Enterprise imaging unfolds as future direction of PACS


The PACS market has changed. It is no longer just about the images.

Over the past decade, hospitals have been the primary PACS consumers. The increase in imaging procedures measured against the decrease in the number of radiologists, however, has created a coverage crisis. Offsite reading and reliance on day and nighthawk teleradiology services are growing, and demands have surfaced for PACS solutions to support new business models. Typical large reading groups in most cities must now interact with many different PACS.

"Radiologists are logging on to as many as five or six different PACS in a single workday," said Seth Koeppel, senior sales vice president at eRAD.

Consequently, interest is growing among radiology groups for purchasing their own PACS and having hospitals send images to the group PACS to be read.

Results are then returned via HL7 and DICOM interfaces. "This is more efficient than having radiologists log onto legacy systems all over town to perform reads," Koeppel said.

PACS must now be capable of handling multiple institutions, with strong load balancing and report management capabilities. PACS must also have data mining features to support ancillary tasks like billing and practice management.

"Efficiency assurance and reporting are important in this model because imaging facilities are now able to change radiology groups quickly," said Ronny Bachrach, marketing manager at Viztek.

ENTERPRISE IMAGING

At the same time, hospitals, which are being driven by bottom line benefits, are moving toward enterprise imaging. The goal is to provide access to images and electronic patient medical records anytime, anywhere, on a shoestring budget.

"Some hospitals have no budget for medical imaging equipment in 2008-2009," said Dr. Rob Falk, founder and medical director of 3DR Laboratories.

The drive for greater efficiency and cost-effectiveness first prompted the integration of RIS with PACS. Now, the emphasis has shifted to creating a virtual community, where PACS is becoming part of a complete IT solution that provides a full range of image and medical record access, storage, communication, teleradiology, business continuity, and high availability across all medical specialties.

"PACS is a lot more than a radiology application that displays images.

It's now a part of the IT strategy that serves the radiology and other image-generating departments, as well as the clinician community," said Lenny Reznik, director of enterprise image and information systems at Agfa Healthcare.

Gone are the days of single-discipline solutions. Many cardiology departments, for instance, are
abandoning the siloed approach of one solution each for echocardiography, nuclear medicine, and cardiac cath.

"Imaging silos are giving way to integrated electronic health records," said K. Thomas Pickard, vice president of marketing and research development at PACSGEAR.

The new trend is toward department- and enterprise-wide common infrastructures to handle all modalities for centralized storage, backup, disaster recovery, and universal access through electronic medical record systems and portals, said ScImage founder and CEO Sai P. Raya, Ph.D. PACS vendors are scrambling to produce reliable, scalable solutions to meet these expanding demands.

Products like Compressus' MEDx-Connect address issues associated with integrating healthcare enterprises plagued by the lack of connectivity and interoperability among disparate islands of HIS, RIS, and PACS.

The future of medical imaging may be broader and deeper than ever expected. PACS vendors may be taking the lead in a universal electronic health record. BRIT Systems, for instance, is committed to supporting a Universal PACS Environment, so images can be pushed to any system that requests them.

The goal is similar at other companies.

The focus at Philips Healthcare Informatics is to enable all healthcare providers access to diagnostic images and clinical information throughout the enterprise. Philips is also creating workstations that support clinical subspecialties. Agfa's IMPAX Data Center consolidates data from disparate systems into a single database to serve the needs of enterprise storage. This enables clinical departments such as radiology, cardiology, dermatology, orthopedics, and women's healthcare to select the workflow solution that works best for them while simultaneously sharing storage infrastructure and creating a single point of integration for image-enabling the EMR.

"Interoperability and connectivity across various HIS, RIS, PACS, and related information systems that enable organizations with vendoragnostic systems to function as one virtual enterprise is the holy grail in the industry today," said Janine Broda, vice president and general manager of Compressus' Medical Solutions Division.

Compressus' MEDxConnect is the first and only solution that indexes, integrates, and routes all relevant patient data in real-time to providers, Broda said.

ScImage provides an infrastructure for centralized exam reading, ties together numerous private practice offices, and enables comprehensive workflow for radiology, cardiology, and ECG in a single solution.

"It's not your grandfather's PACS anymore," said Joe Biegel, vice president of product management in McKesson's Medical Imaging Group. It's not our grandfathers' computer-aided detection anymore, either.

Shifting market demands and changing demographics are forcing providers to explore new CAD applications beyond mammography. New applications include colon, prostate, and, soon, lung cancer detection. iCAD's acquisition of CAD Sciences in July signals its intention to move beyond mammography CAD to providing advanced image analysis and workflow solutions for the early detection of other prevalent cancers.
The temptation for some vendors may be to try to provide everything to everyone. A more prudent direction takes a niche approach, selecting an area on which to focus and doing it well enough to rise to the top of the market.

