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Forensic Data Analytics – Concepts and How to Apply Within an Organization

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Learning Objectives

At the end of this session, you will be able to:

- Discuss how forensic data analytic techniques can be used in investigations and audit procedures
- Discuss how to utilize knowledge of the internal control environment, the common types of fraud to develop a risk-based approach
- Recognize some of the commonly used tools

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Speaker Introduction

Principal
CLA's Digital Practice

He is an experienced financial consultant specializing in business analytics and digital transformation. He is backgrounded in fraud and misconduct investigations, forensic data analysis, litigation consulting, and fraud risk management.

Ryan Merryman

CPA/CFF/CITP, CFE

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Using a Data Analytics Methodology

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Risk Based Approach to Analytics

- Systematically identify greatest risk areas specific to your organization
- Tailor analytics to assess and better understand those areas
- Readily analyze 100% of the data rather than relying on samples
- Compare results across time, by location, by business unit, by supervisor, etc.

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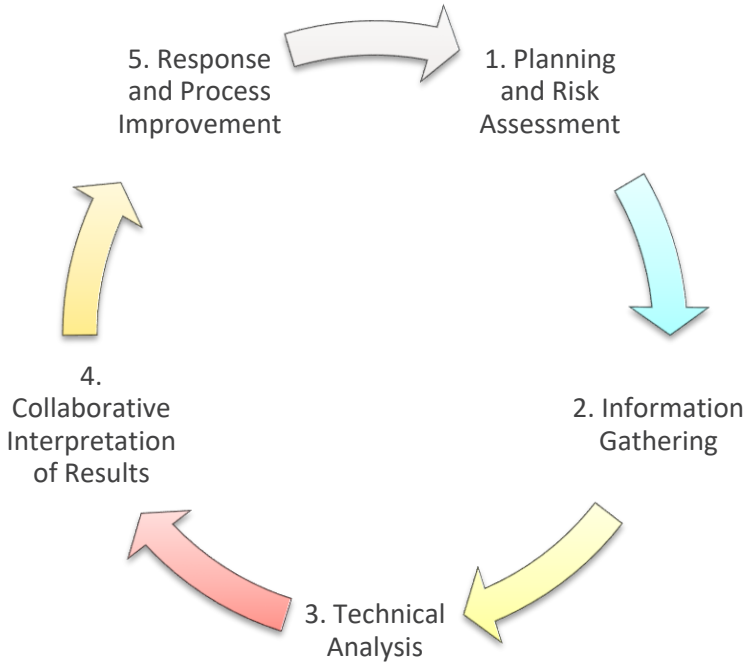
Data Analysis Methodology – 5 Phases



Methodology can be used for proactive and reactive data analysis. The following are common areas:

- Accounting - General Ledger/ Journal Entries
- Accounts Payable
  - Vendor Management
- Procurement Cards
- Travel & Entertainment
- Payroll

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Additional Strengths:

- Analytics can be designed and run in an automated and recurring fashion as needed. Core analytics could be performed in near real-time.
- The flexibility to run ad-hoc analytics will be available for auditors and managers to dig into and extract further information when desired.
- The analytics can take information from just about any system and in many different data types.
- The CLA methodology is not contingent on one software package. Often, a combination of analytics software packages provide the best results. For example,
  - analytics are performed in one software such as IDEA
  - reporting and visualization is done in another such as Excel/Power BI
  - Software become obsolete, whereas proven methodologies evolve over time

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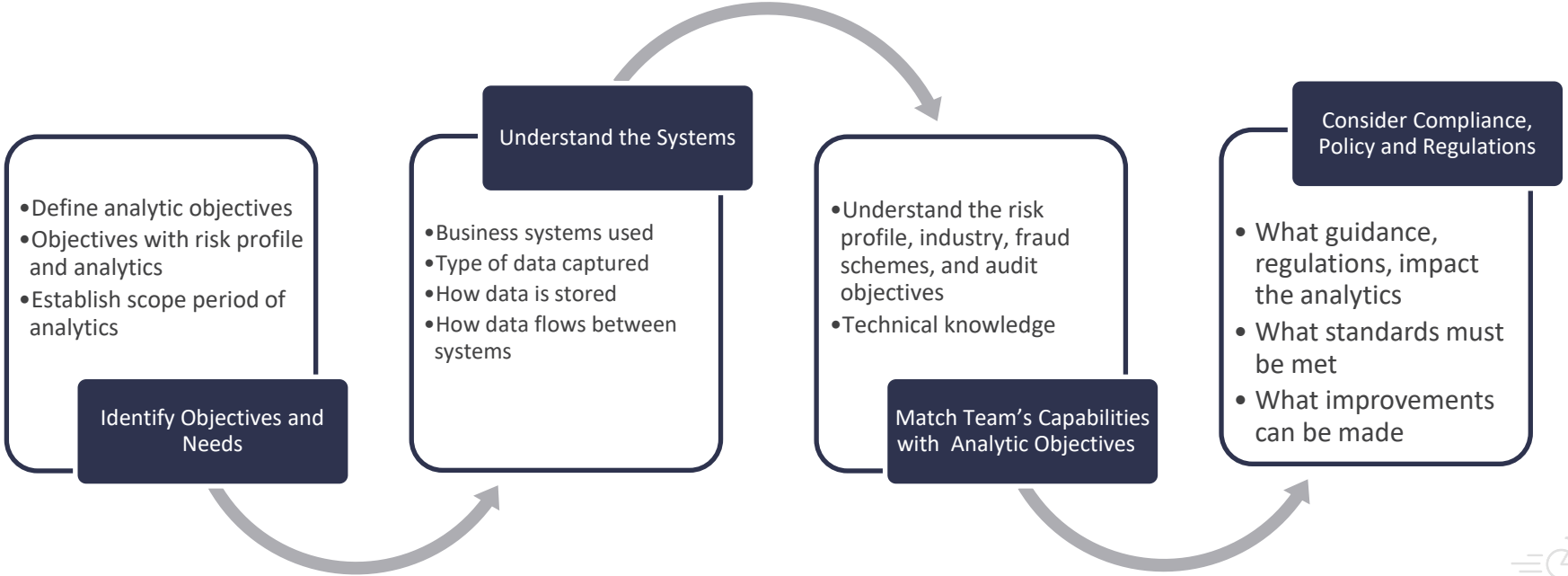
Planning

Planning is required to ensure that analytics are well directed and focused on accomplishing objectives



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Initial Risk Assessment

Risk assessment finds and evaluates the risks facing your organization and enables the design of analytics to address those risks

- A comprehensive risk assessment conducted by key members of management (and CLA where applicable) is critical to conducting an effective and efficient data analytics

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Data Acquisition

Data acquisition is the process by which the team obtain information from your systems:

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Technical Data Analytics - Design and Perform Tests

Analytic tests selected from the following five categories will provide insight into the areas being examined.

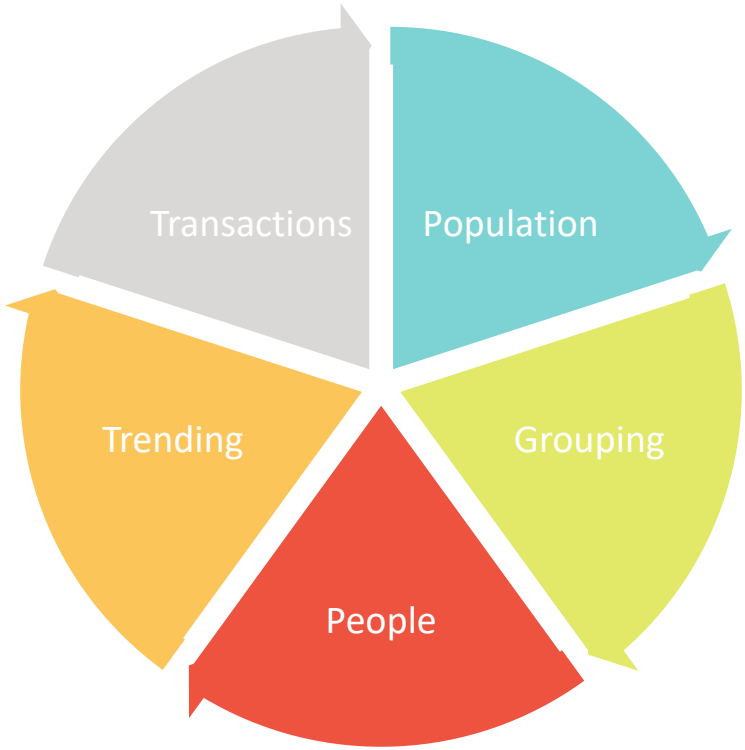
Population Analytics – Conducted to gain an understanding of the entire population.

Grouping Analytics – Summarize transactions into meaningful groups.

People Analytics – Designed to provide insight into who benefits from a transaction and who is responsible for the transaction.

Trending Analytics – Provide interpretive value by showing data results over time.

Transaction Analytics – Isolate transactions exhibiting particular traits or have a certain “DNA”. Rules based review.



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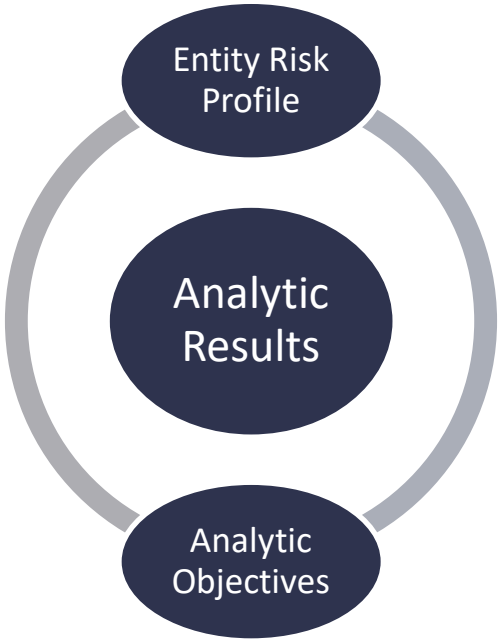
Interpreting Results



- Compare results to the initial risk assessment and expectations while considering analytic objectives
- Follow up on exceptions to better understand these transactions
- Data analysis results are unpredictable, therefore flexibility must be built into the work plan
- Continuously reassess results and risks and refine analytics

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4 Pillars of Success for Data Analytics Practice

Training	Resources	Organizational Leadership Commitment	Review of Work/Support
• The methodology • Applicable Risks • Software and Technical Data Analytics	• Provide a library of tools for the practitioner • Leverage Past Success and Best Practices	• Great messaging from leadership • Integration of Data Analysts into a cohesive team	• Application methodology requires review and support of leadership and team effort • Constant reevaluation and process improvement

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Training the Team:

Value of the training

- Group/collaborative
- Management participation
- Data literacy for the entire group
- All know and understand the process and sub-roles
- Knowledge of the process held with the group rather than one individual, or small group of individuals
- Future ability to perform testing independently as desired
  - Recurring
  - Ad hoc
  - Customized

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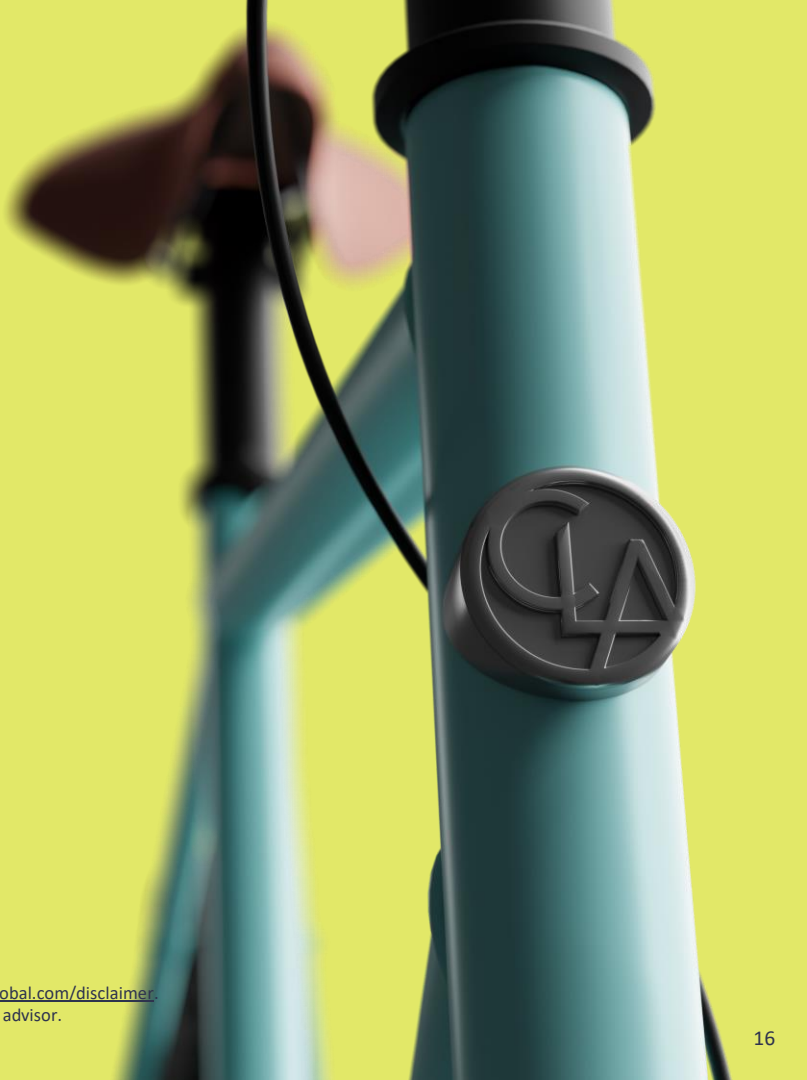
What is Alteryx?



