Exploring Innovation Leads to Data Analytics Phase I

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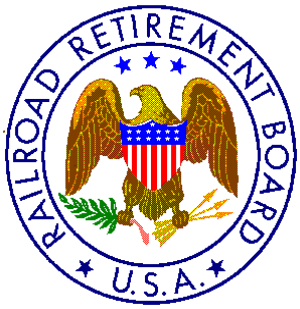

OFFICE OF INSPECTOR GENERAL
RAILROAD RETIREMENT BOARD

INTRODUCTION

In response to the Federal government's mandate to become more innovative, we were asked to explore how the Railroad Retirement Board (RRB) does business while considering best practices for streamlining agency business processes and developing a new approach for identifying areas for change. As a result, we developed a data analytics team within the Office of Inspector General (OIG), Office of Audit (OA). This paper describes the results of our research.

Background

The RRB is an independent agency in the executive branch of the Federal government. The agency administers retirement/survivor and unemployment/sickness insurance benefit programs for railroad workers and their families under the Railroad Retirement Act and the Railroad Unemployment Insurance Act. These programs provide income protection during old age and in the event of disability, death or temporary unemployment and sickness. In Fiscal Year (FY) 2012, the RRB paid over $11.4 billion in benefits to approximately 600,000 beneficiaries. The RRB also administers the Medicare program for railroad beneficiaries and contracts for the payment of their Medicare Part B claims. In FY 2012, the RRB's Medicare contractor processed more than 9.4 million Railroad Medicare claims, which represented approximately $849 million in payments for Part B medical services.

The OIG promotes economy, efficiency, and effectiveness in the RRB's programs and operations by focusing audit and investigative efforts on protecting the integrity of the RRB's trust funds and improving the delivery of benefits to the railroad community. This includes our goal to protect the integrity of the RRB's programs, operations, and trust funds by reducing the potential for waste, fraud, and abuse. The OIG employs 12 executive and administrative staff, including 1 information technology specialist; 20 investigators; and 17 auditors.

Methodology

To meet our objective, we:

- researched innovative accomplishments of other government and private organizations;
- solicited ideas for innovation from OIG audit and investigative staff;
- met with agency officials to discuss current practices;
- visited with other Federal OIG organizations to observe and discuss their data warehousing accomplishments;
- met with private consulting and data management firms to discuss methods and software tools they provide for data warehousing and analytics; and
- met with private corporations and auditing organizations to discuss innovative advances they have made in the area of data analytics.

RESULTS

Innovative Business Processes

We began our efforts by researching innovative accomplishments of other government and private organizations. We realized that true innovation demands a change in culture and business operations. One private corporation that offers consulting services for innovative business processes helped a private insurance company achieve improvements in claim management productivity of over 40% with reduced costs of approximately 25%. These accomplishments were achieved by changing a paper-based claims system to an automated processing system utilizing document imaging and workflow – operations the RRB has already placed in service many years ago.

We also solicited ideas for innovation from OIG audit and investigative staff. We found that our OIG staff had many good ideas, often centered on data analytics and fraud detection, a core goal of all OIGs. After presenting some initial ideas to the Inspector General (IG), we were asked to explore the possibility of data warehousing and analytics.

Data Warehousing and Analytics at Federal Agencies

We considered the accomplishments of three Federal agencies in the areas of data warehousing and analytics. The primary objective of these data warehouses is to identify potential fraud and questionable data. We found that the data warehouses and innovation labs are quite impressive and have already recouped the Federal government millions of dollars in recoveries.

These warehouses generally take many years to develop, one as much as ten years with expansion developments still occurring. We found that viable data warehouses require full time staff, often equivalent to approximately one-half of our audit department, just to maintain and keep the data current. New hardware and equipment must be purchased every three to five years, and initial start-up costs can be millions of dollars, more than our entire annual budget.

