

Just Thorning Blindbæk

@JustBlindbaek



End-to-end BI solution in Azure

How do you setup and build a complete Microsoft BI solution with only Azure Services?

Lessons learned from a project with eleven different source systems in the one end and 12.000 users in seven countries in the other end. Extracting, transforming and loading with the help from Functions, Data Factory, Data Lake Store, Polybase, SQL Data Warehouse, SQL Database, Automation Runbooks, Analysis Services and Power BI Embedded.



End-to-end BI solution in Azure

Customer Story

Our Partners



Agenda

- The project
- The architecture
 - Ingest
 - Store
 - Prep and train
 - Model and serve
 - Visualize
 - Orchestration
- Wrapping up



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The project



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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

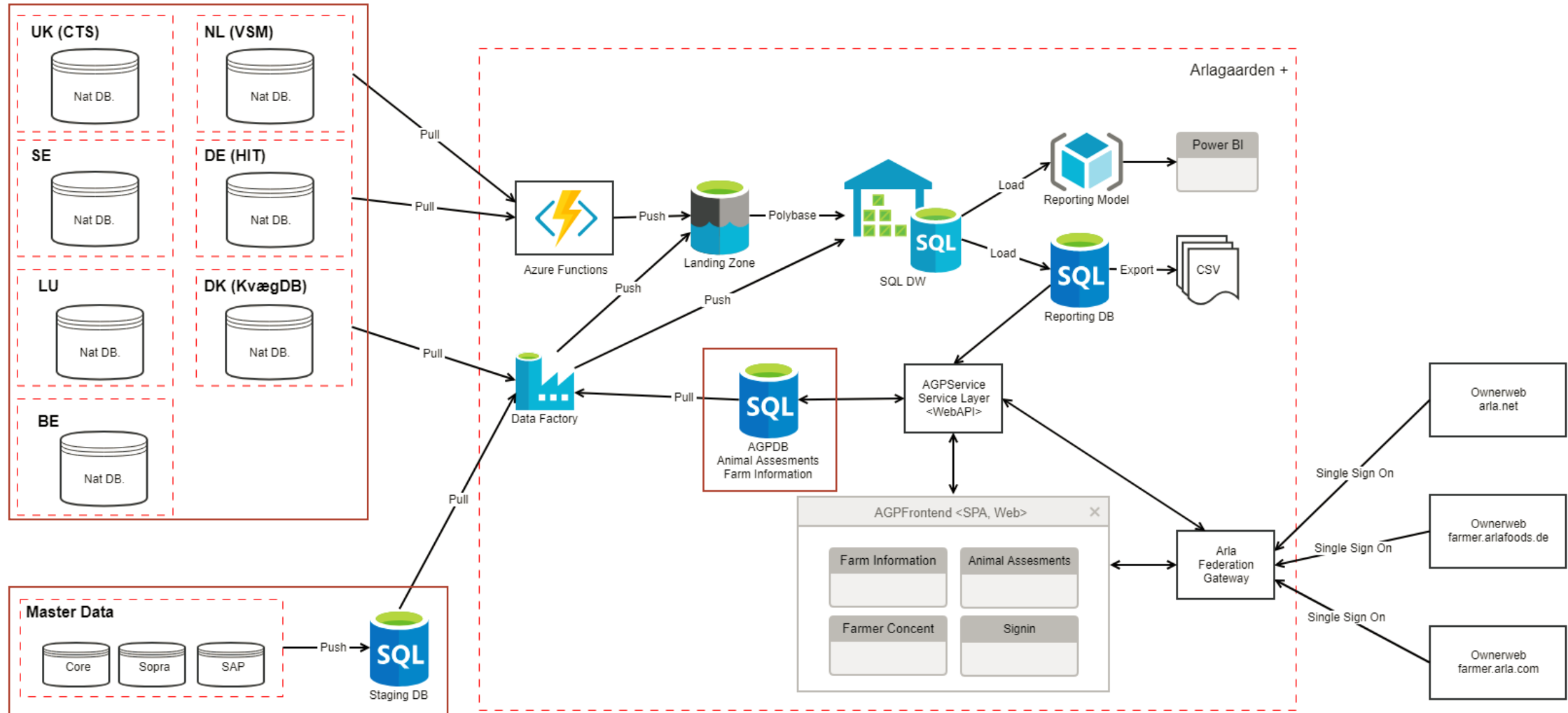
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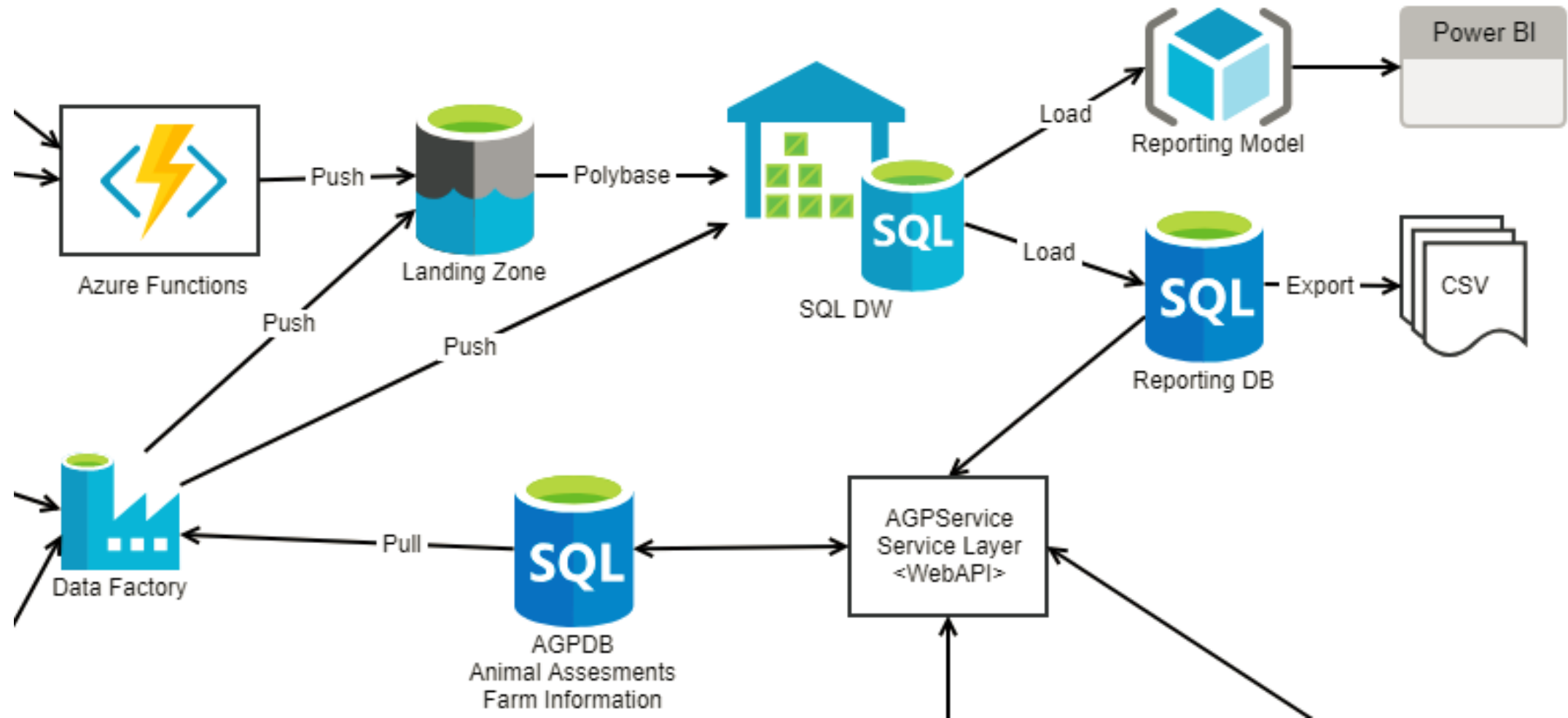
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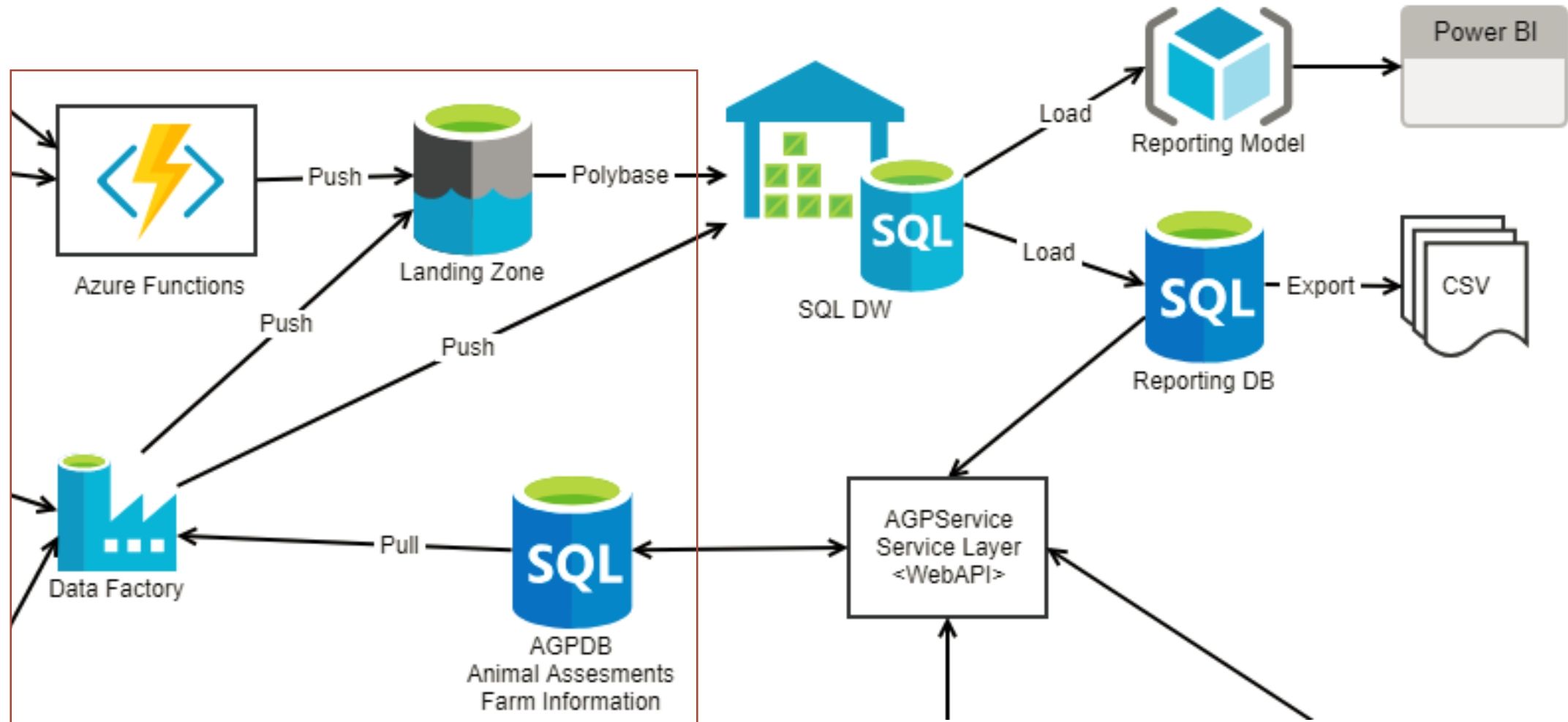
Overall architecture