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A Unified Analytics Platform

With Alteryx Designer, the power to solve is a simple drag-and-drop experience. Solve any analytic use case, regardless of your skillset, and see outcomes in record time.

Prepare, blend, and analyze data

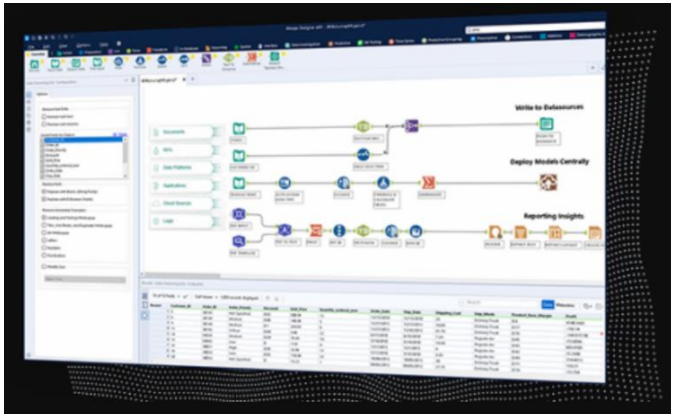
See how easy it is to prep, blend, and analyze data from any data source. Automate reporting, predictive, geospatial analytics, and more.

Low-code, no-code modeling & data science

Create advanced predictive and analytic models using dozens of no-code, low-code building blocks. Experience “expert mode” using integrated R and Python tools.

Location intelligence

Deepen analysis with location intelligence. Easily incorporate geographic information, connect to industry data sources, and enhance spatial and demographic analysis without code.



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BREAKING UP THE LANDSCAPE THE WHAT

Data Exploration

Data is provided by the Business & IT
First Line Support is provided by the Business

Functionally this swim lane represents the freedom to analyze data at one's own discretion. "Data Exploration" is all about agility and use cases in this lane may or may not even ever by published to Alteryx Server, as many "Data Exploration" use cases can be one-time analyses.

Self-Service Analytics

Data is provided by **IT**
First Line Support is provided by the **Business & IT**

Functionally this swim lane represents the balance between analytic agility and productionalized reliability. Use cases can evolve from the Data Exploration swim lane or originate here. Use cases in this swim lane are published to Alteryx Server (scheduled or for on-demand execution).

Full-Service Analytics

Data is provided by **IT**
First Line Support is provided by the **IT**

Functionally this swim lane represents IT Managed analytics and reporting solutions. Use cases can start as a Full-Service Analytics request, but most often Use Cases 'evolve' into the Full-Service Analytics swim lane after maturing through the Self-Service swim lane.

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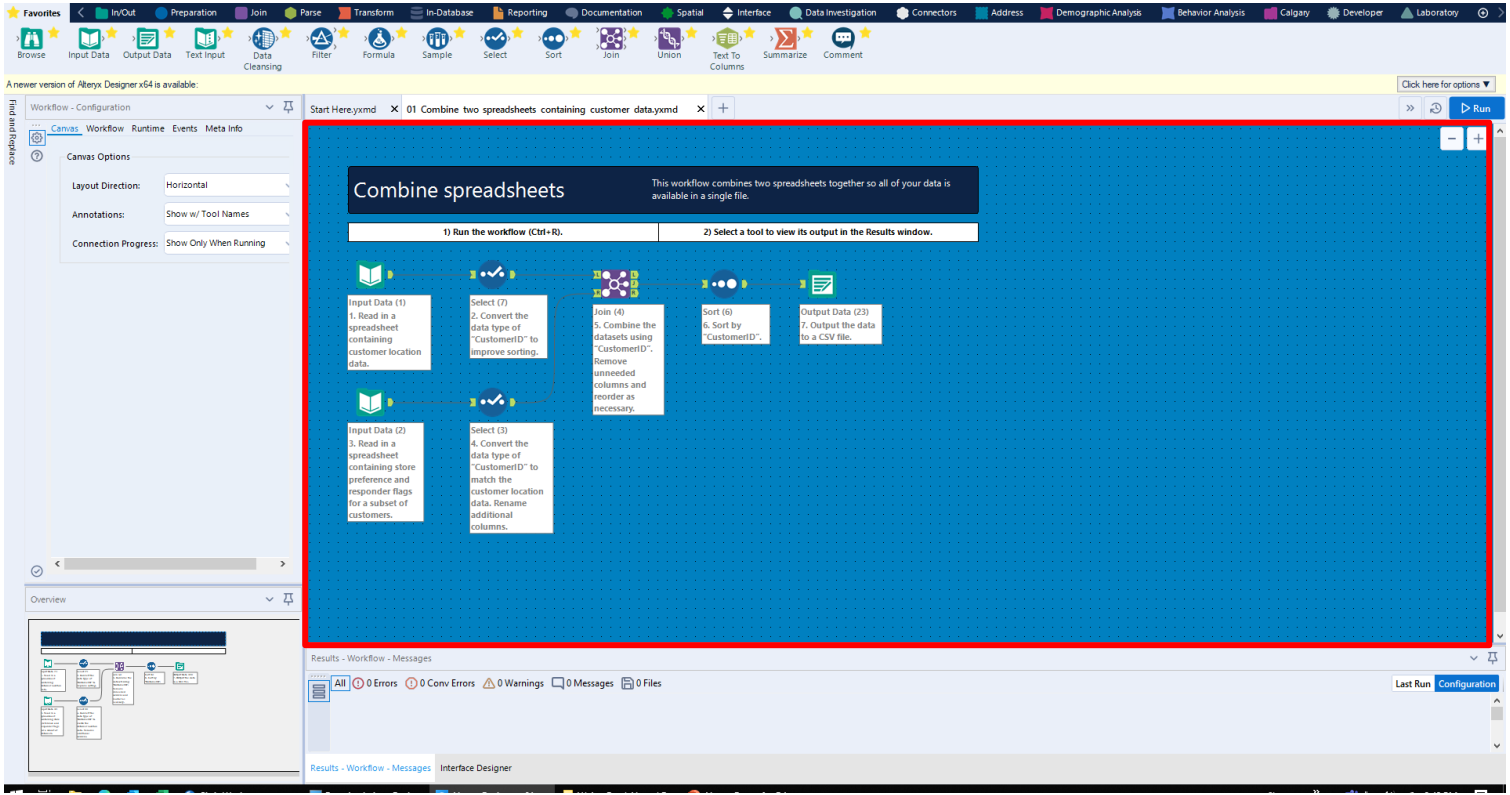
Alteryx Designer Overview – Canvas



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Tool Categories

Text Mining >

Analyze text data.

Machine Learning >

Create machine-learning models.

In/Out Tools >

Provide inputs and outputs for workflows.

Preparation >

Prepare data for downstream analysis.

Join >

Join two or more streams of data by appending data to wide/long schema.

Parse >

Separate data values into a standard table schema.

Transform >

Summarize or rearrange data.

In-Database >

Connect to a database and blend and view data.

Reporting >

Aid in data presentation and organization.

Documentation >

Improve workflow presentation, annotation, and tool organization.

Spatial >

Spatial data manipulation, processing, and object editing.

Interface Tools >

Design user interface elements for apps and macros.

Data Investigation >

Understand the data to be used in a predictive analytics project.

Predictive >

Predictive modeling, model comparison, and hypothesis testing tools

AB Testing >

Carry out A/B testing experiments.

Time Series >

Regular, univariate times series plotting, and forecasting tools.

Predictive Grouping >

Group records or fields into a smaller number of groups.

Prescriptive >

Determine the best course of action or outcome for situations.

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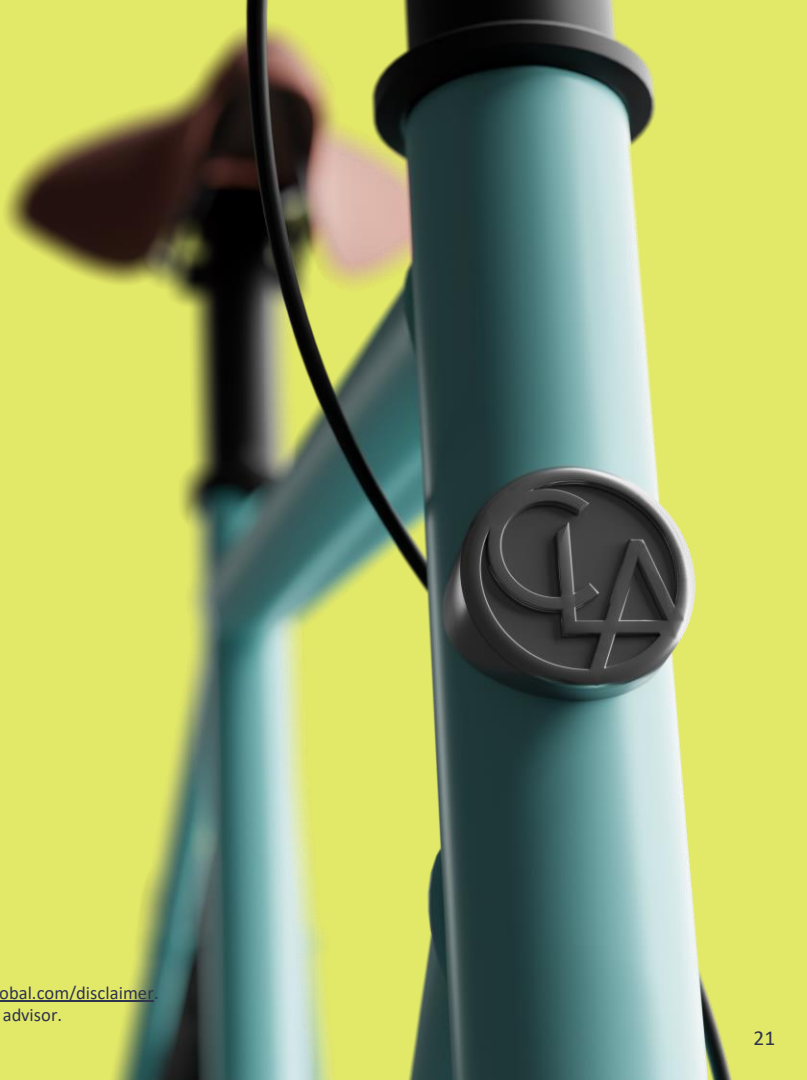
What is IDEA (CaseWare)?



