



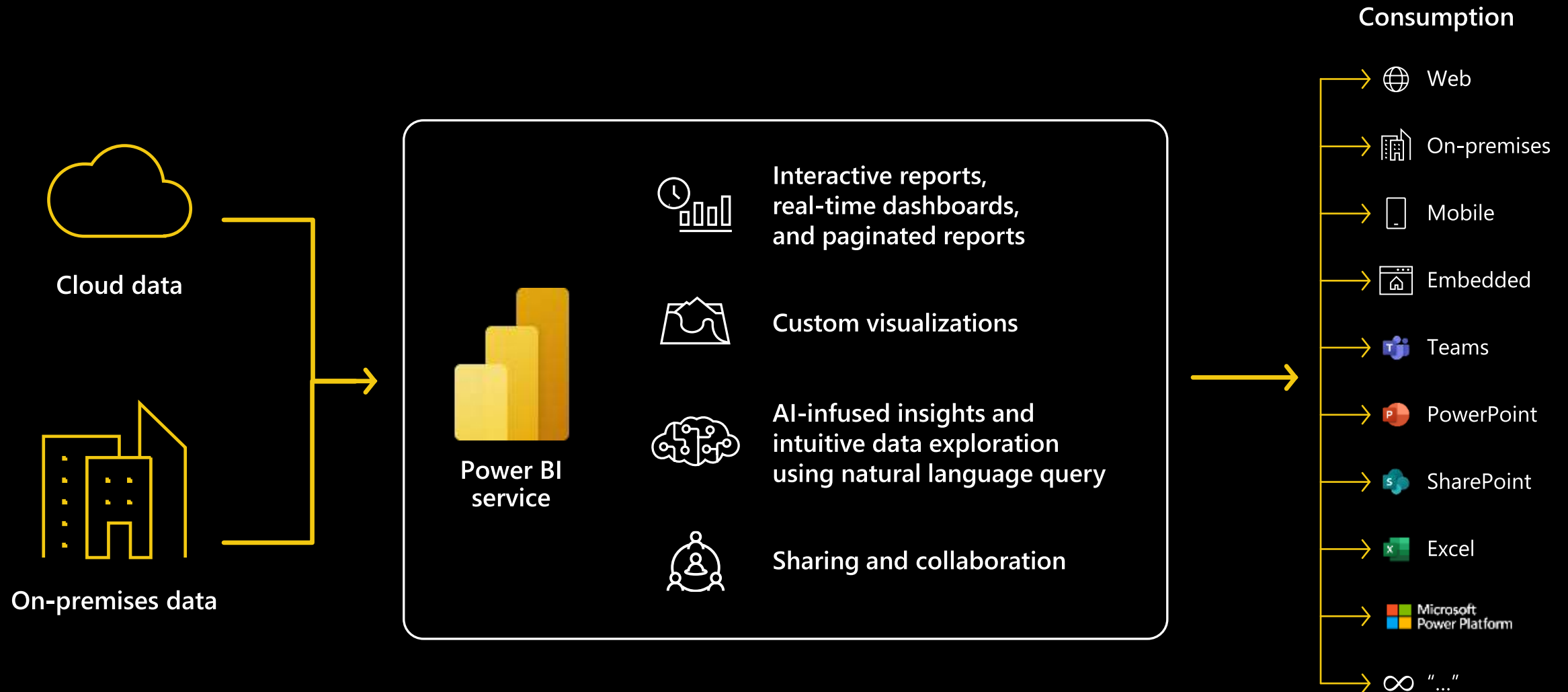
# Power BI

Technical overview

Andrea Benedetti  
Sr. Cloud Solution Architect, Microsoft Italia



# Power BI: The bridge between data and decisions



# Power BI Desktop

Free companion authoring tool for the Power BI service – analytic reports



## Get data

Easily connect, clean, and mashup data



## Analyze

Build powerful models and flexible measures



## Visualize

Create stunning interactive reports



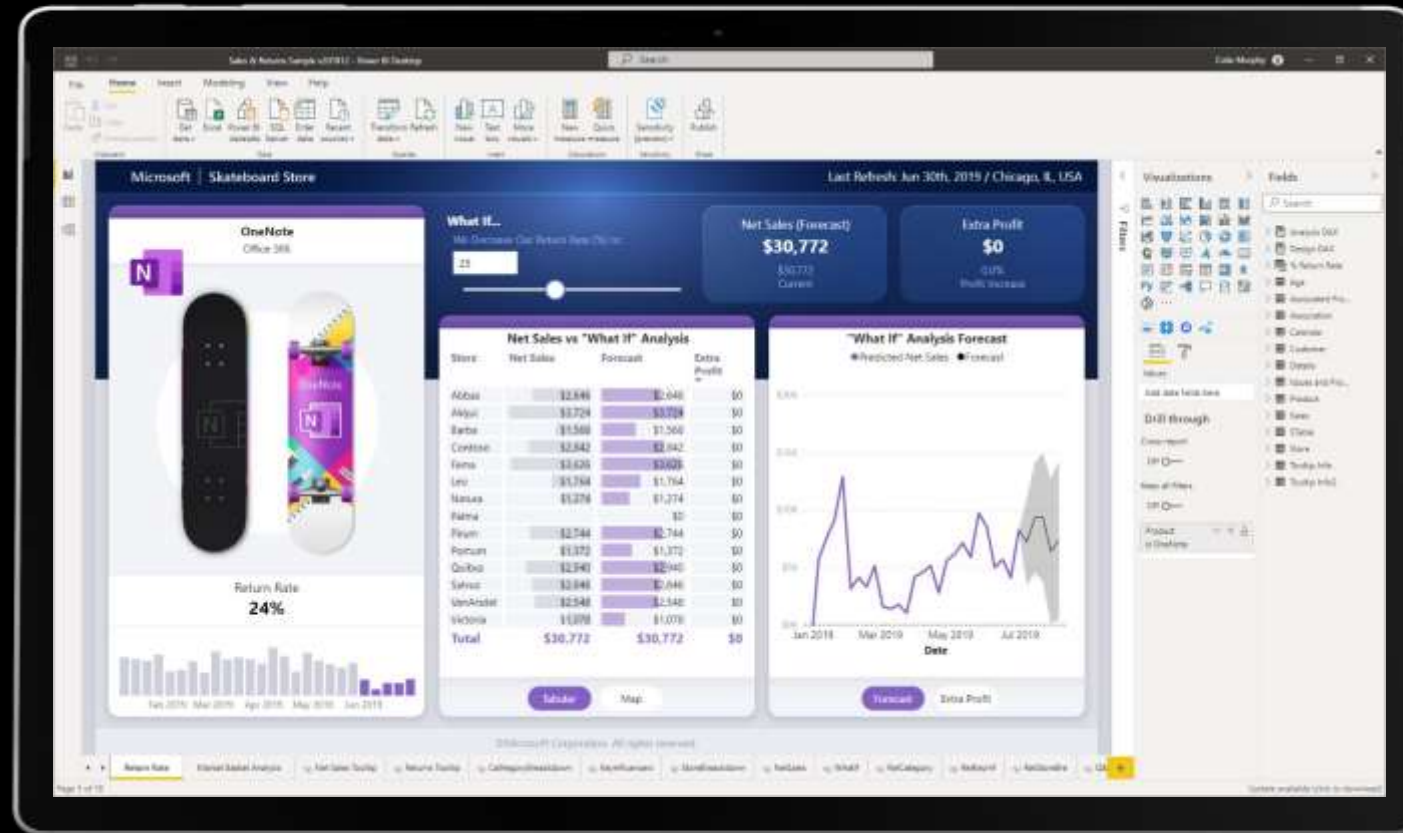
## Publish

Share insights with others



## Collaborate

Empower your organization with self-service analytics



Download free from [PowerBI.com](https://powerbi.com) or the Windows Store

# Power BI Embedded

Embed stunning, fully interactive reports, visuals and analytics into your apps



Spend time focusing on your product instead of building analytics features from scratch



Connect to countless data sources so that you can expose insights to your customers



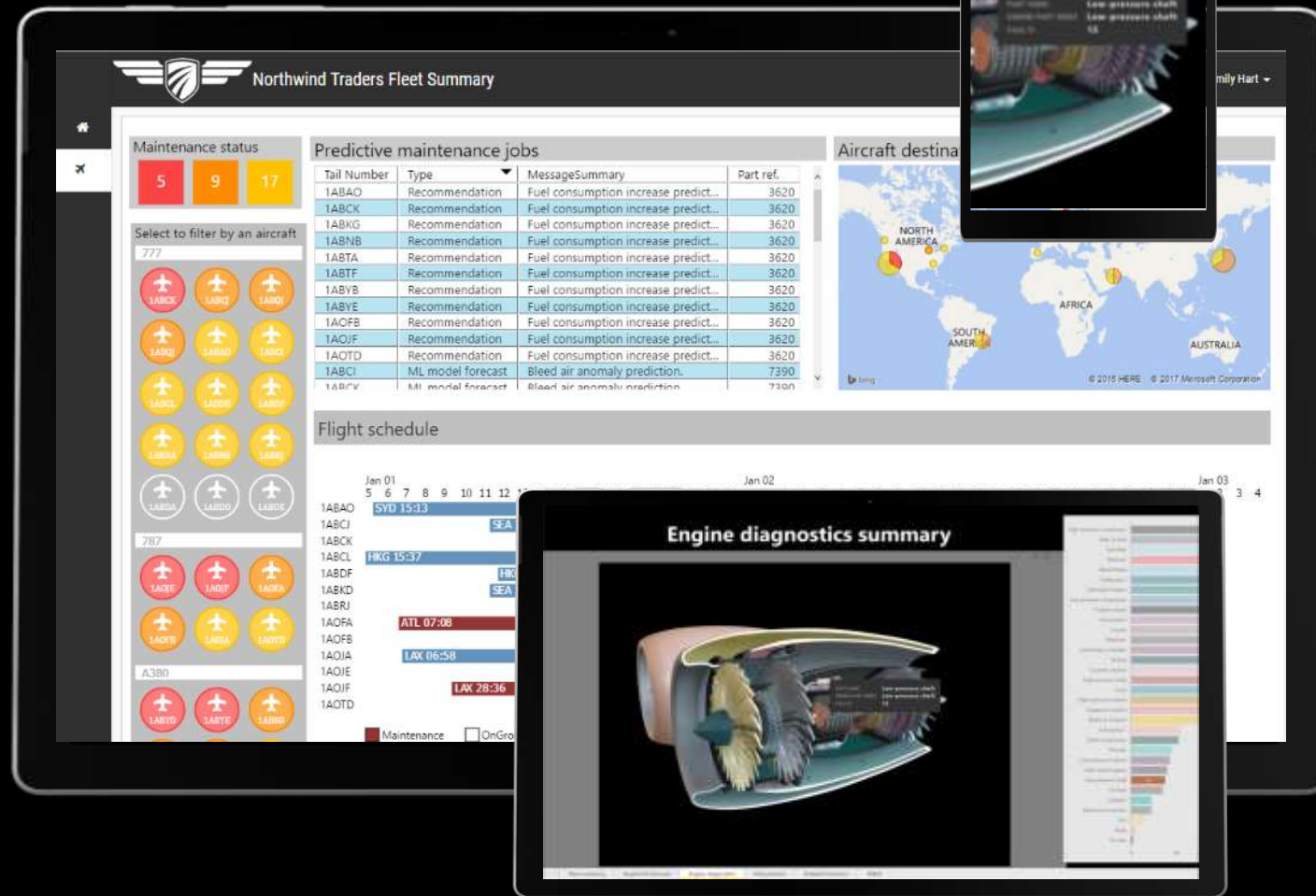
Choose the best way to visualize your data with out-of-the-box, certified, and custom-built visuals



With visualizations optimized for desktop and mobile, your users can easily make decisions from anywhere



From preparing the development environment to deploying analytics in your application, make all of it simple and secure with Power BI Embedded APIs, SDKs, and wizards



# Power BI Mobile

Insights on the move



**Monitor your critical business data – anywhere, anytime**



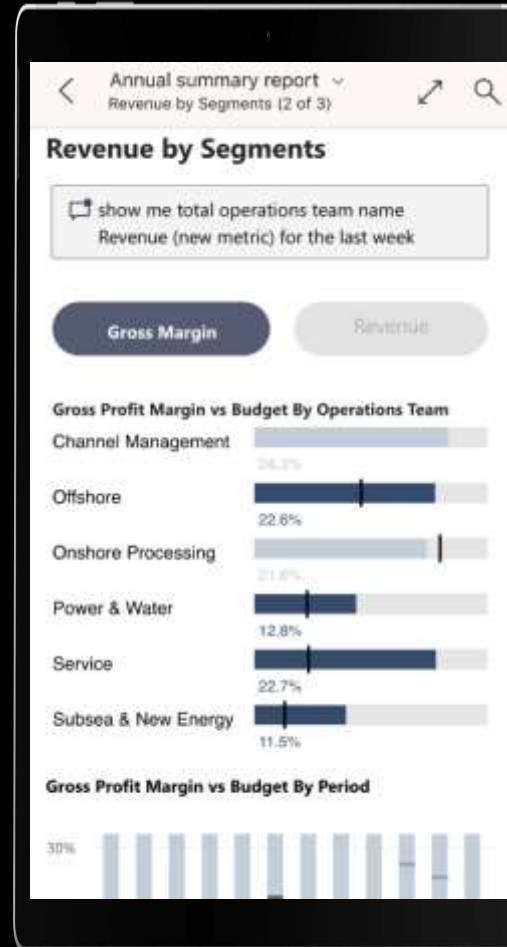
**Discover new insights using mobile optimized views and features**



