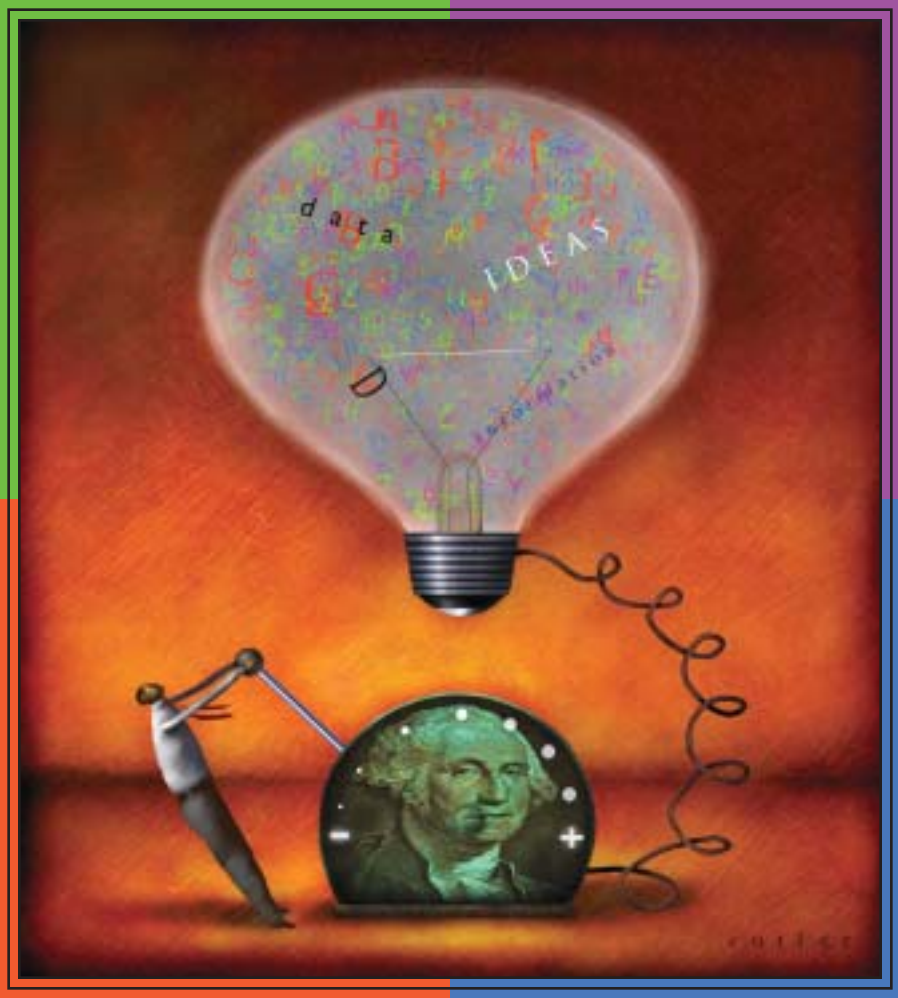

Leading Information Technologies:

Powering Savings With Great Ideas

Special Advertising Section

From the publisher of healthcare INFORMATICS

Powering Savings With Great Ideas

Imagine a future when Joe Patient is rest assured he'll receive quality care in a timely manner. The thought of errors doesn't even cross his mind. From the comfort of his hospital bed, Joe just assumes that the nurse is handing him correct medication as she uses her wireless personal digital assistant (PDA) to scan his arm bracelet and then the bar code on his prescription.

His physician walks into his room carrying a wireless tablet PC, already going over results of a test completed just three hours earlier. Instead of letting Joe bite his fingernails for two days after a CT scan that probed for a blocked artery, his doctor informs Joe of his diagnosis immediately. The radiologist used speech recognition software to dictate and edit test results and immediately sent the information to Joe's electronic medical record for review.

Joe is prepared for surgery that same day. Specialized software has guided hospital personnel in preparing accurate instrument trays based on the operating surgeon's preferences, significantly reducing the likelihood that surgery will be delayed.

