Power BI

Florian Boigner
Technical Specialist, Power BI

in /in/fboigner

✉ florian.boigner@microsoft.com

About me

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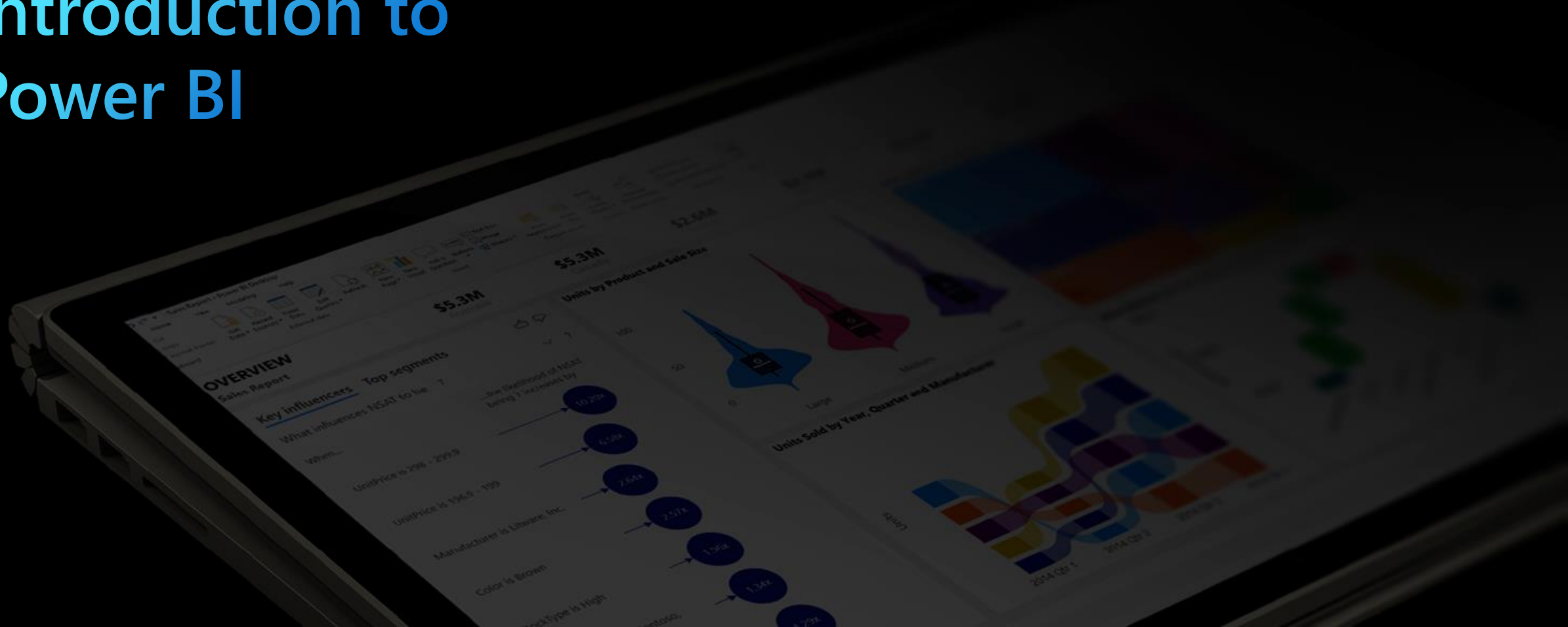
✉ florian.boigner@microsoft.com

Work experience
- 5.5+ years at Microsoft (Dublin, Brussels)
- 2+ years at KPMG (Vienna)

