

Just Thorning Blindbæk



End-to-end Business
Intelligence solution in Azure

Thank you to our AWESOME sponsors!



Agenda

The project

The architecture

- Ingest
- Store
- Prep and train
- Model and serve
- Presentation
- Orchestration

Wrapping up





The project

The project: Arlagården Plus



Quality Assurance Program

- 11.000 suppliers in 7 European countries
- Opt-in gives 1 Eurocent per kg delivered milk
- Story telling: Makes the milk worth more
- Retail requirements to document wellbeing and sustainability. Transparency – from cow to consumer.

Collect data and calculate animal welfare indicators

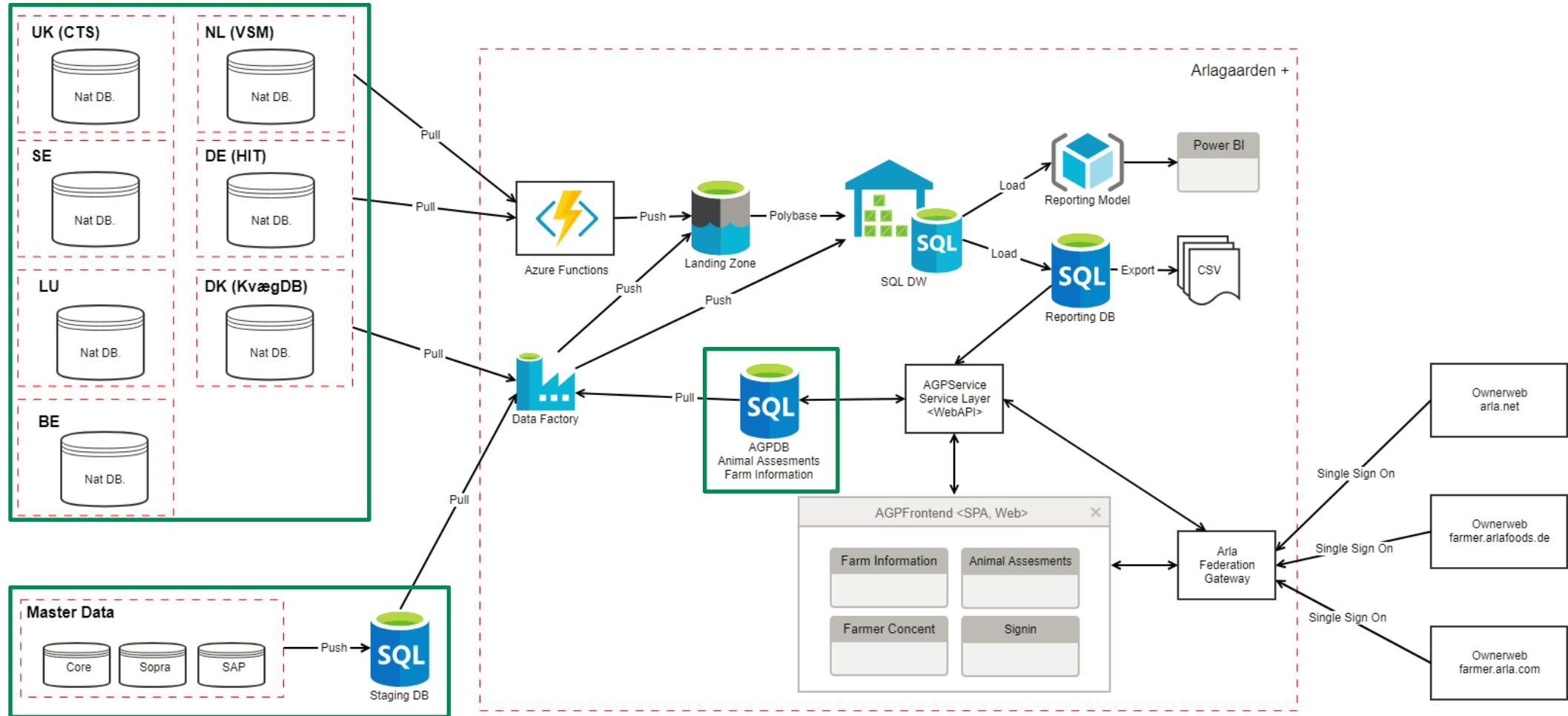
- Master data (SAP, Sopra, CORE)
- Survey and assessment (Web app)
- National herd and animal databases (one for every country)



