decision Support System for US Air Force—Case Study

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The Problem

The U.S. Air Force needed to provide geographically-dispersed financial managers with better tools to manage day-to-day operations. Senior leaders required a near real-time snapshot of how operational entities were performing. Business analysts and resource advisors at all levels needed access to information down to the transaction level in order to do their research, analysis, and make timely decisions. This involved integrating financial data from multiple disparate financial systems with access to over 10 years of historical financial data. The users needed their answers returned in seconds.

A financial decision support system (DSS) capable of serving thousands of users around the world would serve that purpose. The DSS needed to be operational 24/7/365 for users in every time zone around the world. With limited resources, the USAF needed to keep development and deployment costs at a minimum while maintaining the flexibility to grow the solution as usage demanded.

The Approach

Teksouth realized early that the solution, ultimately named Commanders' Resource Integration System or CRIS, would push the limits of typical data warehousing solutions. The solution would need to meet several challenging requirements, including the following—

Remain Evergreen—The solution needed to be built on a technology platform capable of supporting continuous innovations spanning decades. Those innovations and upgrades would need to be applied with zero downtime.

Scale Infinitely—The solution needed to allow for unlimited growth at unpredictable rates, supporting usage and user adoption on demand.

Support Ad hoc Queries—Users required self-service and ad hoc flexibility for building their queries and reports. Canned or stock reports would not be flexible or sufficient and report modifications would be expensive and time consuming.

Support Role-Based Security Authorization—The system's security model required extensive data access controls since it dealt with highly-sensitive financial data.

Support Metadata ETL Process—A metadata-driven approach to data ETL was needed to provide the agility to quickly modify and add new data interfaces as business requirements change over time.

The Solution

Teksouth built CRIS using its EntelliFusion™ architecture. EntelliFusion™ is a turnkey enterprise decision support capability—a cloud-ready suite of tightly integrated products and services built on the latest Microsoft technology platforms. EntelliFusion™ is web-based and uses encrypted connections (HTTPS) so network traffic remains secure. Data is compressed by EntelliFusion™ to preserve bandwidth.

While many DSS implementations restrict or disable ad hoc queries due to performance problems and negative impact on system resources, EntelliFusion™ actually promotes their use. Use of ad hoc queries provides users at all levels with the information needed, exactly when they need it.

The real power of EntelliFusion™ lies in its ability to meet the diverse information needs of users at every level of the Air Force. EntelliFusion's™ metadata–driven, multi-tiered design, makes the creation of custom reports and dashboards both easy and secure for everyone. Regardless of the user's grade or position in the Air Force management structure, they only have access to data intended for their role and the dashboard / report interface is simple to use[1].

Results

Today more than 15,000 users rely on CRIS. The CRIS program has transformed the Air Force's approach to integrating data and providing information from disparate systems. CRIS provides mission critical financial data from 19 different interfaces and systems reporting from over 150 locations across the world.

The first phase of CRIS was deployed on a small scale as planned, with a limited number of users. The Air Force's Financial Information Systems Office (AFISO) was quite pleased from the beginning. As more of the financial community realized the power and ease of use of CRIS's analytical capabilities, they wanted access. Widespread use quickly followed. With EntelliFusion's™ scalable architecture, the transition from a few hundred users to thousands of users was straightforward and non-disruptive.

CRIS now has more than 15,000 users performing an average of more than 1.8 million ad hoc queries each month. CRIS has supported an average of 25 million user queries averaging 7-second response times each of the past three years (2015-2017). Users ran more than 2.8 million ad hoc queries during the fiscal year end surge in September with 3-second response times. CRIS now contains over 15 years of historical financial data. It has scaled out over multiple SQL Server instances. Its databases have tables containing billions of rows of data. It is now over 22 terabytes in size.

CRIS has become the largest financial data warehouse in the U.S. Air Force and arguably one of the largest and most active financial data warehouses in the entire Department of Defense. Each CRIS user, from senior leadership to the field site analyst, has the ability to "slice and dice" information and have it presented in a format that fits their analytical needs at any level of detail.

Summary of Benefits

Efficient, Convenient & Economical—Integrated information from multiple systems is accessed via a single decision support system. Ad hoc query capability does not require customized reports, which are usually expensive, require long development time, and are inflexible to rapidly changing requirements. User query results can be tens- to hundreds-of-thousands of rows with no adverse effects on the system or other users.

Flexible—CRIS' service-oriented architecture offers users and other systems the same self-service, ad hoc capability. Data can be extracted automatically using SOAP (Simple Object Access Protocol) web services.

Secure—Users get access to data from multiple systems using one role-based account. The architecture is configurable to support User name/Password, CAC only, or both—important since the DOD's objective is to eliminate User Id/password authentication. CRIS is configured for PKI (or CAC) only.

Reduces Risk—The ability to quickly make modifications and add data interfaces ensures that users make financial decisions with the best available information and without the delay of lengthy development efforts.

Conclusion

CRIS delivers timely, accurate, and easy to use data while providing superior support to Air Force financial analysts and decision makers. Users can see financial data at any level of detail 24/7/365 from anywhere in the world.