

fabric

FEBRUARY

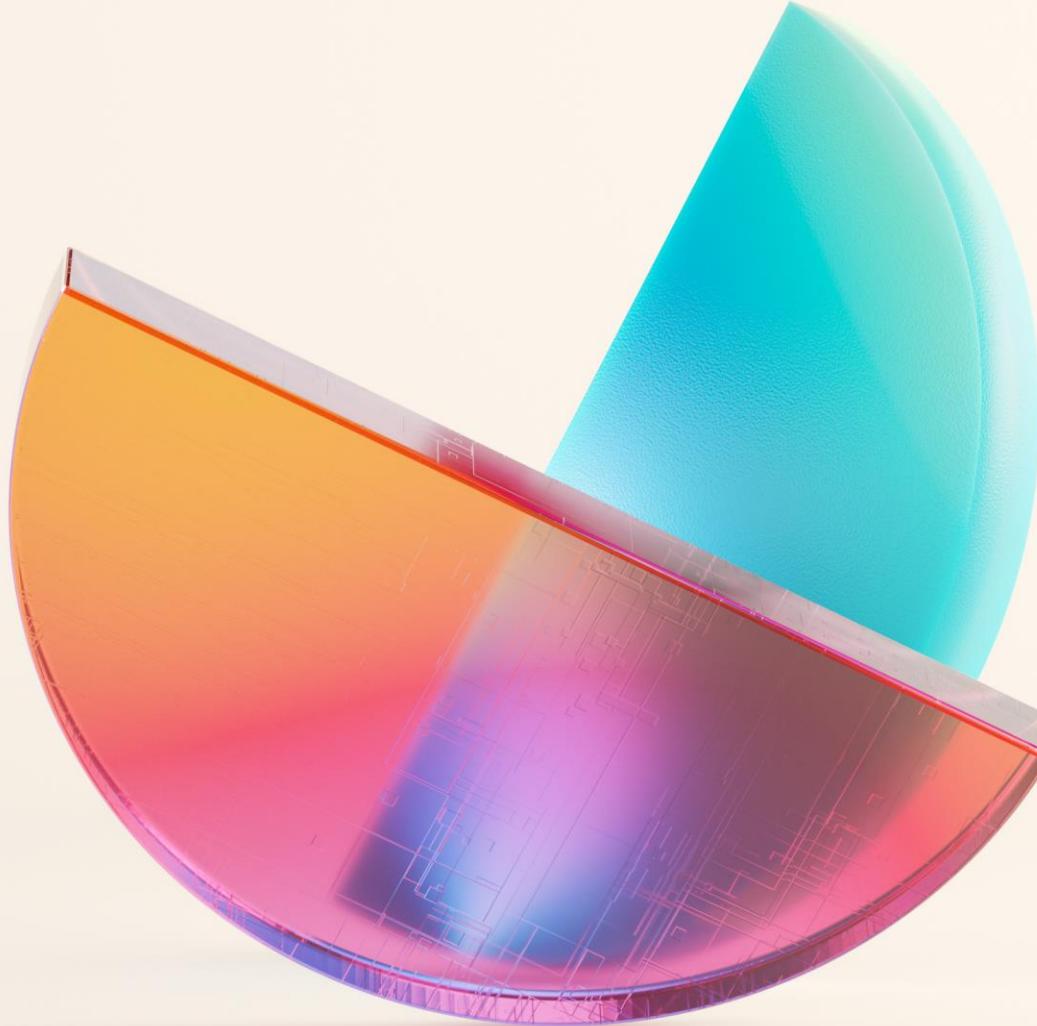
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Code: msevent100dm



Microsoft

Microsoft Fabric



Microsoft Fabric

Deep Dive for Data Analysts

Session Instructors



Just Blindbæk

Microsoft BI architect, trainer,
speaker and MVP



Ásgeir Gunnarsson

Data person, trainer and
Microsoft MVP



Benni De Jagere

Senior Program Manager

Agenda (times are approximate and will be fluid with the class)

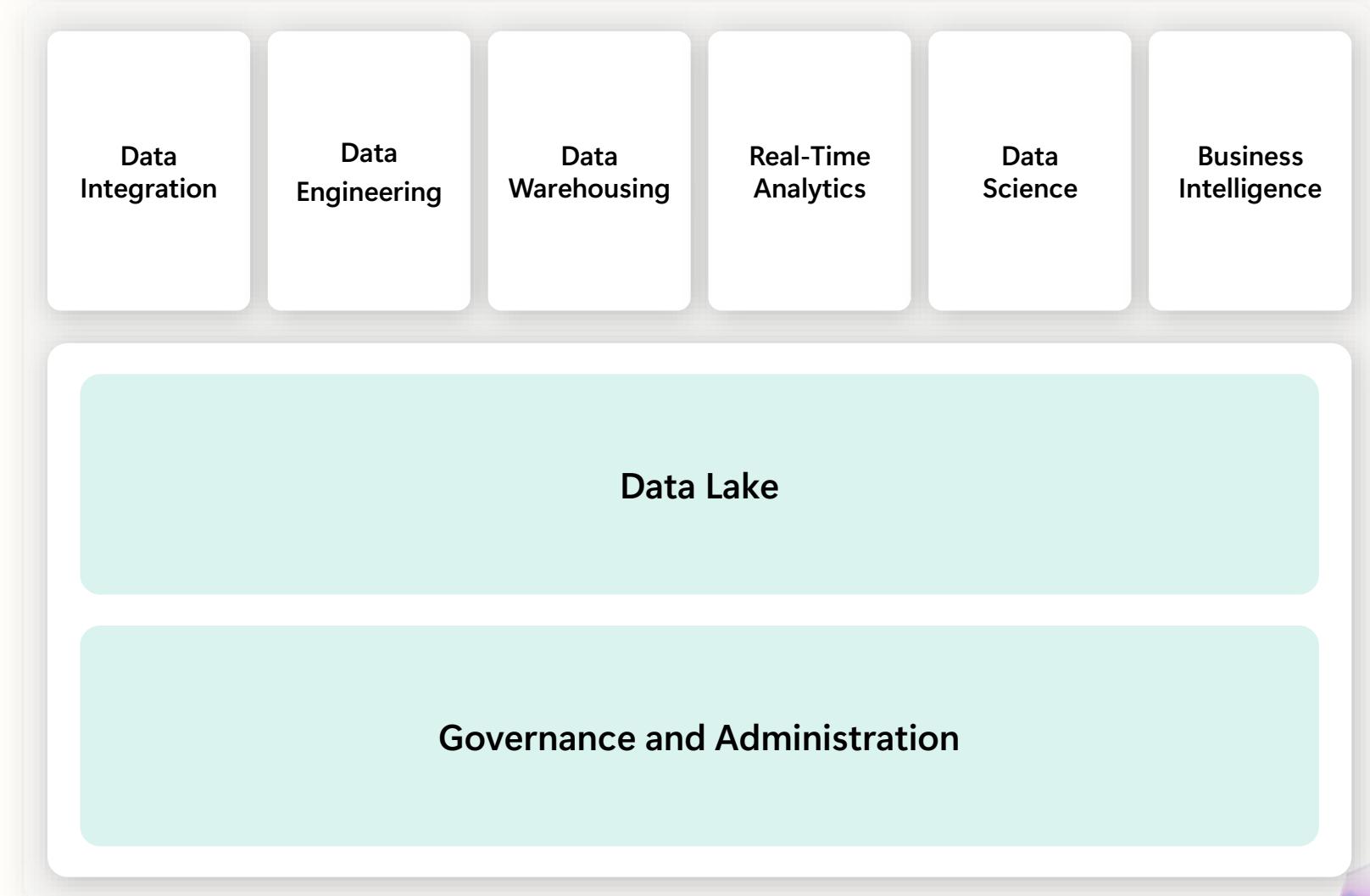
Morning	Presentation
BEGIN	
08:30 AM – 9:00 AM	Welcome, Intro, Setting the Scene
09:00 AM – 10:00 AM	Ingest to Lakehouse: Shortcuts and Data Factory
10:00 AM – 10:15 AM	Break
10:15 AM – 11:30 PM	Explore and prepare with Dataflow Gen2 and SQL
11:30 AM – 12:30 PM	Break for Lunch
Afternoon	Presentation
12:30 PM – 13:00 PM	Explore and prepare with Dataflow Gen2 and SQL
13:00 PM – 13:45 PM	Serve with Semantic models
13:45 PM – 14:00 PM	Break
14:00 PM – 14:45 PM	Copilot for Microsoft Fabric
14:45 PM – 15:30 PM	Wrap up, Kahoot & Open Q&A
END	

Introducing the
new Microsoft
Fabric solution



Analytics today

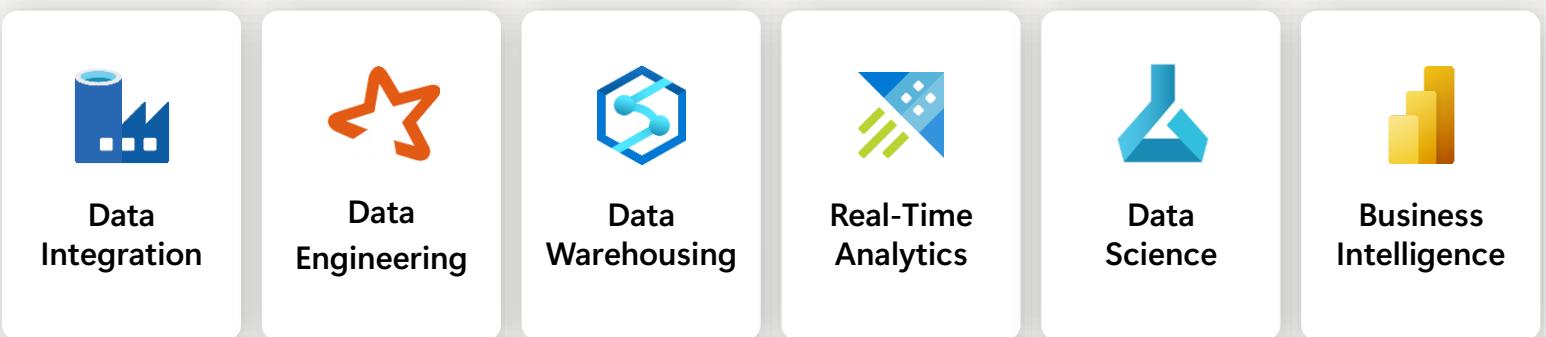
Analytics has very predictable patterns.



Analytics today

Analytics has very predictable patterns.

Microsoft has all the products with the right scale needed to build a complete analytics system.



Still far too complex

Many Products

Different Experiences

Proprietary and Open

Dedicated and Serverless

PaaS and SaaS

Different Business Models

Steep Learning Curves

Deep Expertise Needed

High Integration Effort



Purview



Power BI



Kusto



Data Factory



Azure AI

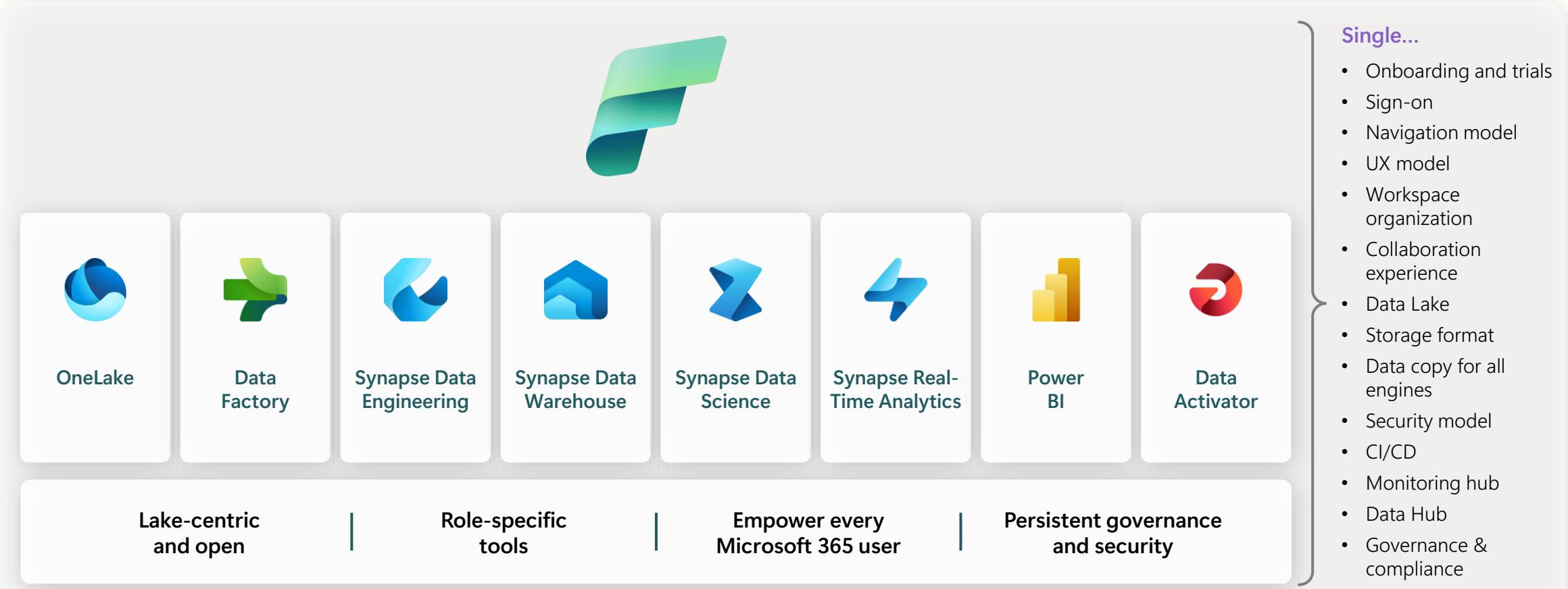


Synapse DW



Synapse Spark

Introducing Microsoft Fabric—a unified analytics solution for the era of AI





Microsoft Fabric

The data platform for the era of AI

Complete Analytics Platform

Everything, unified

SaaS-ified

Secured and governed

Lake centric and open

OneLake

One Copy

Open at every tier

Empower Every Business User

Familiar and intuitive

Built into Microsoft 365

Insight to action

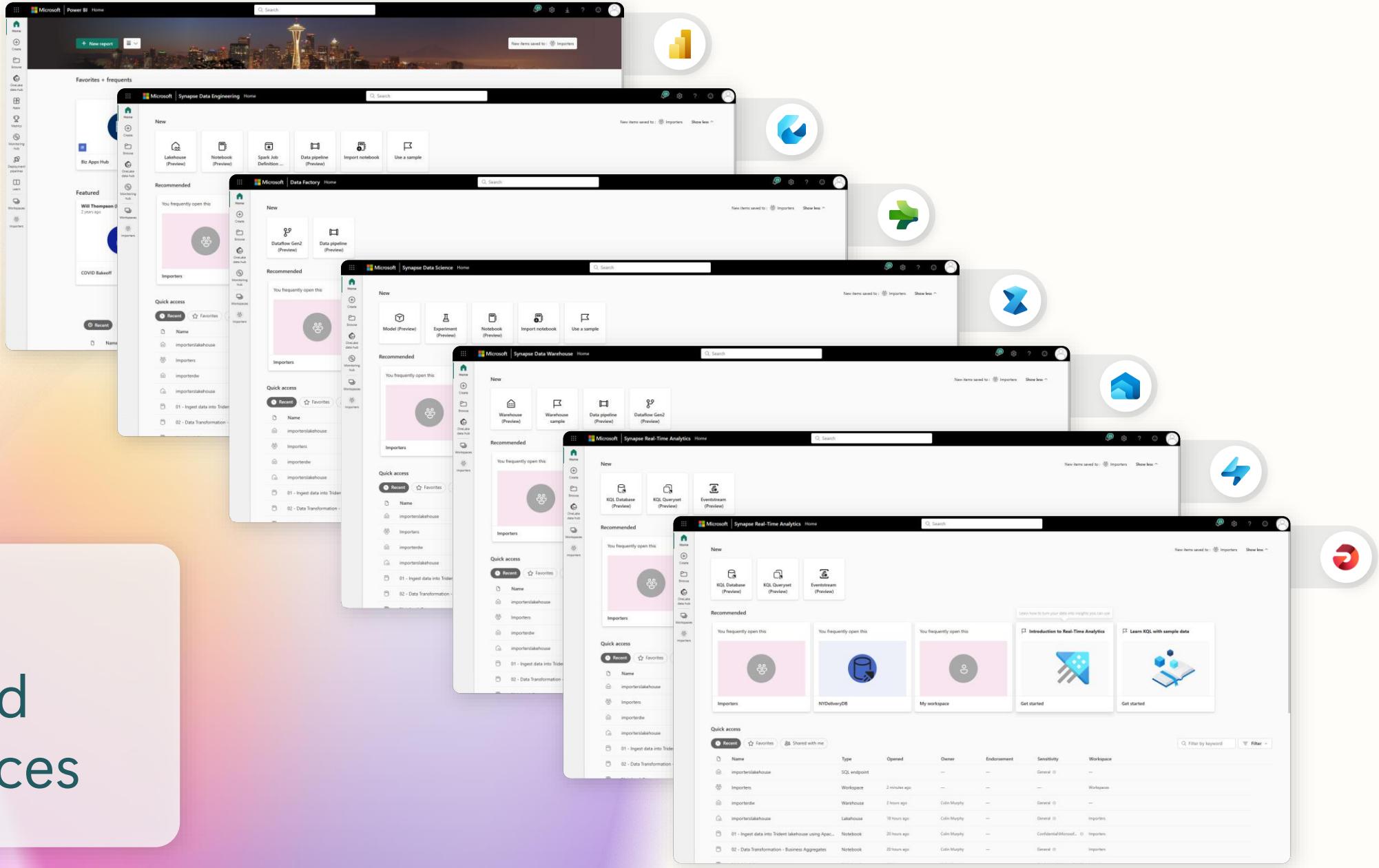
AI Powered

Copilot accelerated

ChatGPT on your data

AI driven insights

Persona optimized experiences



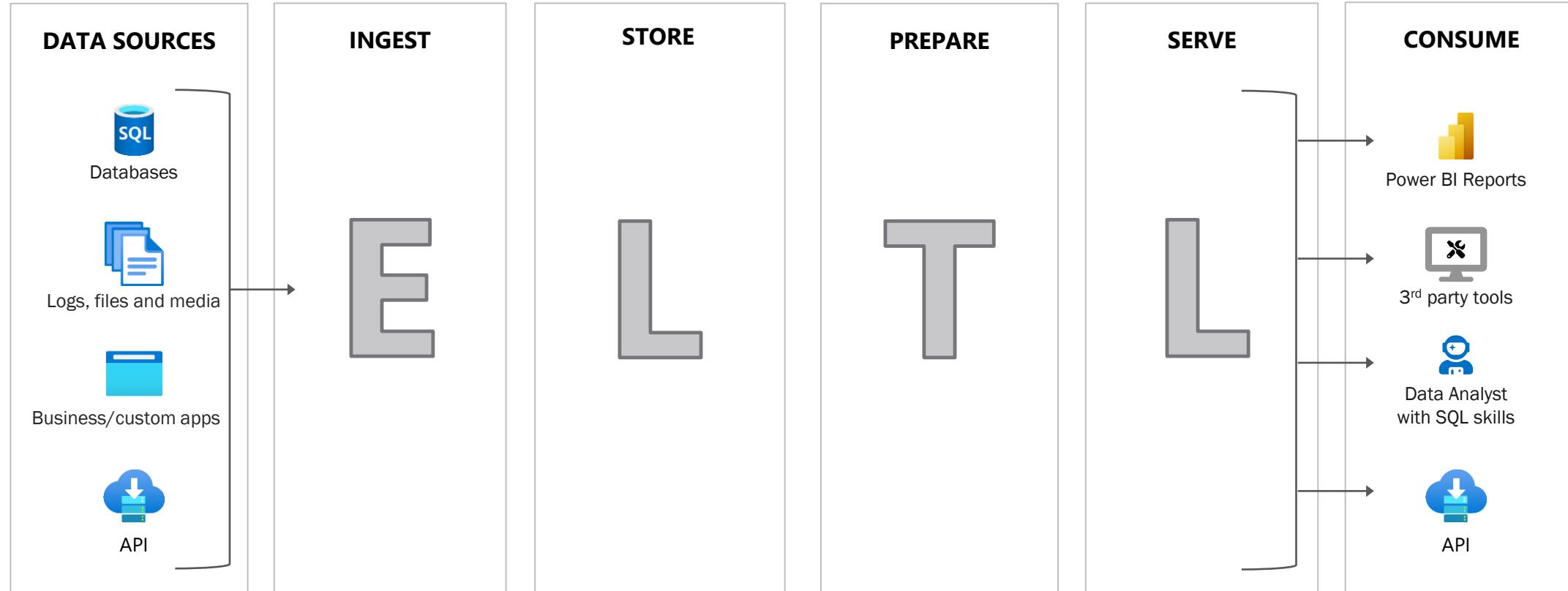


Separating Development

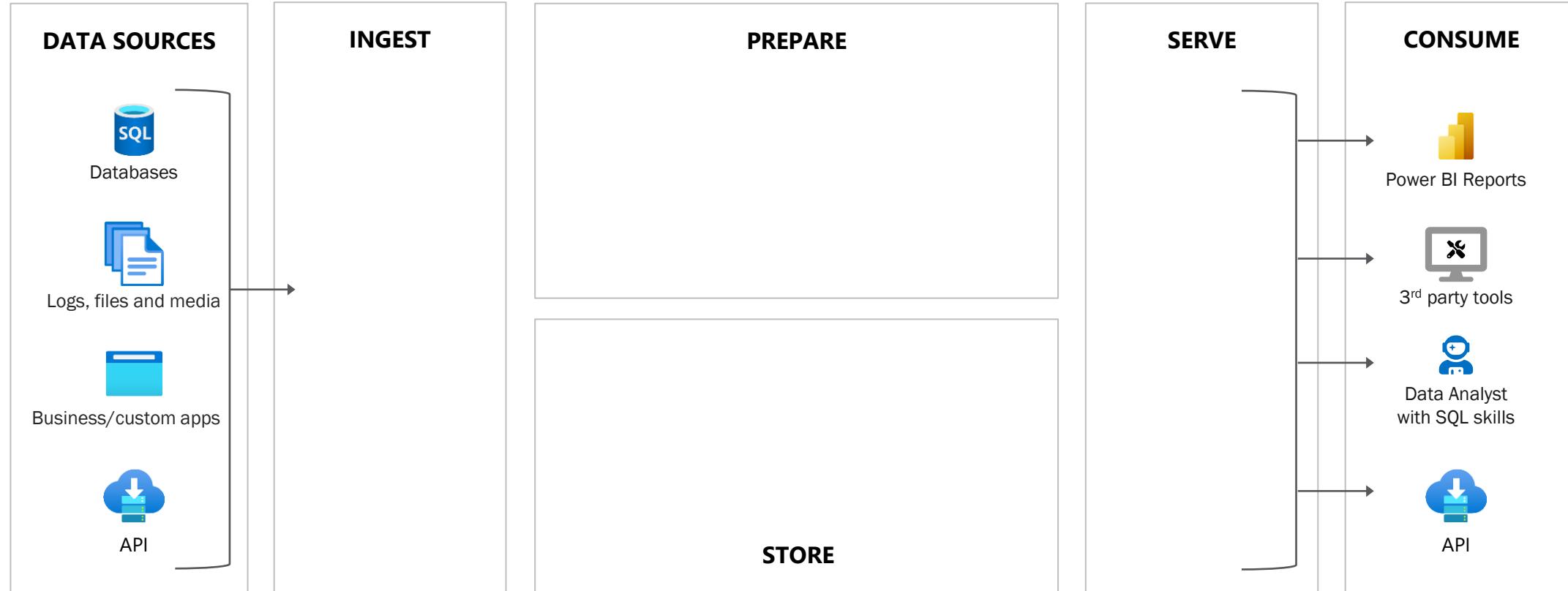
For enterprise scale deployments, it's recommended to separate the data preparation, semantic model, and report development from a single file solution.

This technique allows different solution developers to work independently and collaboratively by sharing components.

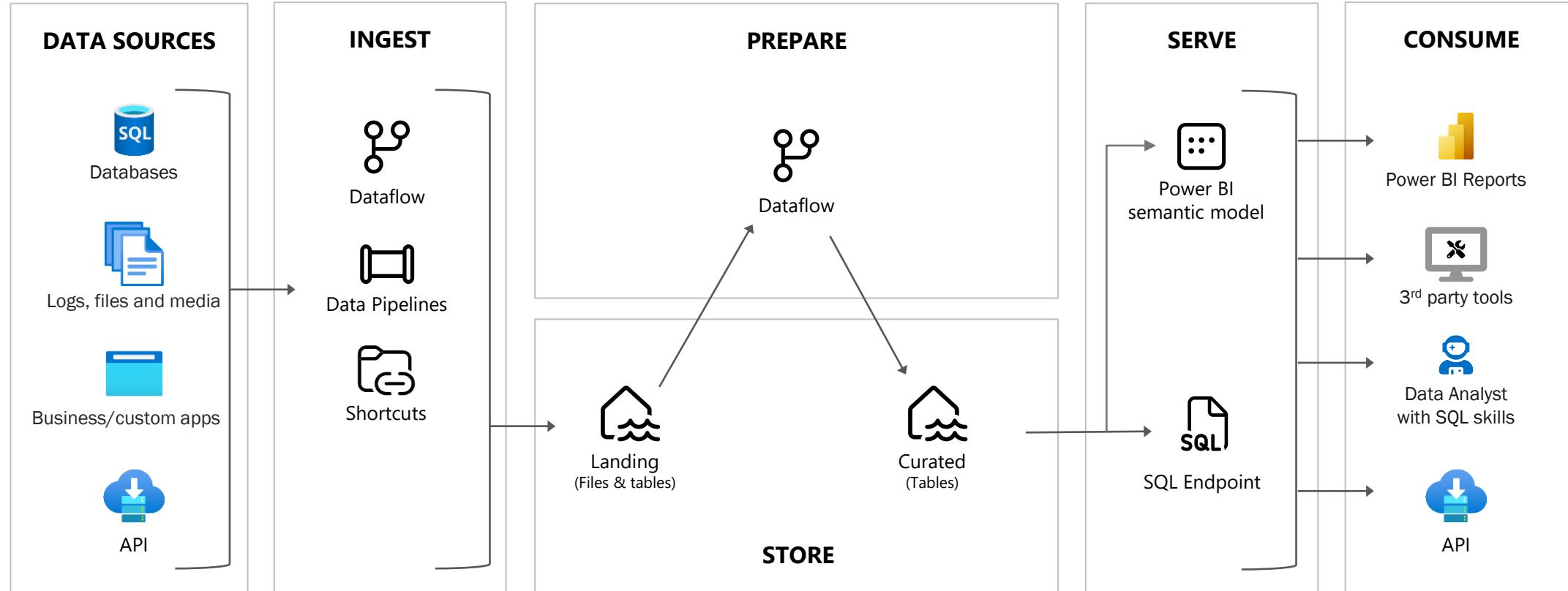
Dataflow in a Modern Data Warehouse



Dataflow in a Data Lakehouse in Fabric



Dataflow in a Data Lakehouse in Fabric



Seven key experiences for end-to-end analytics

Experiences are designed to target specific personas and tasks, yet work together seamlessly in a unified platform via OneLake to enable creators to collaboratively do their best work:



Combines the ease of use of Power Query with the scale and power of Azure Data Factory to leverage 200+ native connectors to data sources on-premises and in the cloud



World-class Spark platform with great authoring experiences to empower data engineers to transform data at scale



Providing industry leading SQL performance and scale, fully separating compute from storage for independently scaling and natively storing data in open Delta Lake



Build, deploy, and operationalize machine learning models directly within Fabric to empower data scientists and analysts with predictive insights



Best-in-class engine for observational data analytics to create actionable insights from real-time data



The world's leading business intelligence platform empowers users to quickly and intuitively to make better decisions with data



Automatically drive actions on your data, without writing code

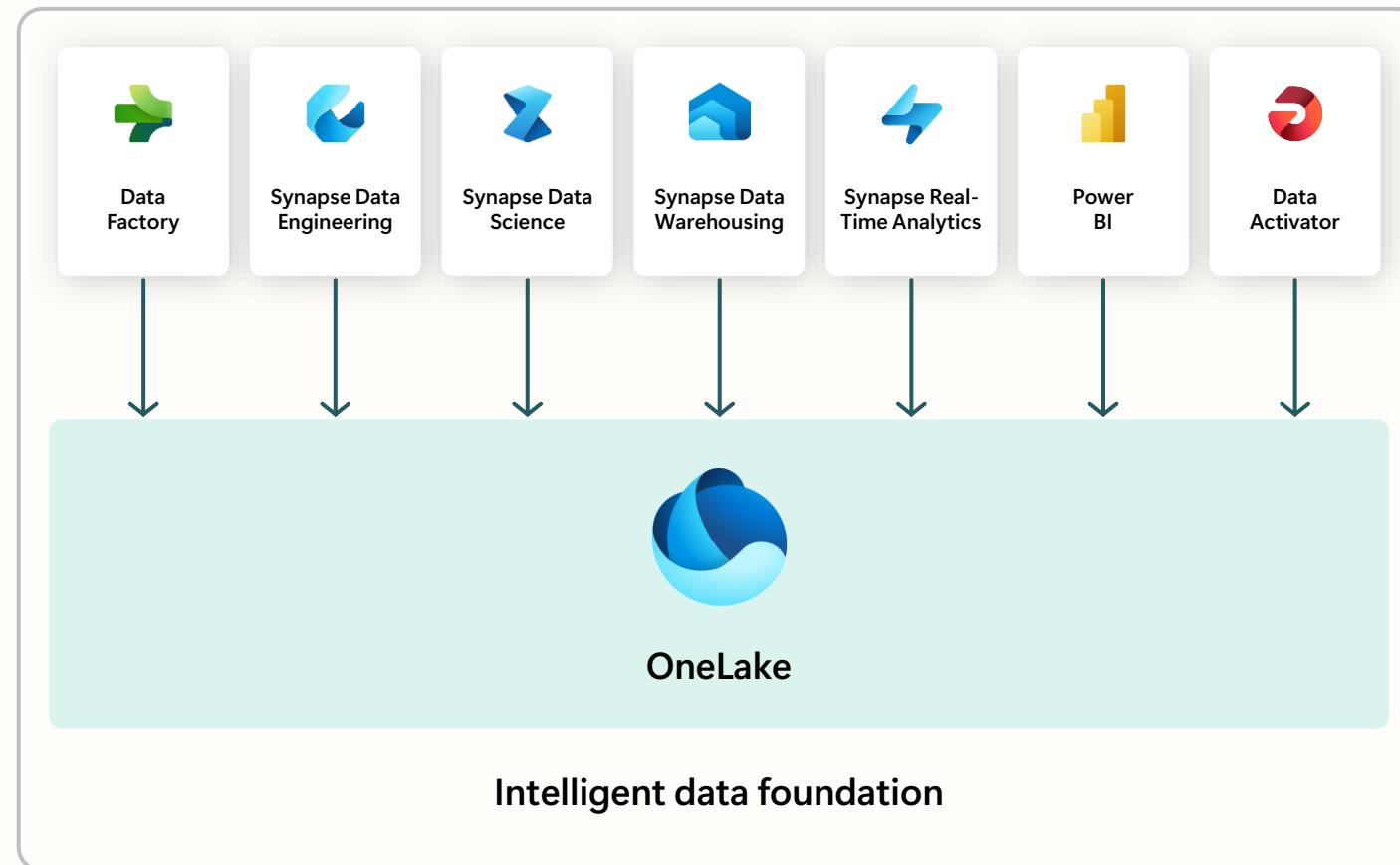


OneLake overview



OneLake for all data

"The OneDrive for data"



A single SaaS lake for the whole organization

Provisioned automatically with the tenant

All workloads automatically store their data in the OneLake workspace folders

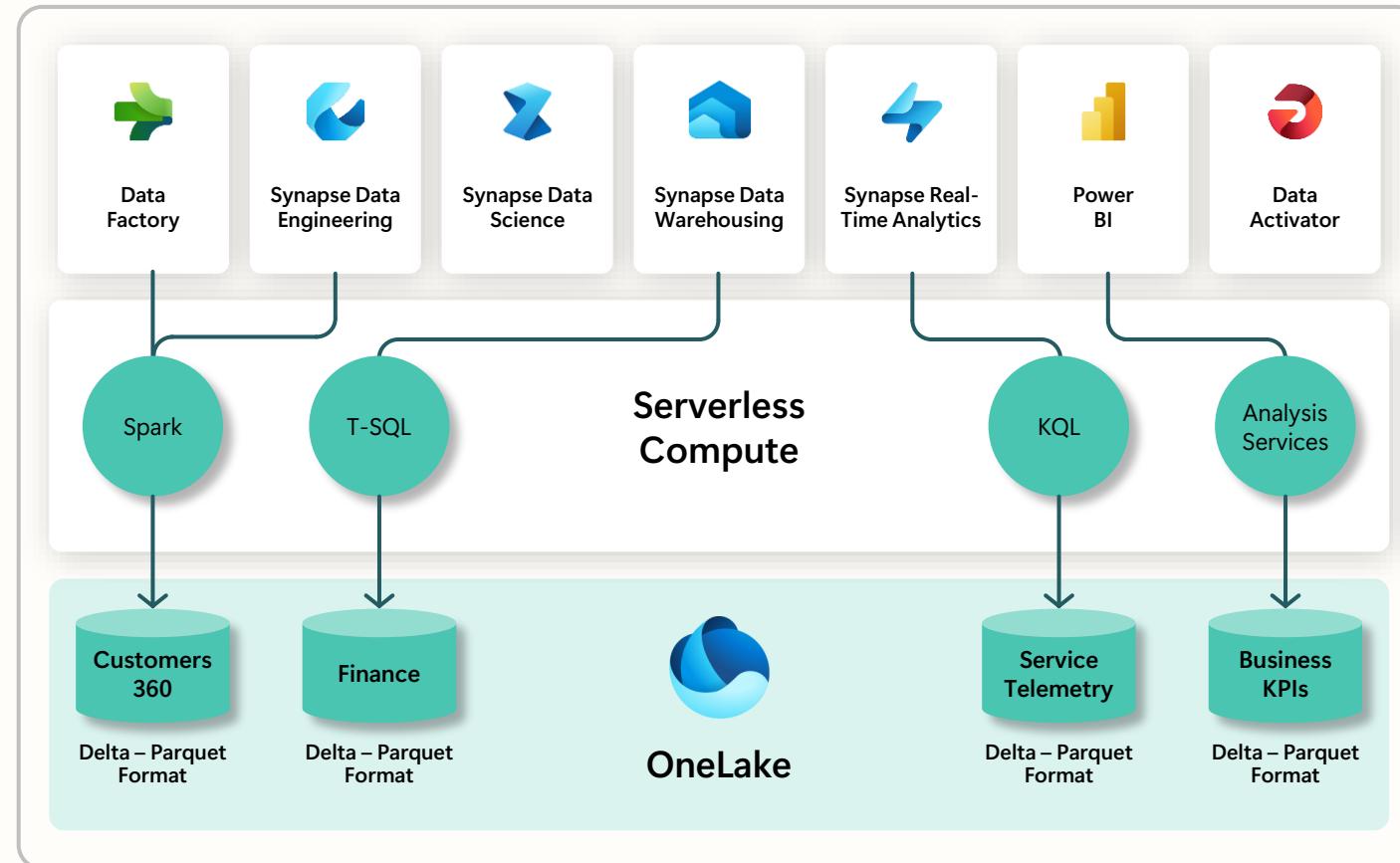
All the data is organized in an intuitive hierarchical namespace