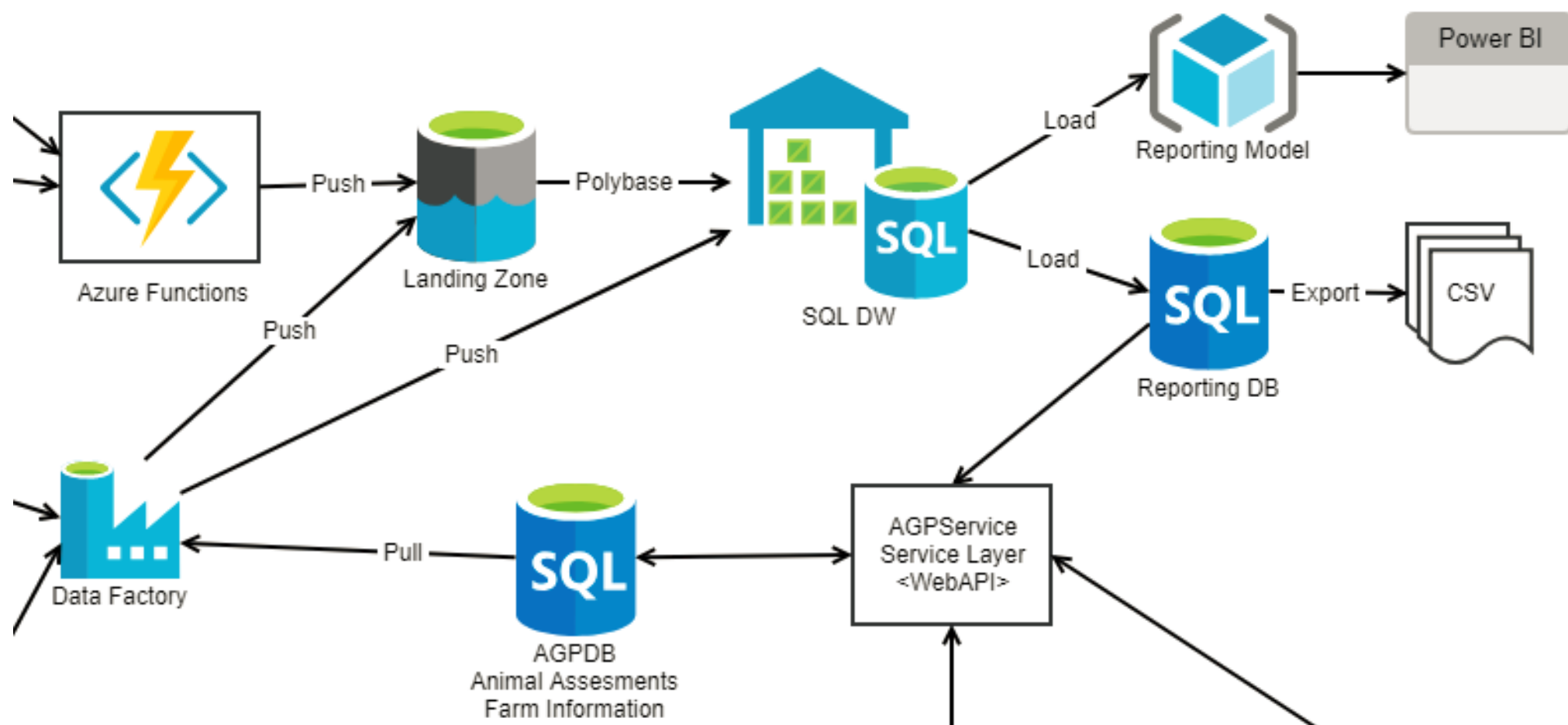


The architecture

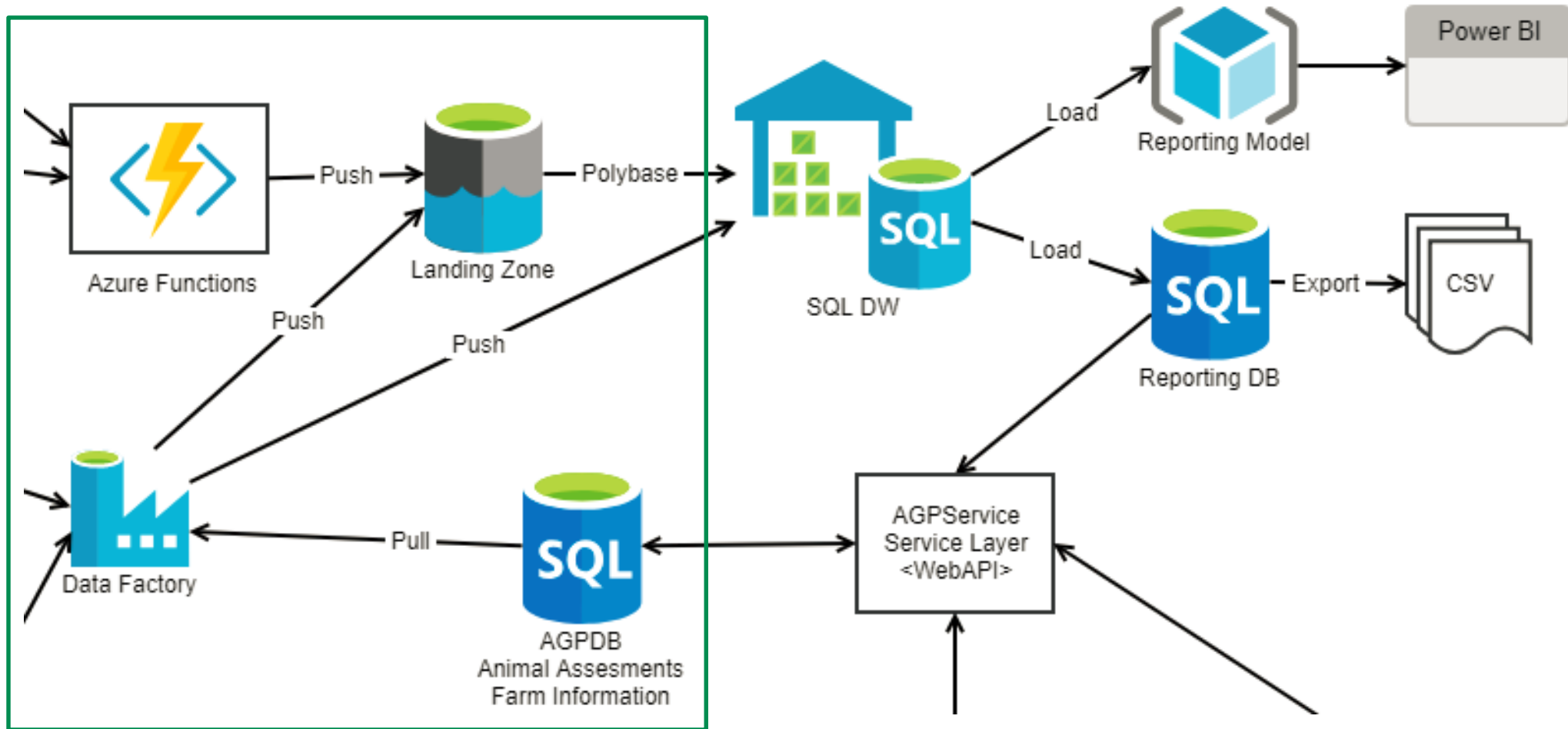
Overall architecture



BI architecture



Ingest and Store (Extract)