Education
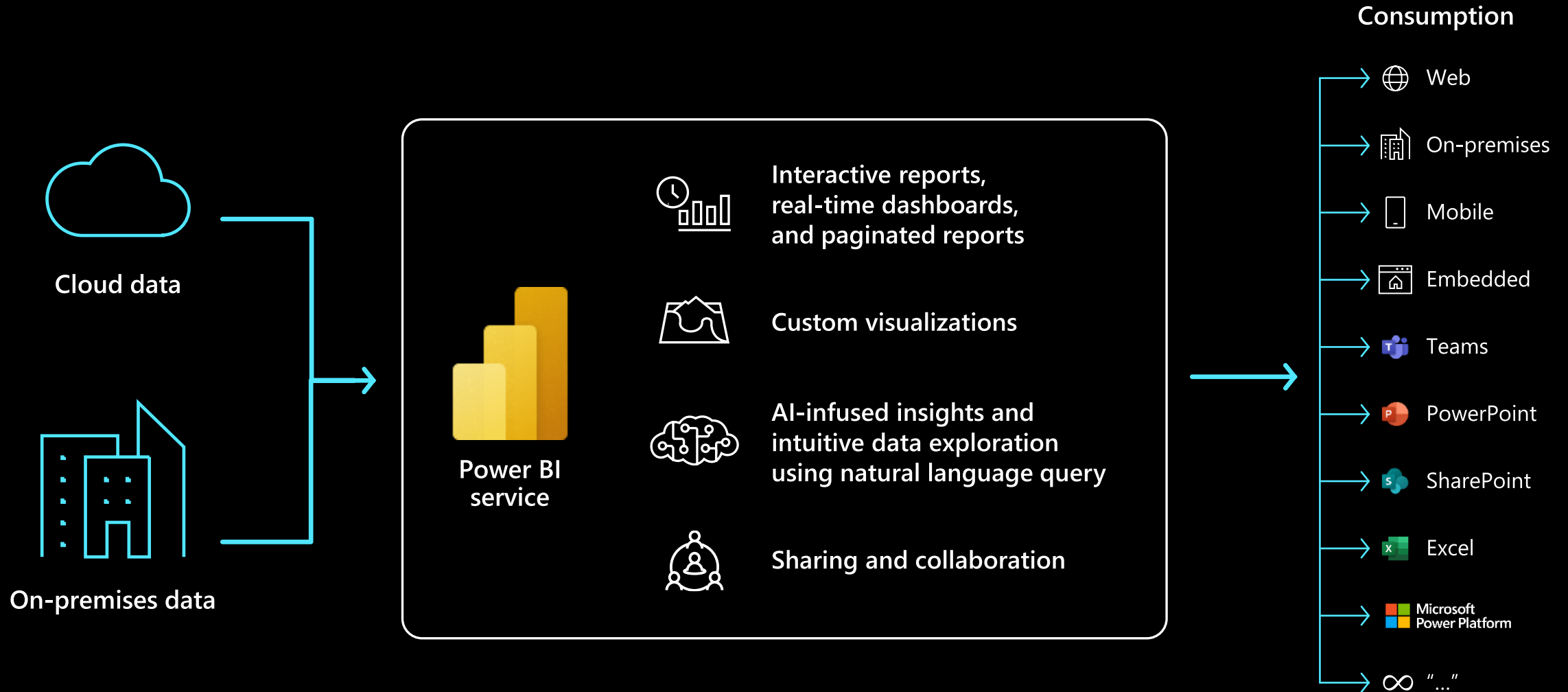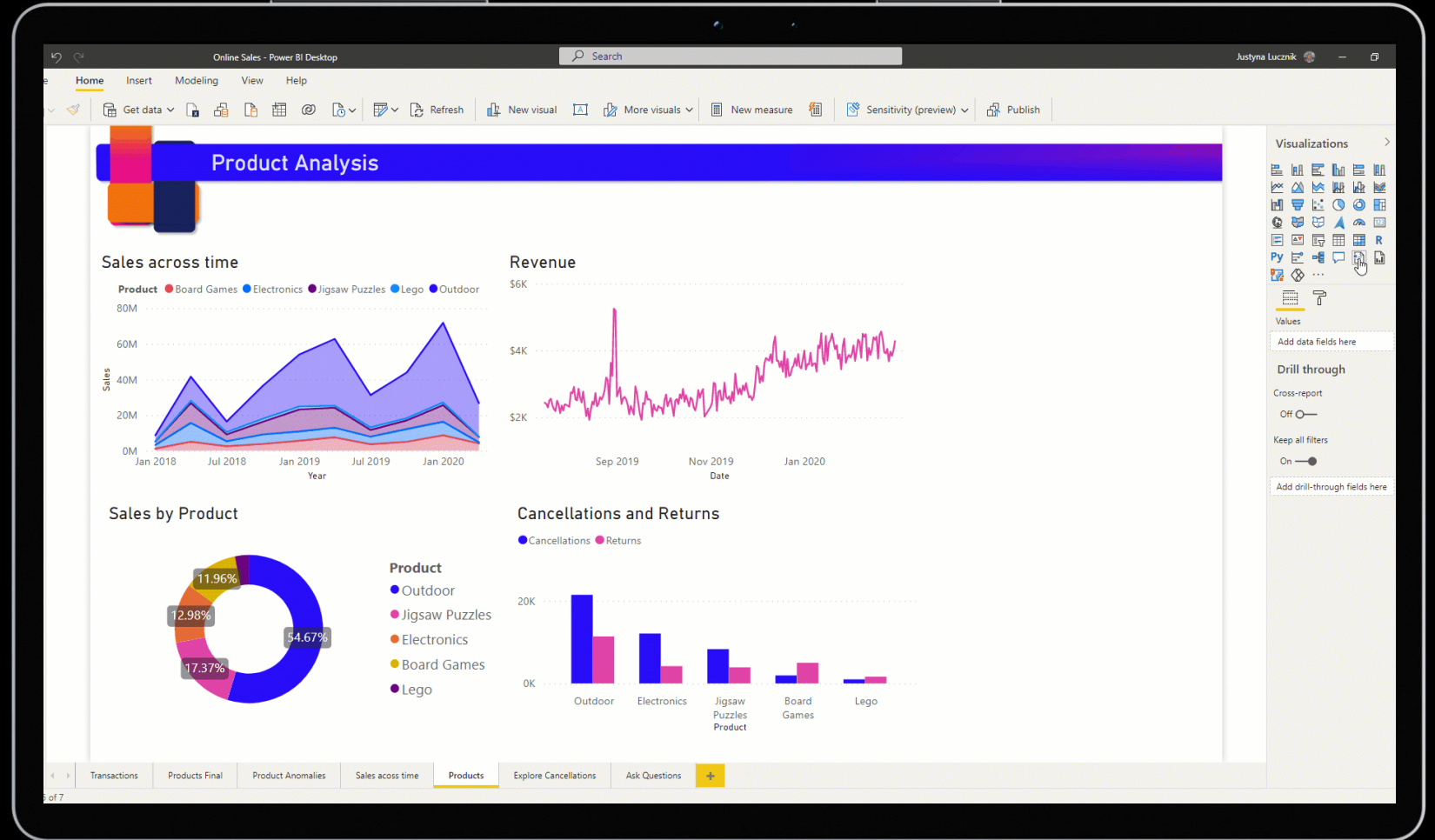- Business informatics, Technical University of Vienna

Introduction to
Power BI

Power BI: The bridge between data and decisions

Consumption

Cloud data

On-premises data

Power BI service

Interactive reports, real-time dashboards, and paginated reports

Custom visualizations

AI-infused insights and intuitive data exploration using natural language query

Sharing and collaboration

Web

On-premises

Mobile

Embedded

Teams

PowerPoint

SharePoint

Excel

Microsoft Power Platform

"..."

PowerPoint
for data

Drag & Drop

AI-powered analytics

The most complete AI capabilities in a BI product

Information workers   **Business analysts**   **Data scientists**
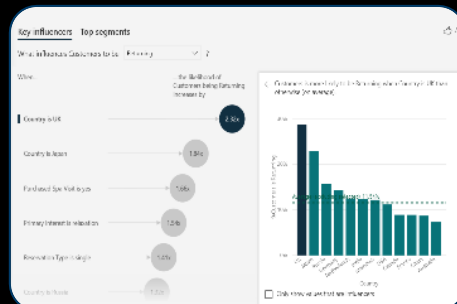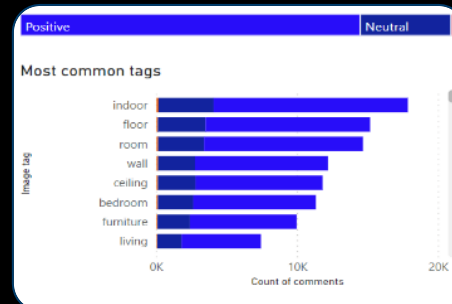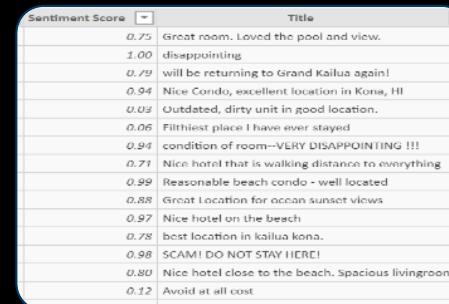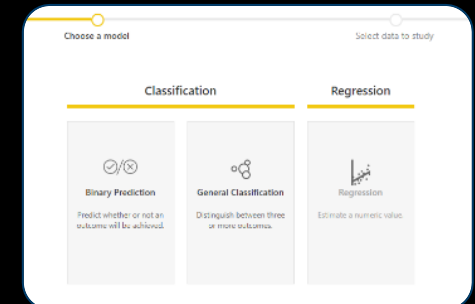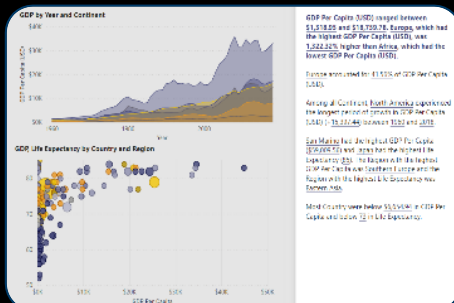

