



DENVER
THE MILE HIGH CITY

Finance Analytics: Overview & Use Cases

March 18, 2022

Presentation to Annual Conference of National Association of State Comptrollers (NASC)
Oklahoma City, OK

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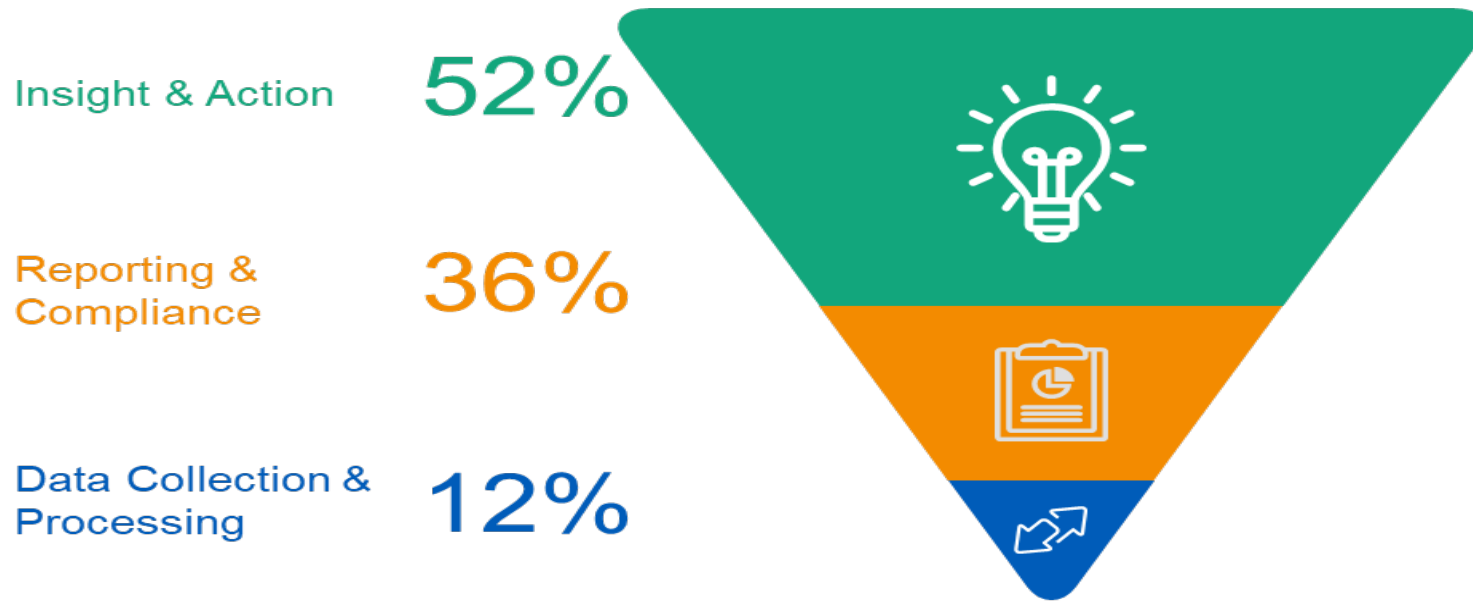
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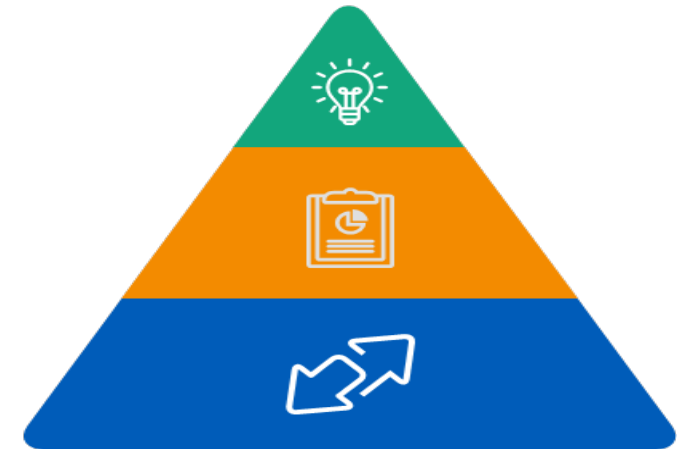
Finance Analytics : An Overview

Growing Demand for Finance to Deliver Insight

Digital 1st Organizations

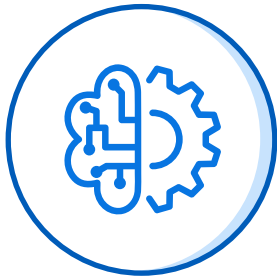


Traditional Level of Effort



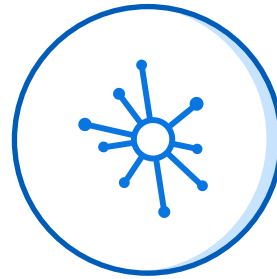
Source: How demand for insight is inverting the finance function, PwC.

