

# Speaker Identification and Verification (SIV) Applications and Markets

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The position taken by this paper is that any SIV module that is developed for VoiceXML must be grounded in usage. That grounding provides a critical “reality check” for the decisions made about the architecture and functionality of the module. Fundamental elements of that grounding are understanding

- Who is using SIV,
- What they are using it for, and
- Why they are using SIV.

This position paper presents an overview. My talk will examine the intersection between the ways in which SIV is being used in the marketplace and VoiceXML.

## 1. WHO IS USING SIV?

Table 1 displays the most active market segments and some (not all) of the organizations that have deployed SIV applications.

**Table 1 Markets**

<b>Industry</b>	<b>organizations</b>
Government general operations	CentreLink, US Dept of Homeland Security, Philippines Government Insurance System, Dubai Police, City of Baltimore Dept of Public Works, Illinois Dept. of Revenue, Rhode Island Dept of Labor and Training, Holland Dept of Justice, New Mexico Youth Opportunities Unlimited, Las Vegas County Dept. of Probation
Government lawful intercept/forensics	Guardia Civil de Espana, Cyber Security Police in Malaysia, General Attorney of the Republic in Mexico, Prosecutor Office of S. Korea, Chile Police investigation, Colombia Police, Police Nationale of France, Russian Federation Ministry of Justices
Government corrections	US Dist. Court of Florida, Maine Dept of Corrections, Cook County of Illinois, Ingham County Michigan, Commonwealth of Pennsylvania, City Court of Iberville Louisiana, Lexington/Fayette KY Detention Center, Los Vegas County Dept of Probation, Montgomery Alabama Work Release, New Jersey Juvenile Justice System, New Mexico Youth Opportunities Unlimited, Philadelphia Juvenile Court, US Pretrial services California, Virginia Dept of Corrections, Wisconsin-Dane County Jail
Financial services	Associated Bank, TD Waterhouse, ABN AMRO, Bank Leumi, DOHA Securities Market, Int’l Bank of Miami, Banco Bradesco, Glenview State Bank, Banco Santander, BBVA Bank of Spain, Progressive Insurance, Allianz, Visa, Intrust Bank, AIM Funds, Ameritrade, Wells Fargo, Pershing, The Hartford, US Bank, Buywayz
Telecom & call Center	Bell Canada (2), British Telecom, Leaco Rural Telecom. Coop., AT&T, Mitel, Telus, West Interactive, Bell South, T3 Telecom
Healthcare	Health Management of Australia, Healthnet, Good Health Network, WellPoint
Transportation	Aeroplan, Union Pacific Railroad, Canadian National Rail
Security	VeriSign, Smith & Wesson Security Services,
Distance Learning	Language Testing International, I Drive Safely
Entertainment & consumer	Mattel/Radica, Austar, Gradiente

There are strong similarities between the current market for SIV and the pre-VoiceXML market for automatic speech recognition (ASR). Those similarities include:

1. The majority of the deployments are by large organizations.
2. Financial services is a market leader.
3. The bulk of the deployments are in North America.
4. Vendors dominate when it comes to solution providers. This dominance is not as total as it was for pre-VoiceXML ASR. The primary reason for this is that VoiceXML integrators are using tags to extend their solutions to include SIV.
5. There are those in the industry who oppose the development of standards – especially an API standard. Before VoiceXML was adopted there was a tremendous amount of opposition.
6. Customers are asking for standards. Some government agencies in the US – and possibly elsewhere – are very clear about not wanting to use technology that is not supported by standards. Some customers/end users ask specifically for BioAPI.

## 2. WHAT ARE THEY USING IT FOR?

Applications of SIV can be employee facing or customer/public facing.

**Employee-facing applications:** The dominant employee-facing application is password reset. Other applications include SIV for field service reporting (Bell Canada), physical and data access (Illinois Department of Revenue, Baltimore Dept. of Public Works, Yorktown Manor), wire transfer (InTrust Bank), access to internal/secured internal telephone calls (Government of Australia),

**Customer/public facing applications:** The dominant customer/public-facing applications are account access and related transactions. The most widespread variant of this is telephone banking. Other applications include background identification for calls to call center agencies or IVRs, railcar release (Union Pacific Railroad), embedded SIV, primarily in toys, PCs (Apple Computer), and automobiles.

In corrections, the most common applications are for electronic monitoring of community-release offenders and outbound calling by prison/jail inmates. SIV is also used to identify prison/jail inmates who are using the telephone to perpetrate criminal activities (Cook County Jail)

Law-enforcement and intelligence agencies use SIV to do lawful intercept for investigatory support.

**Multi-factor systems:** These are emerging applications. For example, intelligence agencies and researchers are using speech search and SI with broadcast news.

### 3. WHY ARE THEY USING SIV?

There are many reasons organizations are using SIV <sup>[1,2]</sup>. Many of them are tied to the use of automation for telephone calls, especially to and from call centers. Among the most common reasons for implementing SIV are:

**Cut costs:** Many organizations are using SIV as a way to cut costs: to automate simple, repetitive operations done over the telephone, primarily by call centers. A prime example is password reset which is a trivial operation from a technical perspective but which is highly sensitive from a security perspective. Cost cutting can take other forms, as well. Language Testing International, which assesses foreign-language skills of job applicants, uses SIV to reduce the cost of sending test proctors to “testee” locations.

**Reduce/prevent fraud or theft:** This is a common reason many organizations use SIV for account access and transactions. Some financial services institutions use SIV in a verification dialogue with a caller and with a “watchlist” to ensure that the caller is not a known criminal. Corrections authorities use SIV for outbound calls placed by prison/jail inmates to make certain that they are not abusing their calling privileges. VeriSign uses SIV over the “out-of-band” telephone channel during a Web session to reduce fraud for renewal of digital certificates. The City of Baltimore deployed SIV on the doors of several buildings to reduce the theft of equipment that was occurring after hours and on weekends.

**Improve service/customer service:** The most common service/customer-service drivers are to provide service 24x7 and to reduce wait time. The Union Pacific Railroad implemented SIV for customers to report their goods have been delivered and they no longer need the railcar used to ship them (:railcar release”). The SIV option eliminates the need to wait until a call-center agent is available. Some organizations have automated password reset with SIV to reduce employee downtime and speed issuance of new/temporary passwords. Others want to cut the length and/or invasiveness of the security operation while maintaining a high level of security. For example, Bank Leumi and a government customer of Canada’s IVRNet were able to drastically reduce the number of authentication questions asked of callers.

**Differentiate from competitors:** Corporations vying for customers in a competitive market may use SIV as a way to set themselves apart from their competitors. This is one of the reasons cited by I Drive Safely, a distance-learning offering courses to departments of motor vehicles mandating driving education for DUI and other driving offenses.

**Comply with regulations/legislation:** Financial services, telecommunications, and healthcare have regulations and legislation related to access to customer/patient data for purposes of data privacy, data security, or both.

**Improve coverage:** Community-corrections agencies use SIV and other automation to provide better monitoring of home and community-released offenders than can be provided through face-to-face contacts, alone. Similarly, SIV is used for intelligence operations that involve very large quantities of data, such as cell-phone traffic in the Middle East.

### REFERENCES

[1] Markowitz, J. 2008. *Voice Biometrics Products and Companies. Vol. 1: Vendors*. Chicago: J. Markowitz, Consultants.

[2] Daboul, C & M. Eckert 2006. *Speaker Identification and Verification Applications* (Internal Working Draft -- May, 2006). VoiceXML Forum Speaker Biometrics Committee.