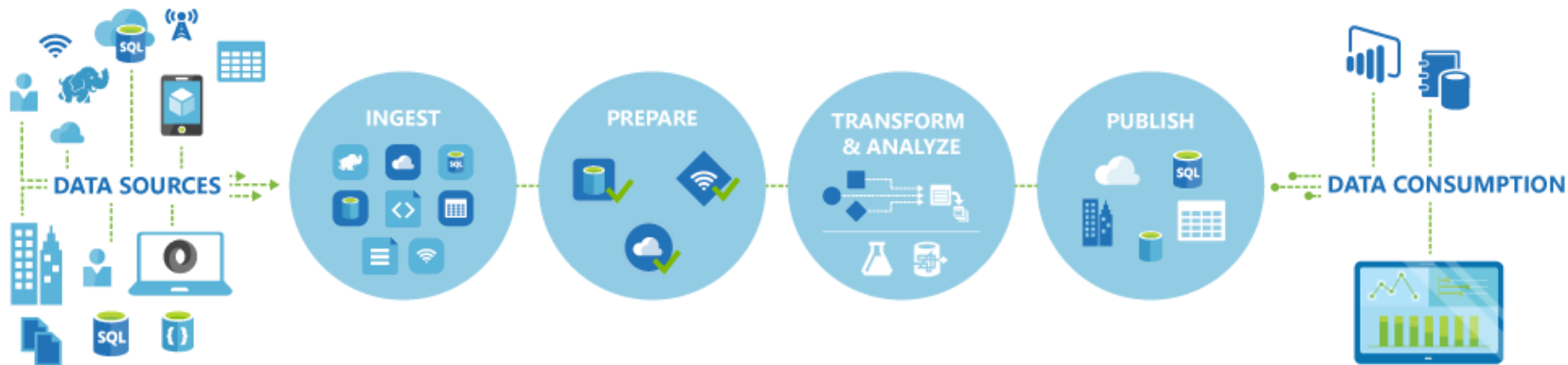
Ingest: Azure Data Factory V2

Hybrid data integration at scale

Create, plan, administer and monitor data pipelines

Execute activities (copy or transform)

V2 has parameters, control flow and triggers

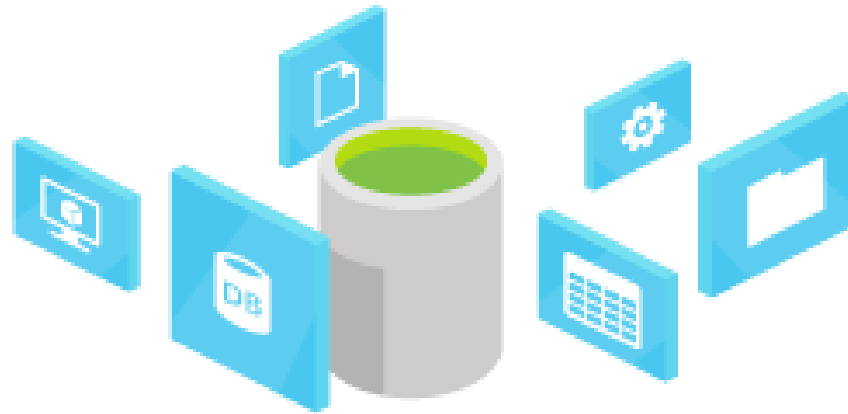


Store: Azure Data Lake Store

Unlimited cheap cheap cheap storage

Can handle structured, semi-structured, and unstructured data

Apache Hadoop file system compatible (HDFS)