Journey to Intelligent Finance Operations



Intelligently Automate

- Detect anomalies continuously to extract time and drive accuracy
- Recommend actions based on historical patterns
- Optimize business workflows and rebalance workload



Intelligently Analyze

- Democratize insight to empower all corners of the business
- Accelerate action from insight to seize opportunities
- Surface insights that answer the “why” behind the “what”

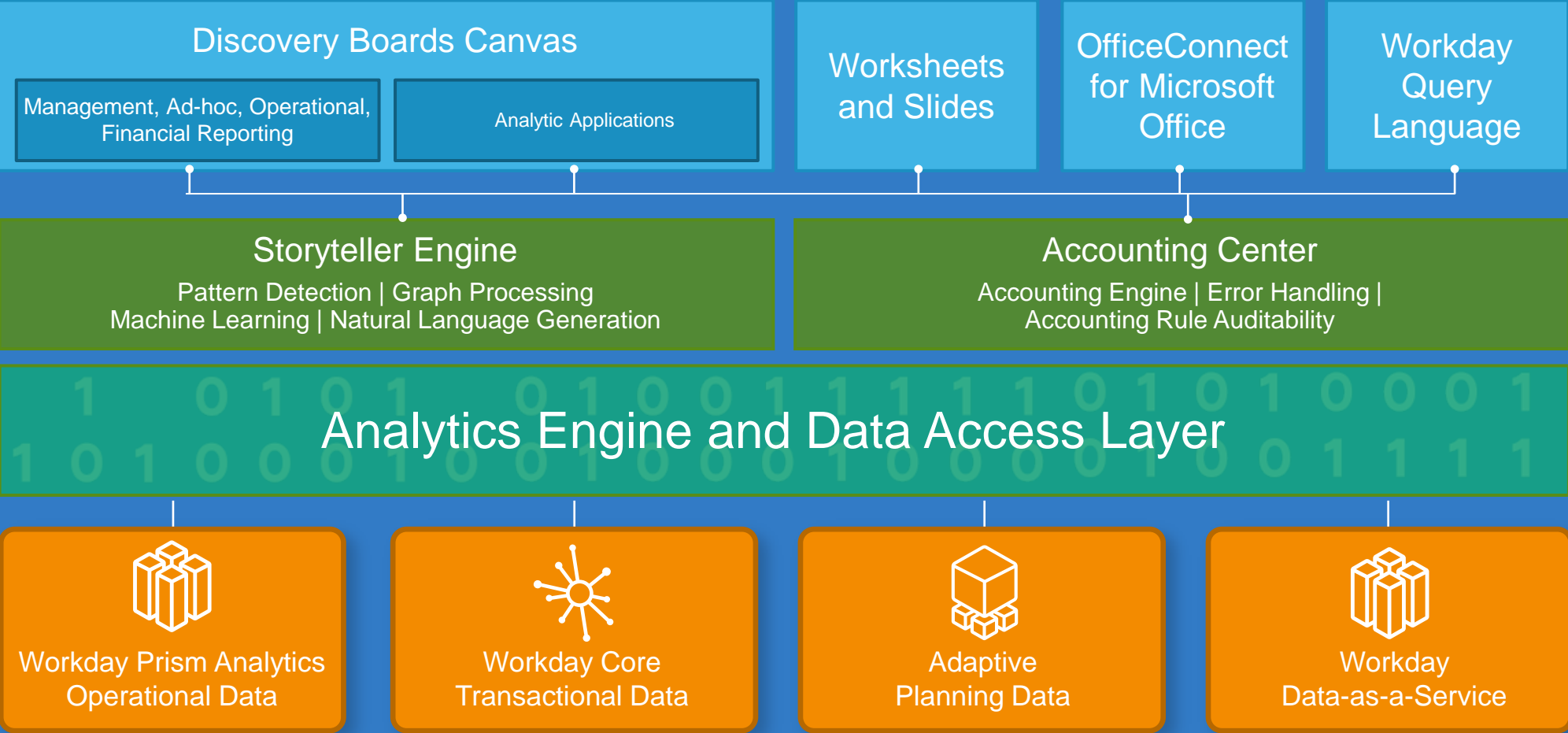


Intelligently Plan

- Course correct and drive financial results
- Forecast cash and liquidity with greater speed and accuracy
- Predict optimal resource allocation during uncertain times