The data in OneLake is automatically indexed for discovery, MIP labels, lineage, PII scans, sharing, governance, and compliance



One Copy for all computers

Real separation of compute and storage



All the compute engines store their data automatically in OneLake

The data is stored in a single common format

[Delta – Parquet](#), an open standards format, is the storage format for all tabular data in Microsoft Fabric

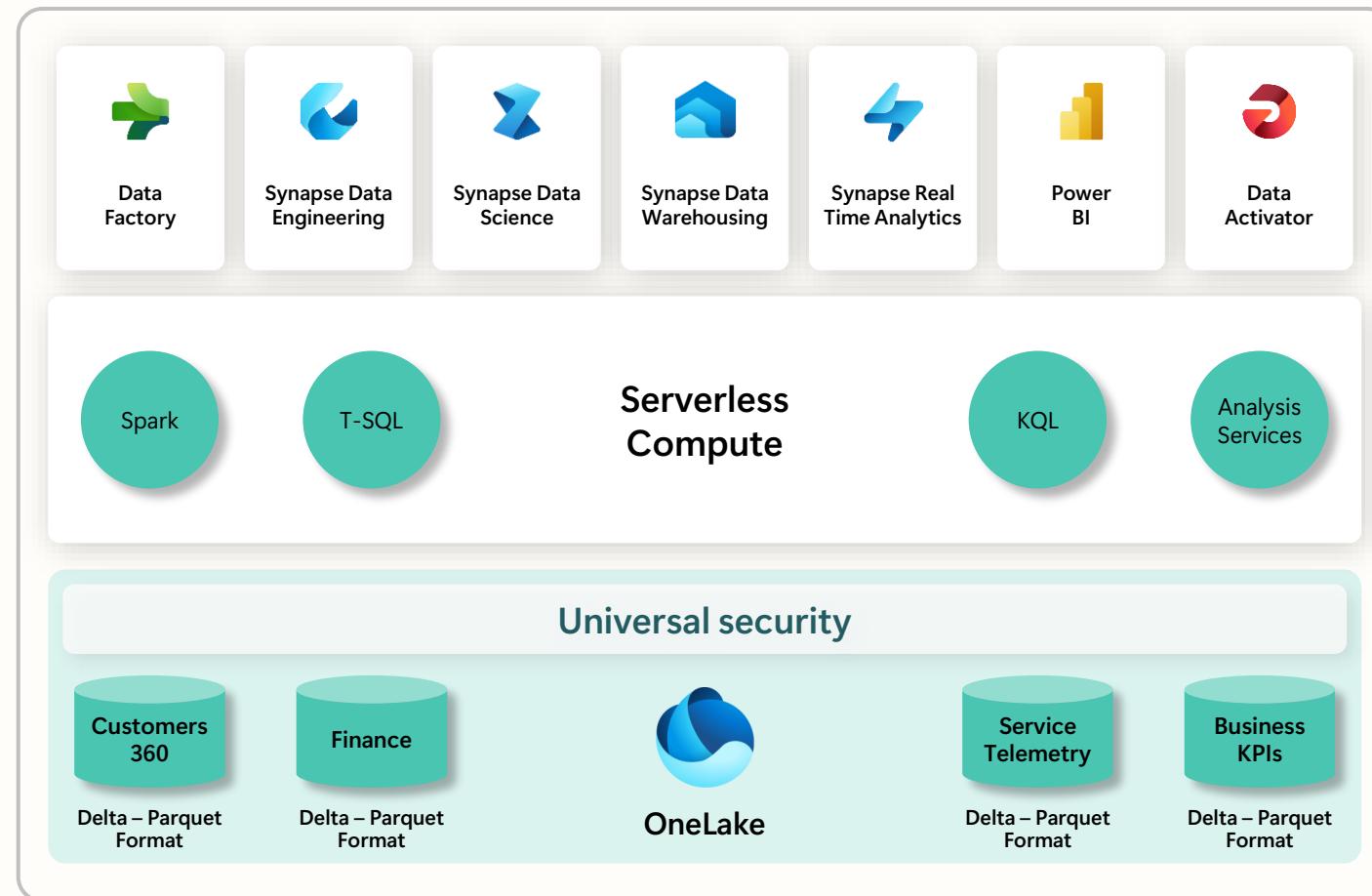
Once data is stored in the lake, it is directly accessible by all the engines without needing any import / export

All the compute engines have been fully optimized to work with Delta Parquet as their native format

Shared universal security model is enforced across all the engines

One Copy for all computers

Universal security makes it real



All the compute engines store their data automatically in OneLake

The data is stored in a single common format

[Delta – Parquet](#), an open standards format, is the storage format for all tabular data in Microsoft Fabric

Once data is stored in the lake, it is directly accessible by all the engines without needing any import / export

All the compute engines have been fully optimized to work with Delta Parquet as their native format

Shared universal security model is enforced across all the engines

OneLake for all domains

A true data mesh across organization domains

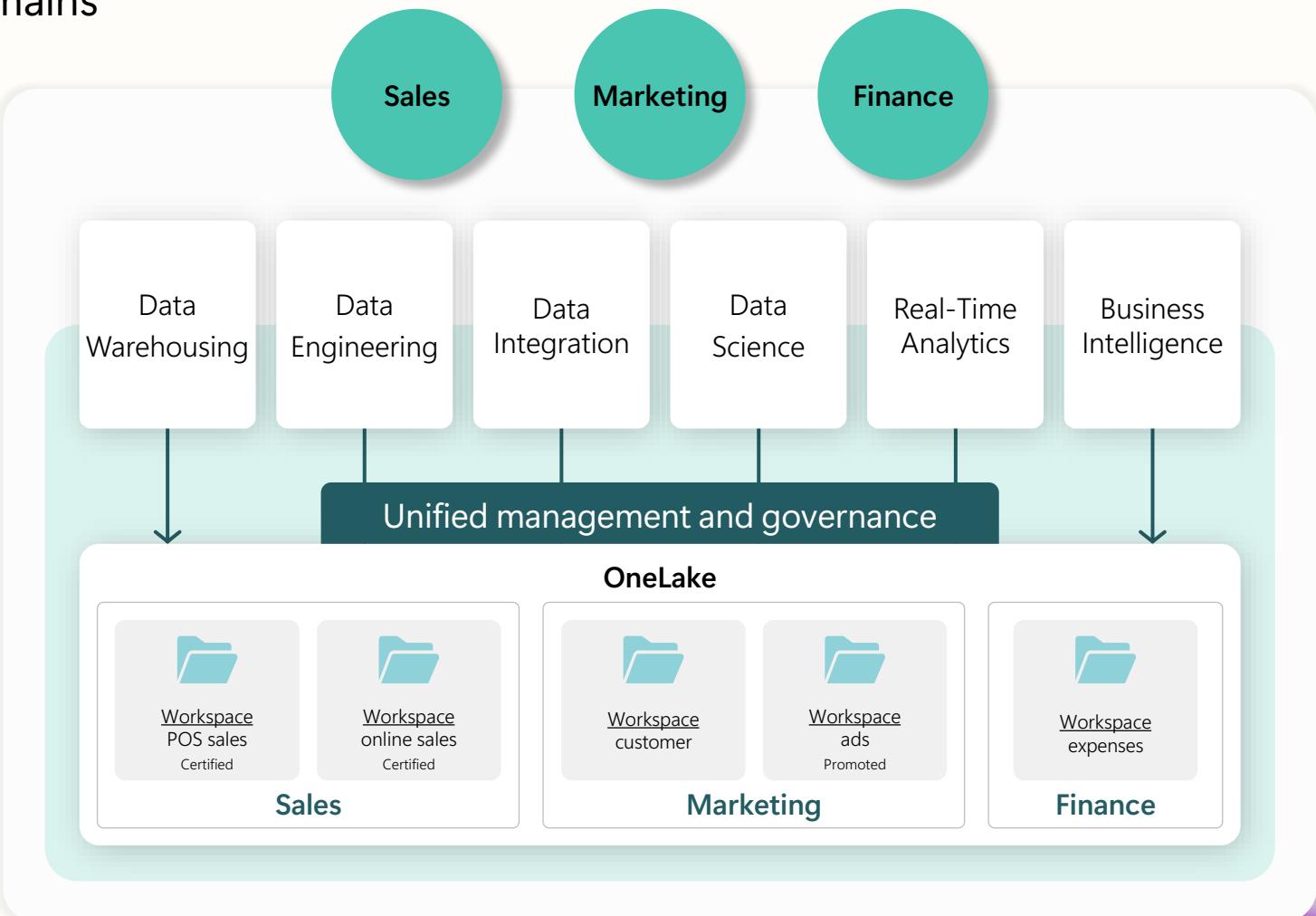
Introducing **domains** as an integral part of Fabric:
A domain is a way to logically group **together** all
the data in an organization relevant to an area or
field, according to business needs

Domains are defined with **domain admins** and
contributors who can **associate** workspaces and
group them together under a relevant domain

Federated governance can be achieved by
delegating settings to domain admins, thus
allowing them to achieve more **granular control**
over their business area

Domains simplify **discovery** and **consumption** of
data across the organization, thus allowing
business optimized consumption

Avoid data swamps by endorsing certain data as
certified or **promoted**, thus encouraging **reuse**



OneLake data hub

Discover, manage, and reuse data in one place

The screenshot shows the Microsoft Fabric OneLake data hub interface. On the left is a vertical navigation bar with icons for Home, Create, Browse, OneLake data hub (selected), Apps, Metrics, Monitoring hub, Deployment pipelines, Learn, Workspaces, and Contoso CRM... At the top right are buttons for Search, Fabric Trial (59 days left), and user profile.

The main area has a header "OneLake data hub" with a sub-header "Discover, manage, and use data from across your org." Below this is a search bar and a "Fabric Trial" badge. A sidebar on the left lists "Recommended" datasets: Business Dataset, US Retail Sales, Contoso Dataset, Supplier-Quality-Analysis-Sample..., and Operating Report. Each dataset card includes a thumbnail, name, owner, and details link.

Below the recommended section is a table titled "Explorer" with columns: Name, Type, Owner, Refreshed, Location, Endorsement, and Sensitivity. The table lists five datasets:

Name	Type	Owner	Refreshed	Location	Endorsement	Sensitivity
Business Dataset	Dataset	Arun Ulag	9/6/22, 5:20:24 PM	Sales Report - Contoso	-	Confidential GDPR
US Retail Sales	Dataset	hcl-admin	10/20/19, 10:42:15 PM	Sales HQ	-	-
Contoso Dataset	Dataset	Arun Ulag	3/17/22, 8:04:24 PM	Contoso Sales	-	General
Supplier-Quality-Analysis-Sample...	Dataset	Arun Ulag	3/22/20, 3:12:13 AM	Sales HQ	-	General
Operating Report	Dataset	Arun Ulag	10/5/19, 1:20:04 AM	Sales HQ	-	Confidential(Intern...

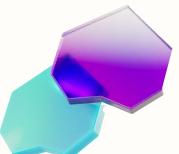
Central location within Fabric to discover, manage, and reuse data. Pervasive experience – available everywhere users discover data (create shortcuts, get data in dataflow, attach a notebook, create a semantic model, and more)

Data can be easily discovered by its domain (e.g., Finance) so users can see what matters to them

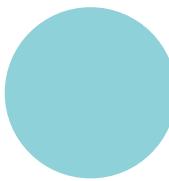
Efficient data discovery using search, filter and sort, or via browsing by folder (workspace) hierarchy

Data actions such as preview, exploration, tracking lineage, report creation, analyze in Excel, and export can be easily done, even by non-technical users

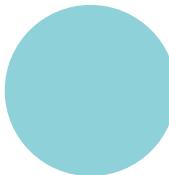
Available in Microsoft Teams, thus bringing OneLake Data hub to Office, enabling both technical and non-technical users with discovery, reuse, and exploration



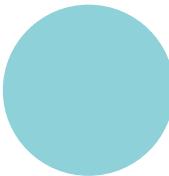
Data Ingestion



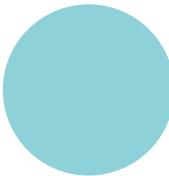
Lakehouse overview



Shortcuts



Data Factory Pipelines



Data Factory Dataflows

Lakehouse | Overview



Store, manage, and analyze all your data in a single location and easily share across the entire enterprise.

Quickly and easily create a Lakehouse without having to provision and configure compute, storage, and networking.



Key Capabilities:

- Flexible and scalable solution that enables organizations to handle large data volumes of all types and sizes
- Built-in SQL endpoint unlocks data warehouse capabilities on top of your Lakehouse with no data movement
- Use 'direct lake' mode to build reports in seconds directly on top of the data lake with blazing fast performance
- Easily ingest data into the Lakehouse through a variety of methods
- Share your Lakehouse as a data product with consumers

The screenshot shows the Microsoft Fabric Data Explorer interface. On the left, the sidebar navigation includes Home, Create, Browse, OneLake data hub, Monitoring hub, Workspaces, Importers, and Importers Lakehouse. The Importers Lakehouse section is currently selected. The main area displays a file tree under 'importerslakehouse'. The 'fact_sale_ly_full' folder is expanded, showing subfolders 'full' and 'incremental'. The 'full' folder contains several Parquet files, each with a timestamped name starting with 'part-'. A search bar at the top right contains the text 'Search'. The bottom right corner features a stylized purple and teal geometric graphic.

Name	Date modified	Type	Size
__SUCCESS	4/24/2023 6:58:06 PM	-	0 B
part-00000-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:09 PM	PARQUET	22 MB
part-00001-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:09 PM	PARQUET	26 MB
part-00002-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:09 PM	PARQUET	19 MB
part-00003-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:09 PM	PARQUET	19 MB
part-00004-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:09 PM	PARQUET	33 MB
part-00005-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:10 PM	PARQUET	20 MB
part-00006-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:11 PM	PARQUET	36 MB
part-00007-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:09 PM	PARQUET	23 MB
part-00008-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:11 PM	PARQUET	24 MB
part-00009-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:11 PM	PARQUET	24 MB
part-00010-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:10 PM	PARQUET	23 MB
part-00011-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:11 PM	PARQUET	31 MB
part-00012-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:11 PM	PARQUET	22 MB
part-00013-ced648ca-e8c8-46e5-8526-5ca85d56e67e-c000.snappy.parquet	4/24/2023 6:58:11 PM	PARQUET	21 MB

Lakehouse Overview

Store, manage and analyze all your data in a single location & easily share across the entire enterprise

Flexible and scalable solution that enables organizations to handle large data volumes of all types and sizes

Easily ingest data from many different sources & store it in an open format

Automatic table discovery and registration for a fully managed file to table experience

Built-in SQL endpoint and semantic dataset enabling users to work on top of Delta tables in the lake, providing a frictionless experience from ingestion to reporting

Lakehouse Sharing

Share your Lakehouse as a data product with consumers

Provide	Provide users access to a lakehouse without adding them to your workspace
Grant	Grant access to lakehouse data through Spark, SQL Endpoint, and default dataset for PBI reporting
Use	Use SQL Security or customer permission to grant access through SQL Endpoint
Discover	Discover lakehouses you have access to in the OneLake Data Hub

Shortcuts



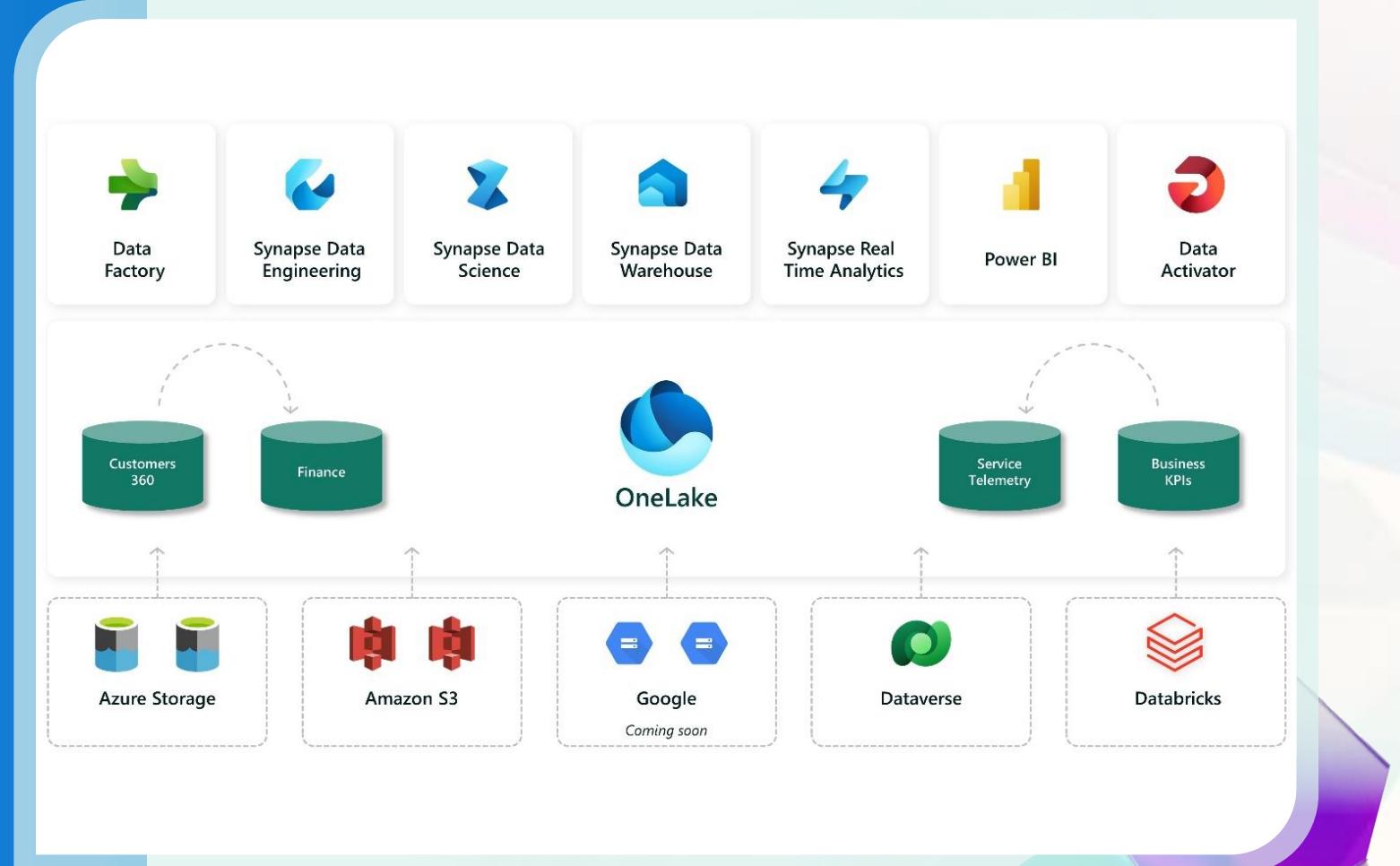
Shortcuts unify data without copying or moving existing data.

This means that data can be used multiple times without data duplication.



Key Capabilities:

- Create shortcuts within Microsoft Fabric to consolidate data across artifacts or workspaces, without changing ownership of the data
- With shortcuts, data throughout OneLake can be composed together without any data movement
- Shortcuts also allow instant linking of data already existing in Azure and in other clouds, without any data duplication and movement, making OneLake the first multi-cloud data lake
- With support for industry standard APIs, OneLake data can be directly accessed by any application or service



Data Integration overview



Data Factory



Data Factory in Microsoft Fabric provides cloud-scale data movement and data transformation services that allows you to solve the most complex ETL scenarios.

Core to Data Factory are Data Pipelines and Dataflows to give users the option to a low-code, collaborative, and enterprise scale approach for their ETL process.



Latest capabilities:

- Output destination to Lakehouse
- 14 new connectors available in Pipeline copy activity
- Warehouse connector for Power BI Desktop
- Sample semantic models
- Pipeline Lakehouse copy assist
- Create data pipeline in Lakehouse portal
- Pipeline templates
- Pipeline support for Spark notebooks
- Service principle auth support

The screenshot shows the Microsoft Data Factory user interface. At the top, there's a navigation bar with tabs like Home, Activities, Run, View, and specific pipeline actions like Validate, Run, Schedule, View run history, Copy data, Dataflow, Notebook, Lookup, and Invoke pipeline. Below the navigation is a search bar and a trial status indicator (Trial: 54 days left). On the left, a sidebar lists various components: Home, Create, Browse, OneLake data hub, Monitoring hub, Workspaces, Importers, and pipeline5 (which is selected). The main area is titled "Start building your data pipeline" and features three buttons: "Add pipeline activity" (with a gear icon), "Copy data" (with a clipboard icon), and "Choose a task to start" (with a square icon). The bottom right corner of the slide features a decorative graphic of overlapping geometric shapes in blue, green, and purple.

Autonomous ETL can unlock operational efficiencies and help orchestrate, monitor, and manage pipeline performance.

Data Pipelines



Data Pipelines enable powerful workflow capabilities at cloud-scale like building complex workflows, moving PB-size data, and defining sophisticated control flow pipelines.

Data pipelines can be used to build complex ETL and data factory workflows that can perform a number of different tasks at scale. Additionally, control flow capabilities are built into pipelines so you can build workflow logic which provide loops and conditional.

A screenshot of the Microsoft Fabric Data Factory interface. The main window shows a 'Copy data' wizard with the first step selected: 'Choose data source'. It displays a list of data sources categorized under 'All categories'. The list includes various services and protocols such as Amazon RDS for SQL Server, Amazon Redshift, Amazon S3, Amazon S3 Compatible, Azure Blob Storage, Azure Cosmos DB for NoSQL, Azure Data Lake Storage Gen1, Azure Data Lake Storage Gen2, Azure Database for PostgreSQL, Azure Synapse Analytics, Azure Table Storage, Azure SQL Database, Data Warehouse Workspace, Hive Database, Microsoft 365, SharePoint Online List, and others. At the bottom of the wizard are 'Back', 'Next', and 'Cancel' buttons.

The screenshot illustrates the complexity and breadth of data sources supported by Microsoft Fabric's Data Pipelines feature, allowing users to move data between a wide range of cloud and on-premises environments.

Data Pipelines | Connectors

New Connectors provide a low-code interface for ingesting data from a variety of data sources.



New Connectors:

- Warehouse connector; connect to existing Azure Synapse
- Lakehouse connector
- **14 new connectors in the copy activity:** Amazon S3, Azure Table, Amazon Redshift, OData, Google Cloud Storage, Apache Impala, Hive, SQL Server, Azure Synapse Analytics, HTTP, REST, PostgreSQL, Azure Database for PostgreSQL, and Azure Data Explorer

The screenshot shows the Microsoft Fabric Data Factory interface. A modal window titled "Copy data" is open, specifically the "Choose data source" step. The window includes a descriptive text block about moving objects from a data source to a destination, a search bar, and a grid of data source icons categorized by type. The categories at the top of the grid are "All categories", "Workspace", "Azure", "Database", "File", "Generic protocol", and "Services and apps". The "All categories" tab is selected. The grid contains numerous icons representing different data sources, such as Amazon RDS for SQL Server, Amazon Redshift, Amazon S3, Azure Blob Storage, Azure Data Lake Storage Gen1, Azure Data Lake Storage Gen2, Azure Synapse Analytics, Azure Table Storage, DataVerse, Dynamics CRM, Google Cloud Storage, HTTP, OData, PostgreSQL, REST, Snowflake, Spark, and SQL server. At the bottom of the modal are "Back", "Next", and "Cancel" buttons.

Data Pipelines | Sample data

Sample Semantic models helps new users get started quickly, building out their ELT processes using Data Pipelines.



Sample Semantic models:

- COVID-19 Data Lake (CSV, JSON, JSON Lines, Parquet)
- NYC Tax – Green (2GB Parquet)
- Diabetes (14K Parquet)
- Public Holidays (500KB Parquet)
- Retail Data Model from Wide World Importers (352MB Parquet)

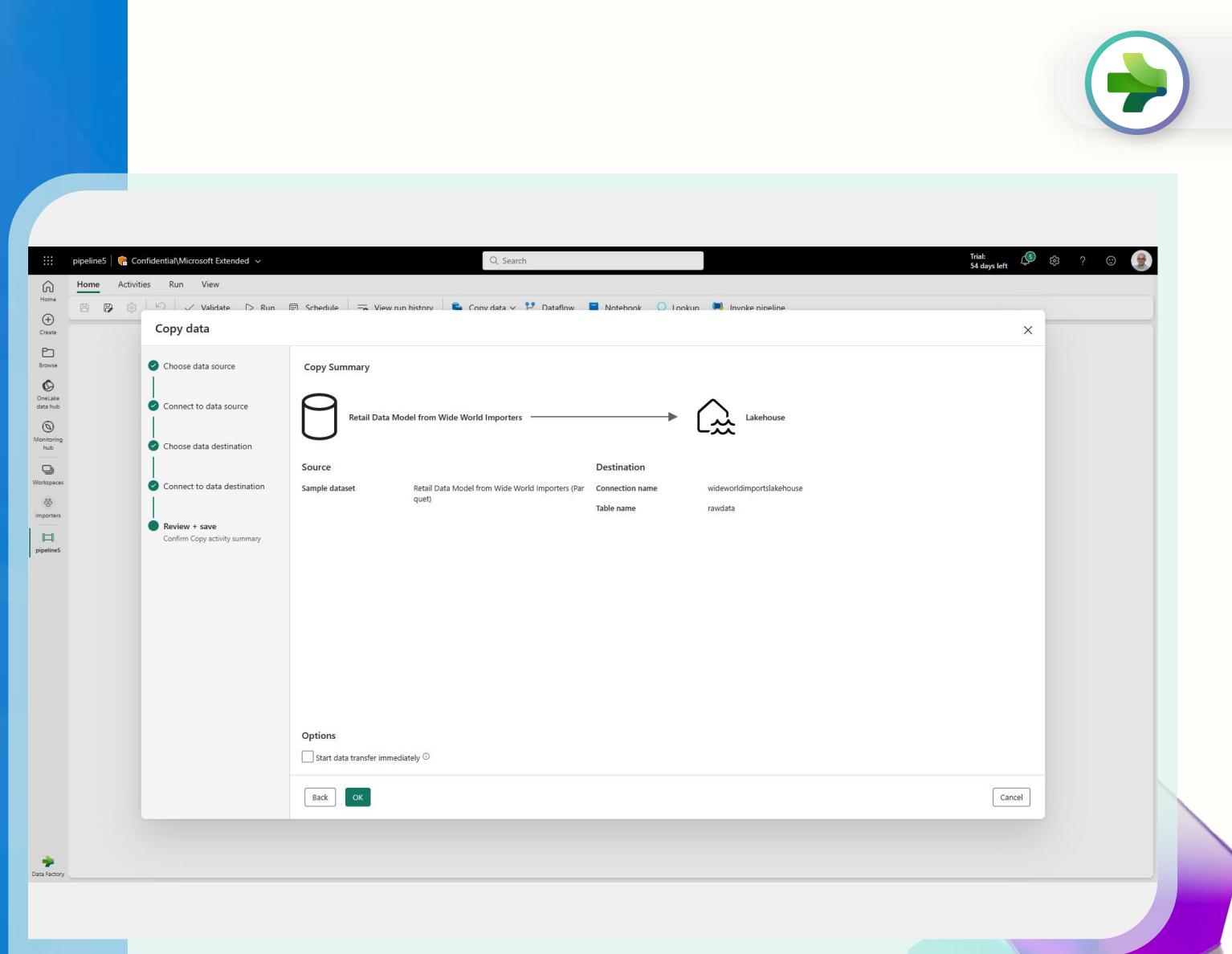
The screenshot shows the Microsoft Fabric Data Pipeline interface. On the left, a sidebar lists various pipelines and data assets. The main area is a 'Copy data' wizard. It starts with a 'Choose data source' step, where the user can select a connector and enter connection information. Below this, there are sections for 'Sample data' and 'Data sources'. The 'Sample data' section shows five datasets: COVID-19 Data Lake (2GB Parquet), NYC Taxi - Green (2GB Parquet), Diabetes (14 KB Parquet), Public Holidays (500 KB Parquet), and Retail Data Model from Wide World Importers (352MB Parquet). The 'Data sources' section lists various cloud and on-premises databases and file systems, including Amazon RDS for SQL Server, Amazon Redshift, Amazon S3, Apache Impala, Azure Blob Storage, Azure Cosmos DB for NoSQL, Azure Data Explorer (Kusto), Azure Data Lake Storage Gen1, Azure Data Lake Storage Gen2, Azure Database for PostgreSQL, Azure SQL Database, Azure SQL Database Managed Instance, Azure Synapse Analytics, Azure Table Storage, and Data Warehouse Workspace.



Data Pipelines | Lakehouse copy assist

Simply copy data to a Lakehouse
with copy assist capabilities within the Data
Pipeline.

Additionally, user can create a Data
Pipeline without having to leave the
Lakehouse portal.



Data Pipelines | Templates



Quickly get started with data integration.

Templates help reduce development time by providing an easy way to create pipeline for common data integration scenarios.



Available Data Pipeline Templates:

- Bulk copy from Database
- Bulk copy from File to Database
- Copy data from ADLS Gen2 to Lakehouse file
- Copy from ADLS Gen2 to Lakehouse Table
- Copy data from Azure AQL DB to Lakehouse Table
- Copy multiple files containers between File Stores
- Copy new files only by Last Modified Date
- Delete files older than 30 days
- Delta copy from Database
- Move files

The screenshot shows the Microsoft Fabric Data Factory interface. On the left, a sidebar lists various workspace options like Home, Browse, OneLake data hub, Monitoring hub, Workspaces, Importers, and the current pipeline named 'pipeline4'. The main area is titled 'Templates' and displays a grid of 12 data transfer and processing templates, each with a preview icon, name, and brief description. The templates include:

- Bulk Copy from Database by Microsoft
- Bulk Copy from Files to Database by Microsoft
- Copy data from ADLS Gen2 to Lakehouse file by Microsoft
- Copy data from ADLS Gen2 to Lakehouse Table by Microsoft
- Copy data from Azure SQL DB to Lakehouse Table by Microsoft
- Copy multiple files containers between File Stores by Microsoft
- Copy new files only by LastModifiedDate by Microsoft
- Delete files older than 30 days by Microsoft
- Delta copy from Database by Microsoft
- Move files by Microsoft

A search bar at the top right allows filtering by keyword. Navigation buttons 'Next' and 'Cancel' are visible at the bottom right of the template grid.

Dataflow



Dataflow provides a low-code interface for ingesting data from hundreds of data sources.

Dataflow quickly and easily unifies disparate data sources, establishes a more collaborative analytics approach, and promotes more informed, agile decision making.



Key Capabilities:

- Accelerate data transformation with code-free data flows
- Standardize dataflows in Power Apps support for loading data
- Load results of data transformations into multiple destinations (Azure SQL Databases, Lakehouse, etc.)

The screenshot shows the Microsoft Data Factory interface with a central modal dialog titled "Choose data source". The dialog lists various data connectors categorized by type. A search bar at the top right of the modal allows users to filter the results. The categories include All categories, File, Database, Power Platform, Azure, Online services, and Other. The connectors are arranged in a grid:

- All categories:** Excel workbook, Parquet, IBM Db2 database, SAP BW Message Server, Dataflows, Azure Analysis Services, SharePoint Online list, Web API, Actian Database, Dremio Cloud, Jethro Database, Lakehouse, Azure Time Series Insights.
- File:** Text/CSV File, SharePoint folder, MySQL database, Oracle database, PDF File.
- Database:** SQL Server database, PostgreSQL database, Access Database, Oracle database, SAP HANA database, SAP BW Application Server, Vertica Database.
- Power Platform:** Power BI dataflows (Legacy), Power BI dataflows (Power Platform), Power BI Data Mart, Power BI Data Mart, Power BI Data Mart, Power BI Data Mart.
- Azure:** Azure Blobs, Microsoft Exchange Online, Web page, Azure Tables, Azure Data Explorer (Kusto), OData, Spark, Data Virtuality LDW, Indexima, Azure Cosmos DB v2, Azure Cost Management, Asana, Automation Anywhere.
- Online services:** SharePoint list, Salesforce objects, Salesforce reports, SharePoint list, Exasol Database, Kylin PCK Style / Multi..., Azure, Asana, Automation Anywhere.
- Other:** Google BigQuery, Google Analytics, Adobe Analytics, Odbc, Denodo Database, TIBCO(R) Data Virtualization, Azure Synapse Analytics, Automy Data Analytics.
- BETA:** Amazon Athena, Dremio Software, MariaDB, Azure Data Lake Storage Gen2, Azure HDInsight Spark, Google Analytics, Adobe Analytics, Odbc, Denodo Database, TIBCO(R) Data Virtualization, Azure Synapse Analytics, Automy Data Analytics.

At the bottom right of the modal is a "Cancel" button, and at the bottom right of the entire interface is a "Publish" button.

Dataflow | Gen1 vs Gen2

Dataflow Gen2 is the new generation of dataflows. The new generation of dataflows resides alongside the Power BI Dataflow (Gen1) and brings new features and improved experiences.



Feature	Dataflow Gen2	Dataflow Gen1
Author dataflows with Power Query	✓	✓
Shorter authoring flow	✓	
Auto-Save and background publishing	✓	
Data destinations	✓	
Improved monitoring and refresh history	✓	
Integration with data pipelines	✓	
High-scale compute	✓	
Get Data via Dataflows connector	✓	✓
Direct Query via Dataflows connector		✓
Incremental refresh		✓
AI Insights support		✓

Dataflow | Output to Lakehouse

Simply write into a Lakehouse from a Dataflow.

Users select the Lakehouse output destination from the list and configure the connection.

This requires the Lakehouse connector to be installed as a custom connector into your data gateway when loading data from on-premise.

