



The Computerworld Honors Program

Honoring those who use Information Technology to benefit society

Final Copy of Case Study

YEAR:
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STATUS:
Laureate

Organization:
CGH Technologies, Inc.

Organization URL:
www.cghtech.com

Project Name:
Federal NOTAM System (FNS)

What social/humanitarian issue was the project designed to address? What specific metrics did you use to measure the project's success?

Growth in air traffic has stressed an air traffic control system that has not kept pace with new technology in communications, navigation, surveillance and air traffic management. Air traffic controllers (ATCs) have been using a system, known as NOTAM (notice to airmen), for over fifty years concerning air travel safety. The system was conceived during an era when teletype was state of the art and for years has been ineffective and untrustworthy. Using the legacy system takes airport officials anywhere from 8 to 15 minutes to issue a NOTAM by phone. Pilots, controllers, and dispatchers are required to manually review any message that could impact safe operations. Each NOTAM is created in a non-standard format -- with cryptic abbreviation patterns -- which is difficult to understand, increases the risk of accidents in heavy traffic situations, and prevents integration with modernized air-traffic management technologies. This process runs a high risk of missing information or the untimely review of information. In the current concept of operations, NOTAM originators, which include airports, FAA Technical Operation Centers, cell phone tower operators, etc., are required to make phone calls to the Flight Service Stations and convey the changes and request the submission of a NOTAM. In addition to the delay of this critical information, mounds of feedback from the aviation community has indicated misreading and misinterpretation of information to the extent that the user community does not trust the legacy system. The FNS solution was built to address all operational and safety concerns raised by the aviation community and Congress and to enable the National Airspace System (NAS) to

move from technology that is no longer supported by the industry and take advantage of the FAA's NextGen modernization plan.

Please describe the technologies used and how those technologies were deployed in an innovative way. Also, please include any technical or other challenges that were overcome for the successful implementation of the project.

The new FNS modernizes and improves the collection, management, and distribution process of notices to airmen (NOTAMs), develops a time-efficient but fail-safe alternative to an antiquated, ineffective information dissemination system and is mission critical to the United States National Airspace System (NAS). NOTAMs convey vital potential life-threatening information -- about the need to alter planned flight patterns due to changes in the national airspace system -- to pilots, controllers, and others within the aviation community, and are typically issued for short periods of time and hence can change dynamically. This is true with conditions such as snow, ice, hurricanes, tornadoes, missile launches, fog, and presidential and VP travels. To address this critical communications issue, CGH's technical engineering staff was involved in the technical architectural design, development, and implementation of the FNS. The goal of this program is to provide a fully digital solution that can take advantage of advanced technology in communications now and in the foreseeable future. The FNS solution uses digital technology versus old 20th-century technology that was coupled with manual processes. FNS was developed following the service-oriented architecture principles, where the design specifically focuses on a customer service base where integration to other applications and software products is available. This new system combines both civilian and military NOTAMs into a single system to balance diverse customer needs from the airline industry to air traffic control (ATC), general aviation, international and military, as well as private airports. The FNS system is completely automated, creating unified documentation for all NOTAMs that are dispatched immediately.

Please list the specific humanitarian benefits the project has yielded so far.

In the current con-ops, the NOTAM originator has to call the Flight Service Specialist to issue a NOTAM. This is done over the phone and typically takes anywhere from 8-15 minutes for the NOTAM to be published for consumption by the aviation community. With FNS, the originator inputs the information using a choice of drop-down selections of locations, flight restriction causes, etc., using buttons and pre-defined information; then the notice is automatically prepared using a uniform template that will not have any data mistakes or misinterpretations and is submitted directly using the FNS application, which publishes the information in less than 5 seconds. Not only is using digital technology a huge time and cost saver, but the new modernization features also impact the safety concerns significantly, as mission-critical information is made available in seconds. The FAA has also experienced a huge cost savings, due to a decrease in resources required to review and approve the NOTAMs. The digital solution now makes it possible for airmen to retrieve and read their messages on handheld devices and graphic images such as maps, to help them visualize the information from any location. It also provides maximum flexibility for future changes and advancements and meets the upcoming global standard for aeronautical information exchange as the means of communication, thus ensuring global harmony. CGH used best-of-breed open source (non-proprietary), state-of-the-art products for designing the database incorporating business rules, and BPM (business process management) services/tools, completely automated system for managing the NOTAMs requirements. The system ensures security while providing simplicity in user access and minimal IT dependency, and provides user tools that offer ease of use and standardize and improve operations.

Please provide the best example of how the project has benefited a specific individual, enterprise or organization. Feel free to include personal quotes from individuals who have directly benefited from the work.

The FNS project when completed will meet the joint goal of the Department of Defense (DOD) and the Federal Aviation Administration (FAA) to have a single federal system with full International Civil Aviation Organization (ICAO) implementation. The ICAO is a specialized agency of the United Nations that codifies the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth. The FNS application was built based on the Aeronautical Information Exchange Model (AIXM), which is going to be the global standard for exchanging aeronautical information worldwide. This, in turn, will enhance aviation safety, as users (pilots) will get information globally in a standard manner.