



A general overview

Development of interactive dashboards using Power BI



Live demo using COVID-19 data from the
PHUSE Open Data Repository (PODR)

March 22, 2021 / Amrit Singh / 0.1



RESTRICTED



Outline

// What is Power BI?

// Data sources

- // Power Query for data transformation
- // Data model for table relationships

// COVID-19 Dashboard demo

- // Interactive visuals
- // Embedding of reports

// Conclusions

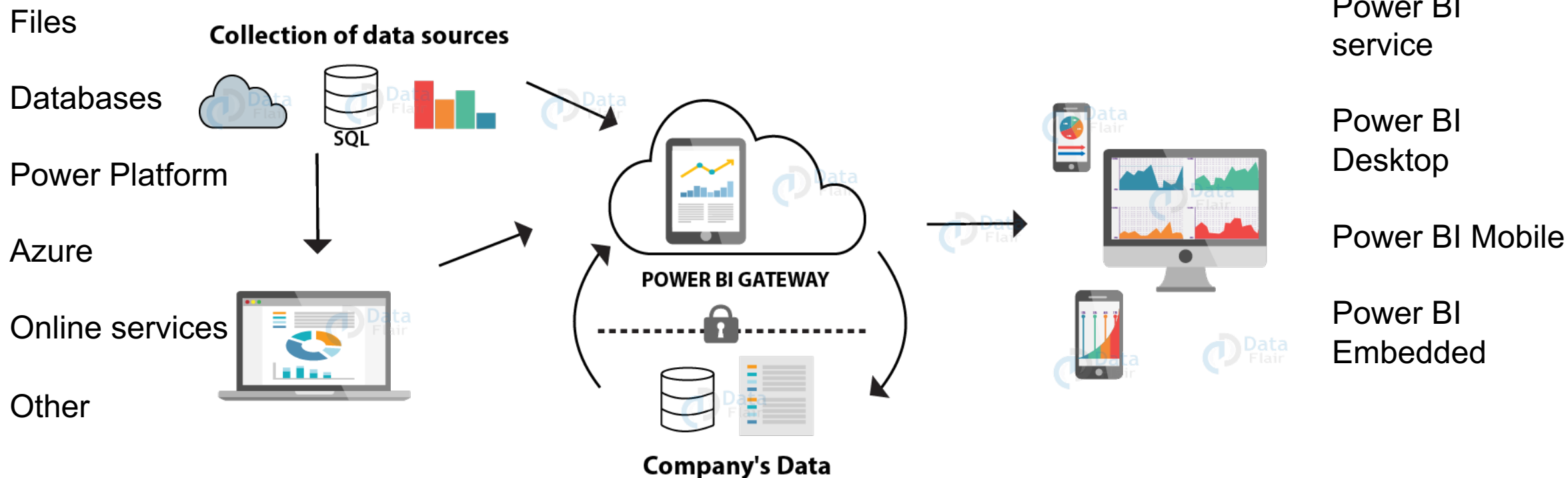


What is Power BI?

SaaS tool that connects different data sources, visualize and share interactive dashboards.

Power BI is compliant with several industry data security standards and compliant with GxP regulation¹.

Process Flow of Power BI



¹Microsoft Azure GxP Guidelines White paper July 2020



Data sources

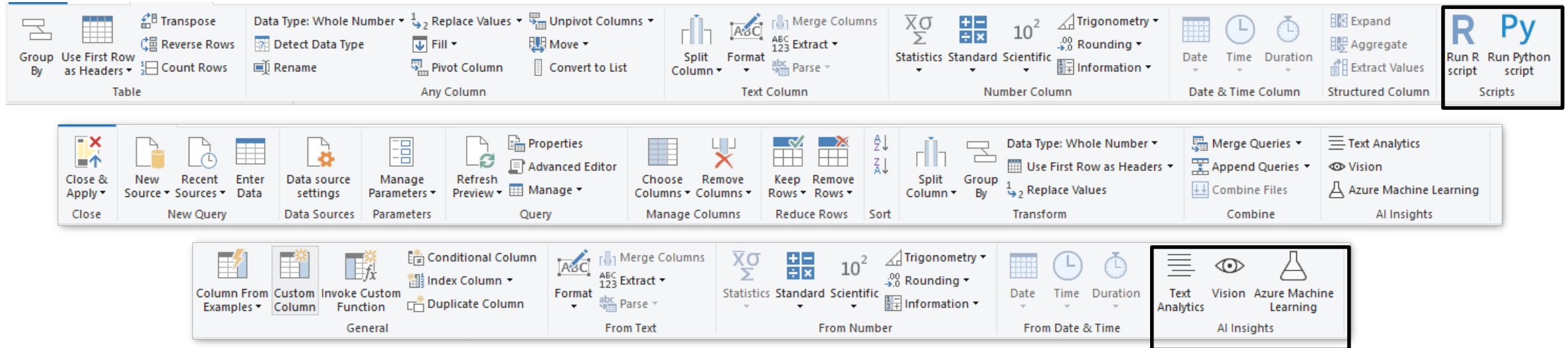
From files to databases to custom scripts...

