

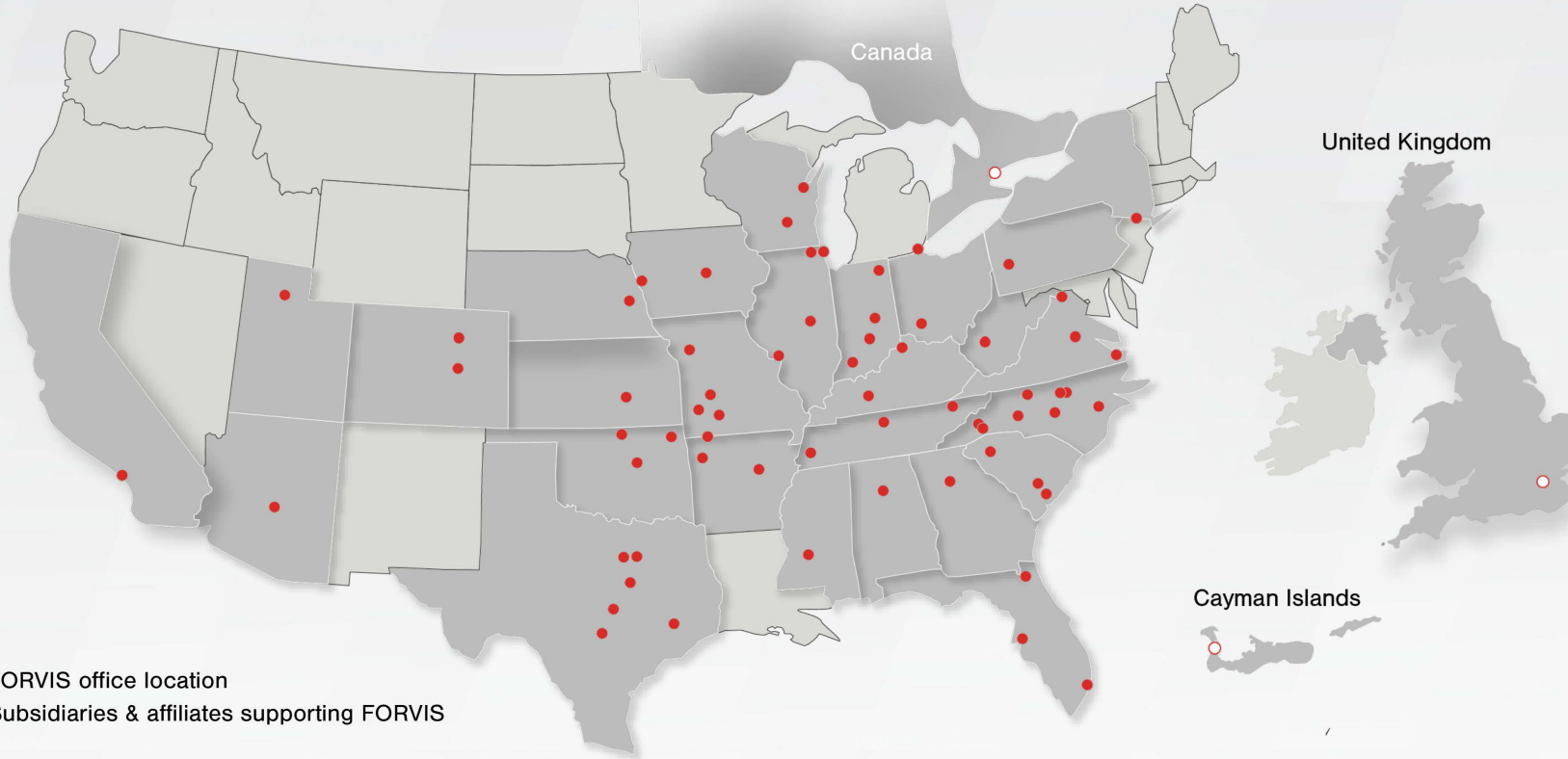
# FORVIS<sup>®</sup>

Business Technology Solutions

## Data Sources & Power BI: Making the Right Connections

March 21, 2024

# Global Presence & Reach



- FORVIS office location
- Subsidiaries & affiliates supporting FORVIS

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- FORVIS Capital Advisors, LLC
- FORVIS Wealth Advisors, LLC
- FORVIS Global Advisory Canada ULC\*\*
- FORVIS Global Advisory Ltd. UK\*\*
- TALENT SHIFT, LLC

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**Top 10**  
U.S. Public Accounting Firm \*

**27**  
States + Canada, U.K., & \*\*  
Cayman Islands

**10+**  
Industries

**68**  
Markets

**500+**  
Partners & Principals

**6,000+**  
Team Members



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# Business Technology Solutions

**FORVIS** provides enterprise resource planning (ERP) and customer relationship management (CRM) platform analysis, design, implementation, upgrade, training, and support services.