The screenshot shows the Microsoft Synapse Data Engineering Importers Power Query interface. The main window displays a query titled 'dimension_customer 7' which is a transformation of 'Table.TransformCustomer'. The 'Add data destination' dropdown menu is open, and the option 'Lakehouse' is highlighted with a red box. The interface includes various Power Query tools like 'Get data', 'Transform', 'Add column', and 'View'. On the right side, there are 'Query settings' and 'Data destination' sections. The 'Query settings' section shows the entity type as 'Custom' and the name as 'dimension_customer 7'. The 'Data destination' section indicates 'No data destination'. The bottom status bar shows 'Completed (0.93 s) Columns: 11 Rows: 99+.'

15 minute break



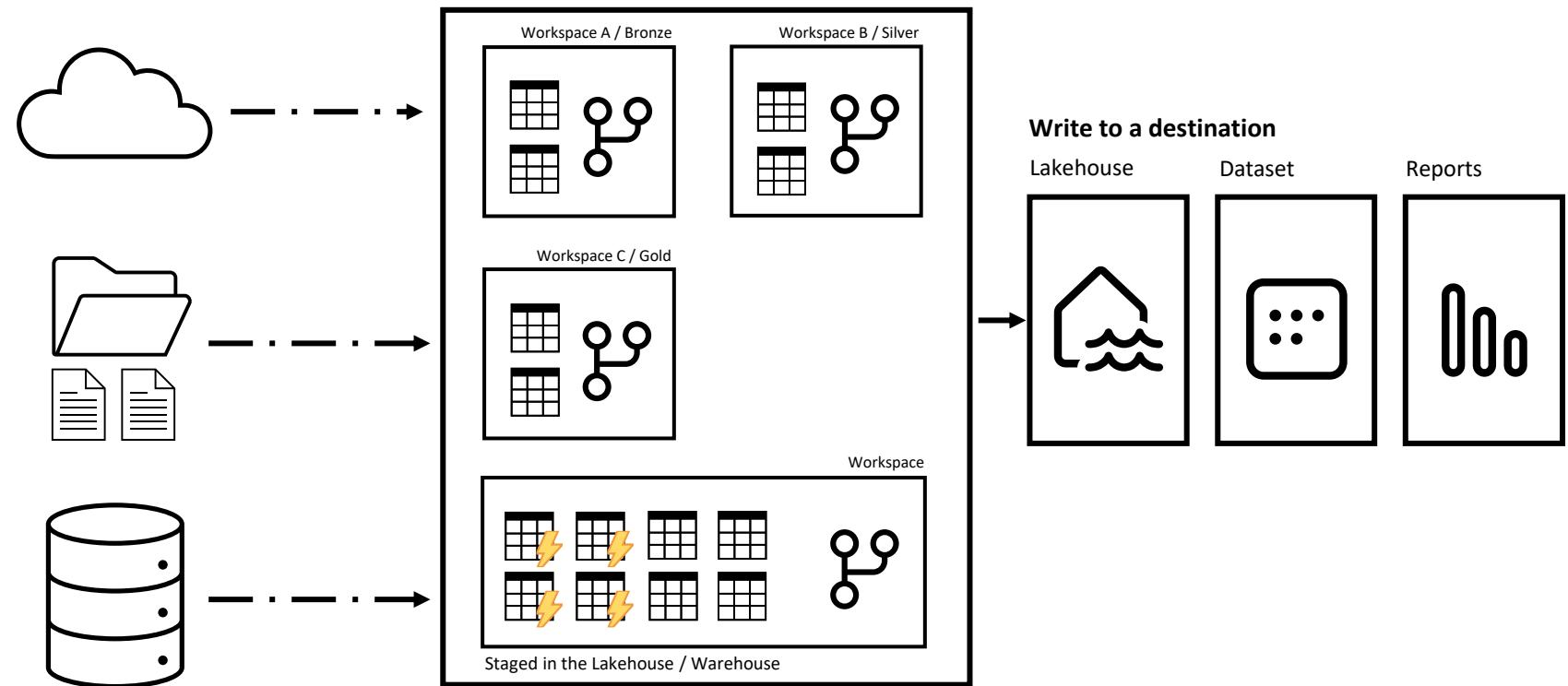


Data prep

Dataflows Gen2

Dataflows are a self-service, cloud-based, data preparation technology

Dataflows are available in Power BI, Power Apps and Dynamics 365 Customer Insights



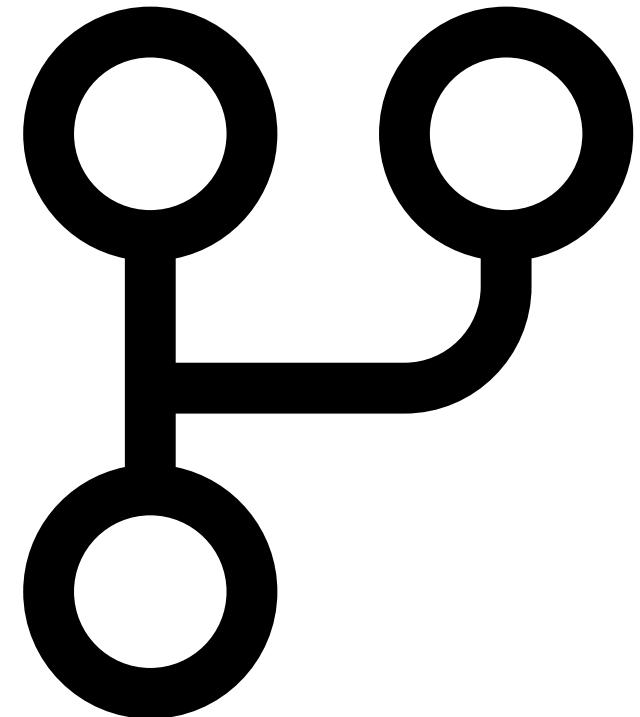
Dataflows Gen2

1. Advantages

- Creates a single source of truth (Endorsements)
- Reduces load at the source by copying the data once and then sharing broadly
- Protects the underlying data sources from direct access

2. Disadvantages

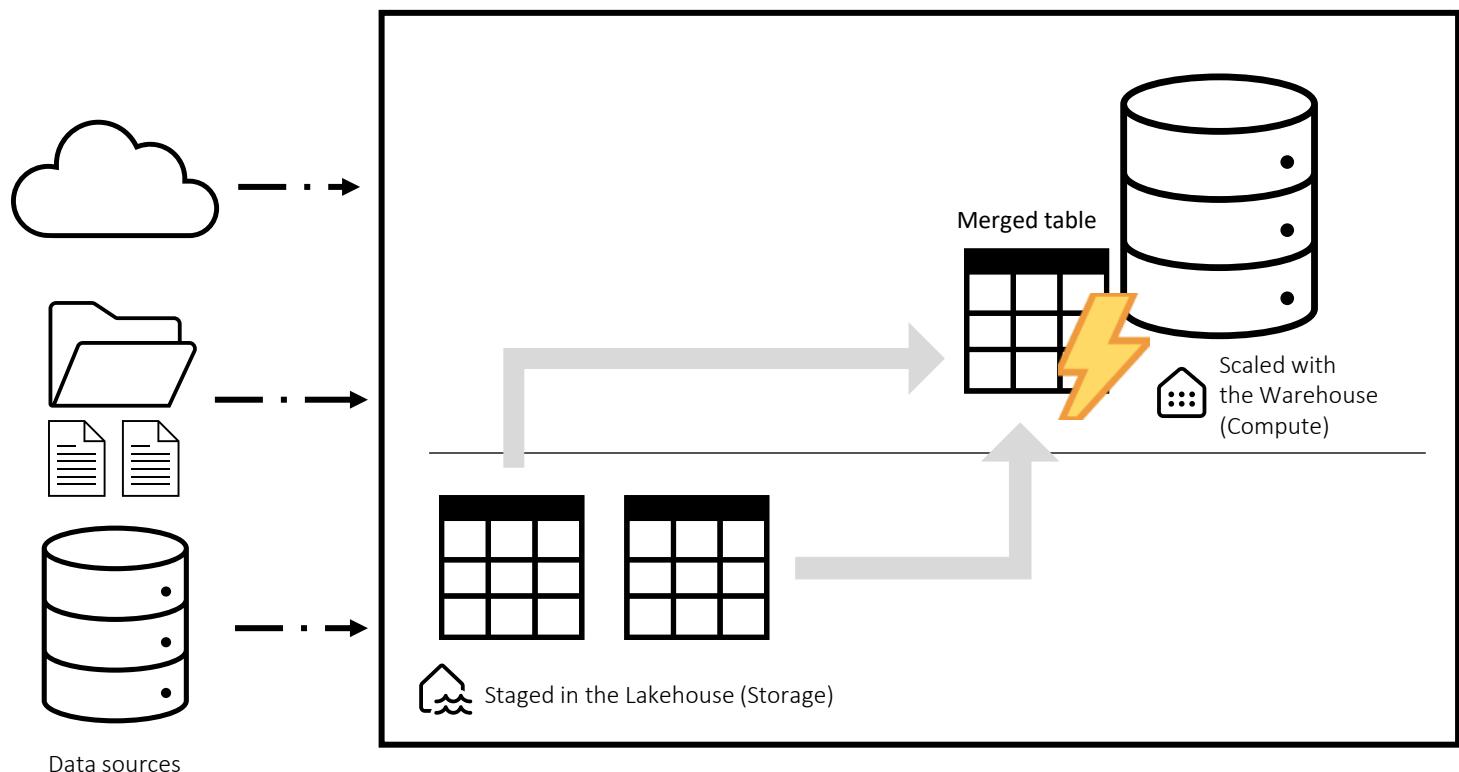
- Cloud-only development
- Lacks multi-author editing/auditing features
- Lacks parameter editing post-authoring



Computed Tables

Power Query Online enables Premium subscribers to use their capacity to optimize the use of dataflows with Fabric compute.

1. Connect to your data and copy it into the Lakehouse using *“Enable staging” (**on by default!**)
2. Create a reference query in a new query.
3. Apply transformation steps to the computed table for complex ETL operations such as join, distinct, filter and group by – leveraging the Warehouse for compute



*Previously titled “Enable load”

Computed Tables

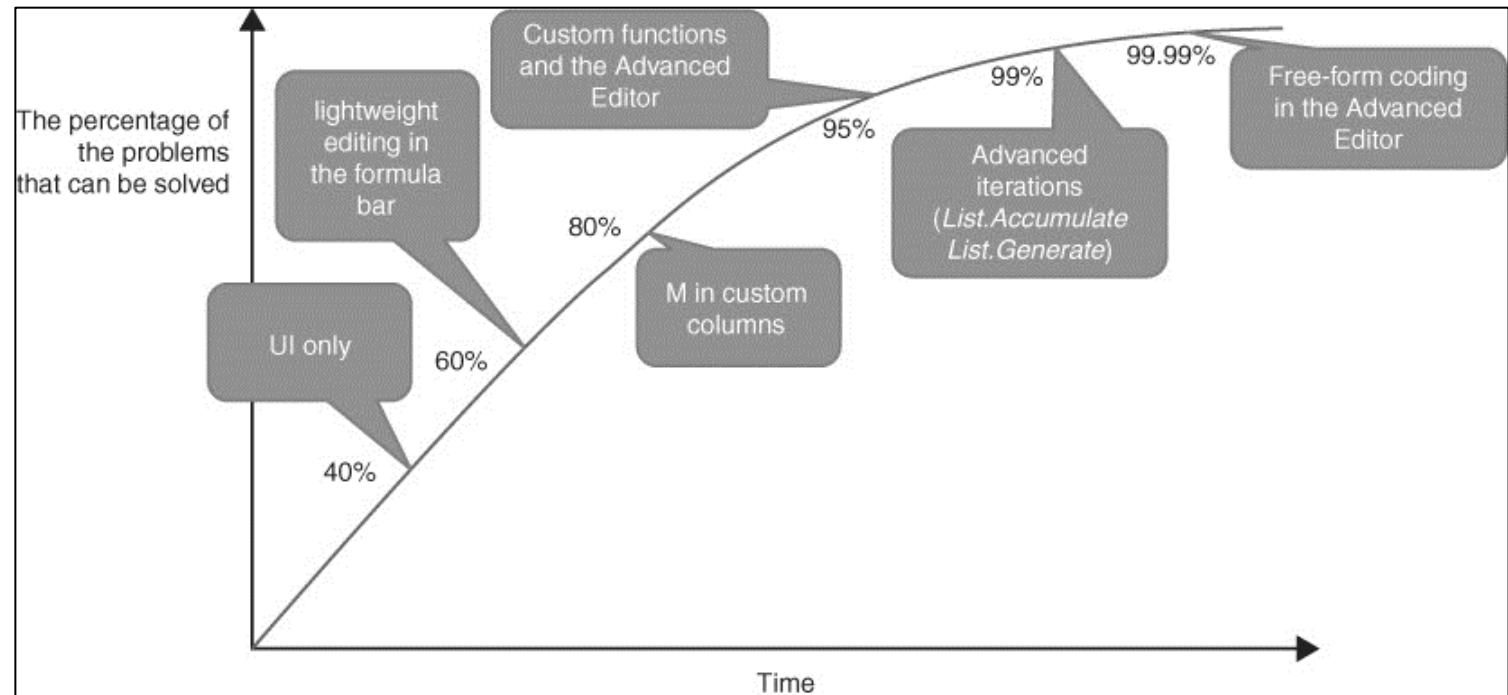
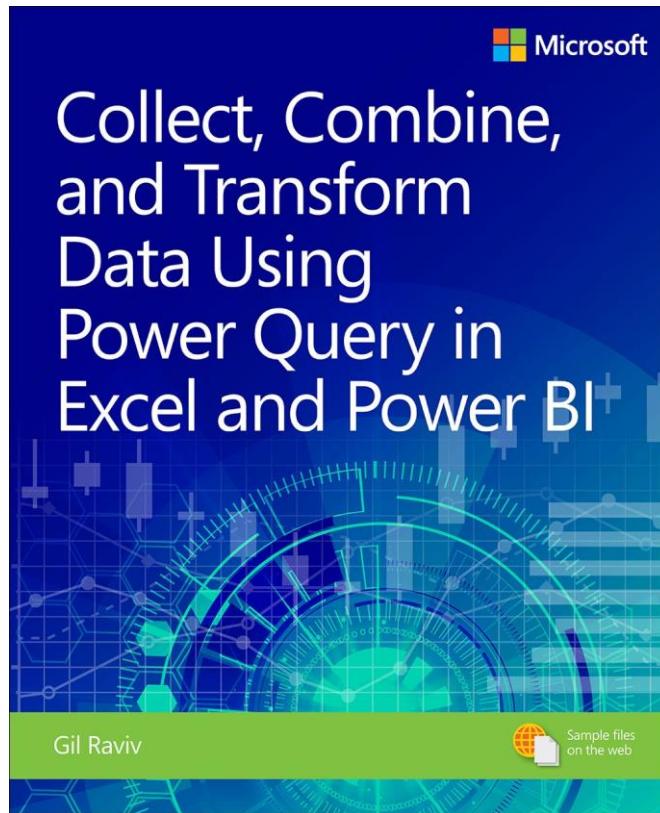
Power Query Online enables Premium subscribers to use their capacity to optimize the use of dataflows with Fabric compute.

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2. Create a reference query in a new query.
3. Apply transformation steps to the computed table for complex ETL operations such as join, distinct, filter and group by – leveraging the Warehouse for compute

The screenshot shows the Power Query Online interface with a dataflow diagram. The dataflow consists of several stages: Data staging (DimProductCategory_raw, DimProductSubcategory_raw, DimCustomer_raw, DimGeography_raw), Data load (DimDate, DimEmployee, DimStore), and Data transformation (DimCustomer, DimProduct). A context menu is open over a step in the DimProduct transformation stage, with the 'Enable staging' option highlighted. The menu also includes options like Copy, Paste, Delete, Rename, Duplicate, Reference, Move to group, Move up, Move down, Create function..., Convert to parameter, Advanced editor, and Properties... Below the menu, a preview of the data shows columns ProductKey, ProductLabel, ProductName, and ProductDescription. The preview table has 99+ rows and was completed in 1.17 seconds. The bottom status bar indicates 'Column profiling based on top 1,000 rows'.

*Previously titled “Enable load”

Power Query Skills



Closing Thoughts on Data Preparation

1. "As far upstream as possible, as far downstream as necessary."
2. Spending hours, to save seconds on refresh times is a cost-benefit analysis of your time.
3. Always default to the UI first and the code last.

the

FLATFILE

the

vs. STAR

which is better?...

Normalized (Flat File)

1. Advantages

- Single table to manage
- Limited maintenance

2. Disadvantages

- Slow refresh
- No organization
- Complicated DAX (possibly)
- Time Intelligence can be challenging

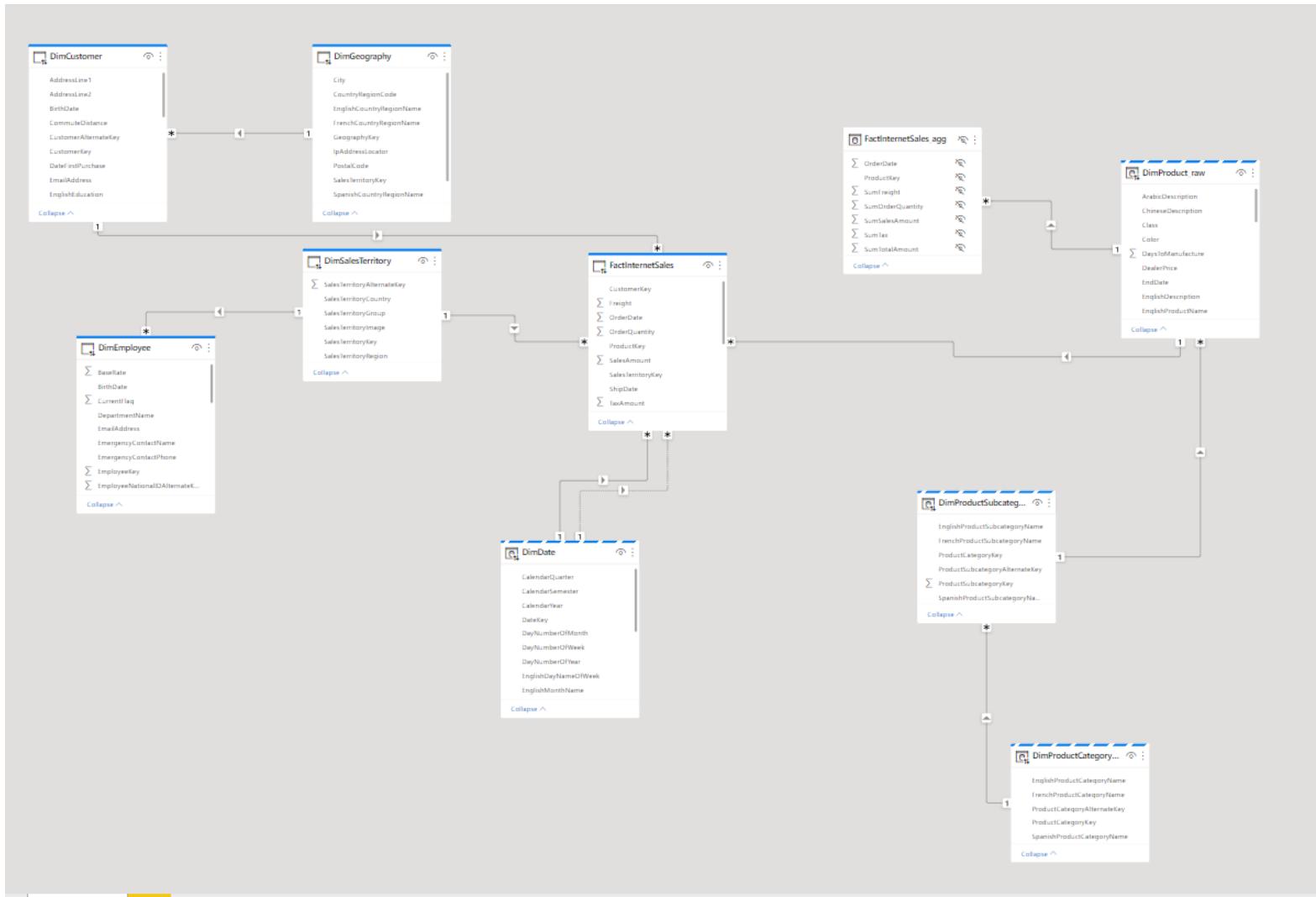
Relationships

1. Advantages:

- Filtering
- Aggregating
- Simpler DAX

2. Disadvantages:

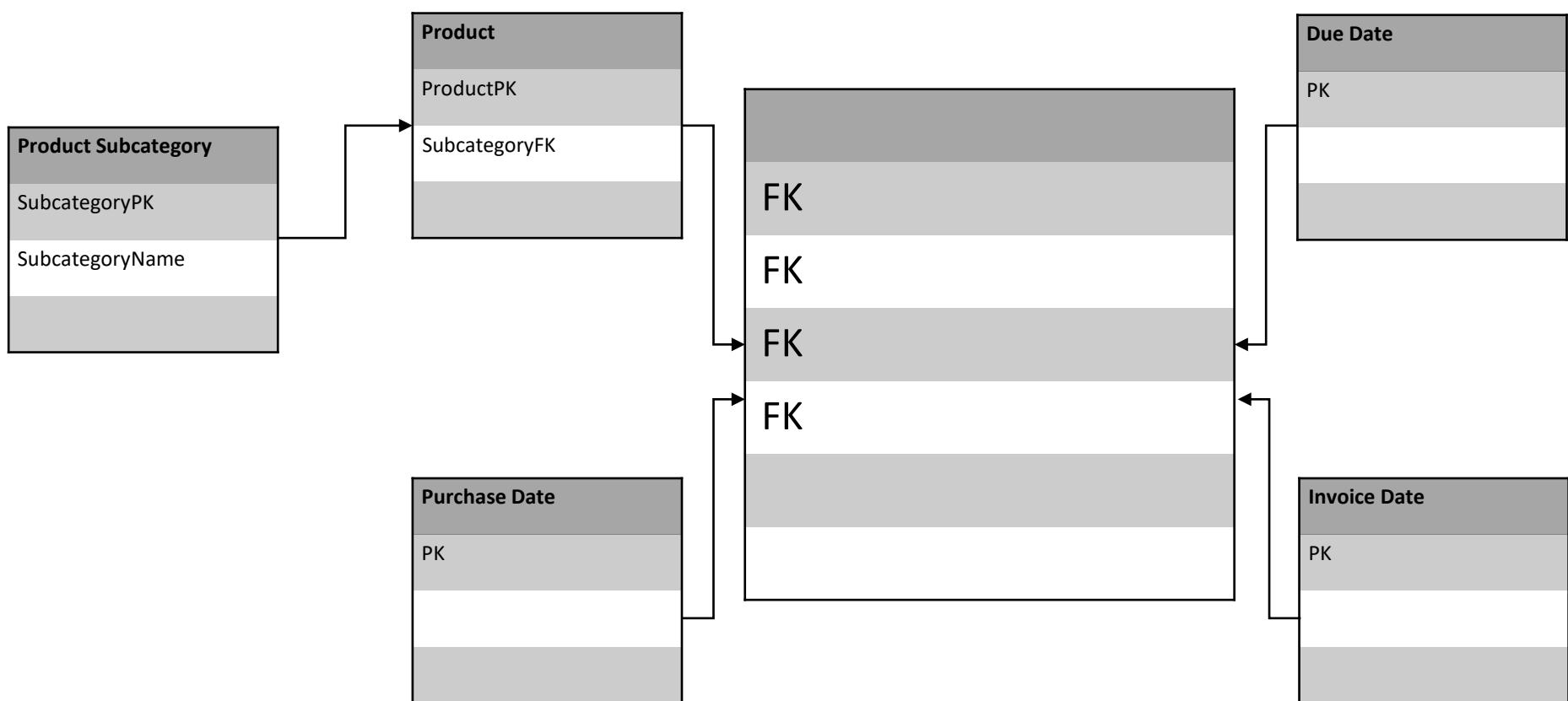
- Only one column
- Can be costly
- Be careful with
 - Many-to-many
 - Bi-directional



Snowflake Schema

Design decisions

- More Tables
- Possibly more DAX
- Relationship size
- Possible query performance



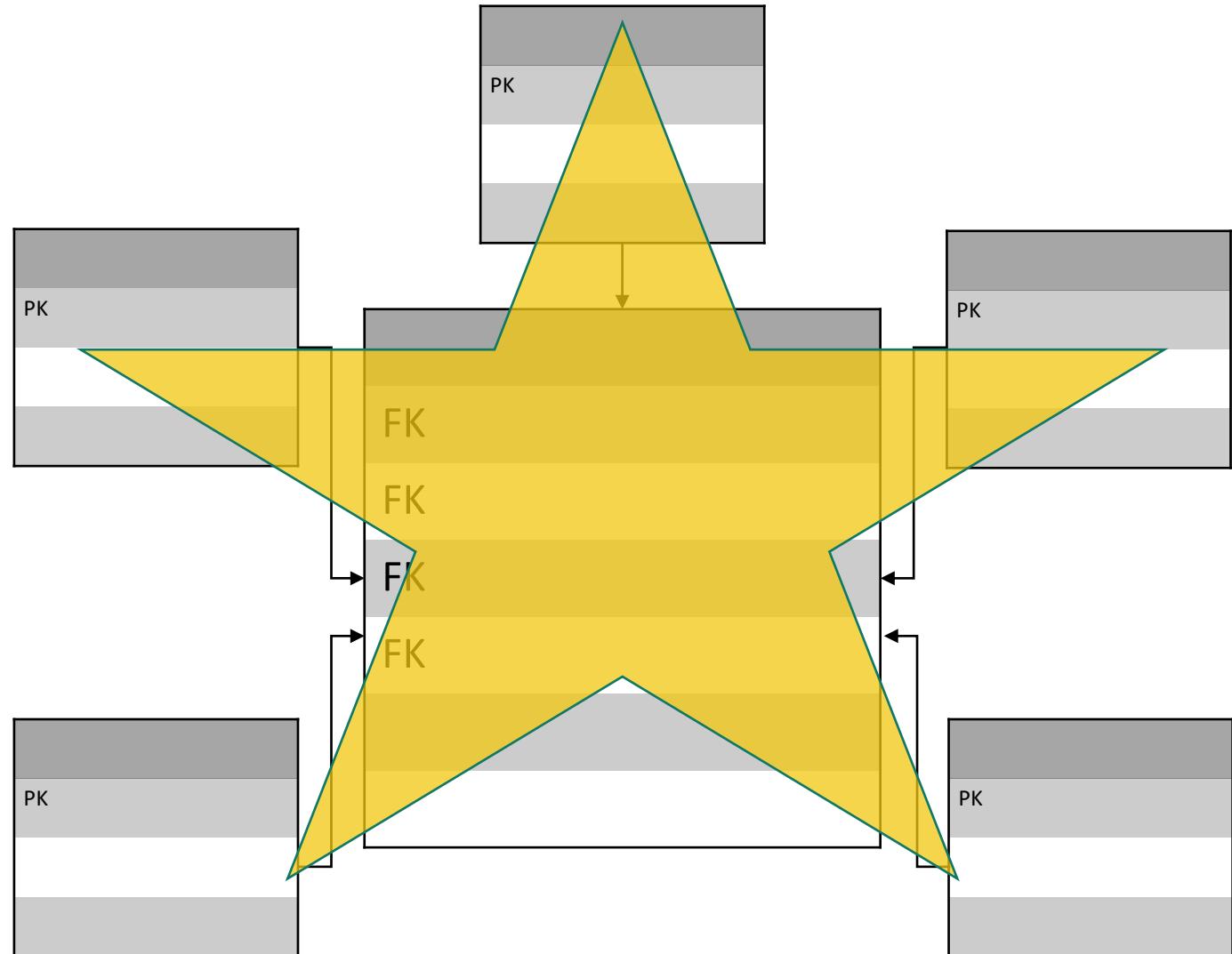
Denormalized (Star Schema)

1. Advantages

- Simple DAX (possibly)
- Organized
- Faster Refresh
- Consistency

2. Disadvantages

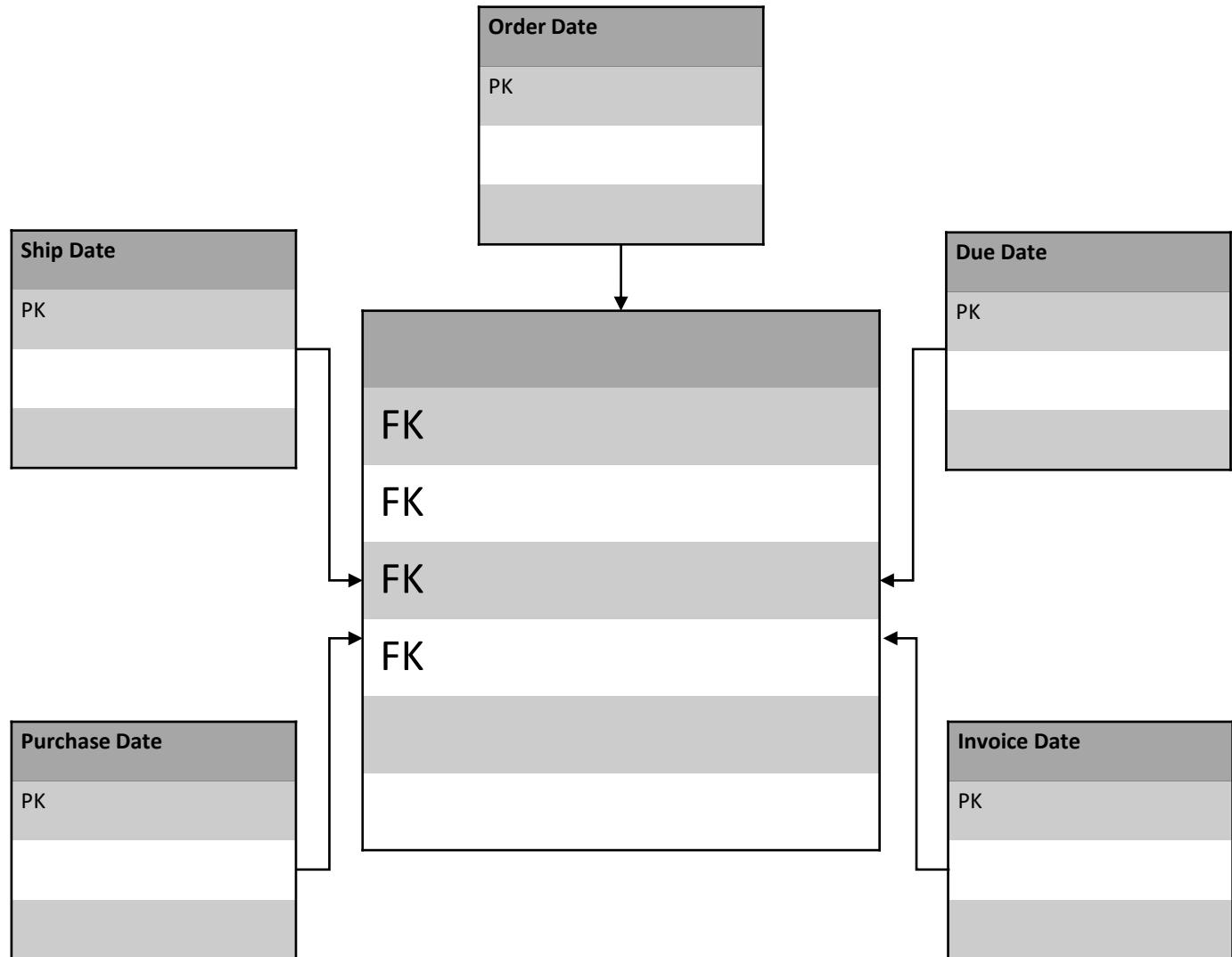
- Subject Matter Expert
- Maintenance
- Cost



Role-Playing Dimensions

Design decisions

- Multiple Tables
- Single-Table
- UseRelationship()



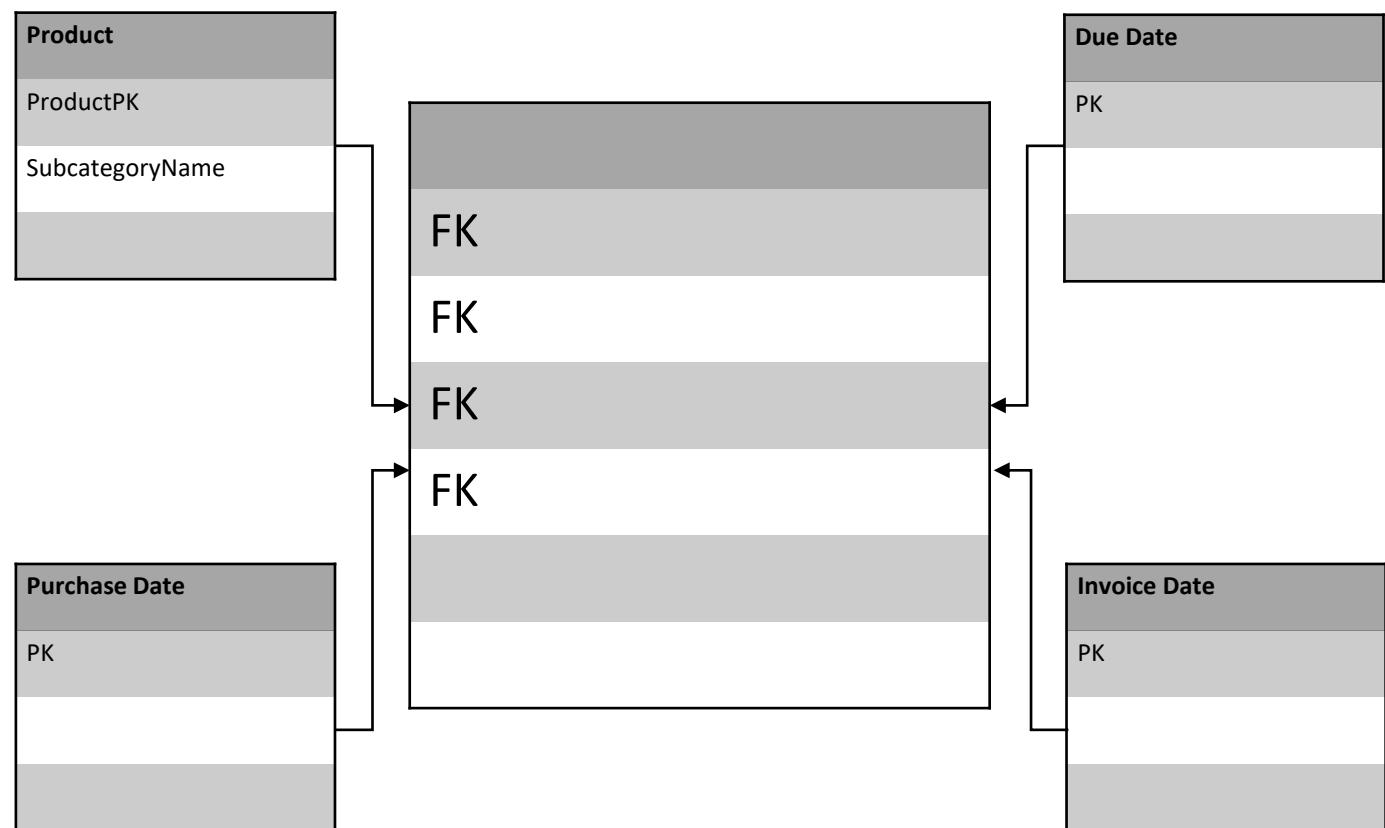
One Dataset...