Q&A

Key driver analysis
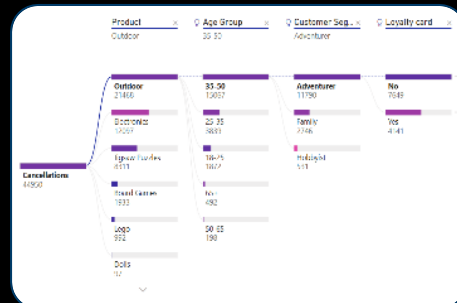

Key phrase extraction
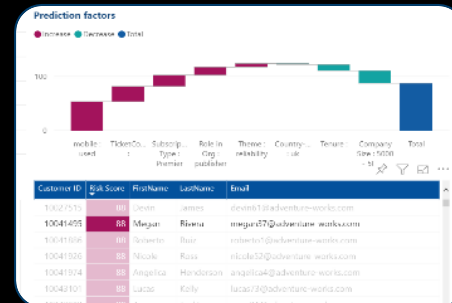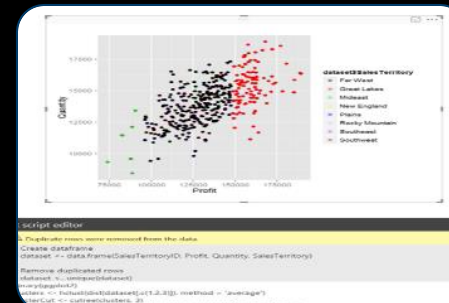

Sentiment analysis
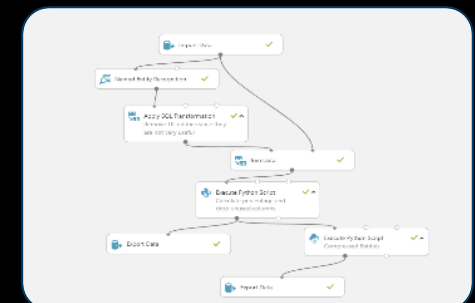

Create ML models

Smart narratives

Root cause analysis

Explore predictions

Python and R integration

Extend with Azure ML

Integrated part of the Microsoft platform

Power BI

Power BI product portfolio

Author

Power BI Desktop   **Power BI Report Builder**

Data exploration and report authoring tools

Share and collaborate

Power BI service

Cloud-based modern business analytics solution, includes free mobile app

Large scale deployments

Power BI Premium

Dedicated capacity for:

- Increased performance and advanced capabilities
- Sharing with large groups

App dev

Power BI Embedded

Visual analytics embedded in your applications

Power BI Desktop

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
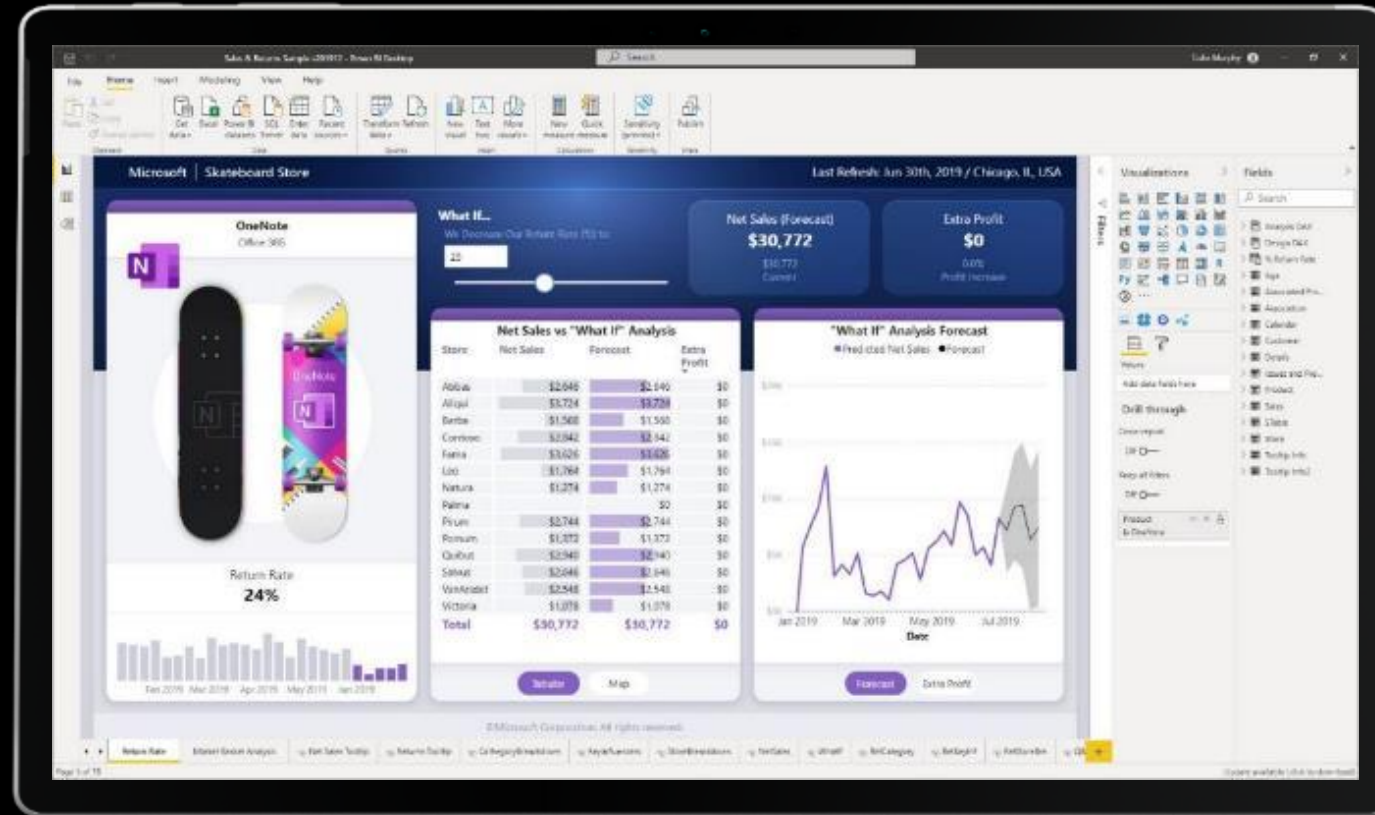
Visualize
Create stunning interactive reports
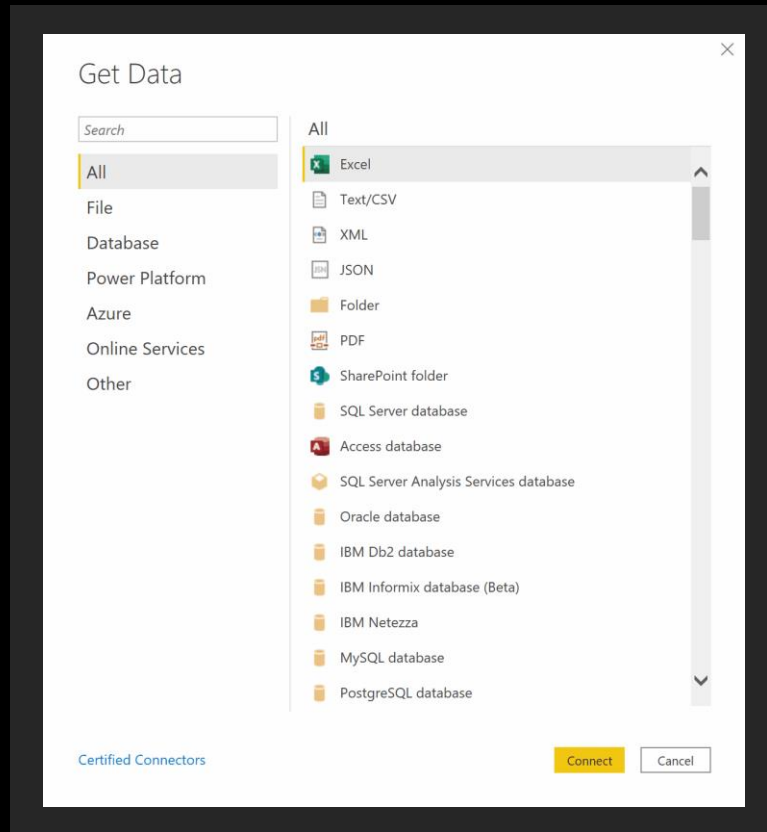
Publish
Share insights with others