File	Database	Power Platform	Azure	Online Service	Other
Excel	SQL Server database	Power BI datasets	Azure SQL database	SharePoint Online List	Web
Text/CSV	Access database	Power BI dataflows	Azure Synapse Analytics (SQL DW)	Microsoft Exchange Online	SharePoint list
XML	SQL Server Analysis Services database	Common Data Service	Azure Analysis Services database	Dynamics 365 (online)	OData Feed
JSON	Oracle database	Dataverse	Azure Database for PostgreSQL	Dynamics NAV	Active Directory
Folder	IBM Db2 database	Power Platform dataflow	Azure Blob Storage	Dynamics 365 Business Central	Microsoft Exchange
PDF	IBM Informix database (Beta)		Azure Table Storage	Dynamics 365 Business Central (on	Hadoop File (HDFS)
Parquet	IBM Netezza		Azure Cosmos DB	Microsoft Azure Consumption Insi	Spark
SharePoint folder	MySQL database		Azure Data Explorer (Kusto)	Azure DevOps (Boards only)	Hive LLAP
	PostgreSQL database		Azure Data Lake Storage Gen2	Azure DevOps Server (Boards only	R script
	Sybase database		Azure Data Lake Storage Gen1	Salesforce Objects	Python script
	Teradata database		Azure HDInsight (HDFS)	Salesforce Reports	ODBC
	SAP HANA database		Azure HDInsight Spark	Google Analytics	OLE DB
	SAP Business Warehouse Application Server		HDInsight Interactive Query	Adobe Analytics	Acterys : Model Automation & Plan
	SAP Business Warehouse Message Server		Azure Cost Management	appFigures (Beta)	Anaplan Connector (Beta)
	Amazon Redshift		Azure Databricks	Data.World - Get Dataset (Beta)	Solver
	Impala		Azure Time Series Insights (Beta)	GitHub (Beta)	Cherwell (Beta)



Power Query

Perform extract, transform, and load (ETL) workloads.

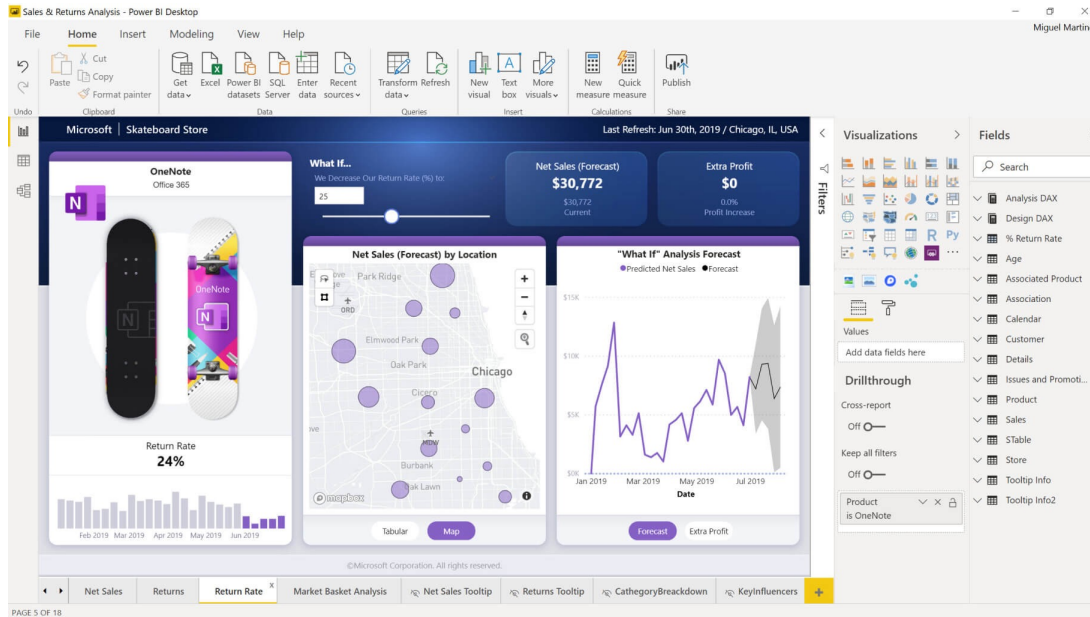


- Excel-like interactive experience for data manipulation or perform R/Python-like data manipulations.
- Each data manipulation step is tracked such that these steps can be refreshed in the future when the underlying data source is updated.
- Useful for processing large datasets and extract the necessary variables for visualization (reduced data size).