Unified Analytics & Reporting Architecture

Augmented Analytics





Finance Analytics: Applications in the City and County of Denver



City and County of Denver

- **Operating Budget of \$2.54 billion in 2022, a 9.22 percent increase from 2021.**
- **21st largest city, growing at about 1,000 residents a month.**
- **650,000 residents**
- **14,000 employees**



The People of the City and County of Denver



Department of Finance



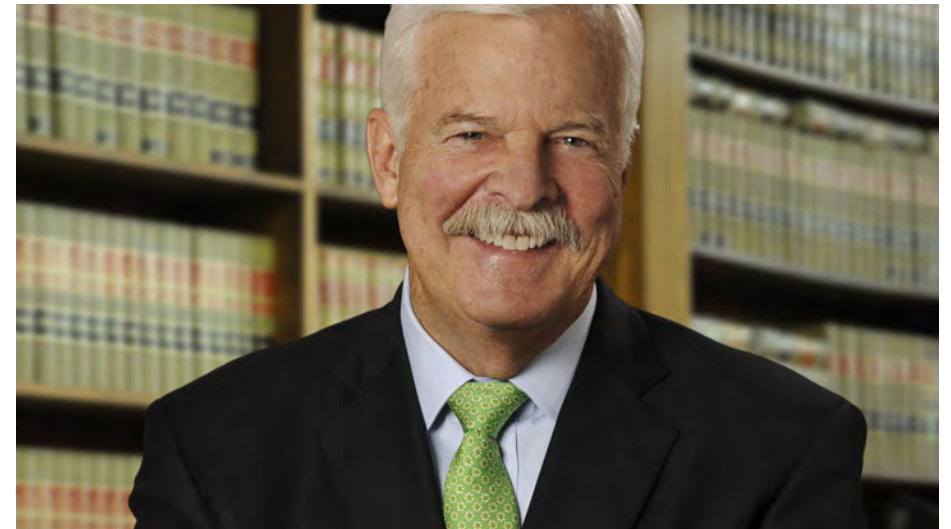
Denver Auditor's Office

- An independent agency
 - Auditor O'Brien is an elected official.
 - Audit function is defined in City Charter and provides broad access to information.
 - We conform to the Generally Accepted Government Audit standards (GAGAS) published by the U.S. Government Accountability Office.
- Denver Labor
 - Recovered over \$700,000 in unpaid wages in 2021.
- Audit Service Division
 - Completed nearly 50 audit products in 2021.
 - 41 auditors and...
 - Four members of the audit analytics team.
 - Two writing specialists.
 - A graphics specialist.