**Tap to explore, filter, cross highlight, bookmark, and zero-in on your data**



**Collaborate and share critical insights, in real-time**



**Power BI Mobile app is free**

Available in

Apple™ App Store

Google™ Play



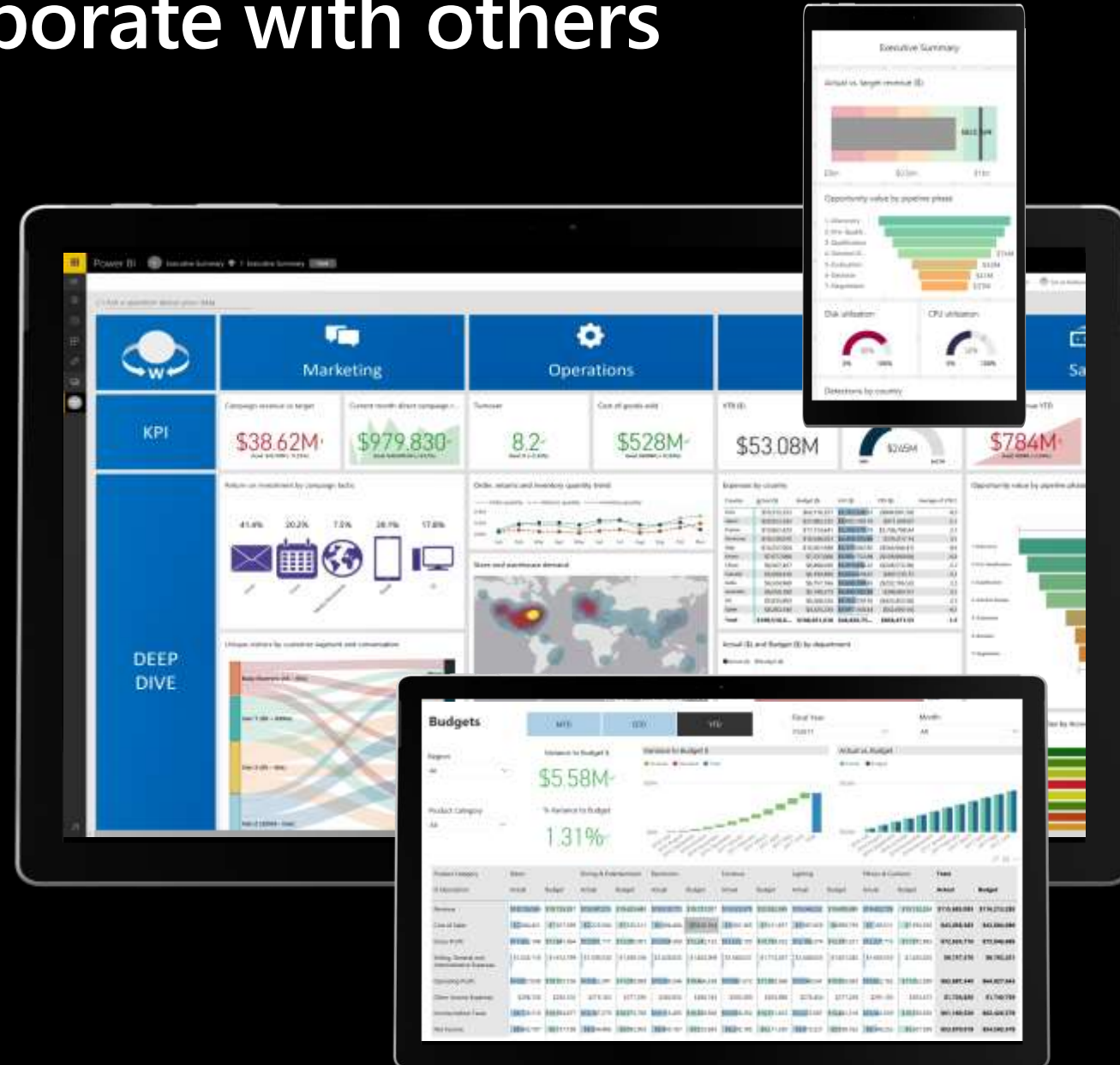
# Share your work and collaborate with others

Share reports and dashboards with colleagues and other users

Collaborate in a workspace with granular membership control

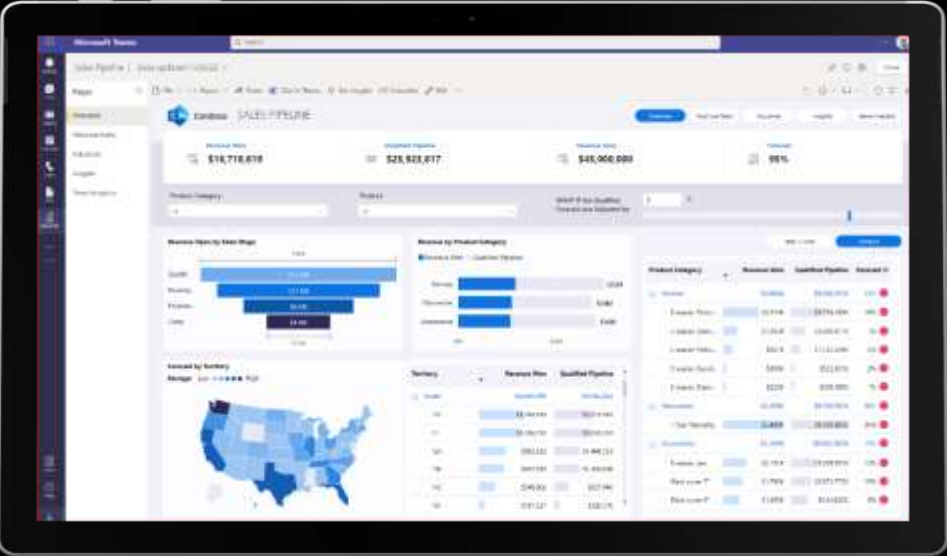
Extend collaboration using an app and publish it to individuals, teams, or your whole organization

