

Voice Biometrics; Evolving Applications for Businesses, Industries and Governments

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1. Voice Biometric Evolution

For those that don't know what it is, the term 'biometrics' may bring to mind a government research project. For those like me that do, it conjures a line out of a James Bond film where he is on a top-secret security mission and gets caught out; "*The name is Bond, James Bond*". The question begs, is it really him?

The truth can now be told. Voice biometrics has been in use by government, military and police intelligence agencies around the world for years, and has in fact, become an integral part of many such operations. Reportedly, one of the Madrid train-bombers was identified and subsequently captured by matching his voice print on intercepted phone taps.

Speech includes two components: a unique physiological component (the voice tract) and a behavioural component (the accent). It is almost impossible to imitate anyone's voice perfectly, and voice recognition systems can discriminate between two very similar voices, including twins.

A voiceprint is characterised by the vocal tract. It belongs entirely and solely to the individual, which makes it highly reliable as a means to authenticate a person's identity. A cold does not affect the vocal tract, so there is no adverse affect on identification accuracy levels. Only extreme vocal conditions such as laryngitis will prevent the match from being made.

Voiceprints are collected by an enrolment process. During enrolment, the enrollee is prompted to repeat a short passphrase or a sequence of numbers to capture the individual voice print.

Today, voice recognition systems can utilise various audio capture devices (e.g. PC microphones, telephones, mobiles and other smart devices). The performance of voice recognition systems may vary depending on the quality of the audio signal and environmental noise levels, so system and software quality is extremely important in getting good results.

Over the past ten or so years this technology has evolved to the point where business thinking has shifted from "what if" to "how to". And because of its proven efficacy across language and dialect differences, voice biometrics is emerging as a leading and practical means across industries for deterring fraud, in particular, curtailing the fraudulent use of credit cards over the Internet.

The flexibility of this identification tool has led the development of innovative applications, such as an access control tool for miners in the mining industry, whose fingerprints are often not usable in biometric devices, and the monitoring of convicts under house arrest or home detention in government judiciaries.

Voice biometrics is most successfully deployed right now in the banking, financial services and insurance) industries, as these generally have a higher risk profile and exposure to identity theft and fraud.

Organisations in these industries have relatively frequent contact with their clients. Whilst banks are mostly interested in additional security both in self service applications as well as with their agent-human interactions, other organisations are also interested in reducing the AHT (Average Handling Time) by automating the identification and verification portion of the call.

In this context, voice biometric resources can be easily integrated into self-service and assisted service settings to provide strong, yet convenient, caller verification, authentication and ID proofing for most any organisation.

Researching the technology is important because there are a few misconceptions in the market about voice biometrics, such as:

1. That it has to be coupled to speech recognition and it acts like speech recognition. The fact is that there is a key difference between the two – speech recognition is about understanding the words people say, whereas voice biometrics is about understanding who is speaking and biometrics can actually be deployed without any speech recognition capability.
2. That the accuracy rates of the technology are the same as they were a few years ago, when some large service providers piloted immature technologies. The reality is that there is significant and continuous improvement of the technology, in particular much higher accuracy rates, which translates to extremely strong results in comparative evaluations.

“One of the most popular business applications for voice biometrics is as a customer interaction solution, where it offers a realistic and affordable means of enhancing security, adding value and trimming costs associated with customer service”, says Brett Feldon, Chief Technology Officer for Salmat Speech Solutions, headquartered in Sydney, Australia.

Feldon supports voice biometrics as an ideal business solution. *“It not only addresses a need for tighter security, but also business objectives around cost containment and increasing efficiencies and convenience”,* says Feldon.

Another global trend is emerging, in companies that deploy voice biometrics to support their Human Capital and Human Resources operations. Their profile typically includes:

- A distributed organisational support workforce employed in around the clock operation
- Centralised Human Capital (HC) / Human Resource (HR) Help Desk or national, distributed HR functions
- Large fluctuation in call demand (resulting in long queues)

Dr. Mike Banbrook, GM Salmat Sales, in Auckland New Zealand and a leading Asia Pacific biometric expert observes *“Changes in labour force demographics and the remote nature of a global workforce can cause those charged with long-term workforce planning to lose sleep at night”*.

He added, *“Retaining highly skilled and expensively trained human capital is one of the top objectives in any HR strategy and by adding automation into the recruitment mix, organisations can keep higher qualified candidates interested in the company and not take a position with a competitor”*.

