| • Databases and tools used | RDM++, Oracle | Sybase |
| • System includes full transaction logging? | yes | yes |
| **Features (listed as a percentage of live installations or based on availability)** | | |
| • Chemistry and hematology | 100% | 100% |
| • Bar-coded collection labels | 100% | 100% |
| • Handheld devices for bedside-positive patient ID | 5–10% | — |
| • NCCLS POCT-1A standard interface for POCT devices | 6% | 10% |
| • Microbiology | 95% | 100% |
| • Surgical pathology | 57% | through Tamtron |
| • Cytology | 57% | through Tamtron |
| • HIS interface: A/D/T | 89% | 98% |
| • HIS interface: order entry | 82% | 98% |
| • HIS interface: results reporting | 81% | 90% |
| • Ad hoc reporting | 100% | 100% |
| • Rules-based system | 100% | 100% |
| • Utilization management | 100% | 100% |
| • Outreach and commercial laboratory | installed | 60% |
| • Compliance checking | 20% | 40% |
| • Billing/accounts receivable | 16% | — |
| • Materials management and inventory | not available | — |
| • Test partition | 100% | 100% |
| • Remote faxing and printing | 100% | 100% |
| • Physician office outreach | 10% | 30% |
| • HIPAA-standard transaction formats | available | 90% |
| • Web-based remote inquiry of reports | 10% | 20% |
| • Web access for order entry | 10% | — |
| Complete LIS ASP solution? | yes | no |
| ASP for physician order entry/results reporting? | yes | yes |
| Method of charging for ASP service | fixed fee | transaction based |
| Client software required | requires software be installed on client PC | browser based |
| ASP information conduit | operates over Internet | operates over Internet |
| Client contracts supported from data center not operated by client | 2 | 0 |
| 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 |
| • Other reportable diseases | not available | not available |
| • Tumor diagnosis/registry data | 1% | not available |
| System provides standard HL7 interface? | yes | yes |
| Hospital/integrated health care systems interfaced | IDX, QuadraMed, McKesson, Keane, Perot, CPSI, custom, Siemens, Epic, Misys, Cerner | McKesson |
| Physician office management systems interfaced | Medical Manager, Healthworks, Alliance-Plus, MedicaLogic, Trizetto, Epic, Misys | — |
| Automated lab transportation systems interfaced | Lab-InterLink, Beckman Coulter, Sysmex, Bayer, Roche/BMC/Hitachi, others | Beckman Coulter, Bayer |
| Validation/testing tools provided? | yes (Modelsoft, Camtasia) | yes |
| LIS allows for third-party updates of tables/rules? | yes (Quadax) | no |
| LIS permits use of voice input technology? | yes (Dragon) | no |
| LIS allows for image capture and display? | yes | no |
| Software provides indexed field in each test definition for LOINC code? | yes | yes |
| Provide LOINC dictionary for each new installation? | no | no |
| LIS supports use of SNOMED CT? | yes | no |
| Market modules for other hospital departments? | yes | yes |
| • Percentage of LIS installations stand-alone | 95% | 2% |
| No. of different lab instruments interfaced with LIS | 500+ | 300+ |
| Source code?/User group? | escrow/yes (meets online as well) | escrow/yes |
| User can modify screens? | yes (also user-defined report writer/custom programming) | yes |
| Query language to retrieve info. from LIS database | SQL, ODBC, XML | ODBC |
| Smallest cost (hardware/software/monthly maintenance) | $30k/$50k/1.5% of total system cost | — |
| Largest cost (hardware/software/monthly maintenance) | $1m/$3m/1.5% of total system cost | — |
| Distinguishing features (supplied by vendor) | • accommodate hospital, commercial, hybrid, core labs<br>• proven ROI for multi-site consolidation<br>• parallel processing (fault tolerance) and artificial intelligence (rules-based engine) | • workflow efficiency features: turnaround time monitor, sample tracking, call management, document links, online supervisory review |