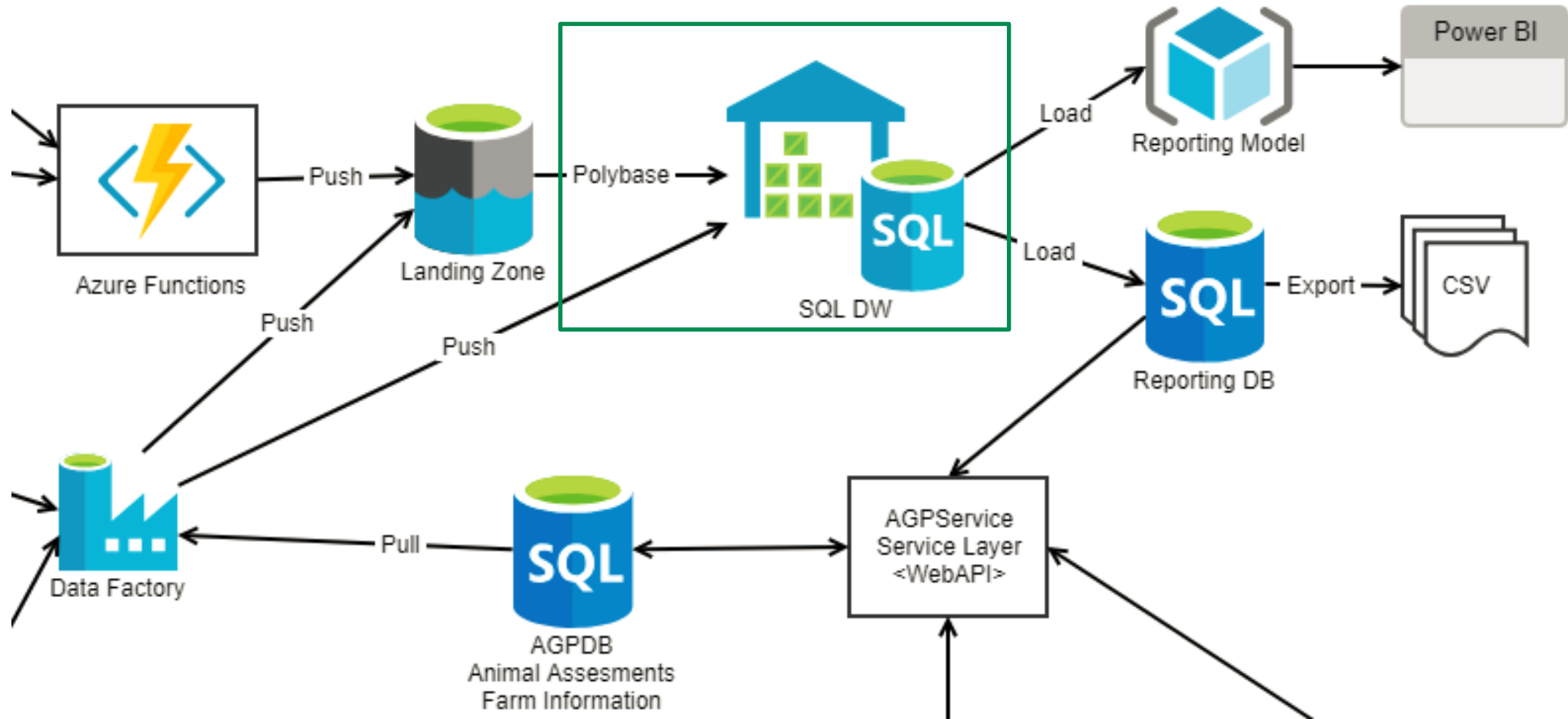
RAW

- KVDB
- Moving
- Calving
 - Archive
 - 2018
 - 2019
 - Latest.csv
- HIT

Now we have Gen2 – combining Azure Blob Storage



Prep and model (Transform)



Prep: PolyBase

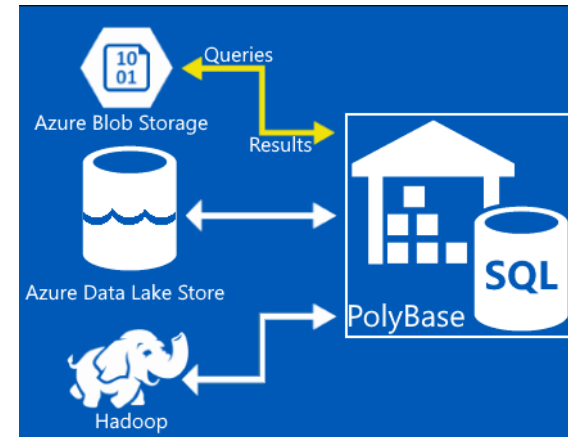
Best practice data loading technique from Azure Data Lake Store to Azure SQL DW

