Anatomic pathology computer systems

Labs slow to adopt some system features

Raymond D. Aller, MD
Kimberly Carey

Featured on pages 52 to 66 is CAP TODAY's annual survey of computer systems that serve surgical pathology and cytology practices.

We note with interest that features that have been highly touted for several years and are now readily available, such as voice recognition and image display on every report, have not yet been widely adopted in clinical practice.

Voice-recognition modules, which are available from several vendors, are susceptible to background noise and must be enthusiastically embraced by pathology staff to facilitate adoption. Some pathology groups are technophilic and others are technophobic—and most have to be convinced that such systems save time. In some cases, voice recognition has been implemented simply because it has been impossible to recruit and retain a staff of qualified medical transcriptionists.

Image display on every report is becoming increasingly more straightforward, and digital cameras offering impressive multi-megapixel resolution are retailing for less than $500. Printing color images remains an expensive and slow proposition; thus higher volume practices have been reluctant to implement image-based paper reports beyond a prototype. However, as medical communities become better integrated with electronic connectivity and a full-fledged electronic medical record moves toward reality, pathology will be better positioned to provide full-color gross and histology images for display at the physician's request.

Software features designed to reduce specimen identification/transposition errors, such as automatic cassette labelers and bar-coded slide labels, also have not entered widespread use. With specimen identification/transposition errors being the most egregious type of laboratory-related medical mistake, we wonder if it will take a multimillion–dollar malpractice settlement to spur laboratories to evaluate and install such technology? Interestingly, many anatomic pathology systems vendors have not installed interfaces to automatic cassette labelers or automatic slide stainers at any of their customer sites.

The vendors on the following pages vary widely in the types of features they offer. Therefore, we advise readers to talk with several vendors and the users of their systems before making a purchasing decision. Much more important than flashy bells and whistles or a slick demonstration is that the vendor will provide reliable, timely service and function as a partner to carry forward your business objectives.

This year's anatomic pathology systems survey features many familiar vendor names and a few new ones. Appearing for the first time in CAP TODAY's anatomic pathology systems lineup is e-Suite Inc., Plano, Tex., a division of Sunquest Information Systems. (E-Suite has absorbed the Answers anatomic pathology product previously marketed by Antrim Corp.) Also new to this year's listing is MediSolution Ltd., Montreal; Novovision, Princeton, NJ; PathLogix Corp., La Jolla, Calif.; the Sysmex company SIA, Tucson, Ariz.; and William Shang, MD, a pathologist in Oneonta, NY, who is marketing a system for small practices that he designed and built for his own practice.

The systems profiled herein differ greatly in scope and price. All data presented in the survey have been provided by the vendors. Please be aware that some vendors have listed the total number of sites for systems built with previous generations of tools, such as COBOL and Fortran, and not the tools featured. The number of sites built with the newer types of tools may be much smaller. □

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Part 1 of 12 *See accompanying article*	Cerner Corp. Lori Cross (lcross@cerner.com) 2800 Rockcreek Parkway Kansas City, MO 64117 816-221-1024 www.cerner.com
Name of system	**PathNet Anatomic Pathology**
First LIS/AP system installation/where software was developed	1982/1984/USA
Most recent AP system installation	November 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	427 (405/11/3/8/0)
No. of sites where system is operational	480
No. of contracts signed by 10/1/00 but AP system not operational	12
No. of contracts signed between 11/1/99 and 11/1/00	15
Percentage of installations stand-alone	5%
Staff to develop/install/support/other**	
• In entire company	961/1,211/186/321
• In LIS division (including AP)	185/80/118/30
• In AP systems only	—
No. of workstations/terminals in sites operating system (min.–max.)	7–60
Range in No. of surgical pathology cases/year in sites operating system	5,000–40,000
Range in No. of gynecologic cytology cases/year in sites operating system	2,000–50,000
Central hardware	Compaq, IBM RISC/6000
Terminals/workstations	PCs, NT workstations
Innovative peripherals	image-enabled, Web-enabled, bar codes
Multiuser operation requires multiple PCs on LAN	yes
Programming language(s)	Visual Basic, Visual C++, Java
Databases and tools used	three-tiered client/server architecture (ORACLE)
Word processor(s) used	MS Word 7.0, Visual Writer
Operating system	Windows 95, 98, NT, AIX, Open VMS
Features (listed as a percentage of live installations, available but no installations, or not available)	
• Surgical pathology information system	100%
• Cytology information system	70%
• Autopsy information system	—
• Specimen log-in	100%
• Entry of block IDs	100%
• Specimen labels	—
• Histology slide labels	100%
• Bar-coded slide labels	100%
• Histology worksheets	100%
• Text editing	n/a
• Word processing on central computer	n/a
• Word processing on PC workstations	100%
• Voice-entry of gross description	pending development
• Voice-entry of final diagnosis	pending development
• Spell checker	100%
• Gross and microscopic images integrated in reports	20% (in alpha testing)
• Electronic signature	100%
• Remote printing of reports	100%
• Direct fax reports	100%
• Web-based remote inquiry of reports	—
• Natural language search capability	100%
• SNOMED II	—
• SNOMED International	100%
• Multiple hospitals-wide area network	—
• Sound-alike retrieval of patient history	100%
• Autopsy measurements/organ weights	100%
• Tumor registry reports	100%
• Management reports	100%
• Cytology abnormal/unsatisfactory list to doctors	—
• Cytology diagnostics statistics by pathologist/cytotechnologist	—
• Histology/cytology correlation report	—
• Reports sufficient to comply with CLIA '88 regulations	100%
• Comprehensive billing/accounts receivable	100% (AR under development)
• HIS interface: A/D/T	100%
• HIS interface: result reporting	100%
• Interface to external billing system	—
Standard ASTM/HL-7 interface?	yes
Software provides indexed field in each test definition for LOINC code?	yes
Provide LOINC dictionary for each new installation?	no
Complete AP ASP solution?	yes
Method of charging for ASP service	fixed fee, transaction based, other (purchase software, pay monthly for hardware)
Client software required	requires software be installed on a PC
ASP information conduit	operates over Internet or requires private, dedicated circuit
Client contracts supported from data center not operated by client	2
How data center is operated	by vendor
Other IS interfaces	commercial vendors
Voice-recognition packages integrated with system	Dragon with radiology
Histology and cytology laboratory instruments interfaced	—
Source code? User group?	escrow/yes
User programming in separate partition?	yes
Cost (hardware/software/installation and training/monthly maintenance)	
• Smallest stand-alone system	—
• Largest stand-alone system	—
Base price of integrated system, excluding AP configuration	—
• Incremental cost to add smallest AP configuration	—
• Incremental cost to add largest AP configuration	—
Distinguishing features (supplied by vendor) *H=U.S. hospitals, IL=independent labs in U.S., C or GP=clinics or group practices in U.S., FI=foreign installations, OS=other sites **other=sales, marketing, administration, and other company functions	• Web-enabled orders, registration, and results inquiry • multifacility logic • integrated AP/CP and imaging reports