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Tools of Trade: IDEA

- IDEA® Data Analysis Software is a comprehensive, powerful and easy-to-use data analysis solution designed by audit experts.
- IDEA accelerates data analytics, provides a more user-friendly experience and enables deeper insights in a timely, cost-effective manner for more informed business decisions

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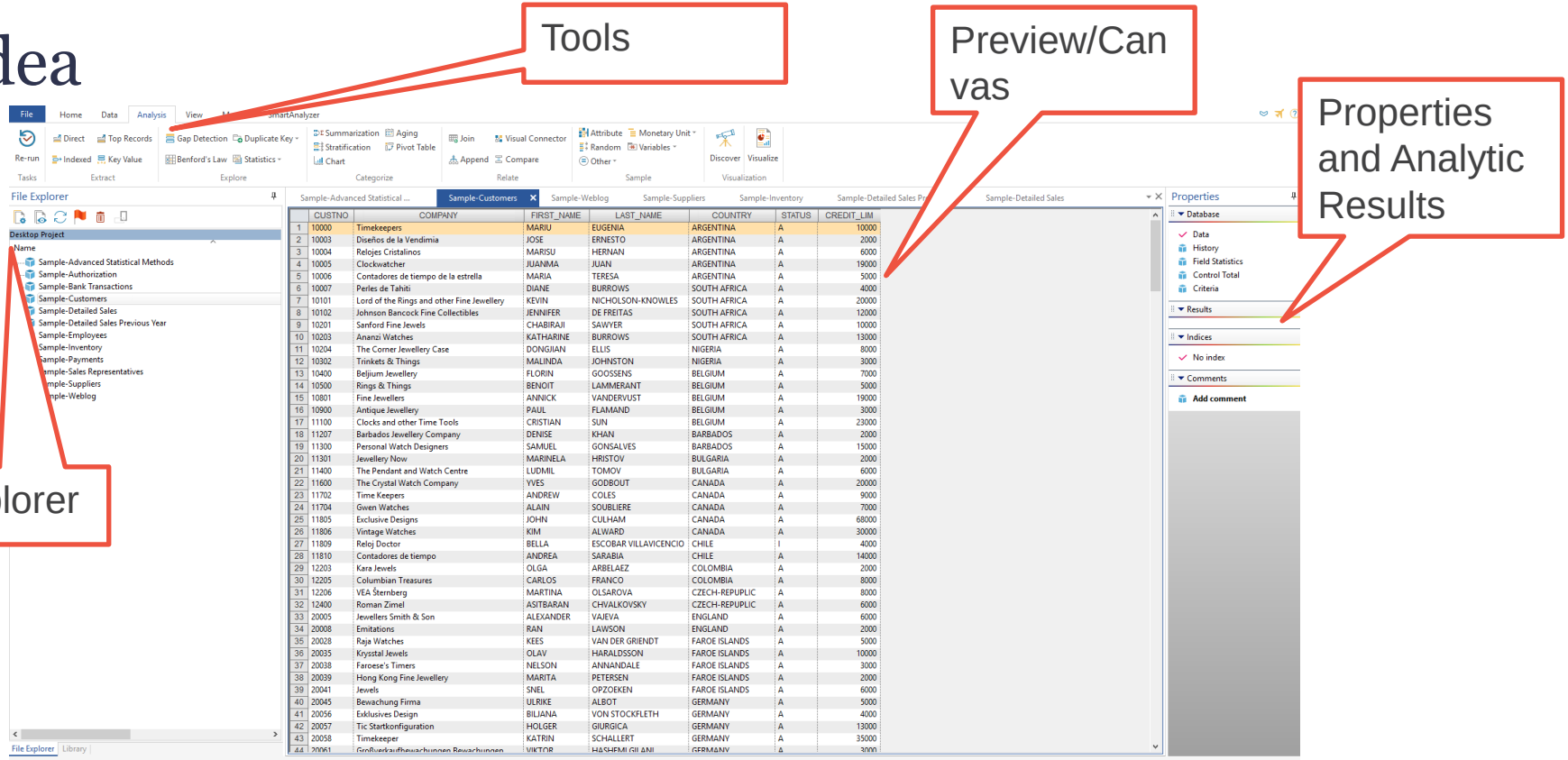
Idea



	CUSTNO	COMPANY	FIRST_NAME	LAST_NAME	COUNTRY	STATUS	CREDIT_LIM
1	10000	Timekeepers	MARIU	EUGENIA	ARGENTINA	A	10000
2	10003	Diseños de la Vendimia	JOSE	ERNESTO	ARGENTINA	A	2000
3	10004	Relojes Cristalinos	MARISU	HERNAN	ARGENTINA	A	6000
4	10005	Clockwatcher	JUANMA	JUAN	ARGENTINA	A	19000
5	10006	Contadores de tiempo de la estrella	MARIA	TERESA	ARGENTINA	A	5000
6	10007	Perles de Tahiti	DIANE	BURROWS	SOUTH AFRICA	A	4000
7	10101	Lord of the Rings and other Fine Jewellery	KEVIN	NICHOLSON-KNOWLES	SOUTH AFRICA	A	20000
8	10102	Johnson Bancock Fine Collectibles	JENNIFER	DE FREITAS	SOUTH AFRICA	A	12000
9	10201	Sanford Fine Jewels	CHABIRAJI	SAWYER	SOUTH AFRICA	A	10000
10	10203	Ananzi Watches	KATHARINE	BURROWS	SOUTH AFRICA	A	13000
11	10204	The Corner Jewellery Case	DONGJIAN	ELLIS	NIGERIA	A	8000
12	10302	Trinkets & Things	MALINDA	JOHNSTON	NIGERIA	A	3000
13	10400	Beljium Jewellery	FLORIN	GOOSSENS	BELGIUM	A	7000
14	10500	Rings & Things	BENOIT	LAMMERANT	BELGIUM	A	5000
15	10801	Fine Jewellers	ANNICK	VANDERVUST	BELGIUM	A	19000
16	10900	Antique Jewellery	PAUL	FLAMAND	BELGIUM	A	3000
17	11100	Clocks and other Time Tools	CRISTIAN	SUN	BELGIUM	A	23000
18	11207	Barbados Jewellery Company	DENISE	KHAN	BARBADOS	A	2000
19	11300	Personal Watch Designers	SAMUEL	GONSALVES	BARBADOS	A	15000
20	11301	Jewellery Now	MARINELA	HRISTOV	BULGARIA	A	2000
21	11400	The Pendant and Watch Centre	LUDMIL	TOMOV	BULGARIA	A	6000
22	11600	The Crystal Watch Company	YVES	GODBOUT	CANADA	A	20000
23	11702	Time Keepers	ANDREW	COLES	CANADA	A	9000
24	11704	Gwen Watches	ALAIN	SOUBLIERE	CANADA	A	7000
25	11805	Exclusive Designs	JOHN	CULHAM	CANADA	A	68000
26	11806	Vintage Watches	KIM	ALWARD	CANADA	A	30000
27	11809	Reloj Doctor	BELLA	ESCOBAR VILLAVICENCIO	CHILE	I	4000
28	11810	Contadores de tiempo	ANDREA	SARABIA	CHILE	A	14000
29	12203	Kara Jewels	OLGA	ARBELAEZ	COLOMBIA	A	2000
30	12205	Columbian Treasures	CARLOS	FRANCO	COLOMBIA	A	8000
31	12206	VEA Šternberg	MARTINA	OLSAROVA	CZECH-REPUPLIC	A	8000
32	12400	Roman Zimel	ASITBARAN	CHVALKOVSKY	CZECH-REPUPLIC	A	6000
33	20005	Jewellers Smith & Son	ALEXANDER	VAJEVA	ENGLAND	A	6000
34	20008	Emitations	RAN	LAWSON	ENGLAND	A	2000
35	20028	Raja Watches	KEES	VAN DER GRIENDT	FAROE ISLANDS	A	5000
36	20035	Krysstal Jewels	OLAV	HARALDSSON	FAROE ISLANDS	A	10000
37	20038	Faroese's Timers	NELSON	ANNANDALE	FAROE ISLANDS	A	3000
38	20039	Hong Kong Fine Jewellery	MARITA	PETERSEN	FAROE ISLANDS	A	2000
39	20041	Jewels	SNEL	OPZOEKEN	FAROE ISLANDS	A	6000
40	20045	Bewachung Firma	ULRIKE	ALBOT	GERMANY	A	5000
41	20056	Exklusives Design	BILJANA	VON STOCKFLETH	GERMANY	A	4000
42	20057	Tic Startkonfiguration	HOLGER	GIURGICA	GERMANY	A	13000
43	20058	Timekeeper	KATRIN	SCHALLERT	GERMANY	A	35000
44	20061	Großverkaufbewachungen Bewachungen	VIKTOR	HASHEMI GILANI	GERMANY	A	3000

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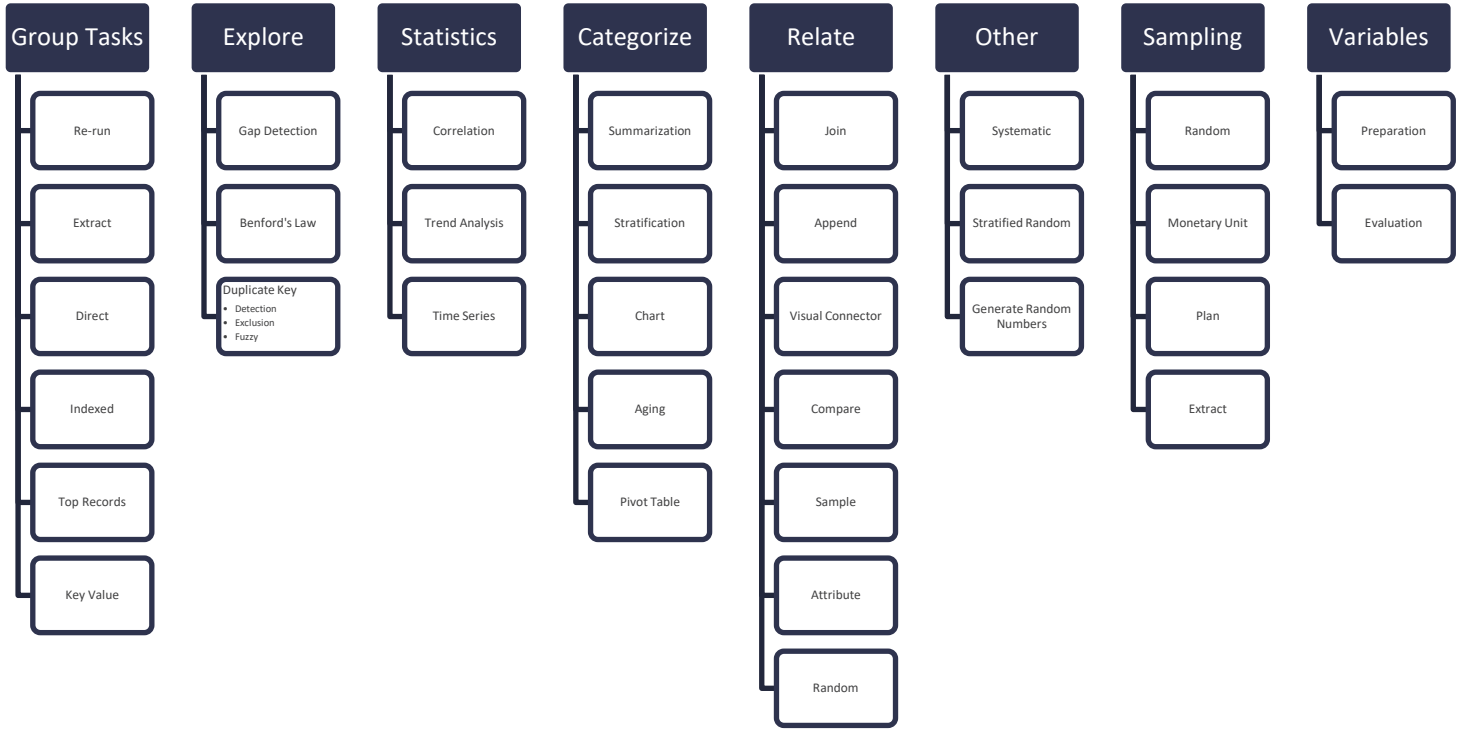
IDEA Functions – Data Interrogation – Audit Analytics



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What is Power BI?

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Tools of Trade: Power BI

Power BI is a collection of software services, apps, and connectors that work together to turn your unrelated sources of data into coherent, visually immersive, and interactive insights.

- A Windows desktop application called Power BI Desktop.
- An online SaaS (Software as a Service) service called the Power BI service.
- Power BI mobile apps for Windows, iOS, and Android devices.