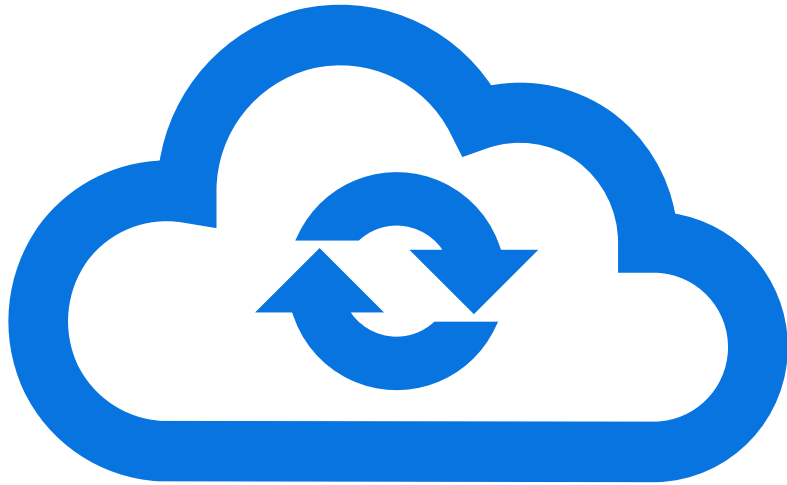


DENVER AUDITOR'S OFFICE
CITY AND COUNTY OF DENVER

AUDIT SERVICES | DENVER LABOR

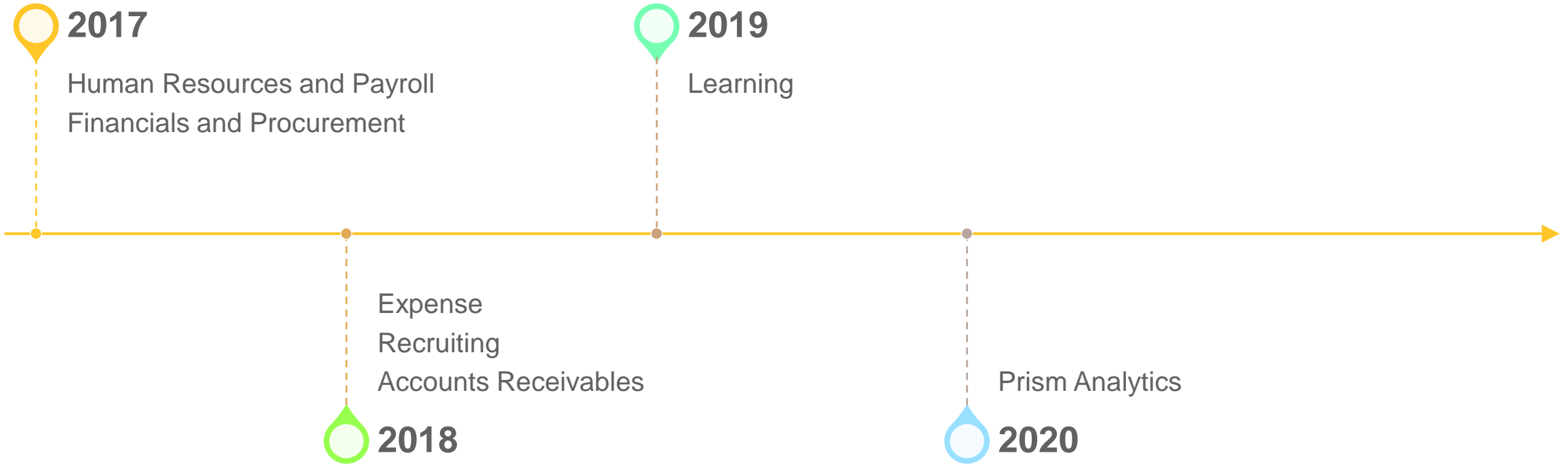


Denver modernized its ERP system on Workday. Driving factors included...



- The need for a cloud-based, flexible system that is easy to configure
- The ability to streamline business processes and support digital transformation
- Desire to reduce in-house support from levels required by the prior, on-premise ERP system
- A competitive RFP process was used to select Workday from among five vendor proposals

Implementation Timeline



Audit Analytics

a necessary response to the digital age

The audit profession is transforming in reaction to digitization occurring in organizations...

- Auditors are faced with massive amounts of data found in a range of sources and configurations
- Business and program functions are not only recorded digitally but can be entirely contained within ERP systems or other databases that handle workflows
- *The end of the paper trail*