Collaborate
Empower your organization with self-service analytics

Download free from **PowerBI.com** or the Windows Store

Power Query – richest data connectivity in the industry

150+ data connectors out-of-the-box

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Built by Microsoft

- Developed by our Product Team
- Bundled w/ Power Query
- **Examples:** SQL Server, Analysis Services, PDF Files, SAP BW & HANA, Web Page & Web API, ODBC, etc.
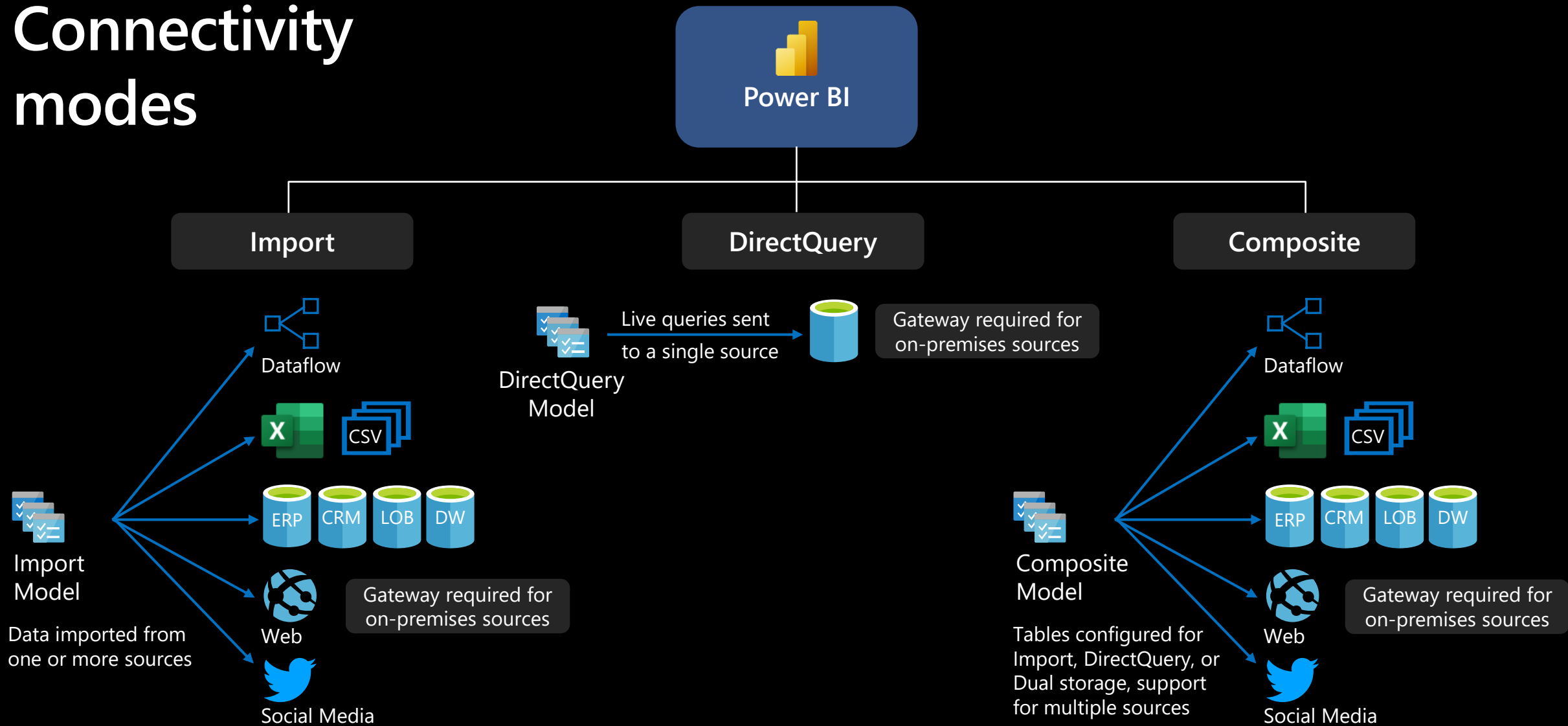
70
Built by ISVs

- Built by 3rd party ISVs, using our Connectors SDK
- Certified and Shipped by Microsoft
- Bundled w/ Power Query
- **Examples:** Denodo, Databricks, etc.

1,000s
Custom

- Built by 3rd party ISVs, SIs, partners, etc.
- Side-loaded by users/admins into Power Query & On-premises data gateway

Connectivity modes

Power BI

Import **DirectQuery** **Composite**

Dataflow

CSV

ERP CRM LOB DW

Import Model

Web

Gateway required for on-premises sources

Social Media

Data imported from one or more sources

DirectQuery Model

Live queries sent to a single source

Gateway required for on-premises sources

Dataflow

CSV

ERP CRM LOB DW

Composite Model

Web

Gateway required for on-premises sources

Social Media

Tables configured for Import, DirectQuery, or Dual storage, support for multiple sources

Learn more about Dataset Modes

Clean and mash-up your data

Consolidate data from a broad range of sources

- Merge or append queries to combine data from multiple queries into a single query