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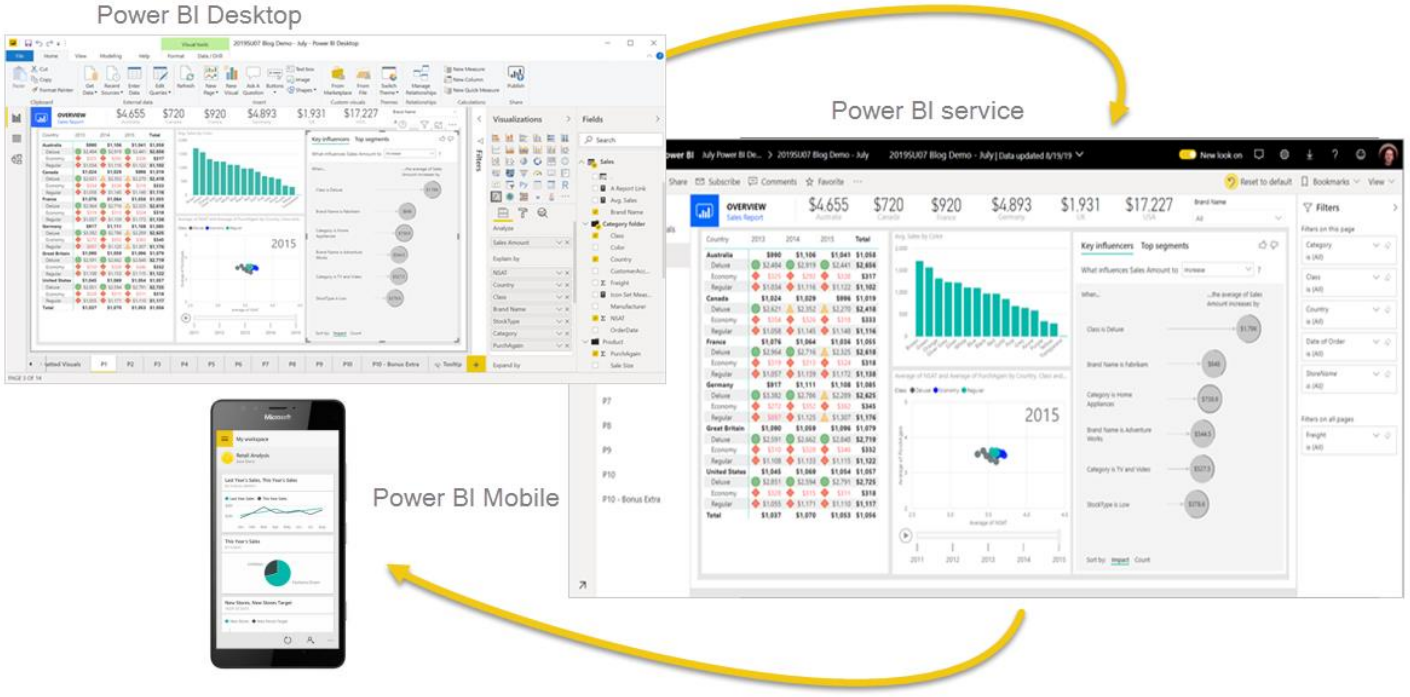
Integrated to Tools to Deliver:



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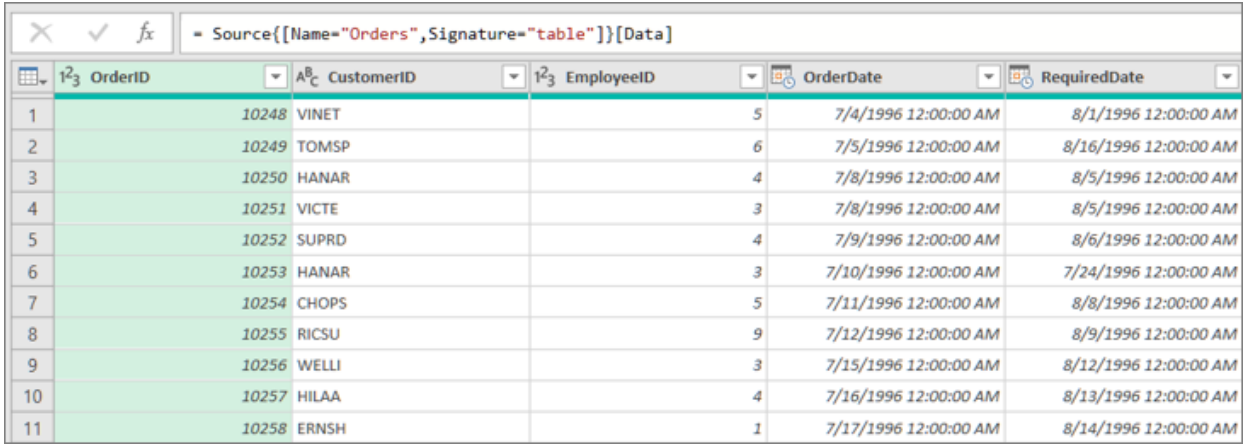
Power BI – Importing Data

Power Query –
Powered by M Code



	OrderID	CustomerID	EmployeeID	OrderDate	RequiredDate
1	10248	VINET	5	7/4/1996 12:00:00 AM	8/1/1996 12:00:00 AM
2	10249	TOMSP	6	7/5/1996 12:00:00 AM	8/16/1996 12:00:00 AM
3	10250	HANAR	4	7/8/1996 12:00:00 AM	8/5/1996 12:00:00 AM
4	10251	VICTE	3	7/8/1996 12:00:00 AM	8/5/1996 12:00:00 AM
5	10252	SUPRD	4	7/9/1996 12:00:00 AM	8/6/1996 12:00:00 AM
6	10253	HANAR	3	7/10/1996 12:00:00 AM	7/24/1996 12:00:00 AM
7	10254	CHOPS	5	7/11/1996 12:00:00 AM	8/8/1996 12:00:00 AM
8	10255	RICSU	9	7/12/1996 12:00:00 AM	8/9/1996 12:00:00 AM
9	10256	WELLI	3	7/15/1996 12:00:00 AM	8/12/1996 12:00:00 AM
10	10257	HILAA	4	7/16/1996 12:00:00 AM	8/13/1996 12:00:00 AM
11	10258	ERNSH	1	7/17/1996 12:00:00 AM	8/14/1996 12:00:00 AM

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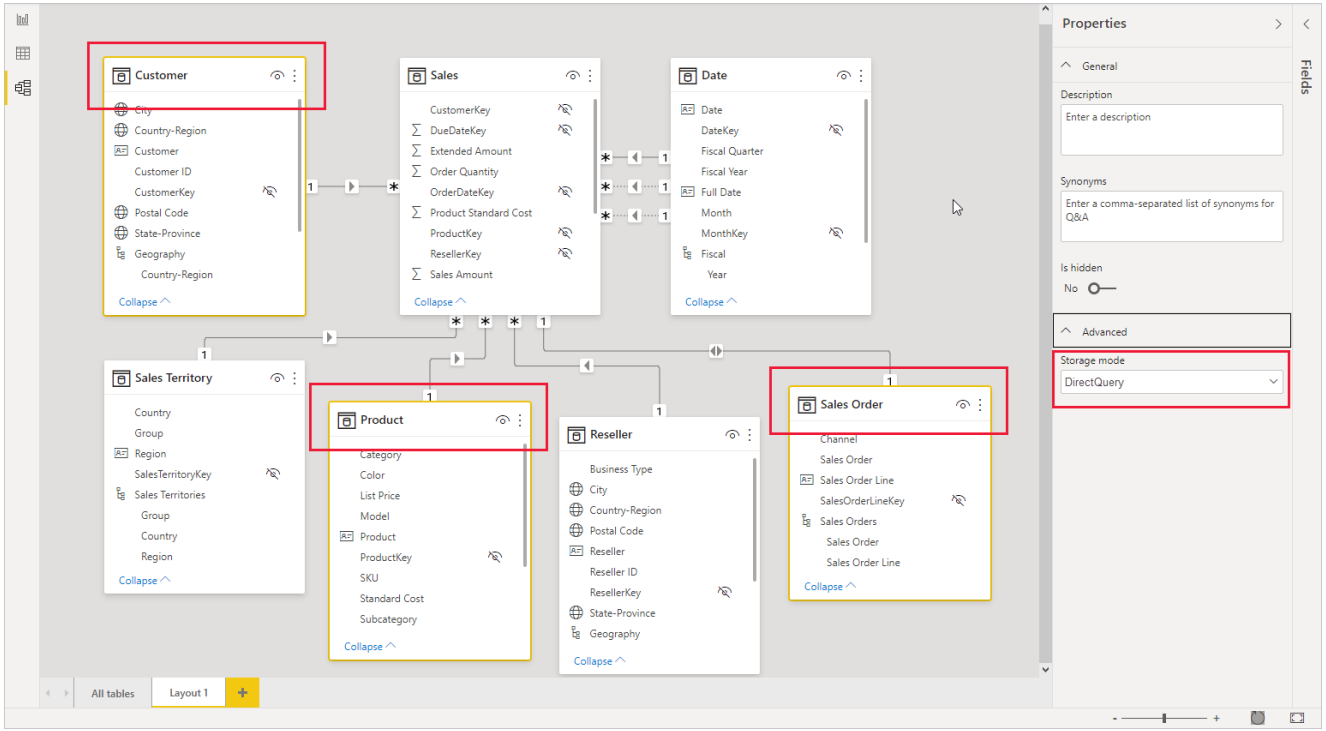
Power Bi – Data Model



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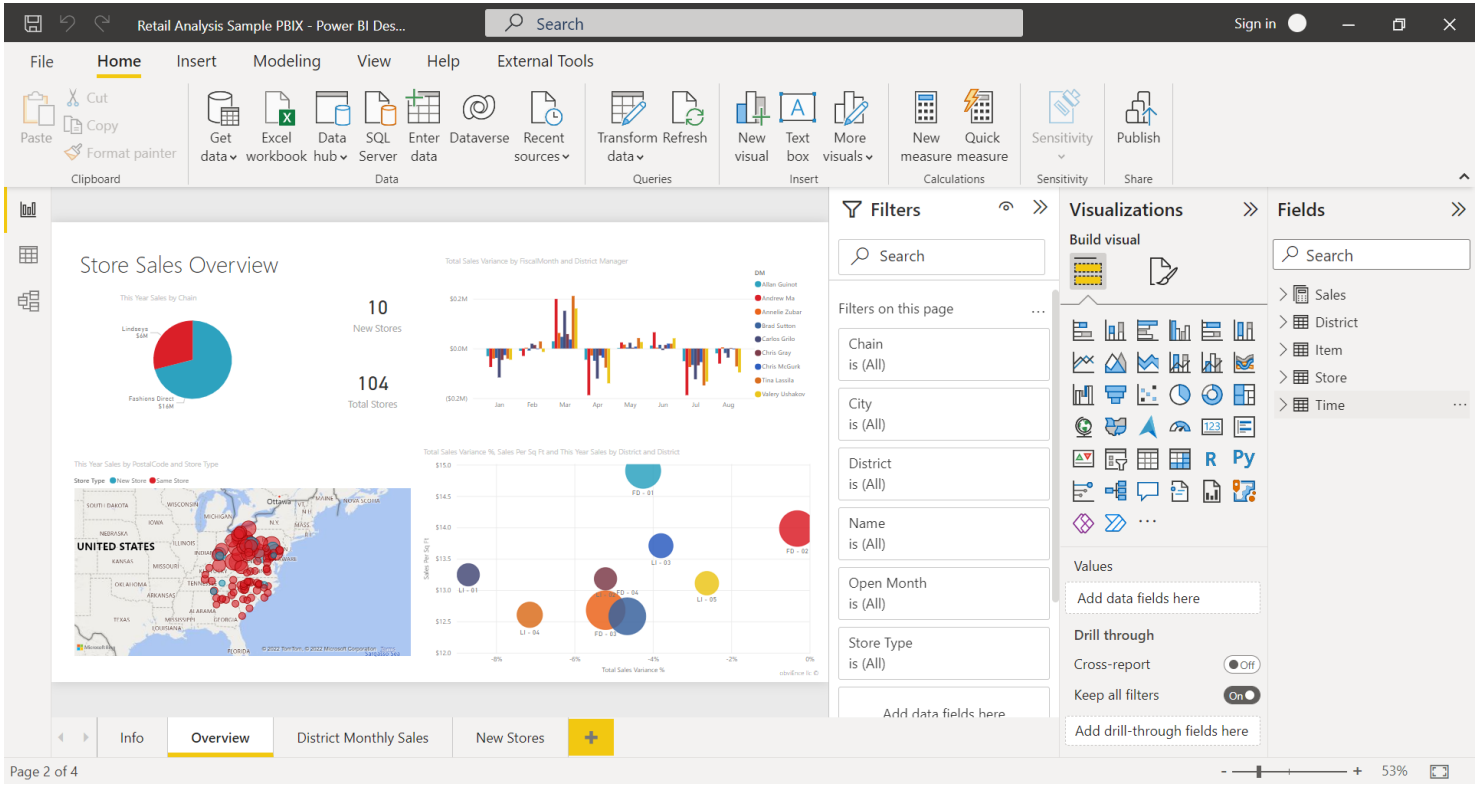
Power BI Desktop – Visualization Canvas



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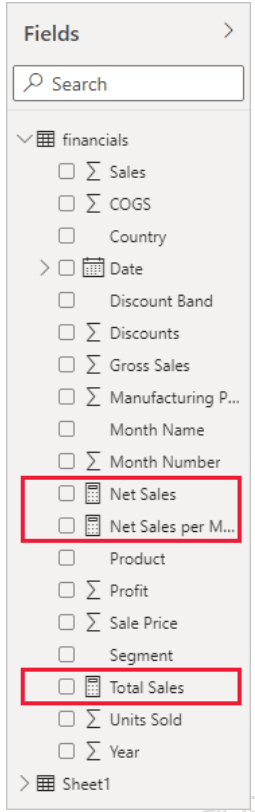
Power BI – Measures

```
DAX

    Projected Sales = SUM('Sales'[Last Years Sales])*1.06
```

What is DAX?
DAX is a collection of functions, operators, and constants that can be used in a formula, or expression, to calculate and return one or more values. Stated more simply, DAX helps you create new information from data already in your model.