In addition to researching data warehousing efforts at other Federal agencies, we also met with private consulting and data management firms to discuss the methods and tools they offer for data warehousing and analytics. We found that products and services of each firm differ, with some data analytic tools costing as much as $800,000 to implement and full data warehousing costing even more. The cost estimates and resource requirements were similar to those cited by the Federal agencies we visited.

Because of the extensive resources required to develop and maintain a data warehouse, one Federal OIG has teamed up with their respective agency to share the cost of maintenance. Both the OIG and agency use the data for their individual reviews and operations. In pursuing this possible approach, we met with RRB officials to discuss their current practices and systems modernization project currently underway.

Systems Modernization at the RRB

Currently, the RRB's information systems consist primarily of mainframe databases, some as much as 30 years old (legacy systems), with separate data in differing formats. Additionally, the RRB has several local area network (LAN) and web-based systems that are used in conjunction with the mainframe databases to accomplish the RRB's mission of paying benefits to the railroad community.

The RRB started their system modernization efforts in 2004 when they began planning for the replacement of the agency's existing database systems to a more strategic database management system. In 2007, the RRB was in a position to begin a data optimization project of the newly converted databases. This project included analyzing the RRB's data for redundancies and similarities amongst the various data tables. The RRB's systems modernization project, currently underway since 2009, includes consolidating the various data sources in order to have fewer instances of redundant data. The RRB has approximately 300 data tables, of which 123 are master tables for individual systems. The goal is to reduce the number of master tables to about nine or ten, allowing all of the systems to use the same data tables. In essence, the RRB is building its data warehouse.

Because the RRB's data warehousing efforts are already underway and are not expected to be completed for several more years, we decided to pursue a more simplified approach of data analytics using auditing software.

Data Analytics Used in Private Corporations and Audit Organizations

We met with several private corporations and auditing organizations to discuss their successful innovative advances in the area of data analytics. We once again found that the methods used differed widely, both in cost and products used.

We were particularly interested in one private auditing organization which described their accomplishments with data analytics in an environment similar to the RRB, one with many legacy systems. They use an auditing software product we already have at our disposal, Audit Command Language (ACL).[1]

OIG-OA Plans for Data Analytics

Based on our current level of staffing and resources, the best approach for implementing innovation and reducing waste, fraud, and abuse at the RRB is to start with improving our own methods and abilities for data analytics. In this respect, we proposed a plan to the IG for implementing our use of ACL by sending individual auditors to formal training classes and purchasing hardware and licensing that would allow a team of auditors to use the software in a LAN-based environment.

[1] ACL is a tool that lets you read and analyze data. It is used by data analysts, auditors, accountants, and other business professionals who need timely access to data and the means to analyze it efficiently and effectively.

Our team of specially trained auditors will be responsible for performing both data analytic reviews for the OIG in addition to their normal audit duties. This will allow us to implement data-mining and analytic techniques to support our audits and investigations with minimal disruption to our normal operations, while gaining expertise with ACL. This approach differs from the Federal agencies we visited that have full-time, dedicated staffs devoted to data warehousing and analytics.

The IG has approved our proposal and work is now in progress for full implementation. Currently, our team of three auditors and one information technology specialist has completed their initial training course. Our information technology department is in the process of expanding our LAN storage capacity and implementing a virtual LAN environment with multiple versions of ACL software. Once this is complete we expect to work with the RRB and the agency's Medicare contractor to obtain downloads of selected data for analysis. As funds and resources become available, we expect to increase the number of auditors trained in the use of ACL software as well as obtain more advanced training for those currently trained.

Conclusion

Although data warehousing and analysis requires extensive resources to develop and maintain, Federal agencies have recovered millions of dollars in improper payments and cost savings as a result of this innovation. Efforts are underway at the RRB to modernize their database systems; essentially, the beginnings for creating a viable data warehouse. The OIG is implementing a plan for data analytics using auditing software which will allow us to identify opportunities for reducing waste, fraud, and abuse, as well as areas for innovative change at the RRB.