2019 Mid-Year Data Analytics Update
July 2019

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Sam Gallaher, Audit Analytics Supervisor
Robert Persichitte, Senior Data Analytics Auditor
William Morales, Senior Data Analytics Auditor
Agenda

- Automating Analyses and Reporting
- Connecting to Workday
- New Analyses
- Audit Support
- Community Engagement
Automation of Analysis and Reporting

In partnership with the City’s Technology Services agency, we connected our audit software to an internally developed dashboard.
The Infrastructure

Databases and other data sources

Arbutus Server

Arbutus Desktop

Outputs

Scheduled Analyses

Source: Graphic designed by Auditor’s Office staff
The Infrastructure

Source: Graphic designed by Auditor’s Office staff
### Continuous Audit Team Journal of Analyses

<table>
<thead>
<tr>
<th>Project</th>
<th>Analysis</th>
<th>Records Reviewed (All time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfresco</td>
<td>Data Reliability</td>
<td>13,187</td>
</tr>
<tr>
<td>Alfresco</td>
<td>Splits</td>
<td>13,187</td>
</tr>
<tr>
<td>GENTAX</td>
<td>Write-off requests</td>
<td>12,333</td>
</tr>
<tr>
<td>P-Card</td>
<td>Recurring Purchases</td>
<td>228,951</td>
</tr>
<tr>
<td>P-Card</td>
<td>Risky Vendor Analysis</td>
<td>261,282</td>
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<td>P-Card</td>
<td>Split Transaction Analysis</td>
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<td>P-Card</td>
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</tr>
<tr>
<td>Short Term Rental</td>
<td>Error Rate</td>
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</tr>
<tr>
<td>Short Term Rental</td>
<td>Error Types</td>
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</tbody>
</table>
The Auditor's Office uses these metrics for risk assessment purposes and requires additional audit work to validate.
Improving Reporting and Analysis Efficiencies

Continuous Audit Team Journal of Analyses

Comments: P-Card-Split Transaction Analysis

Updated split analysis with Jan 2019 through June 2019 data directly from Workday webservice connection. Analysis shows a decrease in splits in 2019 compared to previous years. Note on the data: currently we are not able to identify if transaction was associated with a bid.

<table>
<thead>
<tr>
<th>User</th>
<th>Comment</th>
<th>Alert</th>
<th>Date</th>
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<tbody>
<tr>
<td>SBG</td>
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<td>07/09/2019</td>
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Connecting To Workday

In partnership with Technology Services, we developed reports in Workday that we run and analyze programmatically.
Connecting to Workday

Databases and other data sources

Arbutus Server

Scheduled Analyses

Arbutus Desktop

Outputs

Visualizations and documentation

Python Code

Reporting Dashboard

Source: Graphic designed by Auditor’s Office staff
Connecting to Workday

Source: Graphic designed by Auditor’s Office staff

Databases and other data sources

Arbutus Server

Arbutus Desktop

Python Code

Outputs

REPORTING DASHBOARD

Outputs

Workday

Web Service

Python Code

Scheduled Analyses

VISUALIZATIONS AND DOCUMENTATION
Next Steps: Automate

Databases and other data sources

Arbutus Server

Outputs

Visualizations and documentation

Reporting Dashboard

Web Service

Windows PowerShell

Arbutus Desktop

Python Code

Outputs

Source: Graphic designed by Auditor’s Office staff
New Analyses

Purchase Cards
Analyzed risky transactions through pass-through vendors (e.g. Amazon, Venmo, PayPal, etc.)

Gentax
Expanded analysis of write-off requests to review all tax types
New and Updated Analyses

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- **Purchase Cards**: Risky Transactions
- **Gentax**: Tax Write-offs
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Audit Support

The Data Analytics Team provides training, methodological, and data-related support throughout the year.
Audit Support: Training

- Six-hour training on audit software (Arbutus)
- Two-hour trainings on analysis software (Tableau)
- Four-hour training on statistical sampling
Audit Support: Completed Audits

Jail Safety Audit
- Data acquisition and analysis of jail population, staffing, and incidents
- Attribute sampling support for data reliability assessment

Contract Procurement Processes Audit
- Attribute sampling support
- Imbedded support for test work
Audit Support: Current Audits

- Denver’s Property Tax Spending for Intellectual and Developmental Disabilities
- Preserving Affordable Housing for Denver Residents
- Denver Preschool Program
- Property Tax Exemptions
Community Engagement

The Data Analytics Team is involved in the broader audit community — building knowledge and sharing analytical approaches.
Community Engagement

Association of Local Government Auditors – National Conference (April 2019)

• Four-hour workshop on statistical sampling
• Four-hour workshop on data analytics approaches

Institute of Internal Auditors (Sept. 2019)

• Presentation to Colorado Springs’ local chapter on setting up a data analytics program, including continuous auditing
Next Steps

- Continue to improve automation of current analyses
- Build reports from Workday to allow for continuous analysis of purchase orders and journal entries
- Data modeling for risk assessment