Asia-Pacific organisations are beginning to follow that advice and include voice biometrics and speech recognition to speed up its identification, recruitment and HR processes.

2. Government and Industry Examples and Trends

Other examples of voice biometrics and speech recognition in business applications across industries and government are outlined below:

- **Australia’s largest logistics organisation** - Speech menu and self-service applications for staff leave entitlements and supplier payment status and booking systems
- Second-largest Australian retailer - Recruitment support
- **Largest Australian airline carrier** - Scheduling and rostering application for flight crews

- New Zealand Government Inland Revenue Agency – Speech recognition and voice biometrics
- **Third-largest Australian bank** – open speech menu, self service applications and voice biometric security for identification and authentication
- **Second-largest New South Wales health insurer** - Biometric identity management & password reset voice print applications
- Third-largest Australian Credit Union – Speech recognition for self-service
- **New South Wales Government agency and New Zealand Government agency** - Automation of front-of-house reception functions through an automated voice dialler
- Australian Federal Government Department – speech recognition for natural language call routing
- Large Australian Insurance and Superannuation provider: speech recognition and voice biometrics for member and adviser authentication and verbal contracts

The government organisations commonly realised a positive return and justified their speech recognition investment within nine to eighteen months of the application going live.

In addition, they report:

- Increased staff productivity in the call centre/help desk because agents spend less time identifying callers: some organisations return this productivity gain by offering a higher grade of service, others seize the opportunity to reduce operating costs.
- Staff productivity improvements outside the call centre/help desk, as staff spend less time waiting on the phone before their request is serviced.
- Increased staff satisfaction through self-service (available 24/7) and elimination of mundane, repetitive processes
- Increased security by eliminating security loopholes in network, application, and premise or device access

In a 2011 Voice Leadership Forum address, Charles Ronaldson, then Group Manager Assistance for Inland Revenue in New Zealand cited the following strategic drivers and benefits for implementing voice biometrics:

Strategic Drivers	Benefits
Cost effective	Agent handling time (min. 20 seconds per call)
Convenient and user friendly for customers	Increase in self- service (no agent handling time)
Instant verifications	New self-service applications (e.g. password reset)
Future saving	

Battling security and fraud issues Charles stated that “*stopping just one fraud incident will pay for the biometric solution in full*”.

Speech recognition and speaker verification deliver customer value through improved productivity and ease of use. Similarly, organisations that deploy speech recognition and voice biometrics report substantial improvements in the areas of security and resource utilisation.

Tim Andrew, General Manager of ATMs and Self Service for National Australia Bank says *“voice biometrics is quicker, simpler and more secure, as it is nearly impossible to steal a voice pattern, compared to a password or PIN. We are continuing to refine our voice biometrics system to improve the customer experience and registration process. NAB's aim is to give customers the choice of convenient and 24/7 banking options that are safe and secure”*.

NAB has found that customers are thirty percent more likely to be identified successfully using voice biometrics, compared to when using a PIN, where customers sometime enter it incorrectly or temporarily forget what it is. To date, NAB has seen no fraud linked to customers who have signed up for its voice biometrics service.

Over the next few years, new global trends are predicted:

- Consolidation in the voice biometrics market given the increasing need for competency to cope with mass deployment challenges
- Development of advanced technologies to cope with various challenges in rolling out large deployments
- Hosted players stepping into the market more aggressively through M&A's
- Partnerships with risk management and risk assessment companies to provide a more comprehensive risk management solution
- Taking voice biometrics into the personalization market, whether it's a smart phone, a luxury car, or a smart home...

In 2009 National Institute of Standards and Technology (NIST) began a joint effort with the FBI to conduct research supporting the creation of voice biometric standards for the U.S. Government. The Australian Government is currently reviewing its stance around standards and privacy issues. Currently there are no published government standards.

3. About Salmat

Salmat (ASX:SLM) is a unique Australian owned company that, through strategic use of different communications channels, online technology, demographic insight and detailed data management, engages consumers in cost-effective one to one communication on behalf of its clients - individually in small groups or on a mass scale. Worldwide, the company employs more than 8,000 people, with operations in eight countries.

Salmat's Speech Solutions clients include: National Australia Bank, Standard Life, Dublin Airport Authority, Prudential, Which?, Suncorp, , Radio Taxis, TelstraClear, Westpac Bank, New Zealand Ministry of Social Development, New Zealand Inland Revenue, Tabcorp, St George Bank, ANZ Bank, Department of Defence, Newcastle Permanent Building Society and Woolworths.

the evolution of one to one communication

