Digital & Analytics – Power BI

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Power BI – Agenda

1. Power BI Introduction
2. Power BI Data Sources
3. Power BI Licensing
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5. Power BI Architecture
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    - Shared Datasets
    - Power BI Workspaces, Apps and Sharing
    - App Navigation
    - AI in Power BI
    - Power BI ML Models
7. Demo
8. Power BI Best Practices
9. Customer Story
10. Q&A

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Power BI – Introduction

Power BI is a business analytics service by Microsoft. It aims to provide interactive visualizations and business intelligence capabilities with an interface simple enough for end users to create, publish and share their own reports and dashboards.

Components	
Power BI Desktop	A desktop-based authoring tool of choice for connecting, transforming, and modeling data for creating interactive reports.
Power BI Service	A web-based service for collaboration, sharing, creation of dashboards, and additional functionality such as Q&A and alerts. Usually referred to as “Power BI Service” . Can be accessed by typing “PowerBI.com” or app.powerbi.com and logging in with suitable credentials.
Power BI Report Server	An alternative to the Power BI Service for deploying Power BI reports within an on-premises data center, as opposed to the cloud-based Power BI Service. Power BI Report Server requires a Power BI Premium license or SQL Enterprise with Software Assurance.
Power BI Report Builder	Power BI Report Builder is the latest companion application for authoring Power BI Paginated Reports. It is a free, standalone Windows Desktop application that can be downloaded from the Power BI site. Premium License is required to be able to publish the reports in Power BI service.
Power BI Mobile Apps	Native applications for iOS, Android, and Windows for viewing reports and dashboards from anywhere.
On-Premises Gateway	An agent installed within the corporate network to allow secure access to organizational data stored on-premises. There are two options: Enterprise, and Personal.

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Power BI Desktop Data Sources

Database

SQL Server Database
Access Database
SQL Server Analysis Services Database
Oracle Database
IBM DB2 Database
IBM Informix database (Beta)
IBM Netezza
MySQL Database
PostgreSQL Database
Sybase Database
Teradata Database
SAP HANA Database
SAP Business Warehouse Application Server
SAP Business Warehouse Message Server
Amazon Redshift
Impala
Google BigQuery
Vertica
Snowflake
Essbase
AtScale cubes (Beta)
BI Connector
Dremio
Exasol
Indexima (Beta)
InterSystems IRIS (Beta)
Jethro (Beta)
Kyligence Enterprise (Beta)
MarkLogic (Beta)

Power Platform

Power BI datasets
Power BI dataflows
Common Data Service
Power Platform dataflows (Beta)

Azure

Azure SQL Database
Azure SQL Data Warehouse
Azure Analysis Services database
Azure Blob Storage
Azure Table Storage
Azure Cosmos DB
Azure Data Lake Storage Gen2 (Beta)
Azure Data Lake Storage Gen1
Azure HDInsight (HDFS)
Azure HDInsight Spark
HDInsight Interactive Query
Azure Data Explorer (Kusto)
Azure Cost Management (Beta)

File

Excel
Text/CSV
XML
JSON
Folder
PDF
SharePoint Folder

Online Services

SharePoint Online List
Microsoft Exchange Online
Dynamics 365 (online)
Dynamics NAV
Dynamics 365 Business Central
Dynamics 365 Business Central (on-premises)
Microsoft Azure Consumption Insights (Beta)
Azure DevOps (Beta)
Azure DevOps Server (Beta)
Salesforce Objects
Salesforce Reports
Google Analytics
Adobe Analytics
appFigures (Beta)
Data.World - Get Dataset (Beta)
Facebook
GitHub (Beta)
MailChimp (Beta)
Marketo (Beta)
Mixpanel (Beta)
Planview Enterprise One - PRM (Beta)
Planview Projectplace (Beta)
QuickBooks Online (Beta)
Smartsheet
SparkPost (Beta)
Stripe (Beta)
SweetIQ (Beta)
Planview Enterprise One - CMT (Beta)
Twilio (Beta)
And more..

Other

Web
SharePoint List
OData Feed
Active Directory
Microsoft Exchange
Hadoop File (HDFS)
Spark
R Script
Python script
ODBC
OLE DB
BI360 - Budgeting & Financial Reporting (Beta)
Denado
Information Grid (Beta)
Paxata
QubolePresto (Beta)
Roamler (Beta)
SurveyMonkey (Beta)
Tenforce (Smart)List (Beta)
Workforce Dimensions (Beta)
Blank Query

https://docs.microsoft.com/en-us/power-bi/desktop-data-sources
https://docs.microsoft.com/en-us/power-bi/desktop-directquery-data-sources

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Power BI – modes of connection

Method of Connecting Data	Advantages	Disadvantages
Import Data	Enables data integration and modelling in the form of Power Query ▪ Supports all Power BI data source types ▪ Supports entire DAX functionality, including calculated tables ▪ Supports Q&A ▪ Supports Quick Insights Fastest Method : Data loaded into the memory of the server and report queries will be evaluated from the data loaded into the memory; No lags or Slowness.	**Size Limitation:** Service imposes a maximum model size ▪ Generally 1GB ▪ Can upload up to 3/6/10GB with Power BI Premium P1/2/3 license, which can increase in size with data refresh up to 12GB (for P3) – this limit is planned to be removed in the future ▪ Model requires periodic data refresh ▪ Data refresh reloads the entire table (no partitioning) ▪ Power BI Premium provides incremental refresh (in preview)
Direct Query	**Scalability :** Import model maximum sizes do not apply ▪ Enables reporting over large volumes of data ▪ Does not require data refresh ▪ Delivers near real-time data to reports ▪ Great for "what-if" analysis, writing changes to the data source ▪ Dashboard tiles automatically update automatically (15 minutes – 1 week)	**Limited Functionality:** 1M row retrieval limit ▪ Model queries (M) cannot be overly complex ▪ Limited DAX function support, especially for measure and Time Intelligence expressions ▪ No calculated tables ▪ No Q&A or Quick Insights ▪ Can be slow ▪ Can negatively impact data source performance ▪ Can deliver inconsistent results (especially over volatile data sources)
Live Connection	Exploits existing data assets—helps to deliver a single version of the truth ▪ Allows connecting to the base model, or a perspective ▪ The user's identity is passed through to enforce role permissions ▪ Measures (DAX) can be added to the report (for tabular models only) ▪ For Power BI datasets, separates model development from report development ▪ Dashboard tiles automatically update automatically (15 minutes – 1 week) ▪ SSAS Tabular – give DAX and Multi-Dimensional – give MDX;	**No Power Query :** It will not even have Power Query simple transformation; **Report Level Measures : Supported by SQL Server 2012 SP1 CU4, or later versions .**With SSAS Tabular Live connection ONLY, you get report level measures. which gives you the ability to write DAX measures. However, you might want to keep them in the data source to keep your model consistent. Report Level Measures are a great feature because users can create measures without the need to call BI developer to do that. However, these measures will not be added to the data set. These are just for the report. So for consistency of your model, you might want to keep measures creation to be part of your SSAS data source model.

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Power BI – Licensing Options

Power BI Free

- Power BI Desktop can be explored by any individual. No license required
- Office 365 E3 license includes a free Power BI license.
- Free license includes free publishing to an individuals ‘My Workspace’
- Free users can view content in their ‘My Workspace’ on Power BI service and mobile.
- Free users can view content published on Premium assigned workspaces (Apps, dashboards, reports and embedded views)

Power BI Pro

- Power BI pro users are Power Champions. They are able to create ‘App Workspaces’ where teams can store Power BI content
- PBI Champions are administrators of team App Workspaces and manage user rights (Admin/Contributor/Member or Viewer.
- PBI Champions publish content from desktop into team workspaces and manage data refreshes.
- PBI champions can bundle and publish dashboards and reports as PBI Apps.

Power BI Premium

- Power BI Premium is virtual cores allocated to your company within your Azure subscription
- Premium capacity allows for free users to view Pro content.
- Premium offers much more functionality within Power BI, i.e. Incremental refreshes, AI, AutoML, embedding, Paginated reports and Enhanced Dataflows.
- Power BI service Admins manages Premium Capacity admins and assignment users.
- Microsoft offers three sizes for Premium capacity—P1, P2, and P3. Each comes with a different number of v-cores and memory size.

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Power BI – Azure Data & Analytics Integration

Source	Description
Desktop Data Sources	Power BI Desktop allows connection to a number of Azure Data Sources – like Azure SQL Database, Azure SQL Data Warehouse, Azure HD Insight, Azure Blob Storage, Azure Analysis Services etc. (listed in slide 7)
Service Data Sources (Apps)	Microsoft allows publishing of some data sources as Apps available in the Service Portal. They can be Marketplace apps or Organizational Apps. Examples of Marketplace Apps are Azure Search, Azure Log Analytics. Azure Application Insights etc. (https://appsource.microsoft.com/en-us/marketplace/apps?page=1&product=power-bi)
Stream Analytics	Power BI Can be configured as one of the outputs from Stream Analytics. The dataset is available in Power BI as streaming dataset and cannot be connected from Power BI Desktop.
HD Insight	Microsoft Power BI Desktop connects to Azure HDInsight using ODBC and visualize Apache Hive data.First we need to create connector using Microsoft Hive ODBC Driver. This can then be used to connect to Hive tables in HDInsight. https://docs.microsoft.com/en-us/azure/hdinsight/hadoop/apache-hadoop-connect-hive-power-bi
Azure Data Bricks	Power BI comes with a built in Spark connector which allows us to connect to our clusters in Databricks. In order to connect to your clusters, you will need to generate a personal access token in Databricks. https://azure.microsoft.com/en-us/blog/structured-streaming-with-databricks-into-power-bi-cosmos-db/
Cosmos DB	Connector directly available in Custom connectors. Data is received as records which need to be expanded and columns required are selected in Power Query editor. https://docs.microsoft.com/en-us/azure/cosmos-db/powerbi-visualize
Azure Data Factory	Azure Data Factory can refresh Power BI datasets using Logic Apps Apps connectors.(quite complicated) https://www.mssqltips.com/sqlservertip/5976/refresh-power-bi-dataset-from-azure-data-factory--part-1/. Power BI can also be used to monitor Data Factory pipelines using Data Factory API https://github.com/gbrueckl/Azure.DataFactory.PowerBIMonitor