1. Advantages

- Endorsement
 - Promotion
 - Certification
- Consistency
- Extensible

2. Disadvantages

- Maintenance
- Discipline
- Complication
- Scalability



Closing Thoughts on Data Modeling

1. "As far upstream as possible, as far downstream as necessary."
2. Less is Always More. Only Bring in What You Need.
3. Keep it Simple. Keep it Clean.
4. There is no such thing as "**Come Back To It**".
5. Test. Test. Test.

Lunch break



SQL Endpoint



Lakehouse SQL Endpoint

Use data warehouse capabilities on top of your lakehouse with no data movement



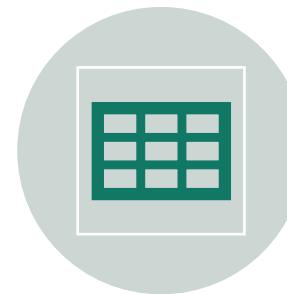
Run and store SQL queries
using the SQL visual editor
or authoring T-SQL



Define functions, views and
custom SQL security



Connect through external
tools like Azure Data Studio
and SSMS



Cross-table and DB querying
(across warehouse artifacts
and lakehouse SQL
endpoints)

Power BI on top of Lakehouse

Build semantic datasets and reports directly on top of your lakehouse



Built-in semantic modelling capabilities enabling users to add measures and relationships inside the lakehouse experience



Blazing fast query performance with Vertipaq compression and direct lake connectivity



Generate reports in seconds directly from the lakehouse

Semantic Models overview



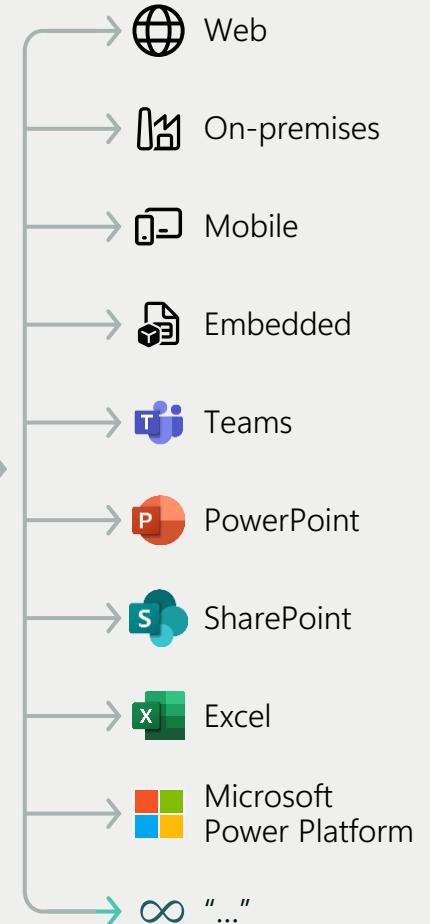
Power BI: The bridge between data and decisions



Semantic model



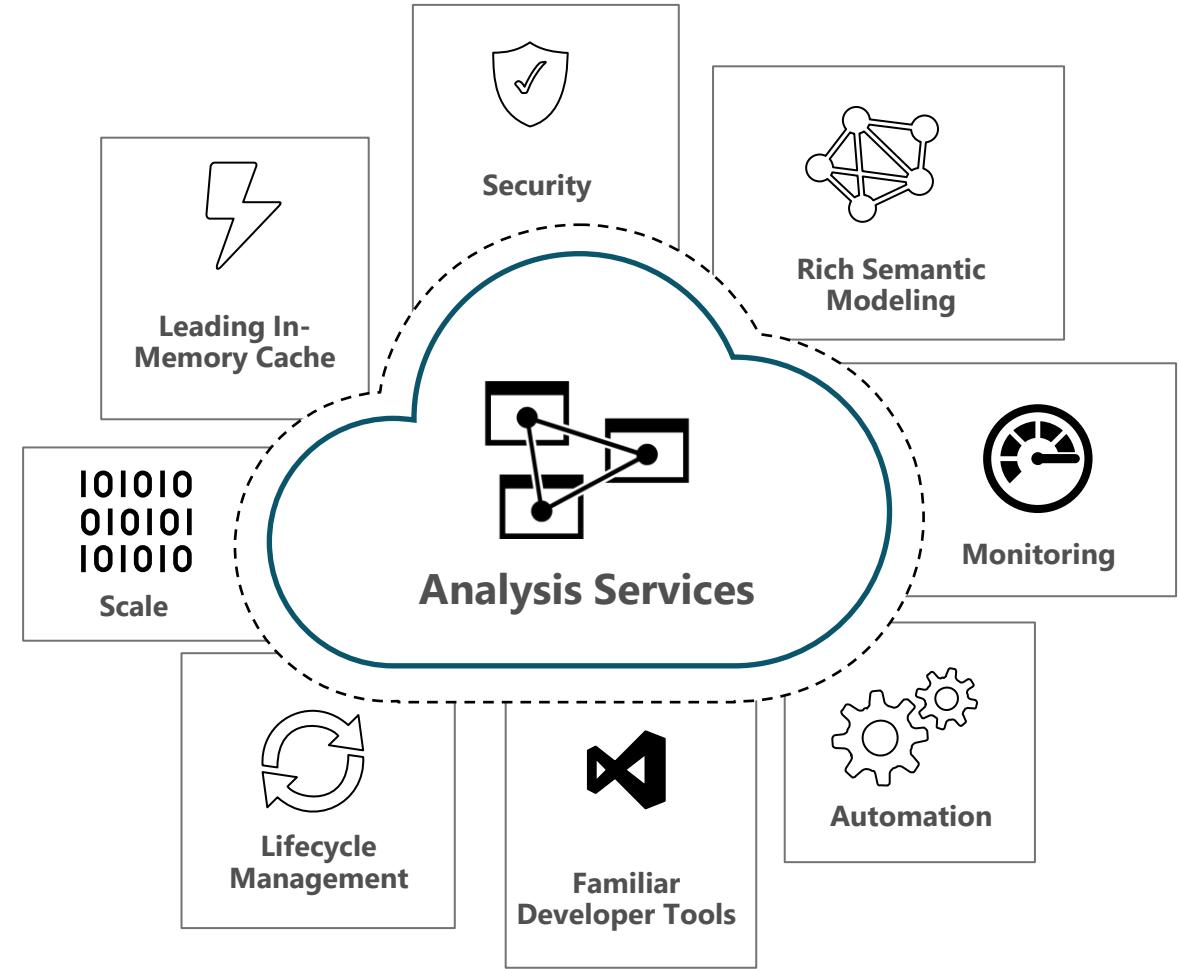
Consumption



Analysis Services Engine

Most Used, Most Battle-Tested Analytics Engine Technology

- Enterprise grade analytics **engine** as a service
- Leading query performance over massive data volumes
- Rich semantic modeling
- Interactive Exploration over even **TRILLIONS** of rows of data, by intelligent proactive caching of aggregates

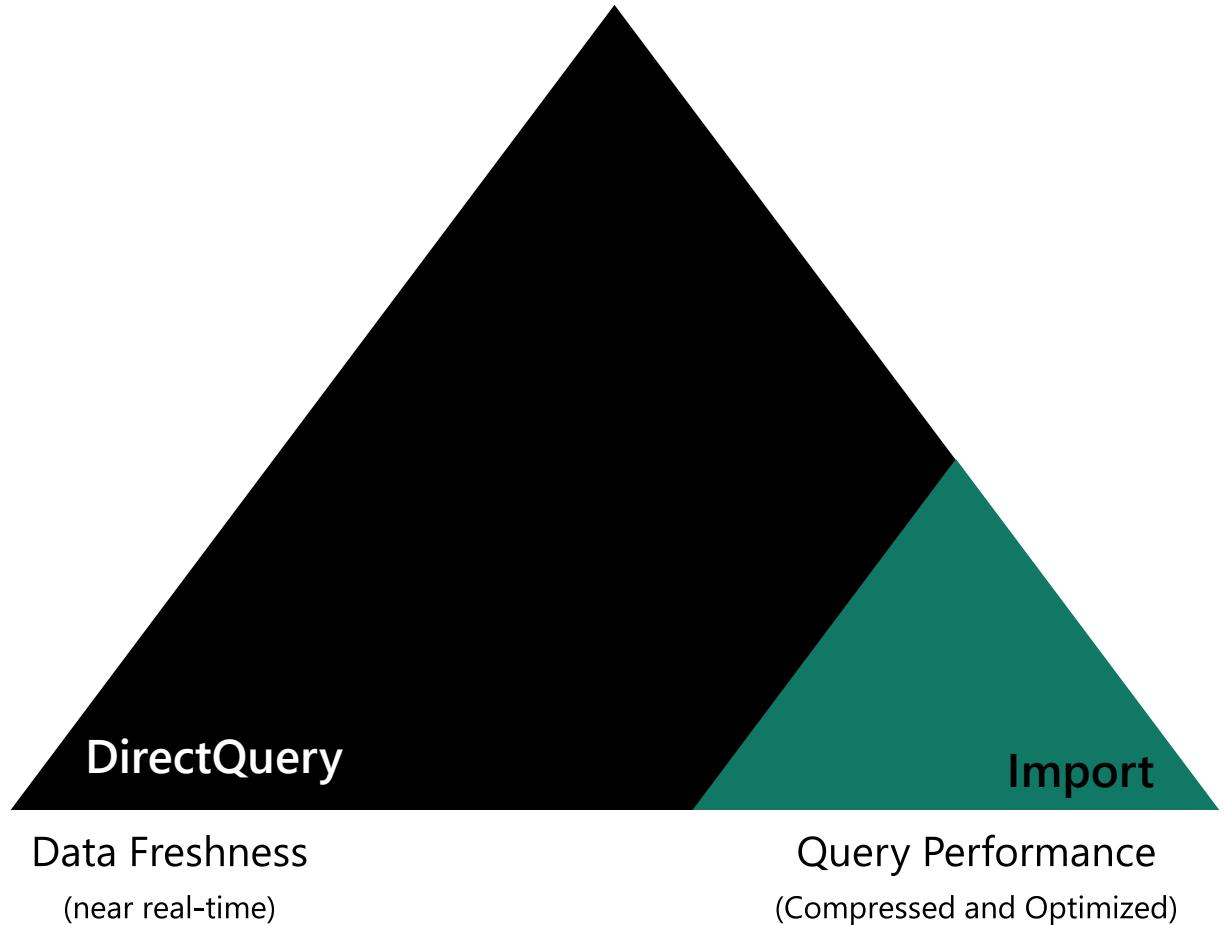


Storage Modes

Import: Caches data into memory to deliver extremely fast performance using the **analysis services** database engine. The default mode when creating a new Power BI Desktop solution along with providing Data Modelers the most design flexibility.

DirectQuery: Does not import the data into memory, consists only of the metadata defining the structure. When the model is queried, native queries are used to retrieve data from the underlying data source.

Changing the **Storage mode** of a table to **Import** is an irreversible operation. Once set, this property can't later be changed using Power BI Desktop.



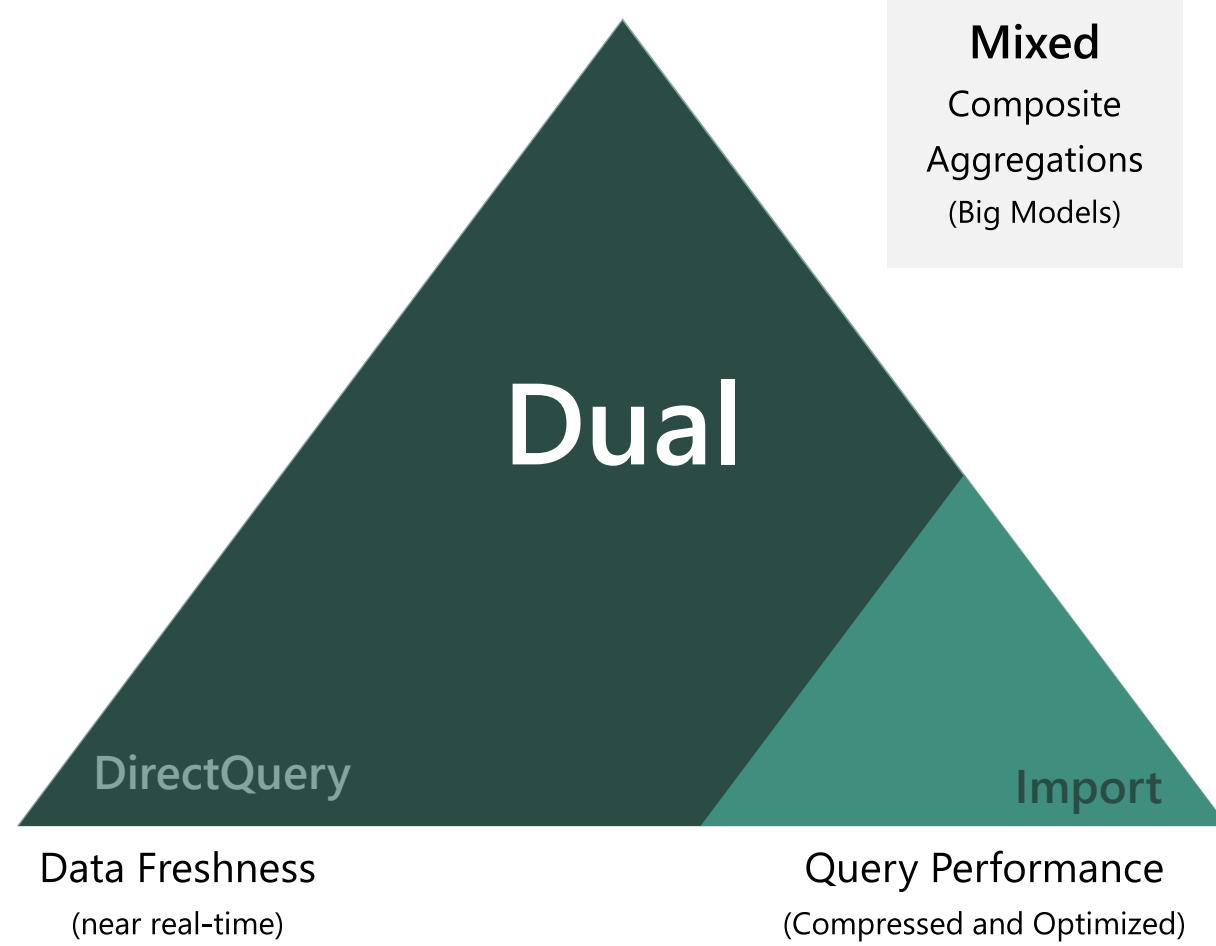
Storage Modes

Import: Caches data into memory to deliver extremely fast performance using the **analysis services** database engine. The default mode when creating a new Power BI Desktop solution along with providing Data Modelers the most design flexibility.

DirectQuery: Does not import the data into memory, consists only of the metadata defining the structure. When the model is queried, native queries are used to retrieve data from the underlying data source.

Dual: Can act as either cached or not cached, depending on the context of the query that's submitted to the Power BI dataset. In some cases, you fulfill queries from cached data. In other cases, you fulfill queries by executing an on-demand query to the underlying data source.

Changing the **Storage mode** of a table to **Import** is an irreversible operation. Once set, this property can't later be changed to either **DirectQuery** or **Dual** using Power BI Desktop.



Storage Modes

Direct Lake: A groundbreaking new dataset capability for analyzing very large data volumes. Based on loading parquet-formatted files directly from a data lake **without having to query a Lakehouse endpoint**, and **without having to import or duplicate data** into a Power BI dataset. Direct Lake is a fast-path to load the data from the lake straight into the Power BI engine, ready for analysis and yielding performance similar to import mode.

DirectQuery (fallback): Automatically switches modes—either due to current limitations or based on factors such as available memory in the capacity.



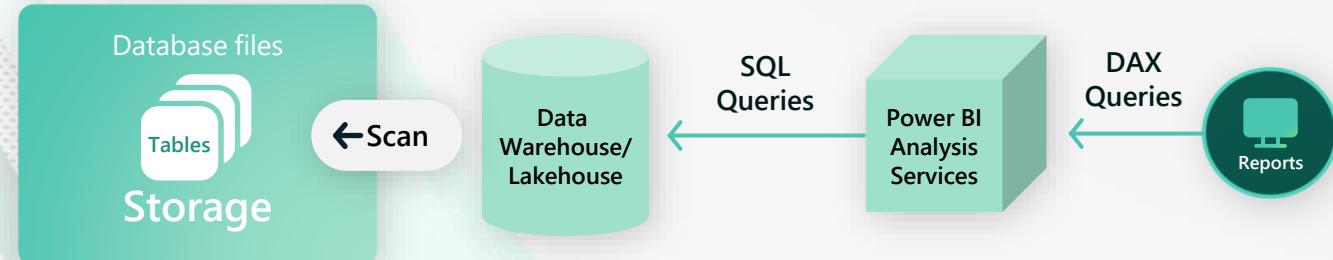


Power BI | Direct Lake Mode

Direct Lake is a fast-path to load the data from the lake straight into the Power BI engine, ready for analysis

Direct Lake is based on loading parquet-formatted files directly from a data lake without having to query a Lakehouse endpoint, and without having to import or duplicate data into a Power BI dataset

DirectQuery Mode. Slow, but real time



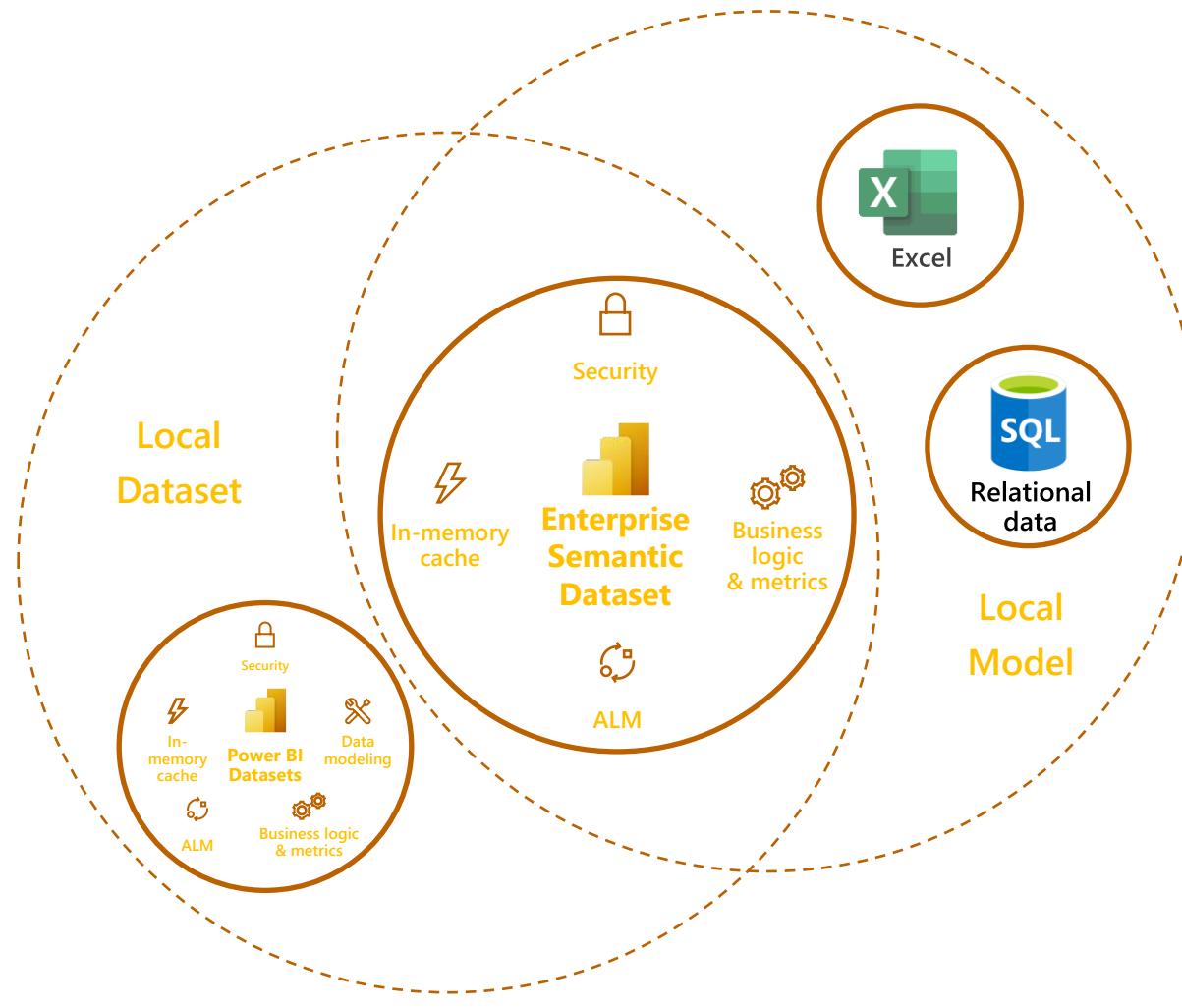
Import Mode. Fast, but latent and duplicative



Direct Lake Mode. Fast and real time



DirectQuery for Power BI datasets and Azure Analysis Services



Data Model Properties

With the **Properties** pane in the Data modeling view, dataset developers can enrich their Tabular Object Model (TOM) with additional rich metadata...

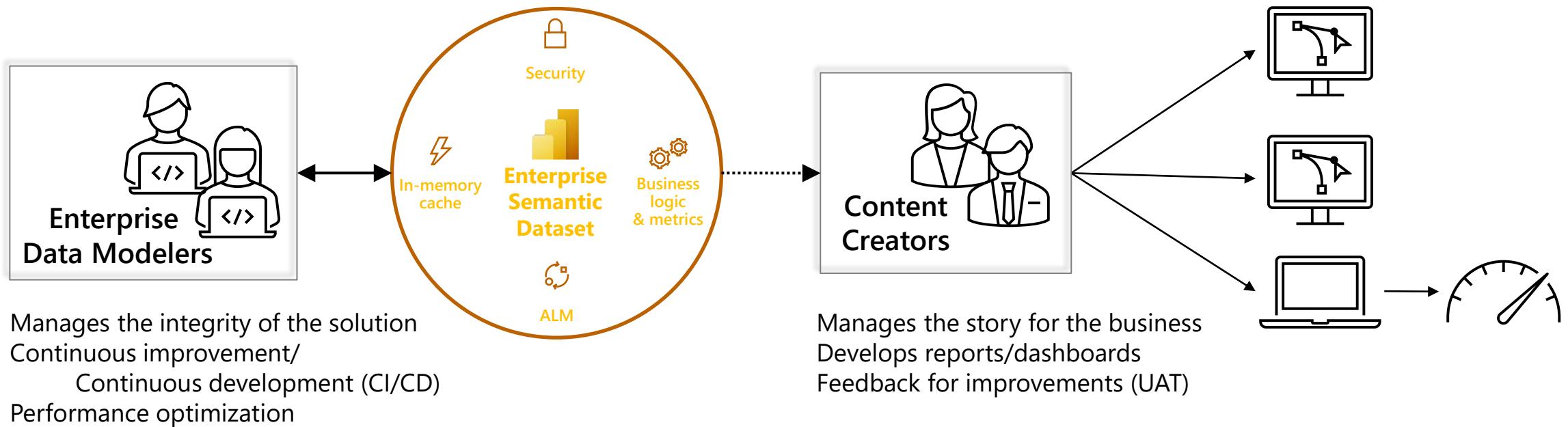
- Description
- Row label
- Key column
- Formatting
- Data category
- and more...

The screenshot shows two side-by-side 'Properties' panes for a dataset named 'Online Sales'. The left pane displays properties under the 'General' section, including Name (Online Sales), Description (Contains all online sales transactions including quantities and amounts), Synonyms (online sale, sale), Row label (Select a row label), Key column (OnlineSalesKey), Is hidden (No), Is featured table (No), and Storage mode (Import). The right pane shows properties under the 'Formatting' section, including Description (Enter a description), Synonyms (PoP % change), Display folder (Enter the display folder), Is hidden (No), Percentage format (No), Thousands separator (No), Decimal places (Auto), and Data category (Uncategorized).

Properties	
General	
Name	Online Sales
Description	Contains all online sales transactions including quantities and amounts.
Synonyms	online sale, sale
Row label	Select a row label
Key column	OnlineSalesKey
Is hidden	No
Is featured table	No
Storage mode	Import
Advanced	
Formatting	
Description	Enter a description
Synonyms	PoP % change
Display folder	Enter the display folder
Is hidden	No
Percentage format	No
Thousands separator	No
Decimal places	Auto
Data category	Uncategorized

Shared Dataset

Live Connection: You can establish a connection to a shared dataset in the Power BI service, and create many different reports from the same dataset. Then you and others can create multiple different reports in separate files and save them to different workspaces.



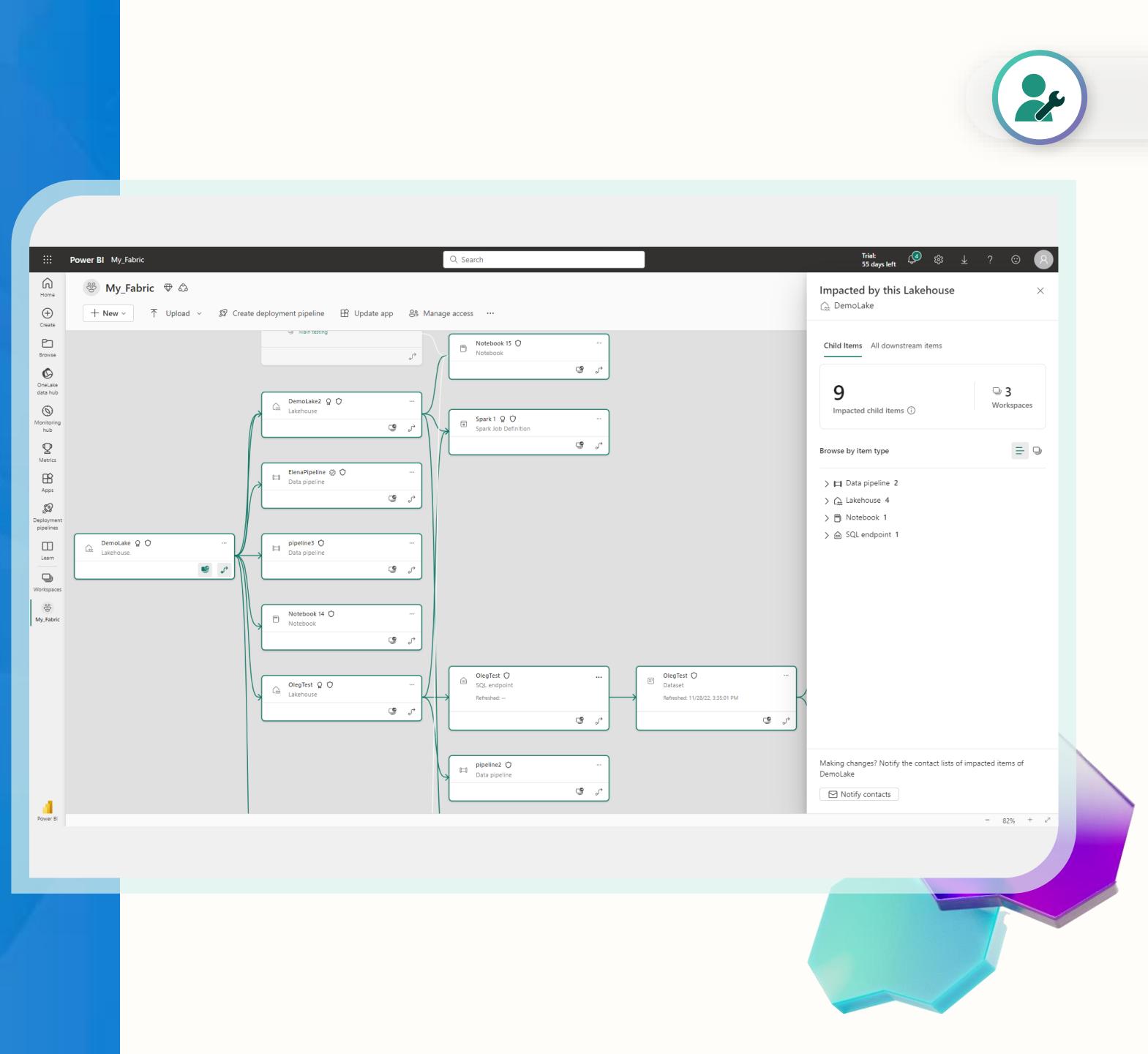
Track data lineage and impact analysis

Data owners can gain insight and track data journey and impact analysis across their analytics projects.



Key Capabilities:

- See lineage view of complex analytical projects
- Understand how the data flows from the source to the destination through all Fabric items, including Lakehouses, data warehouses, pipelines, semantic models, and reports
- Troubleshoot data refresh issues while tracing the data back from the destination to the source and monitor refresh status
- Gain trust in your data while understanding the source of the data
- Perform impact analysis to assess impact for upcoming changes



Copilot in Microsoft Fabric

**Generative AI is
changing the world**



Copilot in Microsoft Fabric

The unified data platform for the era of AI



Data
Factory



Synapse Data
Engineering



Synapse Data
Science



Synapse Data
Warehousing



Synapse Real
Time Analytics



Power BI



Data
Activator



Copilot in Microsoft Fabric



OneLake



Purview

Unified
architecture

Unified
experience

Unified
governance

Unified
business model



Copilot in Microsoft Fabric at Ignite 2023

The unified data platform for the era of AI



Copilot in Microsoft Fabric



Power BI

Quickly create report pages, natural language summaries, and generate synonyms.



Synapse Data Science

Quickly generate code in Notebooks to help work with Lakehouse data and get insights.



Data Factory

Quickly clean and move data using Dataflows and Data Pipelines.



Demo

Public Preview (Nov 23)

Get started creating report pages with Copilot for Power BI

1. Understand your dataset quickly
2. Get suggested topics for report pages
3. Create pages for high-level topics
4. Use our editing tools to customize your report

The screenshot shows the Microsoft Edge browser window with the following details:

- Title Bar:** Power BI
- Address Bar:** https://daily.powerbi.com/groups/4656d0b9-99c6-4d10-bf76-ffff78a78f84/list?experience=power-bi
- Left Sidebar:** Navigation menu with options like Home, Create, Browse, Data hub, Apps, Metrics, Monitoring hub, Workspaces, Copilot Demos (selected), Demo for Hotel Visits, Hotel Demo Clean Model, ..., and Power BI.
- Content Area:** A table listing items in the "Copilot Demos" workspace. The columns are: Name, Type, Owner, Refreshed, Next refresh, Endorsement, Sensitivity, and Included in app.

Name	Type	Owner	Refreshed	Next refresh	Endorsement	Sensitivity	Included in app
Hotel Customer Retention	Report	Copilot Demos	5/10/23, 5:54:33 PM	—	—	Non-Business ⓘ	<input type="checkbox"/> No
Hotel Customer Retention	Semantic model	Copilot Demos	5/10/23, 5:54:33 PM	N/A	—	Non-Business ⓘ	<input type="checkbox"/> No
Hotel Demo Clean Model	Semantic model	Copilot Demos	7/17/23, 10:14:52 AM	N/A	—	Non-Business ⓘ	<input type="checkbox"/> No
Hotel Demo Clean Model 2	Report	Copilot Demos	10/31/23, 12:40:28 AM	—	—	Non-Business ⓘ	<input type="checkbox"/> No
Hotel Demo Clean Model 2.pbix	Dashboard	Copilot Demos	—	—	—	—	<input type="checkbox"/> No
Hotel Demo Created 10.18	Report	Copilot Demos	7/17/23, 10:14:52 AM	—	—	Non-Business ⓘ	<input type="checkbox"/> No
King County Food Safety	Report	Copilot Demos	6/9/23, 8:55:25 AM	—	—	Confidential\Micro... ⓘ	<input type="checkbox"/> No
Marketing Impact	Report	Copilot Demos	7/17/23, 10:14:52 AM	—	—	Non-Business ⓘ	<input type="checkbox"/> No
Table	Semantic model	Copilot Demos	5/19/23, 11:50:07 AM	N/A	—	Confidential\Micro... ⓘ	<input type="checkbox"/> No
Taylor Swift Analysis by Copilot	Report	Copilot Demos	10/23/23, 9:31:54 AM	—	—	Confidential\Micro... ⓘ	<input type="checkbox"/> No
Taylor Swift Data	Report	Copilot Demos	10/20/23, 6:05:23 PM	—	—	Confidential\Micro... ⓘ	<input type="checkbox"/> No
Taylor Swift Data.pbix	Dashboard	Copilot Demos	—	—	—	Confidential\Micro... ⓘ	<input type="checkbox"/> No

- Bottom Bar:** Windows taskbar showing icons for File Explorer, Edge, Task View, Taskbar settings, and system status (4°C, Mostly sunny).