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SYSTEM REVIEW SERIES

Anatomic pathology computer systems

Part 2 of 12

See accompanying article on page 52

	Clinical Information Systems Inc. Bob Woolley (cisbiw@aol.com) 18805 Willamette Drive West Linn, OR 97068 800-869-0680/503-699-9745 www.cislab.com	Computer Trust Corp. David Liberman, MD (info@ctcsurge.com) 1 State St. Boston, MA 02109-3507 617-557-9264 www.ctcsurge.com
Name of system	**CISlab CPS**	**WinSURGE**
First LIS/AP system installation/where software was developed	1988/1988/USA	1989/1989/USA
Most recent AP system installation	September 2000	4th quarter 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	22 (2/20/0/0/0)	45 (30/11/0/0/4*)
No. of sites where system is operational	22	45
No. of contracts signed by 10/1/00 but AP system not operational	0	1
No. of contracts signed between 11/1/99 and 11/1/00	2	10
Percentage of installations stand-alone	50%	100%
Staff to develop/install/support/other**		
• In entire company	8/9/8/1	—
• In LIS division (including AP)	—	—
• In AP systems only	—	—
No. of workstations/terminals in sites operating system (min.–max.)	1–70	1–1,200
Range in No. of surgical pathology cases/year in sites operating system	2,500–115,000	5,000–200,000
Range in No. of gynecologic cytology cases/year in sites operating system	3,000–300,000	0–150,000
Central hardware	DEC, HP, IBM, generic PCs	PCs, IBM RS/6000
Terminals/workstations	generic PCs, Wyse 60s, Link	PCs, thin-client/Windows NT terminal server/Citrix, VPN, terminals
Innovative peripherals	WORM drive, HP scanners, Philips, optical disks	Internet, auto-fax, auto-e-mail, color-print direct to doctors' offices, voice integrated, microscope cameras, others
Multiuser operation requires multiple PCs on LAN	yes	optional
Programming language(s)	Delphi, COBOL	Visual Basic VI
Databases and tools used	Delphi 3, SQL relational database(s)	Caché, SQL, Crystal Reports
Word processor(s) used	WordPerfect Tools	Word, RTF, other options
Operating system	Windows 95, 98, NT 3.51, NT 4.0, SCO UNIX	Windows NT, 98, 95, UNIX, Novell
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	100%	100%
• Cytology information system	100%	91%
• Autopsy information system	5%	44%
• Specimen log-in	100%	100%
• Entry of block IDs	100%	100%
• Specimen labels	100%	100%
• Histology slide labels	100%	87%
• Bar-coded slide labels	100%	87%
• Histology worksheets	100%	87%
• Text editing	100%	100%
• Word processing on central computer	100%	82%
• Word processing on PC workstations	100%	58%
• Voice-entry of gross description	not available	5%
• Voice-entry of final diagnosis	not available	5%
• Spell checker	100%	100%
• Gross and microscopic images integrated in reports	not available	24%
• Electronic signature	100%	100%
• Remote printing of reports	100%	29%
• Direct fax reports	100%	53%
• Web-based remote inquiry of reports	10%	11%
• Natural language search capability	0%	98%
• SNOMED II	0%	27%
• SNOMED International	0%	9%
• Multiple hospitals-wide area network	0%	20%
• Sound-alike retrieval of patient history	0%	100%
• Autopsy measurements/organ weights	5%	44%
• Tumor registry reports	100%	100%
• Management reports	100%	100%
• Cytology abnormal/unsatisfactory list to doctors	100%	91%
• Cytology diagnostics statistics by pathologist/cytotechnologist	100%	91%
• Histology/cytology correlation report	100%	91%
• Reports sufficient to comply with CLIA '88 regulations	100%	100%
• Comprehensive billing/accounts receivable	50%	call vendor for information
• HIS interface: A/D/T	10%	call vendor for information
• HIS interface: result reporting	10%	call vendor for information
• Interface to external billing system	50%	call vendor for information
Standard ASTM/HL-7 interface?	yes	yes
Software provides indexed field in each test definition for LOINC code?	yes	no
Provide LOINC dictionary for each new installation?	no	no
Complete AP ASP solution?	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	—	—
Other IS interfaces	Medical Manager, Medfax, HBOC, Dairyland, PCN, Reynolds & Reynolds	SMS, HBOC, TDS, Datagate, HDS, IDX
Voice-recognition packages integrated with system	none	Dragon Systems Naturally Speaking, IBM ViaVoice, MS Dictation
Histology and cytology laboratory instruments interfaced	none	Shurmark slide etcher, microscope cameras, TWAIN devices
Source code? User group?	escrow/no	escrow (user's option and expense)/yes
User programming in separate partition?	no	yes
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	$10k/$15k/$5k/$.5k	$2k/$3k/$0/$.375k
• Largest stand-alone system	$100k/$100k/$20k/$2.5k	$100k+/$100k+/$200k+/$6k
Base price of integrated system, excluding AP configuration	n/a	$0
• Incremental cost to add smallest AP configuration	—	$2k/$3k/$0/$.375k
• Incremental cost to add largest AP configuration	—	$100k+/$100k+/$200k/$6k
Distinguishing features (supplied by vendor)	• client/server point-and-click access for pathology/cytology • easy to learn and use; efficient • easily integrated into existing network environment	• flexibility: user-controlled workflow, data entry, report formats • usability: integ. voice, imaging, Web/e-mail/fax-reporting capabilities • scalability: uniquely supports PPM and multi-site enterprise needs * pathology practice management companies

*H=U.S. hospitals, IL=independent labs in U.S., C or GP=clinics or group practices in U.S., FI=foreign installations, OS=other sites
**other=sales, marketing, administration, and other company functions

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Anatomic pathology computer systems

Part 3 of 12 *See accompanying article on page 52*	Cortex Medical Management Systems Inc. Stan Gordon (sgordon@seanet.com) 2001 Western Ave., Suite 410 Seattle, WA 98121 206-812-6981 www.cortexmed.com	Cortex Medical Management Systems Inc. Stan Gordon (sgordon@seanet.com) 2001 Western Ave., Suite 410 Seattle, WA 98121 206-812-6981 www.cortexmed.com
Name of system	**Classic DOS**	**The Gold Standard**
First LIS/AP system installation/where software was developed	1986/1986/USA	1997/1986/USA
Most recent AP system installation	February 1999	December 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	80 (29/49/0/2/0)	11 (5/6/0/0/0)
No. of sites where system is operational	91	11
No. of contracts signed by 10/1/00 but AP system not operational	0	6
No. of contracts signed between 11/1/99 and 11/1/00	0	6
Percentage of installations stand-alone	100%	100%
Staff to develop/install/support/other**		
• In entire company	6/2/6/4	6/2/6/4
• In LIS division (including AP)	—	—
• In AP systems only	—	—
No. of workstations/terminals in sites operating system (min.–max.)	1–60	5–30
Range in No. of surgical pathology cases/year in sites operating system	1,000–40,000	2,100–126,000
Range in No. of gynecologic cytology cases/year in sites operating system	8,400–96,000	1,000–42,000
Central hardware	IBM, Compaq, Dell	IBM, Compaq, Dell
Terminals/workstations	PCs	PCs
Innovative peripherals	voice	voice, image, auto-faxing
Multiuser operation requires multiple PCs on LAN	—	yes
Programming language(s)	—	Visual Basic
Databases and tools used	—	SQL 2000
Word processor(s) used	—	MS Word
Operating system	—	Windows 2000
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	100%	100%
• Cytology information system	100%	100%
• Autopsy information system	100%	100%
• Specimen log-in	100%	100%
• Entry of block IDs	100%	100%
• Specimen labels	100%	100%
• Histology slide labels	100%	100%
• Bar-coded slide labels	not available	100%
• Histology worksheets	100%	100%
• Text editing	—	—
• Word processing on central computer	—	—
• Word processing on PC workstations	100%	100%
• Voice-entry of gross description	2%	10%
• Voice-entry of final diagnosis	2%	10%
• Spell checker	50%	100%
• Gross and microscopic images integrated in reports	2%	100%
• Electronic signature	50%	100%
• Remote printing of reports	5%	available but not yet installed
• Direct fax reports	5%	100%
• Web-based remote inquiry of reports	not available	available but not yet installed
• Natural language search capability	100%	100%
• SNOMED II	25%	10%
• SNOMED International	not available	available but not yet installed
• Multiple hospitals-wide area network	8%	available but not yet installed
• Sound-alike retrieval of patient history	100%	available but not yet installed
• Autopsy measurements/organ weights	100%	10%
• Tumor registry reports	100%	10%
• Management reports	100%	100%
• Cytology abnormal/unsatisfactory list to doctors	100%	100%
• Cytology diagnostics statistics by pathologist/cytotechnologist	100%	100%
• Histology/cytology correlation report	100%	100%
• Reports sufficient to comply with CLIA '88 regulations	100%	100%
• Comprehensive billing/accounts receivable	40%	50%
• HIS interface: A/D/T	20%	40%
• HIS interface: result reporting	20%	40%
• Interface to external billing system	20%	10%
Standard ASTM/HL-7 interface?	yes	yes
Software provides indexed field in each test definition for LOINC code?	no	no
Provide LOINC dictionary for each new installation?	no	no
Complete AP ASP solution?	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	—	—
Other IS interfaces	HBOC, SMS, MEDITECH	MEDITECH, HBOC, SMS
Voice-recognition packages integrated with system	Broca II, Philips	Broca II, Philips
Histology and cytology laboratory instruments interfaced	none	none
Source code? User group?	escrow/yes	escrow/yes
User programming in separate partition?	yes	yes
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	$3.5k/$10k/$6k/$.15k	$5k/$24k/$6k/$.408k
• Largest stand-alone system	$75k/$150k/$18k/$2.25k	$50k/$300k/$54k/$4.5k
Base price of integrated system, excluding AP configuration	—	—
• Incremental cost to add smallest AP configuration	—	—
• Incremental cost to add largest AP configuration	—	—
Distinguishing features (supplied by vendor)	• integrated medical billing • Broca speech dictation • strong customer support	• integrated medical billing • Philips speech recognition • imaging module