"Essentially, market sweet spots are determined by a company's strengths or unique competitive advantage, and its ability to create value around that," said Skip Amiot, national sales director at RamSoft.

PowerServer Lite is RamSoft's newest product that emphasizes value as an entry-level web-based PACS built on the same core technology as RamSoft's PowerServer PACS. It runs off a single server and database. For larger institutions, enterprise IT imaging solutions mean PACS companies must look beyond radiology and develop the ability to adapt frequently and quickly to a changing market. This adds pressure on vendors to provide user-friendly products with subspecialty functionality.

McKesson already calls itself a healthcare IT company. It's building a total enterprise-wide clinical IT solution with anytime, anywhere access to the complete patient record, including data, documents, voice, imaging studies, and cardiology images and waveforms.

CoActiv calls its product a "generalist" PACS that provides medical imaging beyond radiology for all specialty departments, including cardiology, orthopedics, and radiation therapy.

Merge Healthcare also views PACS as a key hub in an integrated healthcare delivery system, critical to linking physicians, patients, and payers.

"We are setting our sights on improving integration with healthcare information systems such as referring physician EMR and practice management systems, as well as patient medical record sites," said Nancy Koenig, president of Merge Healthcare's newly renamed Merge Fusion Division.

Sectra, already enjoying success elsewhere in the world, is launching a combined RIS/PACS solution for the North American market, tailored for customers with demands to deliver radiology services across several institutions or communicate among several healthcare providers. At the RSNA meeting, Sectra is showcasing a workstation optimized for orthopedic clinicians, containing preoperative planning tools.

At NovaRad, PACS solutions specifically designed for cardiology and orthopedics are also being developed, including 3D tools for cardiology and templates for orthopedics.

"We also have an FDA-approved 5-Mpi LCD monitor for mammography, at no extra charge," said Paul Shumway, vice president of Nova- Rad's NovaPACS.

Siemens syngo Dynamics cardiology PACS uses integrated PACS workstations with specialized viewing software to view echocardiography and cath lab studies, perform measurements, integrate hemodynamic and electrophysiology data, and facilitate reporting with structured reporting and evidence-based reporting procedures.

The company's syngo Dynamics is also moving beyond cardiology to obstetrics and gynecology. The more responsibility that PACS assumes in the enterprise, the more important system reliability becomes. A new offering at eRAD called "High availability clustered server environment with online archiving" exploits Linux clustering software to provide seamless failover and failback of any server in the cluster in the event of a component failure. "The online versus traditional nearline archive design leverages storage area network architecture for runtime memory and storage, making the solution fast, easily scalable, and costeffective," Koeppel said.

**TELERADIOLOGY SOLUTIONS**

New solutions are also appearing geared specifically to the growing teleradiology market. At the RSNA show, Intelerad will unveil its new InteleONE, designed to help teleradiology companies
struggling to manage workflow when dealing with many different PACS and RIS. InteleONE allows radiology groups that read for multiple facilities to combine all their cases, prior images, and reports into a single solution.

"This will allow faster turnover and more efficient and effective interpretation," said Delia So, Intelerad marketing and business solutions manager.

Medweb also has a solution for large radiology groups and reading services connecting to multiple PACS. The company's Distributed Radiology architecture provides a virtual DICOM bus that connects various institutions and their PACS to each other to create a unified view of all patient studies in the enterprise.

As teleradiology evolves from pure nighthawk operations to providing final interpretations, a need has arisen for vendors to supply more functionality in the areas of prior reports and recent-relevant prior images.

Thinair Data just completed integration work with GE Centricity PACS-IW, Intelerad, and Fuji to support a distributed teleradiology workflow model.

"We hear repeatedly from customers and prospects that the walls built by traditional workflows and vendors must come down," said Tony Gevo, Thinair's director of sales and marketing.

Thinair will preview in Chicago automated launching of multiple PACS from the Thinair work list.

**NEW RIS TWISTS**

Other lines are blurring between RIS and PACS. In the recent past, vendors have focused primarily on developing integrated RIS/PACS packages. RIS vendors are looking beyond that.

Philips already offers RIS integration with lab systems and is now developing embedded RIS links to the EMR, enabling all providers access to complete patient medical history.

"RIS integration with the EMR, as well as extending into specialized clinical workstations and dashboards, will provide caregivers a personalized clinical view of data acquired from multiple sources," said Eric Mahler, director of Philips' strategic programs, global sales, and service North America.

Other vendors are also featuring new twists in RIS functionality to allow retrieval of data from multiple clinical systems in real-time without requiring separate login. Agfa's IMPAX Clinical Module component of its RIS/PACS solution assimilates clinical data from various systems and presents it to the radiology workstation to facilitate access to EMR data.

NovaRad built its NovaRIS from the ground up on the same database as its flagship NovaPACS, which work as one product. NovaPACS has also been configured to seamlessly integrate with third-party RIS.