Demo

Public Preview (Nov '23)

Generate Synonyms with
Copilot

1. Make your models better by generating synonyms
2. Generate synonyms once so all model users benefit
3. Save time over manually entering synonyms

Sales Pipeline Power BI • Last saved: Today at 9:39 PM ▾

Amanda Rivera (DAILY) Share ▾

File Home Insert Modeling View Optimize Help

Paste Cut Copy Format painter Clipboard Get data from Excel workbook OneLake data hub SQL Server Data Enter Dataverse Recent sources Transform Refresh data New visual Text box More visuals Insert Calculations New calculation measure Sensitivity Publish Share

Contoso SALES PIPELINE

Revenue Won \$18,033,692 Revenue Goal \$34,000,000 Forecast 123 % Qualified Pipeline \$23,705,369

Product Category Product Territory, State Or Province WHAT IF the Qualified Forecast was Adjusted by: -10 %

Revenue Open by Sales Stage

Sales Stage	Revenue
Qualify	\$19.6M
Develop	\$11.9M
Propose	\$7.3M
Close	\$4.5M
Total	\$43.3M

Opportunities Created - MoM % Change Year: 2023

Month	% Change
Apr 2023	-11.0 %
May 2023	39.8 %
Jun 2023	35.0 %
Jul 2023	-10.8 %
Aug 2023	42.9 %
Sep 2023	-24.9 %

Key Insights For the current page

- The revenue open by sales stage shows that the "Qualify" stage has the highest revenue at 19.6M, followed by "Develop" at 11.9M, "Propose" at 7.3M, and "Close" at 4.5M.
- In terms of the opportunities created, there was a positive monthly change in May, June, and August, with the highest increase of 0.43 in August. However, there were decreases in April, July, and September, with the largest decrease of 0.25 in September.
- The product category analysis shows that the "Devices" category has the highest revenue won at 8,034.311, followed by "Accessories" at 5,670.687, and "Warranties" at 4,328.694.
- The overall revenue won is 18,033.692, which is 53% of the revenue.

revenue by director

Showing results for *revenue by * manager*

Manager	Revenue
Amelie Garner	\$8M
Peyton Davis	\$8M
Ethan Brooks	\$7M

Product Category Revenue Won In Pipeline Forecast

Category	Revenue Won	In Pipeline	Forecast
Accessories	\$5,670,687	\$5,718,761	127 %
Black cover 6"	\$1,144,032	\$1,370,464	126 %
Black cover 7"	\$1,331,752	\$436,410	88 %
E-reader pen	\$3,194,903	\$3,911,887	118 %
Devices	\$8,034,311	\$11,736,816	124 %
E-reader Dia...	\$1,607,916	\$2,036,794	121 %
E-reader Dia...	\$713,764	\$931,946	165 %
E-reader Plat...	\$1,697,166	\$2,625,727	144 %
E-reader Plat...	\$3,820,817	\$5,288,477	130 %
E-reader Stan...	\$194,648	\$853,872	105 %
Warranties	\$4,328,694	\$6,249,792	132 %
1 Year Warranty	\$4,328,694	\$6,249,792	132 %
Total	\$18,033,692	\$23,705,369	123 %

Summary Total Visits Win/Loss Ratio Industries Trend Analytics Insights Tooltip 1 Tooltip 2 Account Details Salesperson Details Personalize +

Page 2 of 11 General

119%



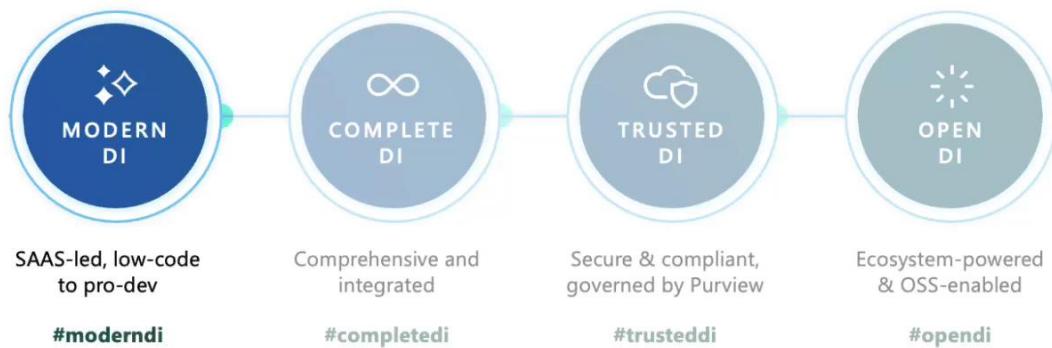
Demo

Public Preview (Nov 23)
Copilot for Fabric helps you
build Dataflows

Data pipelines (coming soon)

1. Quickly clean and transform your data using Copilot
2. Ask Copilot to insert multi-step transforms such as date tables
3. Generate data pipelines with just a few words

Empowering users through AI and ease of use





Demo

Public Preview (Nov 23)

AI Narrative Visual for summarizing data

1. Add a summary of the data in the report to your page
2. Customize the summary using a prompt
3. Summaries respect filters and slicer to reveal new insights.

The screenshot shows the Microsoft Power BI desktop interface. On the left, the ribbon includes 'Work', 'File', 'View', 'Reading view', 'Mobile layout', 'Open data model', 'Copilot', and various icons for 'Create', 'Browse', 'Data hub', 'Apps', 'Metrics', 'Monitoring hub', 'Workspaces', 'Copilot Demos', 'Demo for Hotel Visits' (which is selected), 'Hotel Demo Clean Model', and 'Power BI'. The main area displays a dashboard titled 'Analysis of Customer Types' with four summary cards: 'Money Spent YTD' (\$61.59M), 'Return Rate' (11.7%), 'Average of Length of stay' (2.76), and 'Count of Customer Type' (2). Below these are four detailed visualizations: a world map of money spent by country and island visited; a line chart of money spent over time by date and customer type; a bar chart of money spent by age group and customer type; and a donut chart of customer types by primary interest and gender. The right side of the screen shows the 'Visualizations' pane with a list of available charts and the 'Data' pane with a list of data fields. The bottom of the screen shows the Windows taskbar with various pinned icons.

Data Privacy

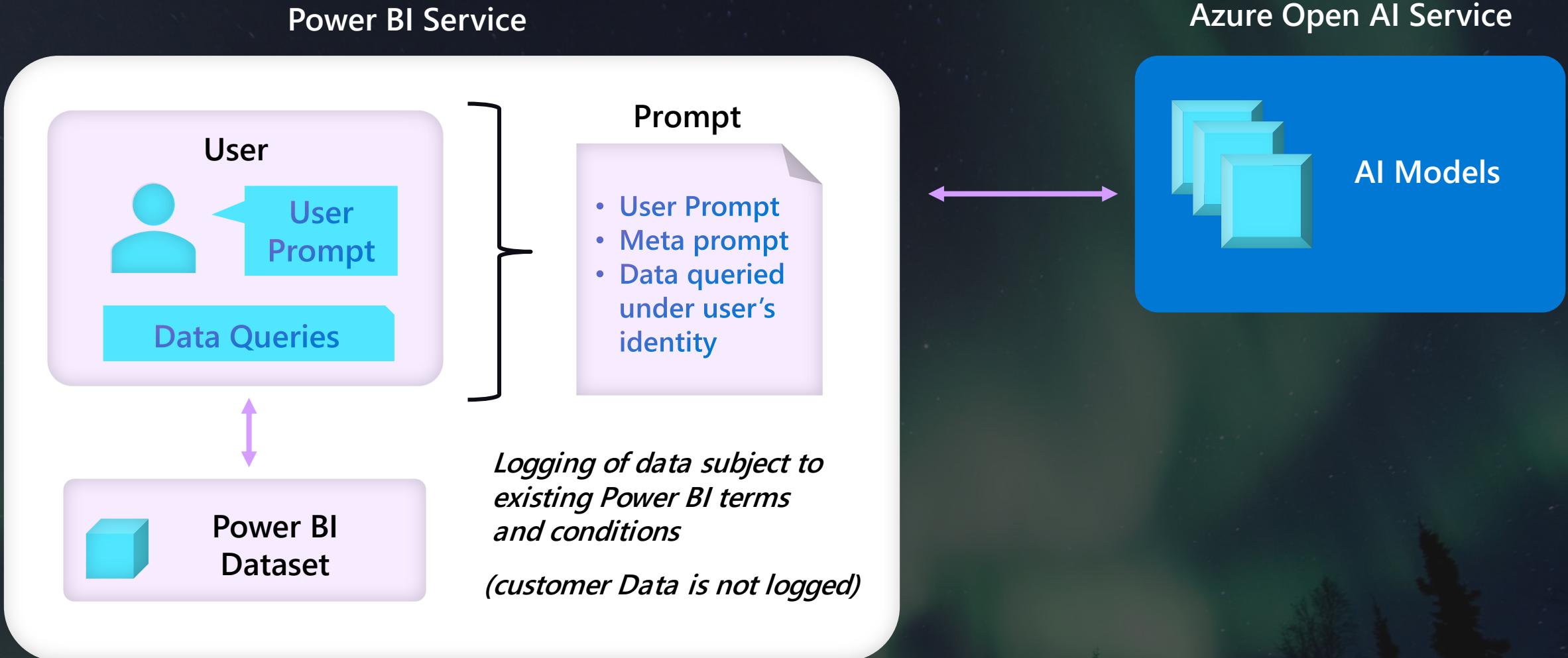
Microsoft Cloud
Runs on trust

Your data is your data

Your data from any fine-tuning is
not used to train the foundation
AI models

Your data is **protected** by
the most comprehensive enterprise
compliance and security controls

Data Privacy





Copilot in Microsoft Fabric: Licensing

The unified data platform for the era of AI



Copilot in Microsoft Fabric

Copilot requires Premium Capacity (F64 and above or P1 and above)

Microsoft Fabric Trial Capacity is not eligible for Copilot

Power BI per user licenses don't include Copilot

Organization must enable Microsoft Fabric

Billing for Copilot will start soon



Public Preview Roll-out

The unified data platform for the era of AI



Copilot in Microsoft Fabric

**Public Preview is available to all customers world-wide
Fabric Admins must enable Copilot (opt-in)**

Fabric Admins need to enable Copilot

When Copilot Preview is available for a Tenant, two new Copilot Settings appear in the Fabric Admin Portal.

Copilot and Azure OpenAI Service (preview)

- Users can use a preview of Copilot and other features powered by Azure OpenAI New

Disabled for the entire organization

When this setting is on, users can access a preview and use preview features powered by Azure OpenAI, including Copilot.

Your data, such as prompts, augmented data included with prompts, and AI outputs, will be processed and temporarily stored by Microsoft and may be reviewed by Microsoft employees for abuse monitoring. [Learn More](#)

By turning this setting on, you agree to the [Preview Terms](#).



Disabled

Admin must enable this setting to use Copilot.

Allowing only specific security groups was added in December 2023.

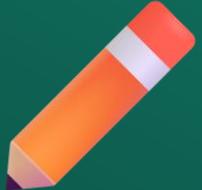
Allows all Copilot experiences for all experiences and workloads.

- Data sent to Azure OpenAI can be processed outside your tenant's geographic region, compliance boundary, or national cloud instance New

Disabled for the entire organization

GPU availability is currently limited globally. While we work to ensure GPUs are available everywhere, some customers will need to allow Azure OpenAI to process data across regions.

Share your feedback in
any language
using voice or text!





AI-powered analytics

The most complete AI capabilities in a BI product

Information workers

Q&A

Key driver analysis

Business analysts

Key phrase extraction

Sentiment analysis

Data scientists

Create ML models

Smart narratives

Root cause analysis

Explore predictions

Python and R integration

Extend with Azure ML

103 Microsoft Fabric



Scenario

For new users to adopt the report it must be “functional”, “fast” and capable of finding new insights with the click of a button.

Connecting to a shared dataset and leveraging design best practices, we'll create an aesthetically pleasing and performant report experiences.

Report Types

Executive

Description: Provides very quick access to most important metrics, leaving little room for misinterpretation.

Analytical

Description: Supports the strategic functions of senior management. Often a balance between simplicity and utility through key performance indicators and business measures displayed in a Dashboard or Scorecard report style. Often built to add depth to an executive report

Operational

Description: Supports an organization's day-to-day functions. Often a highly-formatted and consistent output displayed in a Tabular or List report style.

Ad hoc

Description: Supports the flexibility of a one-time report, created in real-time for a particular purpose or business necessity. Often summarized in a PivotTable report style.



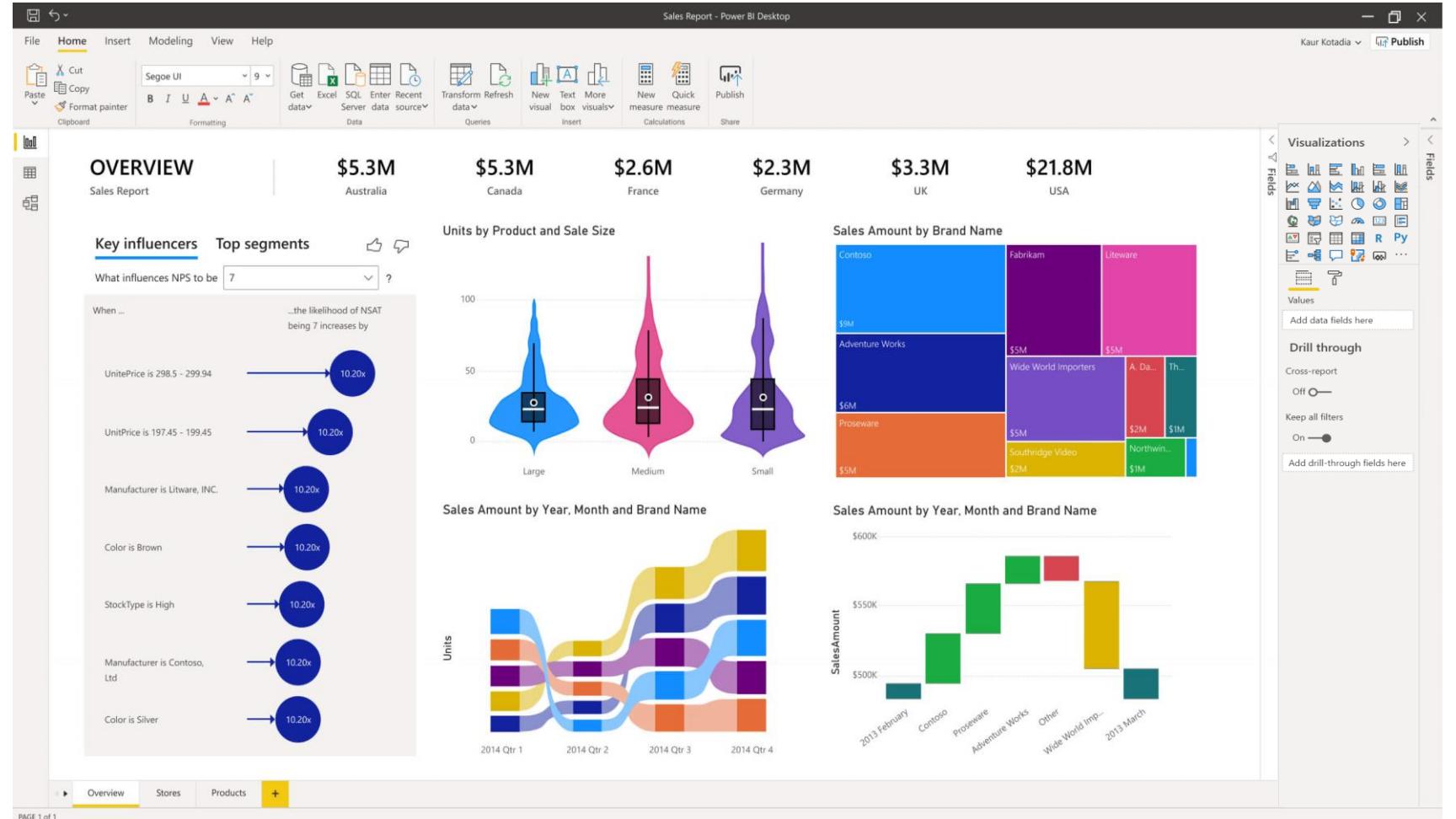
How does Power BI do it?





Power BI Desktop

- Familiar O365 like experience, the **"PowerPoint for data"**
- Create **interactive, immersive** reports and dashboards that provide **actionable insights** and drive business results





Power BI Report Builder

- Create and distribute **highly formatted, multi-page, pixel-perfect** reports
- Use **parameters** to filter data for customized views

The screenshot shows the Power BI Report Builder application. On the left, the 'Report Data' pane lists various data sources and datasets, including 'SalesReturns' which contains 'Category', 'Product', 'Date', and 'Price' tables. In the center, a report view displays a table titled 'SALES & RETURNS' with columns for Category, Product, Date, and Price. A parameter dialog box is open above the report, showing a dropdown for 'Product' set to 'NULL'. To the right, the 'Properties' pane is open, showing settings for the report, such as 'Code', 'Data Only', 'General' (Author: Description, Width: 432.0007pt), 'Localization' (DescriptionLocID, Language), 'Other' (AutoRefresh: 0, ConsumeContainerWhitesp: False, CustomProperties, InitialPageName), 'Page' (BackgroundColor: Automatic, BackgroundImage, BorderColor: Black, BorderStyle: None, BorderWidth: 1pt), 'References' (Assemblies, Classes), and 'Variables' (DeferVariableEvaluation: False, Variables). The 'backgroundColor' property is currently selected in the properties list.

Category	Product	Date	Price
[Category]	[Product]	[Date]	[Price]
			[&Execute]

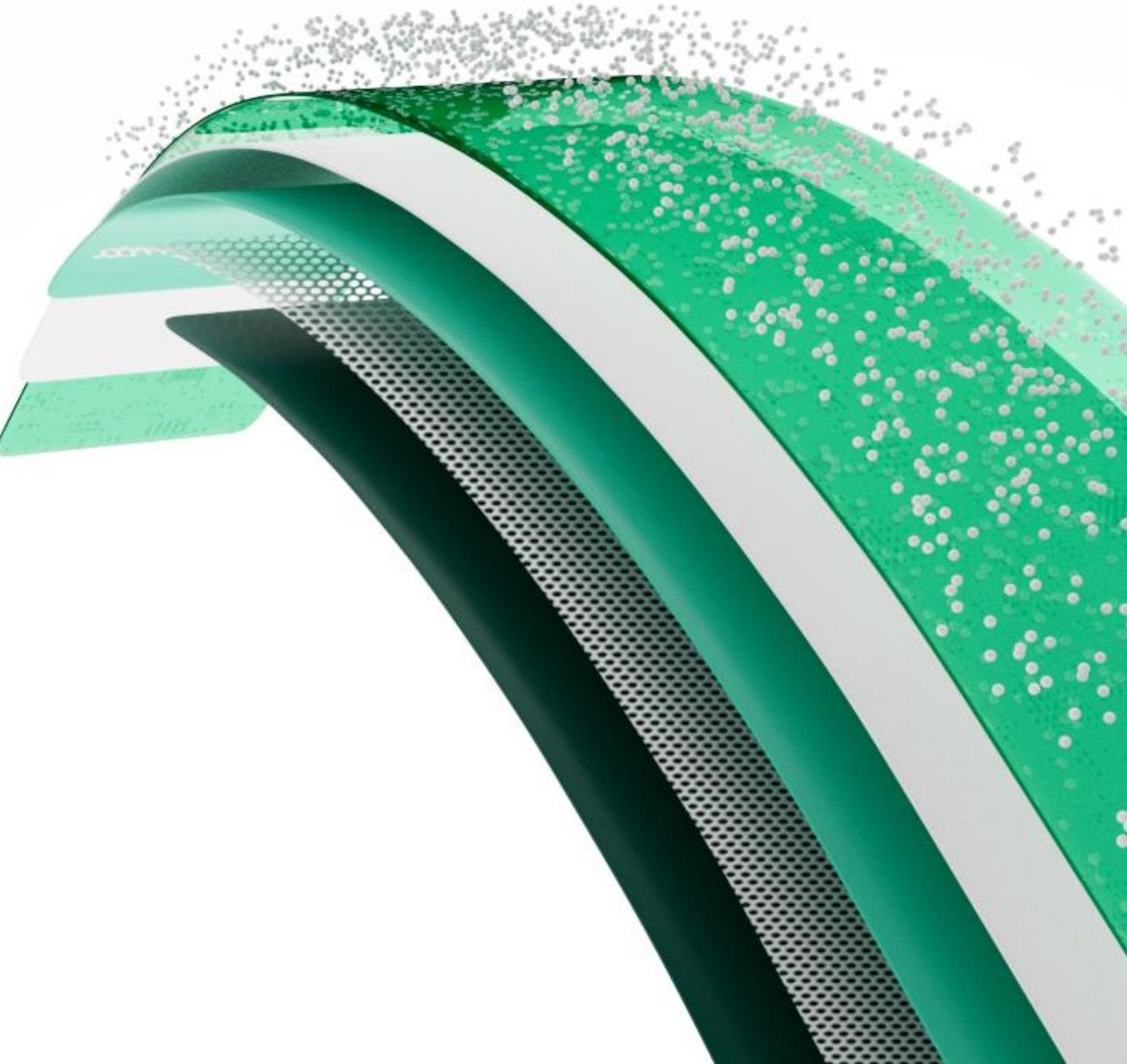
Category	Product	Date	Price
Office 365	Excel	1/27/2019 12:00:00 AM	\$550.00
Office 365	Excel	1/8/2019 12:00:00 AM	\$550.00
Office 365	Excel	1/13/2019 12:00:00 AM	\$550.00
Office 365	Excel	1/20/2019 12:00:00 AM	\$550.00
Office 365	Excel	2/17/2019 12:00:00 AM	\$550.00
Office 365	Excel	2/24/2019 12:00:00 AM	\$550.00
Office 365	Excel	2/10/2019 12:00:00 AM	\$550.00
Office 365	Excel	2/3/2019 12:00:00 AM	\$550.00
Office 365	Excel	3/24/2019 12:00:00 AM	\$550.00
Office 365	Excel	3/3/2019 12:00:00 AM	\$550.00
Office 365	Excel	3/31/2019 12:00:00 AM	\$550.00
Office 365	Excel	3/10/2019 12:00:00 AM	\$550.00
Office 365	Excel	3/17/2019 12:00:00 AM	\$550.00
Office 365	Excel	4/28/2019 12:00:00 AM	\$550.00
Office 365	Excel	4/14/2019 12:00:00 AM	\$550.00
Office 365	Excel	4/21/2019 12:00:00 AM	\$550.00
Office 365	Excel	4/7/2019 12:00:00 AM	\$550.00
Office 365	Excel	5/12/2019 12:00:00 AM	\$550.00



Microsoft Excel

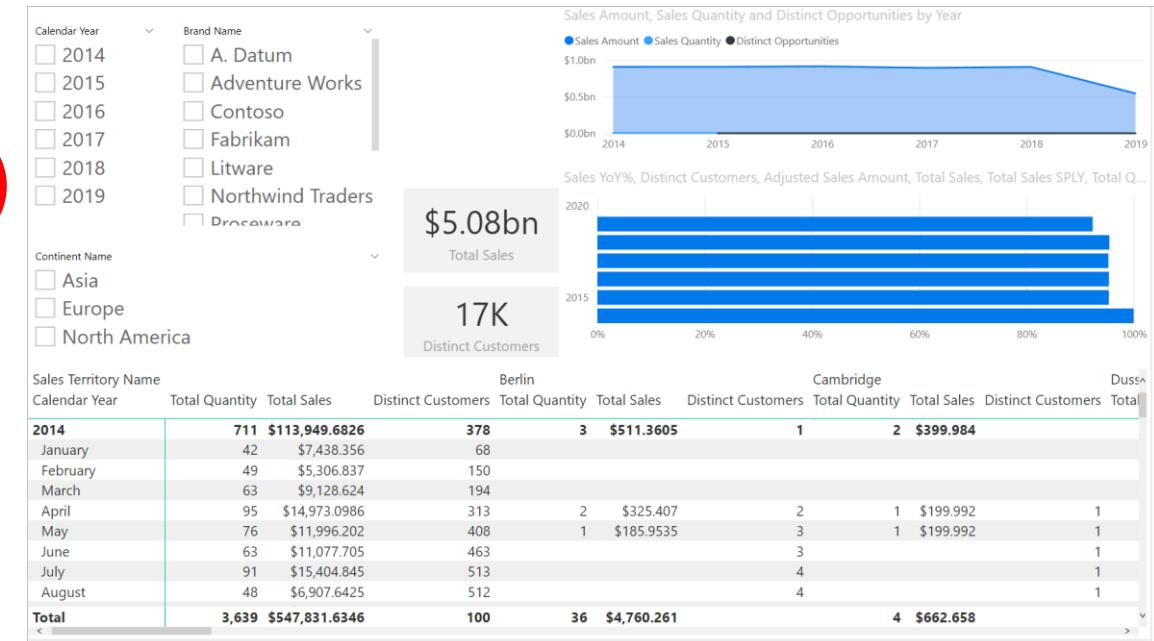
- Power BI users can analyze their data in Excel by using a **live, connected** experience
 - With a PivotTable you can quickly summarize your data, pivot the data to **view it from different angles** and analyze in specific detail

What does a *good
Report look like?



We know it when we see it...

Sales Territory Name		Calendar Year	Berlin			Cambridge			Dusseldorf		
Total Quantity	Total Sales		Distinct Customers	Total Quantity	Total Sales	Distinct Customers	Total Quantity	Total Sales	Distinct Customers	Total Quantity	Total Sales
2014	711	\$113,949.6826	378	3	\$511.3605	1	2	\$399.984	1	1	1
January	42	\$7,438.356	68								
February	49	\$5,306.837	150								
March	63	\$9,128.624	194								
April	95	\$14,973.0986	313	2	\$325.407	2	1	\$199.992	1		
May	76	\$11,996.202	408	1	\$185.9535	3	1	\$199.992	1		
June	63	\$11,077.705	463			3					
July	91	\$15,404.845	513			4					
August	48	\$6,907.6425	512			4					
September	22	\$4,662.0475	490			4					
October	88	\$13,230.3875	432			1					
November	31	\$6,996.25	373			1					
December	43	\$6,827.6875	378			1					
2015	653	\$105,848.6646	367	6	\$862.774	4			1		
January	57	\$8,235.2625	370								
February	41	\$6,414.9715	358	2	\$325.407	2					
March	61	\$11,425.9515	397			2					
April	68	\$10,689.5925	402			2					
May	47	\$6,997.4397	428			2					
June	36	\$6,497.7525	425			2					
July	61	\$8,872.836	395			2					
August	54	\$7,126.87	402								
September	41	\$8,657.625	355								
October	46	\$7,346.9817	328								
November	58	\$8,984.923	315	1	\$119.96	1					
December	63	\$14,598.4587	367	3	\$417.407	4					
Total	3,639	\$547,831.6346	100	36	\$4,760.261	4	\$662.658				



We know it when we see it...

Contoso

SALES

Sales Overview

Revenue won \$11.43M	Qualified Pipeline \$19.90M	Revenue goal \$23M	Forecast 136%
--------------------------------	---------------------------------------	------------------------------	-------------------------

Revenue Open by Sales Stage

Sales Stage	Revenue
1-Qualify	\$7,912.02K
2-Develop	\$8,170.42K
3-Propose	\$7,264.68K
4-Close	\$4,465.27K

Revenue Won and Revenue In Pipeline by Product LOB

Product Category	Revenue Won	Revenue In Pipeline	Total Revenue
Accessories	\$4,485.19K	\$6,534.81K	\$11.52M
Devices	\$5,542.48K	\$4,737.52K	\$10.28M
Warranties	\$2,717.23K	\$7,259.22K	\$9.53M

WHAT IF the qualified forecast was adjusted by 0 % ?

By Team + User By Product

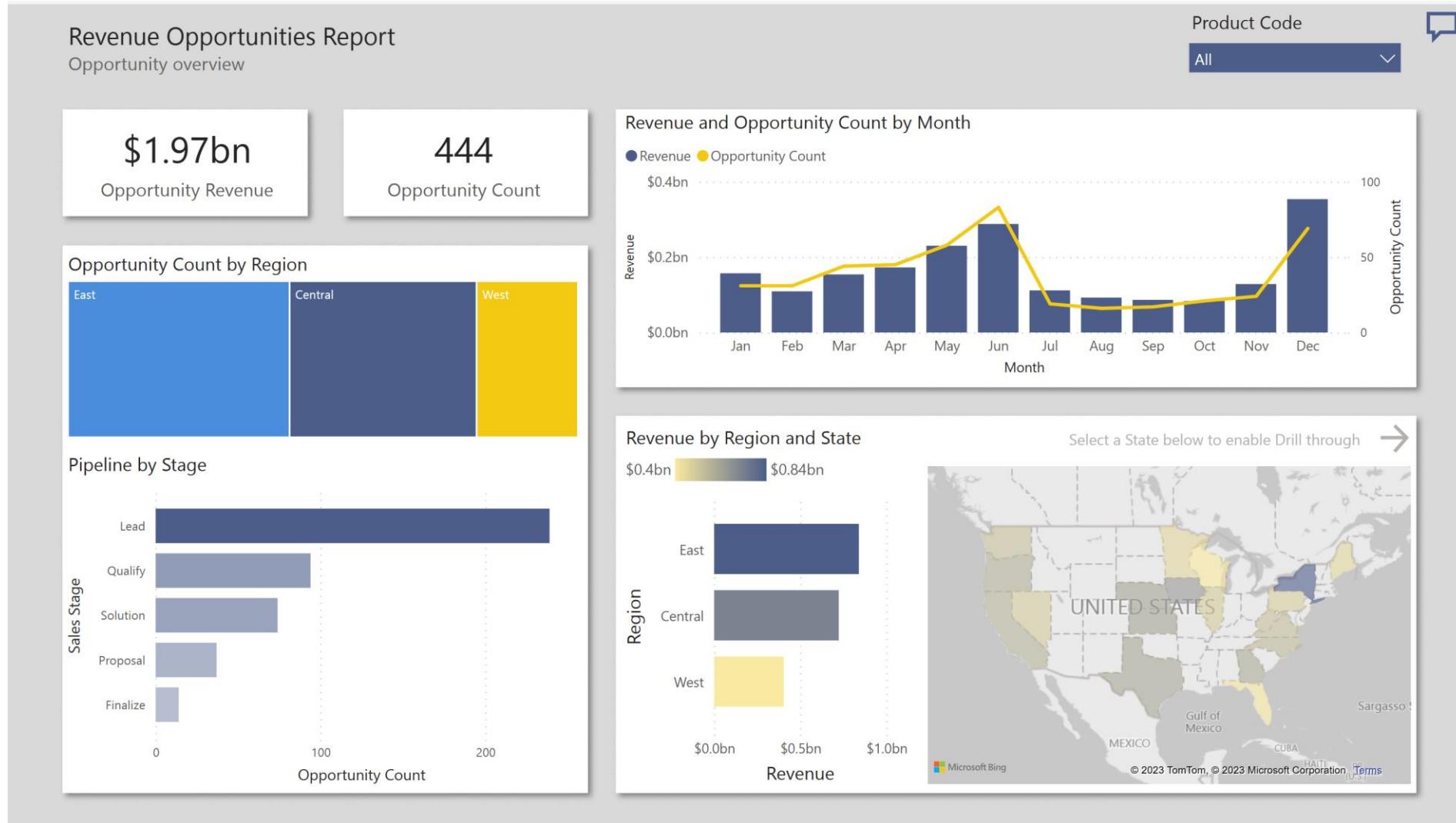
Product Category	Revenue Won	Qualified P...	Forecast %
Accessories	\$4,485.19K	\$7,035.43K	128%
Black cover 7"	\$1,512.09K	\$2,259.50K	126%
E-reader pen	\$1,509.29K	\$2,717.23K	141%
Black cover 6"	\$1,463.81K	\$2,058.70K	117%
Devices	\$3,672.98K	\$6,605.71K	128%
E-reader Plat...	\$1,853.66K	\$3,455.63K	133%
E-reader Dia...	\$971.02K	\$1,562.41K	127%
E-reader Plat...	\$554.24K	\$931.40K	149%
E-reader Dia...	\$156.58K	\$361.14K	129%
E-reader Stan...	\$137.48K	\$295.13K	144%
Warranties	\$3,271.66K	\$6,259.22K	136%
1 Year Warranty	\$3,271.66K	\$6,259.22K	136%
Total	\$11,429.83K	\$19,900.36K	136%

Forecast by Territory

Territory	Revenue Won	In Pipeline	Forecast %
US-SOUTH	\$4,520,554.00	\$7,269.60K	131%
US-WEST	\$3,041,107.00	\$6,061.89K	130%
US-MIDWEST	\$2,686,629.00	\$4,367.79K	141%
US-NORTHEAST	\$1,181,536.00	\$2,201.09K	113%
Total	\$11,429,826.00	\$19,900.36K	136%

Forecast by Location

We know it when we see it...