Massively Parallel Processing Architecture

External data source

External tables

CTAS – Create Table As Select



Prep and Model: Azure SQL Data Warehouse

Built on SQL Server

MPP architecture

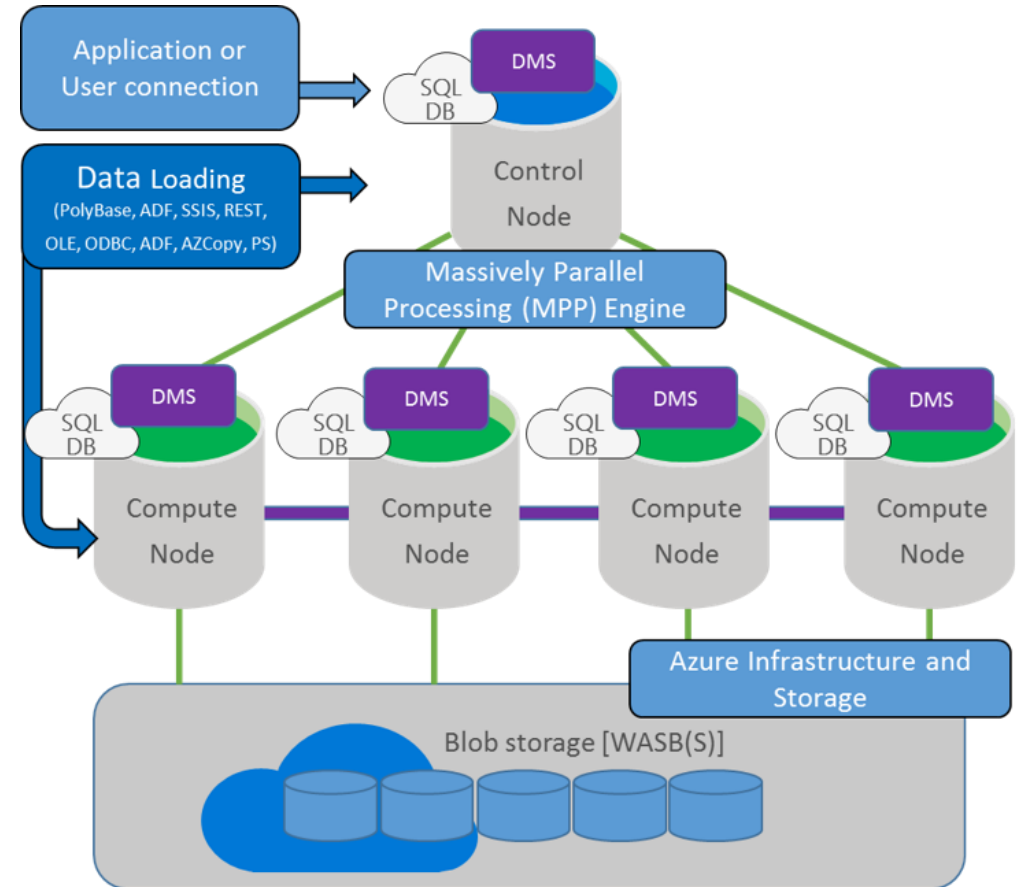
Pause and scale

Limited concurrency

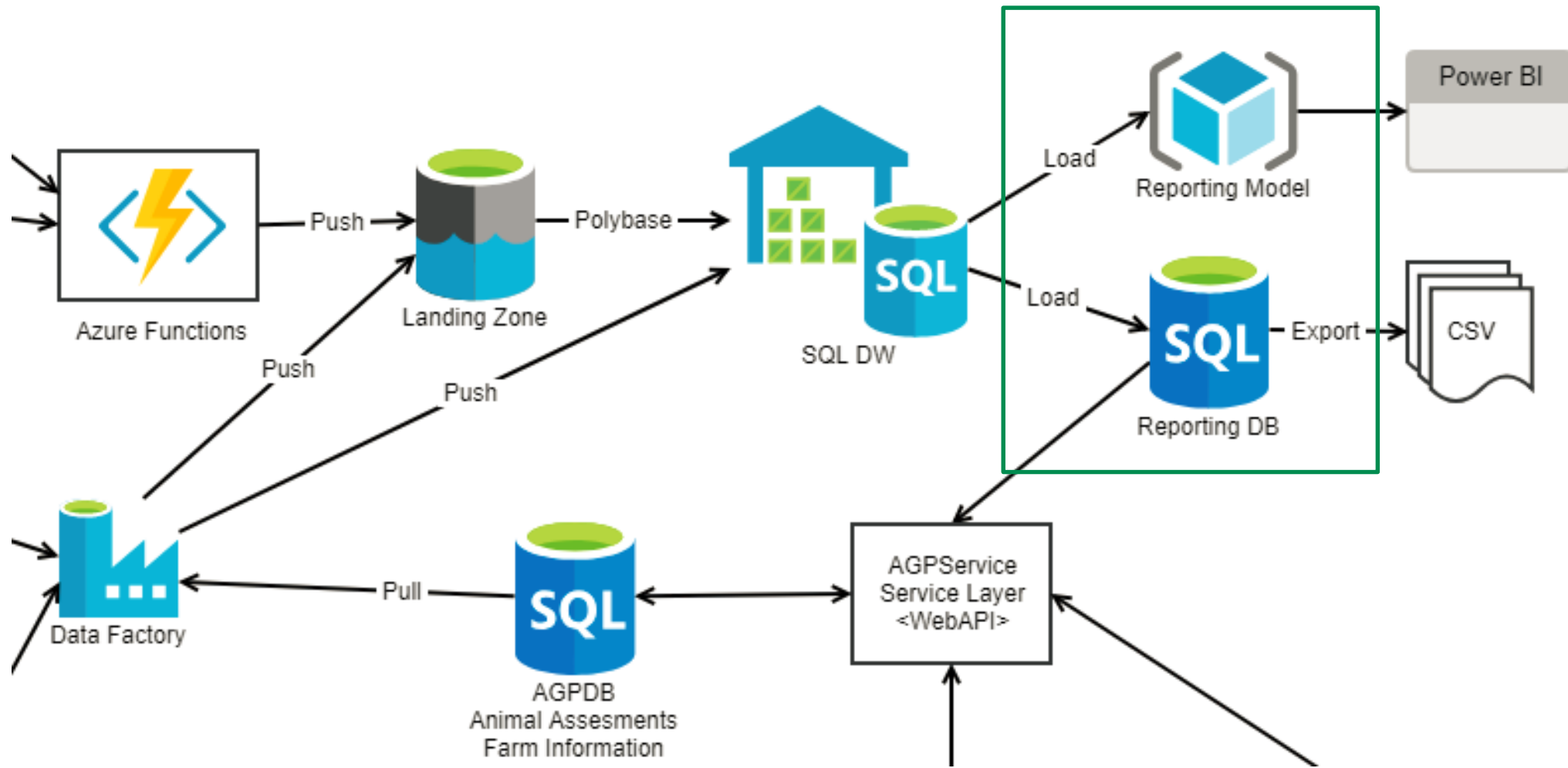
Now: Synapse Analytics

Alternatives:

- Azure Databricks
- Azure Data Lake Analytics
- Azure HDInsight



Serve (Load)



