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Is Now the Time for Speech Recognition?

After years of hype, users say the technology is ready for prime time.

By Joseph Goedert, News Editor

When solo plastic surgeon Kevin Scott, M.D., dictates and edits patient notes, the task rarely takes more than a few minutes to complete.

Scott for three years has been using dictation and document management software from Silver Spring, Md.-based SoftMed Systems Inc., embedded with the front-end Dragon Speech recognition technology of Nuance Communications Inc., Burlington, Mass.

Staff at Scott's practice, Eye Plastic Associates in Fairfax, Va., already have populated a templated report with patient demographic data. Scott uses a variety of templates that contain additional general information pertaining to the condition being analyzed or procedure being performed.

Using a microphone attached to a computer embedded with speech recognition software, he accesses a report, dictates a few sentences of pertinent additional detail for himself and the patient's primary physician, checks the transcribed text and electronically signs the note.

Scott is sold on front-end speech recognition, which he says has advanced significantly over the past few years. "I started with Version 5 and now am on Version 8," he adds. "With each version there has been a leap in improvement."

But experts confirm that outside of radiology and pathology, relatively few physicians have adopted the technology.

The primary reason is that many physicians continue to favor dictating by telephone and letting others worry about transcribing and editing the resulting notes. Those others—mainly in-house or outsourced transcription services—are starting to use speech recognition on the back end as a "middle man" that converts dictation to text reports, which then are cleaned up by transcriptionists.

However, the speech recognition industry itself has a credibility problem, because the hype it's generated has outpaced the performance of its products for many years, says Kerry Waltrip, senior vice president at SoftMed Systems.

"The industry has been touting that it was ready for prime time for seven to 10 years," he notes. "There was too much hype and no proven results."



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Industry forces, however, particularly the economics of reduced transcription costs and pay-for-performance programs, and growing awareness of the technology's capability, could motivate higher adoption of speech recognition in the short-term.

"I'll bet in two or three years, everyone will be using some sort of speech recognition software," says Hayward Zwerling, M.D., a user of the technology and president at ComChart Medical Software, a Lowell, Mass.-based electronic medical records vendor.

When acting as an advisor to physicians or giving a second opinion, Scott, the plastic surgeon, will dictate an entire free-text note using speech recognition, clean it up and sign it.

He advises physicians to test the waters by using speech recognition on their home computer to write e-mails, letters and other personal correspondence, which will enable them to become proficient with the technology.

"From there, physicians will undoubtedly roll it into their practice," he believes. "Once they do that, they'll be hooked."

Users of speech recognition say that not only has the software significantly improved, but supporting technology such as microphones and document management software have been enhanced as well.

As a result, speech recognition doesn't have to go through another generation of development before it's stable enough for clinical use, contends Zwerling, an endocrinologist and primary care physician.

He uses Version 9 of the Dragon software from Nuance. Zwerling has used the application "right out the box" and has not had to train the software to recognize his speech patterns, a sometimes-onerous task that has kept some physicians from considering the technology.

A user typically must train speech software by reading stories or other scripts supplied by the vendor to enable the software to "learn" the user's accent, speech patterns and other characteristics.

While Zwerling hasn't felt the need to train his software, he likely will do so to improve the software's ability to understand medical terms that are common in his specialty but not in the software's medical dictionary.

Though some speech recognition applications now are good enough to work out of the box, training still is advisable despite the marketing claims, says William Meisel, president at TMA Associates, a Tarzana, Calif.-based speech recognition consulting firm.

"You still are training as you speak, it just tunes the system as you go and trains the system slower," he notes. "So why get less than optimum performance at the start? New speech users should train it and get the best performance possible to reduce frustration, build confidence in the system and increase their chances of accepting the technology."

Reality check

Speech recognition might be a technology whose performance

through
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finally matches the hype, but it isn't perfect.

In the past few years, recognition accuracy has increased 30% a year, Meisel says. That's an impressive statistic but is somewhat overblown, because it means an accuracy rate of 98.5% improved a year later to 99%.

But claims of 99% also have to be placed in context, Meisel says. "What they're saying is the system is 99% accurate if you make a well-formed sentence."

That's another reason why training is so important, but it's also a reason why real-world use isn't 99% accurate. "Changing your mind in mid-sentence will result in an error," Meisel says. "A human transcriber takes it out, a machine doesn't."

