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fter nearly 30 years of research and development, speech recognition technology has finally come of age. Just ask anyone who has called a major airline, bank, or retailer lately. People are becoming accustomed to using automatic speech recognition to conduct an ever-widening range of transactions.

The advantages of speech recognition technology – integrated into tools such as interactive voice response – are clear. According to The Wall Street Journal, phone transactions using speech recognition are up to 40 percent faster than touch-tone calls, because customers don’t have to listen to a menu of options (“Virtual Phone Reps Replace the Old Touch-Tone Menus,” Jan. 21, 2003).

It’s no wonder Microsoft recently entered the market with its Speech Server platform, which is likely to further expand speech capabilities beyond large companies and into small and medium-sized enterprises. As speech technology becomes more effective and widespread, Accenture believes it can do much more than automate telephone transactions or replace keyboards.

Through our technology research and development organization, Accenture Technology Labs, we have been exploring the potential for speech recognition as an essential building block for a new generation of intelligent systems. With these intelligent systems, we believe businesses and governments will be able to achieve significant efficiency gains and high performance throughout their enterprises.

Intelligent systems are an integral component of our Reality Online vision, which predicts a fundamental change in the way we will interact with each other and the objects around us. Ubiquitous sensors embedded in everyday objects will capture the transactions and interactions that compose business and consumer reality. Advanced analytic engines will transform that raw sensory input into actionable insights. Speech recognition will play a big part in this process, providing a crucial – but so far underutilized – source of sensory input. By using speech as an intelligent sensing mechanism, our Labs team is giving high performance businesses new opportunities to leverage technology innovation for competitive advantage.

Enabling Intelligent Systems Through Listening

As humans, we develop awareness by listening to the conversations directed at us as well as to the ambient sounds in our environment. We piece together a view of our current situation based on other people’s conversations or tone; we recognize a person’s identity by the sound of their voice. In the same way, speech technology can help machines pick up on verbal cues from the environment. By listening unobtrusively and continuously, a speech engine can feed information into an application, complement other sensory sources and help create a clearer picture of a situation. Our Labs researchers have built several prototypes to demonstrate this new use of speech as an enabler of intelligent systems.

A Memory You Can Turn On And Off

How many times have you met someone and forgotten the person’s name seconds after you heard it? We could all use help remembering the details that bombard us each day, which is why the Labs created the Accenture Personal Awareness Assistant. The prototype is a small, wearable device that listens continuously to conversations between the wearer and the surrounding people, storing information in context for later retrieval. For example, when the wearer meets someone new and says, “Nice to meet you,” that verbal cue triggers the prototype to store 30 seconds of the conversation, which presumably contains the person’s name. Later, the information can be easily retrieved by simply asking, “What is the name of that person I met this afternoon?” Similarly, the Personal Awareness Assistant can help track appointments, phone numbers, and myriad other facts and details that we sometimes struggle to keep straight. Imagine, for
instance, the power of this tool for salespeople working at trade shows, who meet many people in a short time.

Enhancing The Standard Of Care
As medical professionals know, a patient might describe symptoms differently at the doctor’s office than they would if they were at home experiencing the symptoms. Because context is vital to good diagnosis and treatment, speech technology has tremendous potential for home health care. One example of this, developed by the Labs, is the Caring Plant prototype, a houseplant equipped with a variety of sensors, including speech recognition. Built for elderly people living at home, the Caring Plant listens as the person talks to himself or someone else – picking up on even subtle groans or sighs. The plant tracks recurring ailments and prompts the elderly person by asking conversational questions like, “How is your back feeling today?” Based on the response, the prototype can suggest that the person call a doctor or caregiver in order to prevent a problem from escalating. For professional health providers, as well as family members, the Caring Plant can provide on-site, around-the-clock monitoring, serving as the eyes and ears of caregivers.