In addition, our Insights & Automation services include business intelligence (BI), robotic process automation (RPA), assessments, implementations, and training.



We are an award-winning partner of Solver Global, which itself is highly rated by G2, a leading software marketplace.

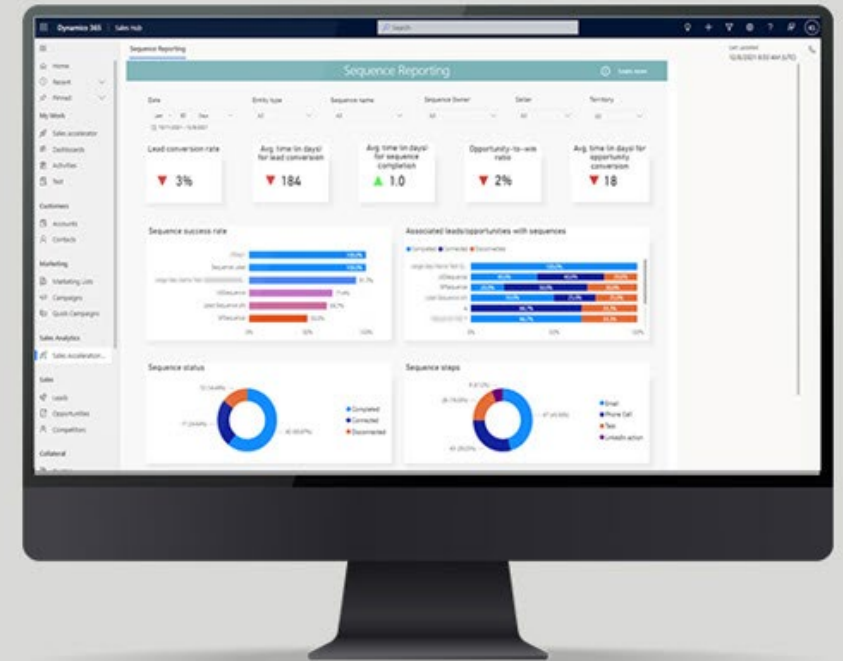
## FORVIS

Microsoft  
Partner

Sage Partner

ORACLE  
NETSUITE  
Solution Provider

salesforce  
PARTNER



From sales forecasting to financial reporting,  
learn what CRM and ERP technologies can do.

# Presenter



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Business Technology Solutions

## Data Sources & Power BI: Making the Right Connections

March 21, 2024

# Objectives

- Explain data connection types for different data sources like SQL Server, Excel, & web APIs based on factors such as data volumes, refresh requirements, & more
- Describe steps for shaping & transforming source data from platforms like Dynamics 365, Azure SQL Database, & CSV files to prepare for reporting & analytics in Power BI
- Discuss troubleshooting tips for common connection errors & replication issues when integrating data from databases, apps, & other sources into Power BI

# Agenda

9 a.m. CT ● A Power BI Data Model

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9:10 ● Getting Data

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9:25 ● Using Power Query to Structure Data

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9:40 ● Troubleshooting

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# A Power BI Data Model

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# A Data Model

## What is a model?

According to Webster ...

1. A small copy or imitation of an existing object
2. A preliminary representation of something

# A Data Model

So, what is a data model?

According to IBM ...

The process of creating a visual representation of either a whole information system or parts of it to communicate connections between data points & structures.