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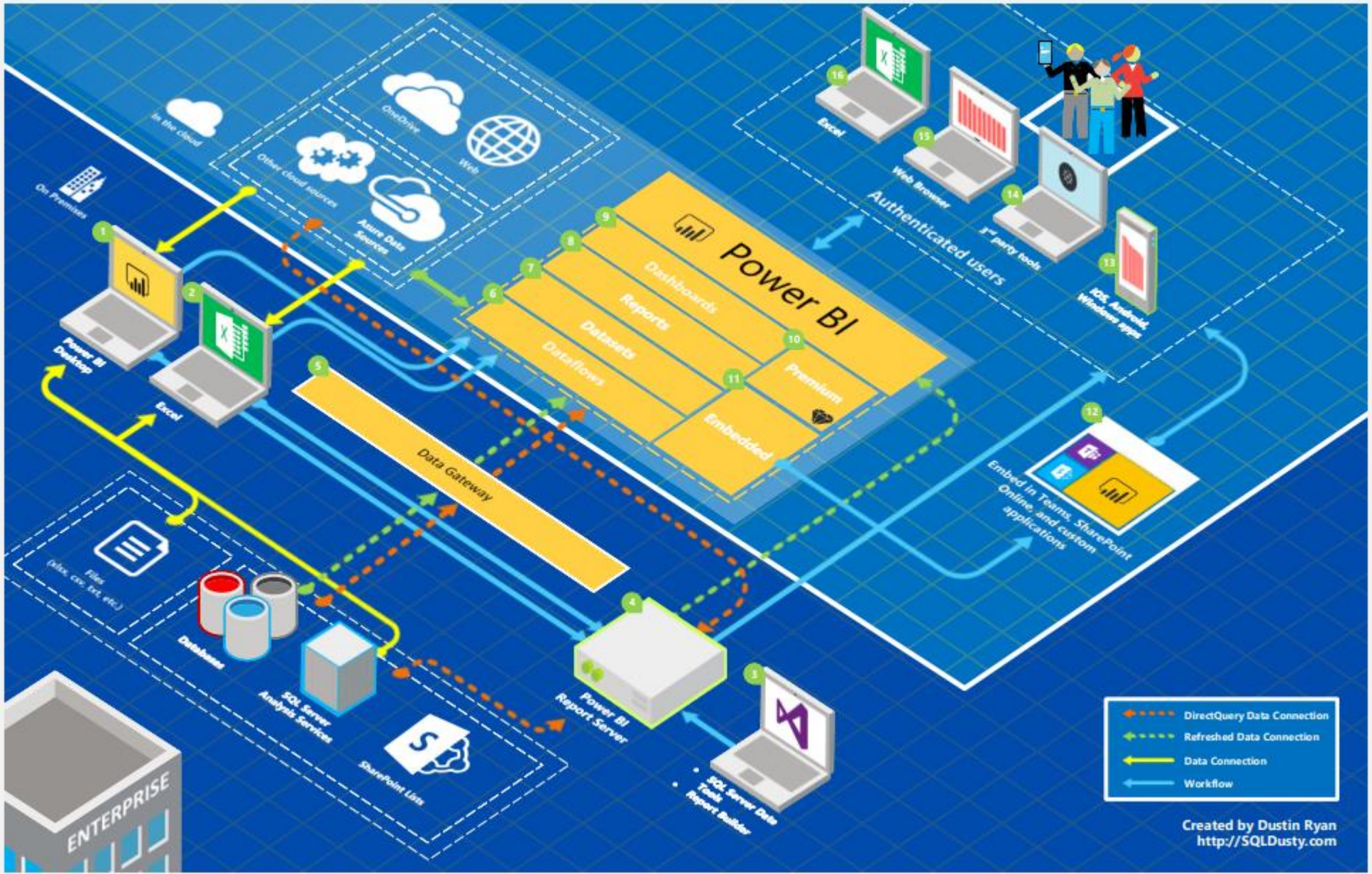
Power BI Architecture



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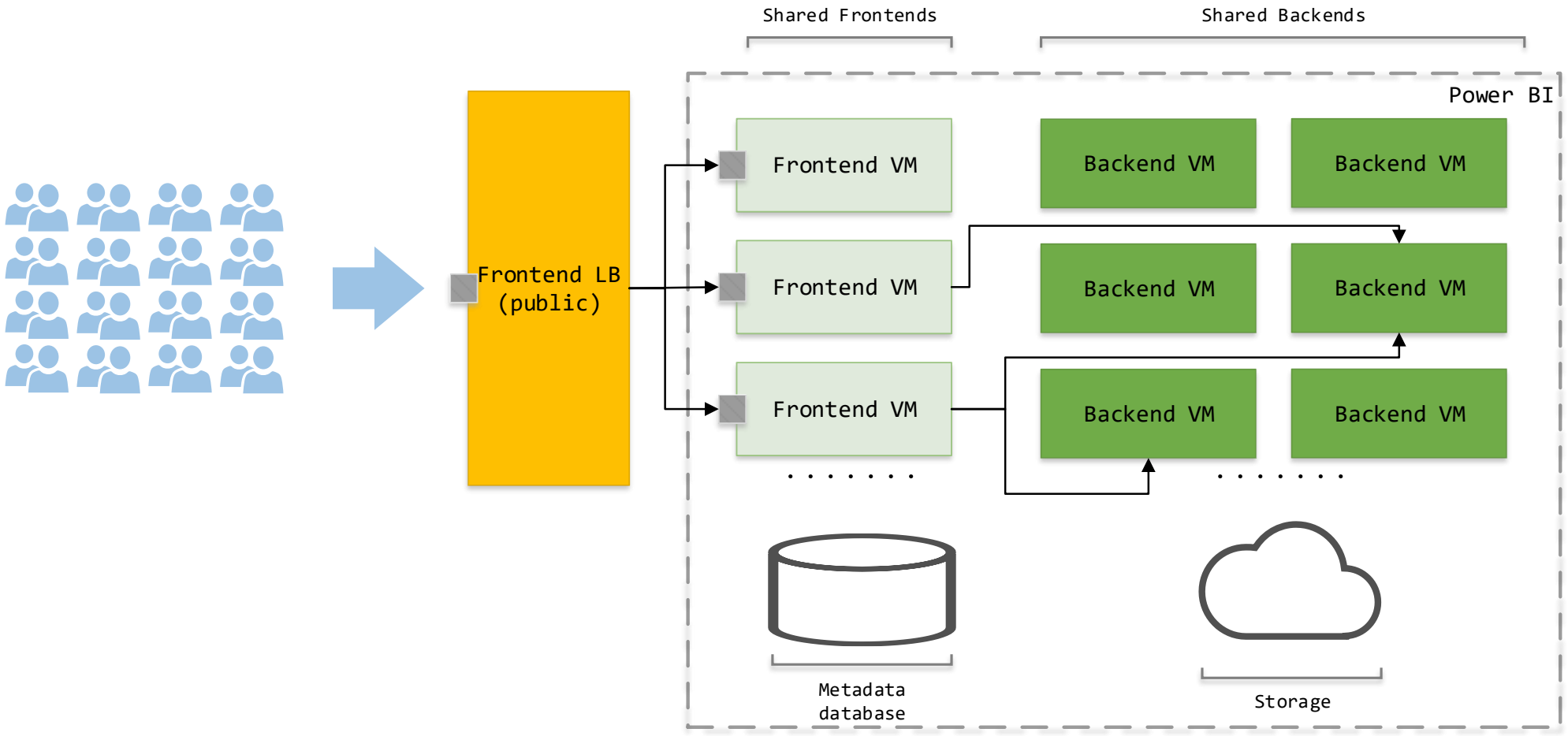
Architecture - Shared Power BI



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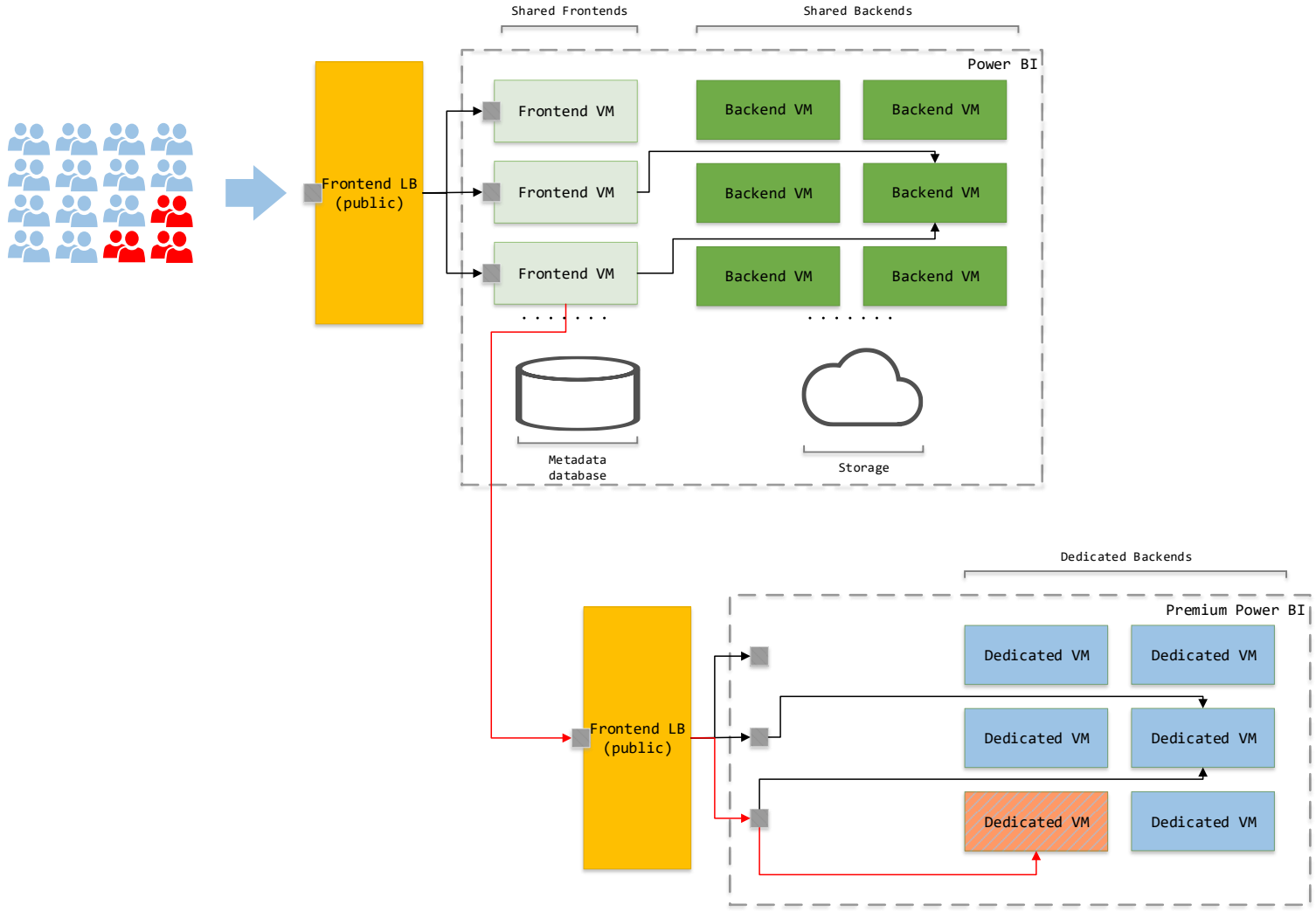
Architecture - Premium Power BI



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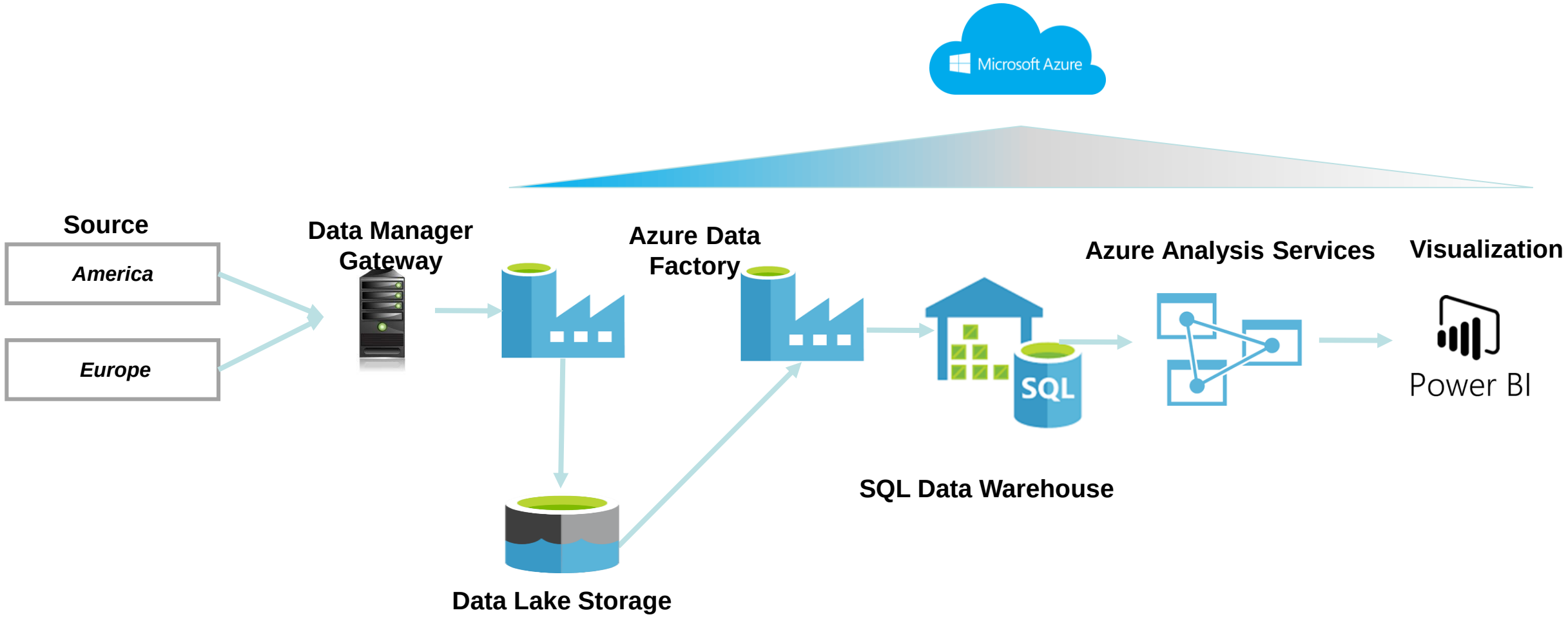
Sample Enterprise Datawarehouse & Power BI Architecture