How fast a physician or other user talks, the position of the microphone, the frequency of mumbled words and other factors all affect the accuracy of speech recognition. "When physicians dictate, they don't talk like normal people," Zwerling says. "They talk faster and there often is background noise."

So in the real world, physicians and others still have to proofread their text and not just spell check and sign off, he cautions. "Speech engines won't misspell much-errors generally are the wrong word. When editing, you really have to read it. You can't just scan for misspelled words."

Wait is finally over

In recent years, back-end speech recognition technology, used to convert physician-dictated notes to text for transcribers to clean up, has made the same technology strides as front-end software.

Carol Weishar waited much of her career for the technology to catch up to the promise. "I've been in the health field since the 1970s, and speech recognition has always been just around the corner," says the director of medical information and transcription for Advanced Healthcare.

The Milwaukee-based organization operates 14 clinics and transcribes for three ambulatory surgery centers in the region. A couple of years ago, Weishar looked at speech technology and was amazed at how well it recognized. "I was a bit of a skeptic, but the technology was there."

Now, about 150 of the organization's 250 physicians dictate via telephone to a transcription system using speech software from Nuance Communications.

Advanced Healthcare also uses electronic medical records software from Madison, Wis.-based Epic Systems Corp. Transcribed documents are posted in the electronic record, but Weishar would like the EMR and speech vendors to tightly integrate their products.

This would enable doctors to dictate when they are in the EMR application and have easy access to pertinent patient data such as vital signs, nurse notes and lab reports, or view images while dictating. Integration also may enable physicians to move within the EMR using voice commands. "If we could do this, I think I'd have a lot more physicians dictating on the front end because the speech recognition is very, very good," she adds.

Since 2004, recognition capability has continued to

incrementally improve, Weishar says. For example, the practice has a couple of physicians from the Middle East whose speech was immediately recognized.

Getting docs on board

Despite advances in speech technology, wide-scale physician adoption on the front end won't happen until a new generation of computer-savvy doctors dominate the industry, Weishar believes. "Most doctors adapt to some technology, but they don't see typing as an efficient use of their time."

The use of front-end speech recognition has penetrated the radiology field-either by choice among radiologists or a mandate of their hospital or imaging center-because turnaround time to get reports to referring physicians is much quicker. "Radiologists were losing business because their turnaround time was too slow," says Waltrip at SoftMed Systems.

Better service means more revenue, says consultant Meisel of TMA Associates. "In radiology, the report is the product-that's what the radiologist delivers to other doctors."

For this reason, Meisel and Waltrip believe other specialists will adopt speech technology before primary care physicians.

A specialist can employ a transcription firm with faster turnaround time, but at a much higher cost, Waltrip says. And for specialists and other physicians alike, economics is often the driver to finally adopt technology, he adds. "When it affects the provider economically as an individual, that's more likely to impact behavior."

Many physicians don't have the turnaround pressures that could compel them to adopt speech technology.

In primary care, for instance, transcribed patient notes are for reference by a patient's physician or colleagues covering for the physician at the next appointment, so the urgency of turnaround time isn't there.

But there are many other reasons physician users of the technology remain a distinct minority, says Zwerling, the physician and vendor executive.

Physicians may not understand the economic benefits of speech recognition, don't want to take the time to learn how to use it, or don't want to stop dictating by telephone, he notes.

For Zwerling, the cost savings of speech recognition were nearly immediate. A \$900 investment in the software can save a physician \$12,000 to \$15,000 in annual transcription costs, he says.

Zwerling dictates notes directly into his company's EMR, but very few of his client physicians use speech recognition. Many physicians remain wedded to the telephone-make a call, dictate, hang up and someone else does the rest of the work, he says.

Physicians won't willingly take the time to self-dictate and edit their notes because they don't believe they have that time to give. They won't even take time to train themselves and the speech software, Zwerling adds. "Every physician I know works to some degree seven days a week. They just won't take a day

to train even if it's clearly cost-efficient."

Market forces

An indirect mandate to use electronic medical records systems, fueled by the need of physicians to better gather data to support pay-for-performance programs, could fuel acceptance of speech technology, says Scott, the solo plastic surgeon in Fairfax, Va.