Why is DAX so important?
It's easy to create a new Power BI Desktop file and import some data into it. You can even create reports that show valuable insights without using any DAX formulas at all. But, what if you need to analyze growth percentage across product categories and for different date ranges? Or, you need to calculate year-over-year growth compared to market trends? DAX formulas provide this capability and many other important capabilities as well. Learning how to create effective DAX formulas will help you get the most out of your data. When you get the information you need, you can begin to solve real business problems that affect your bottom line. This is the power of Power BI, and DAX will help you get there.
Source: Microsoft.com



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Fundamental Data Analytic procedures that can be performed Proactively

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Types of Frauds and Functional Areas of Analysis (1 of 2)

Accounts Payable

- Fictitious vendors
- Employee vendors
- Fictitious, inflated and / or duplicate invoices
- Structured payments
- Conflicts of interest
- Foreign Corrupt Practices Act Kickbacks / Bid-rigging

P-Cards

- Duplicate purchasing and reimbursement schemes
- Unauthorized and/or improper purchases
- Unauthorized users
- Unauthorized SIC codes
- Foreign Corrupt Practices Act

Payroll

- Ghost employees
- Improper supplemental payments
- Improper bonus or incentive compensation payments
- Inflated salaries
- Inflated hours

Travel and Entertainment Expense

- False or inflated reimbursement submissions
- Improper use of corporate credit card
- Purchase for personal use
- Duplicate purchasing and reimbursement schemes
- Foreign Corrupt Practices Act

Journal Entries

- Unbalanced journal entries
- Improper management override
- Improper expense capitalization
- Improper revenue recognition
- Entries to unusual or seldom used accounts
- Improper or unauthorized user activity
- Entries during non-business hours

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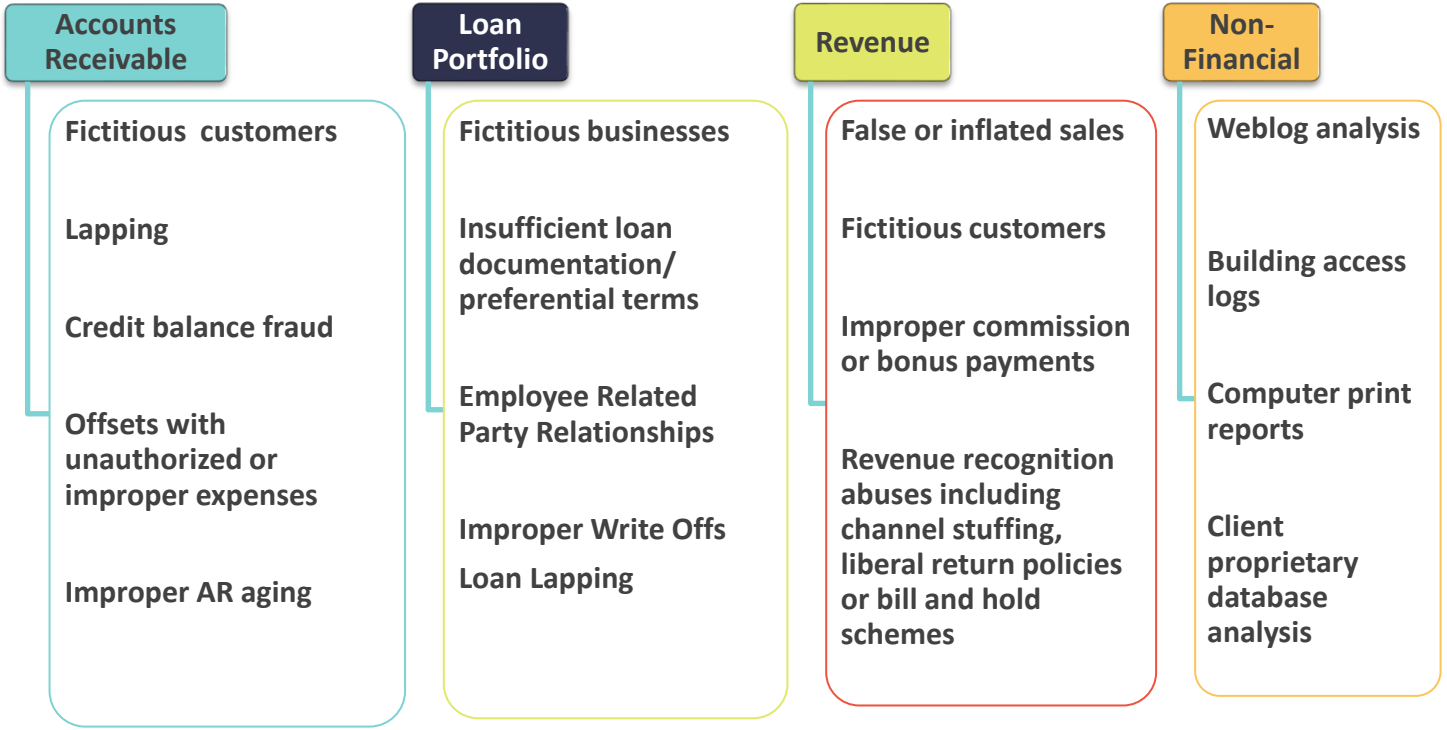
Types of Frauds and Functional Areas of Analysis (2 of 2)



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General Ledger

- Ensure reconciliation and completeness of systems and subledgers flowing to the trial balance
- Assess and review the activity of subledgers, understand manual vs. automated
- Identify user access, user threshold level controls and consistency of access and control across the organization
- Trend results over time, such as monthly:
  - Account level results
  - Business unity level results
  - Geography based results
  - Relevant Revenue and Expense groupings
- Identify suspicious entries such has transactions to suspense accounts, reversals, or entries occurring with strange timing

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Cash Disbursement

- Understand vendor relationships,
  - Identify key vendors
  - Identify new/unapproved vendors
  - Identify related party vendors
  - Identify vendors receiving suspicious recurring or one-time payments
- Reconcile Inter-company and Inter-branch transactions
- Identify duplicate payments
- Identify payments that were structured to evade threshold level controls
- Identify unapproved disbursements
- Understand out of sequence payments
- Understand compliance with threshold level controls
- Analyze disbursements by vendor type, review for reasonableness
- Trend vendor level disbursements by time period to identify increasing or strange trends

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Payroll

- Ensure all paid employees are on the appropriate approved lists
- Ensure paid employees are receiving correct salary and hourly rates
- Analyze and understand overtime payments
- Identify payments made before hire date over after term date
- Understand bonus, commission and other non-standard payments
- Analyze pay and pay rates by:
  - Business Unit
  - Geography
  - Job Function
- Understand headcount by functional area
- Identify manual adjustments to payroll
- Ensure hours logged in timekeeping software is reasonable, identify employees with excessive overtime
- Review employee master file for:
  - Unusual updates and changes
  - Multiple employees that share contact information and/or bank accounts
  - Missing or unusual personal information
  - Assess Active and Inactive employees for reasonableness

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Travel and Expense Reimbursement

- Group payments by meaningful classifications, such as hotel, airfare, meals, mileage, transportation, etc.
- Group payments by meaningful classifications, such as administrative, sales, production, etc.
- Group payments by employee,
- Identify duplicate submissions. This can be run on invoice number, amount, employee, month, description.
- Conduct digital frequency testing. Often, transactions that occur more often than expected are a result of subjective or created amounts. Look for evasion of approval limits, irregular amounts and number invention.
- Identify payments made outside of understood business hours.
- Organizations commonly use credit cards for business expenses. Each credit card transaction will include a Standard Industry Code (SIC), which classifies the expense by meaningful type, such as airfare, lodging, dining, etc. These codes can be used to analyze expenses
- Identify gifts and charitable donations.
- Identify Multiple Gifts to the same person
- Identify instances where the submitter is the same as the approver
- Identify excessive cash reimbursements
- Understand excessive mileage
- Identify abuse and non-compliance with policies

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Polling Question: Which functional area is the biggest challenge?

- Accounts Payable
- Procurement Cards
- Payroll
- Travel and Entertainment Expenses
- GL/Journal Entries
- Accounts Receivable
- Other?

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Polling Question: I have explored using data analytics in my internal audit department?

- Yes – We couldn't live without data analytics
- Yes – We are in early stages
- Yes – We struggled with finding a solution
- No – I'd like to start thinking about it
- No – No need/NA

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Hypothetical CLA levels of Assistance

Analytic Areas:	Year 1	Year 2	Year 3
General Ledger	100%	100%	50%
Cash Disbursements & Procurement	100%	50%	25%
Payroll	100%		100%
Travel and Entertainment Expenses	100%	50%	25%

- Transition performance of data analytics over time to Internal Audit through training
- Reduced reliance on CLA to perform Data Analytics through: design -> perform -> interpret -> train -> refine
- CLA available to consult always as needed

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Proactive Application of Data Analytics: Techniques to Apply to Multiple Populations to Address Risk

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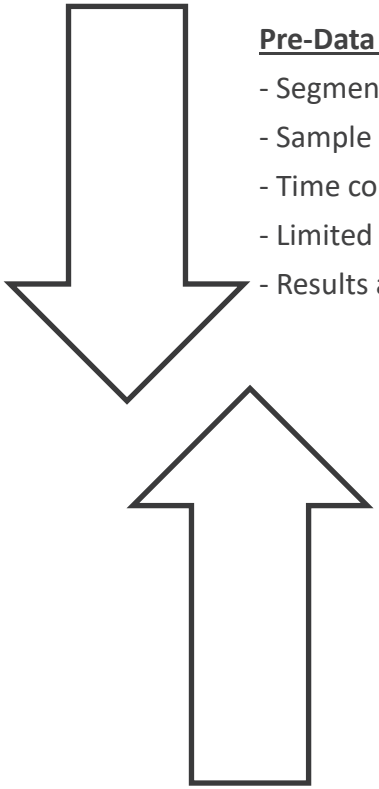
Pre and Post Data Analytic Approach



Pre-Data Analytics

- Segmented by business unit, time period, geography
- Sample Based Approach
- Time consuming
- Limited findings and measurement of policy adherence
- Results and insights not utilized outside of internal audit group

Post -Data Analytics

- Holistic enterprise wide scope, includes **100% of transactions**
- Utilize long periods of results to generate better understand and identify anomalies
- Deploy a **Risk-Based** Approach
- More Efficient and periodic reporting; can be done near real time
- Actionable measurement of compliance
- Insights valued and utilized by the management outside of internal audit
- Abuses identified more timely resulting in cost savings

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Steps 1 and 2: Planning and Data Acquisition

Planning and Risk Assessment – Involved a short face to face meeting

- Policy Non-compliance
- Fraudulent submission
- Have better insights into:

  Cash transactions that were generally low visibility

  Expense types

  Seasonality

  Spending levels by business Unit

  Understand Key Vendors

- Data Acquisition
  - Concur, readily available
  - Employee Time Records
  - Others – building access logs, network logs

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Steps 3 and 4: Data Analysis and Interpretation

- Data Analysis – was performed in approximately four hours, that same day and on the plane home. Analytics of the following types were performed:
  - Population
  - Trending
  - Grouping
  - People
  - Specific Risk
- Collaborative Interpretation of Results – face to face brainstorming and review meeting took place, key analytics were walked through and explained, the organization's specific considerations were included into the analysis in real time to refine and improve analysis.

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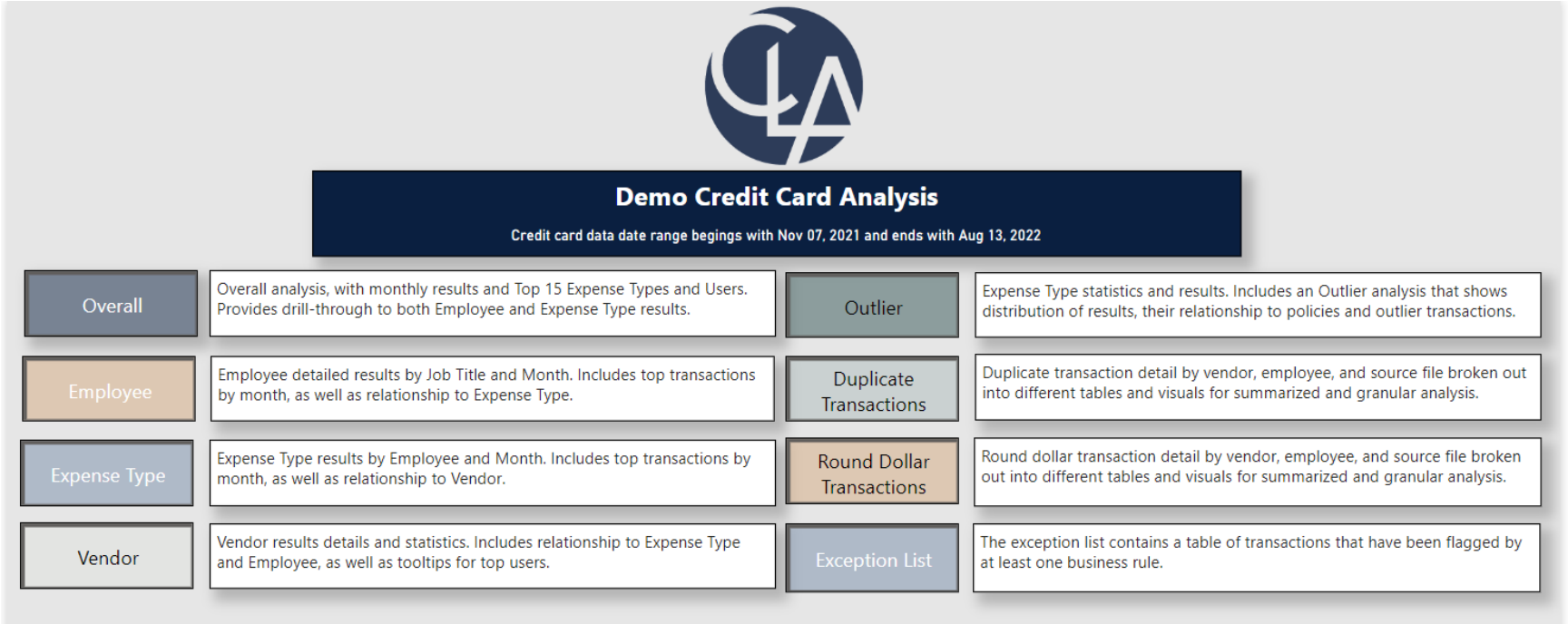
Travel and Entertainment Card – Continuous Monitoring