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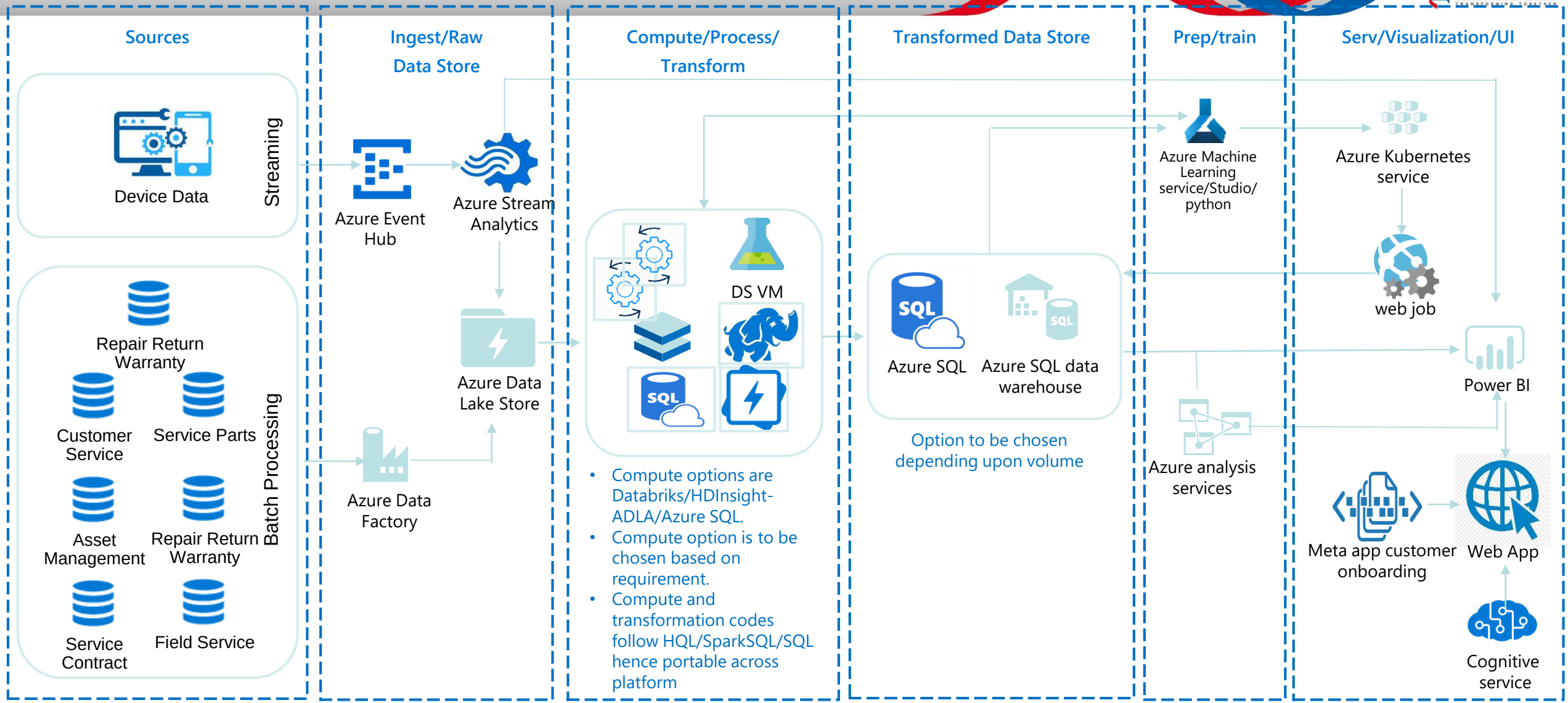
Sample Architecture – Services



1) Data lineage through ADF pipeline 2) Security though Azure Active directory 3) Deployment and multi-tenancy through Azure Resource Manager Template

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Power BI – New Features

Feature	Functionality
Book Marks	Bookmarks enable configuring specific Actions and enable the report navigation from single page.
Sync Slicers	Sync Slicers enable design of slicers on a single page and sync values across all pages. This prevents both time and space in selecting slicers on each page of the report.
Cross Report Drill Through	Power BI now enables Drill Through from one report to another.
Power BI Apps	Power BI Service Apps now allow New App Navigation functionality using Navigation Builder. Users can Group and Reorder Items, Provide external links like Trainings and also embed related content in the Content Area.
Power BI Template Apps	Template apps are a replacement for the current service content packs. Template apps enable Power BI partners to build Power BI apps with little or no coding, and deploy them to any Power BI customer. Permissions are required to create and publish Template apps. https://docs.microsoft.com/en-us/azure/marketplace/partner-center-portal/create-account https://docs.microsoft.com/en-us/power-bi/service-admin-portal#template-apps-settings https://docs.microsoft.com/en-us/power-bi/service-template-apps-overview
Power BI Dataflows	Power BI Dataflows is a Power Query based self service data preparation and storing functionality which enables single source for multiple reporting needs. They can be prepared inside Service workspaces (other than My Workspace) and enable combining data from multiple sources. Data refresh can be scheduled at a single place. Reports can refer to the workflows as Data Source inside Power BI Desktop.

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Power BI – New Features contd..

Feature	Functionality
Automated ML, Cognitive Services and Azure ML on dataflows	Power BI Data Flows in Premium capacity now have Automated Insights, Auto ML Integration, Cognitive Capabilities, Data Science and Azure ML Integration. These automate most of the standard machine learning practices in a non-intrusive yet transparent way.AI in Power BI is not only about achieving great accuracy but about easy translating this accuracy to business impact.
Power Platform Integration	PowerApps visual in Power BI - Power Apps is now shipping as Custom Visual in Power BI which allows writing custom code and even enables updating of the underlying data and instant refresh in case of Direct Query datasets.
	Power BI Tiles in Flow and PowerApps – Respond to Alerts Add Rows to a streaming Dataset Execute DAX Commands Refreshing Datasets (via a custom Connector) Initiate Dataset refresh (via a custom Connector) Automating Power BI Admin Tasks (via a custom Connector)

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Power BI dataflows

Common Data Preparation problems

- **Finding** & **Connecting** to data is too difficult.
- Experiences for data connectivity are too fragmented.
- Data often needs to be **reshaped** before consumption.
- Any shaping is one-off and not **repeatable.**
- Combining data from multiple sources is difficult.
- Volume, Velocity & Variety

Dataflows help in countering these issues by bringing self-service data preparation capabilities into the Power BI online service, and significantly expanding the capabilities in the following ways:

- Power Query available as **web-based self service data prep experience**
- Supports the same set of **300+ transformations** as desktop Power Query (M Engine parity level)
- Currently **~45 connectors**, including cloud & on-prem data sources via the **On-premises data gateway**
- **Use the Power of the cloud to process Large data volumes within Power BI**
- **Leverage the compute of Power BI to transform data easily and quickly**
- **Advanced Analytics and AI with Azure**
- **Support for the Common Data Model**

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Power BI dataflows “FAQ”

- A new capability for self-service data preparation in Power BI
- Delivered in a familiar Power Query experience
- Built on the foundation of Azure Data Lake Storage gen2
- Utilize the CDM folder format for data storage & enable mapping to CDM
- A tool for business users to drive data reuse without requiring IT involvement
- Enable Excel-like data lineage and orchestration

- NOT a replacement for datasets
- NOT a replacement for a data warehouse
- NOT a replacement for Azure Data Factory or SSIS
- NOT a Premium-only feature
- NOT an additional cost or fee
- NOT spelled with a space or any capital letters

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Power BI dataflows – feature comparison

Feature	Pro	Premium
Create dataflows	✓	✓
Connect to dataflows from power bi desktop	✓	✓
Work with on prem and cloud sources	✓	✓
Use ADLS Gen 2 instead of built in storage	✓	✓
Use External CDM folders	✓	✓
Use linked entities (link to other dataflows)		✓
Use computed entities (link to other dataflows and compute over it)		✓
Enhanced compute engine for faster ETL		✓
Direct Query over dataflows		✓
Automated ML and Cognitive Services		✓

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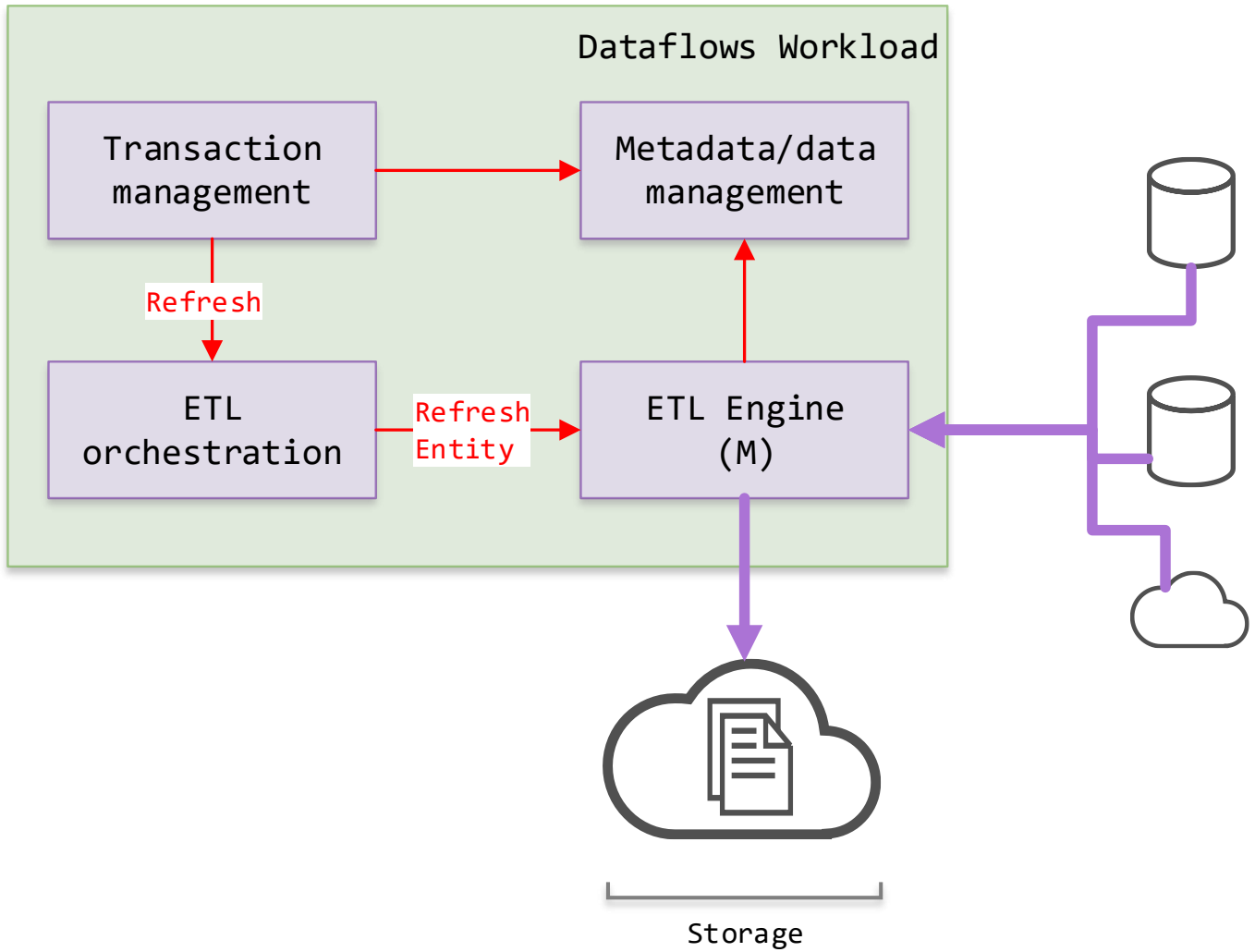
Current Dataflows Engine (GA)