Scott doesn't yet use an EMR in his practice, but he sees the writing on the wall. EMRs loaded with templated report forms will make it easy for doctors to use speech recognition, he contends. The templates will prompt the physician to include data that payers will require under pay-for-performance, EMRs will automatically populate forms with demographic data, and speech technology will enable physicians to quickly complete the rest of the form, he predicts.

Outside the physician market, vendors that sell software and services based on speech recognition technology say a cultural change is coming.

Many insurers, disease management firms and drug manufacturers today understand the technology's capabilities, says Lucas Mellow, CEO and founder of Eliza Corp. The Beverly, Mass.-based company sells speech-enabled interactive telephone voice response services.

"Eliza's days of cajoling and convincing are over," he notes. "We aren't just getting the early adopters and risk-takers now, but have people approaching us."

Sidebar

Back-End Speech Expands Outreach

A program that combines speech recognition and interactive voice response telephone technologies is helping health insurer Highmark Inc. improve its communication with members.

The Pittsburgh-based Blue Cross Blue Shield licensee is using the technology from Beverly, Mass.-based Eliza Corp. to provide specific messages to targeted members and obtain data to better focus outreach programs.

For instance, women of certain ages are receiving telephone calls inquiring if they have had a mammography in the past year. If a woman responds "no," that answer prompts new questions on the reasons why. "We can send educational material if women are fearful of the procedure," explains Carol Chase, manager of clinical outcomes at Highmark. "If they don't know of a nearby facility that performs mammographies, we can mail a list of facilities."

Eliza works with Highmark and other clients to develop the script for outreach calls. The vendor, serving payers, disease management firms and pharmaceutical companies, will place the automated calls using lists provided by the client. "We engage people in simulated conversation," says Lucas Mellow, CEO at Eliza.

All communication from the member called is verbal and transcribed into text and data using Eliza's speech recognition technology.

Many responses from contacted members are short, such as "yes," "no," or verbally selected from a machine-read list of options. But the speech software also captures answers to open-ended questions and other comments members can make at the end of the call.

Highmark also has used the technology to contact women due for cervical cancer screening or to screen elderly members for glaucoma, among other uses.

Eliza gathers data from the calls, which the Blues plan analyzes to identify barriers to care, service problems or new outreach programs. "We also get reports on who listens to all of the message," Chase says. "With mailings, you don't know how many people read them."

Further, some responses during the phone calls, such as, "Well, I've had some chest pain recently," will prompt an alert to the member's physician.

Eliza, founded by speech recognition junkies from the California Institute of Technology, launched its speech-enabled outreach technology in 1999. That's when the technology, "finally got to the point where it was conversational and economical," Merrow recalls.

Today, the software can accurately capture words from a smoker with a heavy rasp, or people with heavy accents.

Despite the advances in technology, outreach programs have limitations because of the quality of data that clients possess, says Alexandra Drane, senior vice president at Eliza.

"Most health plans can't tell us if someone has had diabetes for 30 days or 30 years," she explains. "The answer would result in very different conversations. That's really information we need to take advantage of the interactive technology. So, outreach doesn't yet have all the tools."

Talking the talk

An emerging technology, called natural language processing, has the potential to bring new capabilities to vendors of back-end speech recognition technology, says Stan Nowak, CEO at Silverlink Communications.

Like Eliza Corp., Burlington, Mass.-based Silverlink provides automated, speech-enabled interactive voice response telephone technology.

Silverlink for instance, develops programs to enable computers to contact patients to inquire about their health status. Patients verbally respond to questions with brief answers such as "it hurts" or "I feel great," or state their blood pressure numbers, date of birth, or one of several alternative answers read to them.

But natural language processing will enable better results because it recognizes the natural syntax of how people talk, Nowak explains. "It recognizes a wider range of answers in the same category."

For instance, one person may give their birth date as "1-28-64," while another will say, "January 28th, 1964." Natural language processing also can recognize other different ways of saying the same thing, such as "yep," "yup," and "yes."

Eliza Corp. also has taken an interest in natural language processing but doesn't believe the technology is ready, Drane says.

But Silverlink's Nowak says its time has come. "Natural language processing has improved to the point where we now are integrating it into our technology," he notes. "Two years ago, we weren't able to use it."

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