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C or GP=clinics or group practices in U.S., FI=foreign installations, OS=other sites
**other=sales, marketing, administration, and other company functions

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Anatomic pathology computer systems

Part 4 of 12

See accompanying article on page 52

Diamond Computing
James T. Campbell (jimcampbell-dcc@msm.com)
2345 Fourth St.
Tucker, GA 30084
770-496-0286

Dynamic Healthcare Technologies
J.P. Fingado or Jay Johnson (jjohnson@dht.com)
51 Sawyer Rd., 2 University Office Park
Waltham, MA 02453
781-642-6200
www.dht.com

Name of system	PathGEM	CoPathPlus
First LIS/AP system installation/where software was developed	1984/1990/—	1982/1983/USA
Most recent AP system installation	2000	December 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	16 (6/10/0/0/0)	333 (293/14/22/4/0)
No. of sites where system is operational	16	401
No. of contracts signed by 10/1/00 but AP system not operational	—	21
No. of contracts signed between 11/1/99 and 11/1/00	—	33 direct through DHT/47 through a partnership
Percentage of installations stand-alone	—	100%
Staff to develop/install/support/other**		
• In entire company	—	27/28/52/67
• In LIS division (including AP)	—	—
• In AP systems only	—	19/17/26/6
No. of workstations/terminals in sites operating system (min.–max.)	4–40	2–500+
Range in No. of surgical pathology cases/year in sites operating system	—	3,000–200,000
Range in No. of gynecologic cytology cases/year in sites operating system	—	2,000–1,000,000
Central hardware	IBM RS/6000, DEC Alpha, PC 586/686	IBM RISC, Intel Pentium, SUN Solaris
Terminals/workstations	PCs 586/686	Windows 95, NT, 2000, Citrix thin-client
Innovative peripherals	voice input/output, optical	voice input, image integration/capture, Web delivery, bar coding
Multiuser operation requires multiple PCs on LAN	no	yes
Programming language(s)	M Caché	PowerBuilder, C++
Databases and tools used	—	Sybase
Word processor(s) used	MS Word, WordPerfect	MS Word, Visual Writer
Operating system	UNIX/AIX, Windows, Windows NT	NT, AIX/UNIX
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	100%	100%
• Cytology information system	100%	98%
• Autopsy information system	10%	98%
• Specimen log-in	100%	100%
• Entry of block IDs	100%	100%
• Specimen labels	100%	100%
• Histology slide labels	100%	100%
• Bar-coded slide labels	100%	15%
• Histology worksheets	100%	100%
• Text editing	100%	100%
• Word processing on central computer	available but not yet installed	55%
• Word processing on PC workstations	100%	45%
• Voice-entry of gross description	available but not yet installed	10%
• Voice-entry of final diagnosis	—	10%
• Spell checker	100%	100%
• Gross and microscopic images integrated in reports	—	10%
• Electronic signature	100%	100%
• Remote printing of reports	100%	5%
• Direct fax reports	100%	100%
• Web-based remote inquiry of reports	available but not yet installed	3%
• Natural language search capability	—	100%
• SNOMED II	100%	99%
• SNOMED International	10%	1%
• Multiple hospitals-wide area network	40%	20%
• Sound-alike retrieval of patient history	—	not available
• Autopsy measurements/organ weights	100%	100%
• Tumor registry reports	—	100%
• Management reports	100%	100%
• Cytology abnormal/unsatisfactory list to doctors	100%	100%
• Cytology diagnostics statistics by pathologist/cytotechnologist	100%	100%
• Histology/cytology correlation report	100%	100%
• Reports sufficient to comply with CLIA '88 regulations	100%	100%
• Comprehensive billing/accounts receivable	100%	not available
• HIS interface: A/D/T	40%	95%
• HIS interface: result reporting	40%	95%
• Interface to external billing system	10%	95%
Standard ASTM/HL-7 interface?	yes	yes
Software provides indexed field in each test definition for LOINC code?	yes	no
Provide LOINC dictionary for each new installation?	no	no
Complete AP ASP solution?	yes	yes
Method of charging for ASP service	fixed fee	subscription and transaction-based
Client software required	requires software be installed on a PC, uses dumb terminals	browser-based
ASP information conduit	—	operates over Internet
Client contracts supported from data center not operated by client	—	0
How data center is operated	—	by vendor
Other IS interfaces	—	SMS, MEDITECH, IDX, DHCP, Sunquest, Cerner, Oasis, HBOC, Triple G, SCC, others
Voice-recognition packages integrated with system	—	IBM MedSpeak, L&H Clinical Reporter, Dragon Systems, others
Histology and cytology laboratory instruments interfaced	—	TBS Shurmark
Source code? User group?	—	escrow/yes
User programming in separate partition?	—	yes
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	—	—
• Largest stand-alone system	—	—
Base price of integrated system, excluding AP configuration	—	—
• Incremental cost to add smallest AP configuration	—	—
• Incremental cost to add largest AP configuration	—	—
Distinguishing features (supplied by vendor)	• ad-hoc report writer • open system • voice input/output	• ability to deliver reports over the Internet • able to install in either a customer-hosted environment or ASP *CoPathPlus also available through Sunquest Information Systems*

*H=U.S. hospitals, IL=independent labs in U.S.,
C or GP=clinics or group practices in U.S., FI=foreign installations, OS=other sites
**other=sales, marketing, administration, and other company functions

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Anatomic pathology computer systems