# Types of Data Modeling

Conceptual

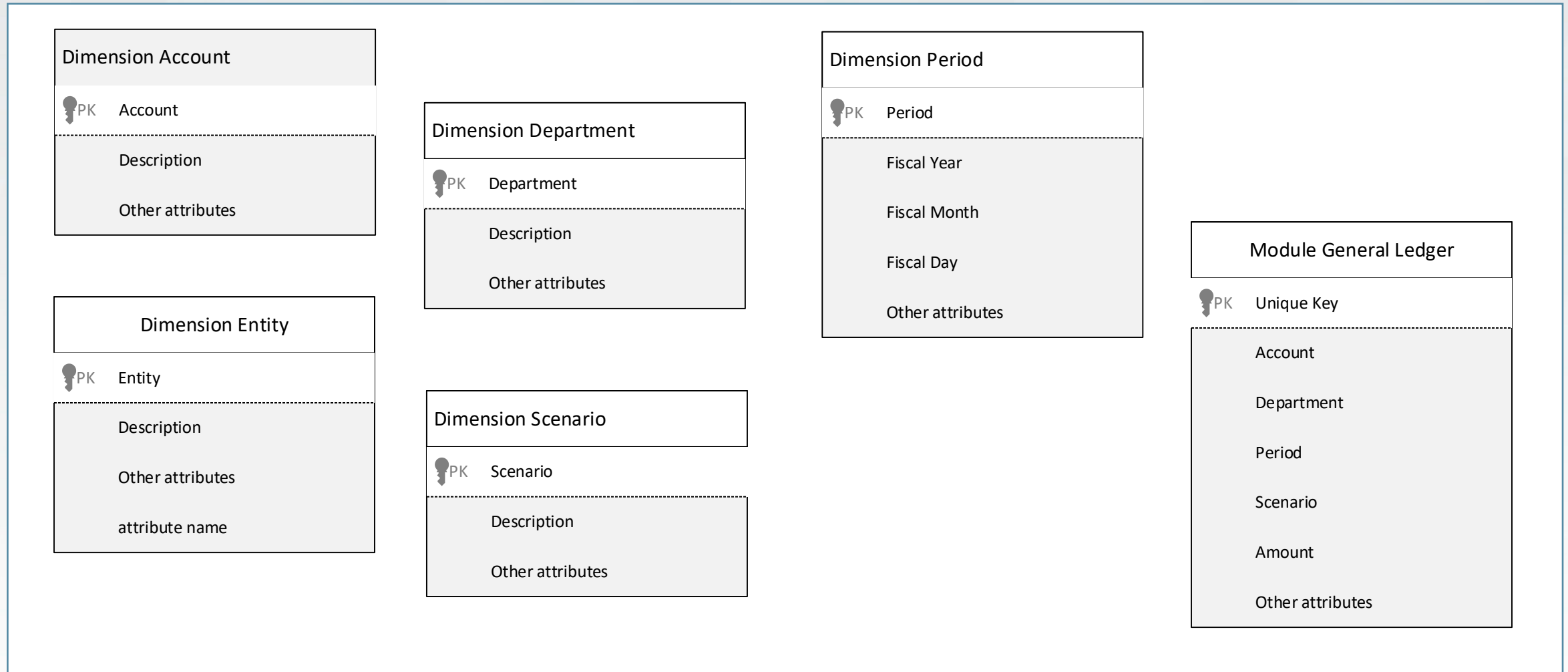
Logical

Physical

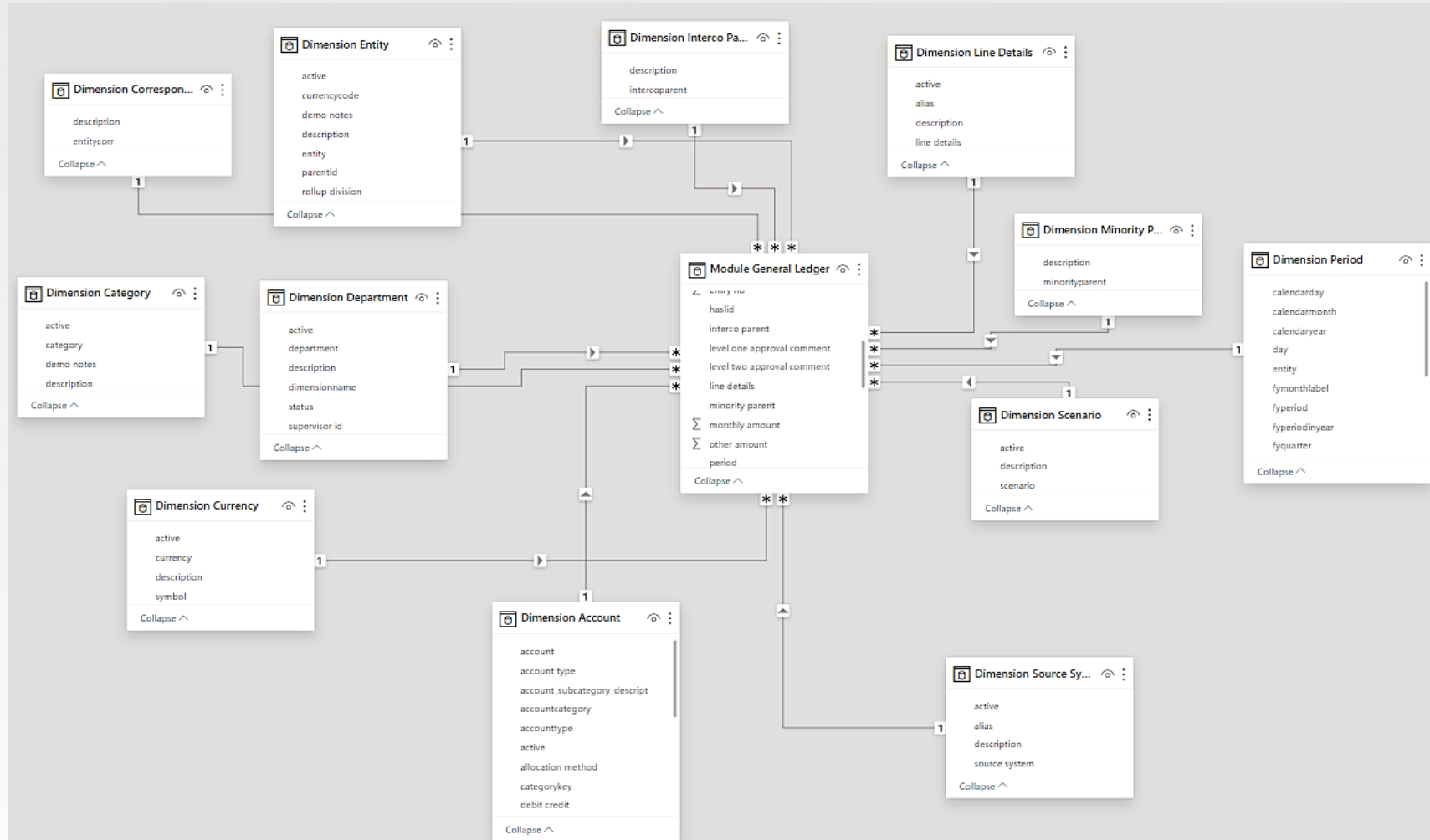
<https://powerbi.microsoft.com/en-us/what-is-data-modeling/>

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# A Data Model – Take This Ragtag Bunch



# A Data Model – Organize Them Into This



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That's a pretty picture but why do I care?

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# Why Create a Data Model?

- Understand the tables available
- Understand how tables relate to each other
- Helps you understand what's missing
- Helps you plan for future changes

# Some Best Practices

- Smaller number of columns is better
- Remove unnecessary data
- Create a star schema
- Work as close to the source as possible
- Disable Auto Date/Time in PBI options
- Why? You want faster refreshes & faster reports!