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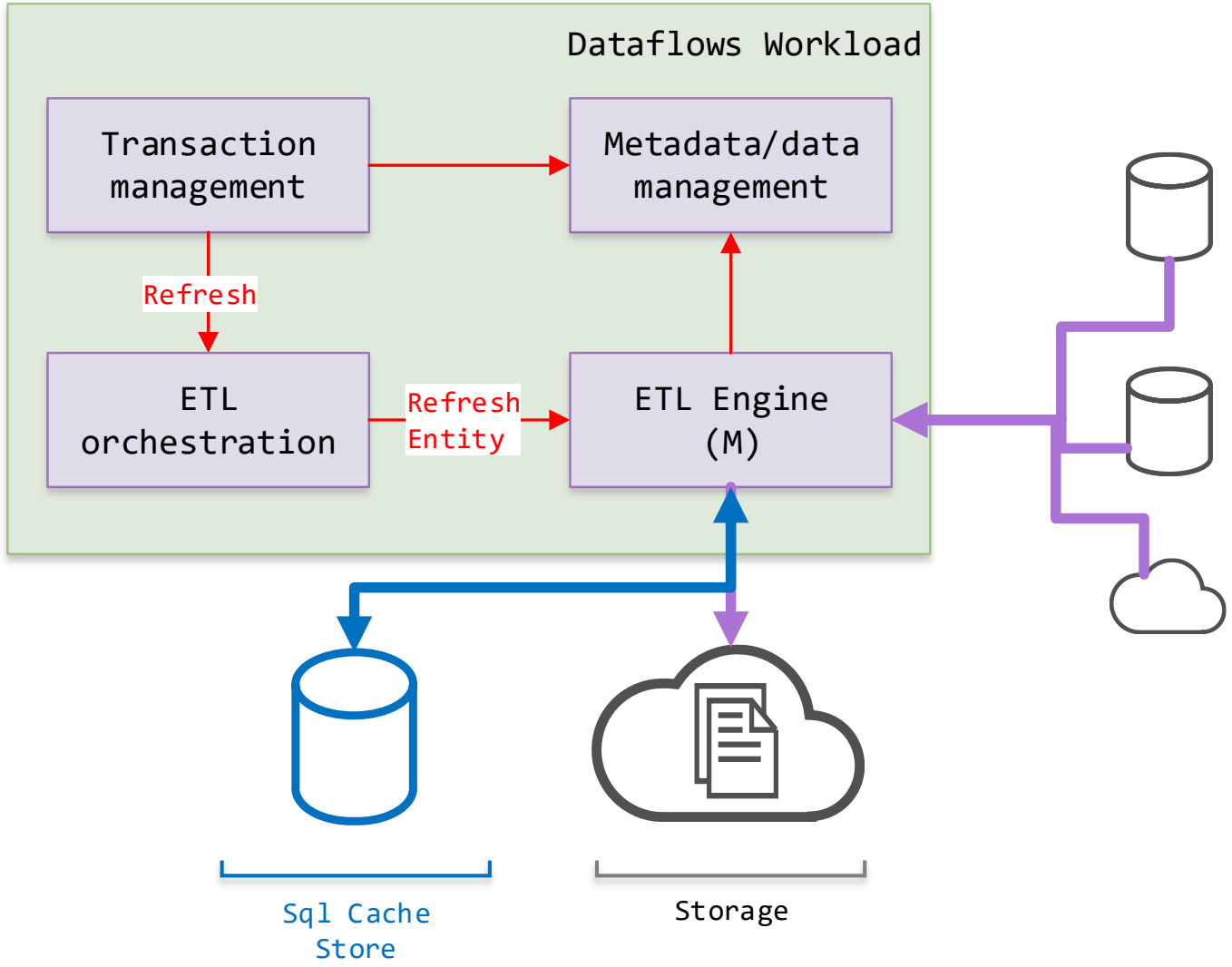
Enhanced Dataflows Compute Engine (Preview)



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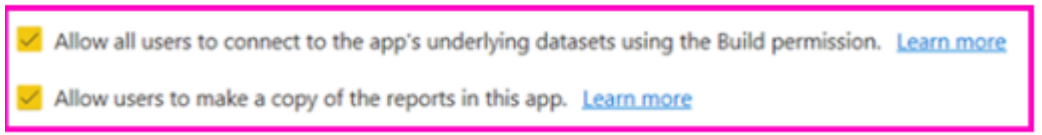
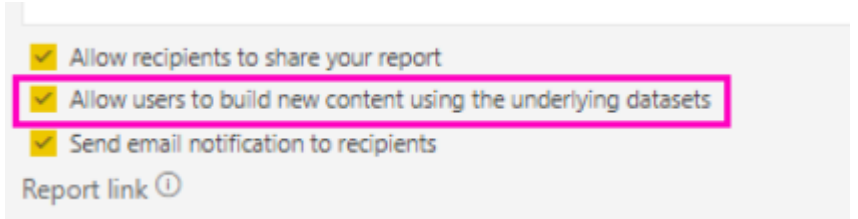
Power BI Shared Datasets

- To connect to a shared dataset in Power BI Desktop requires a Pro license or the dataset must be in a Premium capacity.
- Reuse the same dataset across many workspaces and apps.
- Save reports to any workspace.
- **Copy** reports between workspaces and keep them **connected to the original dataset**.
- **Reuse** the same dataset with **many apps**, and allow **personalization** of app reports.
- Certify datasets as Promoted or Certified.
- Power BI admin can **control** who can **certify** datasets in their organization
- Manage proper permissions in a consolidated way.
- Build Permission allows a user to create new content that connects to the dataset.
- Read permission allows users to consume existing content build on the dataset.





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Power BI Apps

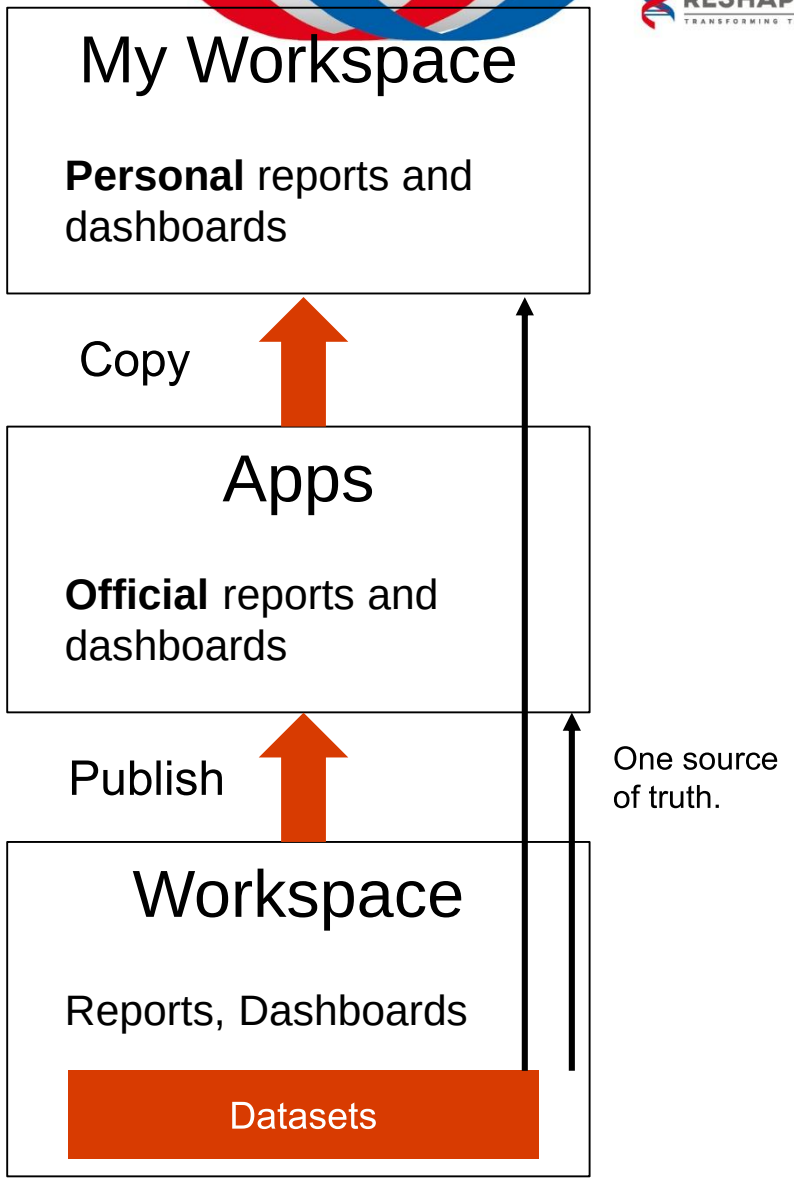
Apps make it easy distribute official content

- Many reports, dashboards, datasets, etc.
- Single package, easy to install
- Data sets are common, and reused
- Single access pane & request access
- Automatically install apps for users who need them
- **Save a copy** of App reports and dashboards
- Add **custom navigation** and **support** experiences

Content packs are deprecated - Tell customers to stop and not use them. The Marketplace content packs are now available as Apps and can be accessed as below -
Power BI Service Get Data-> Apps
OR Click on Apps folder in Power BI Service Menu-> Click on Get Apps -> Apps

Power BI Service has a long list of published Apps apart from organizational Apps- like **Azure Application Insights, Log Analytics, Azure Search** and many more. Organizations who have partnered with Microsoft can publish Template Apps and allow external users to connect to data in various ways.

https://appsource.microsoft.com/en-us/marketplace/apps?page=1&product=power-bi



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What's new in Power BI apps

Navigation builder

Customize app name

Customize app icon

Improved color palette

New information pane

Support site URL

Embed in content area for hybrid BI across multiple assets

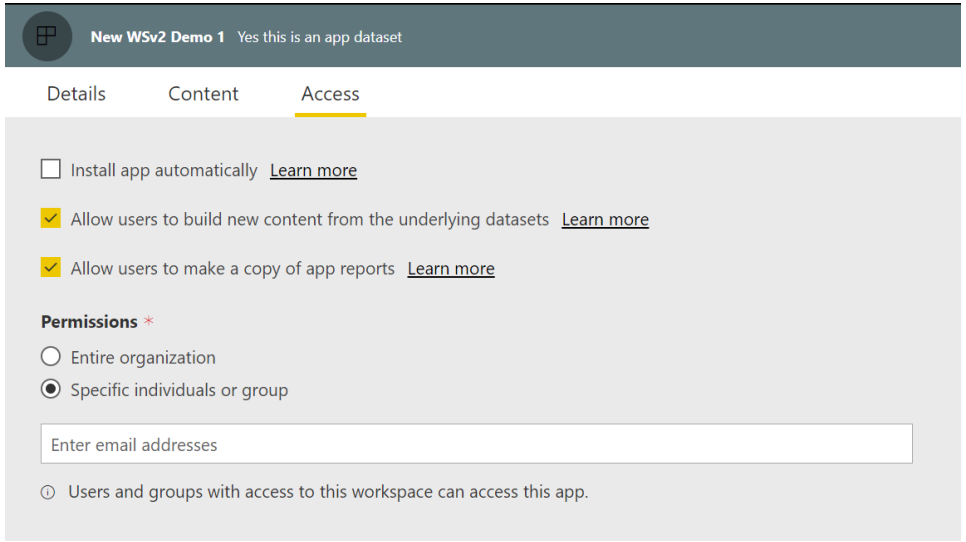
Allow users to build new reports from app datasets

App report personalization

Save a copy of app report allows users to personalize content to meet their unique needs

How saving a copy works -

- App Author enables the option during app publishing or update
- App User can Save As when they view a report within the app
- Reports are saved to the user's My Workspace