Part 5 of 12 *See accompanying article on page 52*	EasyPath Software Selig Leyser (seligl@worldnet.att.net) 2551 103rd SE Beaux Arts, WA 98004 425-899-2799/425-455-9012 home.att.net/~seligl	e-Suite Inc. Barbara Whitter (salesinfo@getesuite.com) 101 E. Park Blvd., 12th floor Plano, TX 75074 972-422-1022/800-726-8746 www.getesuite.com
Name of system	**EasyPath**	**e-Reference Laboratory/e-Hospital Laboratory (AP module)**
First LIS/AP system installation/where software was developed	1992/—/USA	1982/1989/USA
Most recent AP system installation	November 2000	2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	7 (6/0/1/0/0)	2 (0/2/0/0/0)
No. of sites where system is operational	7	7
No. of contracts signed by 10/1/00 but AP system not operational	0	2
No. of contracts signed between 11/1/99 and 11/1/00	1	3
Percentage of installations stand-alone	100%	0%
Staff to develop/install/support/other**		
• In entire company	1.2/0.2/0.2/—	189/97/398/184
• In LIS division (including AP)	—	10/10/15/12
• In AP systems only	—	—
No. of workstations/terminals in sites operating system (min.–max.)	5–10	6–100+
Range in No. of surgical pathology cases/year in sites operating system	3,000–20,000	10,000–100,000
Range in No. of gynecologic cytology cases/year in sites operating system	0–20,000	20,000–200,000
Central hardware	Windows NT, Macintosh PPC	Compaq, Alpha
Terminals/workstations	Windows 95, 98, NT, Macintosh	Pentium PC
Innovative peripherals	—	optical storage
Multiuser operation requires multiple PCs on LAN	yes	no
Programming language(s)	4th Dimension	Open M
Databases and tools used	4D server, 4D Write, 4D Compiler	Open M
Word processor(s) used	4D Write (integrated)	proprietary text editor
Operating system	Windows 95, 98, NT, Macintosh	Open VMS
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	90%	100%
• Cytology information system	90%	100%
• Autopsy information system	80%	0%
• Specimen log-in	100%	100%
• Entry of block IDs	100%	100%
• Specimen labels	60%	100%
• Histology slide labels	60%	100%
• Bar-coded slide labels	0%	80%
• Histology worksheets	100%	100%
• Text editing	100%	100%
• Word processing on central computer	100%	not available
• Word processing on PC workstations	100%	not available
• Voice-entry of gross description	0%	not available
• Voice-entry of final diagnosis	0%	not available
• Spell checker	80%	100%
• Gross and microscopic images integrated in reports	100%	not available
• Electronic signature	60%	100%
• Remote printing of reports	0%	100%
• Direct fax reports	100%	100%
• Web-based remote inquiry of reports	available but not yet installed	50%
• Natural language search capability	100%	not available
• SNOMED II	SNOMED-like feature available	100%
• SNOMED International	SNOMED-like feature available	not available
• Multiple hospitals-wide area network	20%	not available
• Sound-alike retrieval of patient history	0%	not available
• Autopsy measurements/organ weights	100%	100%
• Tumor registry reports	100%	100%
• Management reports	100%	100%
• Cytology abnormal/unsatisfactory list to doctors	30%	100%
• Cytology diagnostics statistics by pathologist/cytotechnologist	30%	100%
• Histology/cytology correlation report	100%	100%
• Reports sufficient to comply with CLIA '88 regulations	100%	100%
• Comprehensive billing/accounts receivable	0%	100%
• HIS interface: A/D/T	0%	0%
• HIS interface: result reporting	0%	0%
• Interface to external billing system	0%	0%
Standard ASTM/HL-7 interface?	no	yes
Software provides indexed field in each test definition for LOINC code?	no	no
Provide LOINC dictionary for each new installation?	no	no
Complete AP ASP solution?	no	yes
Method of charging for ASP service	—	fixed fee
Client software required	—	browser-based
ASP information conduit	—	operates over Internet
Client contracts supported from data center not operated by client	—	5
How data center is operated	—	by vendor
Other IS interfaces	—	—
Voice-recognition packages integrated with system	—	none
Histology and cytology laboratory instruments interfaced	—	none (but capability exists)
Source code? User group?	escrow (on request)/no	escrow/yes
User programming in separate partition?	no	no
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	$1.5k/$5.5k/—/— ($7k total)	—
• Largest stand-alone system	$1.5k for server plus $1.5k for client/$13k/not required/—	—
Base price of integrated system, excluding AP configuration	—	—
• Incremental cost to add smallest AP configuration	—	—
• Incremental cost to add largest AP configuration	—	—
Distinguishing features (supplied by vendor)	• designed and largely programmed by a pathologist • powerful yet easy to set up, use, maintain • one of the best cost-benefit ratios in the industry	• cost-effective solution when bundled with e-Suite Laboratory for a complete lab management system • streamlined processes facilitate efficient workflow • electronic or direct order entry ideal for hospital or commercial labs performing AP

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**other=sales, marketing, administration, and other company functions

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SYSTEM REVIEW SERIES

Anatomic pathology computer systems

Part 6 of 12 *See accompanying article on page 52*	Medical Information Technology Inc. (MEDITECH) Paul Berthiaume (info@meditech.com) 1 MEDITECH Circle Westwood, MA 02072 781-821-3000 www.meditech.com	Medical Information Technology Inc. (MEDITECH) Paul Berthiaume (info@meditech.com) 1 MEDITECH Circle Westwood, MA 02072 781-821-3000 www.meditech.com
Name of system	**MEDITECH AP application (client/server)**	**MEDITECH AP application (MAGIC)**
First LIS/AP system installation/where software was developed	1969/1980/—	1969/1980/—
Most recent AP system installation	December 2000	December 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	69	801
No. of sites where system is operational	69	801
No. of contracts signed by 10/1/00 but AP system not operational	2	6
No. of contracts signed between 11/1/99 and 11/1/00	8	25
Percentage of installations stand-alone	n/a	n/a
Staff to develop/install/support/other**		
• In entire company	1,708 total	1,708 total
• In LIS division (including AP)	—	—
• In AP systems only	—	—
No. of workstations/terminals in sites operating system (min.–max.)	5–1,000+	5–1,000+
Range in No. of surgical pathology cases/year in sites operating system	—	—
Range in No. of gynecologic cytology cases/year in sites operating system	—	—
Central hardware	EMC/DG AViiON, Compaq, Alpha	EMC/DG AViiON, Compaq, Alpha
Terminals/workstations	industry-standard PCs	industry-standard PCs
Innovative peripherals	voice: Dragon Systems	voice: Dragon Systems
Multiuser operation requires multiple PCs on LAN	—	—
Programming language(s)	MAGIC C/S	MAGIC
Databases and tools used	MS SQL server	MS SQL server
Word processor(s) used	—	—
Operating system	Windows NT	MAGIC
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	100%	100%
• Cytology information system	100%	100%
• Autopsy information system	100%	100%
• Specimen log-in	100%	100%
• Entry of block IDs	100%	100%
• Specimen labels	100%	100%
• Histology slide labels	100%	100%
• Bar-coded slide labels	100%	100%
• Histology worksheets	100%	100%
• Text editing	100%	100%
• Word processing on central computer	100%	100%
• Word processing on PC workstations	100%	100%
• Voice-entry of gross description	available but not yet installed	available but not yet installed
• Voice-entry of final diagnosis	available but not yet installed	available but not yet installed
• Spell checker	100%	100%
• Gross and microscopic images integrated in reports	100%	100%
• Electronic signature	100%	100%
• Remote printing of reports	100%	100%
• Direct fax reports	100%	100%
• Web-based remote inquiry of reports	10%	10%
• Natural language search capability	100%	100%
• SNOMED II	100%	100%
• SNOMED International	—	—
• Multiple hospitals-wide area network	100%	100%
• Sound-alike retrieval of patient history	100%	100%
• Autopsy measurements/organ weights	100%	100%
• Tumor registry reports	100%	100%
• Management reports	100%	100%
• Cytology abnormal/unsatisfactory list to doctors	100%	100%
• Cytology diagnostics statistics by pathologist/cytotechnologist	100%	100%
• Histology/cytology correlation report	100%	100%
• Reports sufficient to comply with CLIA '88 regulations	100%	100%
• Comprehensive billing/accounts receivable	100%	100%
• HIS interface: A/D/T	100%	100%
• HIS interface: result reporting	100%	100%
• Interface to external billing system	100%	100%
Standard ASTM/HL-7 interface?	yes	yes
Software provides indexed field in each test definition for LOINC code?	no	no
Provide LOINC dictionary for each new installation?	no	no
Complete AP ASP solution?	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	—	—
Other IS interfaces	major HISs, including McKessonHBOC, SMS, Cerner, others	all major HISs, including McKessonHBOC, SMS, Cerner, others
Voice-recognition packages integrated with system	Dragon Systems	Dragon Systems
Histology and cytology laboratory instruments interfaced	interface can be written for HL-7 compliant sys. where specs are given	interface can be written for HL-7 compliant sys. where specs are given
Source code? User group?	yes/yes	yes/yes
User programming in separate partition?	no	no
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	—	—
• Largest stand-alone system	—	—
Base price of integrated system, excluding AP configuration	—	—
• Incremental cost to add smallest AP configuration	—	—
• Incremental cost to add largest AP configuration	—	—
Distinguishing features (supplied by vendor)	• storage, recording, search capabilities and reporting for pathology findings • significant design input from system end users • 31 years of stability & growth while pioneering the LIS industry	• storage, recording, search capabilities and reporting for pathology findings • significant design input from system end users • 31 years of stability & growth while pioneering the LIS industry