Audit Analytics

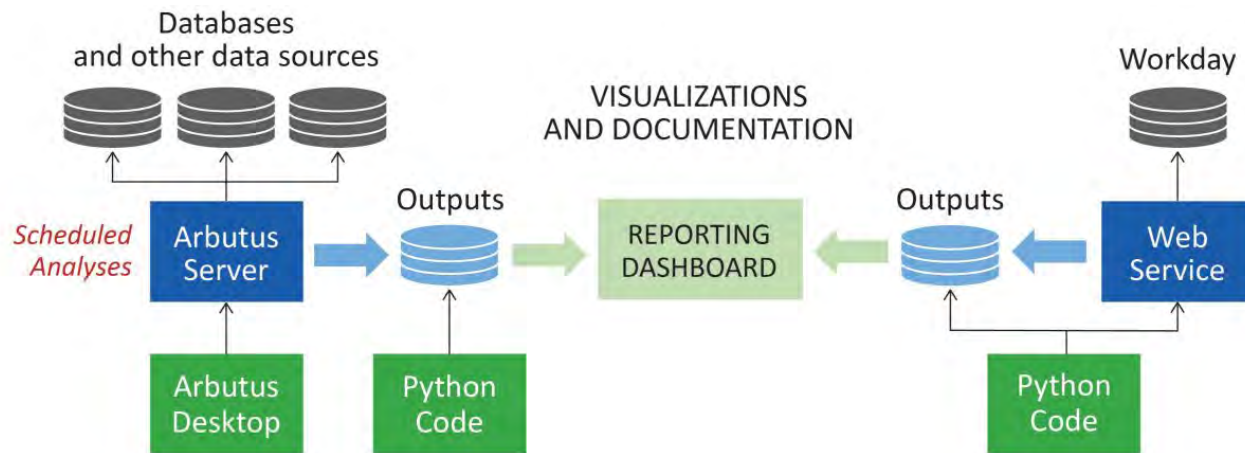
a necessary response to the digital age

Auditors are learning how to conduct control tests and risk assessments from databases.

- Testing entire populations of data, rather than samples.
- Using statistics to identify outliers, oddities, or fraud.
- Automating control tests (e.g., separation of duties).
- Digital communication opens new opportunities for audit functions (e.g., natural language processing on contracts or emails).



Connecting to Workday



denverauditor.org

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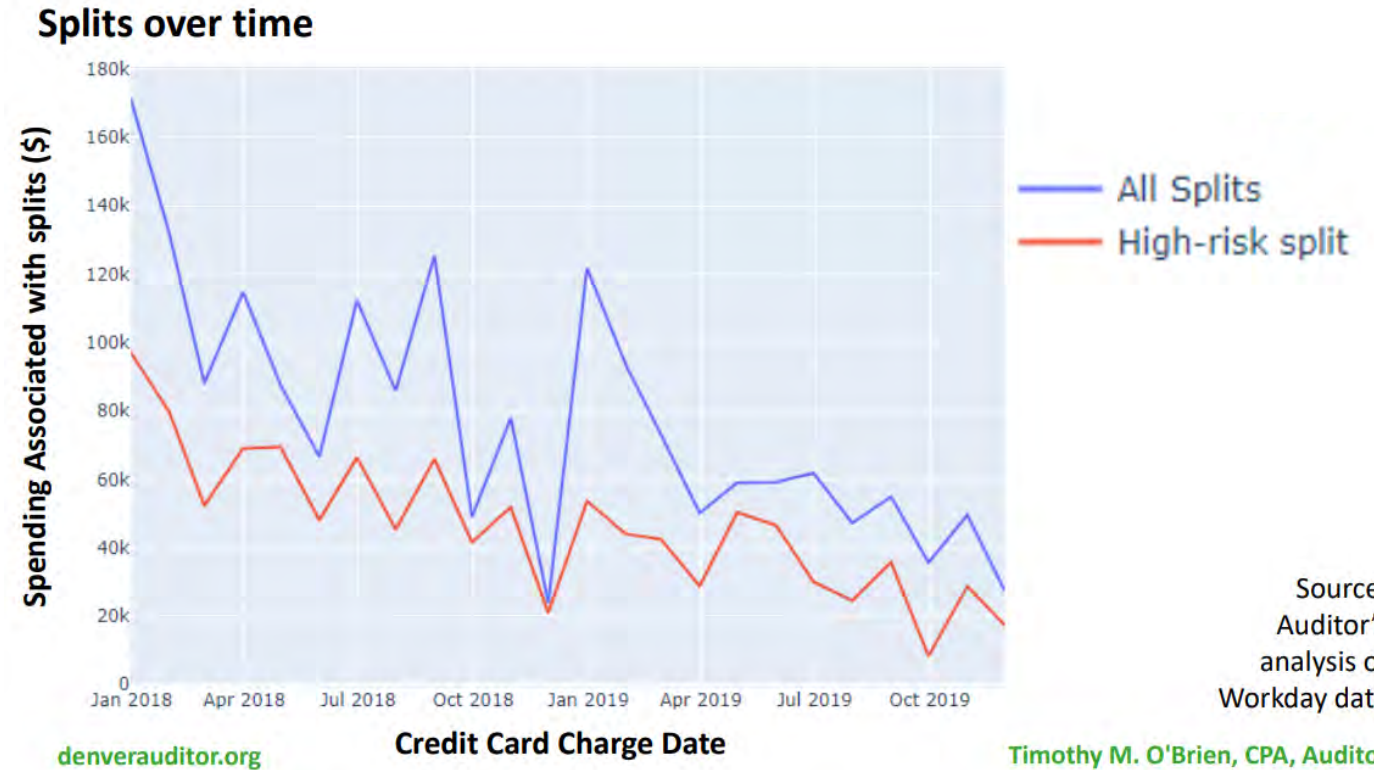
- Challenge: Cloud-based, object-oriented data
- Solution
 - Create a report in Workday.
 - Send to a Web Service.
 - Call the webservice through a REST API using Python.

