

Secure Transactions in IVR Systems with Speaker Verification

Enhancing security with merged touchtone and Speaker Verification technologies

For the past two decades, IVR systems have been used to capture information over the telephone without any accurate means of determining the identity of the caller. While the use of a PIN could help prevent unauthorized callers from accessing the system, it offered no protection against two or more people working in collusion.

The Challenge

This LBi client is a service provider to a large number of federally funded agencies, each employing many field workers. They provide a wide range of billing, payroll and reporting services. For more than a decade, the client utilized the IVR application for the collection of data via the telephone, from field workers providing in-home services. The client wanted to demonstrate that reasonable efforts were being made to verify that callers into the VRU were the reported workers and not a third party attempting to defraud the system.

The client set a goal to increase system security and provide greater Identification Management services when field workers reported over the phone. The current technology could utilize passwords and/or caller-specific questions to improve reliability, however, this still would not verify the caller's identity to the level required.

Alternatively, the client considered verification by random site visits but deemed this too time-consuming and expensive, as well as impractical to implement on a large scale across an expansive geographical base.

The Solution

The client used the IVR application to record and bill services. They wanted to demonstrate that they could integrate technology within the IVR application to accurately verify a caller's identity.

The client acquired a license for Nuance Verifier, leveraging their existing investment in Nuance technology. Nuance Verifier is a software-based biometric application that builds Voiceprints of a person's speech and utterances and can score future comparisons of a caller's speech pattern against the recorded Voiceprint.

The client engaged LBi to build a prototype system that could demonstrate the capabilities of Speaker Verification in authenticating callers and enhancing the security of telephone based applications. The base level design allowed the Speaker Verification to:

- Prompt callers to enter their ID via touchtone
- Enroll callers by capturing their name three times to build a Voiceprint
- Permit authentication by comparing the Voiceprint to spoken responses
- Flag callers that fail authentication

Upon completion of the prototype system, the client was presented with the test results and a hands-on demonstration of the Speech Verification capabilities. The prototype was able to enroll and accurately authenticate each new entry into the database. All attempts to fool the system failed. We even tried using a digital voice recording as a ploy to enter the system as an unauthorized user entering fraudulent claims. The system responded as designed, detecting a failure to authenticate and flagging the transaction for review.

"The goal of the project was to take proven technologies to create an enhanced level of security in telephone based systems. Developing the prototype system required integrating multiple technologies including Java, HTML, C++, and SQL with the IVR capabilities" said Richard Teed, President, LBi Software Engineering. "This challenge to merge old and new technologies is tailor made for our methodology in building solutions".

While the client was impressed with the initial prototype system, it was suggested that an extra level of deterrent could be added by using multiple questions during the enrollment and authentication process. LBi modified the Speaker Verification prototype to ask callers five questions during enrollment and randomly ask a question during authentication. If the caller failed to authenticate, a different question would be asked with the caller being given three attempts to authenticate.

At the completion of this project, the client invited their largest service subscribers to view a demonstration of the technology. The subscribers were excited about the enhanced security capabilities and the feedback was extremely positive. The client then engaged LBi to produce a pilot application with full integration into the IVR application. The pilot application would be used by a limited population, but if successful, would then be opened to all of the subscriber's employees.

The Benefits

The new Speaker Verification system is already providing the client with tangible benefits while undergoing customer review prior to full integration into the IVR application production environment. With a successful demonstration system and initial pilot system, the client can show their commitment to security and fraud prevention.

For LBi's client, having Speaker Verification as an optional service will:

- Increase their revenue for services provided
- Maintain federal compliance for their subscribers
- Expand their subscriber base to include more companies requiring federal compliance

The system will allow subscribers to satisfy federal fraud detection and prevention concerns with minimal administrative overhead. The design of the application is to provide the field workers a secure environment in which to complete their transactions but not to hinder them from reporting transactions. In the event of a failed authentication, the system will highlight failures to management making the investigation of questionable transactions a more focused and timely initiative.