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AI in Power BI

End users	Analysts	BI Professionals	Data Scientists
Natural Language exploration	**AI Enrichment**	**Generate ML models in clicks**	**Pro Data Science integration**	**Azure ML integration**
Automated Insights	**One-click AI transformations**	**Turnkey model deployments**		
CAPABILITIES	**CAPABILITIES**	**CAPABILITIES**	**LANGUAGES**	**INTEGRATION**
• Quick Insights • Q&A • AI Visualizations	• Sentiment analysis • Key phrase extraction • Image Detection	• Predictions • Classifications • Regression • Forecasting	• R • Python	• Azure ML • Azure Frameworks
Insights	**Enrichment**	**Automated ML**	**Data Science Extensibility**	**Azure Extensibility**

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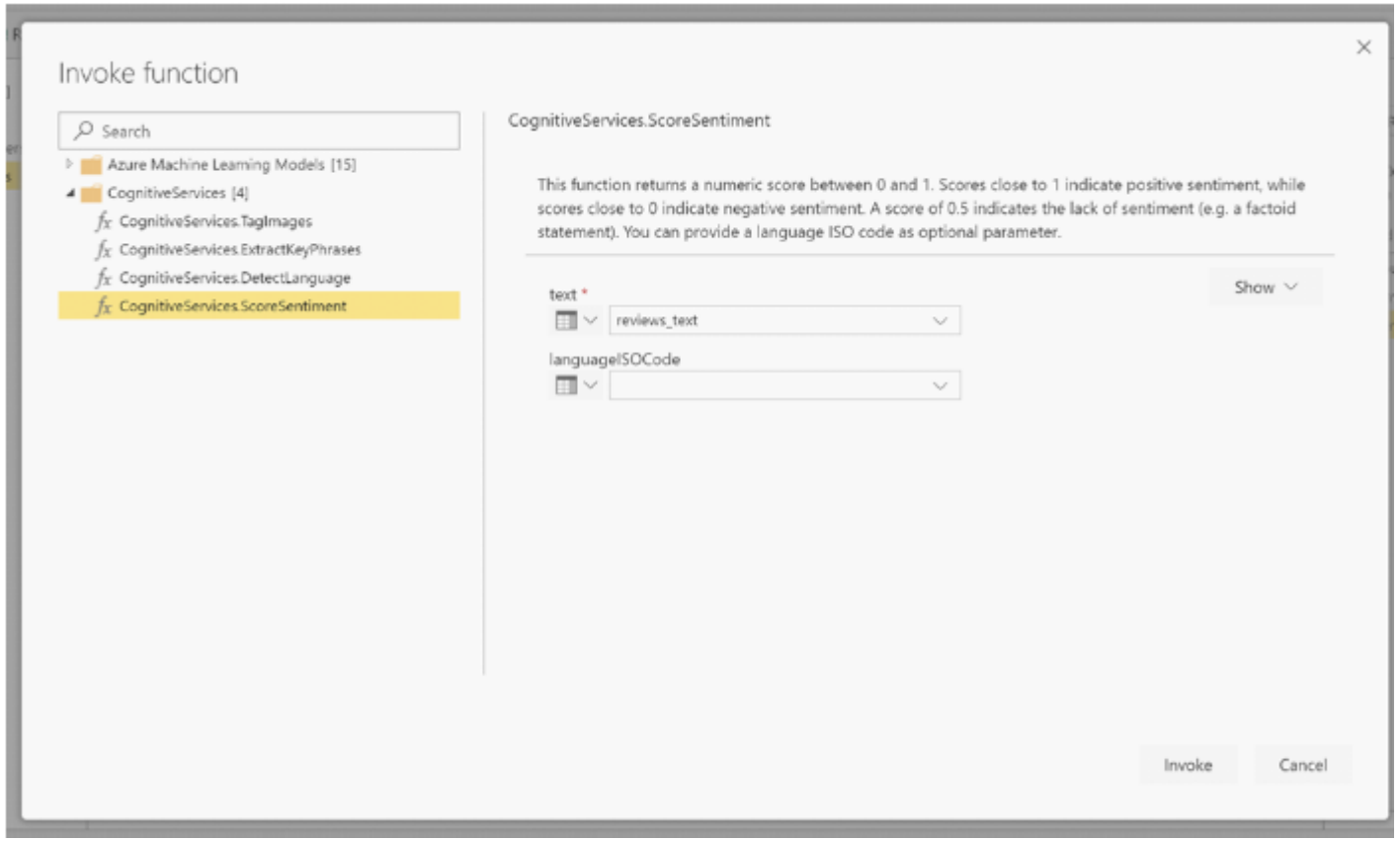
Power BI – AI (Cognitive Services)

Below are the steps for deriving Cognitive insights from data stored in Dataflows with Premium Capacity –

- Click on **edit Entity Action**.
- Next select the **AI Insights button**, which presents the Dialog Box as shown.
- Select the **Cognitive Services - > function** you want to use and the **data field** you want to transform from the dropdown. In this example, we are scoring the **sentiment** of a column that contains review text.
- **Cultureinfo** is an optional input to specify the language of the text. This field is expecting an ISO code
- Next, select **Invoke**. After invoking the function, the result is added as a new column to the table. The **Cognitive transformation** is also added as an **applied step** in the query.

If the function returns multiple output fields, invoking the function adds a new column with a record of the multiple output fields.

Use the expand option to add one or both values as columns to your data.



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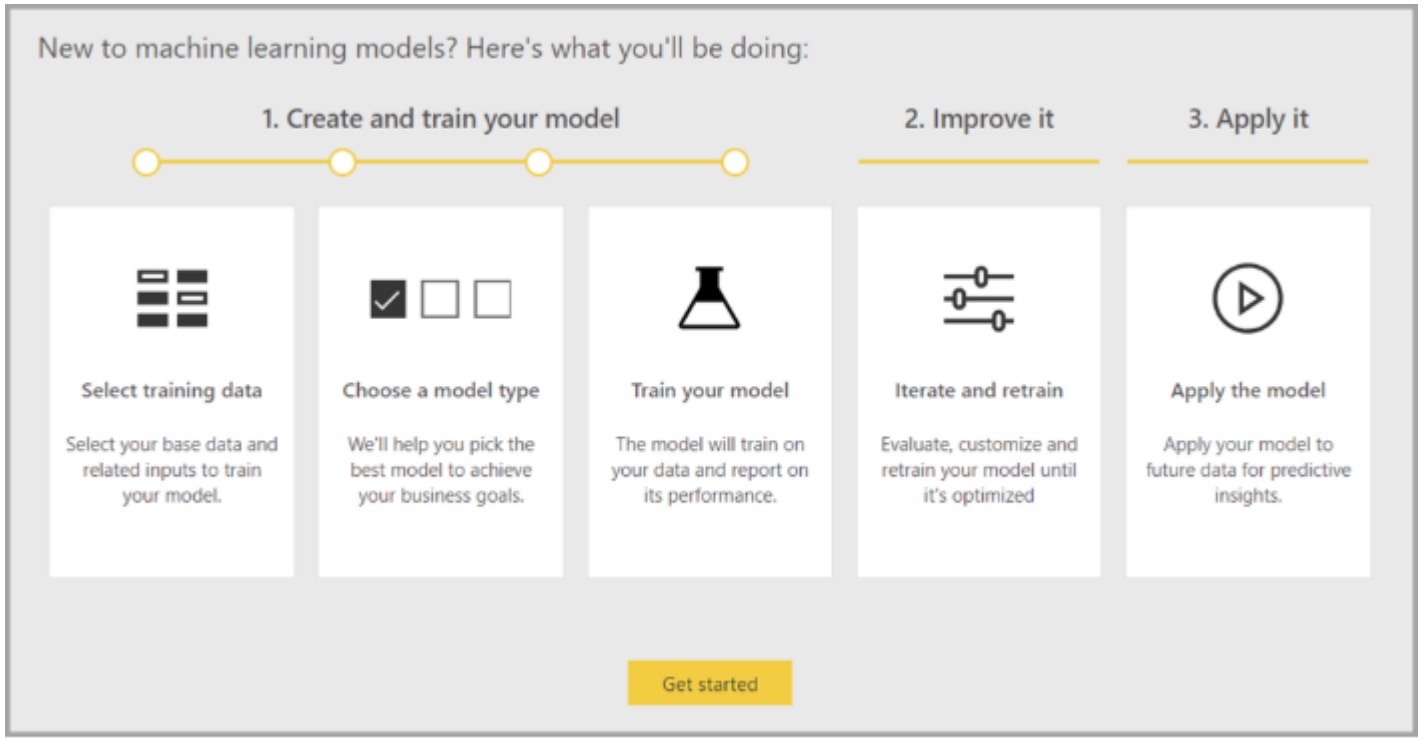
Power BI – Auto ML (Preview)

Automated machine learning (AutoML) for dataflows enables business analysts to train, validate and invoke **Machine Learning models** directly in Power BI.
Automated machine learning is available for dataflows that are hosted on **Power BI Premium** and Embedded capacities only.
AutoML supports the creation of **Binary Prediction, Classification, and Regression models** for dataflows. These are types of **supervised** machine learning models.

In the current release, Power BI uses data from only a single entity to train the ML model.
To create an AutoML model, select the **ML icon in the Actions** column of the dataflow entity with the historical data, and select **Add a machine learning model**. The wizard that guides you through the process of creating the ML model. The wizard includes the following simple steps.

- Select the entity with the historical outcome data, and the field for which you want a prediction.
- Choose a model type based on the type of prediction you'd like to see.
- Select the inputs you want the model to use as predictive signals.
- Name your model and save your configuration.

After an ML model is trained, AutoML automatically generates a Power BI report that explains the likely performance of your ML model.
Different models generate different output columns which can be integrated in the Power BI Report.



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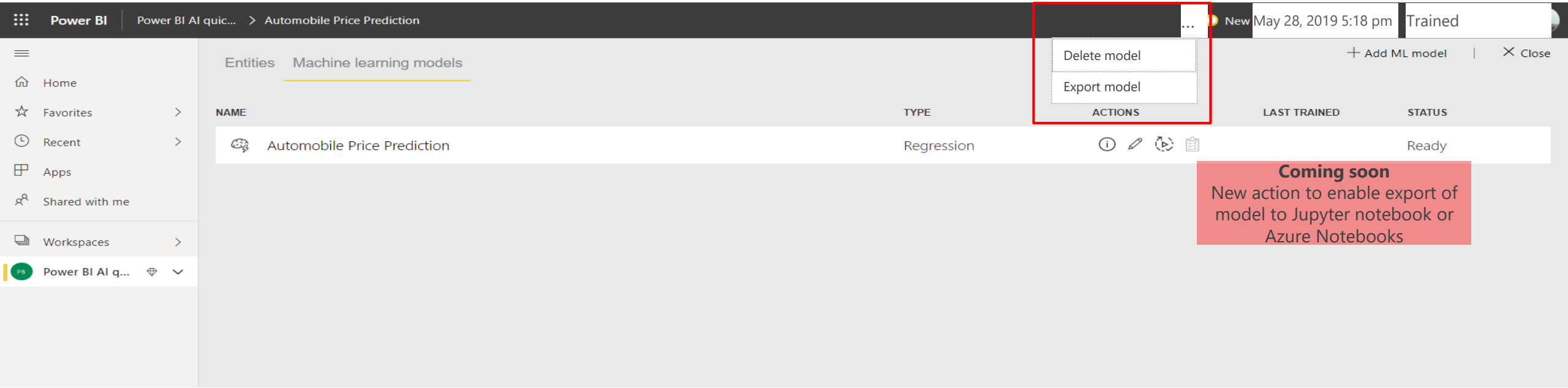
Power BI – Azure ML Models



Machine Learning Models created in Azure Machine Learning Services or ML Studio can be invoked in Power BI.
The data scientist needs to grant access to the Azure ML model to the BI analyst using the Azure portal. Then, at the start of each session, Power Query discovers all the Azure ML models to which the user has access and exposes them as dynamic Power Query functions. The user can then invoke those functions by accessing them from the ribbon in Power Query Editor, or by invoking the M function directly as is done in the Cognitive Services.