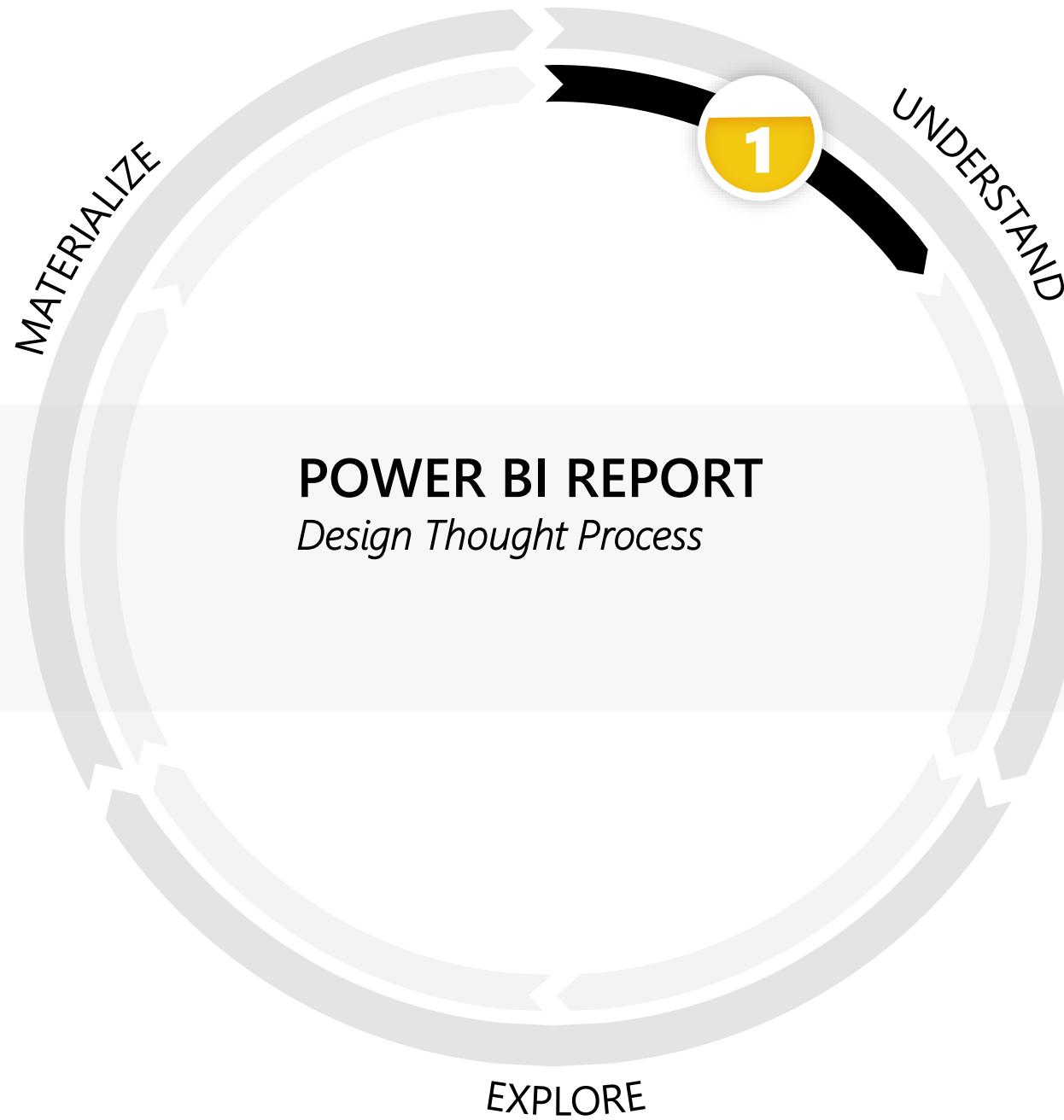
Report Design

Process

Design Tools

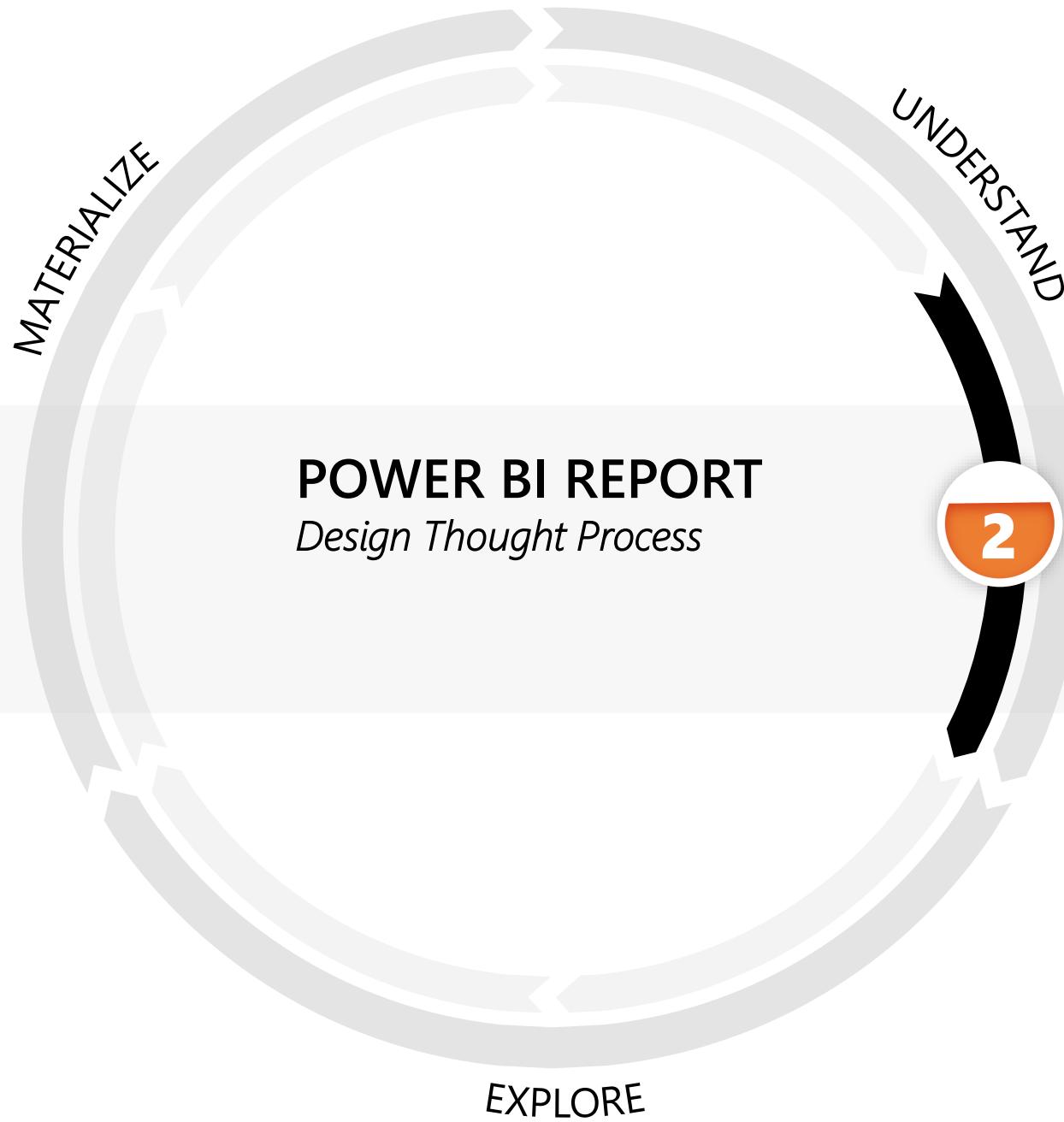
Testing



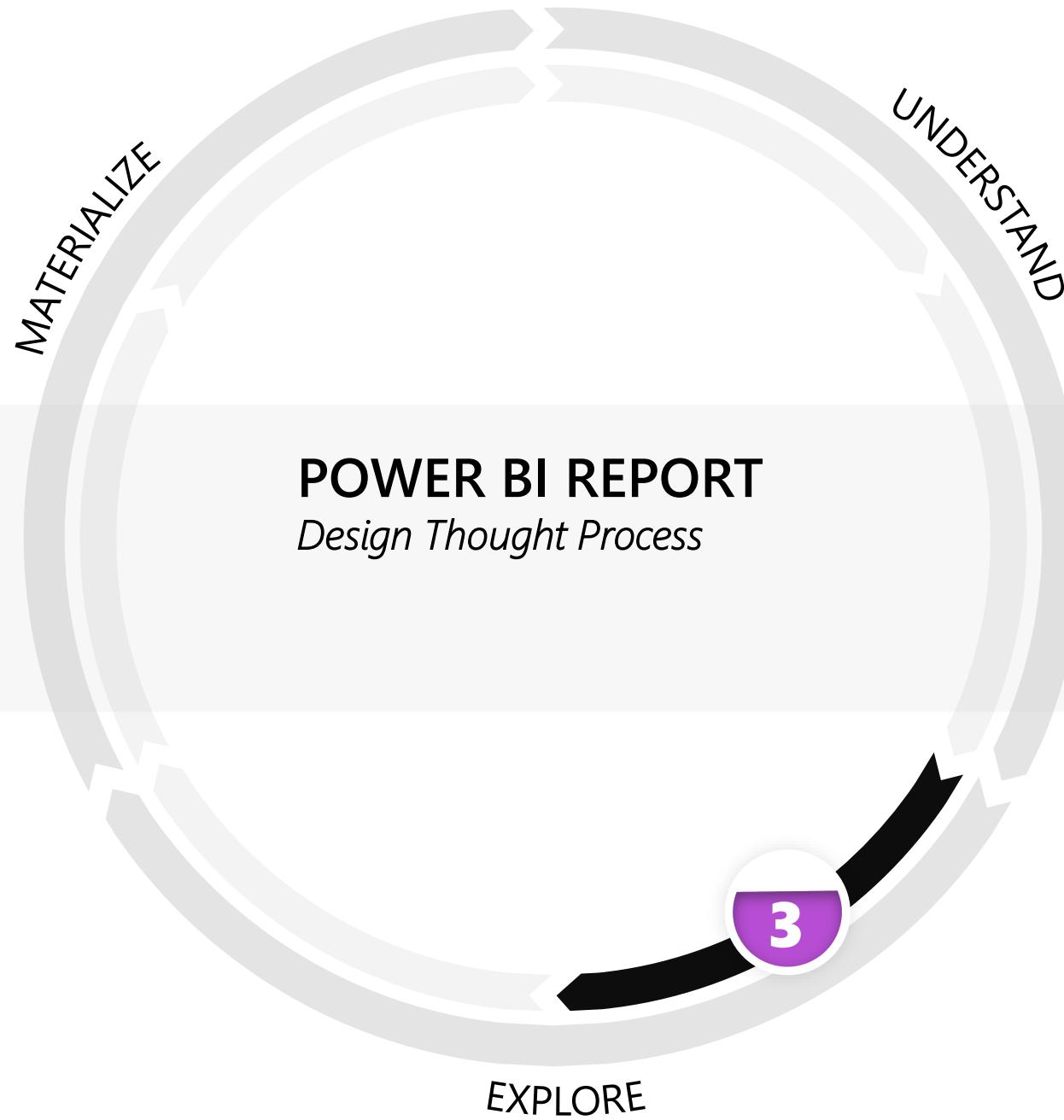


**EMPATHIZE
WITH YOUR AUDIENCE**

Conduct research to develop an understanding of your users

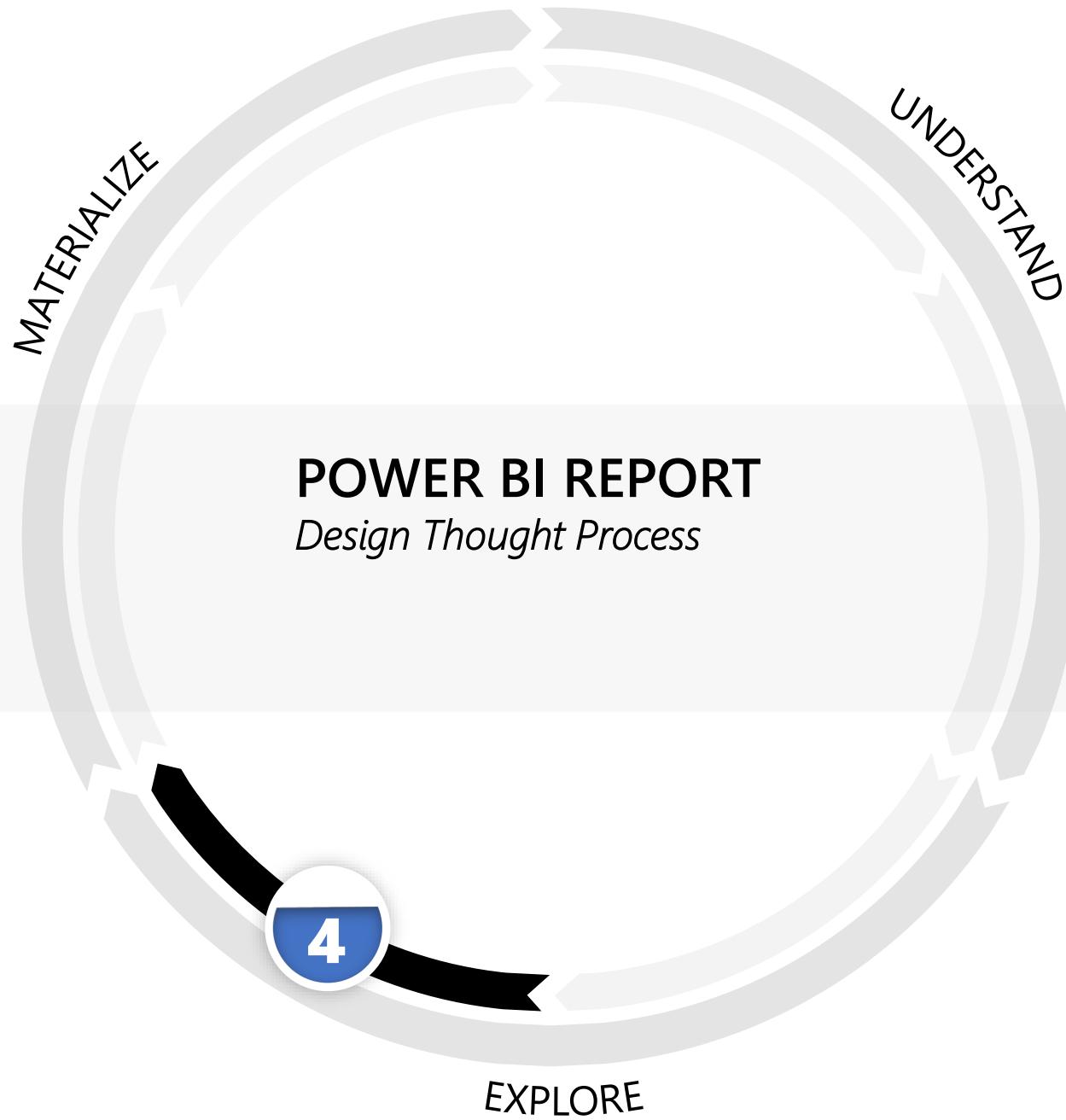


DEFINE
THE PLATFORM & ENVIRONMENT
Combine all research and observe where your users' problems & needs will exist



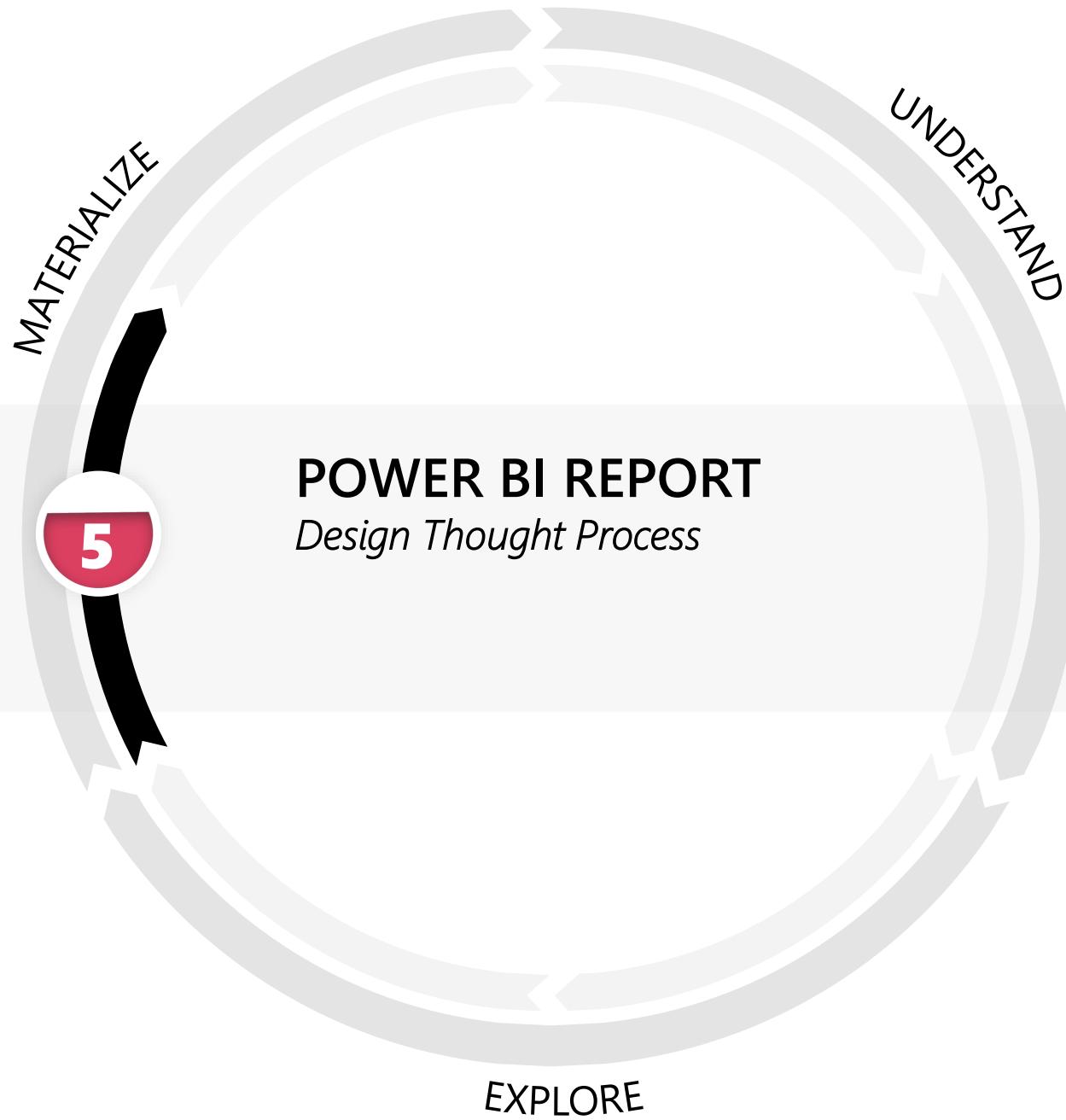
ENCOMPASS THE USER EXPERIENCE

Create easy, efficient, relevant, and all-around pleasant experiences for the user.

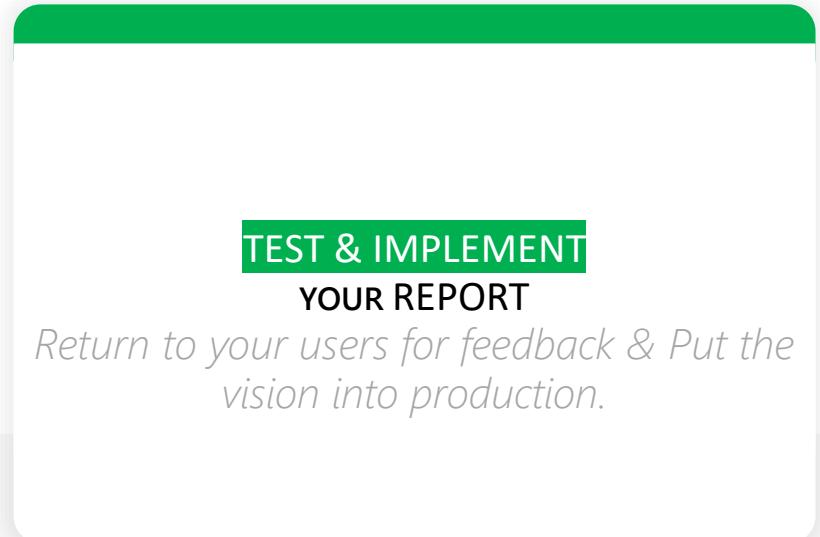
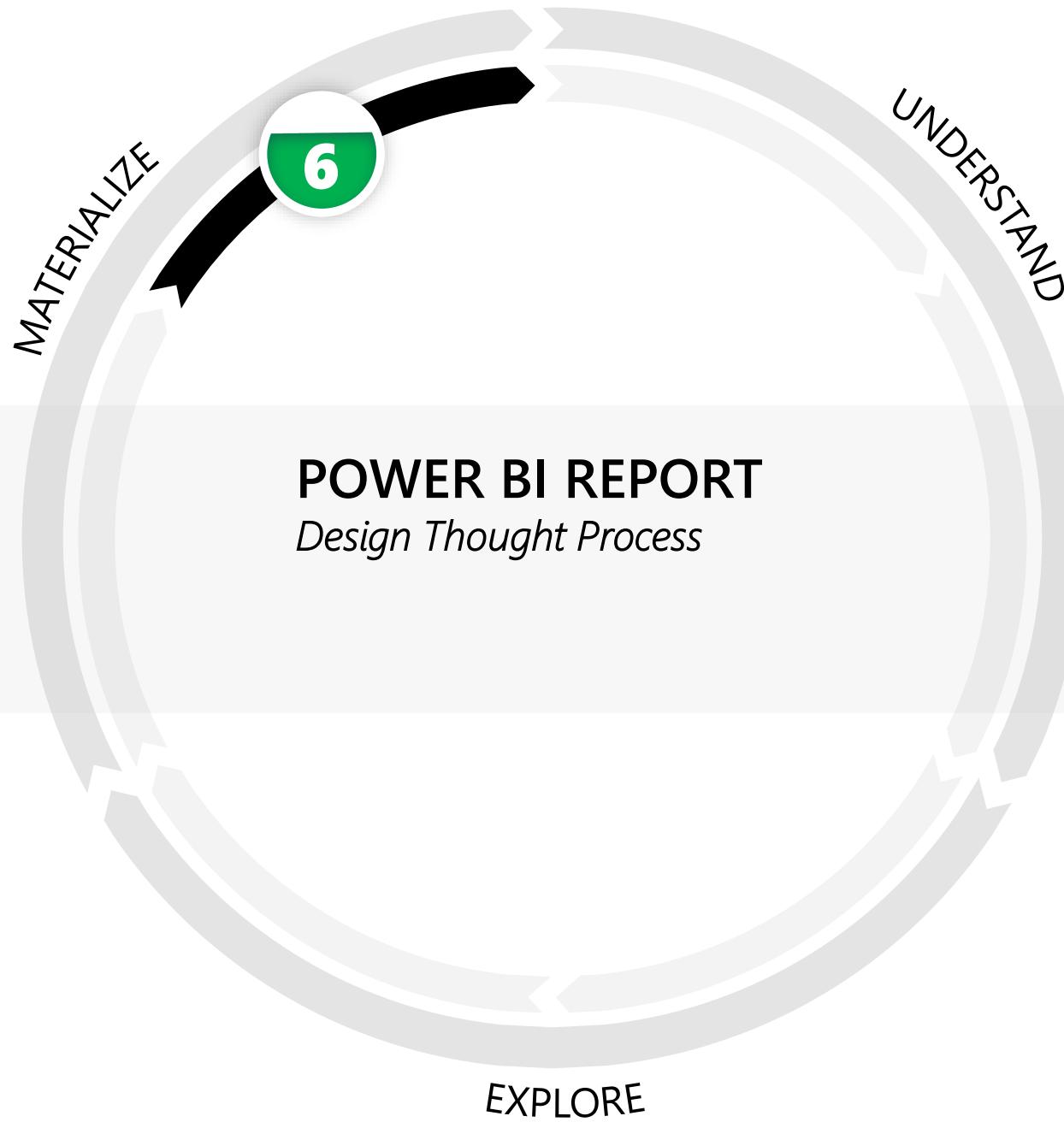


VISUALIZE YOUR DATA

Generate a range of alternative, creative visualizations to tell the stories your users want to know



DESIGN
THE USER INTERFACE
Build real, tactile representations for a range of your ideas



Effective design elements for practical application

USER EXPERIENCE



Navigation



Depth



Context

VISUALS



Visual selection



Formatting options



Conditional format



Dynamic

USER INTERFACE



Margins



Distribution



Alignment



Branding



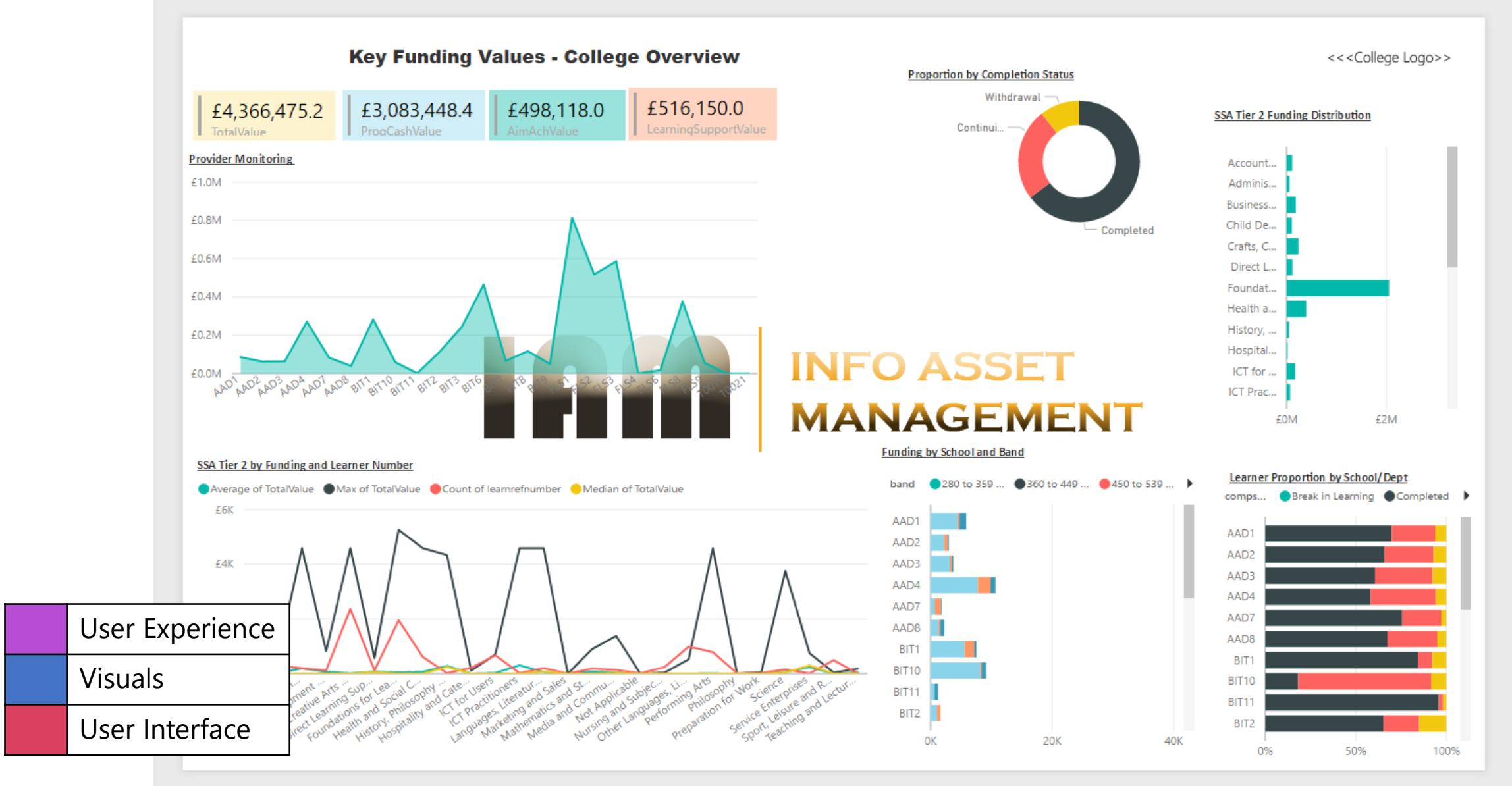
Color



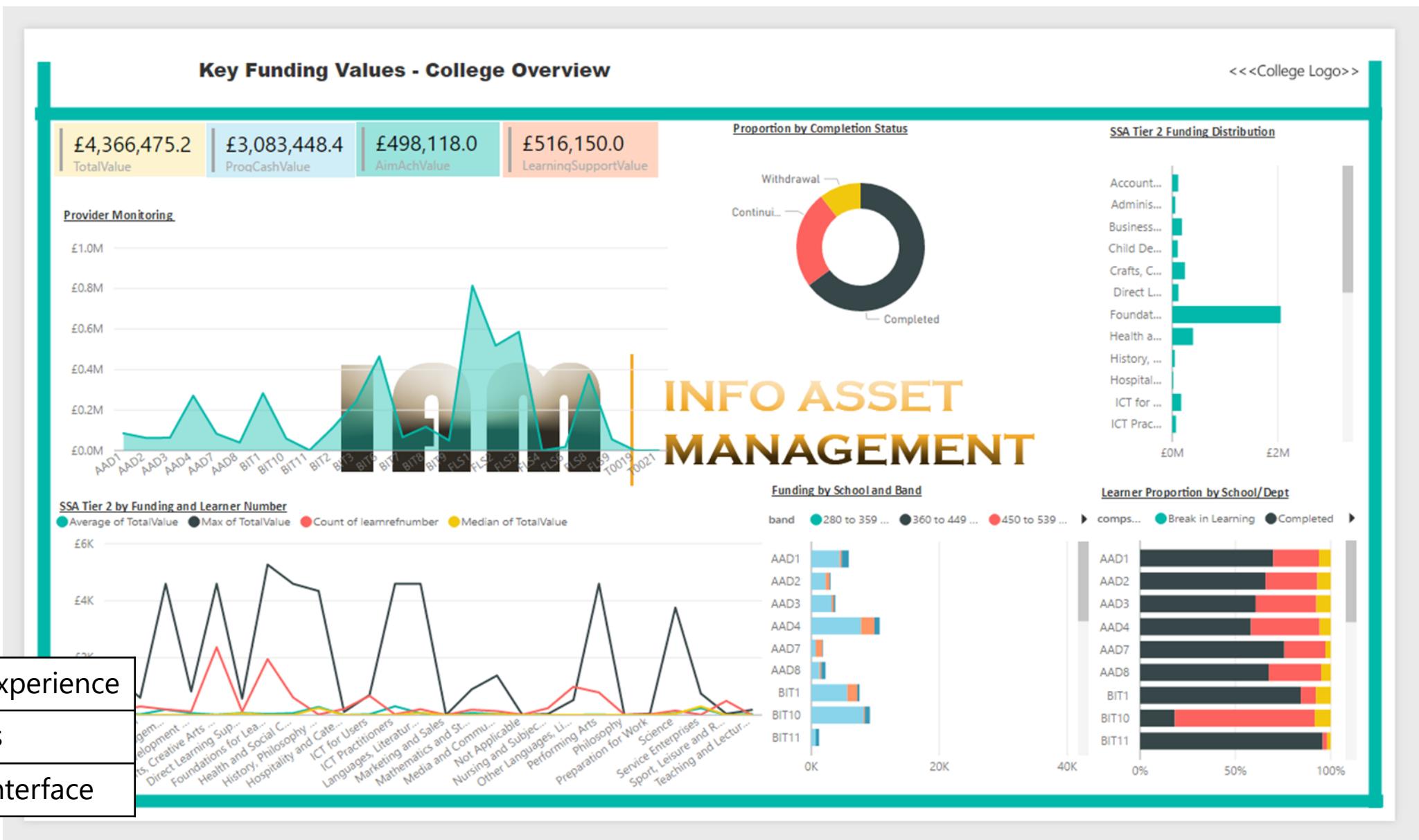
Background



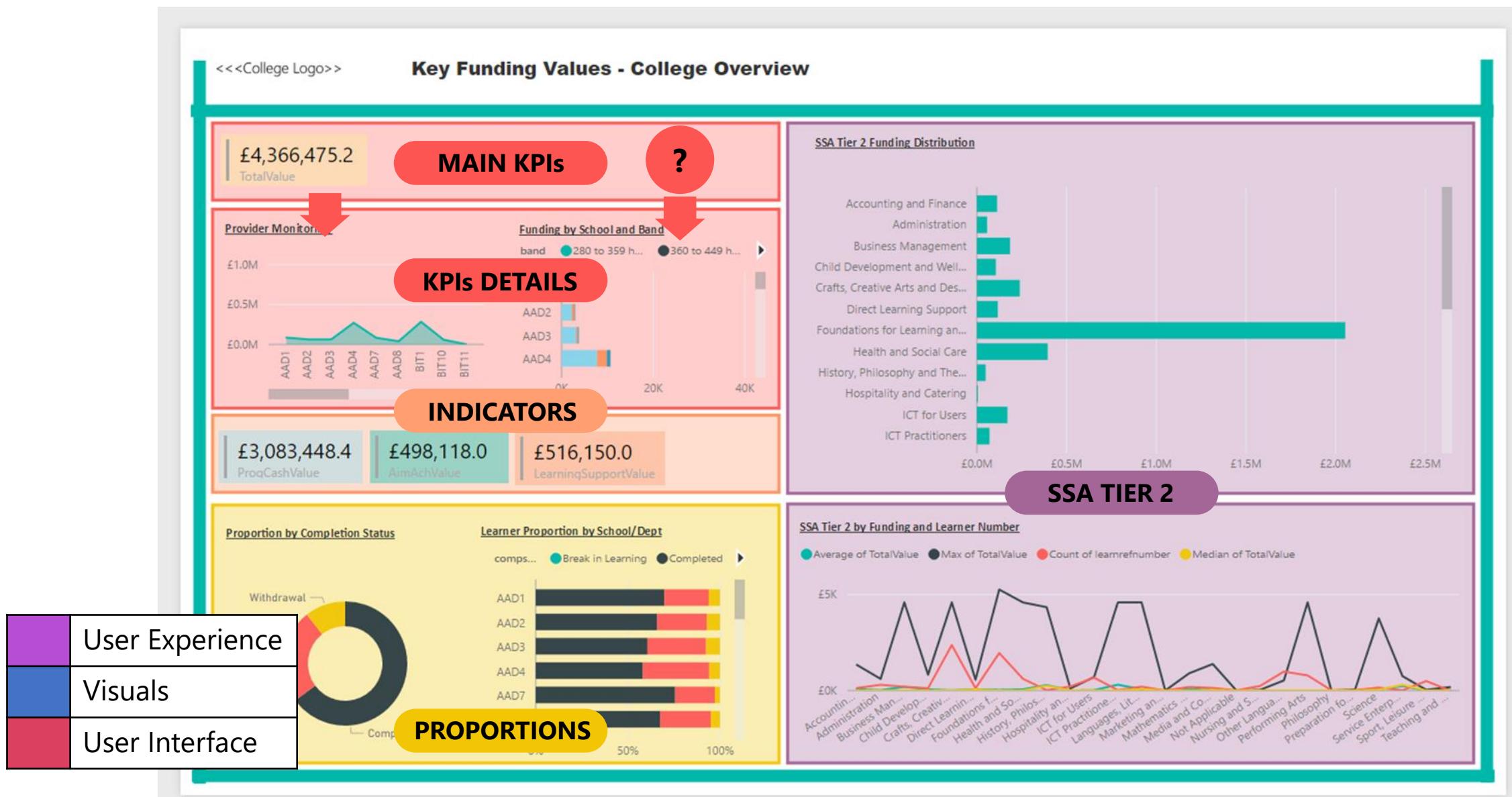
Text consistency



A-Z

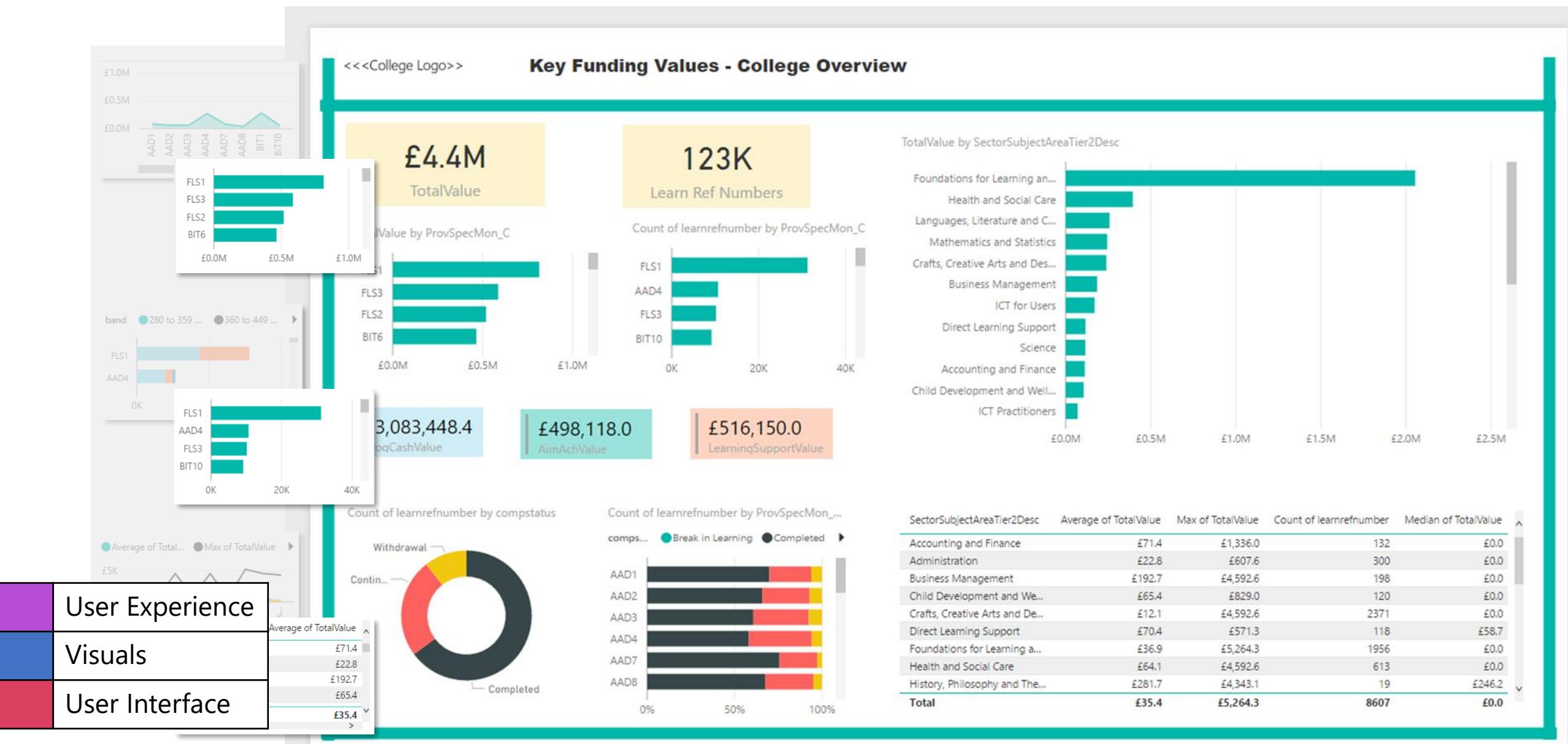


A-Z



A-Z

VISUALS



A-Z

ALIGNMENT

SSA TIER 2

MAIN KPIs

KPIs DETAILS

INDICATORS

PROPORTIONS

User Experience

Visuals

User Interface

Key Funding Values - College Overview

£4.4M

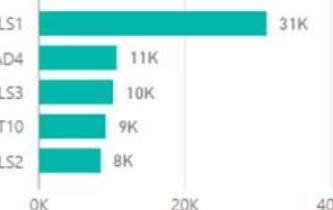
Total Value

123K

Learn Reference Numbers

Provider Monitoring Field/School/Dept

Learn references



£498,118.0

AimAchValue

£3,083,448.4

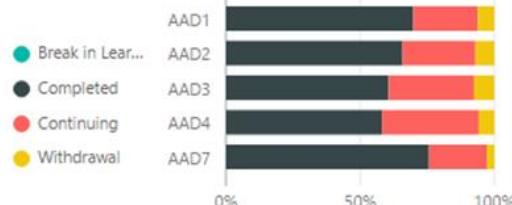
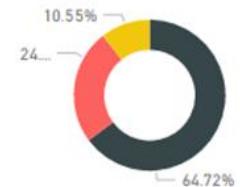
ProgCashValue

£516,150.0

LearningSupportValue

Count of learnrefnumber by c...