Personalize your collaboration by embedding visuals into your own applications



# Support hybrid data

Live Power BI reports and dashboards



Cloud



Gateway Cloud Service

Data source connection credentials are encrypted

Live connection or scheduled refresh



Data source



On-premises Data Gateway

Data source connection credentials can only be decrypted by the gateway



SSAS tabular/  
multidimensional model



On-premises

# AI-powered analytics

The most complete AI capabilities in a BI product



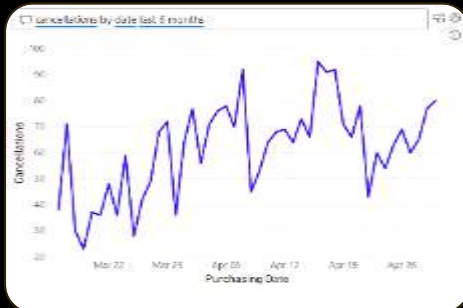
Information workers



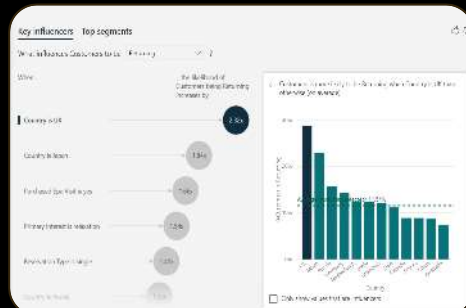
Business analysts



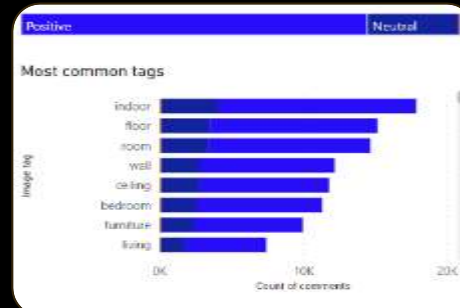
Data scientists



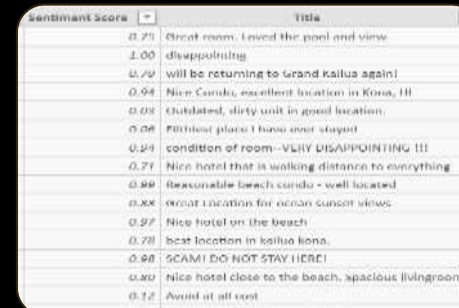
Q&A



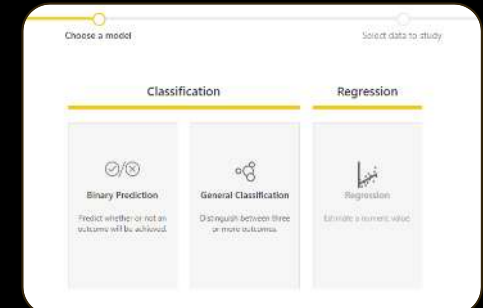
Key driver analysis



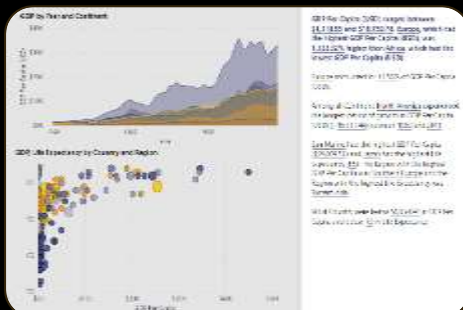
Key phrase extraction



Sentiment analysis



Create ML models



Smart narratives



Root cause analysis



Explore predictions



Python and R integration



Extend with Azure ML

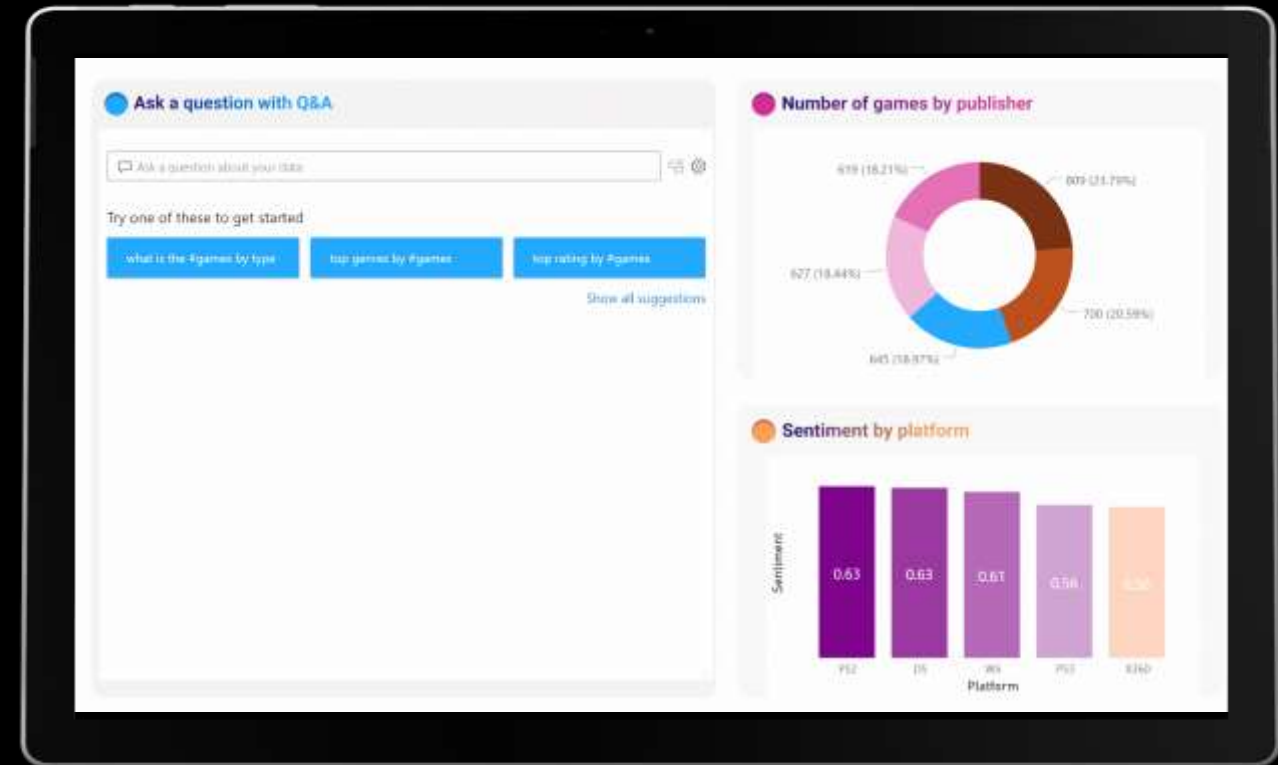


# Enabling information workers – Q&A visual

Ask natural language questions and get answers in the form of a visual

Consumers can quickly get answers to their data

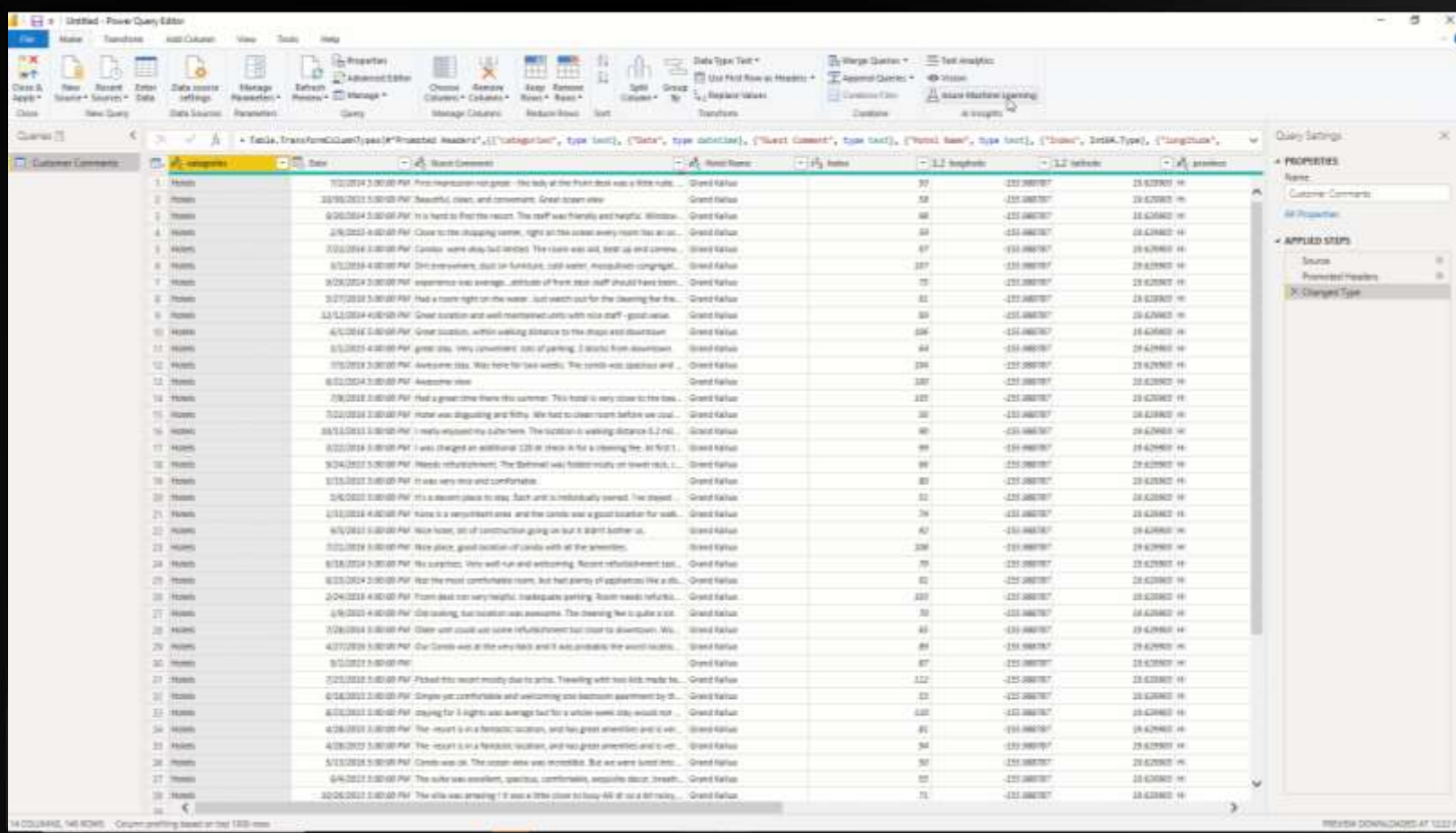
Designers can create visuals in report by simply double-clicking anywhere on the report canvas, and then using natural language to get started



# Enabling analysts – cognitive services

Learn more from your data by using pre-built AI for popular scenarios:

- Sentiment analysis
- Key phrase extraction
- Language detection
- Image tagging



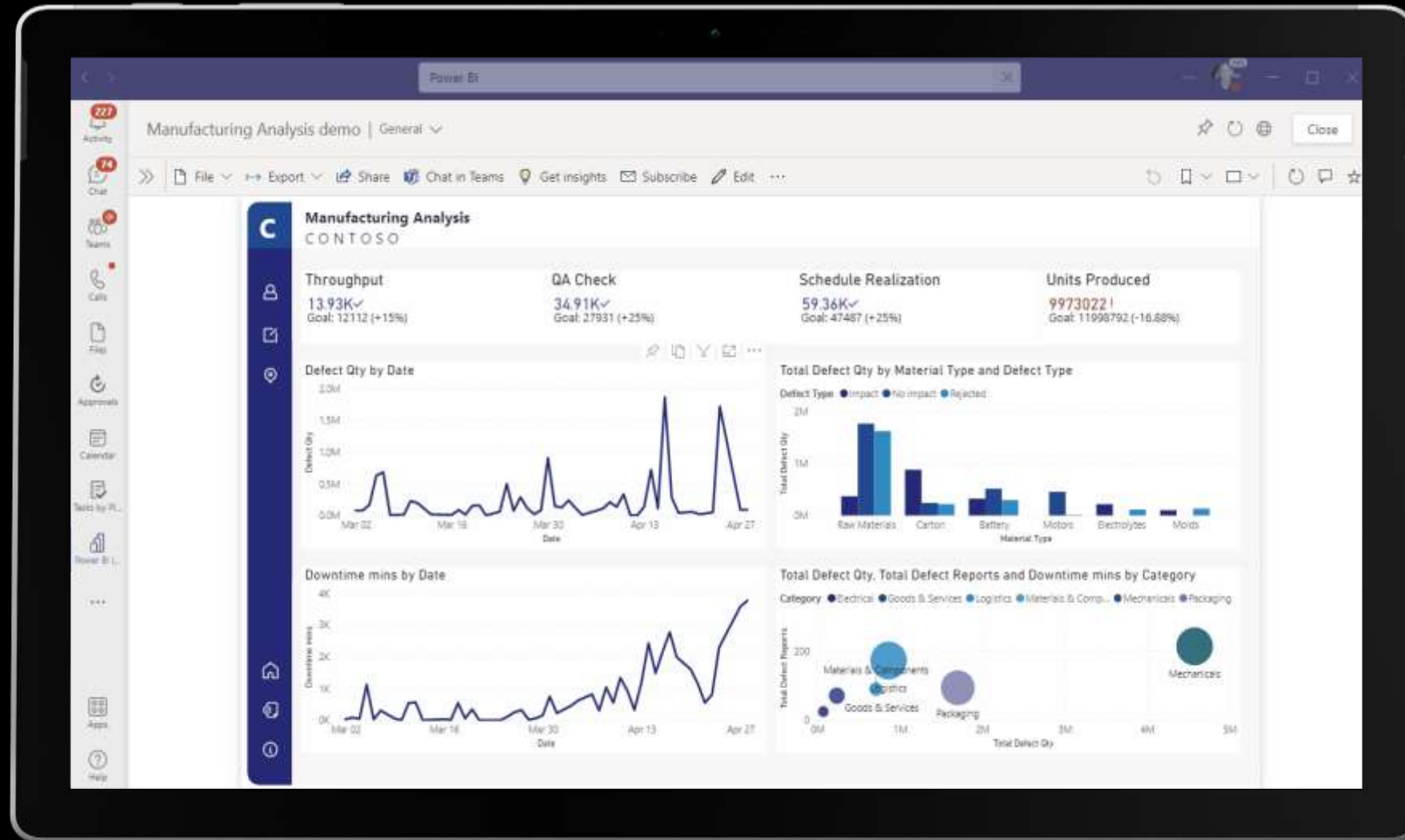
The screenshot displays the Microsoft Power Query Editor interface. The main area shows a table with columns: Date, Review, Rating, and several sentiment analysis metrics. The table contains 30 rows of data, each representing a customer review. The sentiment analysis metrics include Sentiment, Key Phrases, and Language. The interface also shows the Power Query ribbon with various options like 'Sentiment', 'Key Phrases', and 'Language'. The 'Sentiment' column shows values like 'Positive', 'Neutral', and 'Negative'. The 'Key Phrases' column shows extracted phrases from the reviews. The 'Language' column shows the detected language, mostly 'en' (English).

Date	Review	Rating	Sentiment	Key Phrases	Language
1/1/2014 1:00:00 PM	First night sleep not great - the bed of the room was a little noisy.	3	Neutral	First night sleep not great - the bed of the room was a little noisy.	en
1/1/2014 1:00:00 PM	Beautiful, clean, and convenient. Great location.	5	Positive	Beautiful, clean, and convenient. Great location.	en
1/1/2014 1:00:00 PM	It is hard to find the resort. The staff was friendly and helpful. Windows.	4	Positive	It is hard to find the resort. The staff was friendly and helpful. Windows.	en
1/1/2014 1:00:00 PM	Came to the shopping center, right on the corner every room has an air.	5	Positive	Came to the shopping center, right on the corner every room has an air.	en
1/1/2014 1:00:00 PM	Casino were okay but noisy. The room was old, but up and coming.	4	Positive	Casino were okay but noisy. The room was old, but up and coming.	en
1/1/2014 1:00:00 PM	Disappointed, but on furniture, cold water, mosquitoes coming.	3	Negative	Disappointed, but on furniture, cold water, mosquitoes coming.	en
1/1/2014 1:00:00 PM	experience was average... attitude of front desk staff should have been.	3	Neutral	experience was average... attitude of front desk staff should have been.	en
1/1/2014 1:00:00 PM	Had a room right on the water. Just watch out for the cleaning for this.	4	Positive	Had a room right on the water. Just watch out for the cleaning for this.	en
1/1/2014 1:00:00 PM	Great location and well-maintained units with nice staff - good value.	5	Positive	Great location and well-maintained units with nice staff - good value.	en
1/1/2014 1:00:00 PM	Great location, within walking distance to the shops and downtown.	5	Positive	Great location, within walking distance to the shops and downtown.	en
1/1/2014 1:00:00 PM	great stay. very convenient. lots of parking. 2 blocks from downtown.	5	Positive	great stay. very convenient. lots of parking. 2 blocks from downtown.	en
1/1/2014 1:00:00 PM	Average stay. Was here for two weeks. The service was excellent and.	4	Positive	Average stay. Was here for two weeks. The service was excellent and.	en
1/1/2014 1:00:00 PM	Average stay.	3	Neutral	Average stay.	en
1/1/2014 1:00:00 PM	Had a great time there this summer. This hotel is very close to the lake.	5	Positive	Had a great time there this summer. This hotel is very close to the lake.	en
1/1/2014 1:00:00 PM	Hotel was disgusting and filthy. We had to clean room before we could.	2	Negative	Hotel was disgusting and filthy. We had to clean room before we could.	en
1/1/2014 1:00:00 PM	I really enjoyed my stay here. The location is walking distance to downtown.	5	Positive	I really enjoyed my stay here. The location is walking distance to downtown.	en
1/1/2014 1:00:00 PM	I was charged an additional \$20 in check in for a cleaning fee. \$150 total.	3	Negative	I was charged an additional \$20 in check in for a cleaning fee. \$150 total.	en
1/1/2014 1:00:00 PM	Needs refurbishment. The bathroom was filthy and the towels were old.	2	Negative	Needs refurbishment. The bathroom was filthy and the towels were old.	en
1/1/2014 1:00:00 PM	It was very nice and comfortable.	4	Positive	It was very nice and comfortable.	en
1/1/2014 1:00:00 PM	It's a decent place to stay, but not a particularly good one. The staff.	3	Neutral	It's a decent place to stay, but not a particularly good one. The staff.	en
1/1/2014 1:00:00 PM	Room is a very clean area and the beds are a good location for work.	4	Positive	Room is a very clean area and the beds are a good location for work.	en
1/1/2014 1:00:00 PM	New hotel, lot of construction going on but it's a great location.	4	Positive	New hotel, lot of construction going on but it's a great location.	en
1/1/2014 1:00:00 PM	New place, good location of cards with all the amenities.	5	Positive	New place, good location of cards with all the amenities.	en
1/1/2014 1:00:00 PM	No surprises. Very well-run and welcoming. Recent refurbishment too.	5	Positive	No surprises. Very well-run and welcoming. Recent refurbishment too.	en
1/1/2014 1:00:00 PM	Had the most comfortable room, but had plenty of appliances like a fridge.	5	Positive	Had the most comfortable room, but had plenty of appliances like a fridge.	en
1/1/2014 1:00:00 PM	From desk not very helpful. Inadequate parking. Room needs refurb.	3	Negative	From desk not very helpful. Inadequate parking. Room needs refurb.	en
1/1/2014 1:00:00 PM	Disappointing, but location was awesome. The cleaning fee is quite a bit.	3	Negative	Disappointing, but location was awesome. The cleaning fee is quite a bit.	en
1/1/2014 1:00:00 PM	Clean and could use some refurbishment but good to downtown. We.	4	Positive	Clean and could use some refurbishment but good to downtown. We.	en
1/1/2014 1:00:00 PM	Our Casino was at the very best and it was probably the worst night.	3	Negative	Our Casino was at the very best and it was probably the worst night.	en
1/1/2014 1:00:00 PM		3	Negative		en
1/1/2014 1:00:00 PM	Picked this resort mostly due to price. Traveling with two kids made it.	3	Negative	Picked this resort mostly due to price. Traveling with two kids made it.	en
1/1/2014 1:00:00 PM	Single yet comfortable and welcoming one bedroom apartment by the.	4	Positive	Single yet comfortable and welcoming one bedroom apartment by the.	en
1/1/2014 1:00:00 PM	staying for 3 nights was average but for a whole week stay would not.	3	Negative	staying for 3 nights was average but for a whole week stay would not.	en
1/1/2014 1:00:00 PM	The resort is in a fantastic location, and has great amenities and is well.	5	Positive	The resort is in a fantastic location, and has great amenities and is well.	en
1/1/2014 1:00:00 PM	The resort is in a fantastic location, and has great amenities and is well.	5	Positive	The resort is in a fantastic location, and has great amenities and is well.	en
1/1/2014 1:00:00 PM	Casino was OK. The casino area was excellent. But we were bored with.	3	Negative	Casino was OK. The casino area was excellent. But we were bored with.	en
1/1/2014 1:00:00 PM	The staff was excellent, spacious, comfortable, exquisite decor. Great.	5	Positive	The staff was excellent, spacious, comfortable, exquisite decor. Great.	en
1/1/2014 1:00:00 PM	The site was amazing. It was a little close to busy 4th but a great stay.	5	Positive	The site was amazing. It was a little close to busy 4th but a great stay.	en

