

Power BI Composite Models



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- SQL Bits Committee

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- MSc in Business Intelligence, CEng, CITP, FBCS, FIOEE, MIET, MIOD, MIAP, MIOEE
- Over 200 talks in 17 countries

- Run  **purplefrog** BI Consultancy



Business Intelligence Consultancy

Advanced Analytics
Data Warehousing
Cubes
Databricks
Machine Learning

Power BI
ETL Systems
Data Factory
Synapse Analytics
Managed Service



Backups



POWER BI SENTINEL™

Impact Assessment

Change Tracking

Usage Analysis

Data Lineage

Search

Risk Report

Documentation



Alex Whittles



Agenda

- Ways of importing data into Power BI
- Combining them into a composite model
- Layering datasets on top of each other
- Improving Data Management in Power BI



Power BI – Getting Data

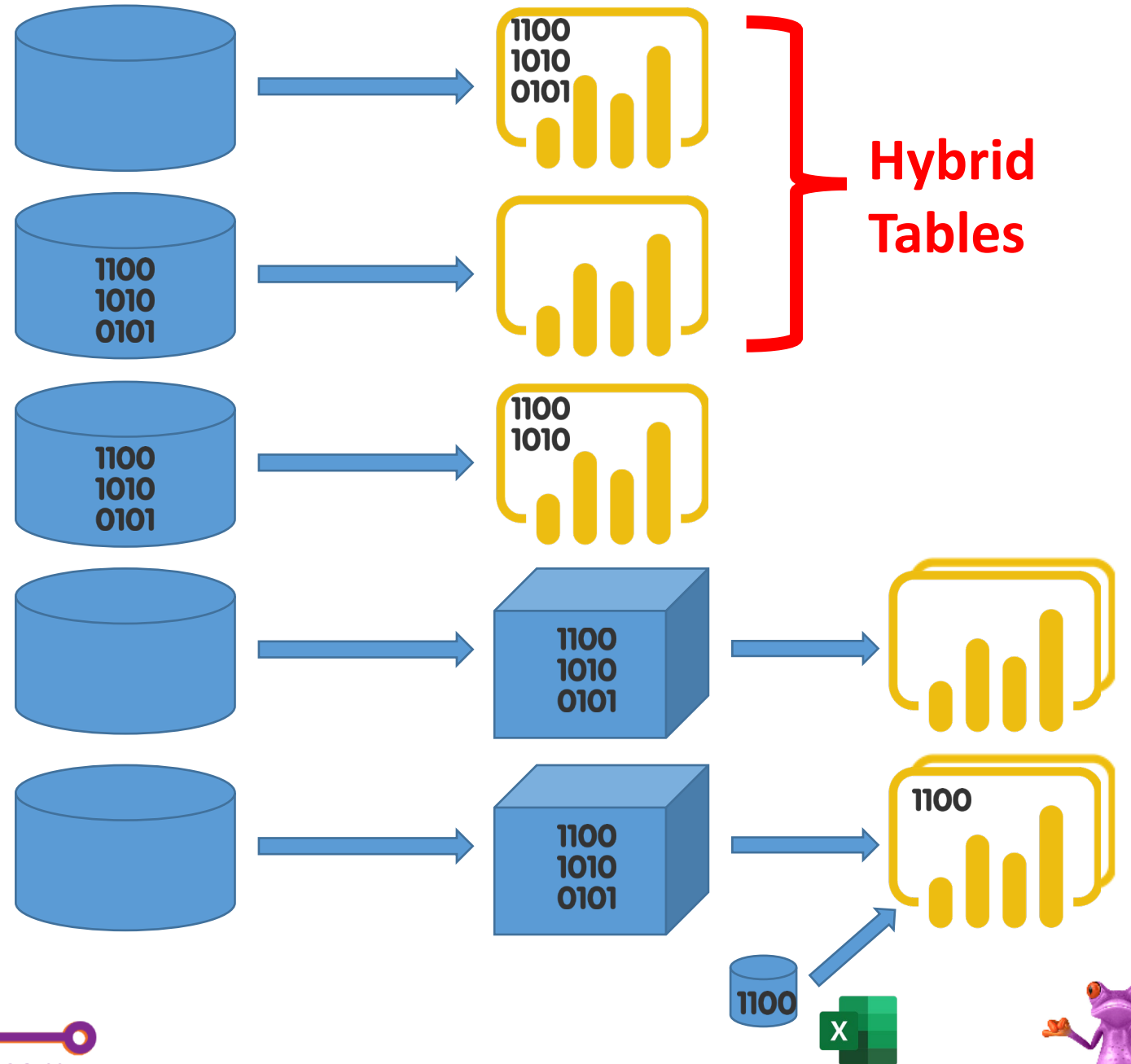
Import Mode

Direct Query Mode

Composite Model

Live Connection

DQoAASaPBIDS



Import Mode



Pros	Cons
Simple	Data latency
Fast	Processing time
Small (10:1* compression in Vertipaq)	Limited data size
Detaches workload from source system	
Full functionality of Power Query	
Full functionality of DAX	

* Approximate Best Case



Direct Query Mode



Pros	Cons
Zero latency	Slow
No processing	Limited Power Query
Low memory requirement	Limited DAX
	Hits source system
	1m row limit (per query)