Proportion by Completion Status



TotalValue by SectorSubjectAreaTier2Desc



SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
ICT Practitioners	£305.4	£4,592.6	22	£0.0
History, Philosophy and Theology	£281.7	£4,343.1	19	£246.2
Service Enterprises	£239.1	£749.3	12	£299.7
Business Management	£192.7	£4,592.6	198	£0.0
Accounting and Finance	£71.4	£1,336.0	132	£0.0
Mathematics and Statistics	£71.3	£894.9	186	£0.0
Direct Learning Support	£70.4	£571.3	118	£58.7
Total	£35.4	£5,264.3	8607	£0.0



A-Z

BRANDING/TARGETING

FLEXIBLE LOGO



The screenshot shows a web browser displaying the website infoassetmanagement.com/products.html. The header features a large, stylized 'IAM' logo followed by 'INFO ASSET MANAGEMENT'. Below the header is a navigation bar with links for HOME, ABOUT US, CONTACT US, PRODUCTS, SERVICES, and PRIVACY. To the right of the navigation bar are social media icons for Facebook, Google+, and Twitter. The main content area includes a sidebar with social media sharing buttons (Facebook, Twitter, Print, Email, Plus) and a main text section about College Information Asset Manager (CIAM). A call-to-action button labeled 'Try CIAM' is visible. To the right, there is a large image of a tablet screen showing a dashboard interface.

	User Experience
	Visuals
	User Interface

MAIN COLOR



COLOR

INFO ASSET MANAGEMENT

Key Funding Values
College Overview

band
All

£4.4M
Total Value

123K
Learn Reference Numbers

Provider Monitoring Field/School/Dept

FLS1	£0.81M
FLS3	£0.59M
FLS2	£0.52M
BIT6	£0.46M
FLS8	£0.38M
BIT1	£0.28M

Learn references

FLS1	31K
AAD4	11K
FLS3	10K
BIT10	9K
FLS2	8K
BIT1	8K

£498,118.0
AimAchValue

£3,083,448.4
ProgCashValue

£516,150.0
LearningSupportValue

Proportion by Completion Status

SSA Tier 2 Funding Distribution

SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
ICT Practitioners	£305.4	£4,592.6	22	£0.0
History, Philosophy and Theology	£281.7	£4,343.1	19	£246.2
Service Enterprises	£239.1	£749.3	12	£299.7
Business Management	£192.7	£4,592.6	198	£0.0
Accounting and Finance	£71.4	£1,336.0	132	£0.0
Mathematics and Statistics	£71.3	£894.9	186	£0.0
Direct Learning Support	£70.4	£571.3	118	£58.7
Child Development and Well Being	£65.4	£829.0	120	£0.0
Languages, Literature and Culture of...	£65.1	£4,592.6	203	£72.7
Health and Social Care	£64.1	£4,592.6	613	£0.0
Science	£62.1	£3,757.6	156	£43.7
Total	£35.4	£5,264.3	8607	£0.0

User Experience

Visuals

User Interface



A-Z

BACKGROUND

INFO ASSET MANAGEMENT

Key Funding Values
College Overview

KEY METRICS

- £4.4M** Total Value
- 123K** Learn Reference Numbers

Provider Monitoring Field/School/Dept

Category	Value
FLS1	£0.81M
FLS3	£0.59M
FLS2	£0.52M
BIT6	£0.46M
FLS8	£0.38M
BIT1	£0.28M

Learn references

Category	Value
FLS1	31K
AAD4	11K
FLS3	10K
BIT10	9K
FLS2	8K
BIT1	8K

£498,118.0 AimAchValue

£3,083,448.4 ProgCashValue

£516,150.0 LearningSupportValue

Proportion by Completion Status

Status	Percentage
Break in Lear...	10.55%
Completed	64.72%
Continuing	23.73%
Withdrawal	0.70%

SSA Tier 2 Funding Distribution

SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
ICT Practitioners	£305.4	£4,592.6	22	£0.0
History, Philosophy and Theology	£281.7	£4,343.1	19	£246.2
Service Enterprises	£239.1	£749.3	12	£299.7
Business Management	£192.7	£4,592.6	198	£0.0
Accounting and Finance	£71.4	£1,336.0	132	£0.0
Mathematics and Statistics	£71.3	£894.9	186	£0.0
Direct Learning Support	£70.4	£571.3	118	£58.7
Child Development and Well Being	£65.4	£829.0	120	£0.0
Languages, Literature and Culture of ...	£65.1	£4,592.6	203	£72.7
Health and Social Care	£64.1	£4,592.6	613	£0.0
Science	£62.1	£3,757.6	156	£43.7
Total	£35.4	£5,264.3	8607	£0.0

User Experience

Visuals

User Interface



A-Z

CONTEXT AND DEPTH

INFO ASSET MANAGEMENT | **Key Funding Values**
College Overview

KEY METRICS

£4.4M
Total Value

Provider Monitoring Field/School/Dept

Code	Description	Value
FLS1	FLS1	£0.81M
FLS3	FLS3	£0.59M
FLS2	FLS2	£0.52M
BIT6	BIT6	£0.46M
FLS8	FLS8	£0.38M
BIT1	BIT1	£0.28M

123K
Learn Reference Numbers

Learn references Drill Through →

£498,118.0
AimAchValue

£3,083,448.4
ProgCashValue

£516,150.0
LearningSupportValue

Proportion by Completion Status

Status	Percentage
Break in Lear...	10.55%
Completed	64.72%
Continuing	10.55%
Withdrawal	10.55%

SSA Tier 2 Funding Distribution

Foundations for Learning a...

Total value Trend

Year

SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
ICT Practitioners	£305.4	£4,592.6	22	£0.0
History, Philosophy and Theology	£281.7	£4,343.1	19	£246.2
Service Enterprises	£239.1	£749.3	12	£299.7
Business Management	£192.7	£4,592.6	198	£0.0
Accounting and Finance	£71.4	£1,336.0	132	£0.0
Mathematics and Statistics	£71.3	£894.9	186	£0.0
Direct Learning Support	£70.4	£571.3	118	£58.7
Child Development and Well Being	£65.4	£829.0	120	£0.0
Languages, Literature and Culture of ...	£65.1	£4,592.6	203	£72.7
Health and Social Care	£64.1	£4,592.6	613	£0.0
Science	£62.1	£3,757.6	156	£43.7
Total	£35.4	£5,264.3	8607	£0.0

User Experience
Visuals
User Interface



TEXT

Font
Segoe UI

Sizes

8
9
14
30

Types
Normal
Bold

	User Experience
	Visuals
	User Interface

IAM | INFO ASSET MANAGEMENT Key Funding Values College Overview

band All

KEY METRICS

£4.4M Total Value 123K Learn Reference Numbers

Provider Monitoring Field/School/Dept Learn references

Category	Value
FLS1	£0.81M
FLS3	£0.59M
FLS2	£0.52M
BIT6	£0.46M
FLS8	£0.38M
BIT1	£0.28M
AAD4	11K
FLS3	10K
BIT10	9K
FLS2	8K
BIT1	8K

£498,118.0 AimAchValue £3,083,448.4 ProgCashValue £516,150.0 LearningSupportValue

Proportion by Completion Status

Completion Status	Percentage
Break in Learner	10.55%
Completed	64.72%
Continuing	24.73%
Withdrawal	0%

SSA Tier 2 Funding Distribution

Funding Category	Value
Foundations for Learning ...	£2.05M
Health and Social Care	£0.39M
Languages, Literature and...	£0.26M
Mathematics and Statistics	£0.24M
Crafts, Creative Arts and D...	£0.24M
Business Management	£0.18M
ICT for Users	£0.17M
Direct Learning Support	£0.12M
Science	£0.12M
Accounting and Finance	£0.11M
Child Development and W...	£0.11M
ICT Practitioners	£0.07M
Media and Communication	£0.06M
Other Languages, Literatu...	£0.06M

SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
ICT Practitioners	£305.4	£4,592.6	22	£0.0
History, Philosophy and Theology	£281.7	£4,343.1	19	£246.2
Service Enterprises	£239.1	£493.3	12	£299.7
Business Management	£192.7	£4,592.6	198	£0.0
Accounting and Finance	£71.4	£1,336.0	132	£0.0
Mathematics and Statistics	£71.3	£894.9	186	£0.0
Direct Learning Support	£70.4	£571.3	118	£58.7
Child Development and Well Being	£65.4	£829.0	120	£0.0
Languages, Literature and Culture of ...	£65.1	£4,592.6	203	£72.7
Health and Social Care	£64.1	£4,592.6	613	£0.0
Science	£62.1	£3,757.6	156	£43.7
Total	£35.4	£5,264.3	8607	£0.0



A-Z

FINAL REPORT

IAM | INFO ASSET MANAGEMENT

Key Funding Values
College Overview

KEY METRICS

£4.4M Total Value	123K Learn Reference Numbers	
Provider Monitoring Field/School/Dept	Learn references	
<ul style="list-style-type: none"> FLS1 £0.81M FLS3 £0.59M FLS2 £0.52M BIT6 £0.46M FLS8 £0.38M BIT1 £0.28M 	<ul style="list-style-type: none"> FLS1 31K AAD4 11K FLS3 10K BIT10 9K FLS2 8K BIT1 8K 	
£498,118.0 AimAchValue	£3,083,448.4 ProgCashValue	£516,150.0 LearningSupportValue
<p>Proportion by Completion Status</p> <ul style="list-style-type: none"> Break in Lear... Completed Continuing Withdrawal 		

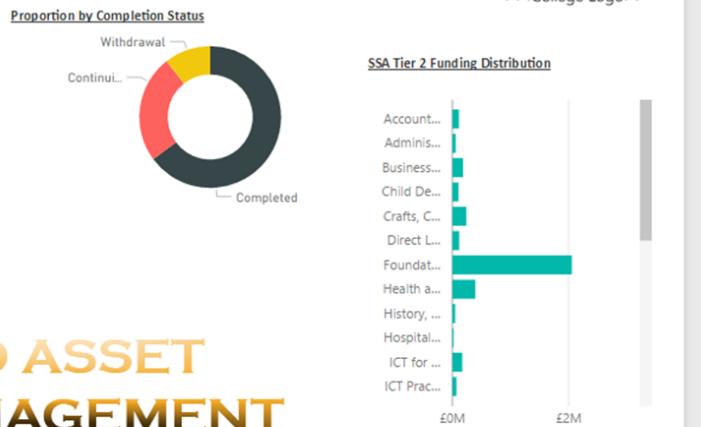
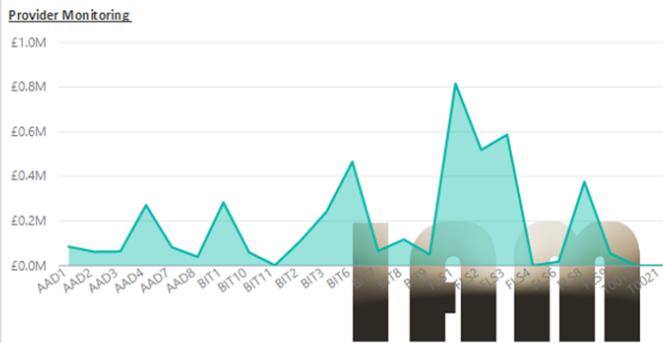
SSA Tier 2 Funding Distribution

SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnrefnumber	Median of TotalValue
ICT Practitioners	£305.4	£4,592.6	22	£0.0
History, Philosophy and Theology	£281.7	£4,343.1	19	£246.2
Service Enterprises	£239.1	£749.3	12	£299.7
Business Management	£192.7	£4,592.6	198	£0.0
Accounting and Finance	£71.4	£1,336.0	132	£0.0
Mathematics and Statistics	£71.3	£894.9	186	£0.0
Direct Learning Support	£70.4	£571.3	118	£58.7
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Languages, Literature and Culture of ...	£65.1	£4,592.6	203	£72.7
Health and Social Care	£64.1	£4,592.6	613	£0.0
Science	£62.1	£3,757.6	156	£43.7
Total	£35.4	£5,264.3	8607	£0.0

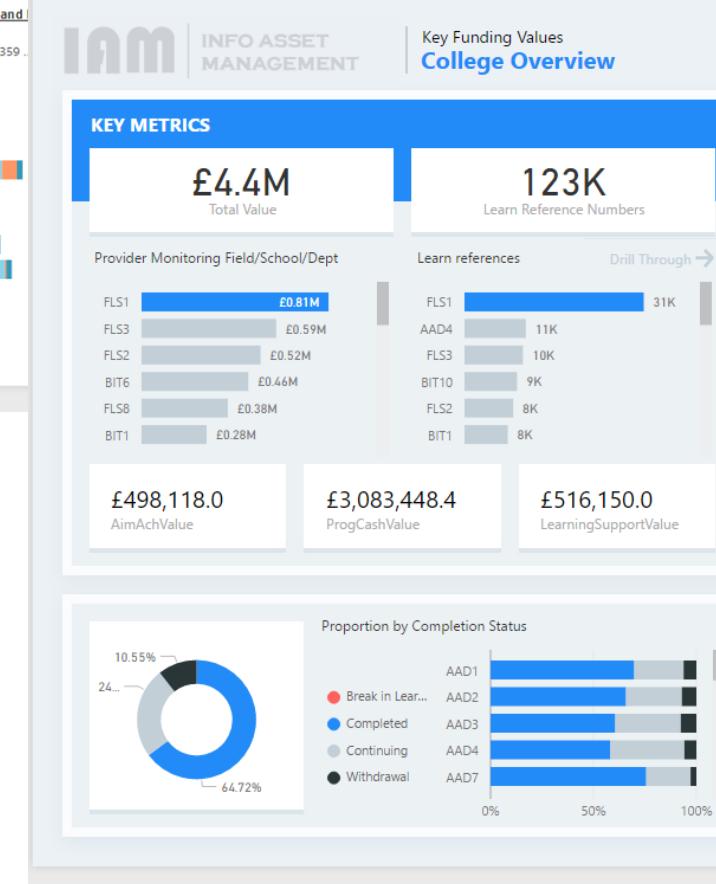
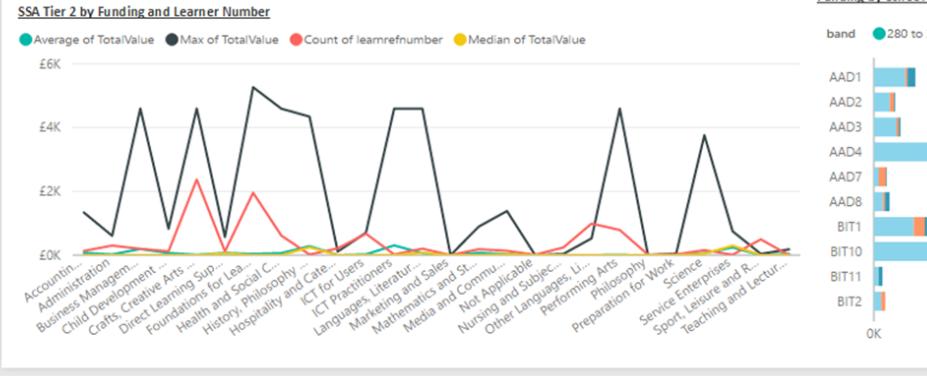
band
All

Key Funding Values - College Overview

£4,366,475.2 TotalValue
£3,083,448.4 ProgCashValue
£498,118.0 AimAchValue
£516,150.0 LearningSupportValue



INFO ASSET MANAGEMENT



SSA Tier 2 Funding Distribution

SectorSubjectAreaTier2Desc	Average of TotalValue	Max of TotalValue	Count of learnerrefnumber	Median of TotalValue
ICT Practitioners	£305.4	£4,592.6	22	£0.0
History, Philosophy and Theology	£281.7	£4,343.1	19	£246.2
Service Enterprises	£239.1	£749.3	12	£299.7
Business Management	£192.7	£4,592.6	198	£0.0
Accounting and Finance	£71.4	£1,336.0	132	£0.0
Mathematics and Statistics	£71.3	£894.9	186	£0.0
Direct Learning Support	£70.4	£571.3	118	£58.7
Child Development and Well Being	£65.4	£289.0	120	£0.0
Languages, Literature and Culture of...	£65.1	£4,592.6	203	£72.7
Health and Social Care	£64.1	£4,592.6	613	£0.0
Science	£62.1	£3,757.6	156	£43.7
Total	£35.4	£2,643.3	8607	£0.0

Report Building Steps

1. Create visuals
2. Add margins *
3. Redistribute to logical sections *
4. Modify visual selection
5. Formatting & alignment
6. Background shapes *
7. Labeling *

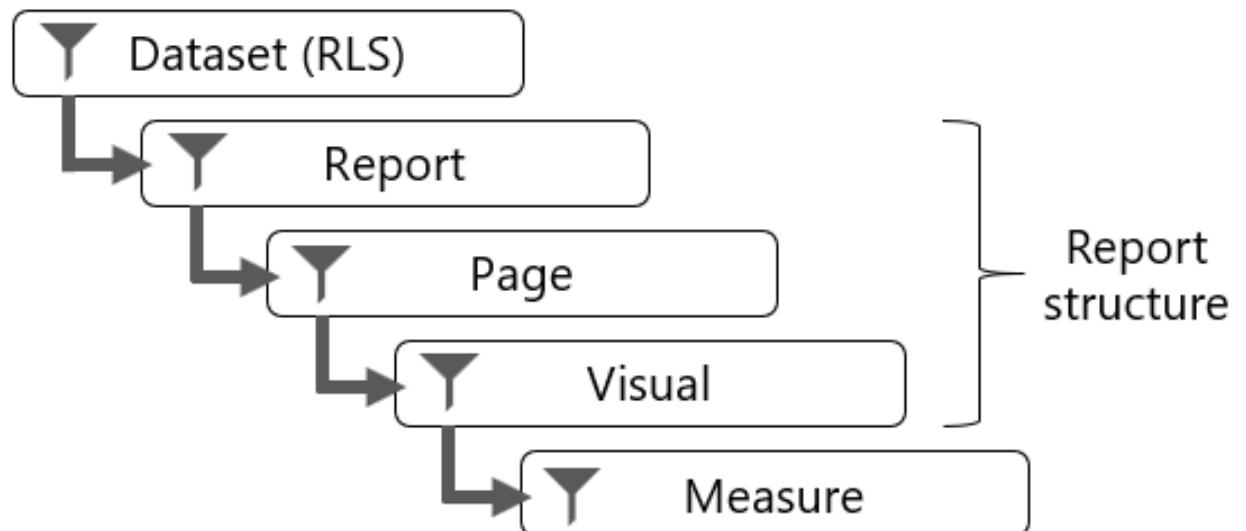
*Can partially be handled using a background image

Report Design Tools

- Format commands (Format ribbon, help to arrange objects)
- Selection pane (Layer order, Tab order)
- Report layout options (View ribbon, gridlines, snap to grid, lock objects)
- Page view (View ribbon, fit to page, fit to width, show actual size)
- Undo/redo (CTRL+Z or CTRL +Y)

Filtering

- You can filter at five different levels
 - Dataset (RLS)
 - Report
 - Page
 - Visual
 - Measure (using DAX/Report-level measure)
- Filter using
 - Filter pane
 - Slicers



Filter Pane or Slicer

Filter pane

- Advantages; same location, advanced filtering, better performance
- Disadvantages; less design flexibility, more difficult to see which filters are applied

Slicers

- Advantages; intuitive layout on report canvas, hierarchical slicer, filter context visible, support edit visual interaction, synced slicers
- Disadvantages; can impact performance, take up space in report canvas

Filtering Tips

- Use either filters or slicers.
 - Avoid using both filter techniques because it can create confusion.
- Use the clear all slicers button to reset to default values
- When a requirement is in place to lay out many slicers, consider creating a page or fly out pane that is dedicated to showing all slicers.

Design For Accessibility

- **Styling**
 - Larger fonts, color blindness. E.g., built-in theme Color blind safe or High contrast
- **Alt text**
 - Can describe the appearance and function of report objects to screen reader users
- **Tab order**
 - Build a logical sequence
- **Conditional formatting**
 - Use icons and colors

Before Publishing

Testing

- User acceptance test, test on different interfaces (Service, mobile app, embedded), Performance!

Prepare for publication

- Set intended initial experience, e.g., define first page, reset filters and slicers, visual drill state, sort orders, and button state

Provide support

- Training, built-in assistance, documentation

Manage change

- Often, it's better to publish a new report that includes many updates than release smaller incremental changes, consider using Deployment pipelines

And...

Validate The Performance

If it doesn't perform well in Power BI Desktop, don't expect it to fix itself in the Power BI service!

Performance analyzer

Start recording Refresh visuals Stop

Clear Export

Name	Duration (ms)
Recording started (9/18/2022 10:41:33 AM)	-
Changed page	-
Really really big Matrix	3958
Sales YoY%, Distinct Customers, Adjusted Sale...	1939
Sales Amount, Sales Quantity and Distinct Opp...	1905
Distinct Customers	1477
Continent Slicer	1748
Brand Slicer	1691
Year Slicer	1722
Total Sales Card	1520

Next steps



Explore the product here:

<https://www.microsoft.com/en-us/microsoft-fabric>



Check out the Microsoft Mechanics show:

<https://youtu.be/oxMUJT3p9f4>



Explore the documentation:

<https://learn.microsoft.com/en-us/fabric/>



Read the free eBook: Getting started with Fabric

<https://aka.ms/fabric-get-started-ebook>

Additional customer-facing links

To learn more about Microsoft Fabric, consider these additional resources:

- See blog post to read the full [Microsoft Fabric GA announcement](#)
- Explore Fabric through the [Guided Tour](#)
- Sign up for the [Microsoft Fabric free trial](#)
- Visit the [Microsoft Fabric website](#)
- Learn new skills by exploring the [Fabric Learning modules](#)
- Explore the [Fabric technical documentation](#)
- Read the [free e-book on getting started with Fabric](#)
- Join the [Fabric community](#) to post your questions, share your feedback, and learn from others

Read the more in-depth Fabric experience announcement blogs:

- [Data Factory experience in Fabric blog](#)
- [Synapse Data Engineering experience in Fabric blog](#)
- [Synapse Data Science experience in Fabric blog](#)
- [Synapse Data Warehousing experience in Fabric blog](#)
- [Synapse Real-Time Analytics experience in Fabric blog](#)
- [Power BI announcement blog](#)
- [Data Activator experience in Fabric blog](#)
- [Administration and governance in Fabric blog](#)
- [OneLake in Fabric blog](#)
- [Dataverse and Microsoft Fabric integration blog](#)



End-to-end tutorials



Lakehouse tutorial

<https://learn.microsoft.com/en-us/fabric/data-engineering/tutorial-lakehouse-introduction>



Data Science tutorial

<https://learn.microsoft.com/en-us/fabric/data-science/tutorial-data-science-introduction>



Real-Time Analytics tutorial

<https://learn.microsoft.com/en-us/fabric/real-time-analytics/tutorial-introduction>



Data warehouse tutorial

<https://learn.microsoft.com/en-us/fabric/data-warehouse/tutorial-introduction>



Power BI tutorial

<https://learn.microsoft.com/en-us/power-bi/fundamentals/fabric-get-started>



Data Factory tutorial

<https://learn.microsoft.com/en-us/fabric/data-factory/tutorial-end-to-end-introduction>



Learn more about these experiences

Navigate to specific experiences and capabilities using the links below



Microsoft Fabric get started

[What is Fabric?](#)
[Microsoft Fabric licenses](#)
[Enable Microsoft Fabric for your organization](#)
[Navigate the Fabric portal](#)
[Workspaces in Fabric](#)
[See more](#)



Power BI

[What is Power BI?](#)
[What is a datamart?](#)
[Azure and Power BI integration](#)
[See more](#)



OneLake

[What is OneLake?](#)
[What are shortcuts?](#)
[Create a lakehouse with OneLake](#)
[OneLake and Azure Synapse Analytics integration](#)
[See more](#)



Data Factory

[What is Data Factory?](#)
[Create your first pipeline](#)
[Create your first dataflow](#)
[Connectors](#)
[See more](#)



Synapse Data Engineering

[What is Data Engineering?](#)
[Create a Lakehouse](#)
[Create a Spark job definition](#)
[See more](#)



Synapse Data Science

[What is Data science?](#)
[Machine learning experiment](#)
[Use end-to-end AI samples](#)
[See more](#)



Synapse Data Warehouse

[What is Data Warehouse?](#)
[Create a Warehouse](#)
[Query using SQL query editor](#)
[See more](#)



Synapse Real-Time Analytics

[What is Real-Time Analytics?](#)
[What is Event stream?](#)
[Create a database](#)
[See more](#)



Data Activator

[What is Data Activator?](#)
[Getting started](#)
[Get data from Eventstreams](#)
[See more](#)



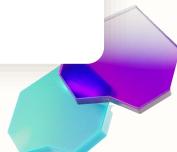
Copilot in Fabric

[Introduction to copilot in Fabric](#) | [Enable copilot](#) | [Copilot for notebooks](#) | [See more](#)



Security, Governance, and Administration

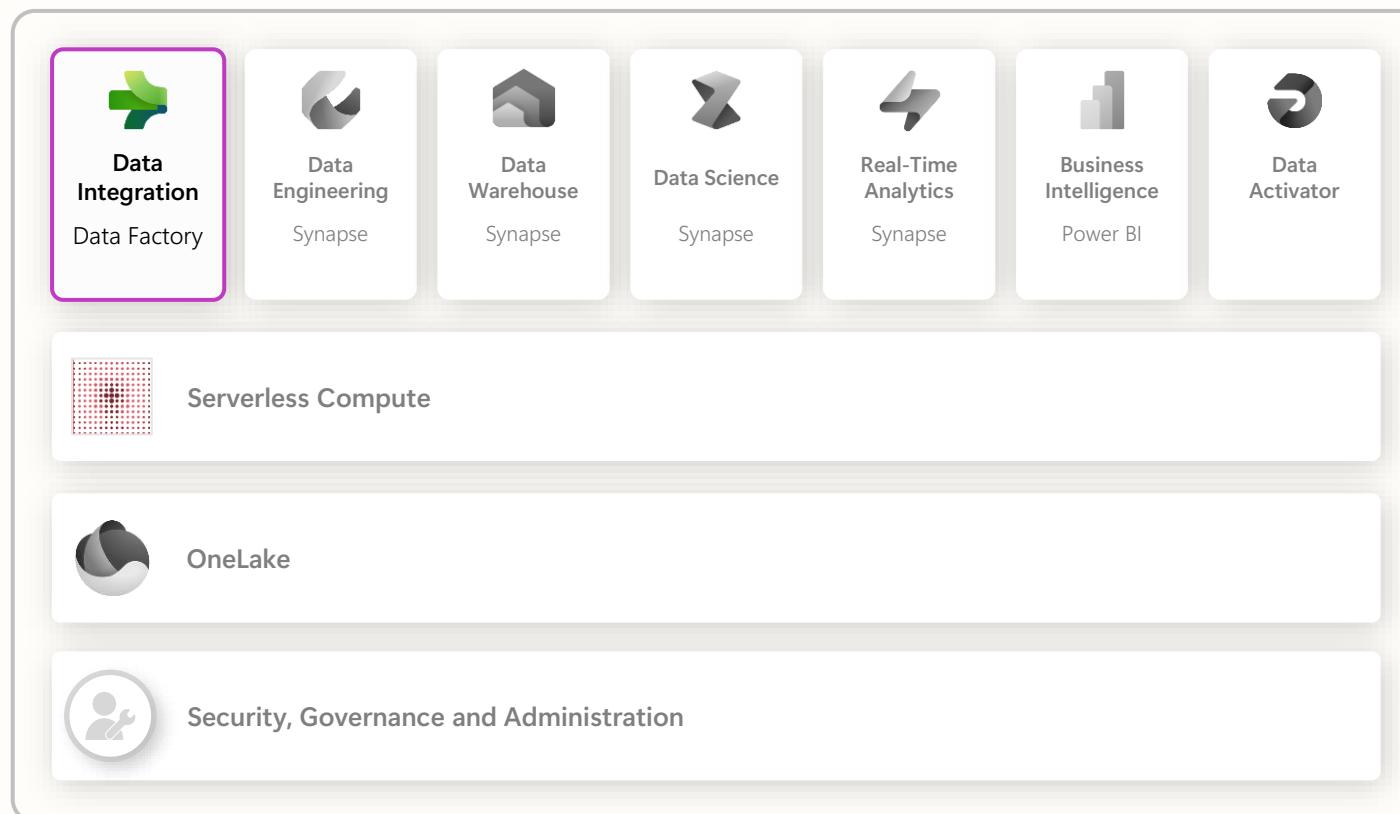
[Buy a Microsoft Fabric subscription](#) | [Fabric administration](#) | [Data governance and compliance](#) | [Security](#) | [See more](#)



Appendix

Data integration experience

Bring together low-code, AI-enabled experiences, multi-cloud connectivity, and persistent data security and governance to help solve complex scenarios for all developers



200+ native data source connectors

Cloud-scale data movement with Data Factory

Low-code interface for ingesting data from hundreds of data sources using Dataflows Gen2

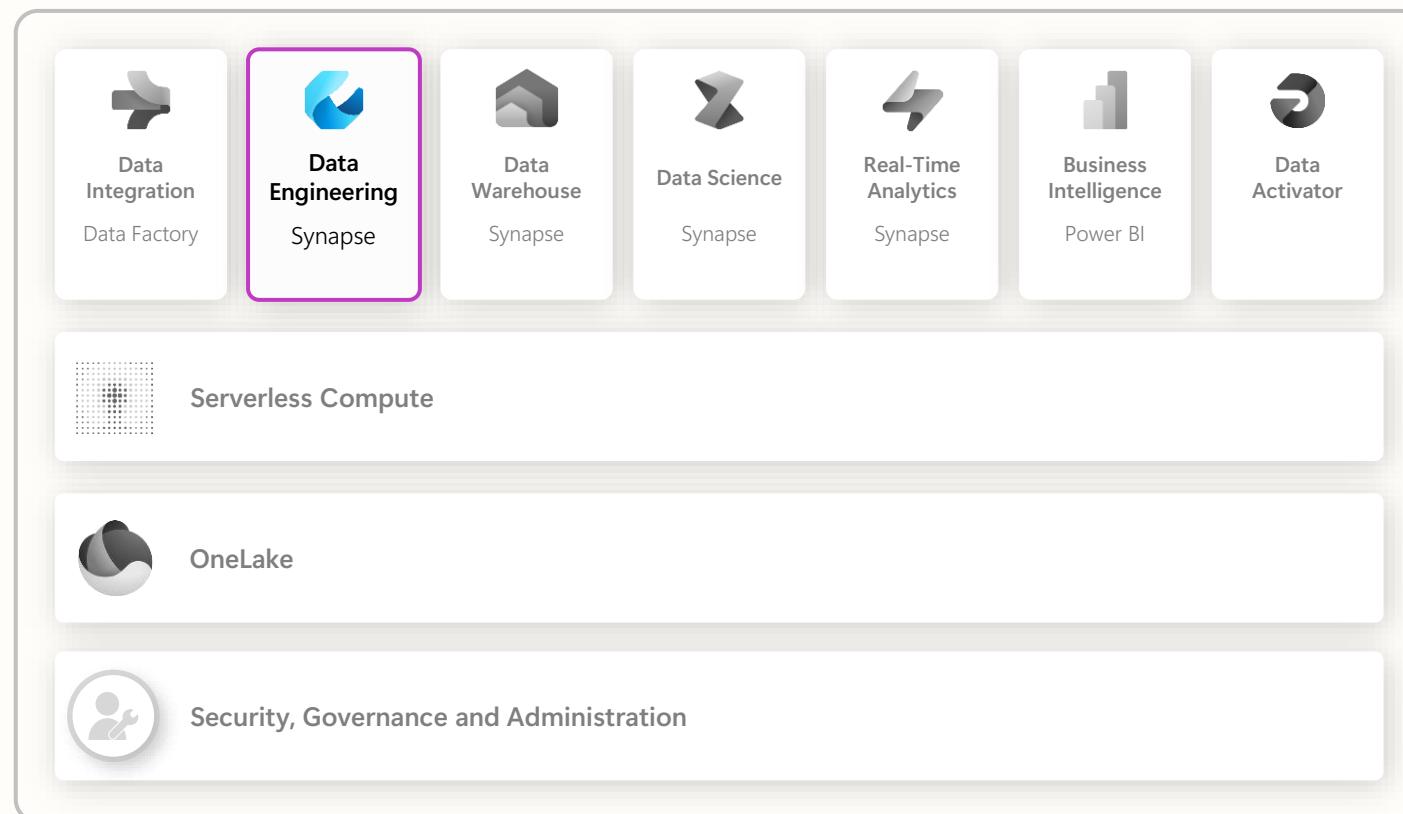
Petabyte scale transformation

Powerful, enterprise-grade Data Factory experience with the best of ADF and Power Query together