# Enabling information workers – quick Insights

Generate data insights on your dataset automatically with Power BI

- When not sure where to start, run quick insights to generate interesting interactive visualizations based on your data
- Can apply to an entire dataset or on a specific chart/tile

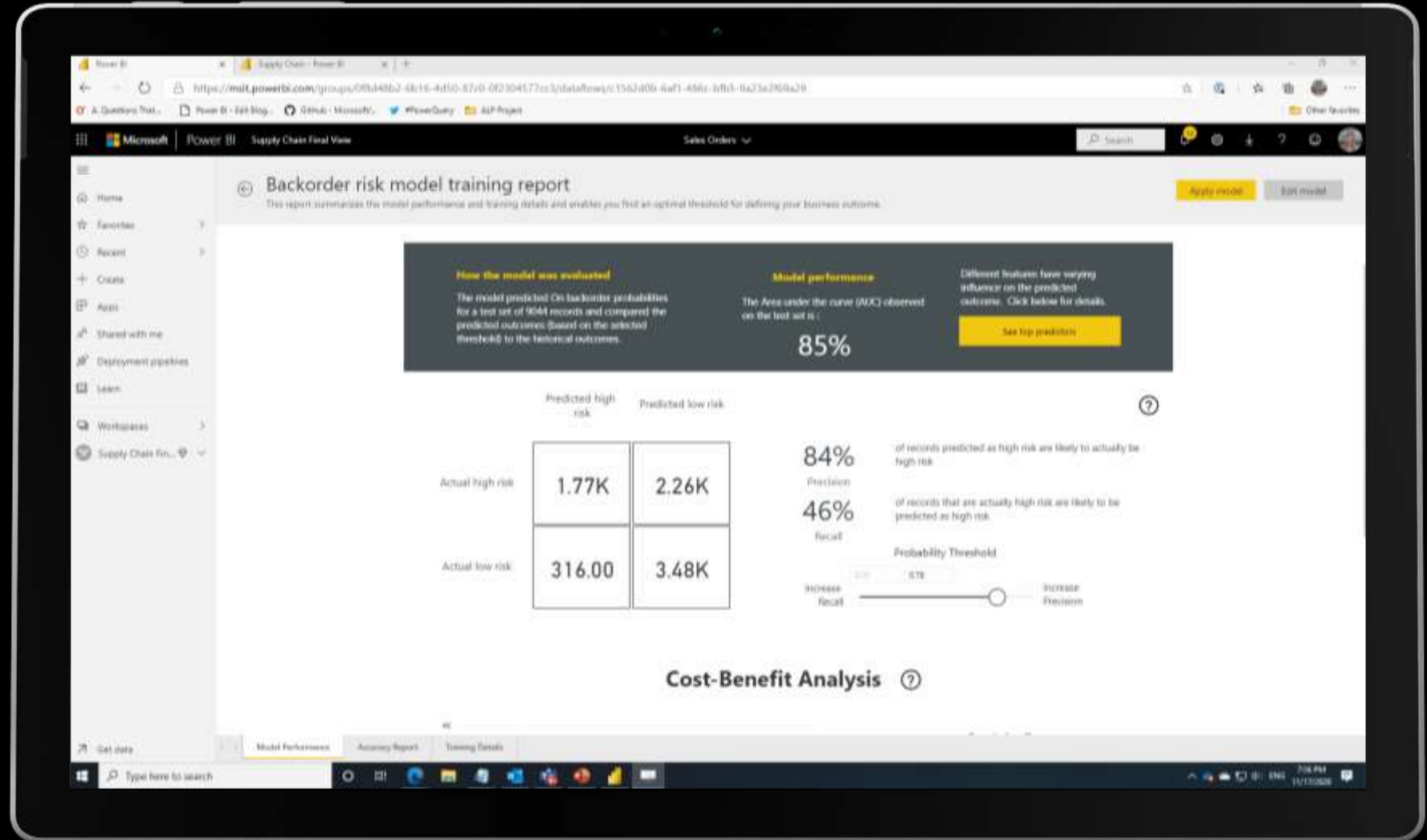


# Enabling information workers – forecast

Add a forecast line to see predicted future values

Simple to configure

Requires a date/time field on the visual axis



# Enabling modern analytics – Python & R integration

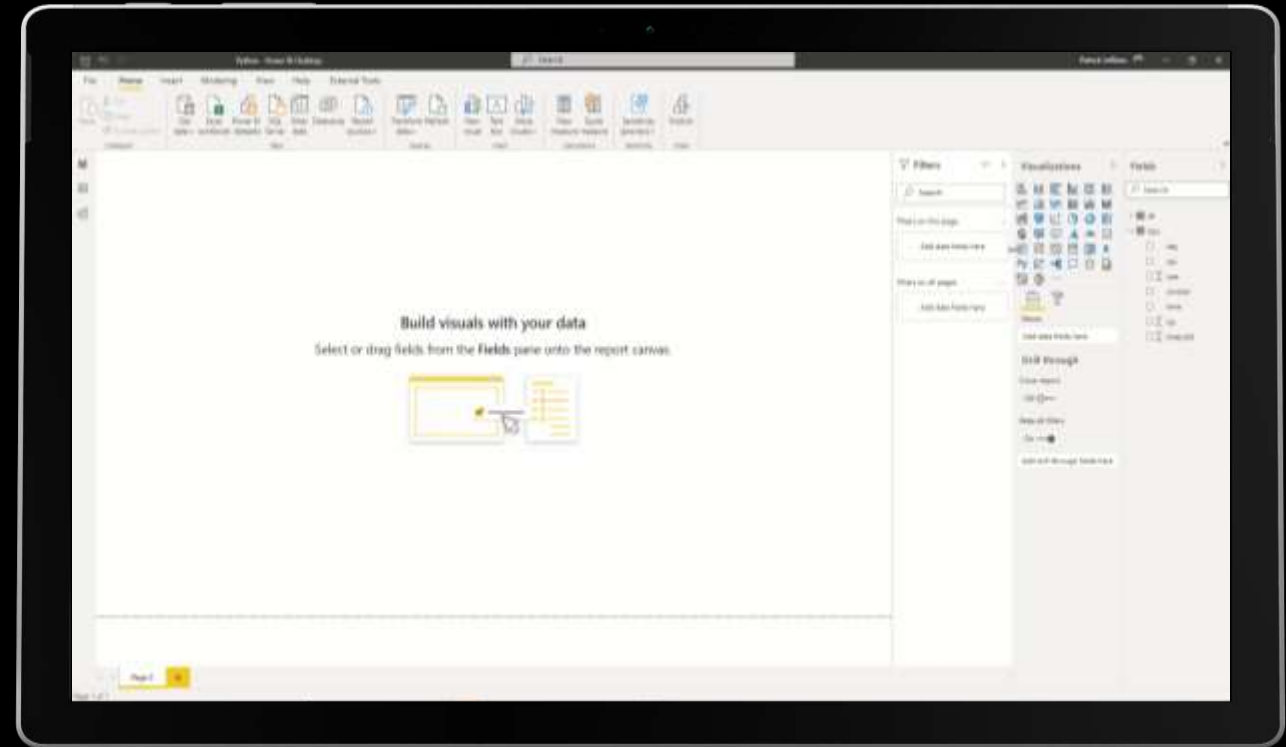
Use your Python & R scripts in Power BI

---

Python & R visualizations behave like any other visualization

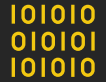
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When you slice the data, the script automatically reruns to update the visualization





# The business analyst role



Get data



Analyze



Visualize



Publish



Collaborate



Power BI Desktop is a **free companion authoring tool** for the Power BI service, updated monthly with new features

# Get data

Easily connect, clean, and mashup data

101010  
010101  
101010



Connect to 275+ data sources, both on-premises and cloud



Shape, transform, and clean data for analysis



Live connectivity to on-premises and cloud data sources



Extend with custom data connectors for any data source

Prep your data using the familiar Power Query experience on the web



# Get data: self-service prep for big data

Ingest, transform, & integrate big data with Power BI

101010  
010101  
101010



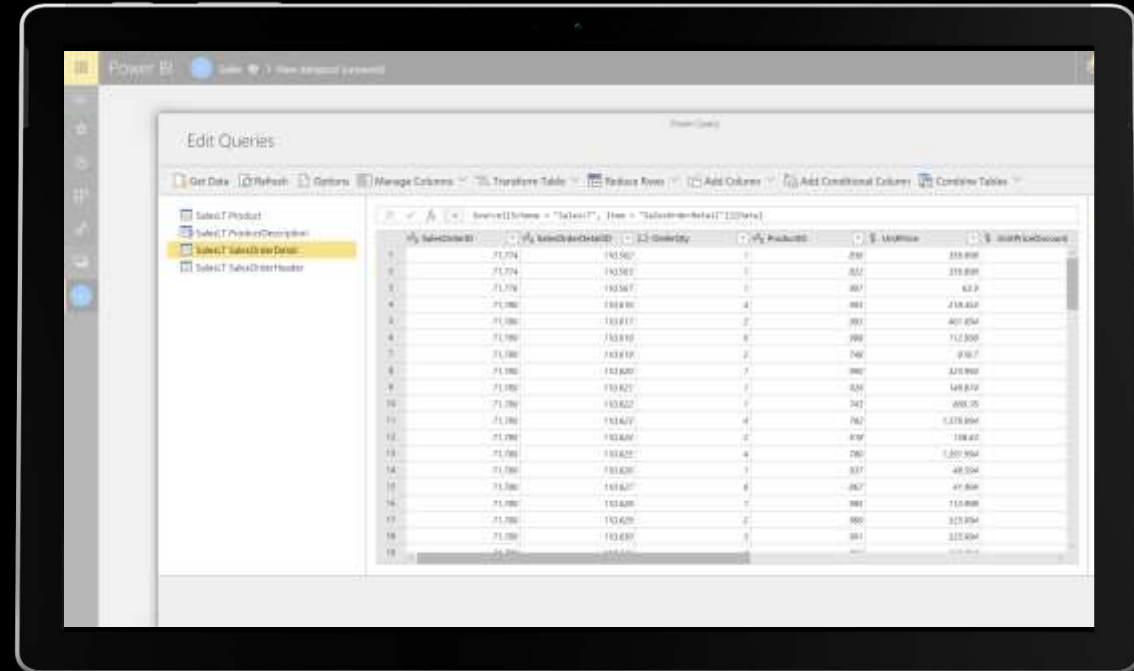
Prep your data using the familiar Power Query experience



