

PACS Reaches Near Saturation in Healthcare Market

ABOUT 90 percent of major medical institutions use picture archiving and communication systems (PACS), up from 40 percent just a few years ago, according to a recent report released by a London-based business analysis company. The report points to lower costs and new modalities as reasons for the increased utilization.

“The main finding is that PACS is going to become the standard in hospitals within a few years, and in some countries it’s already the standard,” said Justin Davidson, an associate analyst with the Datamonitor firm and author of “Digital Imaging: Reducing Medical Error and Improving Diagnostics,” a market study released earlier this year.

The Datamonitor report found the largest areas of PACS growth to be in the Nordic countries, U.K. and North America. “It’s a technology that’s hard to argue against,” said Davidson. “PACS really is sort of a no-brainer. The benefits far outweigh any negative features that may exist.”

In some European nations, said Davidson, the rapid spread of PACS usage over the past three to five years was driven by governmental health initiatives such as Britain’s National Health Service, which worked to link the country’s medical records electronically.

“PACS has shown a pretty classic technology adoption curve,” said James H. Thrall, M.D., co-author of *PACS: A Guide to the Digital Revolution*, originally published in 2002 and updated last year. Dr. Thrall is radiologist-in-chief at Massachusetts General Hospital in Boston and the Juan M. Taveras Professor of Radiology at Harvard



James H. Thrall, M.D.
Harvard Medical School



Justin Davidson
Datamonitor

Medical School. He traces the current PACS boom back to the mid-1990s, when a few systems were being used by leading academic medical centers, “with a few adventurous private practices joining in.”

One factor in the spread of PACS usage, said Dr. Thrall, was the availability of Web-based solutions which substantially lowered costs. “When we first started implementing PACS technology in about 1995, it cost us \$40,000 to \$50,000 per workstation,” he said.

Today, he noted, institutions benefit from the use of software licenses, decreases in the cost of flat-panel displays and “astonishing” increases in computing power per dollar spent—both in terms of processing power and archiving. “We’re spending perhaps \$5,000 to \$10,000 per workstation,” said Dr. Thrall, “and less than 5 percent of the original expense for archiving studies. So it’s really been a series of

tipping points over a period of time.”

“Seeing is Believing” Effect Influenced Some

The falling costs of data storage and computer equipment are helping with the continued spread of PACS, but there are other factors as well, said Davidson, pointing to the “seeing is believing” effect. In North America, he said, “it’s very much up to the hospitals to see the benefit of PACS and start implementing them.” He added that while administrators of some smaller hospitals initially lacked the capital to invest in PACS, they’re now witnessing firsthand how well the systems work in the larger facilities.

The report also indicates a shortage of radiologists in the U.S. contributed to increased PACS usage. “With PACS, industry estimates are that a radiologist can see 10 percent more patients in a day,” Davidson said. He added that the ever-increasing versatility of PACS, allowing radiologists to access images from their home PCs or even download

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them onto their personal digital assistants (PDAs), has also helped spur growth.