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Anatomic pathology computer systems

Part 7 of 12

See accompanying article on page 52

MediSolution
Yves Charron (yves.charron@medisolution.com)
110 Cremazie West
Montreal, Quebec, Canada H2P 1B9
514-850-5000 (local 3252)
www.medisolution.com

Micro Computer Solutions Inc.
Dan Mohr
1640 E. Park Place Blvd.
Stone Mountain, GA 30087
770-879-0588/800-955-7522

Name of system	MEDILAB	PLab-Pathology Laboratory Management Program
First LIS/AP system installation/where software was developed	1972/1978/France	1987/1987/USA
Most recent AP system installation	December 2000	February 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	15 (0/0/0/15/0)	83 (20/57/5/1/0)
No. of sites where system is operational	19	96
No. of contracts signed by 10/1/00 but AP system not operational	4	0
No. of contracts signed between 11/1/99 and 11/1/00	10	2
Percentage of installations stand-alone	20%	100%
Staff to develop/install/support/other**		
• In entire company	100+/200+/100+/100+	6 total
• In LIS division (including AP)	55/9/5/2	—
• In AP systems only	—	—
No. of workstations/terminals in sites operating system (min.–max.)	4–80	1–67
Range in No. of surgical pathology cases/year in sites operating system	2,000–60,000+	2,000–160,000
Range in No. of gynecologic cytology cases/year in sites operating system	8,000–150,000+	4,000–350,000
Central hardware	HP LH4, NT server	Pentium III file servers with duplexed hard drives
Terminals/workstations	Windows NT, 2000, 98, 95	Pentium III workstations
Innovative peripherals	—	bar-code printing and scanning, microscopic and document imaging
Multiuser operation requires multiple PCs on LAN	yes	yes
Programming language(s)	C++	Clarion
Databases and tools used	SQL server, ORACLE	Btrieve client/server, Crystal Reports
Word processor(s) used	MS Word	custom, integrated
Operating system	Windows 2000, NT	Windows 95, 98, Novell
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	100%	95%
• Cytology information system	95%	50%
• Autopsy information system	100%	15%
• Specimen log-in	100%	100%
• Entry of block IDs	100%	100%
• Specimen labels	100%	100%
• Histology slide labels	95%	95%
• Bar-coded slide labels	95%	80%
• Histology worksheets	5%	95%
• Text editing	100%	100%
• Word processing on central computer	not available	—
• Word processing on PC workstations	100%	100%
• Voice-entry of gross description	available but not yet installed	not available
• Voice-entry of final diagnosis	available but not yet installed	not available
• Spell checker	100%	100%
• Gross and microscopic images integrated in reports	10%	available but not yet installed
• Electronic signature	95%	100%
• Remote printing of reports	10%	10%
• Direct fax reports	10%	90%
• Web-based remote inquiry of reports	available but not yet installed	not available
• Natural language search capability	not available	100%
• SNOMED II	available but not yet installed	100%
• SNOMED International	100%	100%
• Multiple hospitals-wide area network	20%	30%
• Sound-alike retrieval of patient history	not available	not available
• Autopsy measurements/organ weights	available but not yet installed	not available
• Tumor registry reports	20%	100%
• Management reports	100%	100%
• Cytology abnormal/unsatisfactory list to doctors	100%	50%
• Cytology diagnostics statistics by pathologist/cytotechnologist	100%	50%
• Histology/cytology correlation report	100%	100%
• Reports sufficient to comply with CLIA '88 regulations	100%	100%
• Comprehensive billing/accounts receivable	available but not yet installed	70%
• HIS interface: A/D/T	90%	10%
• HIS interface: result reporting	25%	10%
• Interface to external billing system	available but not yet installed	30%
Standard ASTM/HL-7 interface?	yes	yes
Software provides indexed field in each test definition for LOINC code?	no	yes
Provide LOINC dictionary for each new installation?	no	no
Complete AP ASP solution?	yes	no
Method of charging for ASP service	fixed fee	—
Client software required	requires software be installed on a PC	—
ASP information conduit	requires private, dedicated circuit	—
Client contracts supported from data center not operated by client	0	—
How data center is operated	—	—
Other IS interfaces	other LIS vendors	ADT, order entry, results reporting, billing interfaces
Voice-recognition packages integrated with system	all that are MS Windows compatible—i.e. ViaVoice, Kurzweil, etc.	n/a
Histology and cytology laboratory instruments interfaced	Shandon cassette printer	developed on request
Source code? User group?	escrow/yes	escrow/yes
User programming in separate partition?	no	yes
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	$2.4k/$40k/$20k/$1.6% of license	$3k/$12k/$2k/$.1k
• Largest stand-alone system	$200k/$300k/$50.4k/1.6% of license	$170k/$83k/$27k/$1.3k
Base price of integrated system, excluding AP configuration	$50k	—
• Incremental cost to add smallest AP configuration	$0	—
• Incremental cost to add largest AP configuration	$50k/$280k/$35k/$5k	—
Distinguishing features (supplied by vendor)	• cytology accountability • three-level recall management • unique workflow adaptation	• fast, flexible, easy to use • fully paperless processing options • 2,000+ software switches allow customized installation