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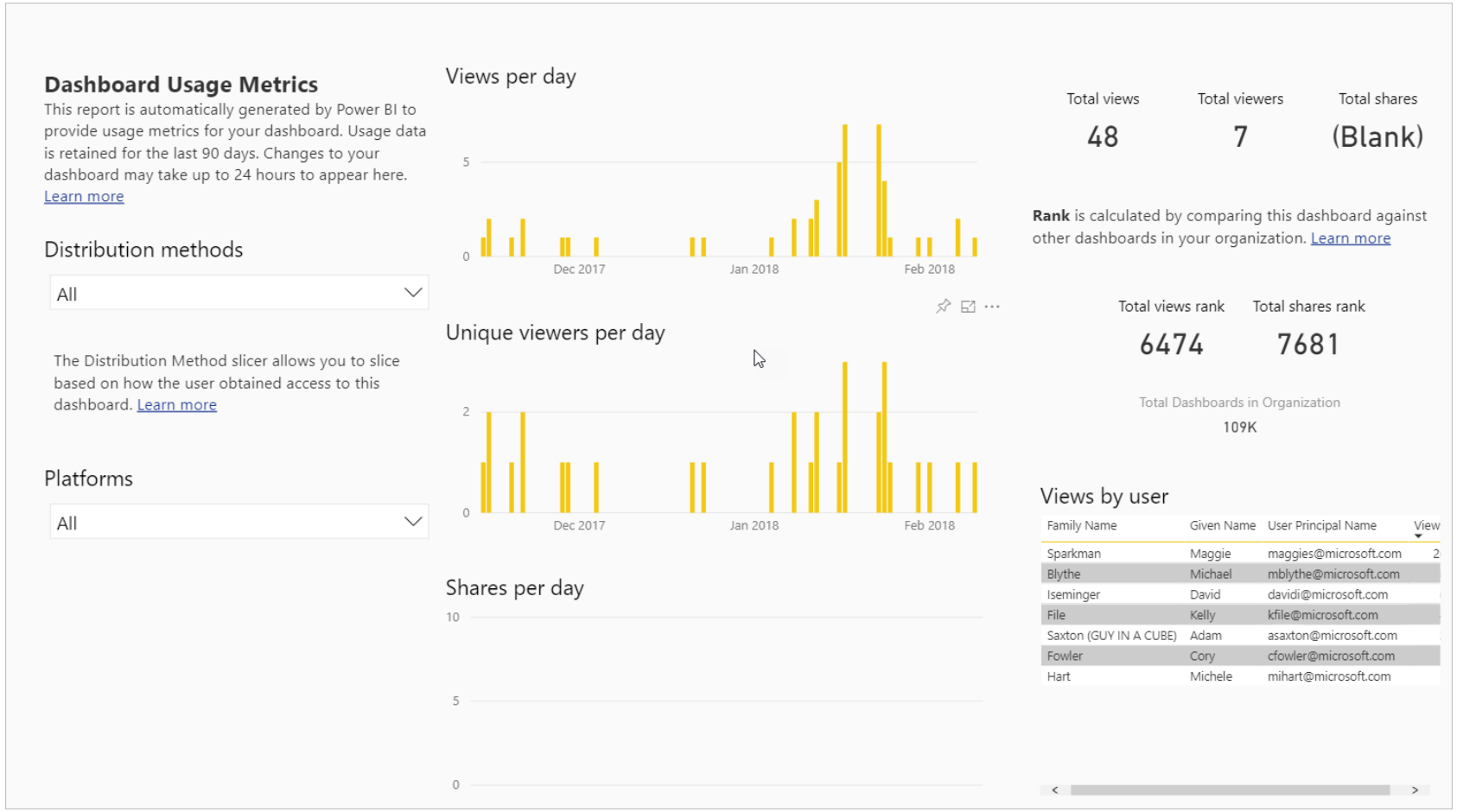
Monitoring - Usage Metrics

- Ability to see usage of individual dashboards and reports
- May differ from audit log numbers due to how it is collected
- Can work with underlying dataset

Usage Metrics are also available for entire tenant but can be accessed by users who are Global Admins in Office 365 or have been assigned the Power BI service administrator role. This consists of 2 sections – first usage data for individual users, and the second section has similar information for groups in your organization.



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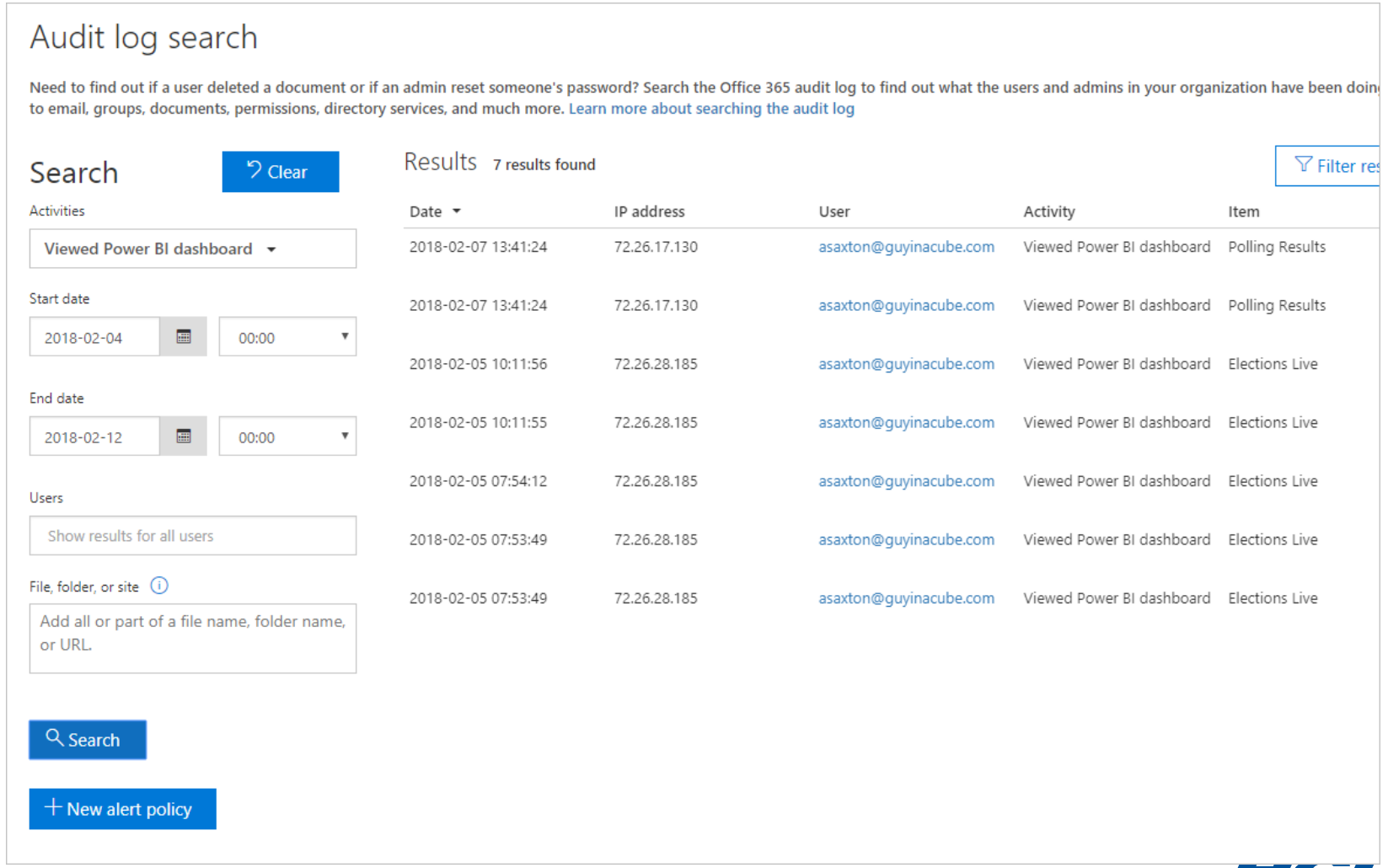
Monitoring - Audit logs

- Requires Exchange Online license.
- Navigate to Admin Portal-> Audit Logs-> Office 365 Admin Center
- On the Audit log search page, under Search, select the drop-down for Activities.
- Select Power BI activities
- Disabled by default
- Can use data to understand usage in Power BI Tenant
- Data is retained for 90 days
- In-Region Auditing
- PowerShell access
- Available as Marketplace App in the Power BI Service.



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Some Power BI Best Practices

- **Managing Authorship and Publish :** Power BI Admin Portal provides settings for Workspace, Export and Sharing and App Settings. Managing Report Authorship Controls over who builds reports, where these reports are published, and how many reports are published, are essential to avoid thorny issues like lot of duplicate reports and datasets , difficulty when the underlying datasets are changed, Data Size limits in Pro and Even in Premium subscriptions.
- Though it is not ideal to limit users from creating new reports, it is important to ensure that:
  i. All report authors are properly trained.
  ii. Report authors follow your organization‘s documented best practices and standards when building reports.
  iii. Duplicate reports and datasets are avoided.
  iv. Reports always have owners who are responsible for maintaining them, and answering questions, after they have been published.
  v. Version Control for reports with version control systems such as Git, Microsoft Team Foundation Server (TFS) or Visual Studio Team Services (VSTS) can be used for avoiding copies of the same report. Power BI template files (.pbit files) instead of .pbix files can be used which makes them much smaller in size.
- **Monitoring Usage -** is useful for a variety of other reasons apart from compliance, for example:
  i. To see which users are making frequent use of Power BI and which users are not.
  ii. To identify the most commonly used sources of data. Frequently a Corporate BI environment can be improved upon by learning what is occurring via Self-Service BI initiatives.
  iii. To determine which workspaces should be assigned to Power BI Premium capacity to improve performance or to avoid limits on dataset size.
  iv. To look for suspicious usage patterns that indicate a user is exporting data for unauthorized purposes.
  v. To identify what type of devices are being used to view reports.
  vi. To become aware of errors being experienced by users. This is particularly true for assisting with data refresh issues.

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Power BI Data Storage Best Practices

- Only use real-time streaming datasets if:
  i. You need near real-time data to be displayed as soon as it is generated, and
  ii. You are using a service such as Azure Stream Analytics or a custom application that can deliver data through the API to Power BI
- Only use Direct Query if:
  i. Your data needs to be refreshed more quickly than it can feasibly be loaded into a Power BI imported dataset or an Analysis Services database, or
  ii. Regulatory concerns mean that your data cannot be stored in a Power BI imported dataset or an Analysis Services database, or
  iii. Your data volumes are so large that the data you need cannot be loaded into a Power BI imported dataset or an Analysis Services database, and
  iv. Your dataset is simple, consisting of relatively few tables and relationships, and
  v. You are using very few DAX measures or calculated columns in your reports, and
- Use Live Connections to Analysis Services if:
  i. You already have all the data you need in Analysis Services cubes
  ii. Row-level security is required but managing RLS within individual Power BI datasets would introduce too much management overhead, and
  iii. You have the resources in-house to support an instance of Analysis Services, and
  iv. Your end users already use, or wish to use, Analysis Services with other tools such as Reporting Services or Excel, and
  v. You need a great degree of control over processing, monitoring, fault tolerance and other architectural features

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Power BI Data Storage Best Practices contd..

- Consider Azure Analysis Services over on-premises Analysis Services if:
  i. Some or all of your data sources already reside in the cloud, and
  ii. Testing shows that the latency involved with using data from an on-premises instance of
  iii. Analysis Services through the On-Premises Gateway in a Power BI report has a noticeable effect on report performance, and
  iv. You have no legal requirements to store data on-premises, and
  v. You do not already have an on-premises instance of Analysis Services (or you purposely want a new Analysis Services instance), and
  vi. You want to be able to scale up and down on demand
- Use imported datasets stored in Power BI Premium storage instead of Analysis Services if:
  i. You prefer easy management over cost and fine control over configuration, and
  ii. Your mix of report developers and read-only consumers means that it is more cost effective to use Power BI Premium versus Analysis Services
- Use Power BI Premium, regardless of whether you are using an imported dataset stored in Premium capacity or you are storing your data in Analysis Services, if:
  i. You have a large number of concurrent users and find that the user experience for operations like publishing reports, using the API and changing settings in the web interface is unacceptably slow with just Pro licenses, and
  ii. Your mix of report developers and read-only consumers means that it is more cost effective to use Power BI Premium versus just Power BI Pro licenses

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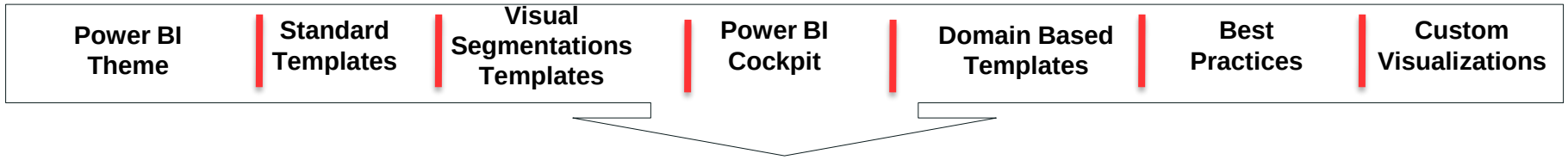
Power BI Cockpit

A Gallery of Power BI Templates provided to end users with Themes, Standard Templates, Solution Based Templates, Domain Based Templates and Custom Visualizations for a quick customer experience.