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

# Laboratory information systems

Part 12 of 13

*See accompanying articles on pages 18, 22*

Sysmex America Inc.
Tammy Kutz   kutzt@sysmex.com
1 Nelson C. White Parkway
Mundelein, IL 60060
847-996-4531
www.sysmex.com/usa

| Name of system | Molis |
| --- | --- |
| First ever LIS install/latest install (for current release) | 1989/2004 |
| No. of contracts for sites operating LIS | 104 |
| • Hospital/independent lab contracts in U.S. | 2/2 |
| • Clinic or group practice contracts in U.S. | 0 |
| • Other contracted U.S. sites/contracts for foreign sites | 0/100 |
| Contracts signed but LIS not yet operational (hospitals/independent labs/other sites) | 9 |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | 6 |
| No. of sites operating LIS | 180 |
| Staff to develop/install/support/other* in entire firm | 300/600/300 |
| Staff to develop/install/support/other* in LIS division | 35/56/25 |
| No. of terminals/workstations in sites operating system | 4–170 (ave. 50) |
| • Central hardware or service type | Compaq (Alpha, Intel), IBM (Intel, RS 6000), others |
| • Central hardware redundant/fault-tolerant? | yes |
| • Terminals/workstations or PC platform | Windows-based PCs |
| **Software** | |
| • Programming language(s) | Compuware Uniface |
| • Operating system(s) | Windows NT, NT 2000, AIX, HP-UX, Linux Red Hat 6.1 |
| • Databases and tools used | Oracle, Sybase, Informix, C-ISAM |
| • System includes full transaction logging? | yes |
| **Features** (listed as a percentage of live installations or based on availability) | |
| • Chemistry and hematology | 100% |
| • Bar-coded collection labels | 100% |
| • Handheld devices for bedside-positive patient ID | available |
| • NCCLS POCT-1A standard interface for POCT devices | 10% |
| • Microbiology | 95% |
| • Surgical pathology | 16% |
| • Cytology | 16% |
| • HIS interface: A/D/T | 55% |
| • HIS interface: order entry | 55% |
| • HIS interface: results reporting | 55% |
| • Ad hoc reporting | 100% |
| • Rules-based system | 100% |
| • Utilization management | 100% |
| • Outreach and commercial laboratory | 90% |
| • Compliance checking | available |
| • Billing/accounts receivable | 90% |
| • Materials management and inventory | 0 |
| • Test partition | 100% |
| • Remote faxing and printing | 100% |
| • Physician office outreach | 30% |
| • HIPAA-standard transaction formats | available in 2006 |
| • Web-based remote inquiry of reports | 30% |
| • Web access for order entry | 30% |
| Complete LIS ASP solution? | yes |
| ASP for physician order entry/results reporting? | yes |
| Method of charging for ASP service | transaction based |
| Client software required | requires software be installed on client PC |
| ASP information conduit | requires use of private, dedicated circuit |
| Client contracts supported from data center not operated by client | 0 |
| How data center is operated | by vendor |
| LIS provides surveillance data to public health agencies using CDC/HL7/LOINC/SNOMED standard** | |
| • Microbiology data | not available |
| • Other reportable diseases | not available |
| • Tumor diagnosis/registry data | not available |
| System provides standard HL7 interface? | yes |
| Hospital/integrated health care systems interfaced | McKesson, Misys, Per Sé, Siemens, Cepage, LaLisa, Sandra, BHIS |
| Physician office management systems interfaced | MCS, Medistar, Healthone |
| Automated lab transportation systems interfaced | Beckman Coulter, Sysmex, Roche/BMC/Hitachi |
| Validation/testing tools provided? | no |
| LIS allows for third-party updates of tables/rules? | no |
| LIS permits use of voice input technology? | no |
| LIS allows for image capture and display? | no |
| Software provides indexed field in each test definition for LOINC code? | no |
| Provide LOINC dictionary for each new installation? | no |
| LIS supports use of SNOMED CT? | no |
| Market modules for other hospital departments? | no |
| • Percentage of LIS installations stand-alone | — |
| No. of different lab instruments interfaced with LIS | 243 |
| Source code?/User group? | escrow/no |
| User can modify screens? | yes (also offer custom programming) |
| Query language to retrieve info. from LIS database | ODBC compliant, SQL |
| Smallest cost (hardware/software/monthly maintenance) | $50k/$200k/$3k |
| Largest cost (hardware/software/monthly maintenance) | $300k/$1.2m/$20k |
| Distinguishing features (supplied by vendor) | • specimen-centric design allows for rapid test processing<br>• rules-based architecture throughout<br>• especially designed for high-throughput labs |