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SYSTEM REVIEW SERIES

Anatomic pathology computer systems

Part 8 of 12

See accompanying article on page 52

	Novovision Inc. Tim Marshall (tmarshall@novovision.com) 301 N. Harrison St., Suite 384 Princeton, NJ 08540 877-668-6123 www.novovision.com/www.novopath.com	PathLogix Corp. Jerry Grayson (info@pathlogix.com) 470 Nautilus St., #307 La Jolla, CA 92037 858-454-8030 www.pathlogix.com
Name of system	**NovoPath**	**PathLogix**
First LIS/AP system installation/where software was developed	1999/1999/USA	—/1998/USA
Most recent AP system installation	September 2000	December 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	6 (0/2/4/0/0)	53 (4/49/0/0/0)
No. of sites where system is operational	10	53
No. of contracts signed by 10/1/00 but AP system not operational	1	—
No. of contracts signed between 11/1/99 and 11/1/00	7	—
Percentage of installations stand-alone	100%	100%
Staff to develop/install/support/other**		
• In entire company	5/4/3/4	—
• In LIS division (including AP)	—	—
• In AP systems only	—	—
No. of workstations/terminals in sites operating system (min.–max.)	3–14	1–80
Range in No. of surgical pathology cases/year in sites operating system	3,000–24,000	1,000–80,000
Range in No. of gynecologic cytology cases/year in sites operating system	1,500–90,000	5,000
Central hardware	IBM or HP Intel-based Pentium III w/ Windows NT or 2000	Pentium II or Pentium III computers or servers running Windows 2000, NT, or 98
Terminals/workstations	PC-based or Internet Explorer running on non-Intel–based PCs	all standard terminals and workstations
Innovative peripherals	voice recognition, image capture, bar coding	—
Multiuser operation requires multiple PCs on LAN	yes	yes
Programming language(s)	MS Visual Studio tools	SQL and Visual Basic
Databases and tools used	SQL server, Oracle, Access	—
Word processor(s) used	MS Word, HTML format, others	—
Operating system	Windows 2000, NT, 98, others	Windows 2000, NT, 98
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	100%	100%
• Cytology information system	100%	10%
• Autopsy information system	100%	available in February 2001
• Specimen log-in	100%	100%
• Entry of block IDs	100%	100%
• Specimen labels	100%	10%
• Histology slide labels	100%	10%
• Bar-coded slide labels	100%	available in January 2001
• Histology worksheets	100%	10%
• Text editing	100%	100%
• Word processing on central computer	not available	100%
• Word processing on PC workstations	100%	100%
• Voice-entry of gross description	100%	5%
• Voice-entry of final diagnosis	100%	5%
• Spell checker	100%	100%
• Gross and microscopic images integrated in reports	100%	5%
• Electronic signature	100%	20%
• Remote printing of reports	100%	50%
• Direct fax reports	67%	5%
• Web-based remote inquiry of reports	67%	5%
• Natural language search capability	100%	100%
• SNOMED II	available but not yet installed	—
• SNOMED International	available but not yet installed	—
• Multiple hospitals-wide area network	33%	5%
• Sound-alike retrieval of patient history	available but not yet installed	100%
• Autopsy measurements/organ weights	100%	—
• Tumor registry reports	available but not yet installed	—
• Management reports	100%	100%
• Cytology abnormal/unsatisfactory list to doctors	100%	20%
• Cytology diagnostics statistics by pathologist/cytotechnologist	100%	20%
• Histology/cytology correlation report	100%	20%
• Reports sufficient to comply with CLIA '88 regulations	100%	20%
• Comprehensive billing/accounts receivable	not available	5%
• HIS interface: A/D/T	available but not yet installed	—
• HIS interface: result reporting	available but not yet installed	—
• Interface to external billing system	67%	5%
Standard ASTM/HL-7 interface?	yes	yes
Software provides indexed field in each test definition for LOINC code?	no	—
Provide LOINC dictionary for each new installation?	no	—
Complete AP ASP solution?	yes	—
Method of charging for ASP service	fixed fee	—
Client software required	browser-based, requires software be installed on a PC	—
ASP information conduit	operates over Internet	—
Client contracts supported from data center not operated by client	0	—
How data center is operated	by a third-party (USI)	—
Other IS interfaces	interface available via HL-7 or ASCII files	IDX and CompuMedic billing systems, HL-7–compatible systems
Voice-recognition packages integrated with system	Dragon Systems Medically Speaking	major systems
Histology and cytology laboratory instruments interfaced	—	—
Source code? User group?	escrow/no	—
User programming in separate partition?	yes	—
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	—	—
• Largest stand-alone system	—	—
Base price of integrated system, excluding AP configuration	—	—
• Incremental cost to add smallest AP configuration	—	—
• Incremental cost to add largest AP configuration	—	—
Distinguishing features (supplied by vendor)	• integrated image capture, document attachments • Web-enabled and scalable with e-mail capabilities • one year of technical support with system purchase and onsite training	• software incl. advanced imaging, advanced Internet features, compatibility with major voice-recognition systems, powerful search engines, auto. and batch faxing, and dozens of regulatory compliance features • quick to learn and easy to use

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Anatomic pathology computer systems

Part 9 of 12

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Pathology Computer Systems
Daniel J. Hellmann (anatrol@seidata.com)
411 Mulberry St.
Madison, IN 47250
800-262-6289

Psyche Systems Corp.
Laura Pollack (info@psychesystems.com)
10 Laurel Ave.
Wellesley, MA 02481
800-345-1514
www.windopath.com

Name of system	Anatrol	WindoPath
First LIS/AP system installation/where software was developed	1987/1987/USA	1975/1986/USA
Most recent AP system installation	October 2000	December 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	13 (6/4/2/1/0)	55 (35/14/0/6/0)
No. of sites where system is operational	—	62
No. of contracts signed by 10/1/00 but AP system not operational	1	7
No. of contracts signed between 11/1/99 and 11/1/00	4	14
Percentage of installations stand-alone	85%	90%
Staff to develop/install/support/other**		
• In entire company	—	10/10/12/7
• In LIS division (including AP)	—	—
• In AP systems only	3 total	3/4/6/3
No. of workstations/terminals in sites operating system (min.–max.)	1–15	1–45
Range in No. of surgical pathology cases/year in sites operating system	~900–~10,000	1,000–40,000
Range in No. of gynecologic cytology cases/year in sites operating system	~800–~40,000	0–100,000+
Central hardware	standard	HP or equivalent (HP LC2000 Netserver or equivalent)
Terminals/workstations	standard	HP or equivalent (HP Vectra VL400 or equivalent)
Innovative peripherals	—	voice recognition: Dragon Naturally Speaking, professional imaging integrated in WindoPath
Multiuser operation requires multiple PCs on LAN	yes	yes
Programming language(s)	Dataflex 3.1d	Small Talk/Visual Basic
Databases and tools used	Dataflex 3.1d	MS SQL server 7.0, BrioQuery Report Writer
Word processor(s) used	WordPerfect, MS Word	integrated
Operating system	DOS, Windows 95, 98	Windows NT, 95, 98, 2000
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	95%	100%
• Cytology information system	100%	100%
• Autopsy information system	95%	100%
• Specimen log-in	100%	100%
• Entry of block IDs	100%	100%
• Specimen labels	100%	100%
• Histology slide labels	100%	100%
• Bar-coded slide labels	available in November 2001	available but not yet installed
• Histology worksheets	100%	100%
• Text editing	available in November 2001	100%
• Word processing on central computer	—	n/a
• Word processing on PC workstations	available in November 2001	100%
• Voice-entry of gross description	—	10%
• Voice-entry of final diagnosis	—	10%
• Spell checker	available in November 2001	100%
• Gross and microscopic images integrated in reports	—	10%
• Electronic signature	available in November 2001	100%
• Remote printing of reports	100%	100%
• Direct fax reports	available in November 2001	100%
• Web-based remote inquiry of reports	available in November 2001	100%
• Natural language search capability	—	100%
• SNOMED II	50%	available but not yet installed
• SNOMED International	50%	available but not yet installed
• Multiple hospitals-wide area network	—	25%
• Sound-alike retrieval of patient history	available in November 2001	100%
• Autopsy measurements/organ weights	—	100%
• Tumor registry reports	100%	100%
• Management reports	—	100
• Cytology abnormal/unsatisfactory list to doctors	100%	100%
• Cytology diagnostics statistics by pathologist/cytotechnologist	100%	100%
• Histology/cytology correlation report	100%	100%
• Reports sufficient to comply with CLIA '88 regulations	100%	100%
• Comprehensive billing/accounts receivable	—	not available
• HIS interface: A/D/T	—	50%
• HIS interface: result reporting	—	40%
• Interface to external billing system	33%	50%
Standard ASTM/HL-7 interface?	—	yes
Software provides indexed field in each test definition for LOINC code?	—	no
Provide LOINC dictionary for each new installation?	—	no
Complete AP ASP solution?	no	yes
Method of charging for ASP service	—	fixed fee
Client software required	—	requires software be installed on a 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
Other IS interfaces	—	HBOC, Sunquest, SMS, MEDITECH, HDS
Voice-recognition packages integrated with system	—	Dragon Naturally Speaking Professional
Histology and cytology laboratory instruments interfaced	—	CAS analyzer
Source code? User group?	no/no	yes/yes
User programming in separate partition?	—	yes
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	$1.2k/$7k/$1.25k/$.14k	$15k/$18.375k/$16k/$.368k
• Largest stand-alone system	$1.2k/$7k/$.25k/$.14k	$125k/$131.25k/$21k/$2.625k
Base price of integrated system, excluding AP configuration	—	—
• Incremental cost to add smallest AP configuration	—	$1.7k/$2.625k/—/$.052k
• Incremental cost to add largest AP configuration	—	$1.7k/$2.625k/—/$.052k
Distinguishing features (supplied by vendor)	• quick and easy specimen log-in and diagnosis • includes custom reporter for ad-hoc reports	• word processing is integrated in the application • extremely fast operations due to object-oriented design • can add new features for individual customers