Carestream has a diagnostic solution it will announce at the RSNA meeting that synchronizes different breeds of RIS and PACS.

"Our information management platform allows clinicians to view laboratory and pathology reports, imaging exams, and video files through one virtual desktop, anywhere, anytime," said Ulf Anderson, who is Carestream's director of marketing and business development.

With its syngo portals, Siemens is focusing on providing solutions that are role-based and context-sensitive.

"The goal is to help clinical staff work more efficiently by providing a system that can seamlessly
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access HIS, LAB, RIS, PACS, and CAD," said Henri "Rik" Primo, director of marketing and strategic relationships. Radiology is not being overlooked. With the syngo Portal Radiologist, radiologists have access to new images and previous studies and reports, as well as lab values, allergies, and scanned documents—all in one application window.

McKesson's integrated RIS/PACS solution not only supports multisite regional reporting but provides a business focus by featuring complete management reporting, allowing for data mining for future planning as well as management and tracking of resource efficiency.

MANAGED SERVICES

One way for imaging groups and hospitals to increase efficiency and stabilize quivering bottom lines is to offload PACS and IT infrastructure responsibilities. Managed services have evolved to facilitate this. Under a managed services model, vendors assume the responsibility for PACS availability and support. McKesson's new architecture—called Horizon Medical Imaging Archive—for instance, offers the opportunity for facilities to reduce the cost of PACS ownership through decreased infrastructure, operating, and management support costs.

"The key to growth and continued acceptance for managed services is likely to come, not from supporting the conventional imaging workflow, but from rapidly evolving business models that require a secure hosted infrastructure to work," Biegel said.

Examples of these new business models include after-hours reading, overreading, and specialty reading. Managed services offerings enable radiology groups to focus on the practice of medicine while vendors assume responsibility for the IT aspects of the radiology business.

"Many radiology groups do not have the capacity to manage PACS and associated integration challenges," said Bob Cooke, vice president of Fujifilm's network business management.

Fuji's Managed Services platform provides these groups with the ability to achieve a common interpretation platform, with Fuji providing the infrastructure, integration, and IT support.

Vendor-hosted PACS are particularly attractive to small hospitals, imaging centers, and teleradiology operations with limited or no IT staff.

"We now offer hosted PACS and teleradiology products to lessen the need for small clinics to have full IT and PACS administration staffs," said Amber Trotman of Radical Radiology. Merge Healthcare will highlight in Chicago its newly announced managed services solution that includes disaster recovery, offsite archiving, and remote system management.

Sectra has offered managed services to its clients for several years.

"The managed services model is increasing in importance as care facilities seek efficiency gains by focusing on the core business of doing diagnostics rather than taking care of IT systems," said Martin Håkansson, Sectra vice president of marketing.

NEW ALLIANCES

New company alliances are often necessary to meet shifting market demands or to maintain and increase market share. Philips acquired four companies recently, all designed to better position the company in a changing market: a RIS company called XIMIS; Emergin, a provider of software used to rapidly transmit medical alarm signals throughout hospitals; VISICU, maker of eICU, a stateof-the-art ICU patient monitoring package; and TOMCAT, which offers a cardiovascular information system. Philips has also teamed with Softek to connect Softek's Google-like search engine to Philips' iSite PACS to give users rapid access to all radiology reports and images in their systems.
Fujifilm Medical Systems strengthened its position by partnering with Empiric Systems to bundle Empiric's RIS with Fujifilm's Synapse PACS. To enhance its competitive position, CoActiv has developed partnerships with peerVue for system integration, Dilon for image acquisition, and IMAC and Elekta for new radiation therapy data management.

BRIT Systems has recently solidified several strategic partnerships. After it identified a need for better tools for working with raw nuclear medicine images, BRIT partnered with NuMed, a company that specializes in nuclear medicine services. BRIT has also teamed with Ten20, a provider of orthopedic and neurosurgical services, indicating that BRIT intends to concentrate more in these specialty areas.

PACSGEAR recently signaled its intention to use standards in making mammography records portable by partnering with Three Palm Software to add a mammography viewer to its DICOM CDs and DVDs. Pending FDA approval, another new viewer is due out in 2009 from Meta Fusion, which has been working closely with Osirix.

"Radiologists are discovering that you don't have to pay so much for high-quality viewers," said Meta Fusion president Cyrus Hazari.

Significant cost savings are available by using more affordable thirdparty viewers, or even by using free DICOM viewers such as Osirix, Hazari said.

In an effort to attract large volume facilities, Viztek has formed an alliance with DR panel manufacturer CMT to bundle CMT's DR with Viztek's PACS. DR is a new direction for Viztek, which traditionally focused on smaller sites performing fewer than 30,000 exams annually.

"This bundle has the potential to save facilities hundreds of thousands of dollars over the combined price of two separate purchases," Bachrach said.

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