Get started quickly with a common data model



Extend self-service prep to Azure Data Lake Storage





# Visualize

Create stunning interactive reports

101010  
010101  
101010



Author reports using 150+ visuals  
via a drag-and-drop canvas



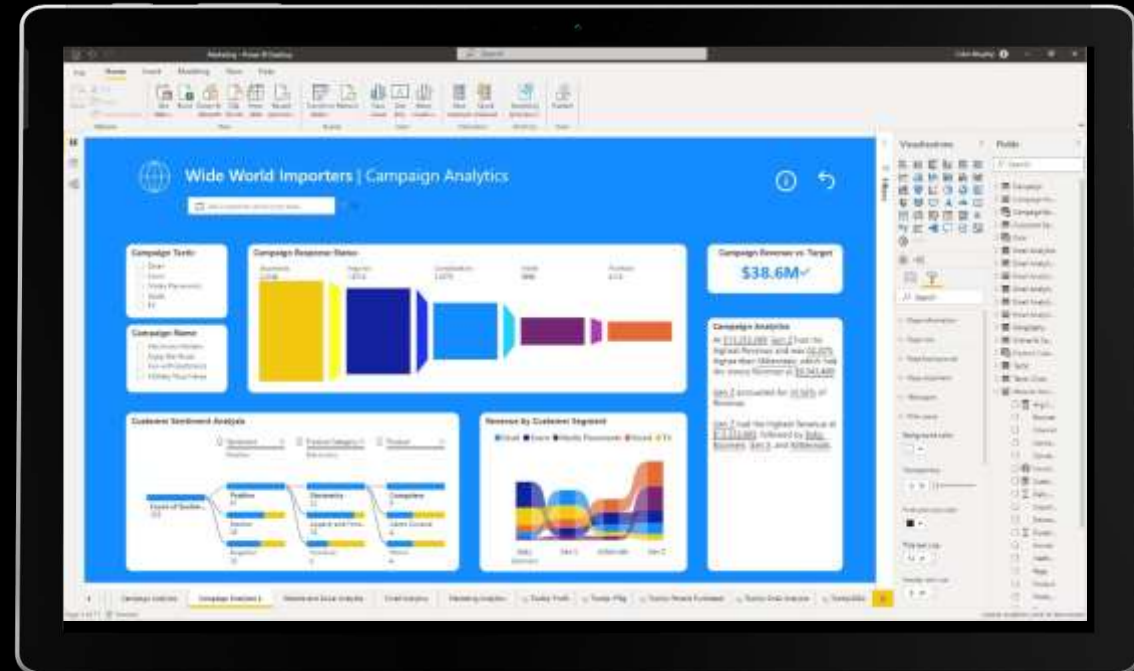
Explore data across multiple  
interactive visualizations



Provide insights in the context of  
your business with Custom Visuals



Visualize your data story with bookmarks  
and custom navigation





# Publish

Share insights with others

101010  
010101  
101010



Publish directly to the cloud or on-premises



Automatic data refresh, so your reports are always up to date



Package your reports in apps for easy consumption and control



Manage your analytics content with admin and governance tools



# Collaborate

Empower your organization

101010  
010101  
101010

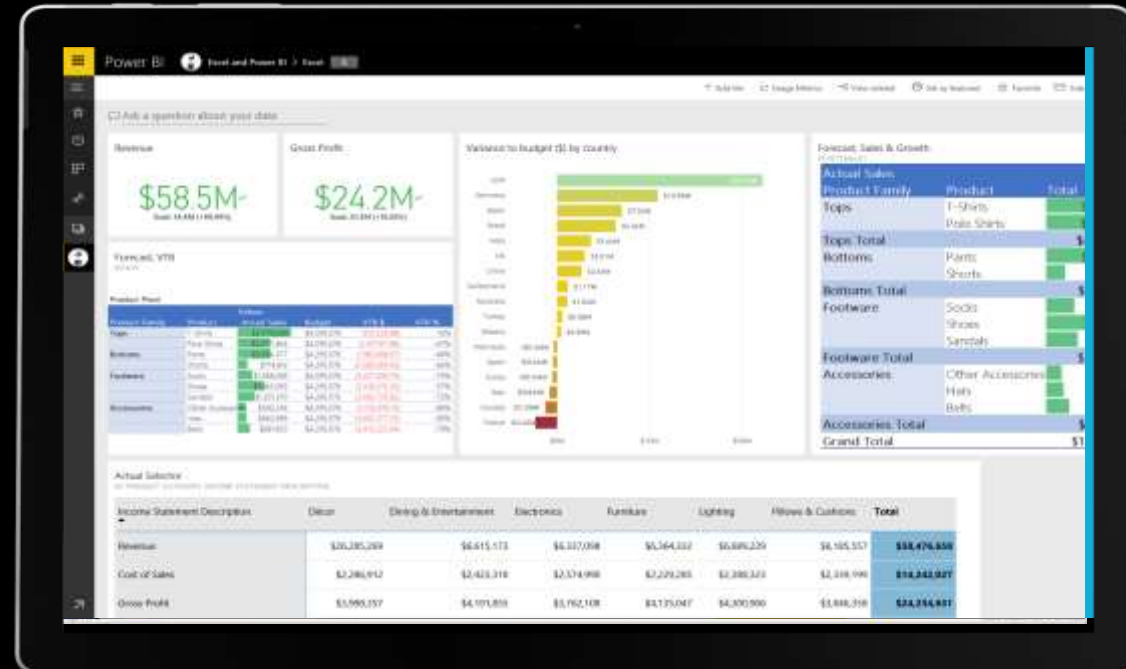


Provide access to reports and dashboards anywhere on any device

Enable users to ask questions and automatically discover insights from the data

Deliver insights through other services such as SharePoint and Teams

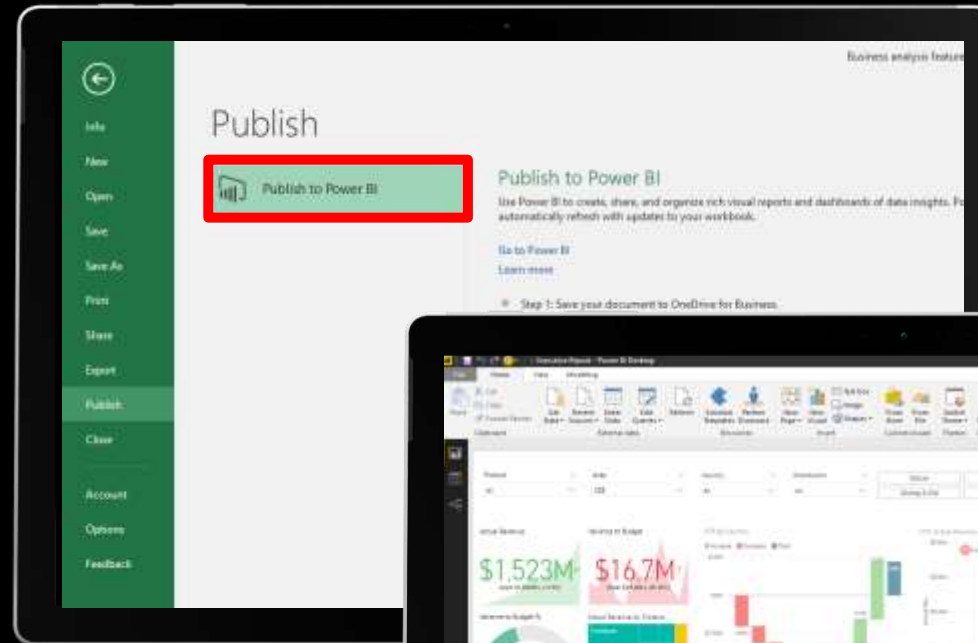
Connect live to your models in Excel and Power BI Desktop



# One-click publish to the Power BI service

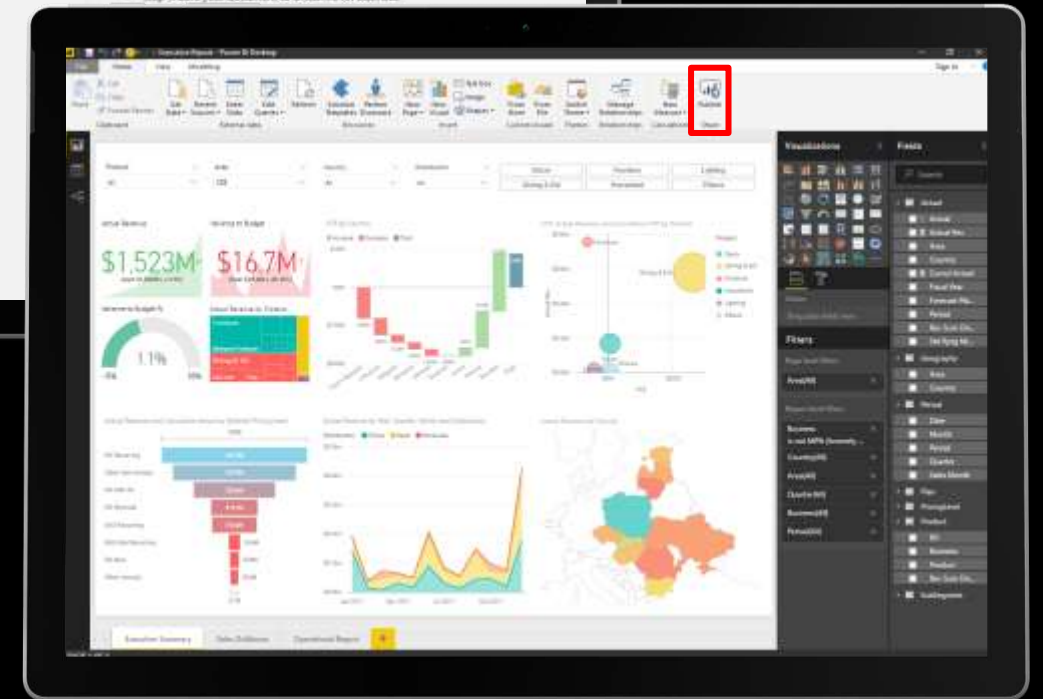
## Power BI Desktop

Publish button on the ribbon

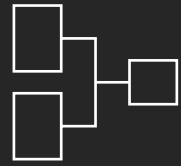


## Excel

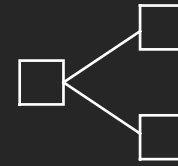
Publish to Power BI button



# Simplified data management



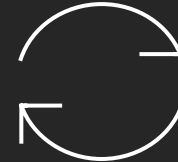
Semantic models



Lineage and impact analysis



Shared & certified datasets

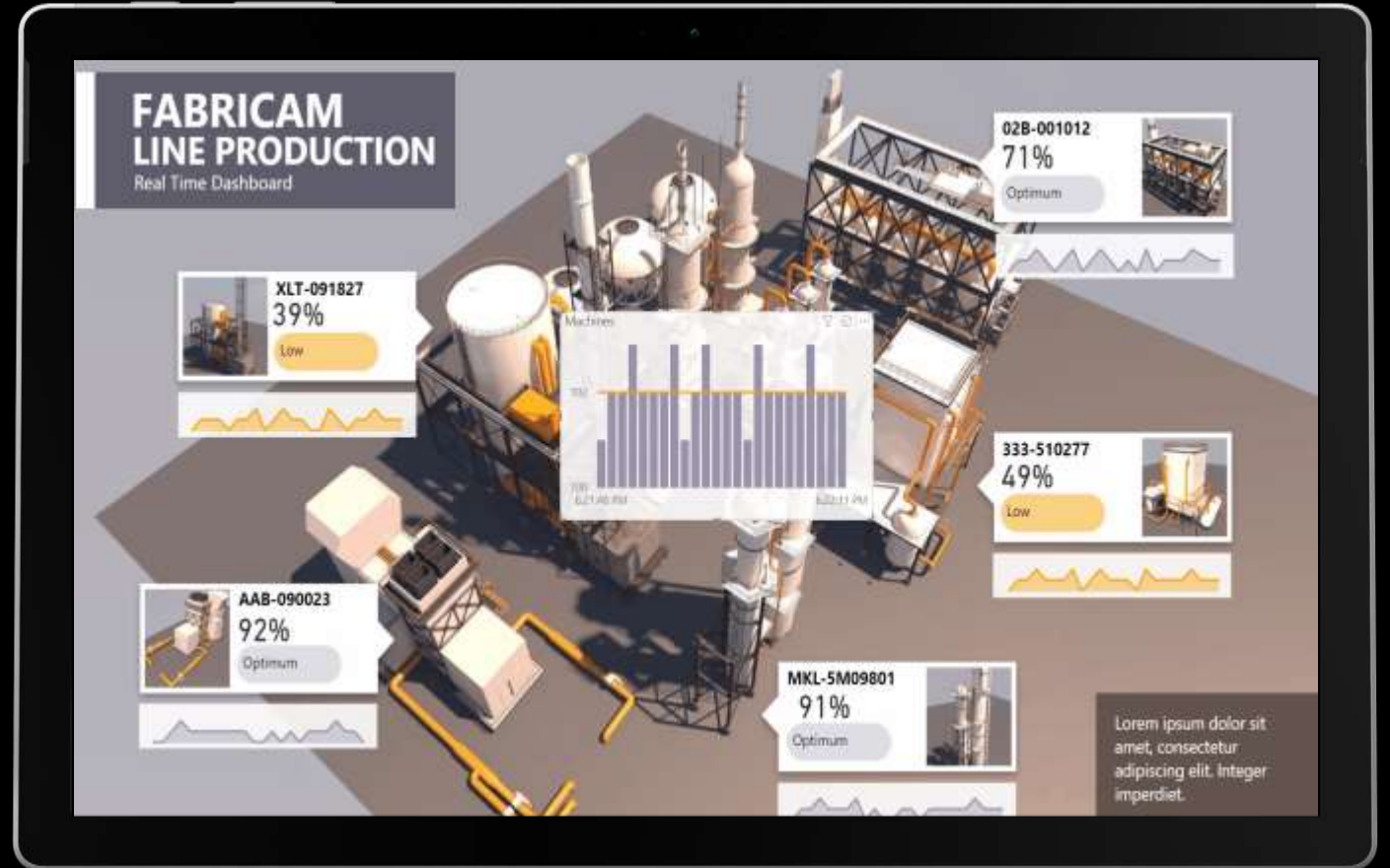


Real-time scenarios

# Real-time scenarios

Real-time scenarios can be delivered with:

- Push datasets
- Azure Stream Analytics
- Streaming datasets
- Automatic page refresh



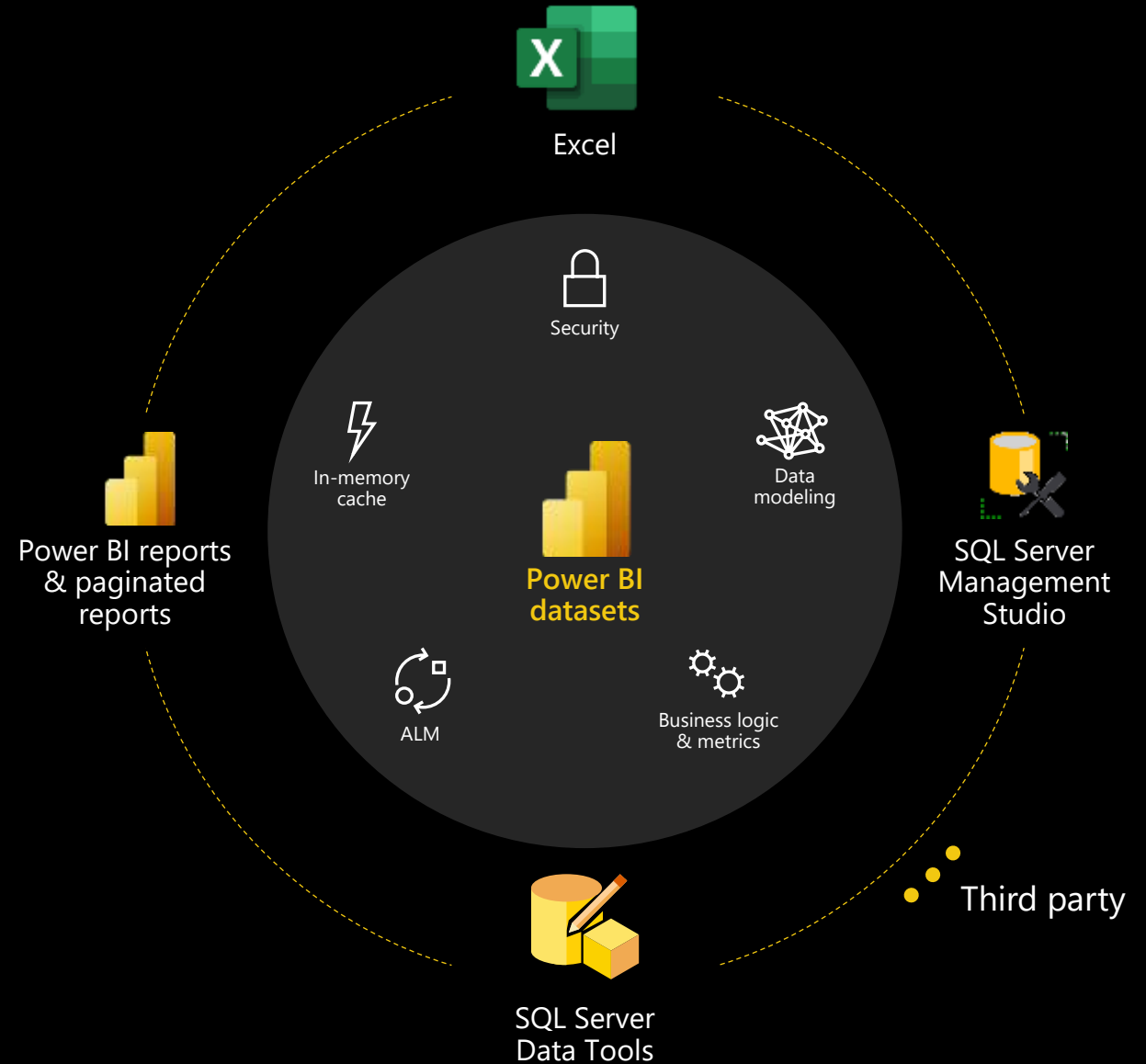


## Simplified data management

# Open semantic models

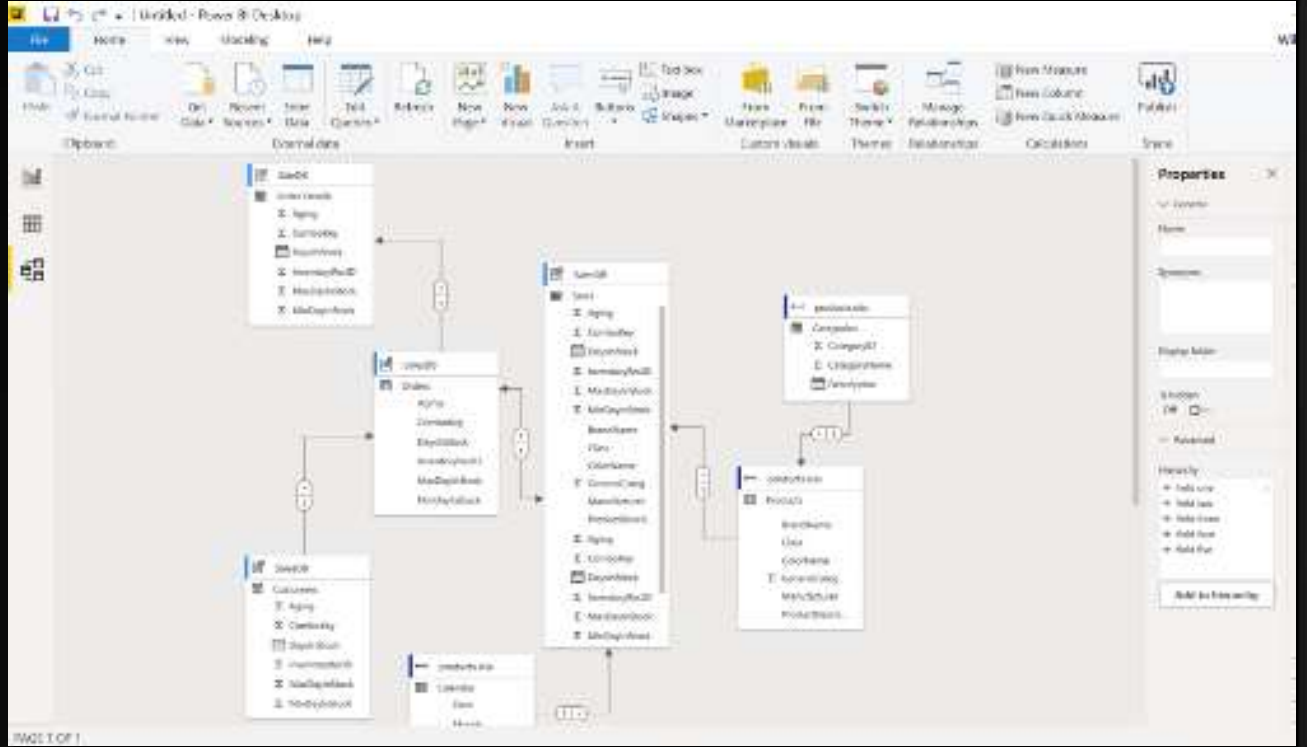
Power BI datasets represent data models, or semantic models. These models can be developed and published using Power BI Desktop

Once published to the Power BI service, they can be secured, refreshed, and they become the source for reports (Power BI and paginated) and dashboards



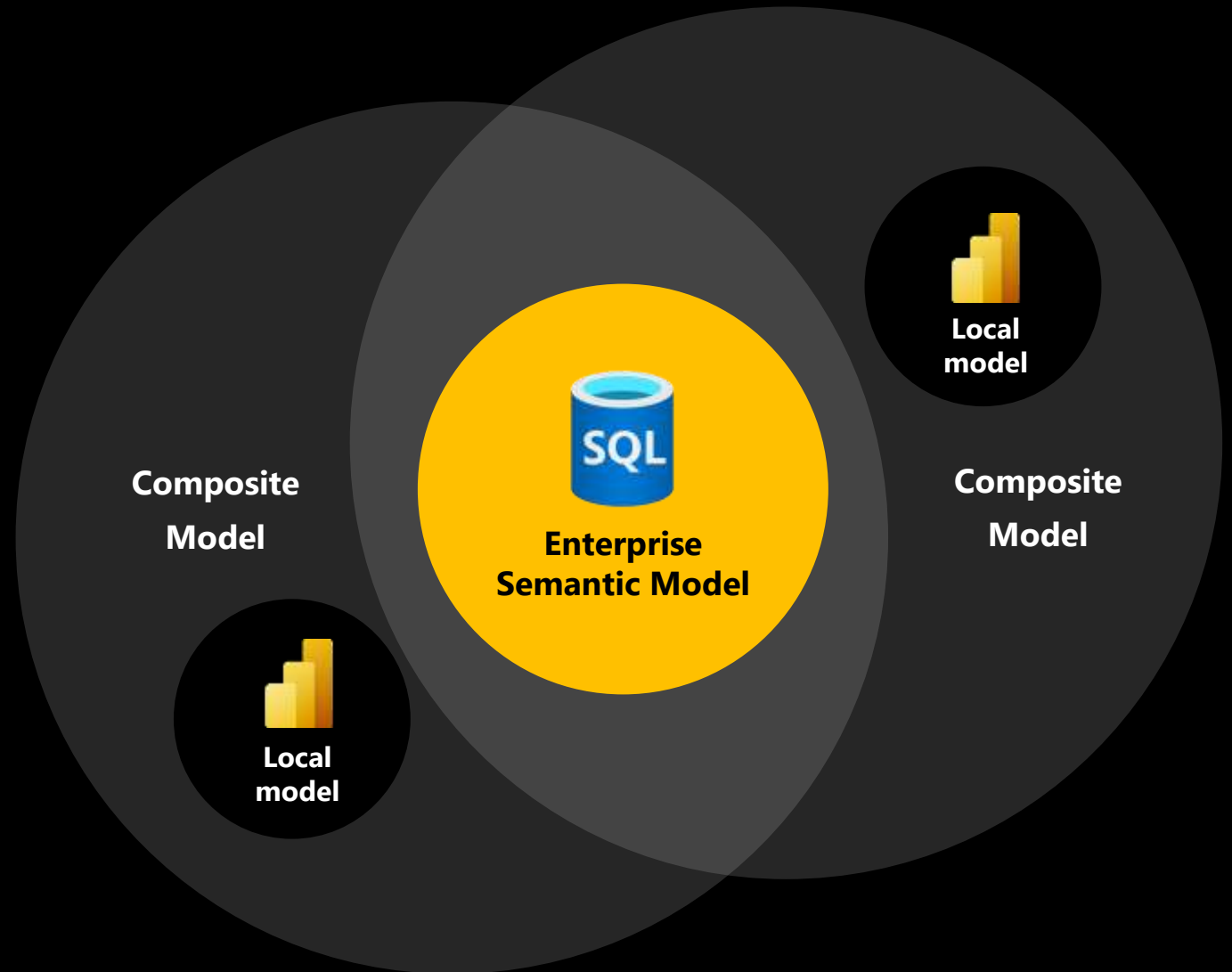
# Open semantic models: XMLA—read/write

Read/write capabilities support many additional scenarios for dataset management, advanced semantic modeling, debugging, and monitoring



# Open semantic models: composite models

Composite models easily combine multiple DirectQuery data sources into a single model