Guy in a Cube on Power BI



# Getting Data

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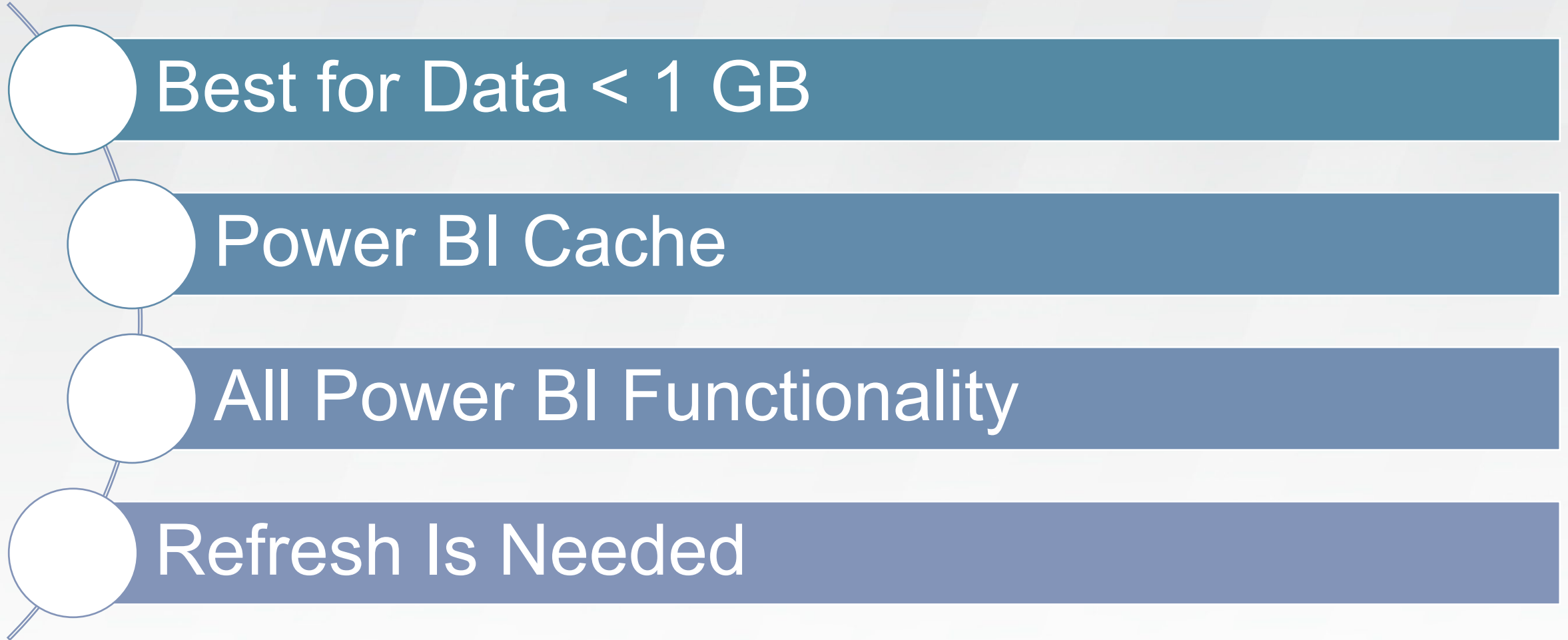
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# Getting Data

- Import
- Direct Query

# Import



# Direct Query

- Only for Certain Types of Sources
- Data Sources Are Queried, Not the Cache
- Smaller Power BI Files – Data Is Not Stored
- Not Limited by Power BI Data Maximums
- Max of 1 Million Rows

# Direct Query Sources

- SQL Server
- SQL Analysis Server
- Azure Databricks
- Azure Synapse Analytics
- Dataverse
- Others