Overview

- Industry standard layouts
- Theme based Power BI Reports
- Pre-defined template with different color
- Collection of existing Power BI reports
- All templates are available for preview to get the real sense
- Cockpit galleries are updatable, hence Team can contribute to enhance the collection
- Future roadmap:
  - Preview of Customer data directly
  - Branding

Customer Benefits

- Faster creation of reports and layouts
- Customer get the feel before start of actual development
- Productivity Improvement
- Standard reports & layouts recommendation for all major industries
- Usage of custom visual
- Report reusability
- Can reduce almost 20% of development time

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Customer Story

Microsoft Business Applications Summit 2019

Standard Bank

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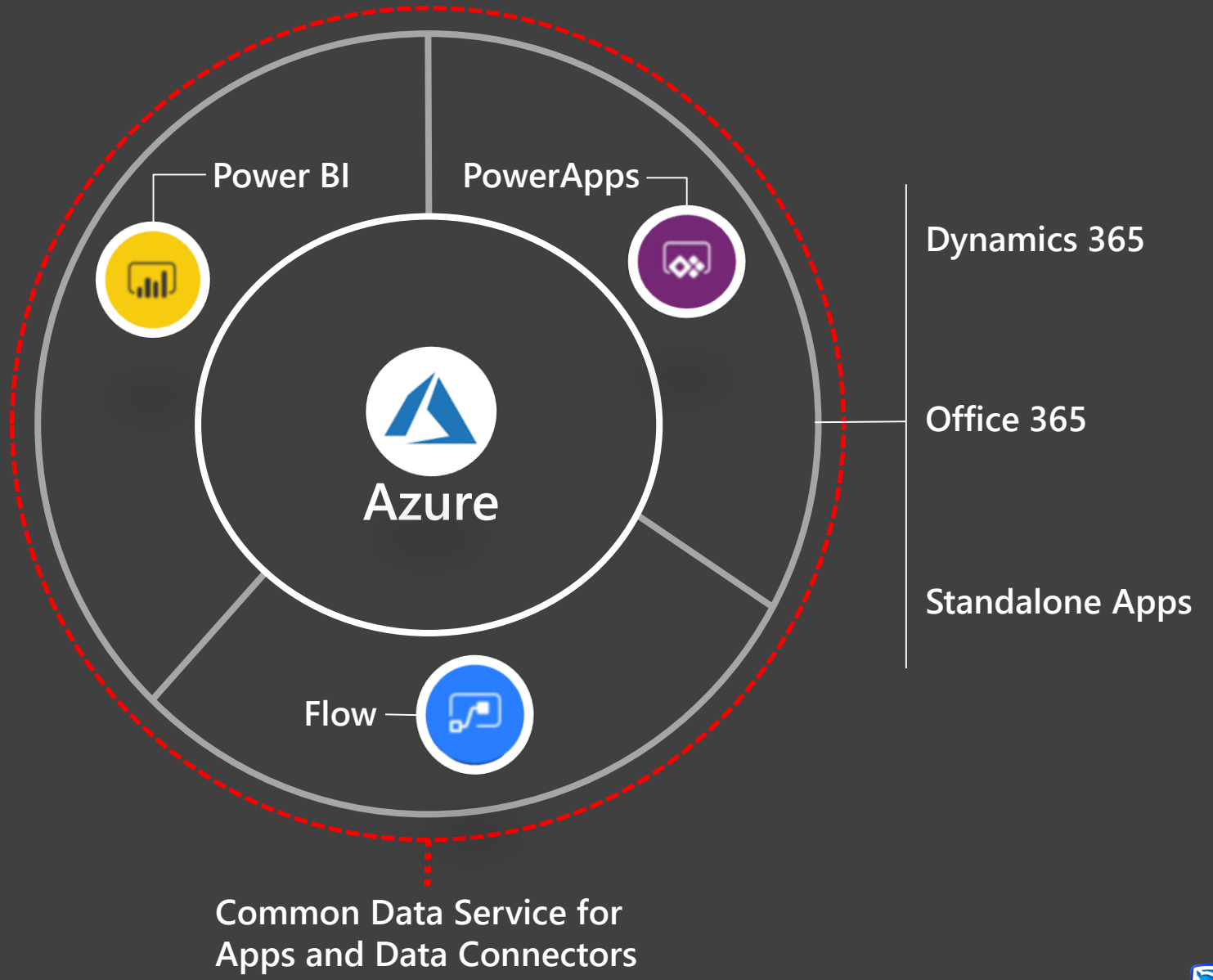
Why Power BI?

With an abundance of BI tools now in the market, why did we choose Power BI?

The Microsoft Power Platform

Integration across the Microsoft Power Platform as well as third party tools and services made the decision to use Power BI an obvious choice



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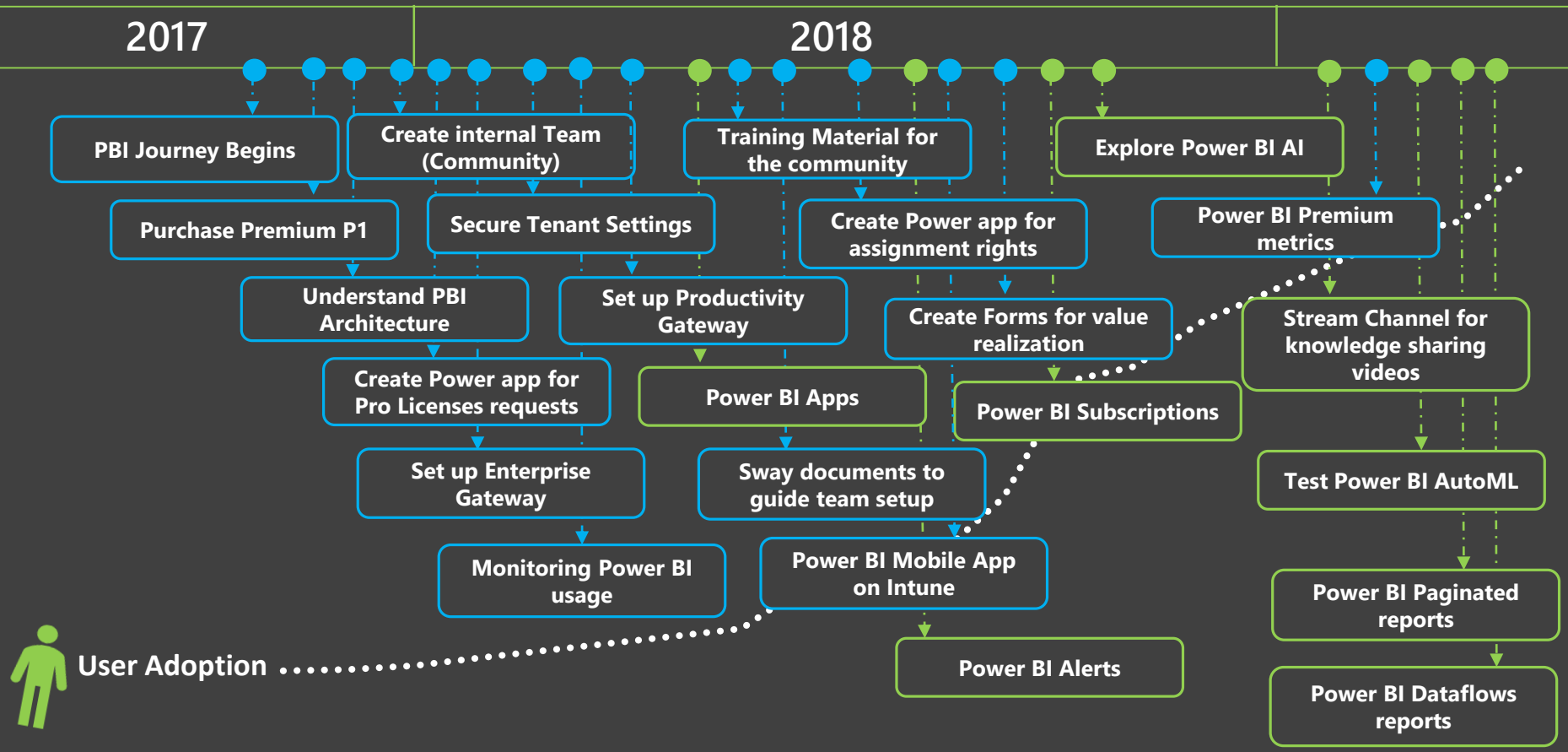
Our journey

We started our journey in 2017 and we faced various challenges along the way. These foundational learnings allowed us to fine-tune our PBI implementation over time.



BI+ The Next Frontier ...

2019 + Beyond >

BI Adoption across the Group has now matured. Over **40%** of Standard Bank staff are now directly deriving data-driven insights from the use of BI.

We will need to advance the intelligence & value derived from the use of BI as well as mature the stability & security of all our BI Platforms in order to remain relevant in this new era of exponential change.

The Benefits of BI+

- **BI Architecture Modernization**
- **AI through BI**
- **Enhanced BI Automation**
- **Actionable Insights**
- **Embedded BI Everywhere**
- **Intelligent Insights & Analytics**

Microsoft

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The components

The various components that make up the Power BI Feature Set and the ease of Interoperability is what really makes Power BI shine.

Data Import & Modeling

- Power Query - Data Connectors
- Power Query editor - ETL
- Power View -Data modeling
- Relationships
- Gateways – Cloud vs on premise connectors
- AI APIs

Power BI Service

- Power BI Home
- Workspaces and Apps
- Commentary – Dashboard, reports and tiles.
- Subscriptions
- Alerts
- Preview Visuals
- Custom Visuals
- AI enabled Visuals
- Mapping
- Power BI Mobile
- Embedding

Enabling AI Capabilities

- NLP – Power BI desktop, Service and Mobile QnA
- Recommended Apps
- Quick Insights
- Analyze Increase/decrease over time
- Analyze Distribution in dimensions
- QR Codes
- HoloLens
- Key Influencers
- Cognitive Services
- AI insights
- AutoML

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Team setup

The various components that make up the Power BI Feature Set and the ease of Interoperability is what really makes Power BI shine.