Financial Analytics Use Cases from Workday Data

- Split Purchase Cards Transactions.
- Risky Travel Expense Reports.
- Ghost Employees.
- Risky Journal Entries.

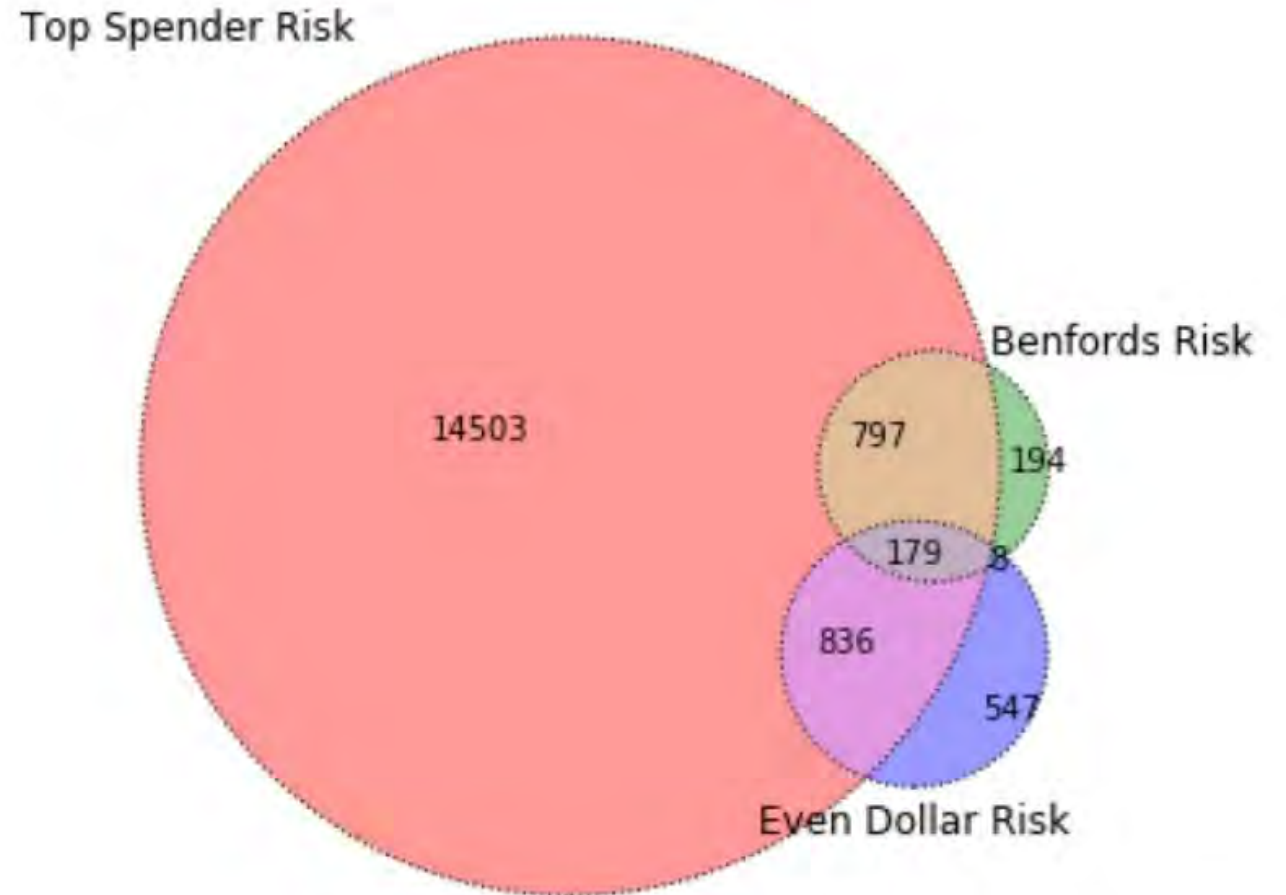
Purchase Card Splits

- Same card, same place, same day.
- Greater than 1 transaction.
- Total value is greater than single-purchase spending limit.