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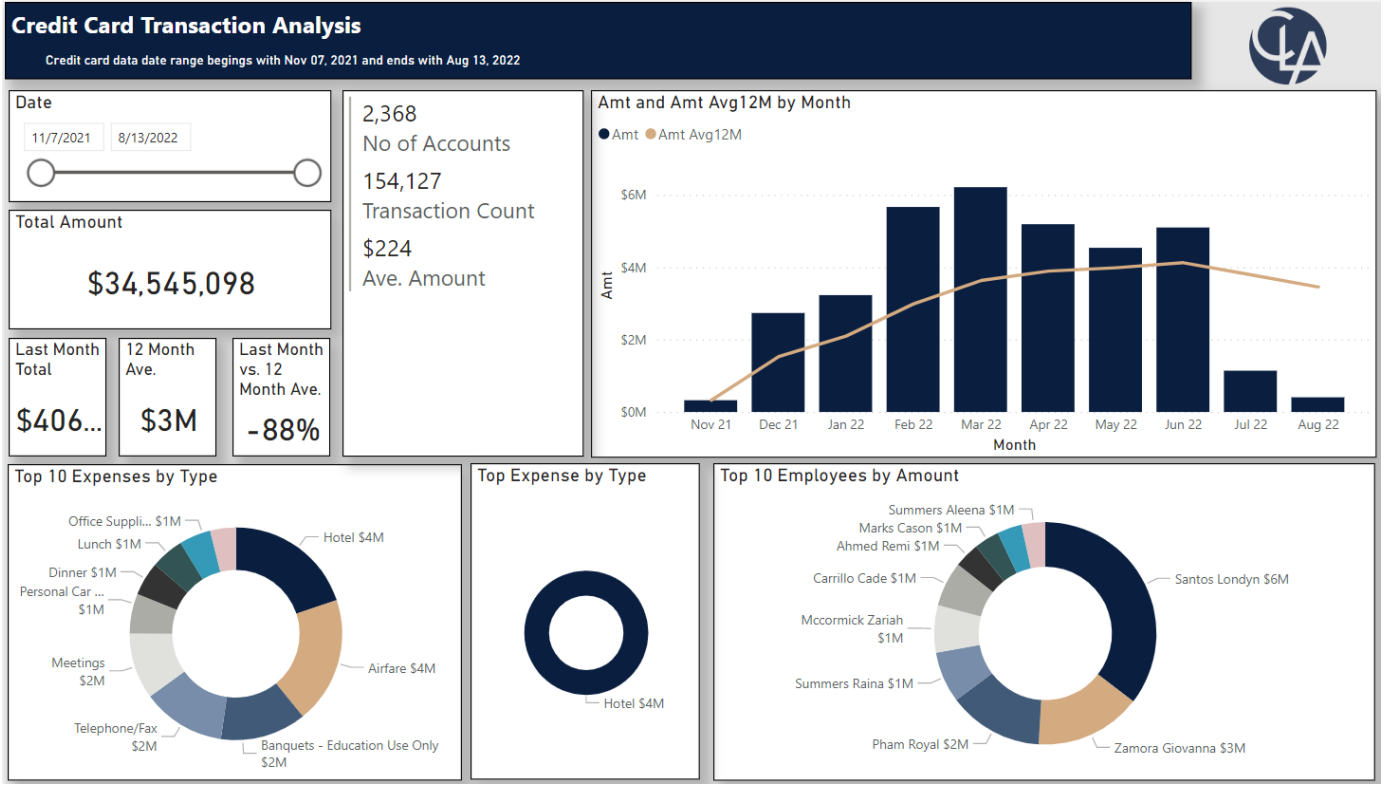
Overall View – Population information



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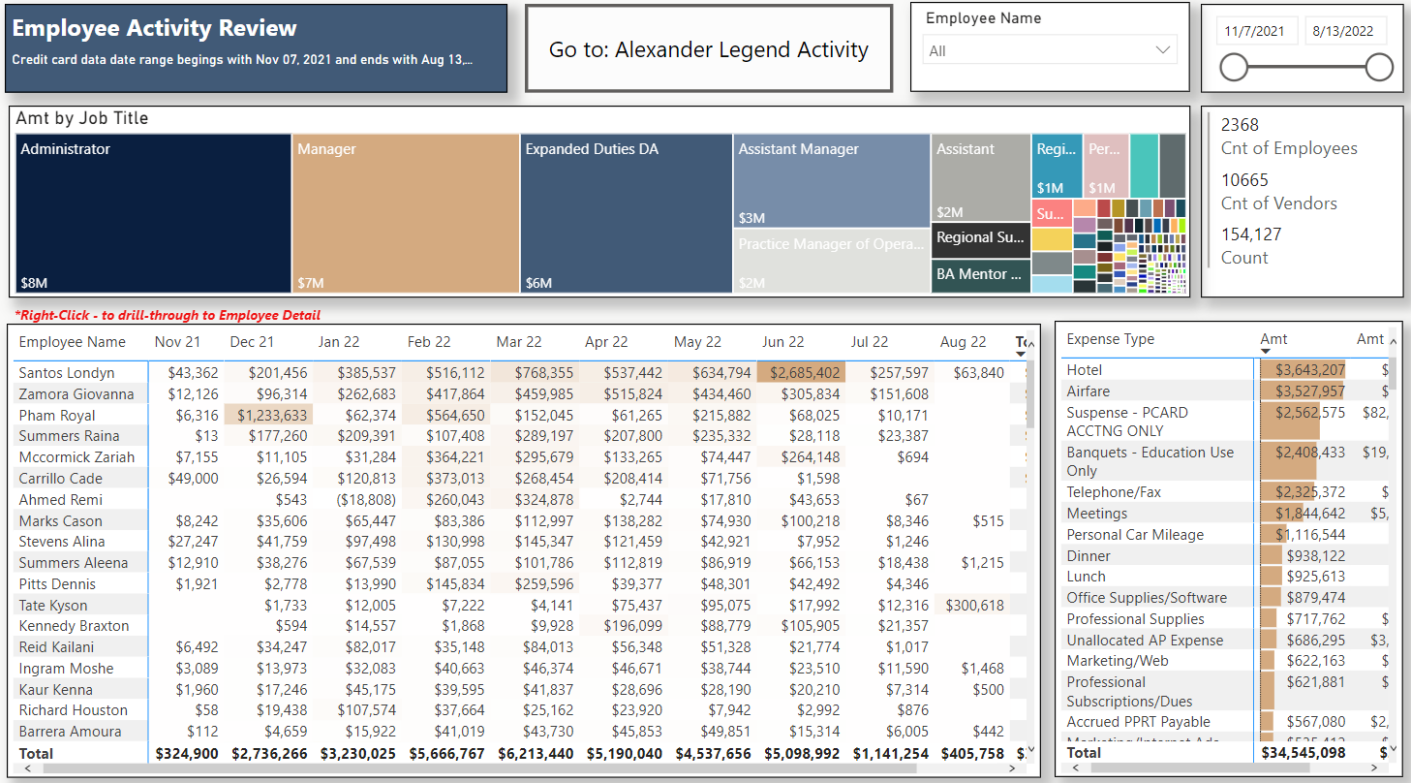
Employee Overall



Employee Name	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	To
Santos Londyn	$43,362	$201,456	$385,537	$516,112	$768,355	$537,442	$634,794	$2,685,402	$257,597	$63,840	
Zamora Giovanna	$12,126	$96,314	$262,683	$417,864	$459,985	$515,824	$434,460	$305,834	$151,608		
Pham Royal	$6,316	$1,233,633	$62,374	$564,650	$152,045	$61,265	$215,882	$68,025	$10,171		
Summers Raina	$13	$177,260	$209,391	$107,408	$289,197	$207,800	$235,332	$28,118	$23,387		
Mccormick Zariah	$7,155	$11,105	$31,284	$364,221	$295,679	$133,265	$74,447	$264,148	$694		
Carrillo Cade	$49,000	$26,594	$120,813	$373,013	$268,454	$208,414	$71,756	$1,598			
Ahmed Remi		$543	($18,808)	$260,043	$324,878	$2,744	$17,810	$43,653	$67		
Marks Cason	$8,242	$35,606	$65,447	$83,386	$112,997	$138,282	$74,930	$100,218	$8,346	$515	
Stevens Alina	$27,247	$41,759	$97,498	$130,998	$145,347	$121,459	$42,921	$7,952	$1,246		
Summers Aleena	$12,910	$38,276	$67,539	$87,055	$101,786	$112,819	$86,919	$66,153	$18,438	$1,215	
Pitts Dennis	$1,921	$2,778	$13,990	$145,834	$259,596	$39,377	$48,301	$42,492	$4,346		
Tate Kyson		$1,733	$12,005	$7,222	$4,141	$75,437	$95,075	$17,992	$12,316	$300,618	
Kennedy Braxton		$594	$14,557	$1,868	$9,928	$196,099	$88,779	$105,905	$21,357		
Reid Kailani	$6,492	$34,247	$82,017	$35,148	$84,013	$56,348	$51,328	$21,774	$1,017		
Ingram Moshe	$3,089	$13,973	$32,083	$40,663	$46,374	$46,671	$38,744	$23,510	$11,590	$1,468	
Kaur Kenna	$1,960	$17,246	$45,175	$39,595	$41,837	$28,696	$28,190	$20,210	$7,314	$500	
Richard Houston	$58	$19,438	$107,574	$37,664	$25,162	$23,920	$7,942	$2,992	$876		
Barrera Amoura	$112	$4,659	$15,922	$41,019	$43,730	$45,853	$49,851	$15,314	$6,005	$442	
Total	**$324,900**	**$2,736,266**	**$3,230,025**	**$5,666,767**	**$6,213,440**	**$5,190,040**	**$4,537,656**	**$5,098,992**	**$1,141,254**	**$405,758**	**$**

Expense Type	Amt	Amt
Hotel	$3,643,207	$
Airfare	$3,527,957	$
Suspense - PCARD ACCTNG ONLY	$2,562,575	$82,
Banquets - Education Use Only	$2,408,433	$19,
Telephone/Fax	$2,325,372	$
Meetings	$1,844,642	$5,
Personal Car Mileage	$1,116,544	
Dinner	$938,122	
Lunch	$925,613	
Office Supplies/Software	$879,474	
Professional Supplies	$717,762	$
Unallocated AP Expense	$686,295	$3,
Marketing/Web	$622,163	$
Professional Subscriptions/Dues	$621,881	$
Accrued PPRT Payable	$567,080	$2,
Total	**$34,545,098**	**$**

