

## **Voice Biometrics Case Study: Government Service Insurance System**

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*A government employee pension program serving 1.5 million people in the Philippine Islands has become a showcase for voice biometric-based authentication to enable loan applications and payment distribution. At Voice Biometrics Conference London 2008, Jean Bengo, vice president of the Government Service Insurance System, shared the organization's experience and delivered insights into both its origins and technological underpinnings.*

### **GSIS Moves to the Forefront of Speaker Verification**

Opus Research has long thought that authenticating the identity (and indeed “liveness”) of recipients of government transfer payments is an ideal application for voice biometrics. Previously, we predicted Centrelink, the Australian social security service, to be the first large-scale implementation of voice biometric authentication for government services – and indeed its service went live on Telstra’s network last month.

Additionally, as showcased at Voice Biometrics Conference London last week, the Government Service Insurance System (GSIS) of the Philippines has undertaken a massive effort to utilize voice biometrics in authenticating user identities. GSIS, the primary pension program for about 1.5 million government retirees in the Philippines, is in the process of leapfrogging many of its peers in the transfer payment and loan application business by charging ahead with implementation of a system that extends the reach of its network of ATMs and wireless kiosks that support biometric-based authentication of members as part of simplifying and controlling loan application and benefit distribution.

### **Background and the Evolution of GVAPS**

GSIS was established in 1936 as the administrator of the pension fund for government employees. Today, it has over about 50 branches or satellite offices throughout the islands that comprise the Philippines. In 2004, GSIS introduced eCards as a major step toward extending services to members and pensioners with access to the network of ATMs supporting cards with the Visa logo.

This was the first step in a major conversion of the system’s underlying operations from what Vice President Jean Bengo referred to as a “social welfare fund” that operated at a deficit to a “social insurance program” that deployed leading-edge technologies to extend a broader spectrum of financial services (primarily loans) in addition to the disbursement of transfer payments to pensioners.

### **Introducing eCard Plus**

Two years later, GSIS hardened the network and broadened its reach with the introduction of a major upgrade to its services by upgrading to a new generation of “smart cards” that served as a GSIS identification card while continuing to provide transactional services through the network of ATMs.

The so-called “eCard Plus” added near-field communications (based on RFID). In addition to accessing the network of

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ATMs, the new card supported access to services through a network of wireless kiosks, called GWAP. The kiosks integrated a touchscreen, chipcards and “touchless” RFID-based interaction into the mix. Most importantly, (from the point of view of enabling biometric authentication) each kiosk supports fingerprint-based biometric authentication. Bengo observed that the use of a biometric delivers high levels of confidence when identifying members and authenticating their identity in order to carry out specific “frontline transactions,” referring to loan applications or arranging for disbursement of insurance payments.

The specially designed terminals streamline the processes involved in both user authentication and service delivery. As such, they mask the complexity of the interactions that take place in order to support such activity. As Bengo explains, the implementation called for unprecedented interaction and inter-networking between five different parties, referring to the member seeking a service, the GSIS agency providing the specific service, Unionbank of the Philippines, the telephone company serving the area, and the parent company (GSIS).

#### **Voice for Remote/Unattended Authentication**

By adding voice access for remote authentication, GWAPS has evolved into GVAPS. This program supports the effort to extend GSIS’s services coverage area by enabling members who already have the “eCard Plus” to carry out business without venturing to a bank branch or kiosk. With pensioners who live at some distance from a bank branch and find it hard to travel, GVAPS uses speaker verification (in this case deploying PerSay’s Vocal Password) to provide assurance that the caller is a registered GSIS member or pensioner.

Bengo points out that the Philippines is an archipelago that consists of over 7,000 islands and travel to some remote towns can involve hours of travel and the use of planes, boats and automobiles. Yet wireless carriers have done a very good job of extending their coverage areas across the islands, extending the reach of electronic services beyond those that can be offered through brick-and-mortar branches or kiosks.

GVAPS enables authenticated members to apply for loans or cash advances. In addition, and this may be the most important feature, it supports the “annual renewal of active status.” This is the core of liveness testing and, potentially, a service that Opus Research believes could be a model for pension companies and welfare organizations around the

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world to authenticate payments to recipients in a way that mitigates fraud.

### **The End-to-End Process**

ID proofing is only as efficacious as the initial enrollment process permits. In the case of GVAPS, users are required to have an eCard in their possession – making it explicit that, at some point, they appeared in a bank branch or GSIS office for face-to-face (or “attended”) identification by a GSIS Account Representative (called a “GAR”).

The GAR instructs the GSIS member or pensioner to say the digits 0 through 9 three times in order to complete the enrollment process. They await confirmation from the GVAPS system and, when received, the enrollment process is complete.

Extension of GSIS services to pensioners living abroad is one of the benefits of GVAP. To support remote, unattended enrollment and authentication, GSIS has turned to the use of Skype, specifically the use of broadband, Webcam-based video to support what amounts to rudimentary facial recognition. Prospective enrollees are required to have their passports and two other forms of identification and to be prepared to show them to the GAR through the Webcam.

Once their visual presence is established, they can use the GVAP system over Skype to provide the digits that support subsequent access and authorization.

Authentication is conducted over GSIS’s toll-free number through an interactive voice response (IVR) “teleservices” system. Callers are prompted to enter their eleven-digit GSIS membership number through the touchtone keypad then they are prompted to carry out their desired transaction. To complete the selected transaction, the caller is prompted to say the nine-digits three times in order to authenticate their transaction. Once they have completed the authentication process, they are prompted to say four randomly selected digits in order to authorize the transaction (much like a spoken signature). The order of digits is randomized to prevent the dreaded “replay attack.”

### **Global Implications and Opportunities**

In GVAPS, Opus Research sees the seeds of future large-scale, customer-facing voice biometric implementations. The evolutionary path that GSIS pursued is a roadmap, of sorts,

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for large insurance, financial services and “e-government” implementations around the world.

During tough economic times, “do more with less” will be a common theme heard among a multiplicity of e-commerce service providers. At the same time, due to financial incentives identity theft and related fraud is destined to grow. GSIS’s solution to its “island problem” has relevance for any business that requires strong authentication and identity proofing for distribution of entitlements to remote recipients, be it farmers in sparsely populated, rural areas or construction workers building future cities in the desert.

As GSIS illustrates, non-disruptive change is incremental. First came eCards, then eCard Plus, then the network of kiosks with biometric (fingerprint) readers, then extension to remote areas using wireless networks and acceptance of voice biometrics. Success hinged upon cooperation, participation, integration and inter-networking of wireless phone carriers, in addition to the five entities mentioned above.

The reward for successful cooperation is a global footprint of secure networks with potential to support e-commerce, e-government, and e-payments over telephone networks. Opus Research sees such programs as the sleeping giants of voice biometrics and speaker verification and we are grateful that GSIS has generously shared its experience thus far. We will watch with interest to learn more about user uptake and the patterns of adoption across eCards, kiosks and wireless phone-based authentication.

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