Simplified data management

# Lineage and impact analysis

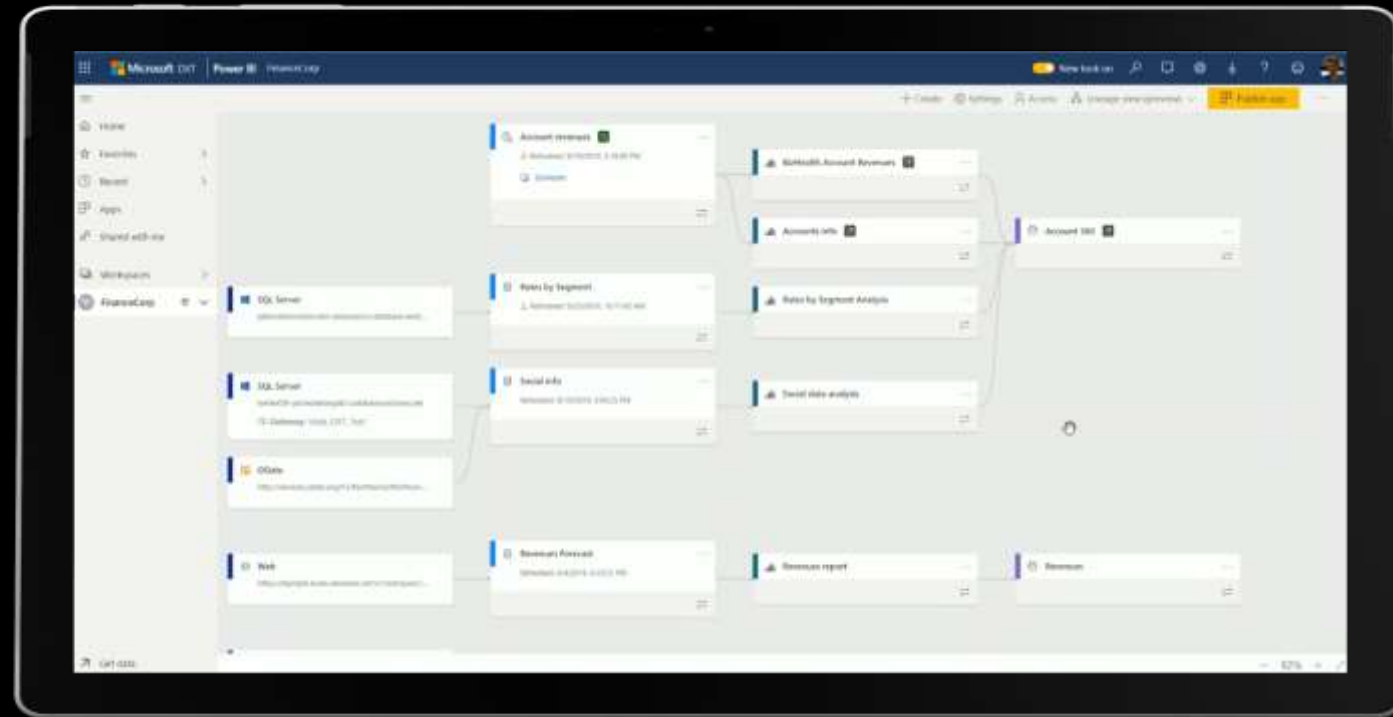
Use lineage view to understand the flow of data from data sources to their destinations

---

Covers all Power BI workspace artifacts, including dataflows, datasets, reports, and dashboards and their connections to the external data sources

---

Understand dataset impact analysis across workspaces



Simplified data management

# Shared and certified datasets

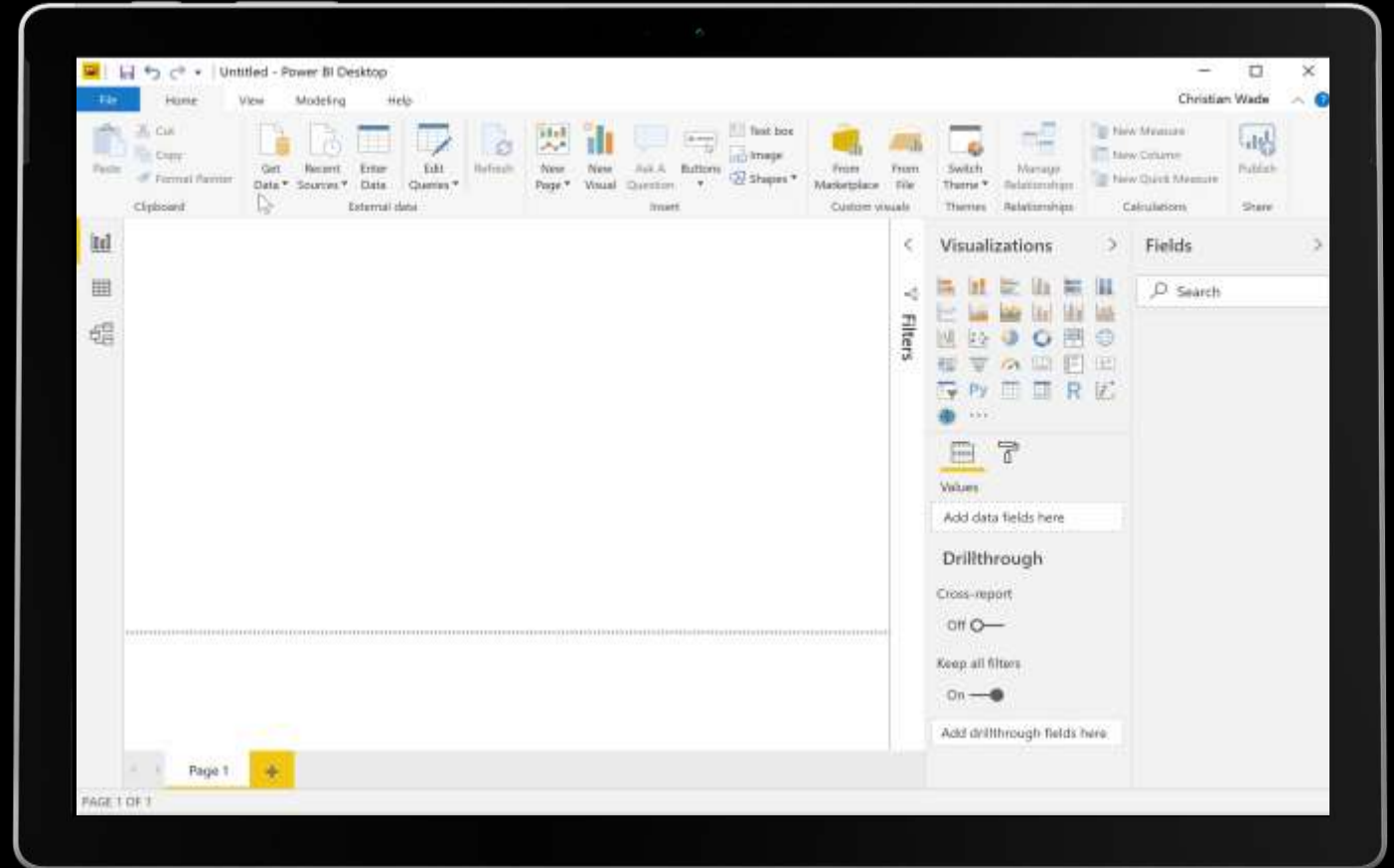
Use datasets across workspaces

---

Certify datasets to establish authoritative data sources

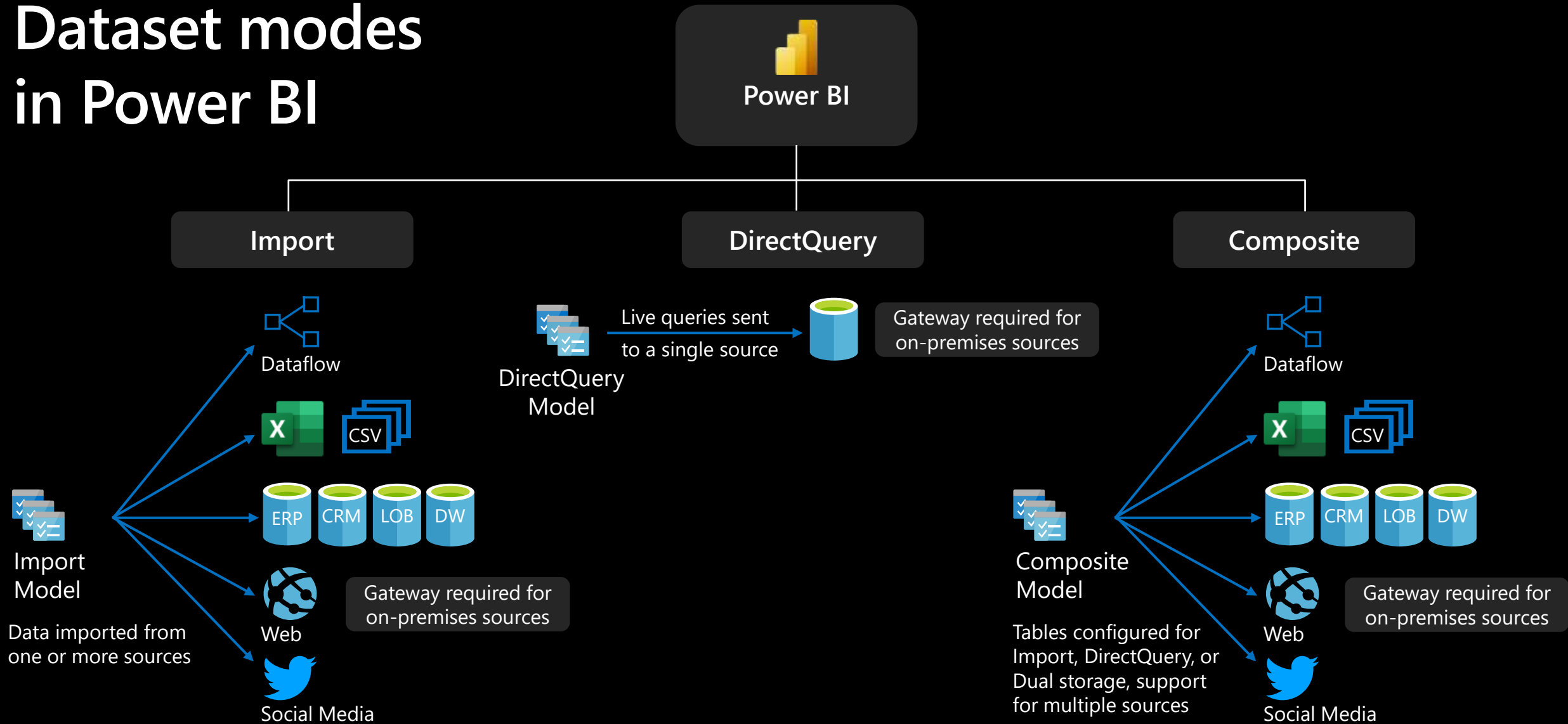
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Govern the use of shared datasets as needed for your organization





# Dataset modes in Power BI



[Learn more about Dataset Modes](#)