BI architecture

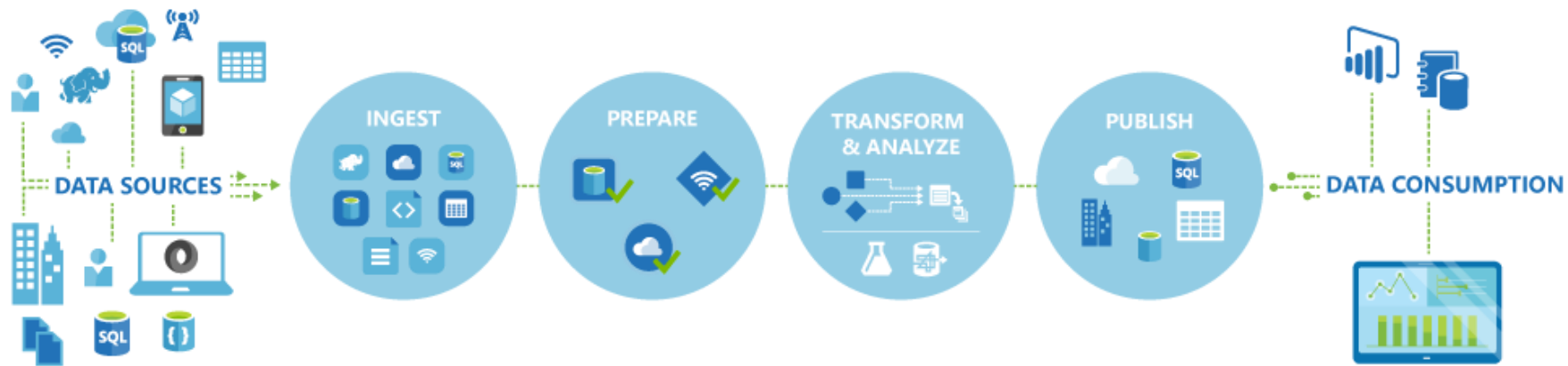


Ingest and Store (Extract)



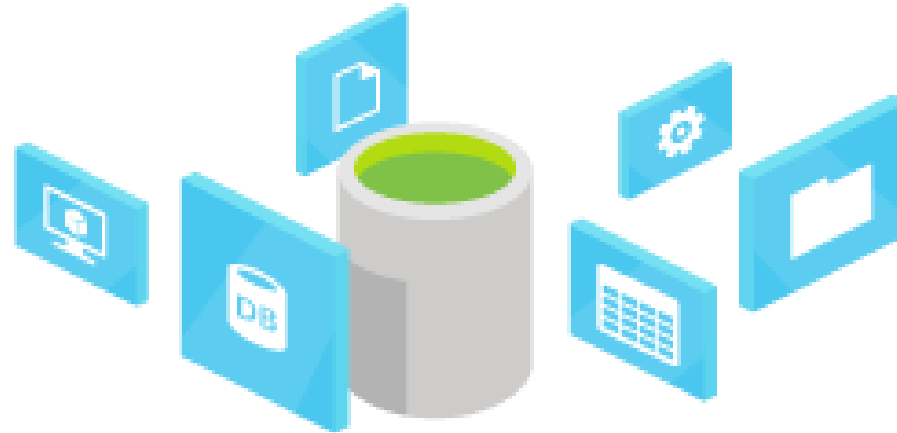
Ingest: Azure Data Factory V2

- Hybrid data integration at scale
- Create, plan, administer and monitor data pipelines
- Execute activities (copy or transform)
- V2 has parameters, control flow and triggers