Transform data to fit your needs using intuitive UI

- Select data for inclusion
- Cleanse data and remove errors

Define calculations to generate new fields for use in reports

Develop advanced analytics using a combination of measures and relationships

- Uncover correlations, highlight exceptions and understand business outcomes
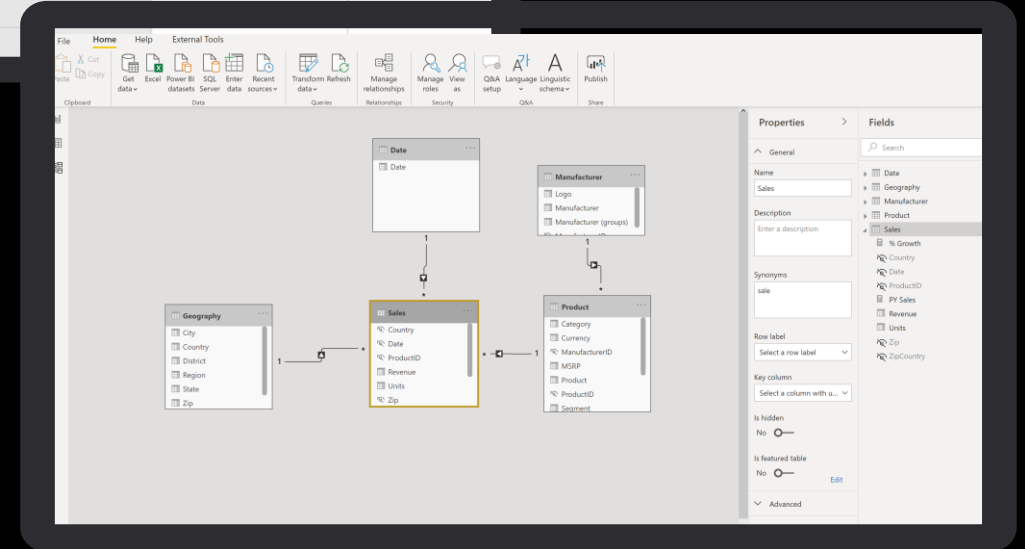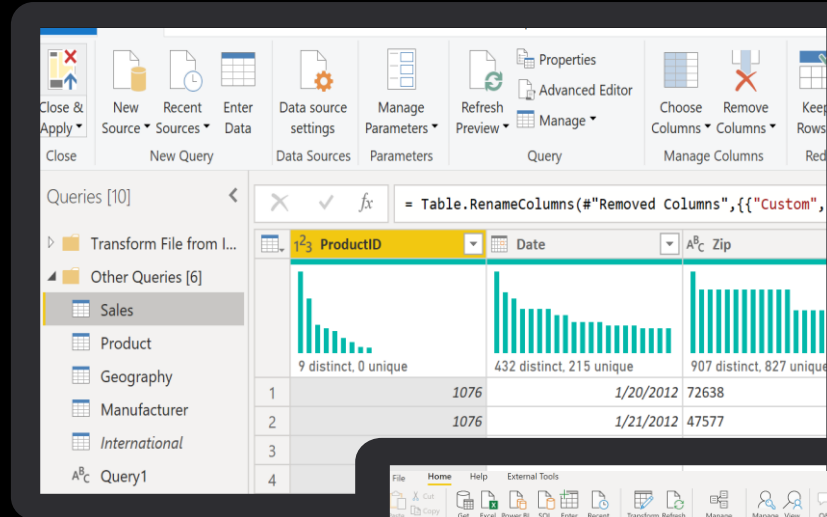
Power Query

Data transformation and data preparation engine used in Power BI and other Microsoft tools (e.g., Excel)

- Comes with graphical interface
- Code can also be edited directly
- Formula language is called "M"

Interface

1. Ribbon: Navigation
2. Queries pane
3. Current view: Preview of query
4. Query settings: Includes transformation steps
5. Status bar

Additional resources

- [What is Power Query? - Power Query](#)
- [Transform, shape, and model data in Power BI - documentation](#)
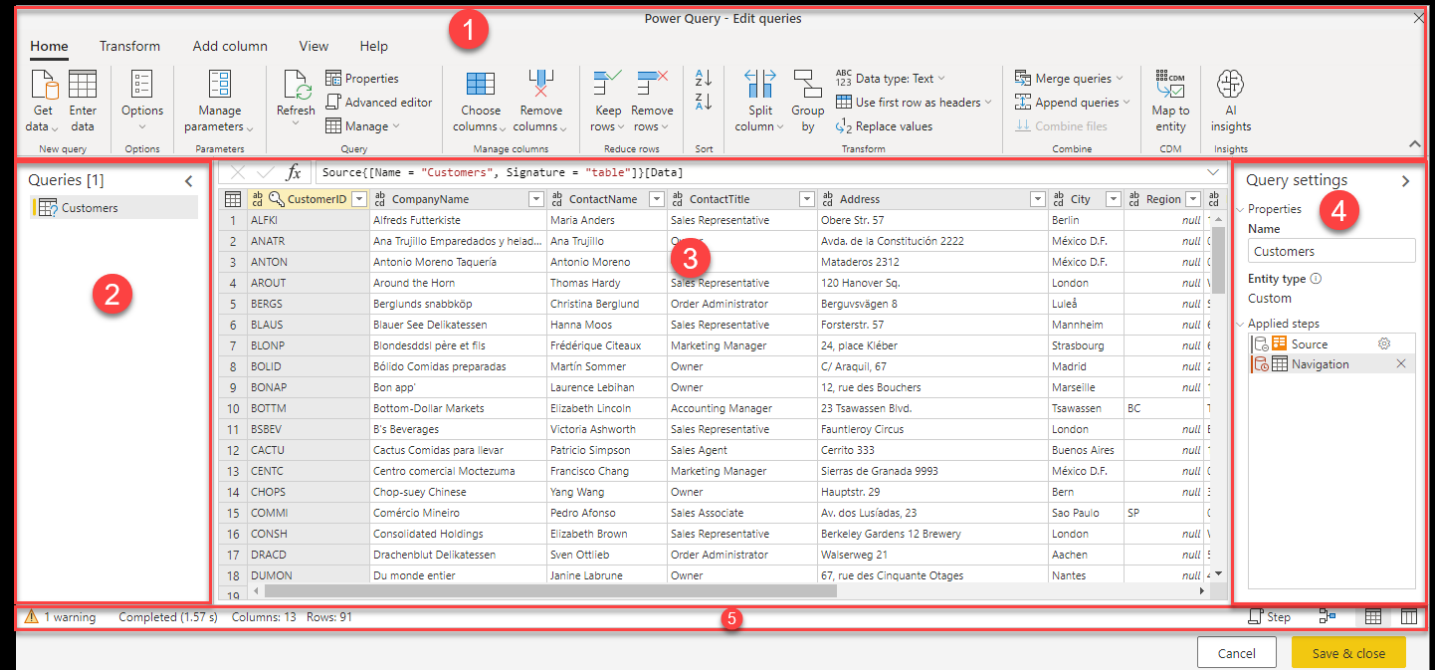
Data modelling

Create a data model in Power BI Desktop based on your tables

- Create relationships between your tables and data sources (queries)
- Optimize data by hiding fields and sorting visualization data
- Configure filter directions