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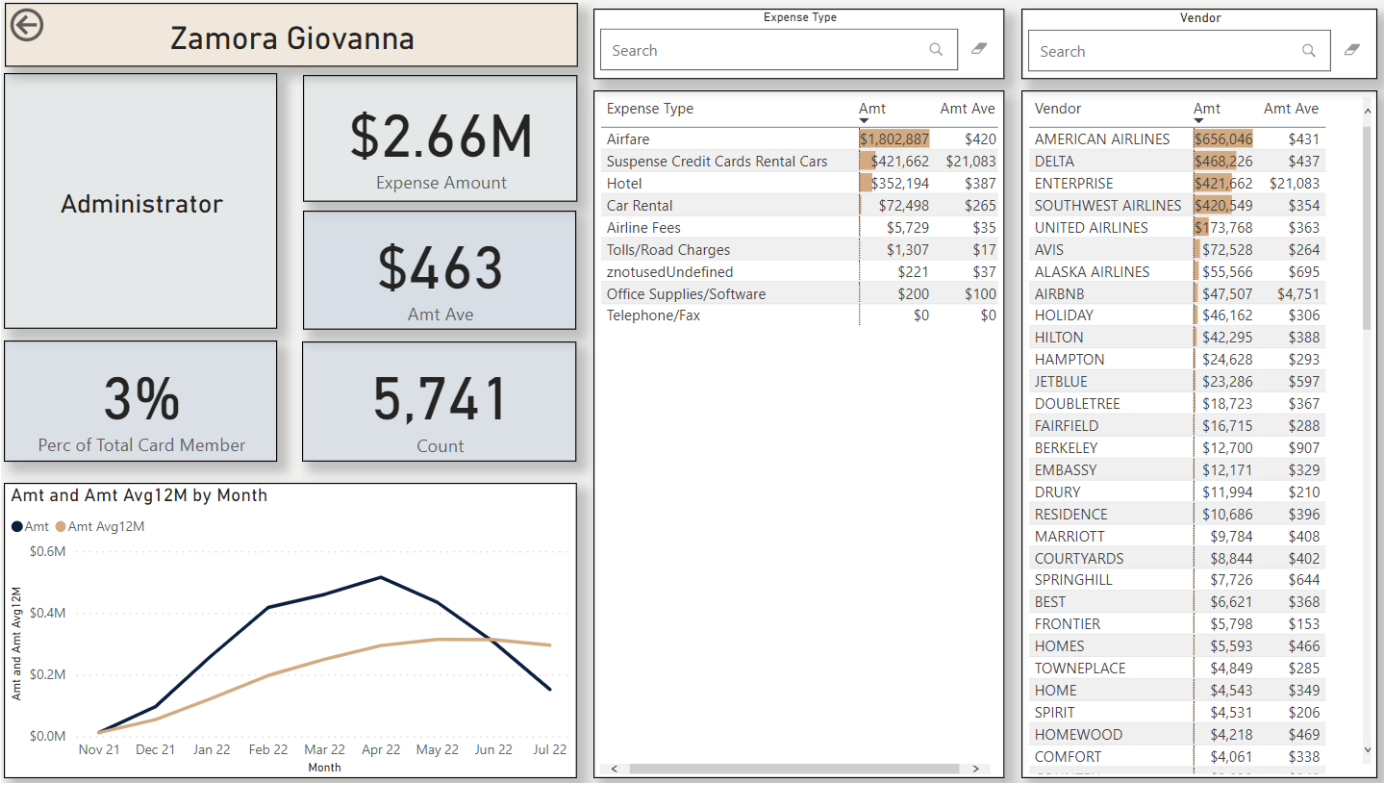
Employee – Detailed View



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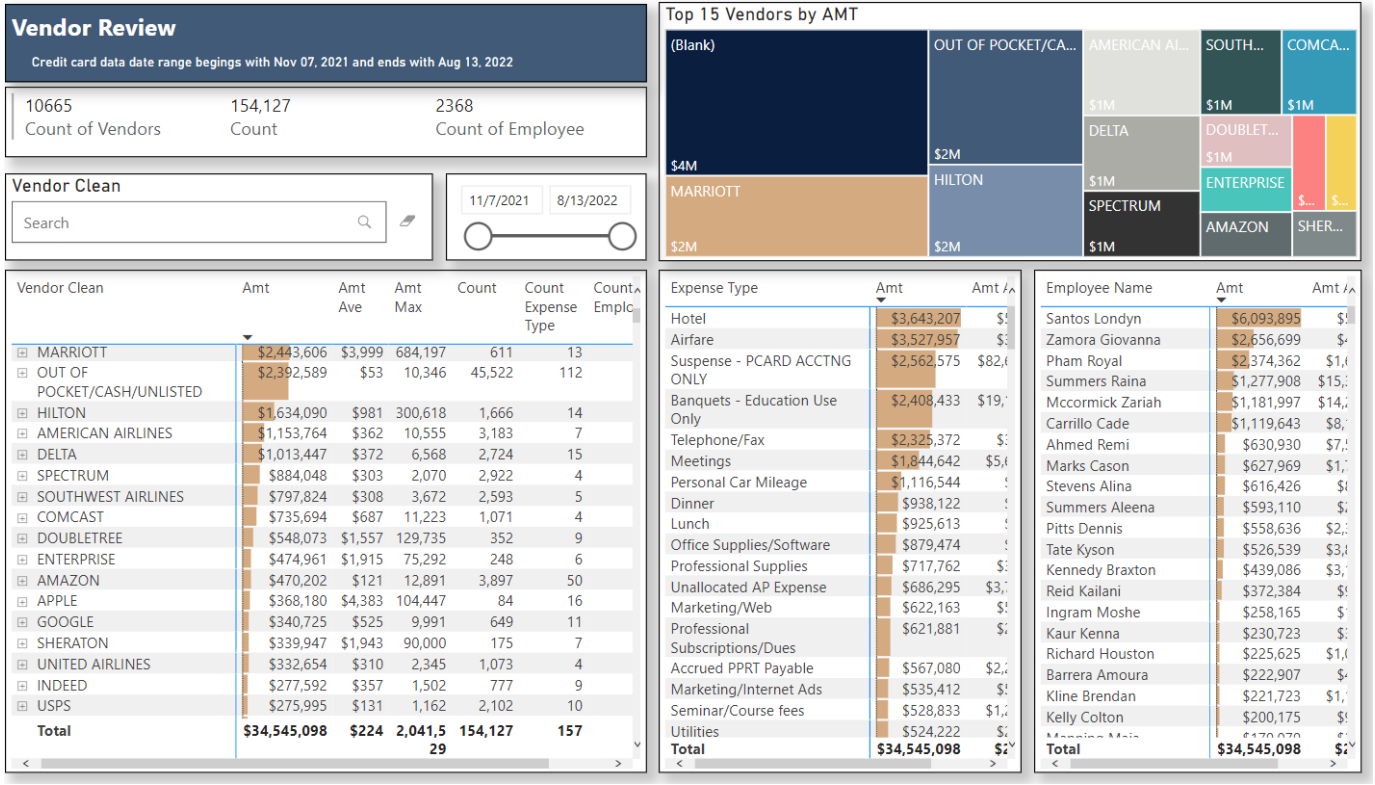
Vendor Review



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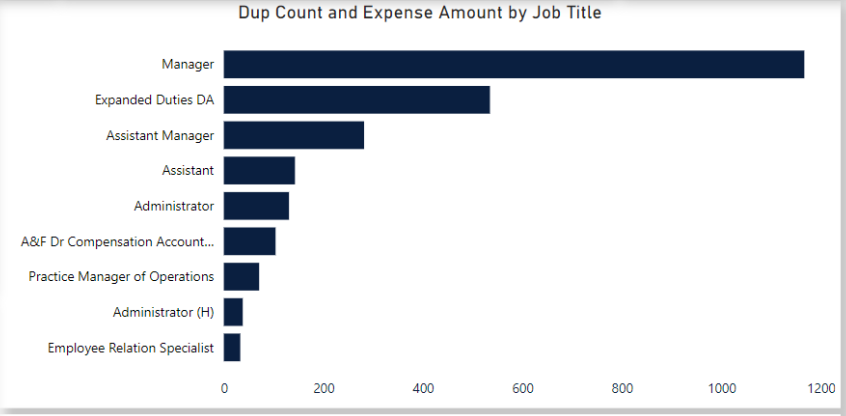
Duplicate Transaction Review (+$500 transactions only)

Credit card data date range begings with Nov 07, 2021 and ends with Aug 13, ...

3251	$5,486,294.73	195	11/7/2021	8/13/2022
Dup Count	Expense Amount	Vendors with Duplicates		

Vendor	Count of Dup Amounts	Dup Count	Sum of Expense Amount
GOOGLE	3	440	$247,500.00
AMERICAN AIRLINES	128	387	$370,303.13
DELTA	119	316	$283,540.08
SOUTHWEST AIRLINES	67	209	$147,360.67
	47	204	$978,240.08
SPECTRUM	64	170	$114,769.36
COMCAST	45	101	$72,683.52
UNITED AIRLINES	31	77	$48,761.72
INDEED	34	72	$36,275.61
Total	**864**	**3251**	**$5,486,294.73**

Vendor	Expense Amount	Dup Count	Sum of Expense Amount
MARRIOTT	$500,000.00	2	$1,000,000.00
	$200,000.00	2	$400,000.00
	$150,000.00	2	$300,000.00
GOOGLE	$500.00	407	$203,500.00
APPLE	$89,138.44	2	$178,276.88
HYATT	$50,000.00	2	$100,000.00
MARRIOTT	$20,000.00	5	$100,000.00
FACEBK	$900.00	51	$45,900.00
DOUBLETREE	$15,000.00	3	$45,000.00
AMERICAN AIRLINES	$7,757.37	5	$38,786.85
AMERICAN AIRLINES	$7,288.57	5	$36,442.85
SCRIPPS	$7,600.00	4	$30,400.00
DELTA	$5,968.07	5	$29,840.35
SMARTBOX	$4,780.00	6	$28,680.00
Total		**3251**	**$5,486,294.73**



Posted Date	Employee Name	CC Trans Key	Purpose	Vendor	Expense Amount	V
4/11/2022	JESUS HICKS	1039657	Botox Cosmetics	AAFE	$1,178.00	A
5/19/2022	BENSON BRYAN	1057014	Supplies	AAFE	$1,178.00	A
6/17/2022	JAZMIN HUTCHINSON	1068259	Supplies	AAFE	$1,767.00	A
	LAWRENCE RANGEL		Botox for Pts	AAFE	$1,767.00	A
2/11/2022	CASON MARKS	1013896	Melissa Duran Lopez EFDA course		$927.00	A
4/18/2022	CASON MARKS	1042258	Jessica Moore Anesthesia Sedation course		$927.00	A
4/18/2022	CASON MARKS	1042259	Valorie Graham EFDA and Dunder Mifflin Radiology		$927.00	A
Total					**$5,486,294.73**	

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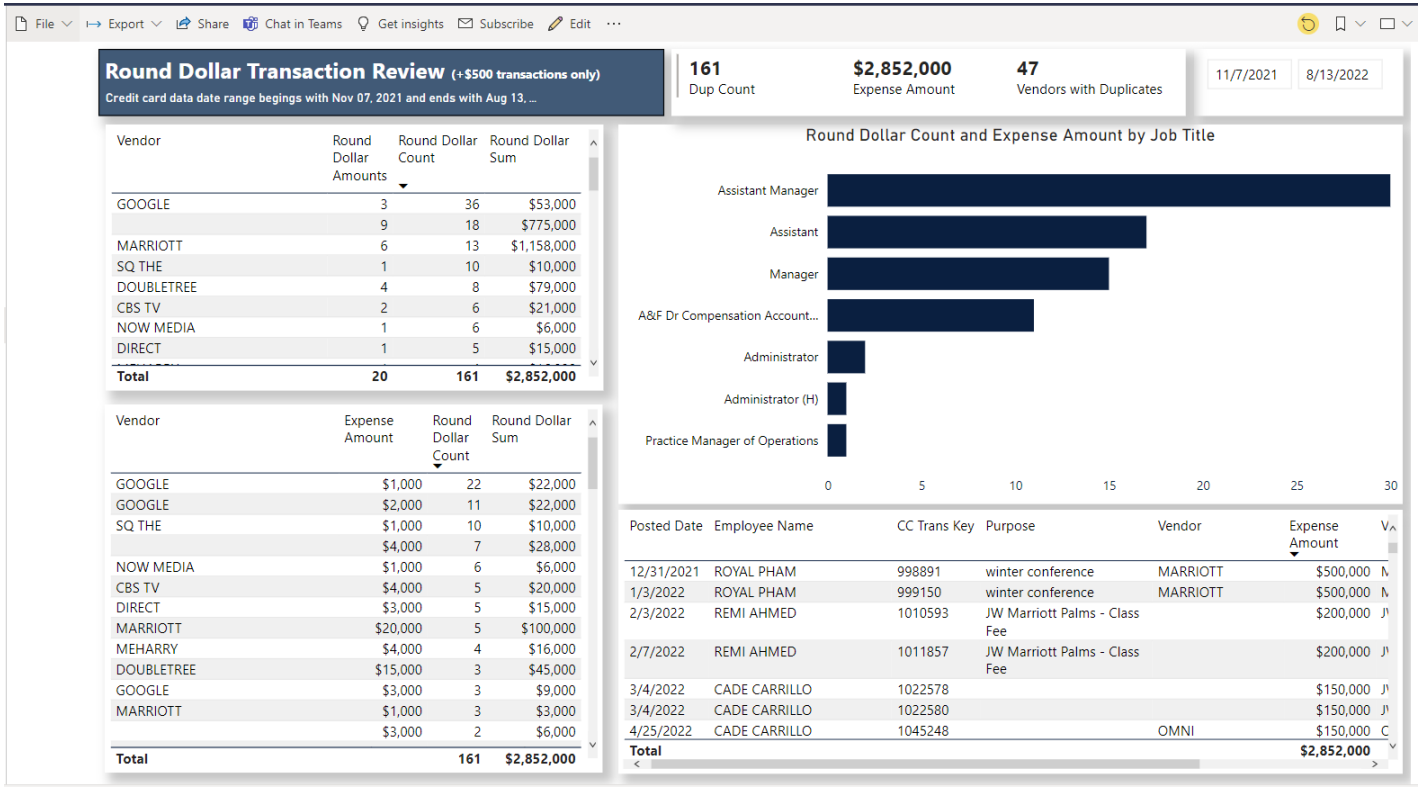