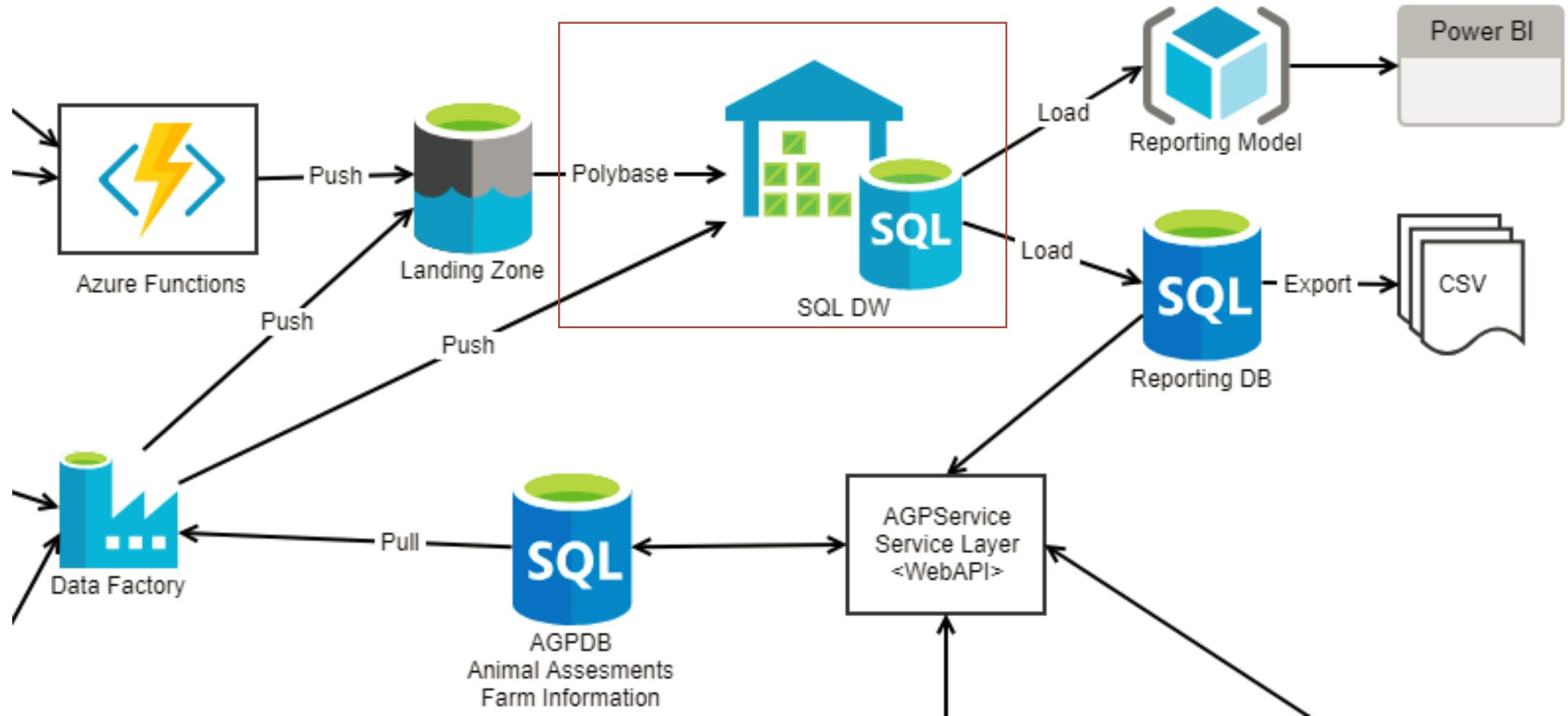
Store: Azure Data Lake Store

- Unlimited cheap cheap cheap storage
- Can handle structured, semi-structured, and unstructured data
- Apache Hadoop file system compatible (HDFS)



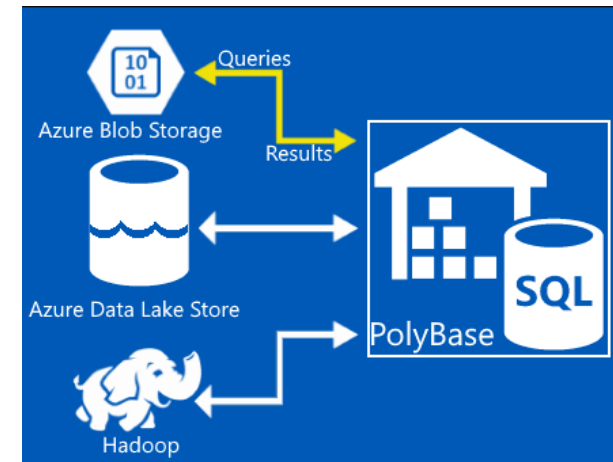
- Now we have Gen2 – combining Azure Blob Storage

Prep and model (Transform)