# Power BI Hybrid Tables

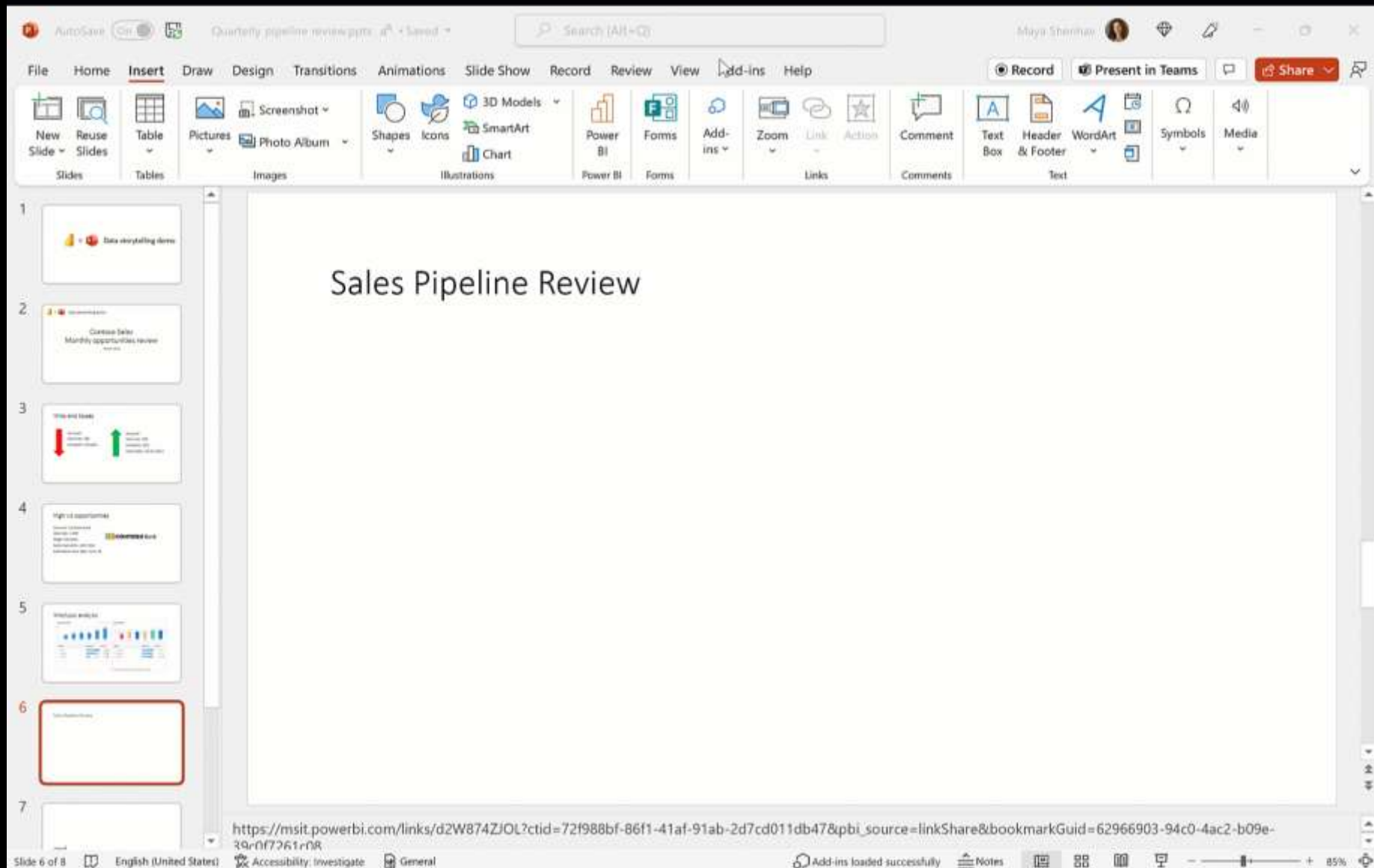
## Incremental Refresh with Real Time Data



Query over trillions of rows of data  
with blazingly fast performance

Granularity	Name	Row Count	
Year	2011	295,489,717	Archived: <b>Import</b>
Year	2012	297,678,498	
Year	2013	295,575,442	
Year	2014	292,477,875	
Year	2015	297,780,469	
Year	2016	294,060,081	
Year	2017	300,419,682	
Year	2018	296,541,108	
Year	2019	292,787,420	
Year	2020	299,273,979	
Quarter	2021Q1	74,135,277	Incremental refresh: <b>Import</b>
Month	2021Q104	24,939,498	
Day	2021Q10501	820,805	
Day	2021Q10502	826,885	Real time: <b>DirectQuery</b>
Day	2021Q10503	821,043	
Day-DirectQuery	2021Q10504-DQ	271,110	
Total		3,063,898,887	

# Data Storytelling in Power Point

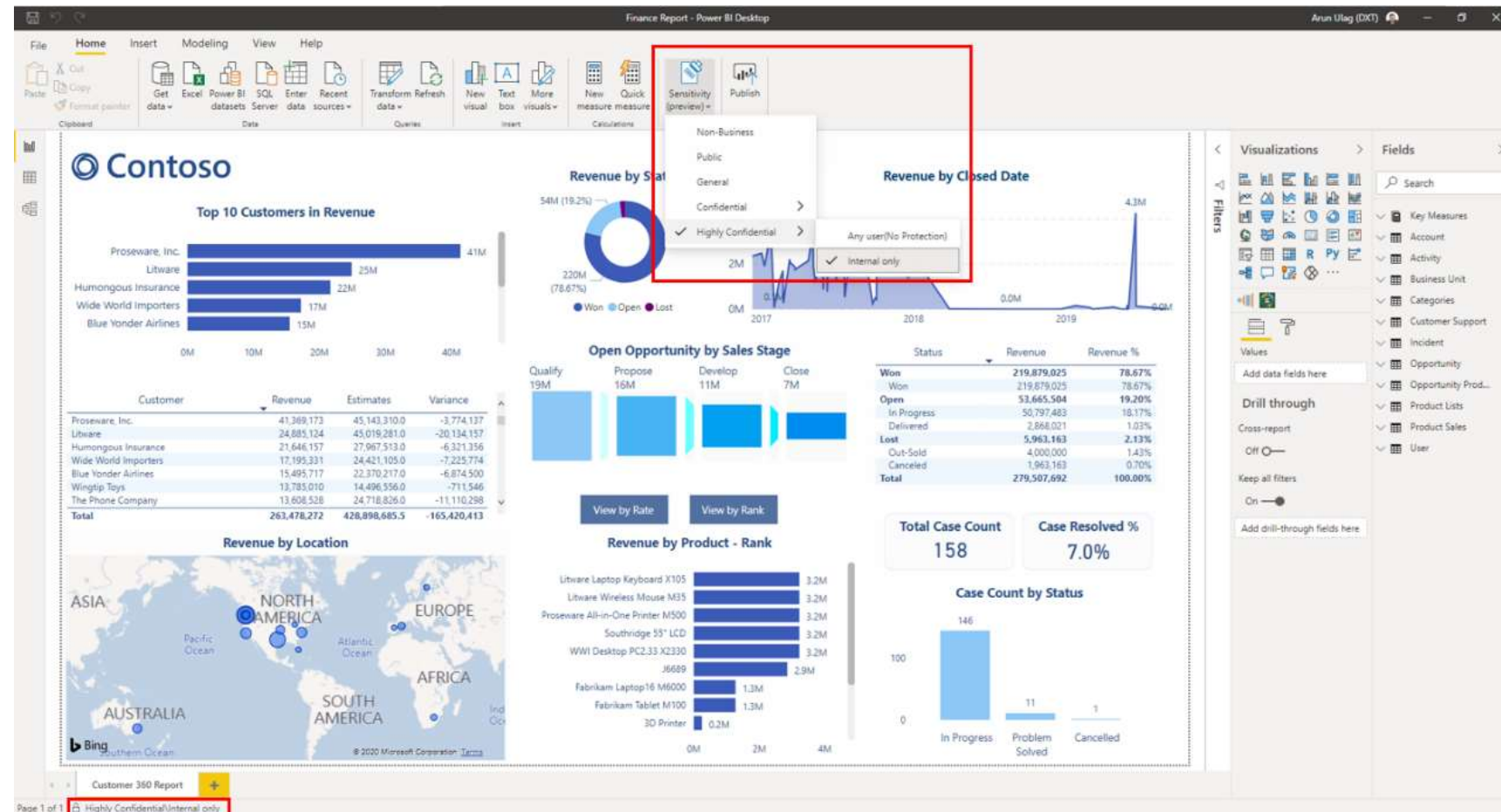


# MIP sensitivity labels in Power BI

## MIP sensitivity labels in Power BI

Power BI is the only BI product in the industry to support [MIP sensitivity labels](#), helping enterprises classify content in Power BI and protect it even as data is exported to Excel, PowerPoint and PDF files.

- **Power BI dataset MIP sensitivity label applied on Excel file when using live connect**
- **MIP sensitivity labels in Power BI desktop**
- **MIP in Template**



🔍 Search content...

Showing 2 items

[Dashboards](#) [Reports](#) [Workbooks](#) [Datasets](#) [Dataflows](#)

NAME 

## ACTIONS

OWNER

## SENSITIVITY

INCLUDED IN APP



2019 Q2 Revenue - Internal



Contoso Finance D...

General ⓘ



Sales 2019 - External



Contoso Finance D...

General ⓘ



🔍 Search content...

Showing 2 items

[Dashboards](#) [Reports](#) [Workbooks](#) [Datasets](#) [Dataflows](#)

NAME 

## ACTIONS

OWNER

## SENSITIVITY

INCLUDED IN APP

2019 Q2 Revenue - Internal

Contoso Finance D... Highly Confiden... ⓘ 

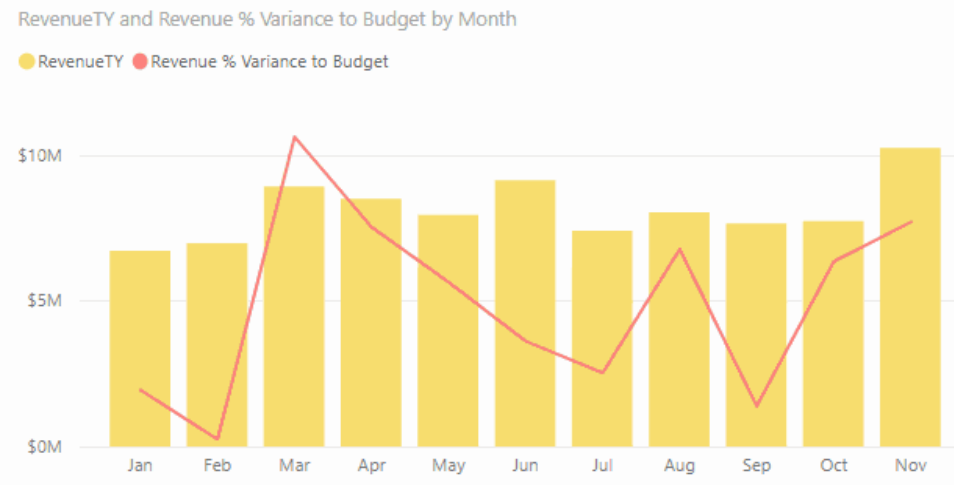
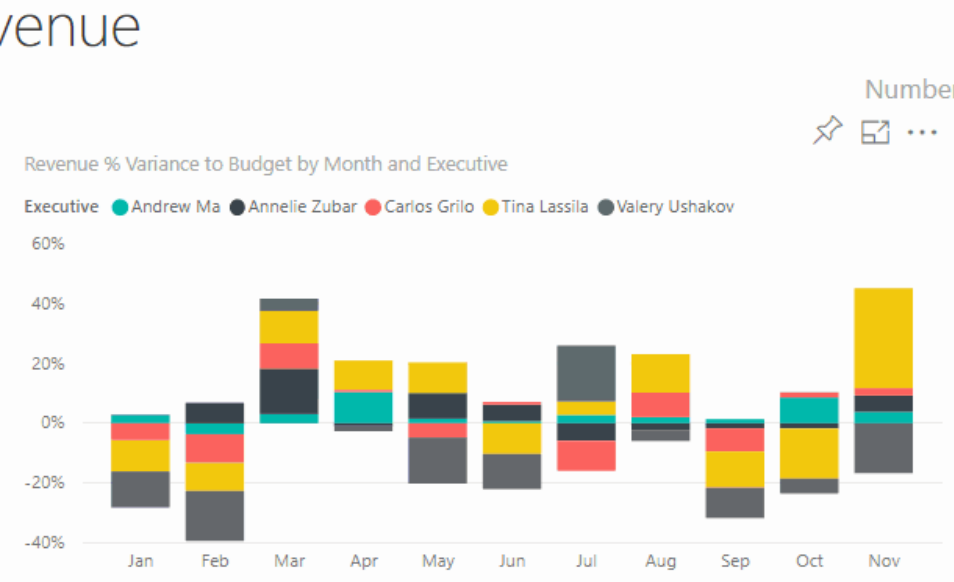
Sales 2019 Q2 Revenue - Internal

Contoso Finance D... General ⓘ 

- Team Scorecard
- Industry Margin Analysis
- Executive Scorecard

# Team Revenue

- Executive
- Andrew Ma
  - Annelie Zubar
  - Carlos Grilo
  - Tina Lassila
  - Valery Ushakov



83

Number of Customers

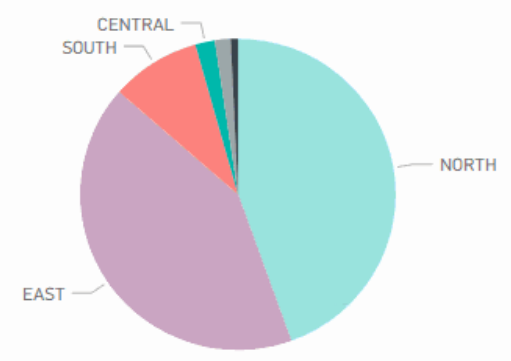
7

Number of Products

42.5%

Gross Margin %

Total Revenue by Region



RevenueTY by State





It's easy to get started...

**PowerBI.com**



# Other resources



Power BI Documentation

<https://docs.microsoft.com/power-bi/>



Power BI Guided Learning

<https://docs.microsoft.com/power-bi/guided-learning/>



Power BI Guidance

<https://docs.microsoft.com/power-bi/guidance/>



Power BI Whitepapers

<https://docs.microsoft.com/power-bi/guidance/whitepapers>



Power BI Blog

<https://powerbi.microsoft.com/blog/>



Power BI Training Content

<https://aka.ms/pbitraining>