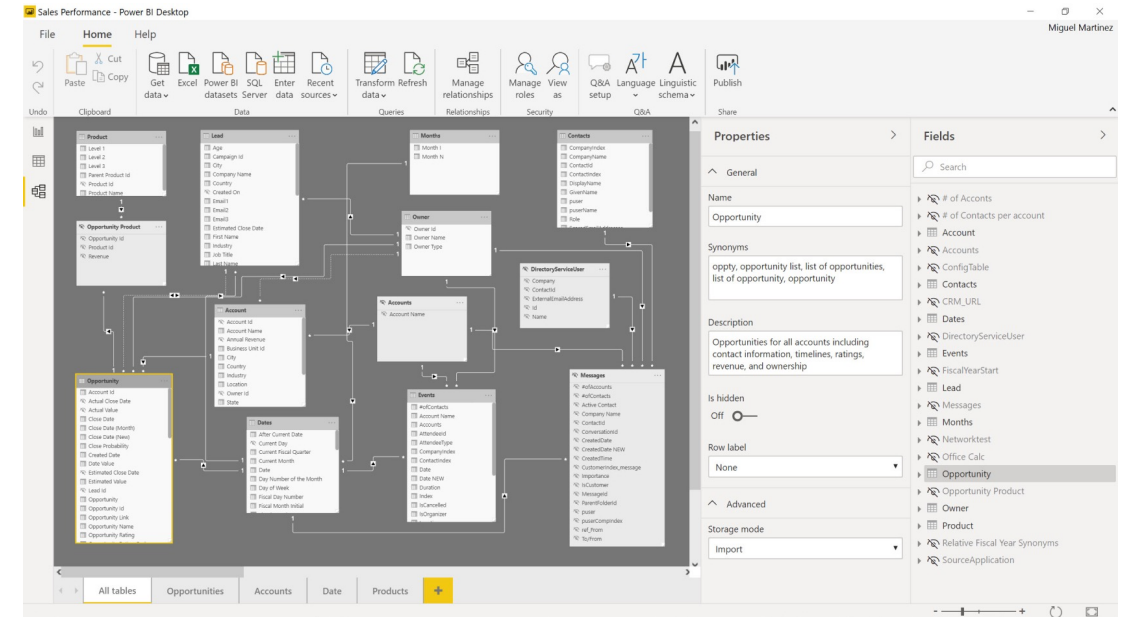
Power BI Desktop

<https://powerbi.microsoft.com/en-us/desktop/>



Visualization dashboard

- // Drag and drop visualizations/variables
- // Decide how variables are summarized in visualizations.
- // Add custom R/Python visuals or from AppSource



Data model

- // Create new columns and tables
- // Build relationships between tables from different data sources



COVID-19 Dashboard

Live Demo



Pros and Cons of Power BI

Too many pros and very little cons.

Pros

- // Affordability
 - // Power BI Pro (\$10 USD/month)
 - // Interactive dashboards linked to underlying data sources.
 - // Power BI Premium (\$20 USD/month)
 - // Advanced AI: Azure Machine Learning for big data
- // Custom visualizations (including R/Python)
- // Large number of available data sources
- // Power BI embedded
- // Personal Gateway (connect to on-premises data)

Cons

- // Power BI Desktop only available on Windows
- // Complex data manipulations can be challenging.
- // Not used for data entry
- // Handling large data volumes
 - // Depending on the data sources re-syncing with data source can be time-consuming
 - // Interactivity of dashboard will be slow if the underlying data model is large with many tables.



Conclusions

Is Microsoft Power BI the right choice for me?

- Does you/our organization use Microsoft resources? Power BI integrates with other Microsoft products (pull data from SharePoint and share dashboards through Teams)
- Are your databases constantly updating? Power BI refresh options allows for up-to-date dashboard visualizations.
- Are you displaying real-time analytics? Power BI integration with Azure Machine Learning allows visualizations of various ML outputs.
- Power BI is suited for both beginners and experts.

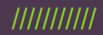
Open resources:

Power BI file: https://github.com/singha53/PODR/tree/master/sample_code/powerbi

PHUSE Open Data Repository: <https://github.com/phuse-org/PODR>



Thank you!



Bye-Bye