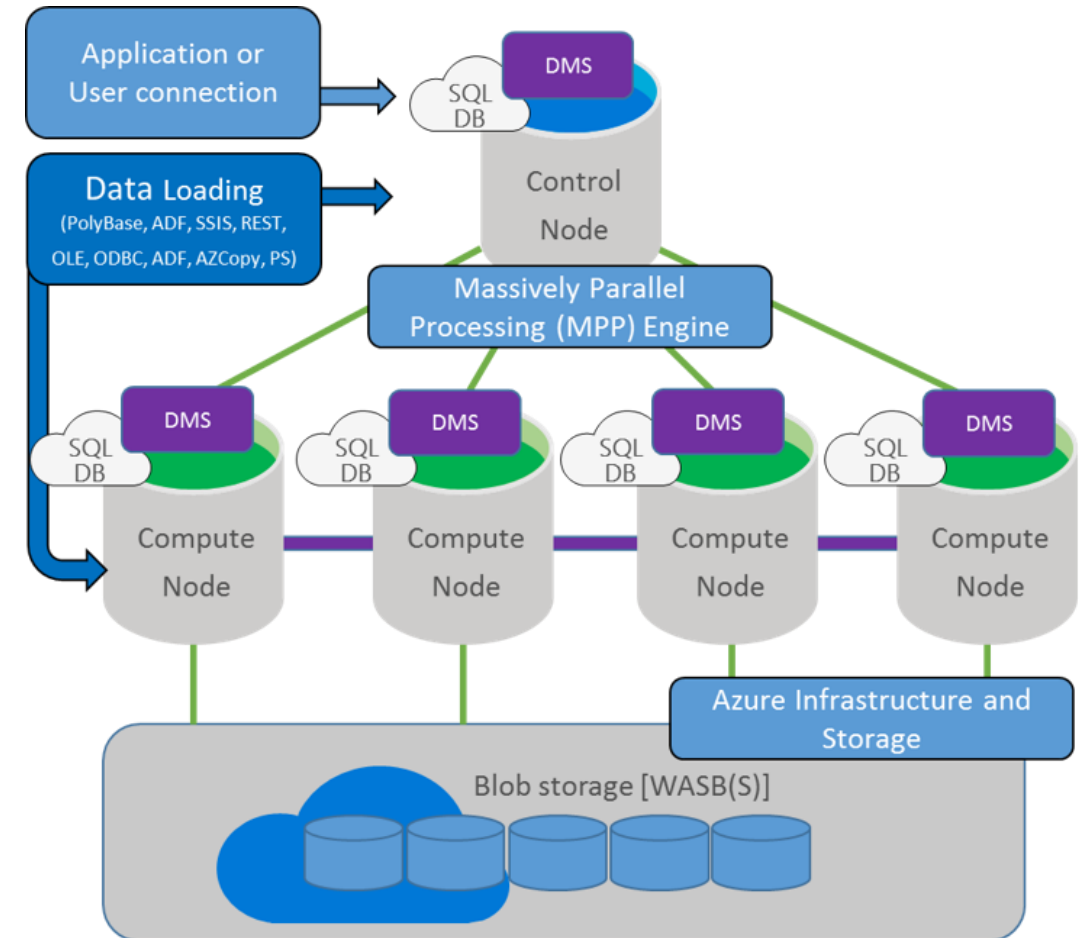
Prep: PolyBase

- 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

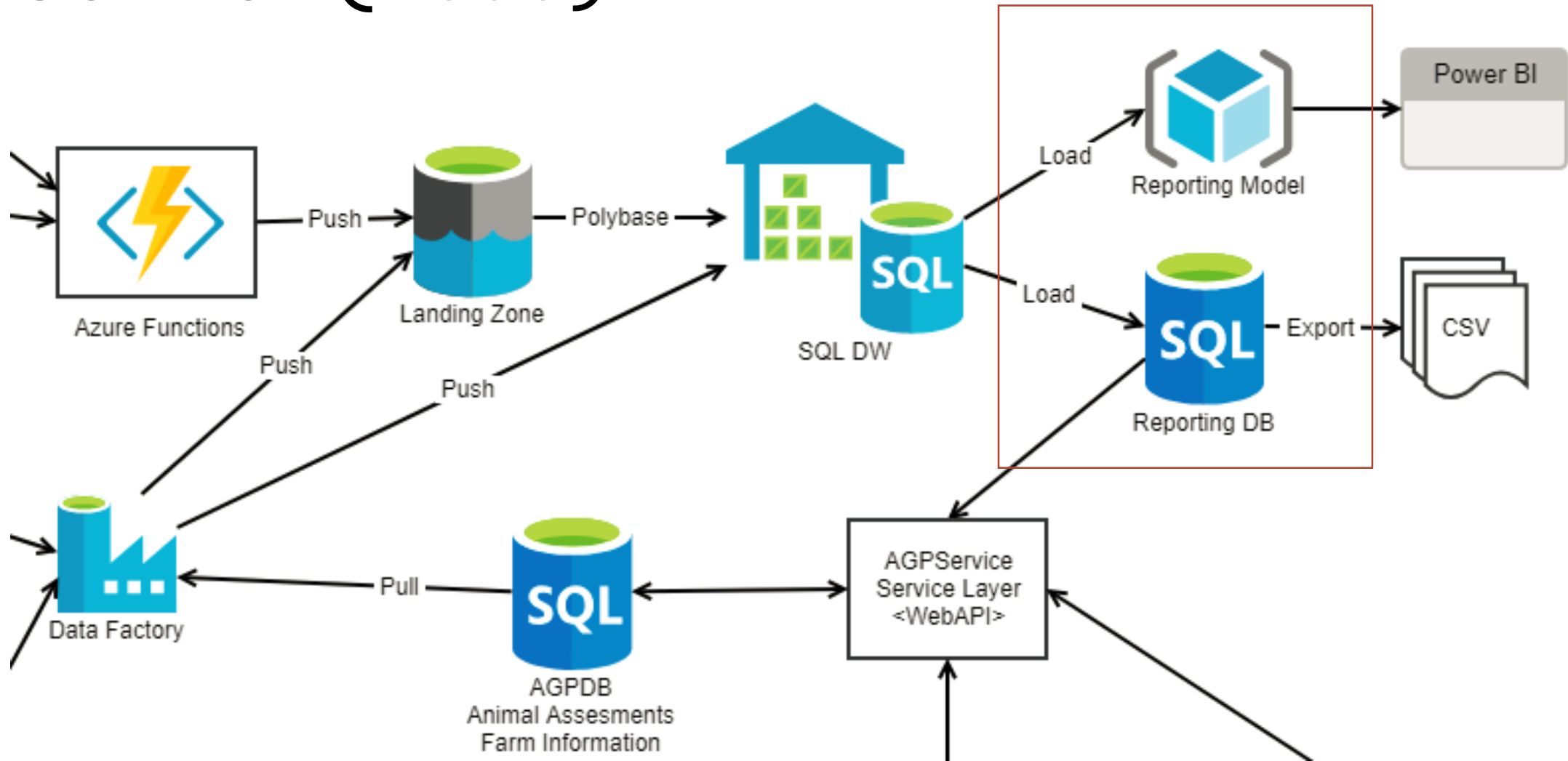


Prep and Model: Azure SQL DW

- Built on SQL Server
- MPP architecture
- Pause and scale