Serve: Azure SQL Database

Relational database-as-a service

Scale to your needs

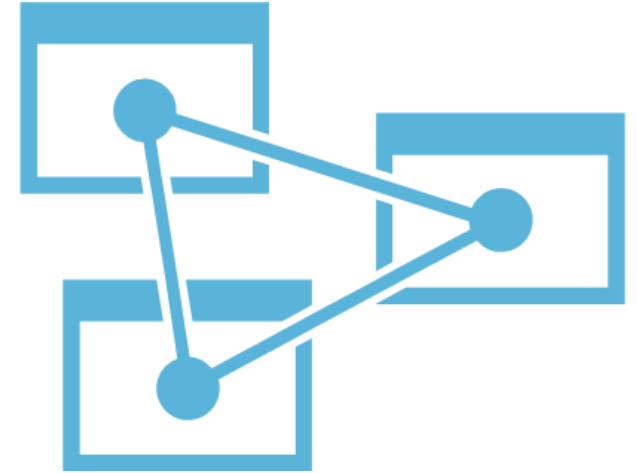
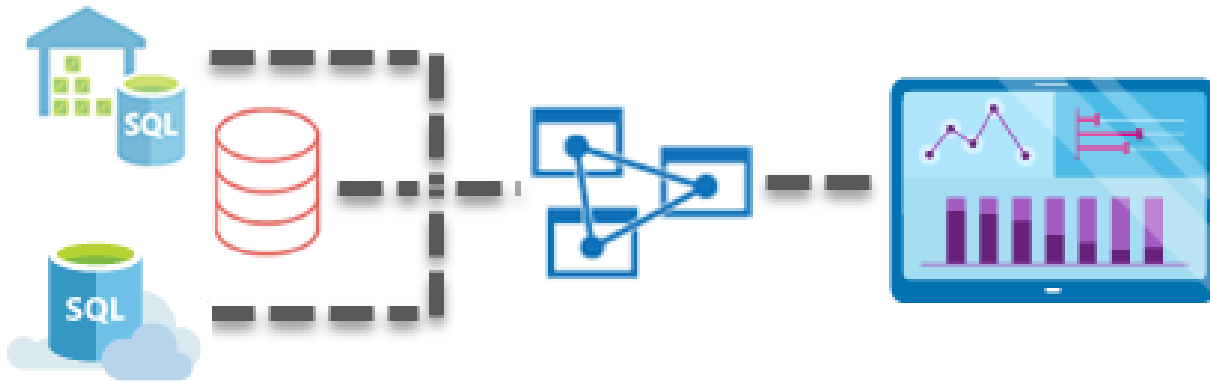