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SYSTEM REVIEW SERIES

Anatomic pathology computer systems

Part 10 of 12

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	SCC Soft Computer Ellie Vahman (sales@softcomputer.com) 34350 U.S. Highway 19 North Palm Harbor, FL 34684 727-789-0100 www.softcomputer.com	SIA (a Sysmex company) Bill Blair (blairb@sysmex.com) 5210 E. Williams Circle, Suite 600 Tucson, AZ 85711 520-790-4624
Name of system	**SoftPath**	**MOLIS AP**
First LIS/AP system installation/where software was developed	1979/1993/USA	1983/1984/New Zealand
Most recent AP system installation	December 2000	September 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	118 (87/8/3/20/—)	33 (0/0/0/33/0)
No. of sites where system is operational	124	33
No. of contracts signed by 10/1/00 but AP system not operational	2	3
No. of contracts signed between 11/1/99 and 11/1/00	13	3
Percentage of installations stand-alone	14%	2%
Staff to develop/install/support/other**		
• In entire company	202/47/111/85	39/35/27/26
• In LIS division (including AP)	167/35/97/70	35/31/25/25
• In AP systems only	35/8/14/4	4/4/2/1
No. of workstations/terminals in sites operating system (min.–max.)	5–100	4–60
Range in No. of surgical pathology cases/year in sites operating system	26–65,000	—
Range in No. of gynecologic cytology cases/year in sites operating system	60–400,000	—
Central hardware	IBM RS/6000, HP 9000	IBM RS/6000, HP 9000, Windows NT, Netware, Solaris
Terminals/workstations	PCs	Windows 2000, NT, 95, OS/2, Macintosh, Solaris
Innovative peripherals	multiple voice options; color image-enabled reports with full-version MS Word, bar coding	voice input/output
Multiuser operation requires multiple PCs on LAN	—	yes
Programming language(s)	C, C++, Visual C++, Java	Lotus Notes
Databases and tools used	Centurasoft RDM, Oracle	Lotus Notes
Word processor(s) used	MS Word	Lotus Notes
Operating system	UNIX, Windows NT	Windows NT, HP, UNIX, IBM, Macintosh
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	100%	60%
• Cytology information system	100%	40%
• Autopsy information system	100%	40%
• Specimen log-in	100%	40%
• Entry of block IDs	100%	7%
• Specimen labels	100%	7%
• Histology slide labels	100%	7%
• Bar-coded slide labels	100%	available but not yet installed
• Histology worksheets	100%	40%
• Text editing	100%	100%
• Word processing on central computer	100%	5%
• Word processing on PC workstations	100%	50%
• Voice-entry of gross description	available in June 2001	100%
• Voice-entry of final diagnosis	available in June 2001	100%
• Spell checker	100%	100%
• Gross and microscopic images integrated in reports	5%	30%
• Electronic signature	100%	100%
• Remote printing of reports	100%	100%
• Direct fax reports	100%	available but not yet installed
• Web-based remote inquiry of reports	100%	available but not yet installed
• Natural language search capability	100%	100%
• SNOMED II	100%	70%
• SNOMED International	available but not yet installed	10%
• Multiple hospitals-wide area network	40%	70%
• Sound-alike retrieval of patient history	100%	not available
• Autopsy measurements/organ weights	100%	60%
• Tumor registry reports	not available	60%
• Management reports	100%	80%
• Cytology abnormal/unsatisfactory list to doctors	100%	40%
• Cytology diagnostics statistics by pathologist/cytotechnologist	100%	20%
• Histology/cytology correlation report	100%	100%
• Reports sufficient to comply with CLIA '88 regulations	100%	available but not yet installed
• Comprehensive billing/accounts receivable	100%	20%
• HIS interface: A/D/T	100%	100%
• HIS interface: result reporting	90%	100%
• Interface to external billing system	100%	80%
Standard ASTM/HL-7 interface?	yes	yes
Software provides indexed field in each test definition for LOINC code?	no	no
Provide LOINC dictionary for each new installation?	no	no
Complete AP ASP solution?	yes	no
Method of charging for ASP service	individual basis	—
Client software required	requires software be installed on a PC	—
ASP information conduit	operates over Internet	—
Client contracts supported from data center not operated by client	0	—
How data center is operated	by vendor	—
Other IS interfaces	major vendors	TDS, RHIS, HCMS, ZMS, MDIS
Voice-recognition packages integrated with system	MedSpeak, ViaVoice, Dragon, Philips	IBM ViaVoice Gold, L&H, Dragon Systems Naturally Speaking, others
Histology and cytology laboratory instruments interfaced	Shurmark cassette edger	—
Source code? User group?	escrow/yes	no/yes
User programming in separate partition?	no	yes
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	$25k/$30k/$20k/1.25%	$15k/$100k/$60k/$1.5k
• Largest stand-alone system	$100k/$150k/$40k/1.25%	$50k+/$250k/$100k/$3.2k
Base price of integrated system, excluding AP configuration	$200k	—
• Incremental cost to add smallest AP configuration	$13k/$30k/$14k/1.25%	—
• Incremental cost to add largest AP configuration	$65k/$150k/$28k/1.25%	—
Distinguishing features (supplied by vendor)	• integration of lab results and color images in pathology reports • comprehensive quality assurance program • long-term stability of company with heavy investment in R&D and new technologies	• paperless • uses groupware to control workflow • ease of use

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**other=sales, marketing, administration, and other company functions

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Anatomic pathology computer systems