"Computer-based patient record systems, made portable by wireless PDAs and tablet PCs, can help physicians and other providers give better care by facilitating faster and more comprehensive sharing of patient information," writes Jim Klein, vice president at Stamford, Conn.-based research firm Gartner, in his report *Hype Cycle for Healthcare Provider Technologies, 2003*. Improved input technologies, such as voice recognition, will also play a large role, says Klein.

"Medicine is an information intensive business. Every treatment, diagnosis and test generates information, and numerous people are involved in care. ***To bring information technology to bear has an enormous effect on quality and cost."***

—Jim Klein, vice president, Gartner

That includes leading technologies such as enterprise-wide speech recognition and wireless computing, and software written specifically for managing surgical instruments.

Making wireless practical; ensuring HIPAA security

Care providers are rapidly bringing information technology to the bedside through wireless technology. They increased spending on wireless more than 30 percent in 2003 over 2002, according to Klein. "The price of wireless is tumbling while expenditures continue to increase," he says.

Going wireless has great potential to increase healthcare quality and productivity, but application software often requires significant redesign to take full advantage of wireless appliances.

According to Aaron Burnett, marketing director for NetMotion Wireless, Seattle, the company's NetMotion Mobility product enables enterprises to wirelessly deploy applications that were originally written for a wired environment, without having to customize, modify or rewrite those applications. "That's quite a quantum leap forward," he says. "Typically, there would be tremendous expense associated with customization."

The award-winning system also enables wireless computer users to roam and preserves the state of applications when connections are disrupted. Tom Berg, director of clinical information services at Marshfield Clinic, Marshfield, Wis., explains: "As we go in and out of buildings on our campus and into areas that may not be covered by wireless yet, or into an area like radiology with dead spaces, NetMotion Mobility preserves the state of our sessions until we come back into wireless range. The computer's state is restored so that no data is lost. And, we don't have to log in again," he says.

The system provides HIPAA-compliant, 128-bit encryption that auto-authenticates as the clinician moves in and out of coverage or among different subnets or networks. It also provides policy management capabilities—to control access to applications based on a workgroup, a class of devices or even on individual appliances.

Applications

NetMotion Mobility allows the use of existing client-server applications through two means: suspending and resuming applications during coverage gaps, as Berg describes, and managing Internet Protocol (IP) address changes as users roam from network to network.

"By its very nature, wireless provides intermittent connectivity," says Burnett. As doctors are making their rounds and enjoying the fact that they have patient data right at the bedside, they will almost certainly step into areas such as elevators and stairwells that lack wireless coverage. Without our software, the applications they're working with and data they've been managing are lost. The applications crash because they no longer have connectivity back to the application server."

When clinicians waste time re-entering data, re-authenticating and restarting programs, the advantages of wireless become overshadowed by frustration. NetMotion Mobility preserves sessions when a wireless device runs out of battery power or is suspended—even for days—and is then resumed.

This is critical to physician acceptance. "A wireless system would not be tolerated by busy physicians if they had to log in every time they lost the state of

their sessions. It's too time consuming. ***For the busy physician, this stuff has to work 99.99 percent of the time. Period."***

—Tom Berg, director of clinical information services, Marshfield Clinic

While piloting wireless technology, Marshfield Clinic encountered problems as clinicians moved around hospitals and among some of its 39 centers. To resolve the issue, it launched NetMotion Mobility simultaneously with its wireless network. "Now," says Berg. "if a physician in the pediatric department gets called to the emergency room to see a patient, she can access the patient's electronic medical record on her tablet PC, travel down to the first floor on an elevator where there's no wireless connection, walk into the emergency room where there is a connection and go about her business of seeing the patient. The electronic medical record resumes and is available at the bedside. The physician doesn't have to log in again to get the software up and running."

Besides its patented roaming technology, another key feature of NetMotion Mobility allows clinicians to seamlessly move from wireless to wired networks.

"For example," says Burnett, "as clinicians roam throughout the Marshfield Clinic's 39 facilities, they might work in a wireless LAN, or they might dock their tablet PC and work on ethernet. They may need to transmit data as they're moving from facility to facility, in which case they might use wide

area wireless technologies such as those provided by AT&T Wireless or Sprint PCS. Finally, some clinicians take their tablet PCs home with them to update records. As they roam, they securely access enterprise resources in a manner that's completely transparent to them. They don't even need to know our software is there."