Vendor	Round Dollar Amounts	Round Dollar Count	Round Dollar Sum
GOOGLE	3	36	$53,000
	9	18	$775,000
MARRIOTT	6	13	$1,158,000
SQ THE	1	10	$10,000
DOUBLETREE	4	8	$79,000
CBS TV	2	6	$21,000
NOW MEDIA	1	6	$6,000
DIRECT	1	5	$15,000
Total	**20**	**161**	**$2,852,000**

Vendor	Expense Amount	Round Dollar Count	Round Dollar Sum
GOOGLE	$1,000	22	$22,000
GOOGLE	$2,000	11	$22,000
SQ THE	$1,000	10	$10,000
	$4,000	7	$28,000
NOW MEDIA	$1,000	6	$6,000
CBS TV	$4,000	5	$20,000
DIRECT	$3,000	5	$15,000
MARRIOTT	$20,000	5	$100,000
MEHARRY	$4,000	4	$16,000
DOUBLETREE	$15,000	3	$45,000
GOOGLE	$3,000	3	$9,000
MARRIOTT	$1,000	3	$3,000
	$3,000	2	$6,000
Total		**161**	**$2,852,000**

Posted Date	Employee Name	CC Trans Key	Purpose	Vendor	Expense Amount	V
12/31/2021	ROYAL PHAM	998891	winter conference	MARRIOTT	$500,000	M
1/3/2022	ROYAL PHAM	999150	winter conference	MARRIOTT	$500,000	M
2/3/2022	REMI AHMED	1010593	JW Marriott Palms - Class Fee		$200,000	J
2/7/2022	REMI AHMED	1011857	JW Marriott Palms - Class Fee		$200,000	J
3/4/2022	CADE CARRILLO	1022578			$150,000	J
3/4/2022	CADE CARRILLO	1022580			$150,000	J
4/25/2022	CADE CARRILLO	1045248		OMNI	$150,000	C
Total					**$2,852,000**	

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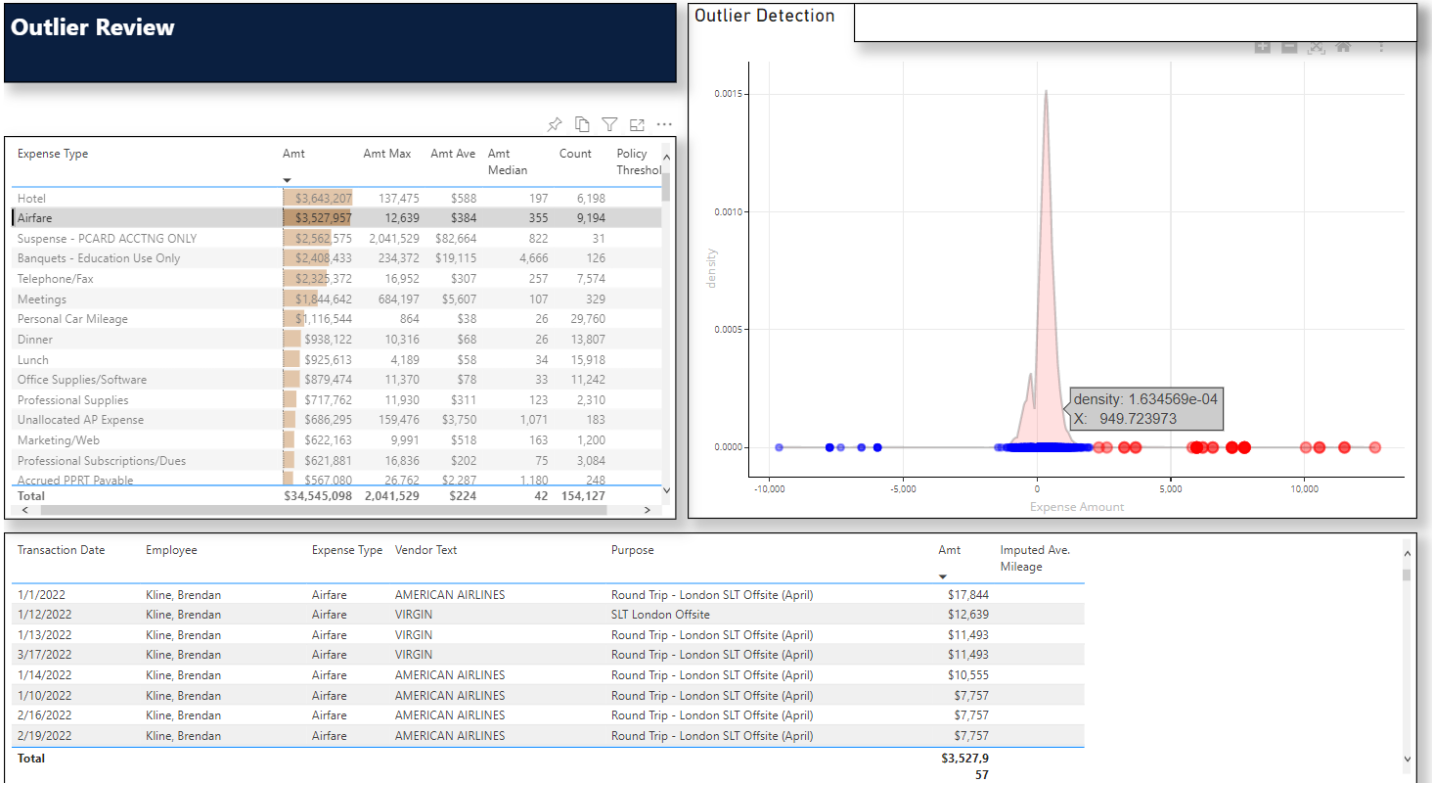
Outlier Detection



Expense Type	Amt	Amt Max	Amt Ave	Amt Median	Count	Policy Threshol
Hotel	$3,643,207	137,475	$588	197	6,198	
Airfare	$3,527,957	12,639	$384	355	9,194	
Suspense - PCARD ACCTNG ONLY	$2,562,575	2,041,529	$82,664	822	31	
Banquets - Education Use Only	$2,408,433	234,372	$19,115	4,666	126	
Telephone/Fax	$2,325,372	16,952	$307	257	7,574	
Meetings	$1,844,642	684,197	$5,607	107	329	
Personal Car Mileage	$1,116,544	864	$38	26	29,760	
Dinner	$938,122	10,316	$68	26	13,807	
Lunch	$925,613	4,189	$58	34	15,918	
Office Supplies/Software	$879,474	11,370	$78	33	11,242	
Professional Supplies	$717,762	11,930	$311	123	2,310	
Unallocated AP Expense	$686,295	159,476	$3,750	1,071	183	
Marketing/Web	$622,163	9,991	$518	163	1,200	
Professional Subscriptions/Dues	$621,881	16,836	$202	75	3,084	
Accrued PPRT Payable	$567,080	26,762	$2,287	1,180	248	
Total	**$34,545,098**	**2,041,529**	**$224**	**42**	**154,127**	

Transaction Date	Employee	Expense Type	Vendor Text	Purpose	Amt	Imputed Ave. Mileage
1/1/2022	Kline, Brendan	Airfare	AMERICAN AIRLINES	Round Trip - London SLT Offsite (April)	$17,844	
1/12/2022	Kline, Brendan	Airfare	VIRGIN	SLT London Offsite	$12,639	
1/13/2022	Kline, Brendan	Airfare	VIRGIN	Round Trip - London SLT Offsite (April)	$11,493	
3/17/2022	Kline, Brendan	Airfare	VIRGIN	Round Trip - London SLT Offsite (April)	$11,493	
1/14/2022	Kline, Brendan	Airfare	AMERICAN AIRLINES	Round Trip - London SLT Offsite (April)	$10,555	
1/10/2022	Kline, Brendan	Airfare	AMERICAN AIRLINES	Round Trip - London SLT Offsite (April)	$7,757	
2/16/2022	Kline, Brendan	Airfare	AMERICAN AIRLINES	Round Trip - London SLT Offsite (April)	$7,757	
2/19/2022	Kline, Brendan	Airfare	AMERICAN AIRLINES	Round Trip - London SLT Offsite (April)	$7,757	
Total					**$3,527,957**	

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Selected Tests Performed by Areas

Population Analytics:

1. Population Stats – Max, Min, Ave, No of Records, Total
2. Cash vs. Credit Card vs. P-Card
3. Expenses by Geographic region
4. Stratification of expenses by amount, understand large and small and where the data lies
5. Benford's law to identify excessive frequency
6. Benford's law to identify impact of threshold controls
7. Perform completeness checking procedures
8. Identify lack of use and or implementation of controls such as blank description fields, generic usernames
9. Identify expenses to unauthorized SIC/MCC codes

Trending Analytics:

1. Late Report Submissions
2. Transactions on holidays, weekends, and on Personal time off days
3. Flights booked in close proximity to travel days
4. Trending expenses by Organization Unit by Month
5. Trending expenses by Type (Hotel, flights, mileage, meals, etc.) by month
6. Expenses by date
7. Organizational Unit monthly results and forecasting
8. Top "X" transactions by Type by Month
9. Top "X" transactions by Expense Type by Month

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Selected Tests Performed by Areas

People Analytics:

1. Headcount – total, department
2. Spend by Employee by Business Unit
3. Identify Employees whose spend is increasing at “x” rate
4. Personal and Non- business expenses by Industry code
5. Compare Number of purchases and amount of purchase over time to other with similar job tiles
6. Identify employees with more volume and large dollar value of credit transactions
7. Identify employees who approved their own expense reports
8. Identify Employees who spent large amounts by expense type (for example a hotel stay of $1,250/night, when the average was $200 for hotel in city)
9. Identify employees with excessive lack of supporting documentation
10. Expenses at Merchants that are related parties to employees

Grouping Analytics:

1. T&E Spend by Organization Unit
2. T&E Spend per Expense Type
3. Calculate totals and average per day for travel by location, identify lavish locations and trips to known locations outside of the norm
4. Spend by Merchant, review merchant names for personal use (PayPal, Apple stores, etc.)
5. Group transactions by type by time period for reasonableness (for example, 2+ parking expenses per day)
6. Group by description and search for suspicious words, such as cash, consulting fees, misc., government official

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Selected Tests Performed by Areas

Specific Risks:

1. Duplicates where the Amount, Date, and Employee were the same
2. Duplicates where the Amount, Month/Quarter and Employee were the same
3. Duplicates where the same item was charged to the credit card and P-card
4. Duplicates submitted within 90 days
5. Policy non-compliance
6. Hotel stays with no corresponding flights
7. ID Payments to electronic currency vendors (PayPal, google wallet, apple pay, bitcoin, etc.)
8. ID third party CC fraud, such as stolen CC numbers
9. Excessive mileage/parking/per diem
10. Excessive submission below threshold
11. Excessive travel in “x” period of time
12. Split (or structured) transactions that are broken down into smaller amounts
13. Mileage on the same days as rental car
14. Identify instances where the employee received a credit from the airline, for example booked a first class seat, then flew coach and took the difference

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Attributes of a Highly Ethical Organization

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Attributes of a Highly Ethical Organization

1. Person or office dedicated to anti-fraud, ethics, and compliance
2. Lead by example (“tone at the top”)
   a. Highest level executives promote an environment of high ethics and integrity
   b. Board holds top level executive accountable
3. Encourage transparency and accountability
   a. Review, oversight, monitoring
4. Well developed anti-fraud and ethics policy
   a. Documented in writing and communicated to employees
   b. Read and acknowledged by all employees
   c. Communicate during hiring; carefully screen job applicants
   d. Leverages Data Analytics to look for fraud and unethical behavior
5. Well developed and updated written policies and procedures

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Attributes of a Highly Ethical Organization

6. Regular technical training of employees on policies, procedures, applicable laws, ethics, fraud awareness, etc.
7. Strong compliance/internal audit programs
    a. Internal, outsourced, or combination
    b. Leverages Data Analytics to look for fraud and unethical behavior
    c. Prioritized and communicated
    d. Access to Board
8. Establish a fraud and ethics hotline
    a. Provide for anonymity
    b. Maintain confidentiality
    c. Incorporate whistleblower protections; protect employees that come forward
9. Reinforce good behavior; don't reinforce bad behavior
    a. Follow through with reports of misconduct and promote effective internal controls
    b. Encourages people to come forward

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Questions

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Thank you!

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