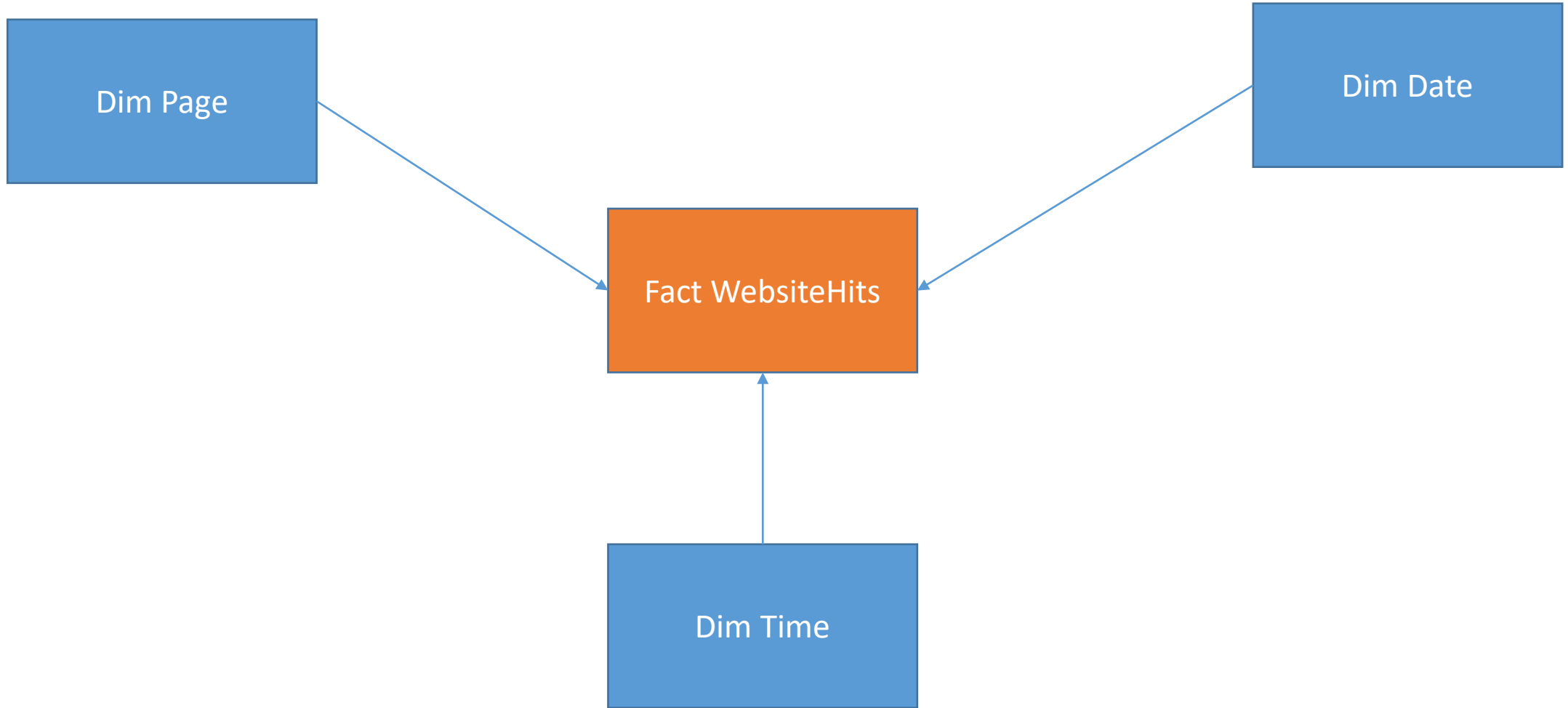
Composite Model



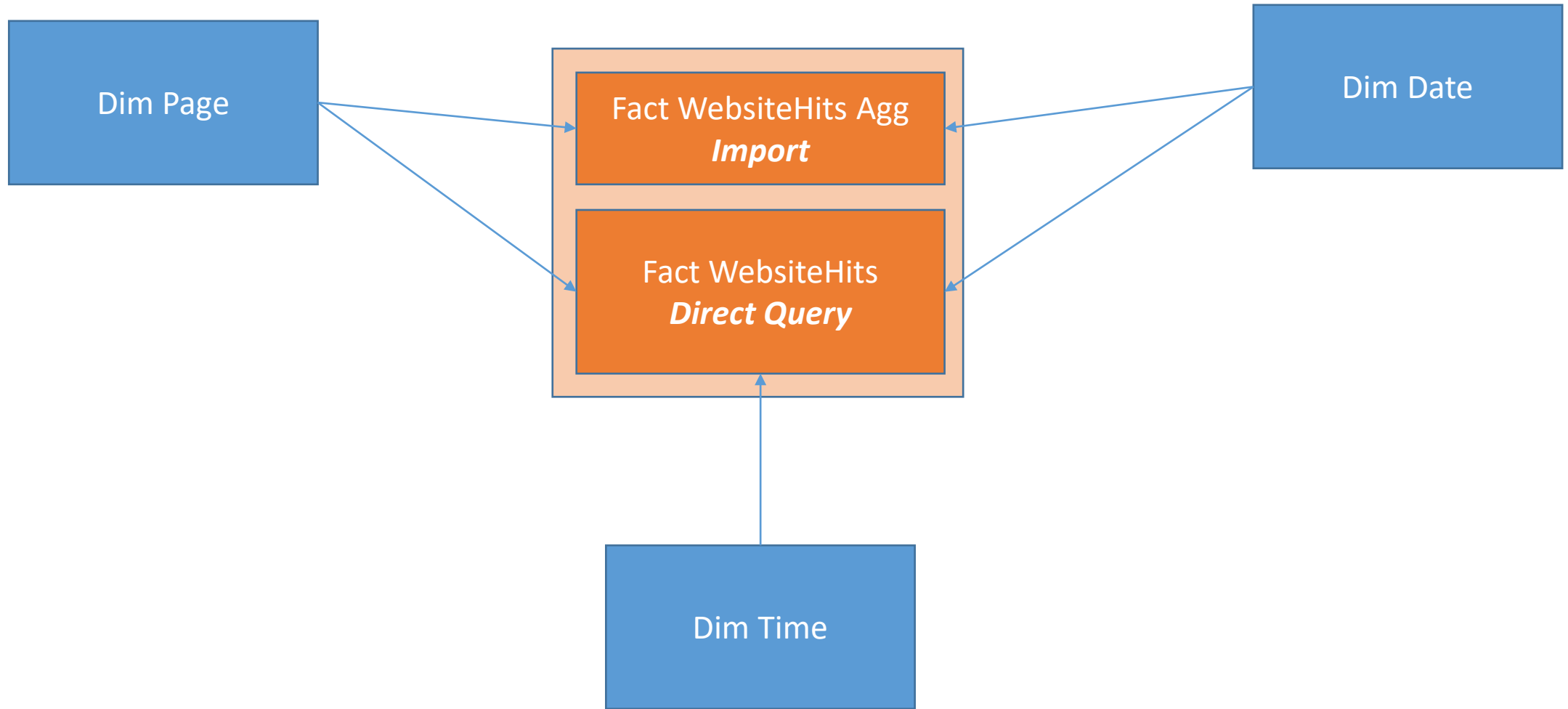
Pros	Cons
Less processing	Slow for some data
Lower memory requirement	Variable performance
No data size limits	More complex to implement
	Processing latency