<https://learn.microsoft.com/en-us/power-query/connectors/>

# Using Power Query to Structure Data

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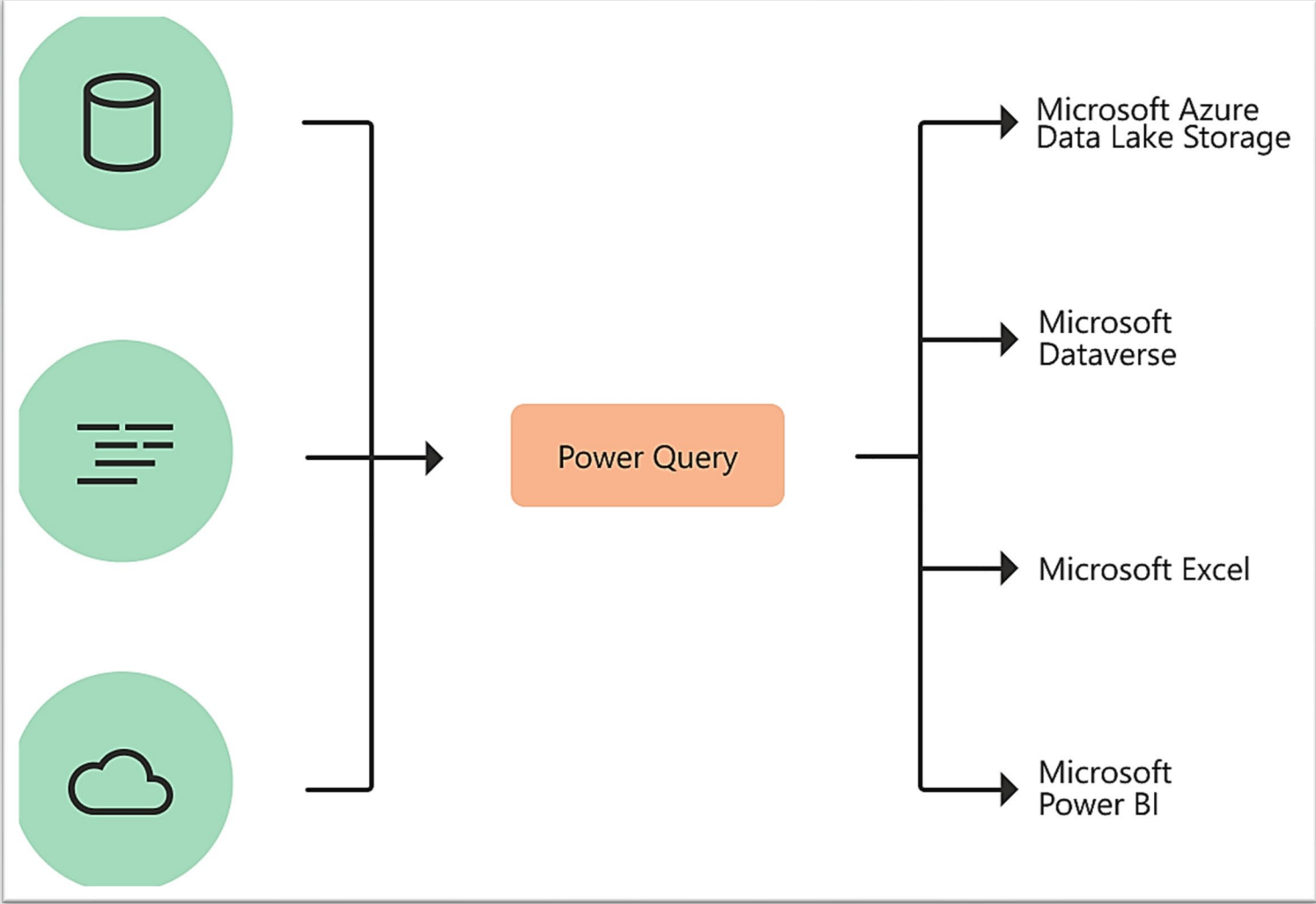
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# What Is Power Query?

- An engine for transforming data & preparing it for use
- Graphical interface for getting data
- Power Query Editor for applying transformations