An optimized data model should follow a star-schema

Additional resources

- [Model data in Power BI – Training](#)
- [Design a data model in Power BI - Training](#)
- [Understand star schema and the importance for Power BI](#)
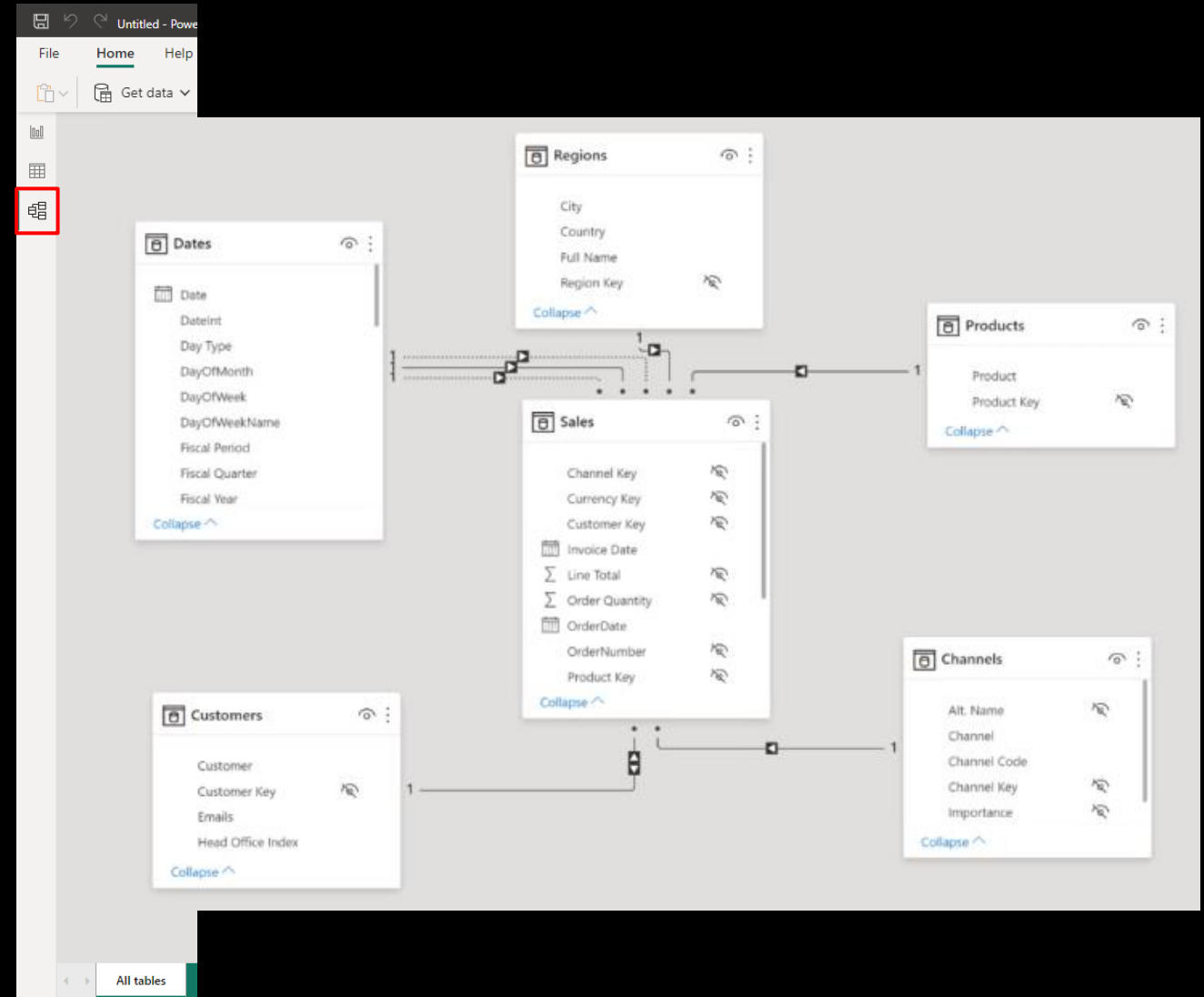
DAX (Data Analysis Expressions)

Formula expression (calculation) language in Power BI

- Used in measures, calculated columns, calculated tables, and row-level security
- Can be used for simple aggregations (count, sum, average, ...) or complex calculations
- Measures are calculated at execution, columns/tables on dataset load

Easy to learn, difficult to master

Additional resources

- Data Analysis Expressions (DAX) Reference - DAX
- Learn DAX basics in Power BI Desktop - Power BI
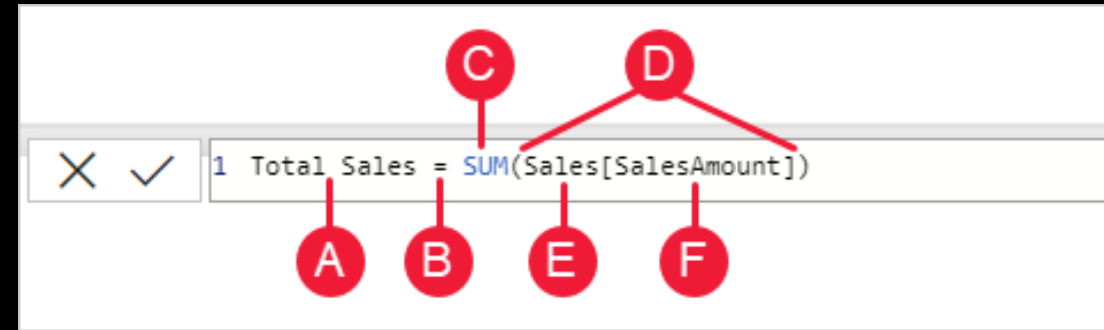
A. Measure name "Total Sales"
B. = indicates beginning of formula
C. DAX function
D. Function arguments
E. Table reference
F. Column reference

Data visualization

Visualize data in a variety of ways

Growing number of visualization types

- Donuts, basic area, waterfall, filled maps, tree maps, funnel, gauges combo charts and more
- Custom visuals available from Power BI Visuals Marketplace
- Tools to develop, test, package new custom visuals

Visualizations on report page are connected – select value in one visualization to change other visualizations

Full screen pop out mode for report visuals to show additional details
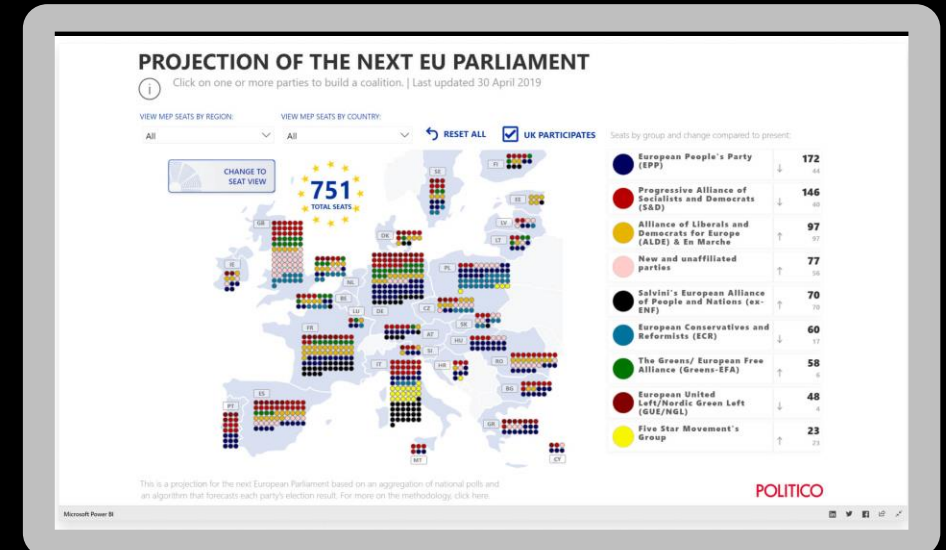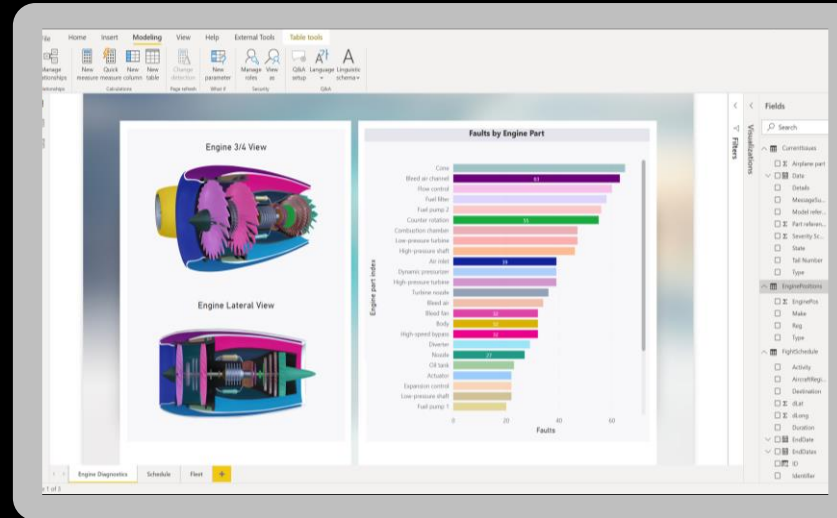
Data exploration