Travel Expenses

- Each expense report examined for three risks.
- Those three risk flags were treated as a 'high-risk' group.
- Auditors sampled and completed testing on the high-risk group.

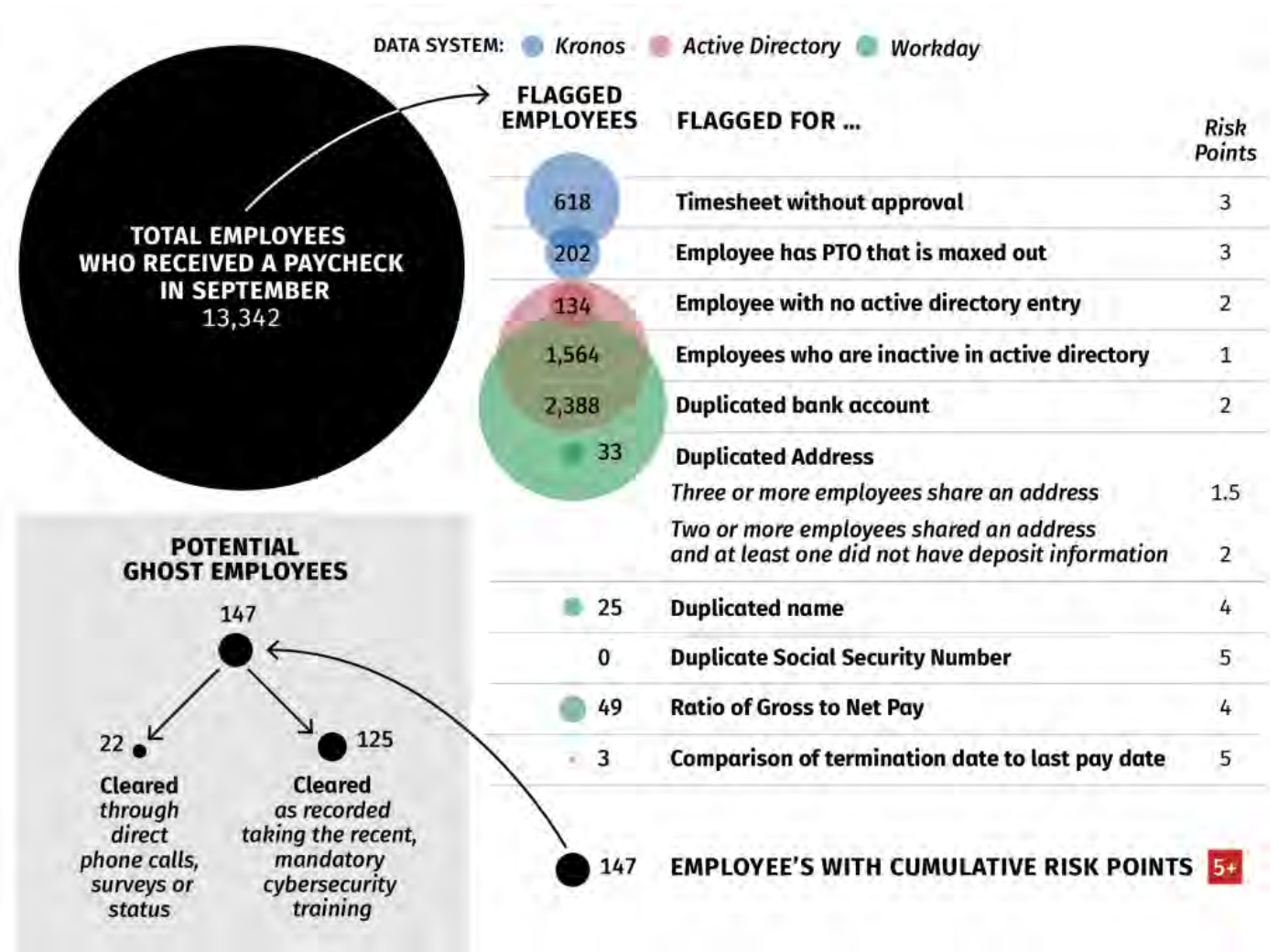


Source: Auditor's Office analysis of expense reports.
*These metrics are used only for risk assessment purposes and may require additional audit work to validate.