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

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

**SYSTEM REVIEW SERIES**

# Laboratory information systems

| | |
|---|---|
| *Part 13 of 13* | Sysware Healthcare Systems<br>Mark Trigsted  mtrigsted@syswareinc.com<br>26677 W. 12 Mile Rd.<br>Southfield, MI 48034<br>248-888-7701 |
| *See accompanying articles on pages 18, 22* | www.syswareinc.com |

| Name of system | PowerLab |
|---|---|
| First ever LIS install/latest install (for current release) | 1989/2004 |
| No. of contracts for sites operating LIS | 44 |
| • Hospital/independent lab contracts in U.S. | 4/38 |
| • Clinic or group practice contracts in U.S. | 1 |
| • Other contracted U.S. sites/contracts for foreign sites | 0/1 |
| Contracts signed but LIS not yet operational<br>   (hospitals/independent labs/other sites) | 12 (6/6/0) |
| • Contracts signed between Sept. 1, 2003–Aug. 31, 2004 | 12 |
| No. of sites operating LIS | 184 |
| Staff to develop/install/support/other* in entire firm | 49/23/10 |
| Staff to develop/install/support/other* in LIS division | — |
| No. of terminals/workstations in sites operating system | 4–2,471 (ave. 35) |
| • Central hardware or service type | Windows 2003 (Dell Power Edge) |
| • Central hardware redundant/fault-tolerant? | yes |
| • Terminals/workstations or PC platform | Windows PC, thin client, Web browser |
| Software | |
| • Programming language(s) | C, C++, Java, Clarion, .NET |
| • Operating system(s) | all Windows platforms |
| • Databases and tools used | P.SQL |
| • System includes full transaction logging? | yes |
| Features (listed as a percentage of live installations<br>   or based on availability) | |
| • Chemistry and hematology | 100% |
| • Bar-coded collection labels | 100% |
| • Handheld devices for bedside-positive patient ID | available |
| • NCCLS POCT-1A standard interface for POCT devices | 10% |
| • Microbiology | 100% |
| • Surgical pathology | 10% |
| • Cytology | 10% |
| • HIS interface: A/D/T | 100% |
| • HIS interface: order entry | 100% |
| • HIS interface: results reporting | 100% |
| • Ad hoc reporting | 100% |
| • Rules-based system | 100% |
| • Utilization management | 100% |
| • Outreach and commercial laboratory | 80% |
| • Compliance checking | 100% |
| • Billing/accounts receivable | 40% |
| • Materials management and inventory | 20% |
| • Test partition | 100% |
| • Remote faxing and printing | 100% |
| • Physician office outreach | 75% |
| • HIPAA-standard transaction formats | 100% |
| • Web-based remote inquiry of reports | 75% |
| • Web access for order entry | 50% |
| Complete LIS ASP solution? | yes |
| ASP for physician order entry/results reporting? | yes |
| Method of charging for ASP service | fixed fee |
| Client software required | requires software be installed on client PC |
| ASP information conduit | operates over Internet |
| Client contracts supported from data<br>   center not operated by client | 0 |
| How data center is operated | by vendor |
| LIS provides surveillance data to public health<br>   agencies using CDC/HL7/LOINC/SNOMED standard** | |
| • Microbiology data | 10% |
| • Other reportable diseases | 10% |
| • Tumor diagnosis/registry data | 10% |
| System provides standard HL7 interface? | yes |
| Hospital/integrated health care systems interfaced | Eclipsys, Cerner, McKesson, Keane |
| Physician office management systems interfaced | A⁴, EHS, Medical Manager, PMSI |
| Automated lab transportation systems interfaced | available but not yet operational to Lab-InterLink, Beckman Coulter, Roche/BMC/ Hitachi |
| Validation/testing tools provided? | yes (built in) |
| LIS allows for third-party updates of tables/rules? | yes (any Windows product) |
| LIS permits use of voice input technology? | yes (any Windows-compliant product) |
| LIS allows for image capture and display? | yes |
| Software provides indexed field in<br>   each test definition for LOINC code? | yes |
| Provide LOINC dictionary for each new installation? | no |
| LIS supports use of SNOMED CT? | yes |
| Market modules for other hospital departments? | yes |
| • Percentage of LIS installations stand-alone | 100% |
| No. of different lab instruments interfaced with LIS | 250+ |
| Source code?/User group? | escrow/yes (meets online as well) |
| User can modify screens? | yes (also user-defined report writer/custom programming) |
| Query language to retrieve info. from LIS database | any ODBC-compliant report writer |
| Smallest cost (hardware/software/monthly maintenance) | $10k/$100k/$1k |
| Largest cost (hardware/software/monthly maintenance) | $500k/$2m/$45k |
| Distinguishing features (supplied by vendor) | • patient- and specimen-centric for seamless hospital and reference lab integration<br>• fully integrated<br>• 100% paperless |

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

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