Serve: Azure Analysis Services

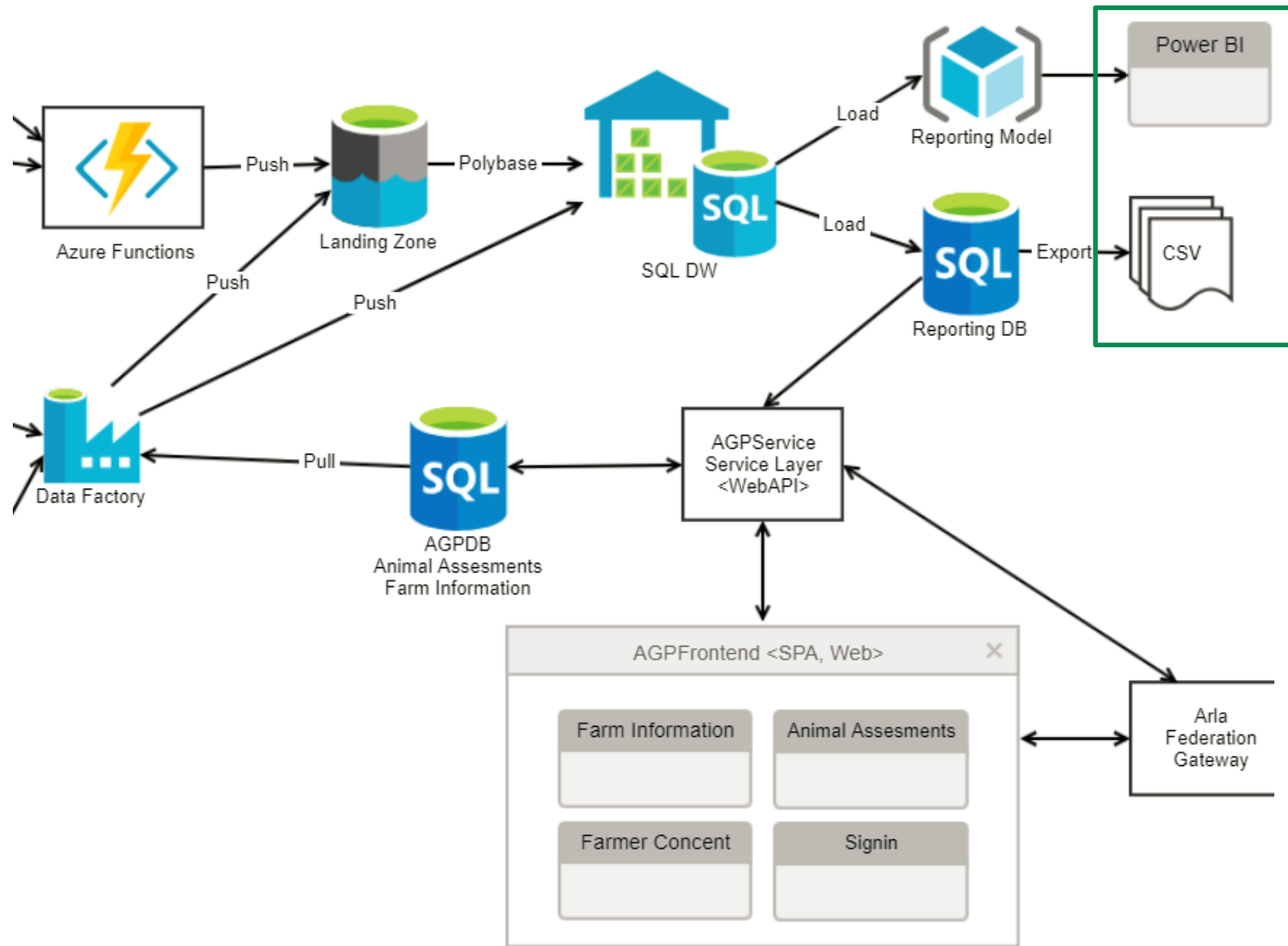
Analysis Services Tabular

Easy scale up and out

Power BI sits perfect on top



Presentation



Presentation: Power BI Embedded

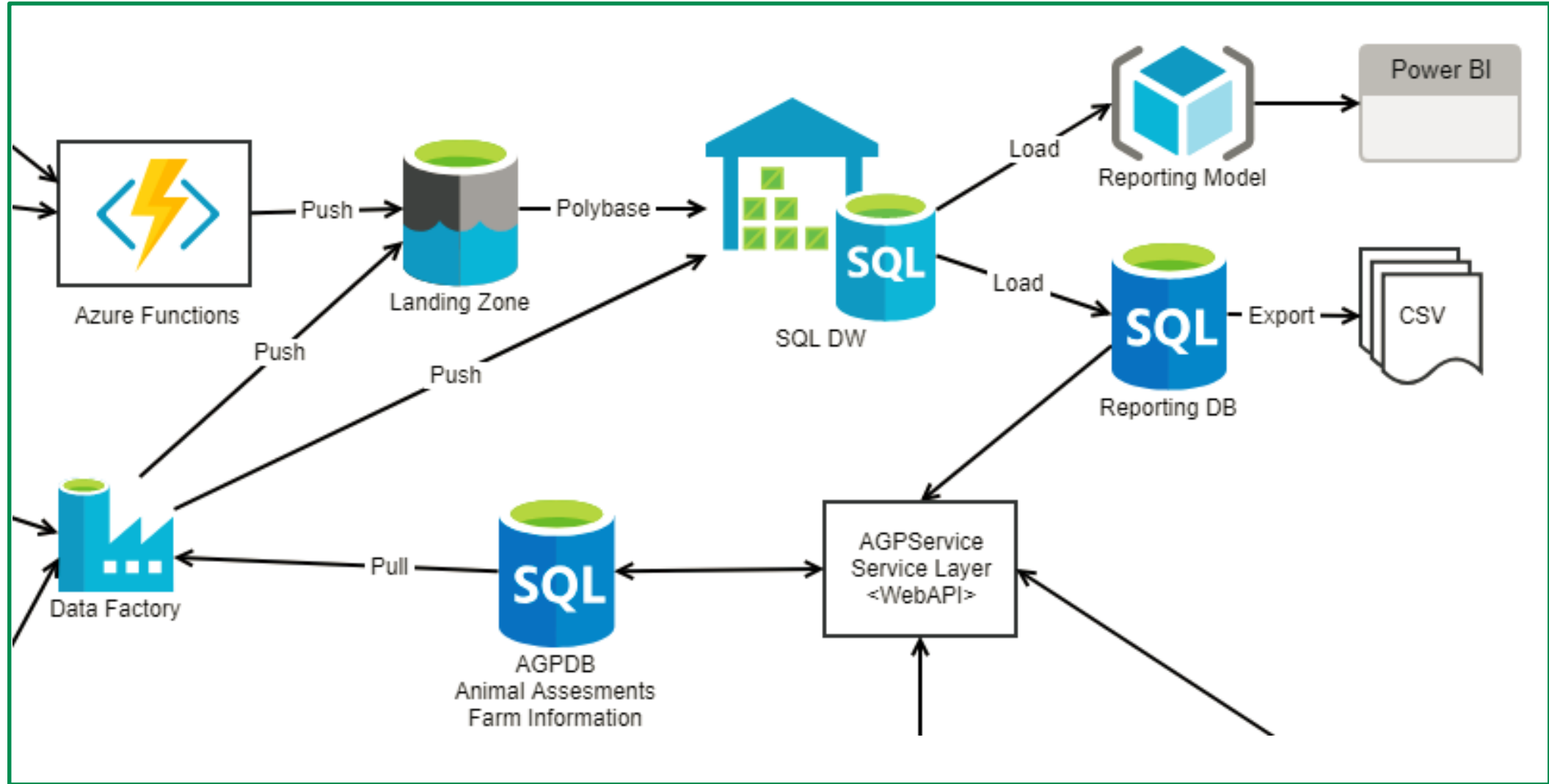
Stunning visuals, reports and dashboards directly into the application

Easy implementation

Security handled with RLS in Analysis Services



Orchestration



Orchestration: Data Factory and Automation Account

Process Automation

Runbooks = PowerShell scripts

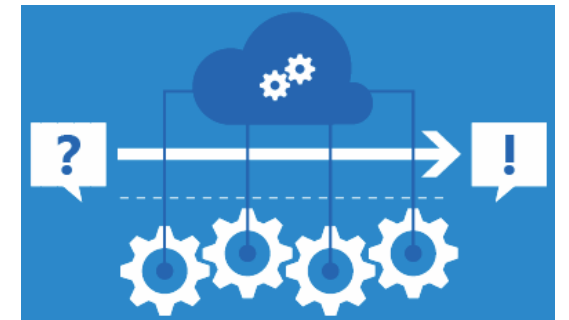
Integration with other Azure services

- Turn Azure SQL DWH on and off
- Process Azure Analysis Services
- Refresh Power BI dataset



Alternatives:

- Azure Functions
- Azure Logic Apps





Wrapping up

Lessons learned

Plus

- Start service – fast going
- Easy to test different services
- Many options for mixing services
- Cost: Scale and pause services