- Limited concurrency
- Alternatives:
 - Azure SQL DB
 - Azure Databricks
 - Azure HDInsight
 - (Azure Data Lake Analytics)



Serve (Load)



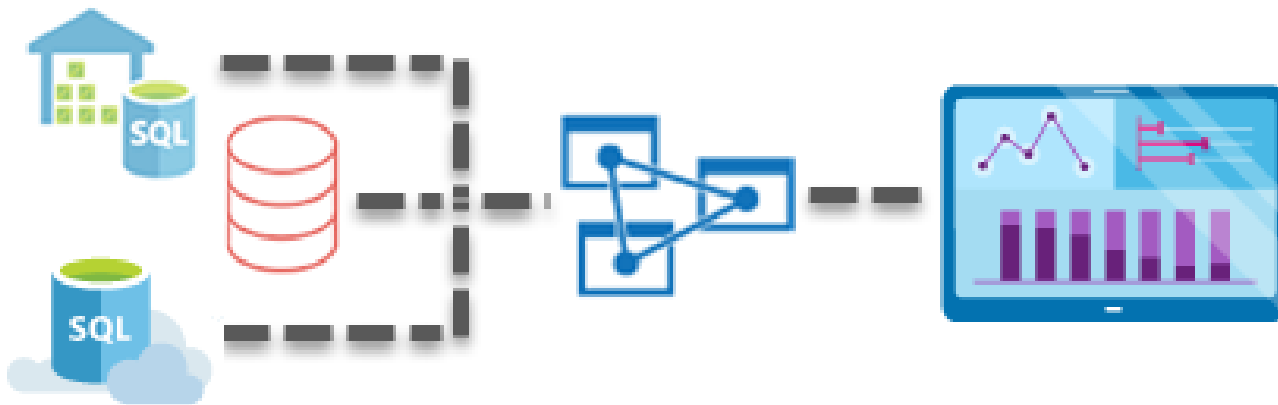
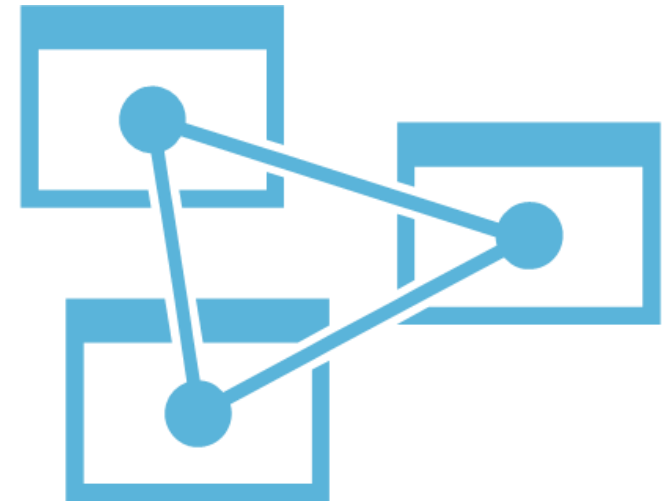
Serve: Azure SQL Database