# What Is Power Query?





# Why Do You Need It?

Take data in & put it into a usable form

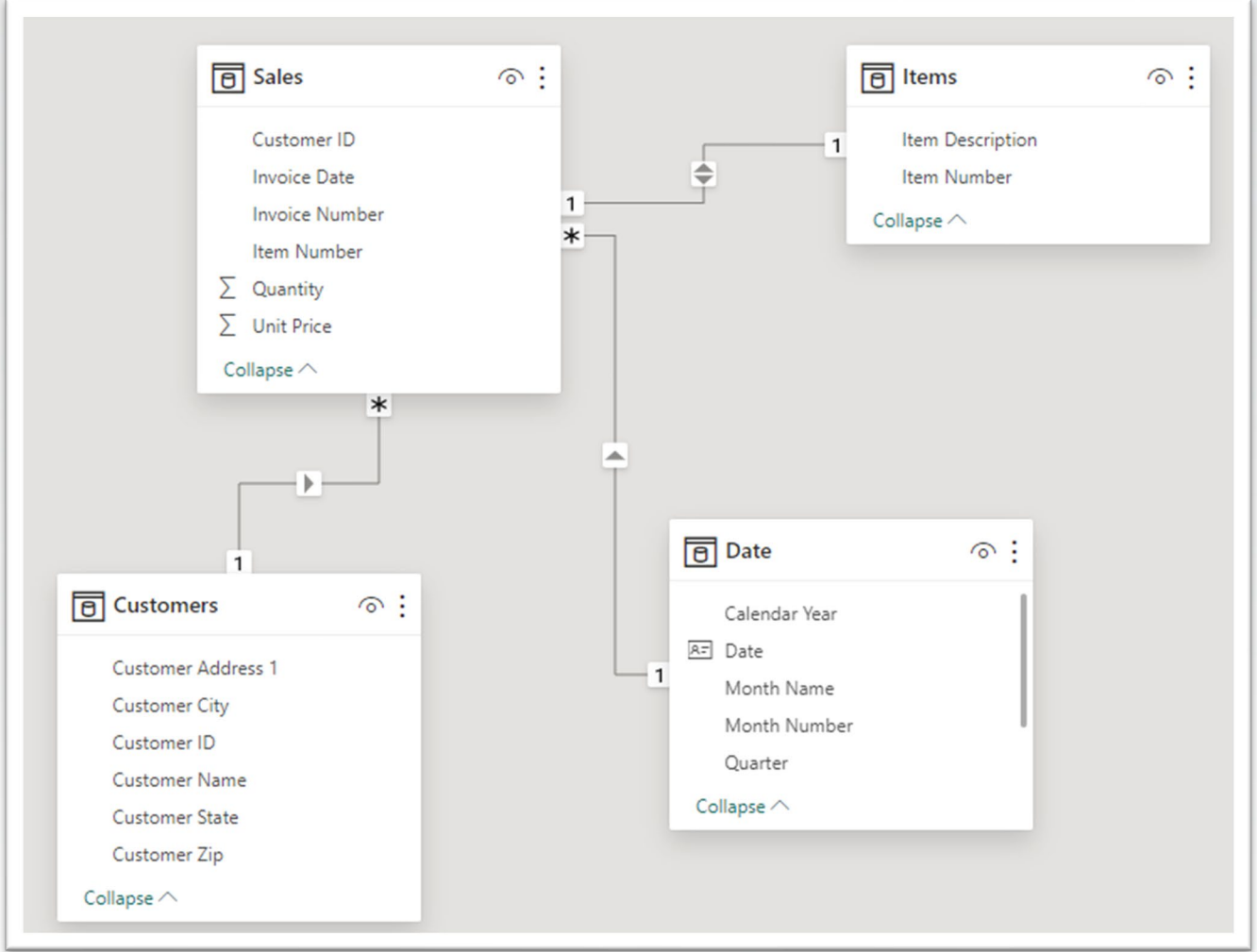
A	B	C	D	E	F	G	H	I	J	K	L
Invoice Number	Invoice Date	Customer ID	Customer Name	Customer Address 1	Customer City	Customer State	Customer Zip	Item Number	Item Description	Quantity	Unit Price
100001	2/4/2024	ACME0001	ACME Corporation	5420 Main St	Los Angeles	CA	90458	SAMGALS24ULTRA256	Samsung Galaxy S24 Ultra 256 GB	5	1299
100001	2/4/2024	ACME0001	ACME Corporation	5420 Main St	Los Angeles	CA	90458	OBDEFXTCLRSAMGALS24U	Otter Box Defender Series XT Clear for Samsung Galaxy S24 Ultra	5	69.95
100002	2/7/2024	AARONFIT0001	Aaron Fitz	45274 Elm St	Bozeman	MT	59715	SAMGALS24ULTRA512	Samsung Galaxy S24 Ultra 512 GB	10	1419
100002	2/7/2024	AARONFIT0001	Aaron Fitz	45274 Elm St	Bozeman	MT	59715	OBSYMSFTTCHSAMGALS24U	Otter Box Symmetry Series Soft Touch	4	59.95
100002	2/7/2024	AARONFIT0001	Aaron Fitz	45274 Elm St	Bozeman	MT	59715	OBCOMMSAMGALS24U	Otter Box Commuter Series	6	39.95
100003	2/10/2024	ADAMPARK0001	Adam Park Resort	1458 McClarty	Oxford	MS	38655	APP15PROMAX512GB	Apple iPhone 15 Pro Max 512 GB	12	1399.99
100003	2/10/2024	ADAMPARK0001	Adam Park Resort	1458 McClarty	Oxford	MS	38655	OBFREMGSAFEAPP15PROMAX	Otter Box Fre Series for MagSafe	12	99.95