Explore data in a variety of ways and across multiple visualizations using drag and drop canvas

Dig deeper into your reports

- Drill-down in your hierarchical data
- Filter, sort, hover over and highlight data

Leverage Quick Insights to find insights in your data

Ask questions of your data in natural language with Q&A

- Type questions in plain language
- Q&A intelligently filters, sorts, aggregates, groups and displays data based on the question

Report view
Data view
Model view

Menu and ribbon

Filter, visualization and data pane

Report view

Canvas of current report page, can contain multiple visualizations

Select the visualizations here →

Select a visual on the canvas. Move the data fields via drag-and-drop to the visual

Report pages

Lab
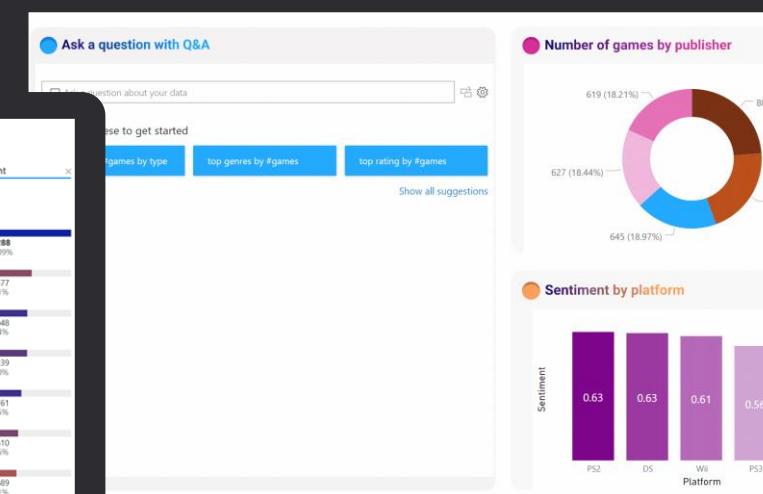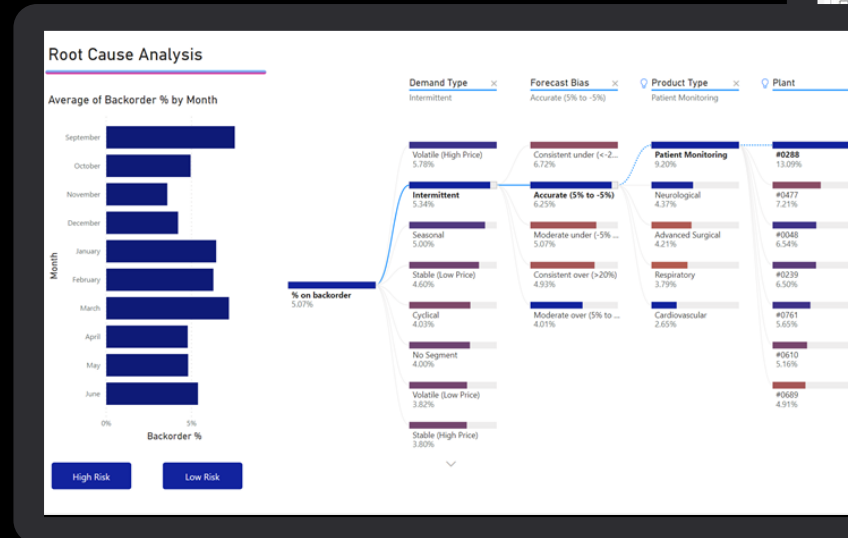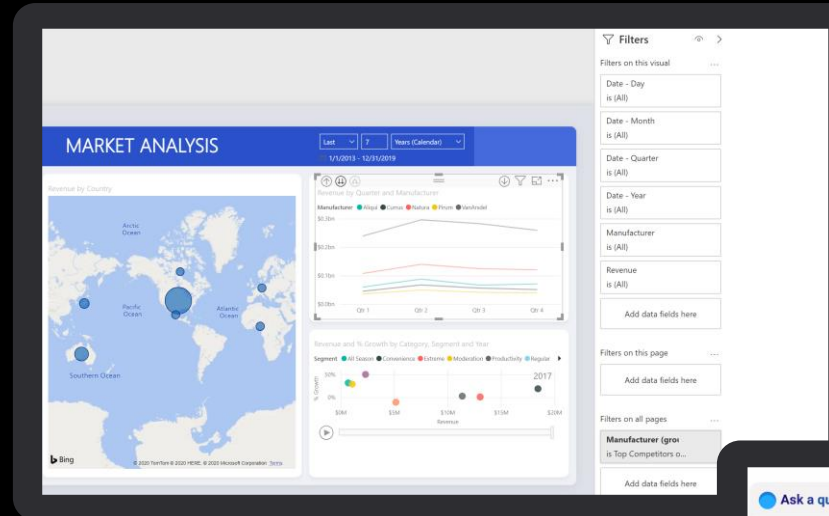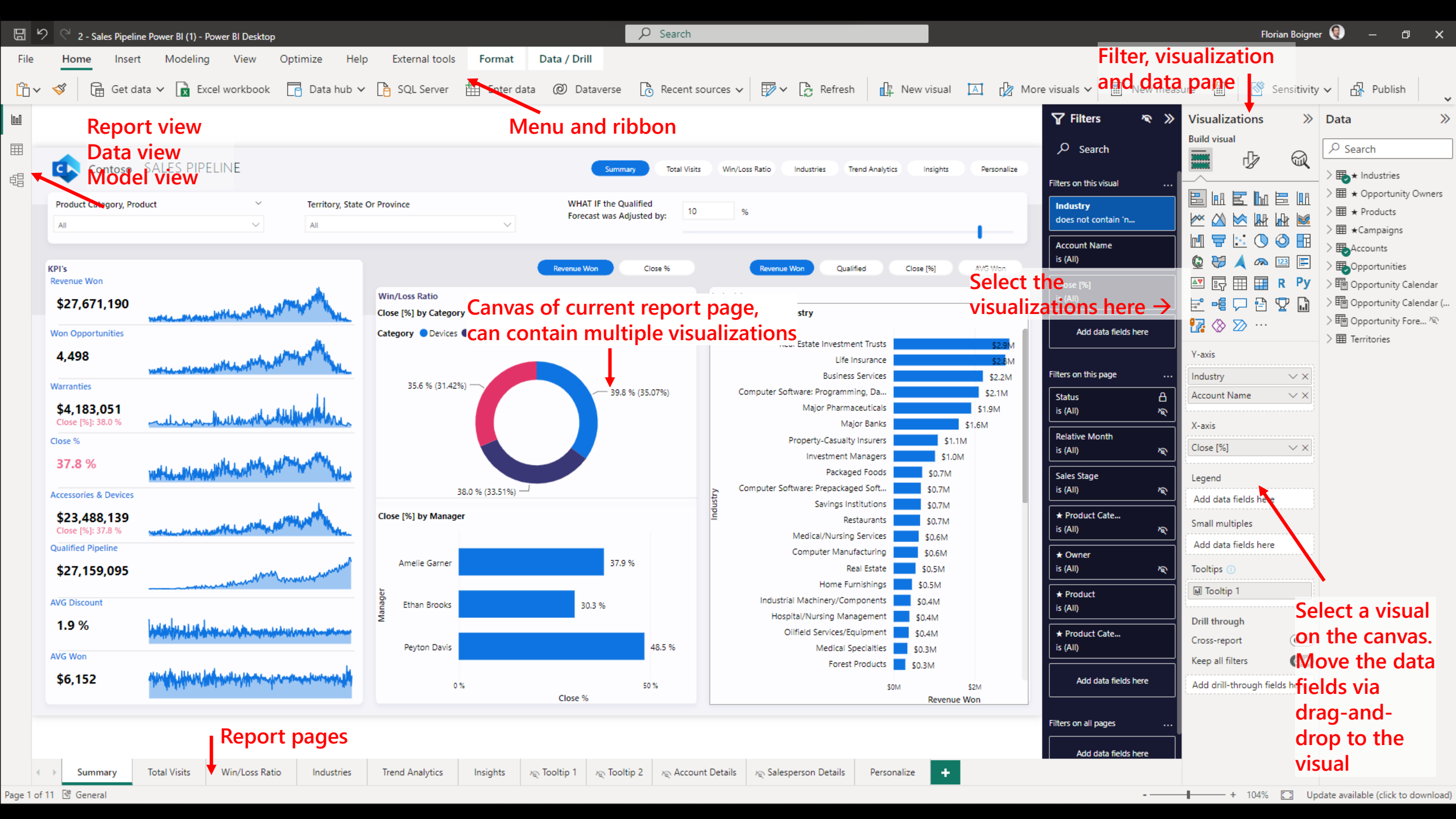
https://aka.ms/PBIDLab