- Relational database-as-a service
- Scale to your needs

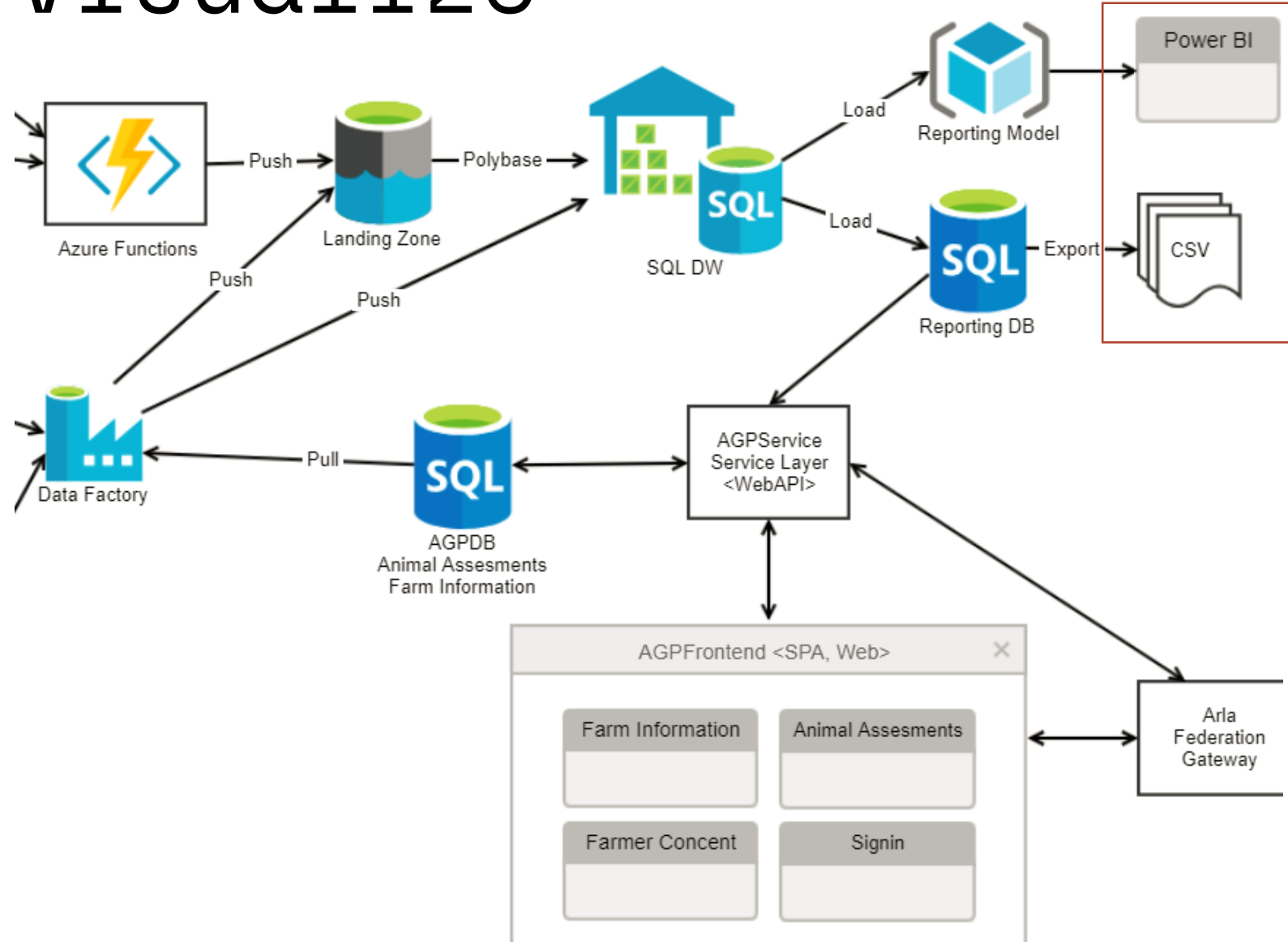


Serve: Azure Analysis Services

- Analysis Services Tabular
- Easy scale up and out
- Power BI sits perfect on top