In a heterogeneous environment, the enterprise application server "doesn't know that the new IP address is associated with the old address. And, everything falls down around the clinician's ankles," Burnett says. "We mask that and ensure that clinicians using mobile devices can roam seamlessly from one subnet to another subnet, or from one network type to another network type—even in and out of coverage areas."

NetMotion Mobility's seamless roaming and application persistence helps facilities save money by deploying fewer access points. "To get around issues of intermittent connectivity, some healthcare organizations overloaded buildings with access points. They bought hundreds of access points to the tune of hundreds of thousands of dollars. With our software, you no longer have to blanket healthcare facilities with access points, which dramatically reduces hardware expense," says Burnett.

Security

Security can be problematic in the wireless world, given the various networks with different security paradigms. NetMotion Mobility helps ease security woes by providing HIPAA-compliant security through its Roamable VPN, a standards-based, secure, virtual private network.

"Folks in the healthcare setting are dealing with critical data and, of course, must be compliant with HIPAA. They need a consistent and manageable level of security and we provide that with 128-bit AES encryption," says Burnett. "NetMotion Mobility encrypts data all the way from the mobile device back to the application server, so it's end-to-end security. The VPN auto-authenticates as the clinician moves in and out of coverage."

Another security feature allows healthcare facilities to "quarantine" a device that is stolen or misplaced, precluding unauthorized users from connecting with any of the institution's networks. "You certainly don't want a mobile device that provides access to sensitive data floating around without an authorized user," says Burnett.

Management

NetMotion Mobility began offering policy management with its latest update, which was released last fall. Now IT managers can control the applications and data available to groups of workers, individual users or to types of devices.

"The IT manager can ensure that only those people intended to have access to certain data have access, and only over the networks that the IT manager chooses. That means that the IT manager might say, 'You have access to everything when you're on our wireless LAN. But, we don't want you to have access to radiology records over wide area wireless because we pay for that data throughput and broadcasting radiological images is expensive.' We automatically enforce that policy on the client side," says Burnett.

NetMotion Mobility helps ease the jobs of information technology managers and clinicians when they go wireless, says Burnett. "They get secure, reliable access to mission-critical clinical data and enjoy a tremendous level of reliability and performance."

Safeguarding the tools of the trade

From macro-scale wide-area mobility to specialized systems to track life saving tools, information technology has the potential to improve the quality of care. But, it has yet to reach its potential, according to authors of *Crossing the Quality Chasm: A New Health System for the 21st Century*, the 2001 Institute of Medicine report. "A highly fragmented delivery system that largely lacks even rudimentary clinical information capabilities results in poorly designed care processes characterized by unnecessary duplication of services and long waiting times and delays," they wrote.

Lawson, based in St. Paul, Minn., recently added Surgical Instrument Management software to its supply chain offerings by

acquiring a small company in San Francisco called Apexion. This new weapon in the hospital's arsenal can improve safety, service and cost-effectiveness in the operating room, where well-designed care processes are essential and unnecessary delays unacceptable.

Preparing surgical trays is a complicated process. "The employees who prepare surgical trays are typically given limited information but are expected to differentiate between thousands of instruments that look similar and have similar names.

"Employees need better tools to prepare trays in a skilled manner so that an operating room nurse isn't running to find instruments at the time of surgery."

—Angie Franks, director of healthcare market development, Lawson.

"If she can't find an instrument, she'll pull one from another prepared tray, which means reassembling and resterilizing all the instruments on that tray, not to mention the frustration for the physicians and delay in surgery for the patient."

"If the right tray isn't ready, the OR staff needs to make a decision whether to delay or cancel the procedure," says Franks. "If a surgery is delayed, it throws off the entire day in the OR, which can be costly."

Surgical Instrument Management software provides simple and clear instructions with visuals to help employees accurately assemble trays, and it stores tray preferences for different physicians. It also tracks the location of assembled trays, identifies shortcomings in staff performance to pinpoint needed training, and protects against dangerous bacteria outbreaks and instrument damage by revealing sterilization errors.