Closing
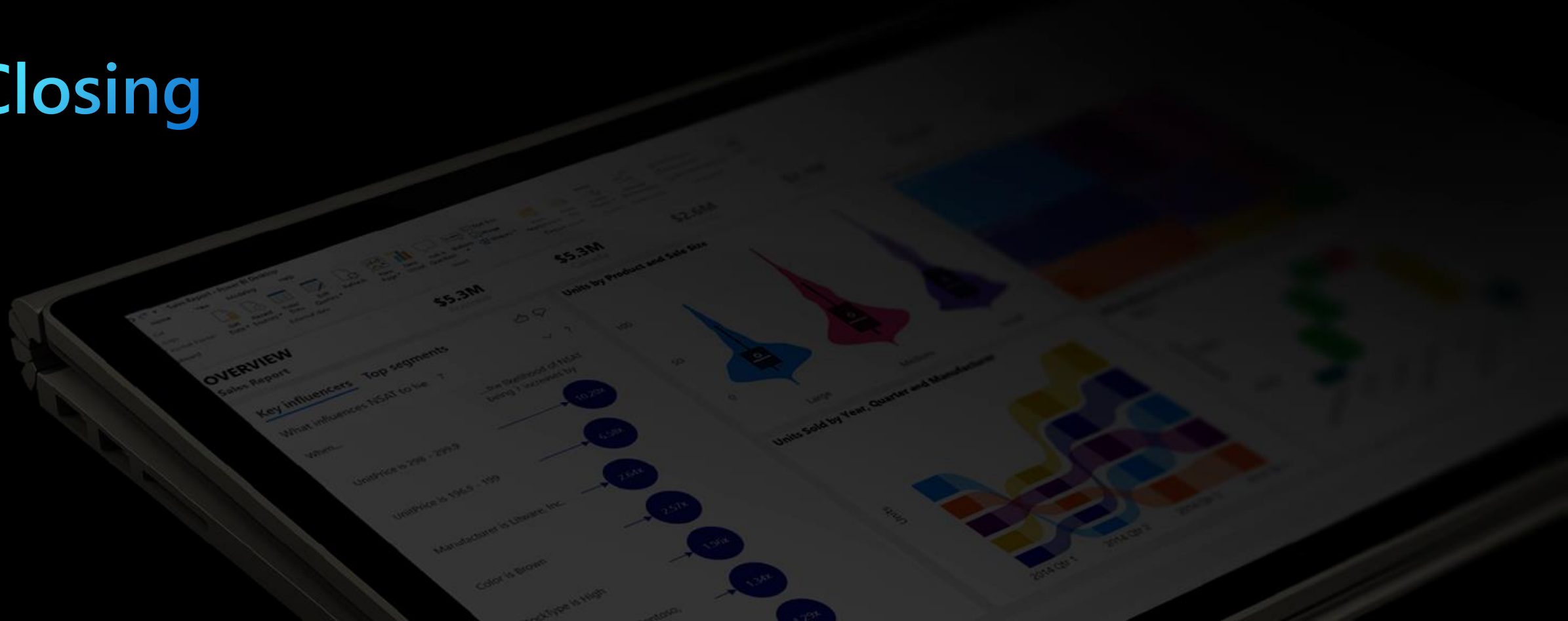
Microsoft Learn

- Self-paced learning for everyone in different levels (beginner, intermediate, advanced)
- Various modules grouped by learning paths, covering core concepts in Power BI
- Can be filtered by product, user profile and more

[Power BI on Microsoft Learn](#)

Power BI Learning Catalog

Free role based self-paced learning material which also includes hands on examples and use cases for certain roles, like the analyst.

Content is mostly a collection of curated recorded webinars and videos that have been grouped by topic and role.

Power BI learning catalog - Power BI | Microsoft Learn

Microsoft

Thank you