Visualize

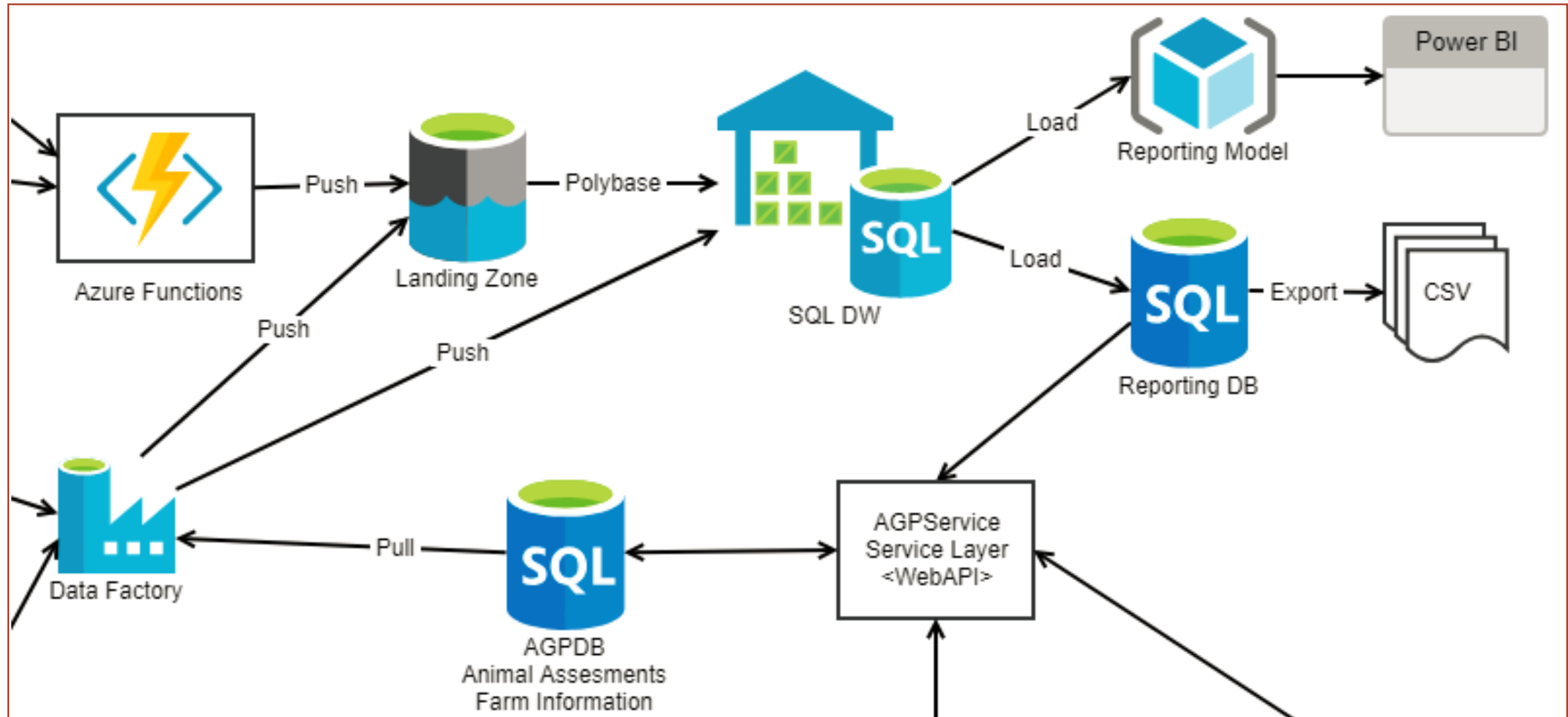


Visualize: Power BI Embedded

- Stunning visuals, reports and dashboards directly into the application
- Easy implementation
- Security handled with RLS in Analysis Services



Orchestration



Orchestration: Azure Automation

- Process Automation
- Runbooks = PowerShell scripts
- Integration with other Azure services
 - Start Azure Data Factory pipelines
 - Turn Azure SQL DWH on and off
 - Execute stored procedures in DWH
 - Process Azure Analysis Services
 - Refresh Power BI dataset
- Alternatives:
 - Azure Data Factory
 - Azure Logic Apps



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Wrapping up

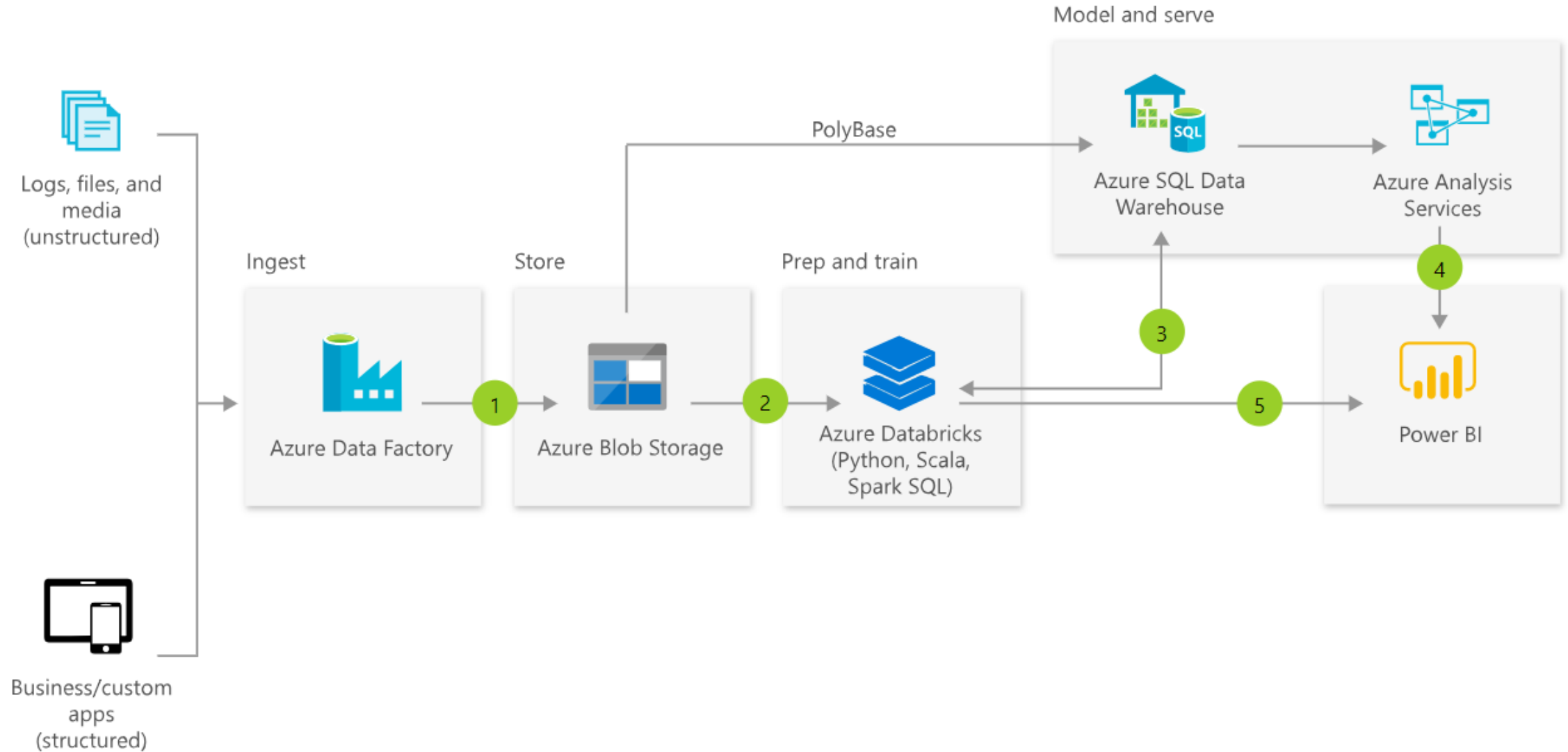


Lessons learned

- 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



Questions?



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What do you think?

1. Open the form
2. Provide constructive feedback
3. Be eligible for an amazing prize!

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<http://bit.ly/dataMindsConnectSession>

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