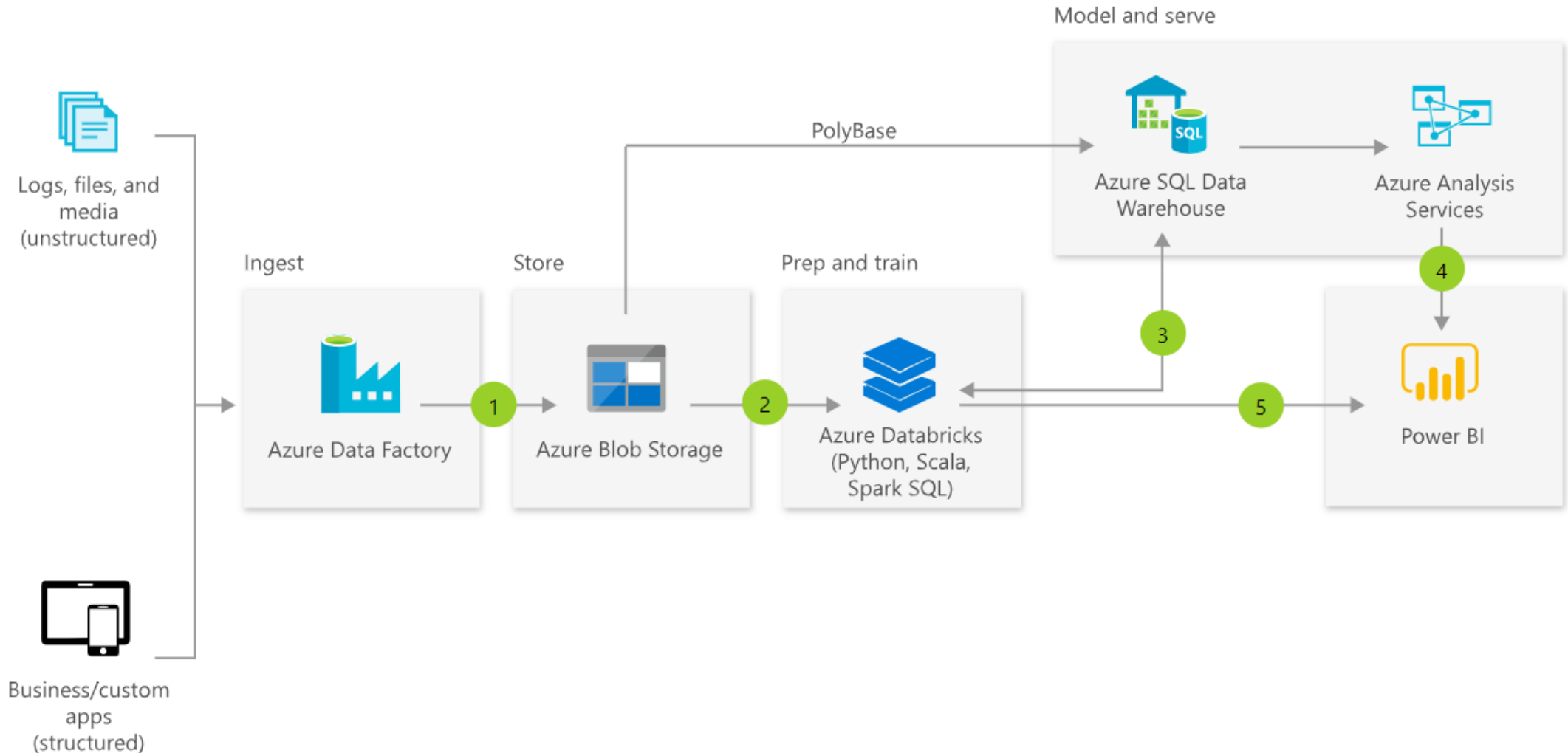


Challenges

- Overview of possibilities and limitations
- Limited SQL syntax support in Azure SQL DW
- Azure Data Lake Store and GDPR
- No support for translations in Power BI
- (Missing Visual Studio templates to SQL DW and Data Factory)



Modern Data Warehouse Architecture



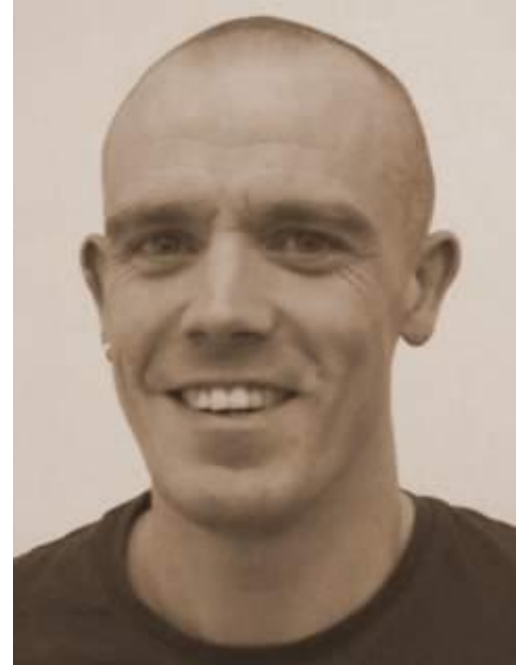
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Questions and time for raffle'n'snaps



Ressources

Arlagården Plus: <https://www.arla.dk/om-arla/vores-ansvar/kvalitet-pa-garden/>

Modern Data Warehouse:

<https://azure.microsoft.com/en-us/solutions/architecture/modern-data-warehouse/>



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