# Why Do You Need It?

**Data** >>

Search

- > Customers
- > Date
- > Items
- ✓ Sales
  - Customer ID
  - Extended Price
  - Invoice Date
  - Invoice Number
  - Item Number
  - Quantity
  - Unit Price



# Selecting Tables

- Select Get Data to start the process
- Select the Data Source
- Select one or more tables

Navigator

Source Data.xlsx [3]

- Sheet1
- Sheet2
- Sheet3

Sheet1

Invoice Number	Invoice Date	Customer ID	Customer Name	Customer A
100001	2/4/2024	ACME0001	ACME Corporation	5420 Main !
100001	2/4/2024	ACME0001	ACME Corporation	5420 Main !
100002	2/7/2024	AARONFIT0001	Aaron Fitz	45274 Elm !
100002	2/7/2024	AARONFIT0001	Aaron Fitz	45274 Elm !
100002	2/7/2024	AARONFIT0001	Aaron Fitz	45274 Elm !
100003	2/10/2024	ADAMPARK0001	Adam Park Resort	1458 McCla
100003	2/10/2024	ADAMPARK0001	Adam Park Resort	1458 McCla

Load Transform Data Cancel

# Transform the Data

The screenshot shows the Microsoft Power Query Editor interface. The ribbon includes tabs for File, Home, Transform, Add Column, View, Tools, and Help. The Transform tab is active, showing options like Split Column, Group By, and Replace Values. The main area displays a query with the formula `= Table.Distinct("#Removed Columns")`. Below the formula is a table with 6 columns and 3 rows of data. The right-hand pane shows the Query Settings, including Properties (Name: Customers) and Applied Steps (Source, Navigation, Promoted Headers, Changed Type, Removed Columns, and Removed Duplicates).

	Customer ID	Customer Name	Customer Address 1	Customer City	Customer State	Customer Zip
1	ACME0001	ACME Corporation	5420 Main St	Los Angeles	CA	90458
2	AARONFIT0001	Aaron Fitz	45274 Elm St	Bozeman	MT	59715
3	ADAMPARK0001	Adam Park Resort	1458 McClarty	Oxford	MS	38655

6 COLUMNS, 3 ROWS Column profiling based on top 1000 rows

PREVIEW DOWNLOADED AT 10:53 PM



# It's a Date

- Dates are used for time intelligence calculations
  - YTD
  - MTD
  - This Week
- Multiple Options

# It's a Date

- Use a Date Table From the Source
- Create a Date Table Using DAX
- Use a Tool Like Bravo From SQLBI

# Example DAX for a Date Table

```
1 Date =
2 VAR MinYear = YEAR ( MIN ( Sales[Invoice Date] ) )
3 VAR MaxYear = YEAR ( MAX ( Sales[Invoice Date] ) )
4 RETURN
5 ADDCOLUMNS (
6     FILTER (
7         CALENDARAUTO( ),
8         AND ( YEAR ( [Date] ) >= MinYear, YEAR ( [Date] ) <= MaxYear )
9     ),
10    "Calendar Year", "CY " & YEAR ( [Date] ),
11    "Month Name", FORMAT ( [Date], "mmm" ),
12    "Month Number", MONTH ( [Date] ),
13    "Weekday", FORMAT ( [Date], "ddd" ),
14    "Weekday number", WEEKDAY( [Date] ),
15    "Quarter", "Q" & TRUNC ( ( MONTH ( [Date] ) - 1 ) / 3 ) + 1
16 )
```

<https://www.sqlbi.com/articles/creating-a-simple-date-table-in-dax/>

# What's Next

Streamlining  
Manufacturing &  
Distribution Reporting  
& Planning

Thursday, March 28

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A promotional graphic for a webinar. It features a dark background with a hand pointing at a tablet displaying data charts. The text is overlaid on the image. A red box with the word 'WEBINAR' is positioned above the main title. The main title is 'Streamline Manufacturing & Distribution Reporting & Planning'. Below the title is the date and time: 'Thursday, March 28 • 10-11 a.m. ET'. The FORVIS logo is in the bottom right corner.

**WEBINAR**

**Streamline Manufacturing &  
Distribution Reporting & Planning**

Thursday, March 28 • 10-11 a.m. ET

**FORVIS**



# Questions?

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# Thank you!

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