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Ghost Employee Risk Model

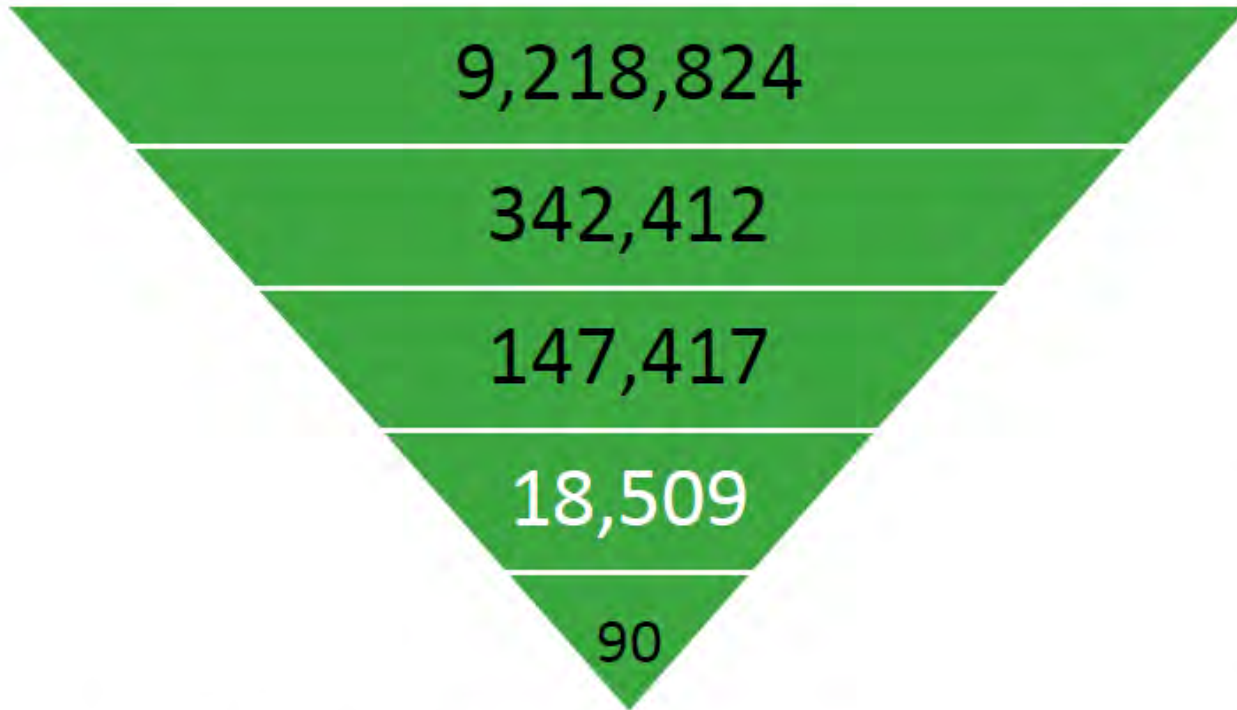
- Risk model using 10 factors, each with their own weight.
- Model identifies abnormal system use or uncommon employee activity.



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Risky Journal Entries

- Time of Day
- Day of Week
- Key words in memo lines



Total journal lines

Manual journal lines.

Entries without net-zero entry.

High-risk entries (one or more flags).*

Random sample for test work. Stratified across each risk analytic.

Source: Auditor's Office analysis of journal entries.

*These metrics are used only for risk assessment purposes and may require additional audit work to validate.

Key Takeaways

Benefits

- Quick, repeatable analyses for specific risks and controls.
- Analyzing entire populations rather than samples.
- View risks/control tests over time.
- May not find the needle, but we reduce the size of the haystack.

Current Limitations

- Most analytics need validation.
 - Processes allow for exceptions to rules.
 - Documentation can exist outside of the system or in an unreadable format.
- Large amounts of data are in free text fields and PDF.

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