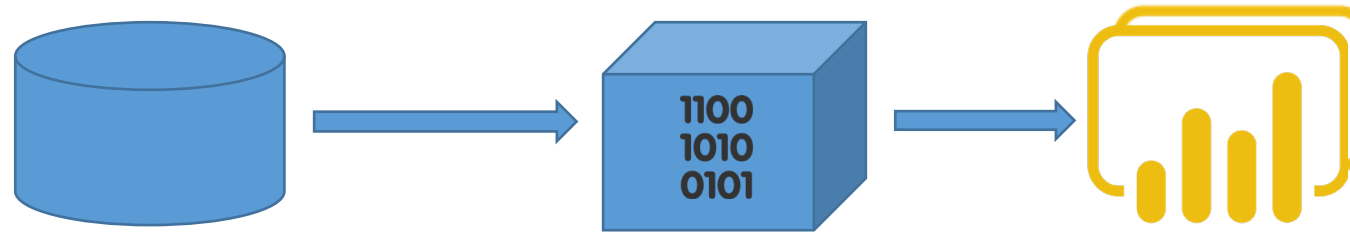
Composite Model Demo



Composite Model Demo



Live Connection

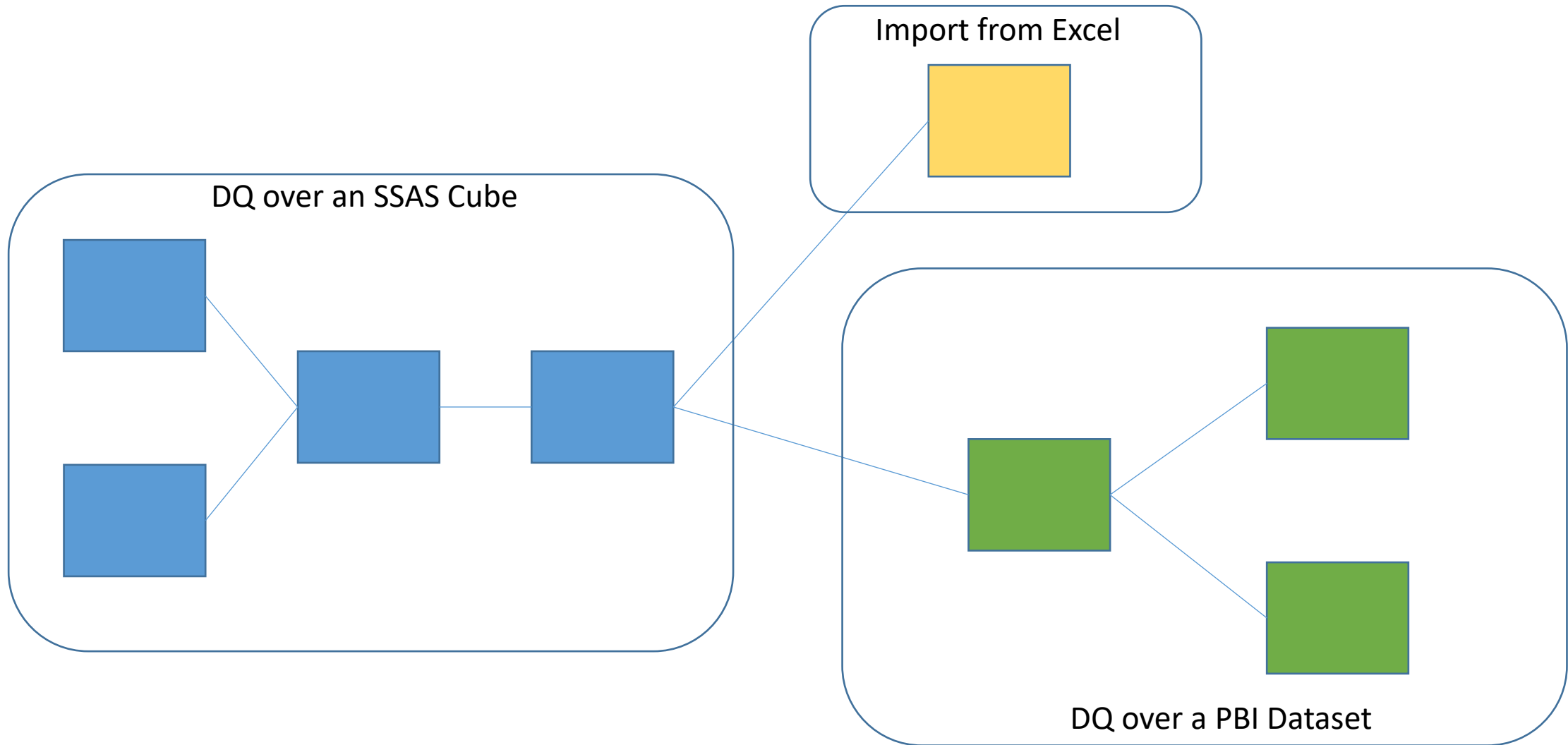


Pros	Cons
Fast report creation	Management of cube
Single version of the truth	Slow release process
No PBI processing	Cost if using Cubes (AAS)
Lower memory requirement	Rigid functionality
High Scalability (if Cube)	