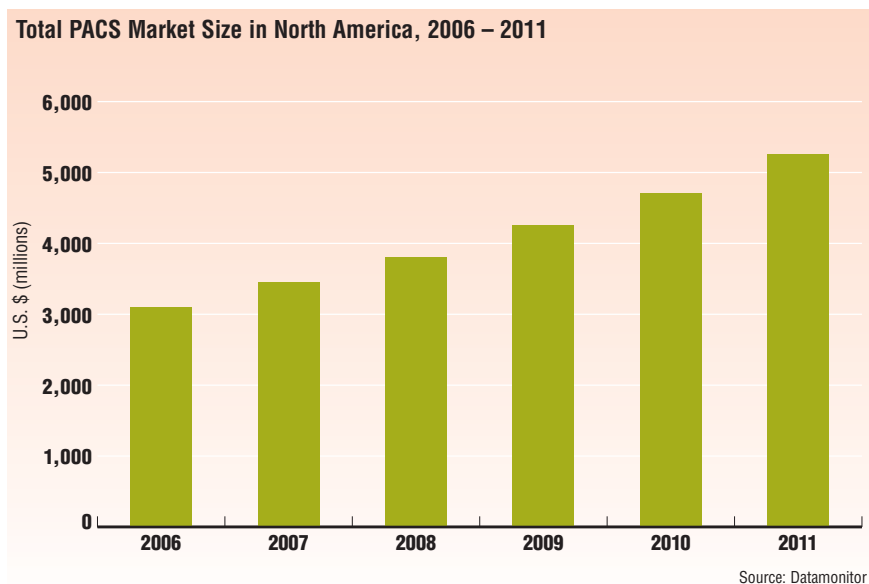
The advent of multidetector CT scanners around the year 2000 added to the PACS boom by substantially increasing the number of images that radiologists had to handle, said Dr. Thrall. "Even the most technophobic and recalcitrant radiologists began to realize they could not work with hard-copy images when a complicated CT angiogram might have 2,000 images," he said. "The number of images has just skyrocketed."

The use of PACS has not only increased how many images radiologists can easily examine, but also how well they examine them, Dr. Thrall added. PACS has allowed radiologists to extract more value from images, he said, by facilitating image post-processing, 3D rendering and extraction of quantitative parameters. "That's a huge part of the value we've pushed," he said. "Computer-aided diagnosis, reformatting of the transaxial images into coronal images, volumetric renderings and surgical planning are all advantages of the PACS era."

The Datamonitor report also highlights how healthcare professionals are seeing opportunities for PACS beyond radiology, with uses in departments such as cardiology, pathology and dermatology.

Tech Support, Integration Remain Challenges

There are some speed bumps on the road to total PACS saturation, said Dr. Thrall. The costs of purchasing new PACS equipment, software and storage have been overcome, he said, but now there is a shortage of technology support for PACS systems in smaller institutions. "Probably the majority of radiology departments do not have someone trained to manage a PACS," he said. He noted that the Society for Imaging Informatics in Medicine (SIIM) offers certification for PACS administrators, but "there's still a sort



of mismatch between the level of sophistication you would like to have from a PACS administrator and the pool of available people." This "human resource gap," he said, has "put the brakes on the spread of PACS."

Still, Dr. Thrall added, "for larger institutions, it's not a question of whether you want PACS or not, you've got to have PACS to stay in business. You just can't practice radiology on any large scale without electronic image management."

Dr. Thrall said he sees other immediate challenges as PACS become nearly ubiquitous in most U.S. hospitals. With many hospital administrators now beginning to plan the purchases of their second or third generation of PACS, they must think about how these new PACS, with images in the digital imaging and communications in medicine (DICOM) format, are going to converge with the digital infrastructure of the rest of the hospital, which typi-

cally uses HL7 standards to format information, he said.

"One of the things we're going to see in the next five to 10 years is the first and second generation of PACS, that were departmental and closed in their design for use by radiologists, replaced with Web-based enterprise PACS solutions that converge with the entire hospital's digital system," said Dr. Thrall. "This is a 20-year revolution, and we're now about three-quarters of the way through it." □

Learn More

■ The American Board of Imaging Informatics (ABII), founded earlier this year by the Society for Imaging Informatics in Medicine (SIIM) and American Registry of Radiologic Technologists (ARRT®), oversees Imaging Informatics Professional certification for PACS administrators. More information is available at www.siiimweb.org.

PACS at RSNA 2007

Picture archiving and communication systems (PACS) will be the focus of Part 2 of the "Practical Informatics for the Practicing Radiologist" refresher course at RSNA 2007. Among the topics to be addressed are orphaned workstations and how to integrate advanced image processing (3D and computer-aided diagnosis) into PACS workflow. For more information and to register now for RSNA 2007 courses, go to RSNA2007.RSNA.org.