Recognizing that how someone says something is often just as important as what they say, our Labs team has also been developing audio analysis technology that can assess the speaker’s emotional state. Integrating the emotional component into speech engines – from the Caring Plant to call center applications – can also add vital context and help shape appropriate reactions.

Product Information At Our Fingertips
Good sales professionals are both knowledgeable and persuasive, which is why we created a speech-driven tool that can boost sales effectiveness by providing real-time access to knowledge. The Accenture Intelligent Sales Suite is a mobile application that delivers learning and sales support directly to the person who needs it, wherever they may be. A sales associate working in a retail store is equipped with a small Bluetooth earpiece and a tablet PC. When a customer asks a question about a specific product or topic, like “wireless networks,” the Intelligent Sales Suite uses verbal cues and other sensory input, such as the associate’s current location in the store, to come up with the most relevant product information. The tool then transmits that information to the tablet PC to be shared with the customer, just in time and without the sales associate having to initiate the search. By providing on-the-spot information for customers and reducing the need for training, this tool can be a tremendous aid to retailers that face high turnover or sell complex and knowledge-intensive products. The tool can also help associates identify cross-selling and up selling opportunities.

For pharmaceutical salespeople, face-time with physicians is a challenging but vital opportunity to shape prescribing behaviors. Using a tool similar to the Intelligent Sales Suite, pharmaceutical representatives could focus the conversation more quickly on the doctor’s area of interest, adding a depth of knowledge to the conversation that would exceed even the most seasoned sales veteran’s expertise. Similarly, the Intelligent Sales Suite could be easily adapted to augment the knowledge of call center representatives with relevant customer and product information based on the current conversation with the customer.

Sensing Customer Needs
Integrating speech recognition into existing applications is a vital step in using this technology as a sensing mechanism that enables new business outcomes. Our Labs team has been working with Accenture CRM professionals to bring together interactive voice response (IVR) with Accenture innovations in customer insight. One result: an insight-driven IVR solution based on the speech application language tags specification and the Microsoft Speech Server platform. The solution delivers an intelligent, streamlined customer experience by combining existing customer insights with dynamic voice prompts to help each customer explore and order new services most likely to appeal to them. This intelligent self-service capability holds great potential for businesses, including telecommunications providers, banks and retailers, that are looking for ways to build customer loyalty and enhance revenue while containing their customer contact costs.

“Opportunities to incorporate speech technology in business applications will grow tremendously over the next decade,” according to Dr. Kai-Fu Lee, corporate vice president of Natural Interactive Service Division at Microsoft. “Accenture's R&D work in this area can give organizations a head start in harnessing speech technology by helping them explore applications relevant to their industry.”

Implications For The High Performance Business
The prototypes referred to above are just a few examples of how speech can be used as an enabler for intelligent systems and, ultimately, high performance business. As speech technology is further integrated with other sensor input like health monitors, global positioning systems, cameras and data warehouse applications, businesses will be able to gain more actionable insight about the customers and events that are important to them. At the same time, they will need to confront issues around privacy and security – the same issues that will emerge as the physical world is increasingly equipped with sensors and other means of collecting data. Accenture believes that businesses will need to approach privacy issues proactively, with a focus on building trust with customers. Trust will enable them to take advantage of promising new technologies, while mitigating the legitimate concerns many have about the future of privacy.

While IVR will probably remain the focus of most enterprises over the next two or three years, the long-term future of speech lies in intelligent systems. We believe that businesses can use speech technology as a powerful means to elevate performance – in both efficiency and customer service.

Accenture Technology Labs
Accenture Technology Labs, the technology research and development (R&D) organization within Accenture, has a 16-year track record of turning technology innovation into business results. The Labs create a vision of how technology will shape the future and invent the next wave of cutting-edge business solutions. Working closely with Accenture’s global network of specialists, Accenture Technology Labs helps clients innovate to achieve high business performance. The Labs are located in Chicago, Ill.; Palo Alto, Calif.; and Sophia Antipolis, France. For more information, please visit our Web site at www.accenture.com/accenturetechlabs.