



Data Warehousing and Audit Selection

Rich Clum – Ohio

Roger Koss – Illinois

Gideon Lowe - Michigan



Biographies and Brief Introduction

- **Richard Clum - Administrator, Ohio Department of Taxation**

- 11 ½ year employee with the Ohio Department of Taxation. Major role in overhaul of the Audit Division's Case Management System, Data Analytics Initiative, Audit Selection Process and creation of new audit programs, which included the development of 80+ custom audit models. Currently leads a team that focuses on Business Intelligence and Business Analysts.

- **Roger Koss**

- 36-year employee with the Illinois Department of Revenue where he has served as Revenue Auditor and Audit Supervisor. Currently a Field Compliance Division Manager which oversees the operations of approximately 300 auditors located within Illinois and areas throughout the U.S. The Division conducts approximately 4,000 audits per year in the areas of Sales and Use Tax, Business Income Tax and other Miscellaneous Taxes. Graduated from Illinois State University with a BS in Accounting in 1983 and passed the CPA exam in 1986.

- **Gideon Lowe**

- 3 year employee with the Michigan Department of Treasury. Previously served in leadership roles with Target and Thermo Fisher Scientific in their Supply Chain and Distribution area. His team supports the supply of data to all Treasury Data Warehouse users, and focuses on process improvements to support Data Analytics and Governance. Graduated from Michigan State University with a degree in Packaging, and is currently pursuing a Masters of Science in Business Analytics from Michigan State University.

Ohio

Data Warehousing

- Record and analyze as many data points as possible
 - Case Management
 - External Data
 - Ohio Return Information
- Measurable data is mined in Audit Lead Management System
 - Separated by Full-Scope and Limited Scope
 - Machine Learning/Predictive Models, Trending Models, Post Audit Compliance Models, Comparison Models, Etc.

Audit Selection

- Consists of 5 Specialized Auditors
- Reviews leads from 63 different analytical models
 - Audit pool reduced from entire tax population down to approximately 100k of model identified “non-compliant” taxpayers.
 - Many of the models quantify the leads giving them a score, level of non-compliance, or estimated under-reported amount
- Leads are dispositioned as good or bad and processed back through the model selection algorithms, which allow them to make more accurate predictions
 - Good leads are placed in a queue and assigned to auditors as they request work.
 - Completed audit results are tracked in our case management system and fed back into our audit selection models.
- New methodology increased efficiency by 56% and 29% for our two main tax types
- Generated \$90 million in revenue from new program types

Illinois

Data Warehousing

- Information obtained from 3rd Parties
 - Federal Extracts
 - Corporate Affiliations
 - W-2 Data
 - Sister Agency Data – Intergovernmental data sharing agreements are required
- Data Analytics
 - Business Intelligence data
 - Historical data based on prior audits and types of businesses

Audit Selection

- Centralized staff of Audit Planners located in Springfield, Illinois headquarters
- Audits are assigned a level based upon various factors. Audits are then placed in a supervisor's inventory for assignment to the appropriate level of auditor
- Several categories of selection criteria – audit referral, audit request, targeted issues, random selection, mandatory follow-up audits
- Discovery auditors work on leads established based on criteria

Michigan

Data Warehousing

- Enterprise wide Teradata platform
 - Multiple agencies utilize the platform
 - Supported by centralized IT through Data Center Operations
- Approximately 3000 users/accounts
 - 150 Treasury with 30 TB of data
- Various sources are integrated
 - IRS data
 - Business tax
 - Individual Income Tax
 - Other Agencies

Audit Selection

- Data replicated to SQL Server environment and viewed through ESKORT
- Population provided to Selection auditors based on rules
- Selection Auditors utilized data from data warehouse to make selection
- Integrating KNIME for further use in selection process
- Leveraging Data Analytics and Governance team for improved audit selection