PBI Champions

- PBI Desktop Development
- Dashboard & Report development
- Create team 'App Workspaces'
- Share content with free users
- Review security and access on App Workspaces
- Comply to data security and privacy policies

Admins

- Manage Tenant settings
- Assist users with service requests
- Usage monitoring
- Knowledge sharing sessions
- Manage gateway connections
- Information desk for group
- Manage pro and premium licenses
- Explore new and preview features
- Announce new environment changes & features
- Manage Premium Capacity workspace assignments

Viewers

- Comment on dashboard, reports or tiles
- Download pbix/export to pdf, ppt or excel
- Edit and create own views
- Set data alerts
- Sign up for email subscriptions
- Pin tiles to Power BI home page

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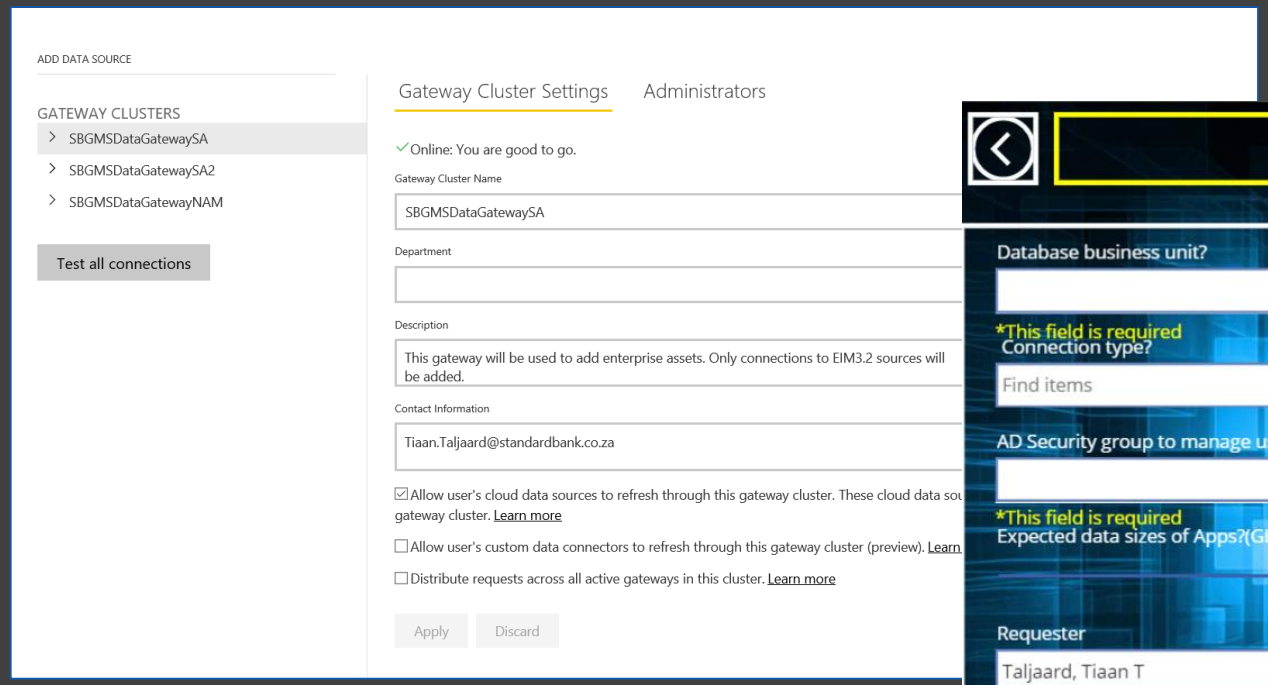
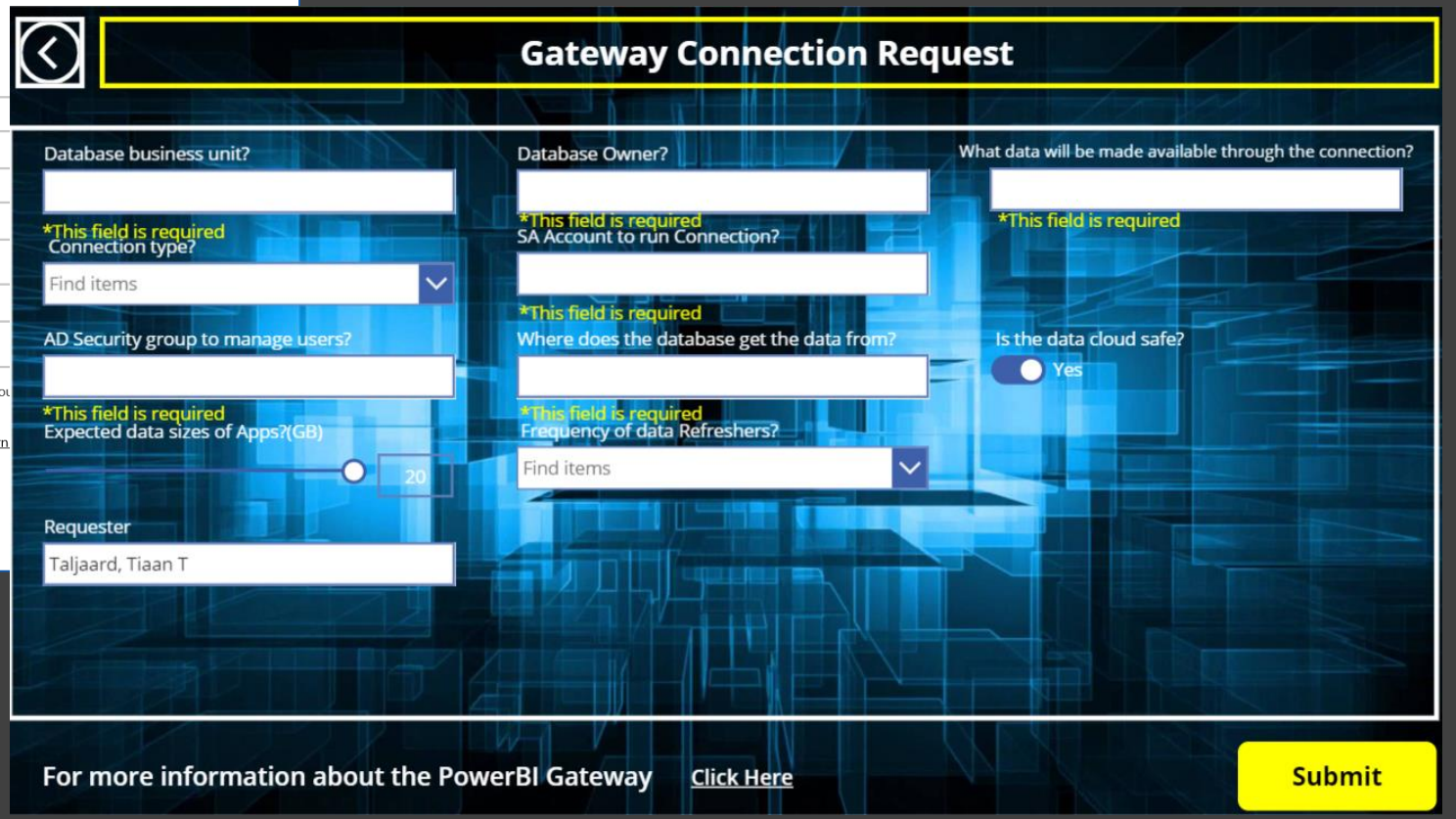
Gateway setup (enterprise vs productivity)





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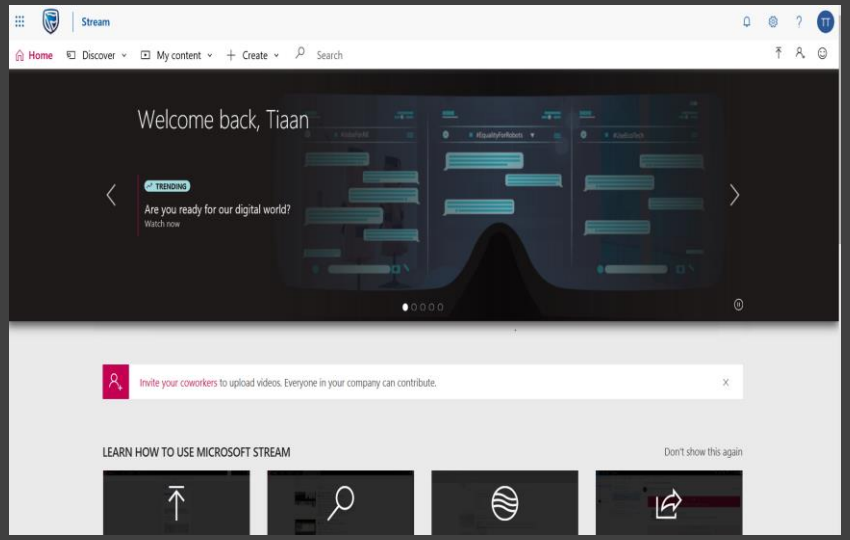
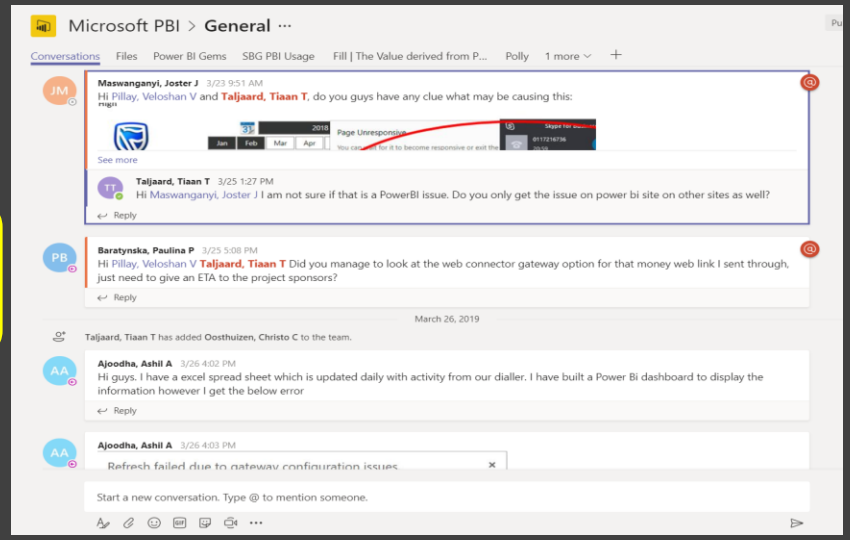
Power BI training

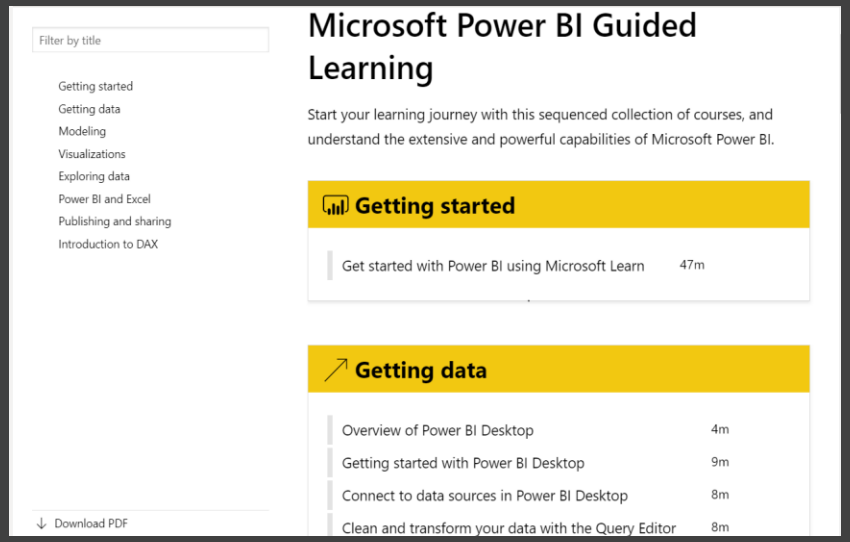
Microsoft Stream



Microsoft Teams



Power BI



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References

https://www.microsoft.com/en-us/download/details.aspx?id=45331
https://app.powerbi.com/home

https://community.powerbi.com/t5/MBAS-Gallery/bd-p/MBAS_Gallery?filter=pc_power+bi
https://community.powerbi.com/t5/MBAS-Gallery/Customer-stories-with-**Standard-Bank**/m-p/712517#M169
https://community.powerbi.com/t5/MBAS-Gallery/Microsoft-Power-BI-AI-powered-analytics/m-p/712524
https://community.powerbi.com/t5/MBAS-Gallery/Microsoft-Power-BI-Enterprise-grade-BI-with-Power-BI-dataflows/td-p/711416
https://community.powerbi.com/t5/MBAS-Gallery/Microsoft-Power-BI-Enterprise-reporting/td-p/711413

https://powerbi.microsoft.com/en-us/blog/introducing-power-bi-data-prep-wtih-**dataflows**/
https://azure.microsoft.com/en-us/solutions/**architecture**/?product=power-bi&Page=1
https://powerbi.microsoft.com/en-us/blog/power-bi-paginated-**report-builder**-now-available/

https://docs.microsoft.com/en-us/power-bi/**report-builder**-power-bi
https://docs.microsoft.com/en-us/**business-applications-release-notes/April19**/business-intelligence/planned-features
https://docs.microsoft.com/en-us/**power-platform-release-plan/2019wave2/**business-intelligence/planned-features

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