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	Small Business Computers of New England Inc. Gene Calvano (genesbcne@aol.com) Route 101–Meeting Place, Box 397 Amherst, NH 03031 800-647-2263/603-673-0228 www.sbcne.com	Tamtron Corp. Teri Malkin (info@tamtron.com) 6203 San Ignacio Ave., Suite 110 San Jose, CA 95119 408-972-9600 www.tamtron.com
Name of system	**AP Easy**	**PowerPath 2000**
First LIS/AP system installation/where software was developed	1989/1989/USA	1984/1984/USA
Most recent AP system installation	December 2000	October 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	106 (43/60/0/3/0)	170 (112/48/7/3/0)
No. of sites where system is operational	106	270
No. of contracts signed by 10/1/00 but AP system not operational	0	20
No. of contracts signed between 11/1/99 and 11/1/00	20	45
Percentage of installations stand-alone	100%	100%
Staff to develop/install/support/other**		
• In entire company	3/2/3/3	14/16/11/17
• In LIS division (including AP)	—	—
• In AP systems only	—	—
No. of workstations/terminals in sites operating system (min.–max.)	1–18	5–100
Range in No. of surgical pathology cases/year in sites operating system	1,000–50,000	2,000–75,000
Range in No. of gynecologic cytology cases/year in sites operating system	2,000–75,000	5,000–300,000
Central hardware	Windows 95, 98, NT, 2000, Macintosh platforms	Compaq, IBM, HP, DG
Terminals/workstations	Windows 95, 98, NT, 2000, Macintosh platforms	Compaq, HP
Innovative peripherals	image-enabled reports, digital camera, microscope camera, color printing, direct fax	—
Multiuser operation requires multiple PCs on LAN	yes	yes
Programming language(s)	FileMaker Pro	Borland's Delphi
Databases and tools used	FileMaker Pro	MS SQL server
Word processor(s) used	integrated with FileMaker Pro	MS Word
Operating system	Windows 95, 98, NT, 2000, Macintosh OS	Windows NT
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	100%	100%
• Cytology information system	100%	95%
• Autopsy information system	100%	50%
• Specimen log-in	100%	100%
• Entry of block IDs	100%	100%
• Specimen labels	100%	100%
• Histology slide labels	100%	100%
• Bar-coded slide labels	available but not yet installed	10%
• Histology worksheets	100%	100%
• Text editing	100%	n/a
• Word processing on central computer	100%	100%
• Word processing on PC workstations	100%	100%
• Voice-entry of gross description	available but not yet installed	available first quarter 2001
• Voice-entry of final diagnosis	available but not yet installed	available first quarter 2001
• Spell checker	100%	100%
• Gross and microscopic images integrated in reports	100%	10%
• Electronic signature	100%	100%
• Remote printing of reports	100%	10%
• Direct fax reports	100%	90%
• Web-based remote inquiry of reports	available but not yet installed	available first quarter 2001
• Natural language search capability	100%	100%
• SNOMED II	100%	—
• SNOMED International	available but not yet installed	—
• Multiple hospitals-wide area network	available but not yet installed	65%
• Sound-alike retrieval of patient history	100%	100%
• Autopsy measurements/organ weights	100%	50%
• Tumor registry reports	100%	100%
• Management reports	100%	100%
• Cytology abnormal/unsatisfactory list to doctors	100%	100%
• Cytology diagnostics statistics by pathologist/cytotechnologist	100%	100%
• Histology/cytology correlation report	100%	100%
• Reports sufficient to comply with CLIA '88 regulations	100%	100%
• Comprehensive billing/accounts receivable	15% (client billing)	10%
• HIS interface: A/D/T	5%	75%
• HIS interface: result reporting	5%	75%
• Interface to external billing system	100%	90%
Standard ASTM/HL-7 interface?	no	yes
Software provides indexed field in each test definition for LOINC code?	no	no
Provide LOINC dictionary for each new installation?	no	no
Complete AP ASP solution?	yes	—
Method of charging for ASP service	fixed fee	—
Client software required	requires software be installed on a PC	—
ASP information conduit	operates over Internet	—
Client contracts supported from data center not operated by client	2	—
How data center is operated	by a third-party (Data Path, LLC)	—
Other IS interfaces	Antrim, MEDITECH, CPSI	McKesson HBOC, SMS, IDX, Eclipsys, Sunquest
Voice-recognition packages integrated with system	Dragon Systems	—
Histology and cytology laboratory instruments interfaced	none	—
Source code? User group?	yes/no	escrow/yes
User programming in separate partition?	yes	yes
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	$1k/$2.5k/$0/$0	—
• Largest stand-alone system	$50k/$12k/$5k/$.166k	—
Base price of integrated system, excluding AP configuration	n/a	—
• Incremental cost to add smallest AP configuration	—	—
• Incremental cost to add largest AP configuration	—	—
Distinguishing features (supplied by vendor)	• customized solution with active lab involvement in features design • report imaging from digital cameras and microscope cameras • integrated bill client module, Internet reporting module, Internet requisition module	• AP systems leader • "case centric" workflow • outstanding customer satisfaction *PowerPath 2000 also available through McKesson HBOC and SMS*

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Anatomic pathology computer systems

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Name of system	Ultra AP	Integrity
First LIS/AP system installation/where software was developed	1991/1994/Canada & Australia	1998/1998/USA
Most recent AP system installation	November 2000	August 2000
No. of contracts for sites operating AP system (H/IL/C or GP/FI/OS)*	30 (3/1/0/26/0)	1 (1/0/0/0/0)
No. of sites where system is operational	50	1
No. of contracts signed by 10/1/00 but AP system not operational	3	0
No. of contracts signed between 11/1/99 and 11/1/00	6	0
Percentage of installations stand-alone	0%	100%
Staff to develop/install/support/other**		
• In entire company	55/34/18/16	1 total
• In LIS division (including AP)	—	—
• In AP systems only	5/3/3/0	—
No. of workstations/terminals in sites operating system (min.–max.)	2–50 (AP only)	7
Range in No. of surgical pathology cases/year in sites operating system	5,000–100,000	5,000
Range in No. of gynecologic cytology cases/year in sites operating system	1,000–75,000	13,000
Central hardware	UNIX servers–support IBM RS/6000, HP 9000, SUN, DEC/Compaq, DG	IBM-compatible PC
Terminals/workstations	Windows 95, 98, NT, 2000	IBM-compatible PC
Innovative peripherals	voice input, optical storage, bar-code input, image capture & retrieval interfaces	open platform, accepting of all Windows-compatible input
Multiuser operation requires multiple PCs on LAN	yes	no
Programming language(s)	Unify Vision, C	Access 97
Databases and tools used	Unify Dataserver database, Unify development tool kit included	Access 97
Word processor(s) used	MS Word	Dragon Naturally Speaking (any Windows-based acceptable)
Operating system	UNIX	Windows 95, 98, NT
Features (listed as a percentage of live installations, available but no installations, or not available)		
• Surgical pathology information system	75%	100%
• Cytology information system	75%	100%
• Autopsy information system	50%	100%
• Specimen log-in	75%	100%
• Entry of block IDs	100%	0%
• Specimen labels	100%	0%
• Histology slide labels	50%	0%
• Bar-coded slide labels	5%	0%
• Histology worksheets	75%	0%
• Text editing	100%	100%
• Word processing on central computer	50%	100%
• Word processing on PC workstations	50%	100%
• Voice-entry of gross description	5%	100%
• Voice-entry of final diagnosis	available but not yet installed	100%
• Spell checker	50%	100%
• Gross and microscopic images integrated in reports	available second quarter 2001	0%
• Electronic signature	50%	100%
• Remote printing of reports	100%	100%
• Direct fax reports	100%	100%
• Web-based remote inquiry of reports	5%	0%
• Natural language search capability	100%	100%
• SNOMED II	10%	0%
• SNOMED International	15%	0%
• Multiple hospitals-wide area network	100%	0%
• Sound-alike retrieval of patient history	100%	0%
• Autopsy measurements/organ weights	50%	0%
• Tumor registry reports	15%	100%
• Management reports	100%	100%
• Cytology abnormal/unsatisfactory list to doctors	75%	100%
• Cytology diagnostics statistics by pathologist/cytotechnologist	75%	100%
• Histology/cytology correlation report	75%	100%
• Reports sufficient to comply with CLIA '88 regulations	5%	100%
• Comprehensive billing/accounts receivable	20%	0%
• HIS interface: A/D/T	100%	100%
• HIS interface: result reporting	100%	0%
• Interface to external billing system	80%	0%
Standard ASTM/HL-7 interface?	yes	no
Software provides indexed field in each test definition for LOINC code?	yes	no
Provide LOINC dictionary for each new installation?	yes	no
Complete AP ASP solution?	yes	no
Method of charging for ASP service	fixed fee or transaction-based	—
Client software supported	browser-based	—
ASP information conduit	requires private, dedicated circuit	—
Client contracts supported from data center not operated by client	0	—
How data center is operated	by a third-party (Montefiore Medical Center)	—
Other IS interfaces	SMS, HBOC, MEDITECH, Ulticare, IDX, Compucare	none
Voice-recognition packages integrated with system	Dragon Systems	Dragon Naturally Speaking
Histology and cytology laboratory instruments interfaced	Shurmark	none
Source code? User group?	escrow/yes	yes/no
User programming in separate partition?	yes	yes
Cost (hardware/software/installation and training/monthly maintenance)		
• Smallest stand-alone system	$50k/$150k/$125k/$3.5k	—*
• Largest stand-alone system	$1m/$2m/$500k/$25k	—*
Base price of integrated system, excluding AP configuration	$500k	—
• Incremental cost to add smallest AP configuration	varies/$75k/varies/$1.125k	—*
• Incremental cost to add largest AP configuration	—	—*
Distinguishing features (supplied by vendor)	• fully integrated modules; single database design • designed for multiple laboratory, IDN environment • proven in high-volume laboratories	• diagnosis/microscopic description combinations are customizable and menu driven ** freeware, open architecture. Help with installation and training in Access 97 available on a fee basis*

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