Data engineering experience

Build your data estate and empower data engineers with a world-class Spark platform, fully integrated with Data Factory, to transform and democratize data at scale



World-class Spark serverless compute

Pro and low-code authoring experience

Schedule and orchestrate data transformations with notebooks and Spark jobs

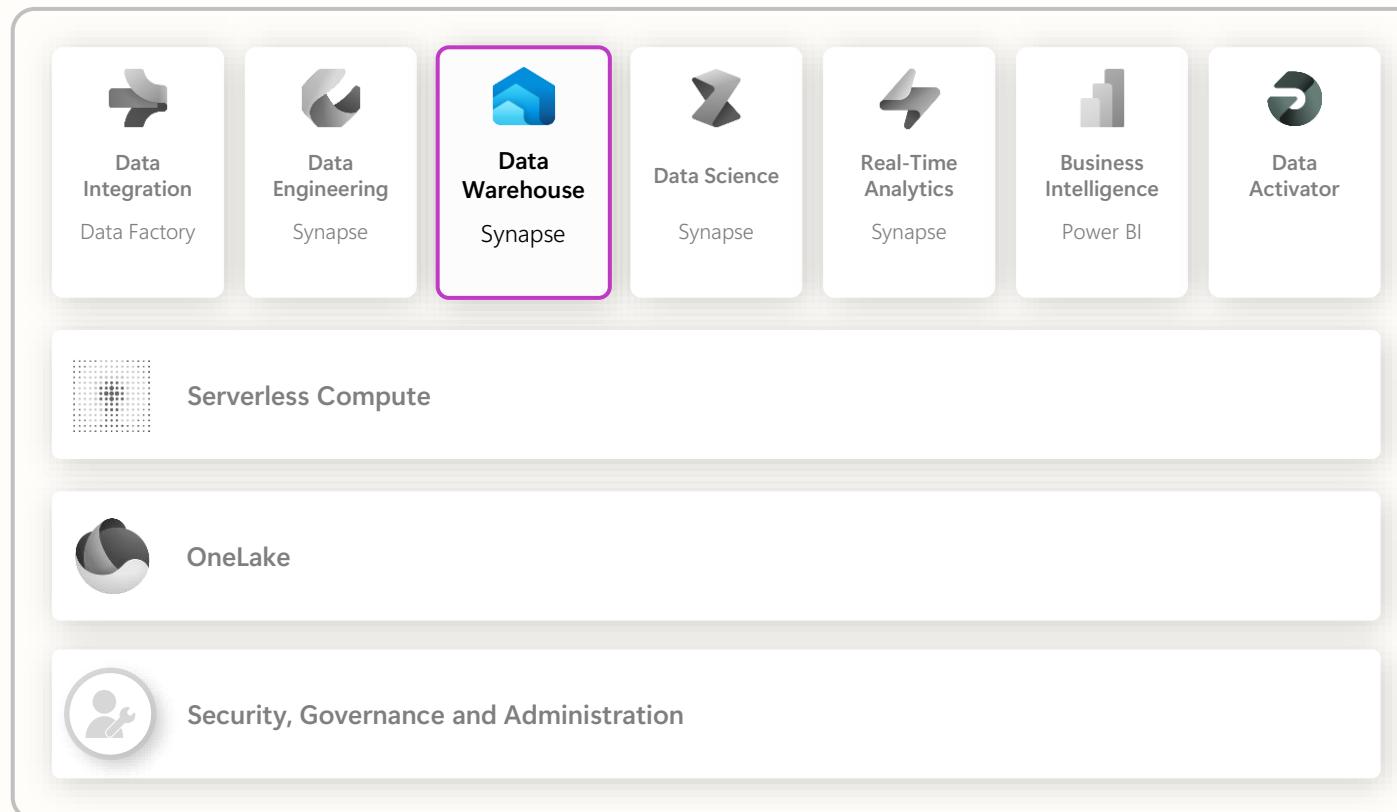
Launch clusters on demand and dynamically scale in, scale out, pause, and resume

Perform code-free interactive data exploration and add to your data pipeline



Data warehouse experience

Achieve data platform goals with ease and cost efficiency, while empowering your developers and engineers with accelerated reporting and insights



Industry-leading SQL performance and scale, including reporting tools using T-SQL and TDS end-points

Fully separate compute storage that can independently scale

Build relational layers on top of physical data in Lakehouse and natively store data in open Parquet/Delta Lake to remove need for data duplicity

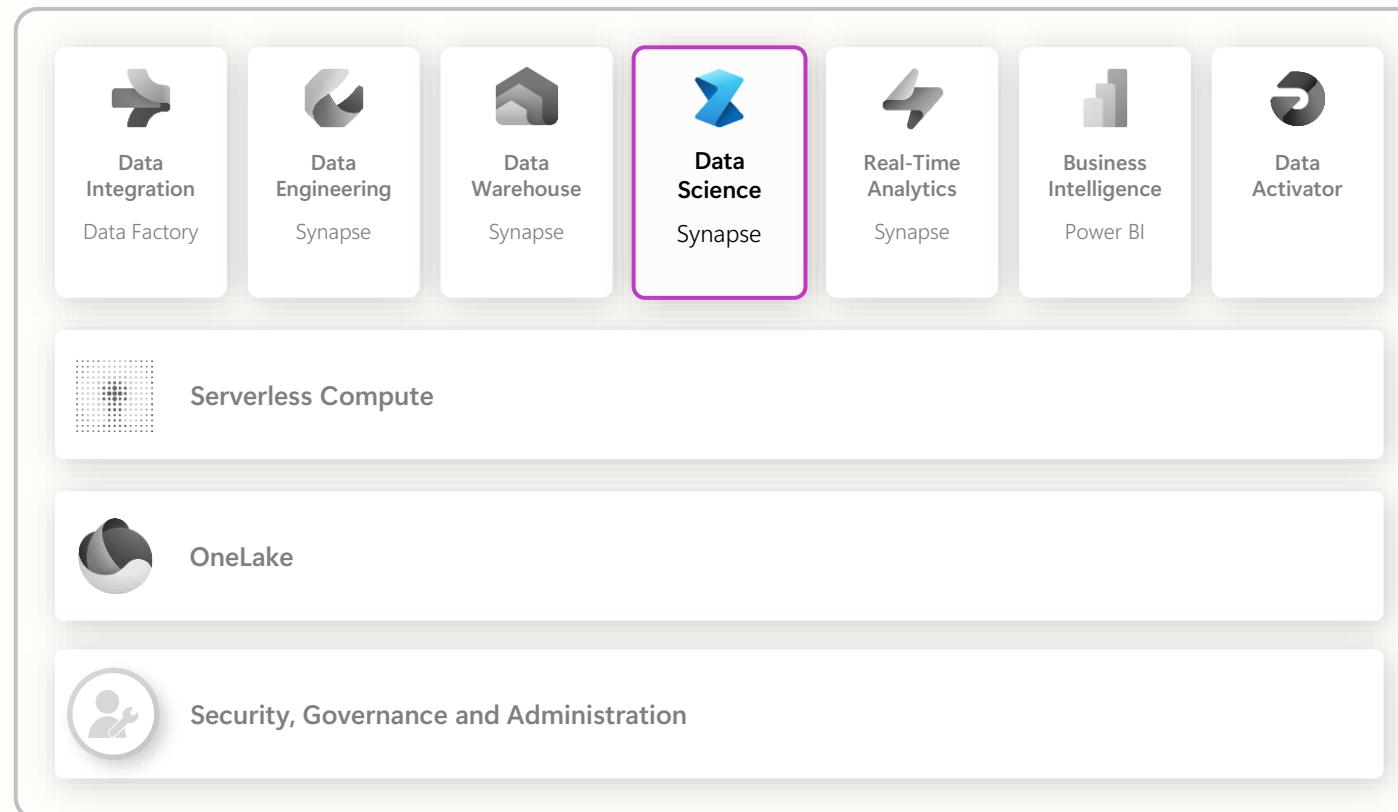
Consume data with Power BI for reporting and visualization

TLS 1.2 encryption protects all connections for granular security across your data platform



Data science experience

Build, deploy, and operationalize machine learning models with boundaryless collaboration and seamless integration with Azure ML



Access data from multiple sources and store data and insights in Lakehouse(s)

Leverage data science capabilities for model prediction at scale to gain and share business insights

Iterate, build, and track Machine Learning experiments using ML flow

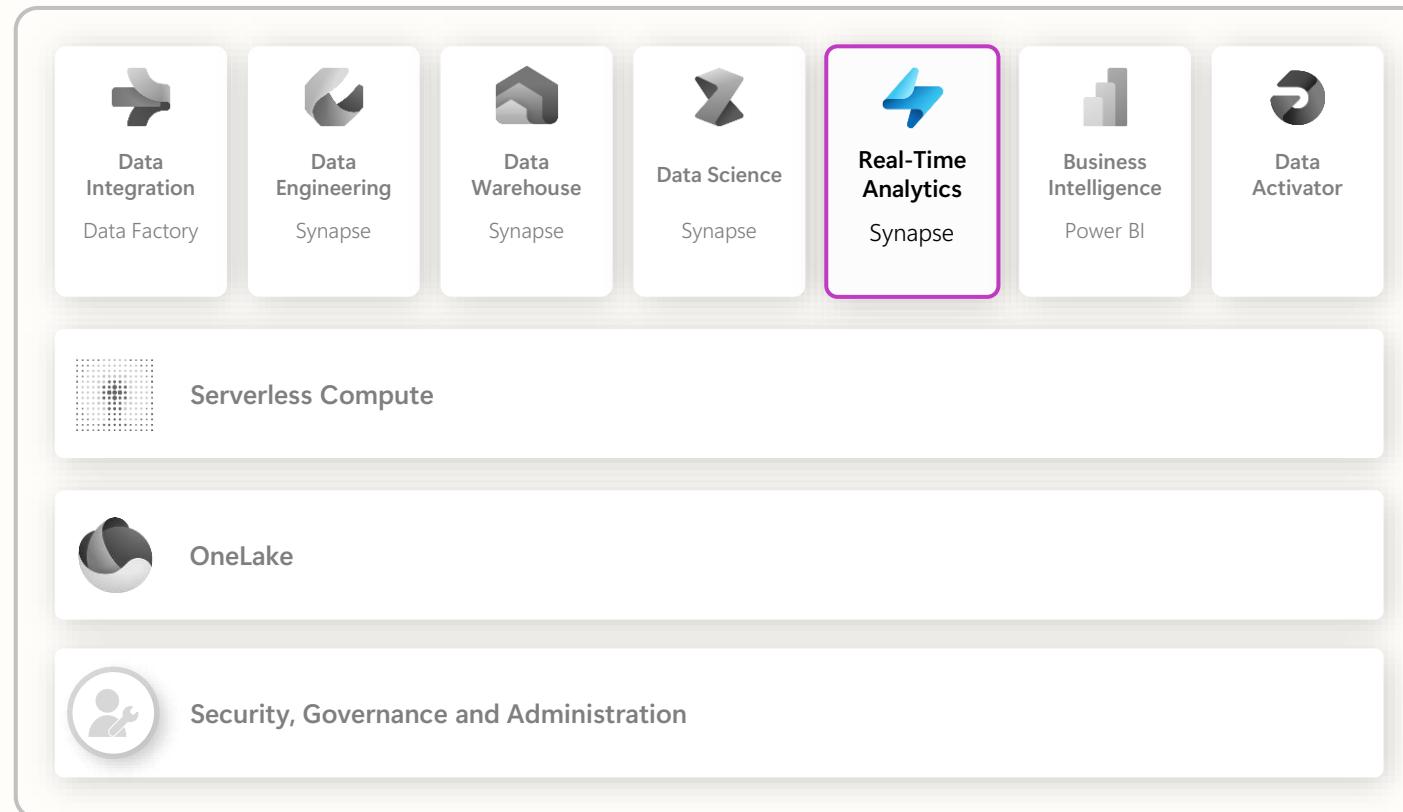
Perform transformation, exploration, and featurization by leveraging built-in experiences

Collaborate with others via Notebook, Power BI, and Lakehouses in real-time



Real-time analytics experience

Unlock value and turn insights into actions with real-time analysis across telemetry data to better predict, optimize, and improve data applications

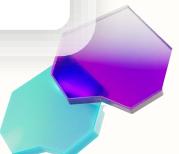


High velocity, low latency data analysis capable of indexing diverse data formats and structures up to several petabytes large

Leverage Kusto Query Language (KQL) to explore data and discover patterns, identify anomalies and outliers, and create statistical modeling

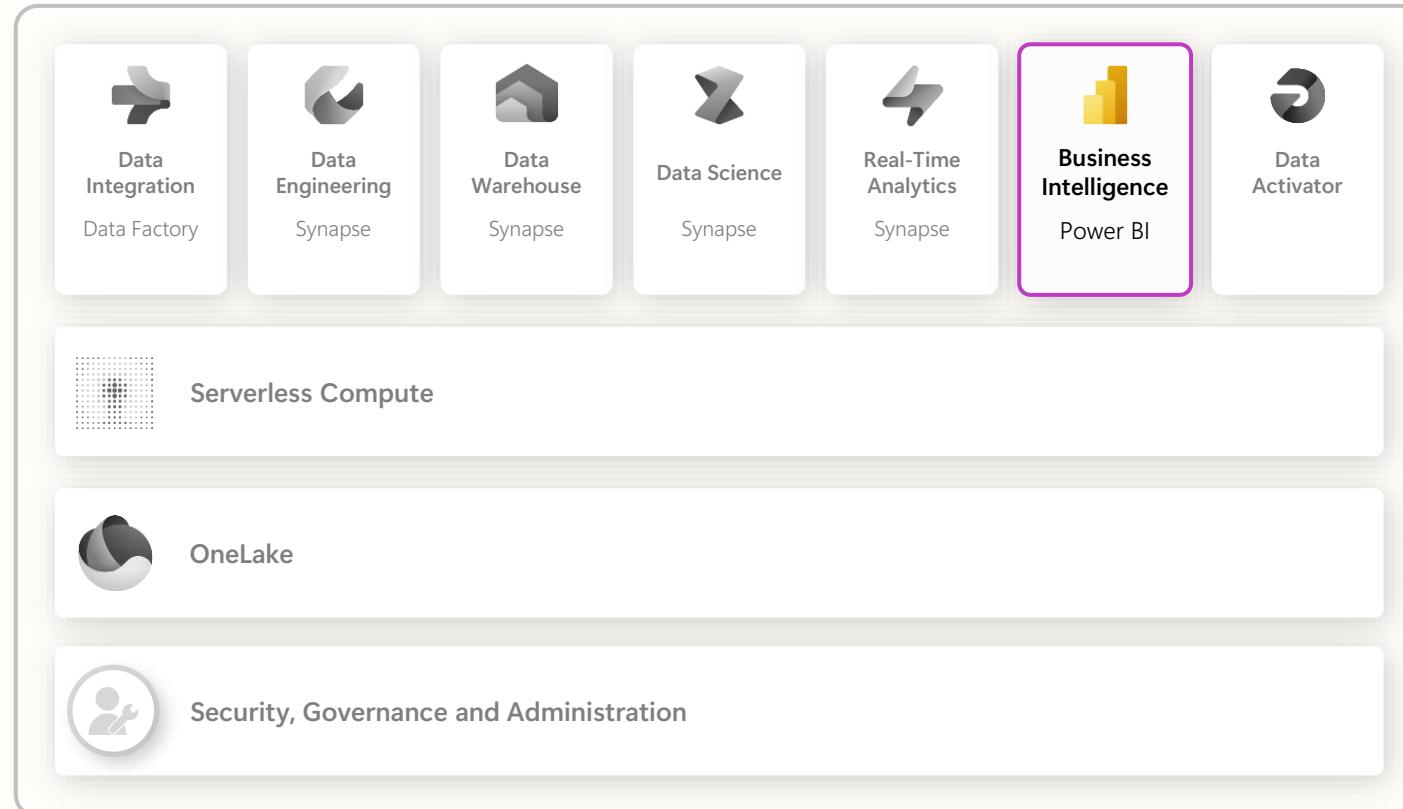
Easy ingestion of data from any source, in any data format, like applications, websites, and IoT devices

Democratize data responsibly with Microsoft Purview and use observability with Data Activator to activate timely actions



Business intelligence experience

Uncover powerful insights with intelligence visuals, leverage data quickly and intuitively, and help achieve faster and better data-based decisions with the industry leading Power BI platform



Native Integration with Microsoft 365

Powerful built-in AI capabilities and visuals illuminate hidden patterns, opportunities and anomalies in data with the click of a button

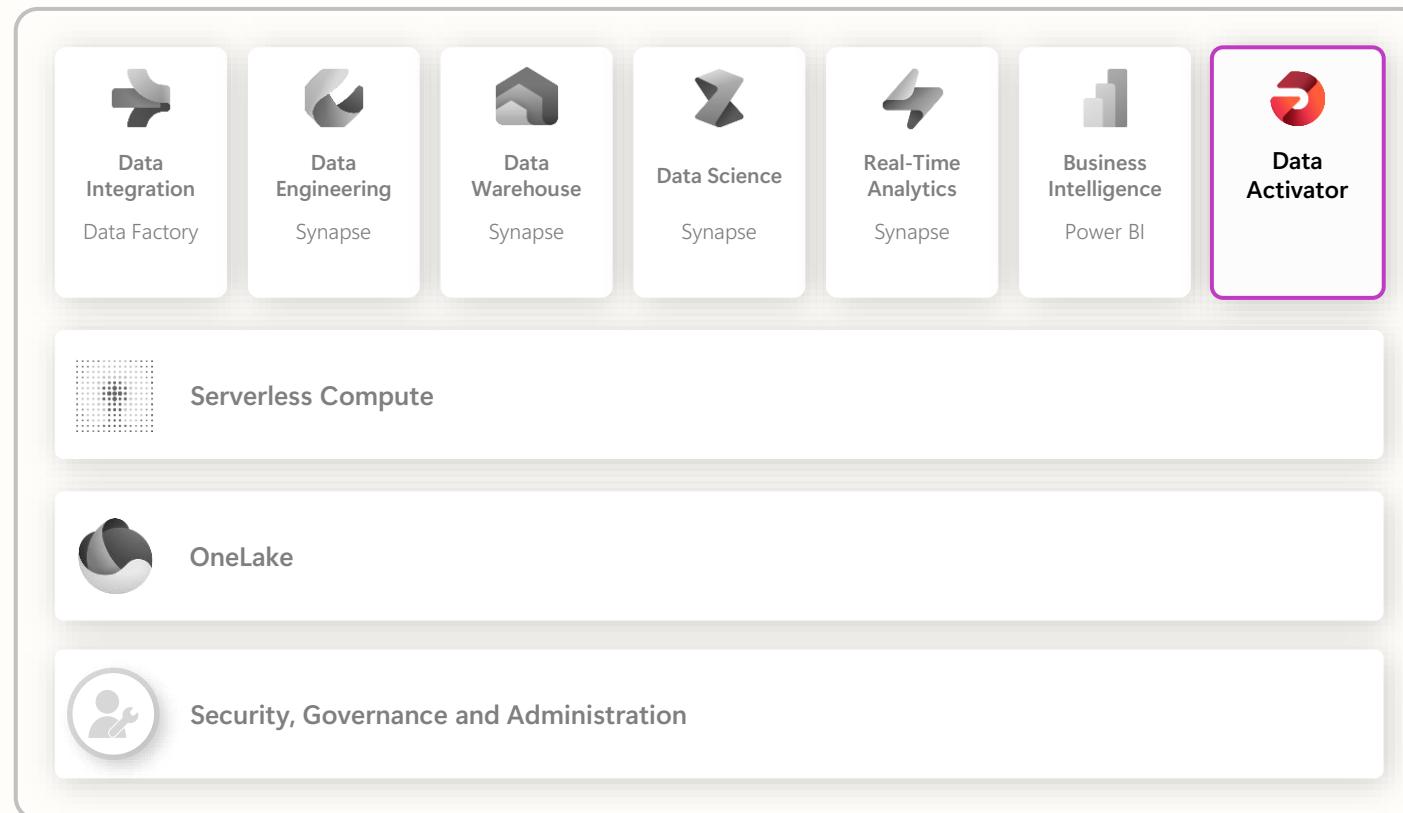
Connect to, index, and certify semantic models in the Power BI data hub

Build governed databases, like data models or data marts, in a trusted and secure hub



Data Activator experience

Eliminate manual monitoring of operational dashboards. Automatically detect actionable conditions in your data, then drive alerts and actions, without writing code



Automatically monitor Power BI semantic models and event streams.

Define no-code rules to detect actionable conditions in your data.

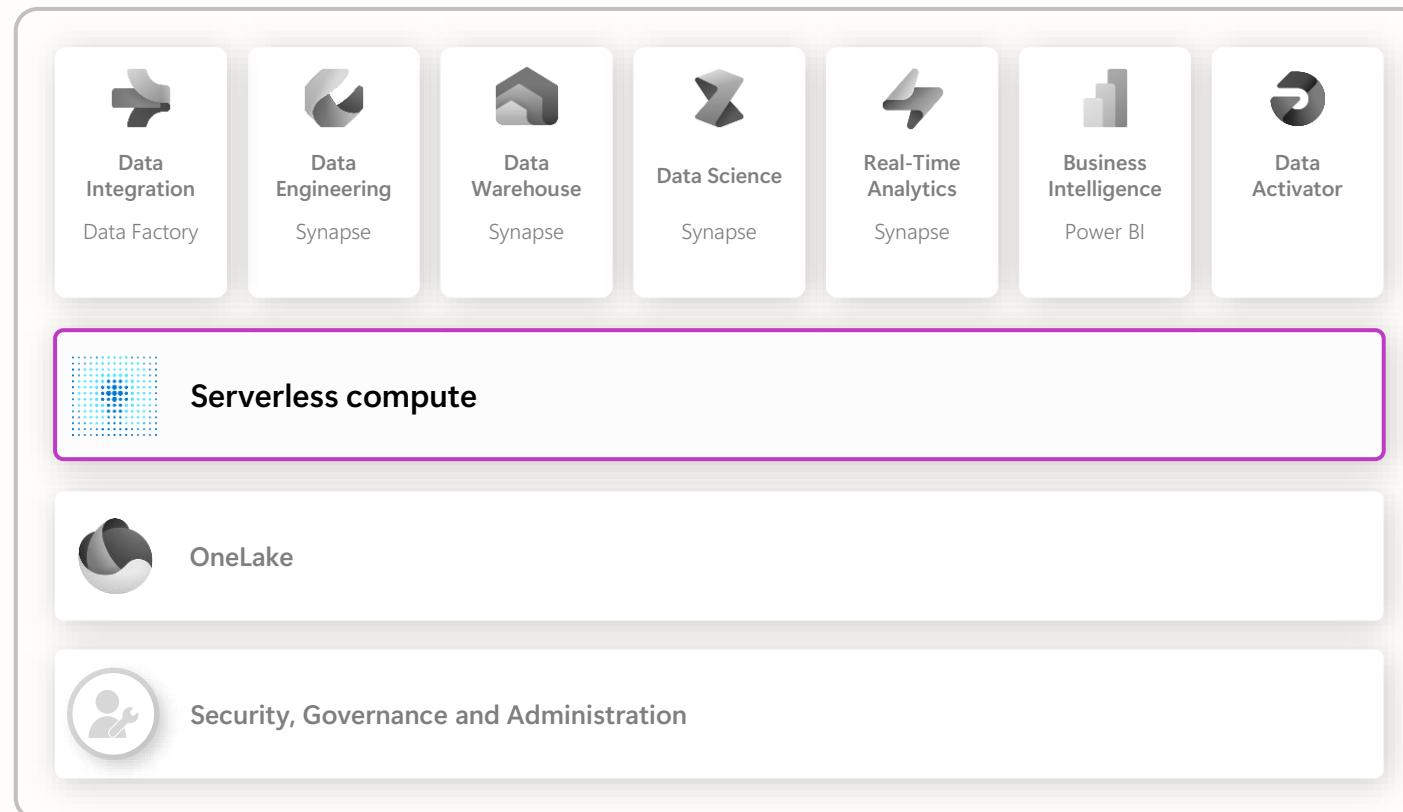
Send alerts in Microsoft Teams or email when actionable conditions occur.

Combine Data Activator with Power Automate to send alerts via 3rd party systems, or trigger actions in ticketing systems and other apps.



Serverless compute

Run workloads without having to provision compute. Live compute pools are already provisioned with a workspace resulting in instant productivity.



Limitless scale for the most demanding jobs

Automatically create with each workspace

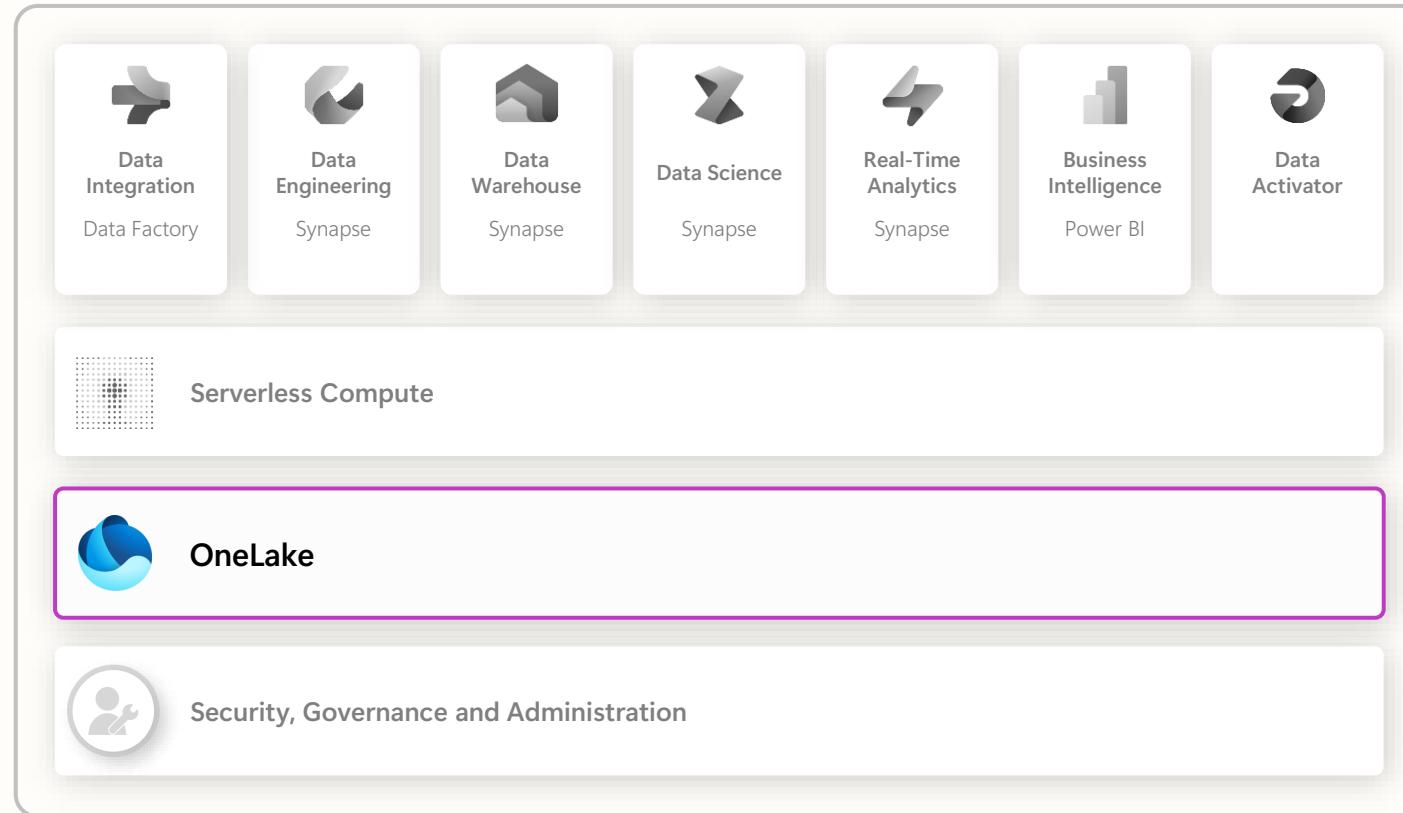
With support for high concurrency mode there's no need to start a new session to run a notebook

Memory optimized



Unified data foundation with OneLake

Eliminate pervasive and chaotic data siloes to provide a unified, secure, and centralized storage system for developers with OneLake—the “OneDrive” for data



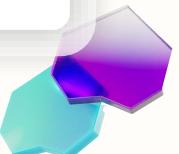
A single SaaS lake for the whole organization

Abstraction layer over Azure Storage and third-party storage services, provisioned automatically with the tenant

All workloads automatically store their data in OneLake workspace folders

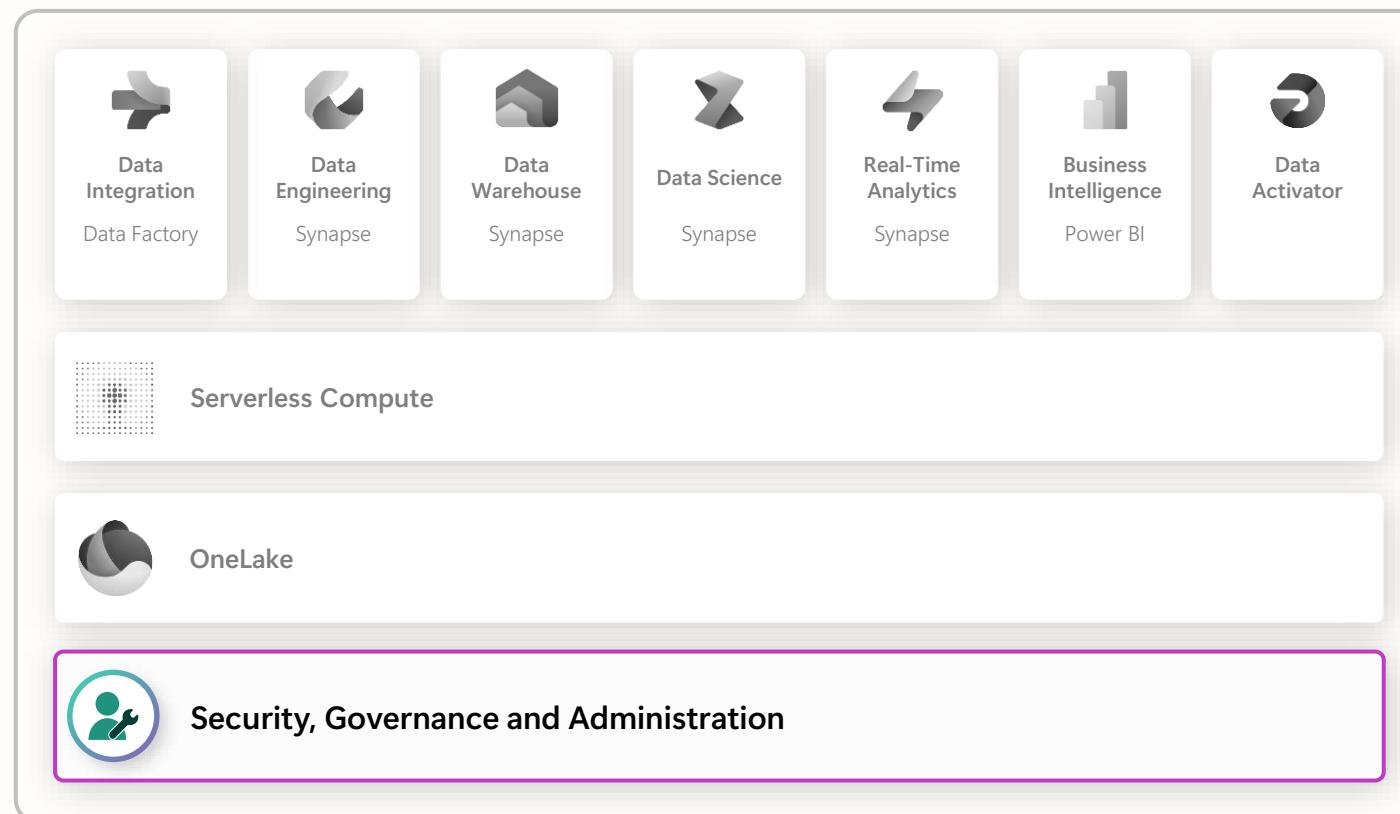
All data is organized in an intuitive hierarchical namespace

Data in OneLake is automatically indexed for discovery, sharing, governance, and compliance



Persistent data governance and security

Built-in security and reliability features secure your data, and a set of governance and compliance capabilities help you manage, protect, and monitor sensitive information



Centralized Administration via the Admin Center

Governance powered natively by Microsoft Purview

Insights via Admin Monitoring, Capacity Insights, and more – enabling effective administration and governance

Security at Data, Workspace, and Network layers

Key enterprise promises like data residency, auditability, and much more