"The end goal is helping ensure that the correct instrument and trays arrive on time when and where they're needed, improving service to the OR, reducing costs and streamlining processes," says Steffan Haithcox, product marketing manager at Lawson.

A midsize hospital typically keeps about $2 million in instrument inventory and spends about $500,000 annually on instrument replacement and repair. "The instruments require various sterilization methods, so we provide error checking. The risks associated with improper sterilization include ruined items, rework and delays, and safety issues for patients," says Haithcox.

Franks points out that some items can cost $15,000-plus to replace if damaged. But, she adds, that's nothing compared with possible patient safety consequences. About two years ago, a serious lung infection at a respected teaching hospital affected patients treated with contaminated bronchoscopes. Although the instrument manufacturer recalled the bronchoscope because of defects that led to sterilization problems, the outbreak points to the serious safety risks associated with contaminated instruments.

Lawson has also used Surgical Instrument Management software

to help hospitals achieve cost savings through lowered instrument inventory. "For example, one of our customers had seven basic plastic sets, which we consolidated into just one. After comparing and standardizing instrument sets, they need fewer overall trays on the shelves," says Haithcox.

Haithcox says Surgical Instrument Management is Web-based, which meanseasier implementation and lower total cost of ownership. It's installed on the hospital's server behind its firewall and can be accessed by virtually any computer on the hospital's network. Lawson also offers wireless, cradle synchronization, or intermittent wireless connectivity, so a significant portion of instrument management can be done on handhelds.

According to Franks, Surgical Instrument Management is one aspect of Lawson's Enterprise Resource Optimization package, which helps hospitals manage its people, supplies and money, with the goal of reducing the cost of delivering high-quality healthcare.

Speak to me

Speech recognition is poised for a dramatic take-off. According to a HIMSS survey, 19 percent of IT executives employed speech recognition in 2002 and 46 percent planned to use it in the next two years.

"Speech technology is a carrot that encourages physicians to use information systems."

—Ross Weinstein, president and CEO, Voicebrook

"Caregivers typically have not been typists. Now you're giving them a natural interface, something they're used to doing: dictating." New York-based Voicebrook provides a speech technology platform called VoiceOver. The solution builds upon leading speech recognition engines from ScanSoft and Philips, providing a complete solution for caregivers.

While most speech recognition software targets transcription-heavy specialties like radiology and pathology, Voicebrook takes an enterprise approach. VoiceOver is networkable and application neutral, allowing it to be accessed as a toolbar in Windows-based applications ranging from electronic medical records to billing systems, Microsoft Word and email.

Voicebrook offers plug-ins for radiology, pathology and ambulatory medicine, to provide specific solutions that build on the enterprise platform. VoiceOver also includes controls for various microphones and input devices, as well as tools to easily create structured document templates and macros for normal observations.

"By implementing enterprise speech recognition, healthcare organizations benefit on two levels: individual caregivers use the same tools and speech profiles in multiple applications, and administrators reduce complexity and own-

ership costs. There's no need to train and manage multiple speech platforms," says Weinstein.

Michael Cipriani, Voicebrook's chief technical officer, is a proponent of front-end speech technology. Physicians use speech recognition to control the dictation and editing process and produce a final document, eliminating the use of transcriptionists.

A recent Voicebrook implementation in a large New York hospital underscores the potential for productivity and cost improvements. Medical transcription costs were reduced from $850,000 per year to $35,000, with report turnaround time going from more than 24 hours to less than one hour. Productivity improvements are illustrated by one radiologist whose load increased from 60 to 90 cases per day.

"Caregivers are realizing that speech recognition technology is a natural extension of the documentation process and are using it to streamline workflow," says Cipriani. "It makes their lives easier."

The way of the future

Maturing technologies like speech recognition and wireless computing, as well as software to aid in OR instrument management, are leading the way to timely, high-quality medicine. According to Klein's hype cycle report, speech recognition for transcription, wireless local area networks and other leading technologies have reached a point when benefits are demonstrated and mass implementation is underway, making Joe Patient's need for quality care much more likely to be satisfied.

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