Direct Query over AAS and PBI

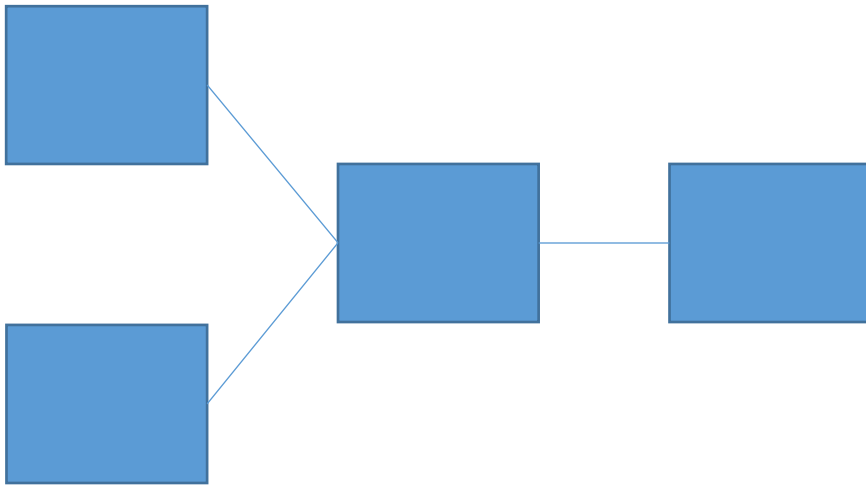
Multiple Islands, linked together



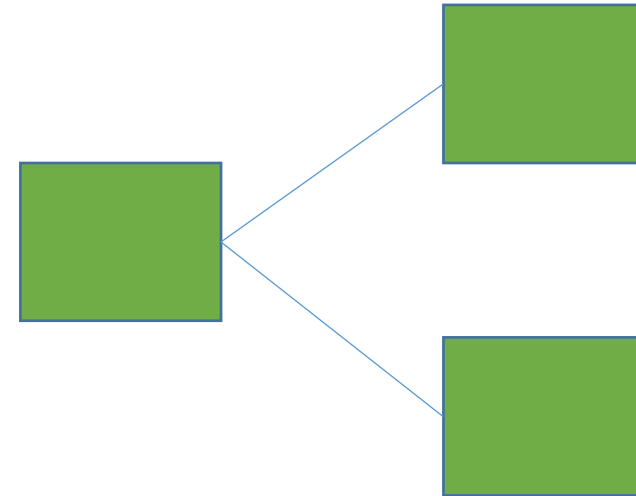
Direct Query over AAS and PBI

Multiple Independent Islands, to show in the same report

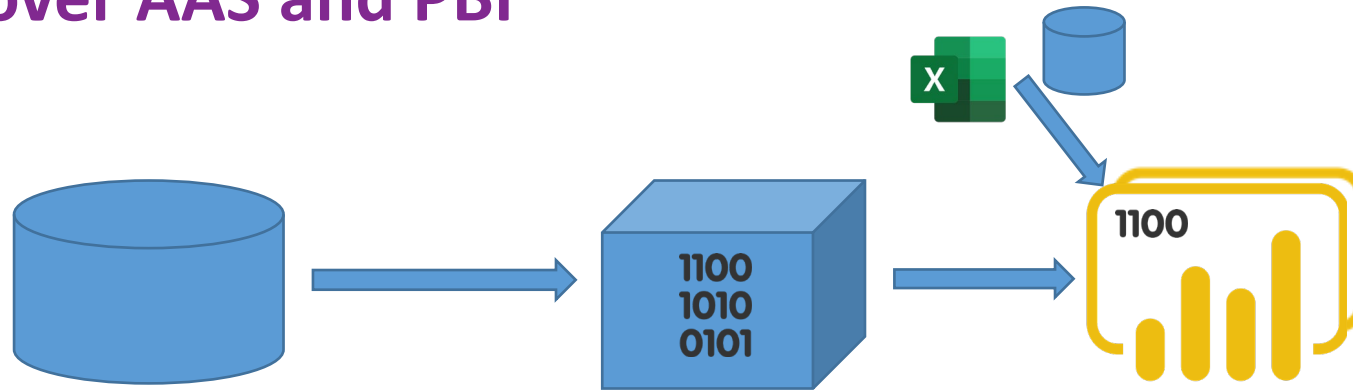
DQ over a PBI Dataset



DQ over a PBI Dataset



Direct Query over AAS and PBI



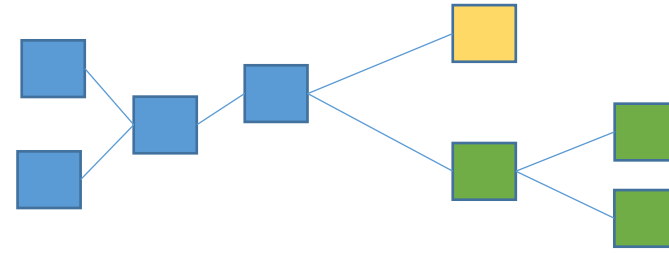
Pros	Cons
All benefits from Live Connection	It's in preview
Flexibility to enhance	Anything else?
Layered dataset management: Central -> Team -> Personal	



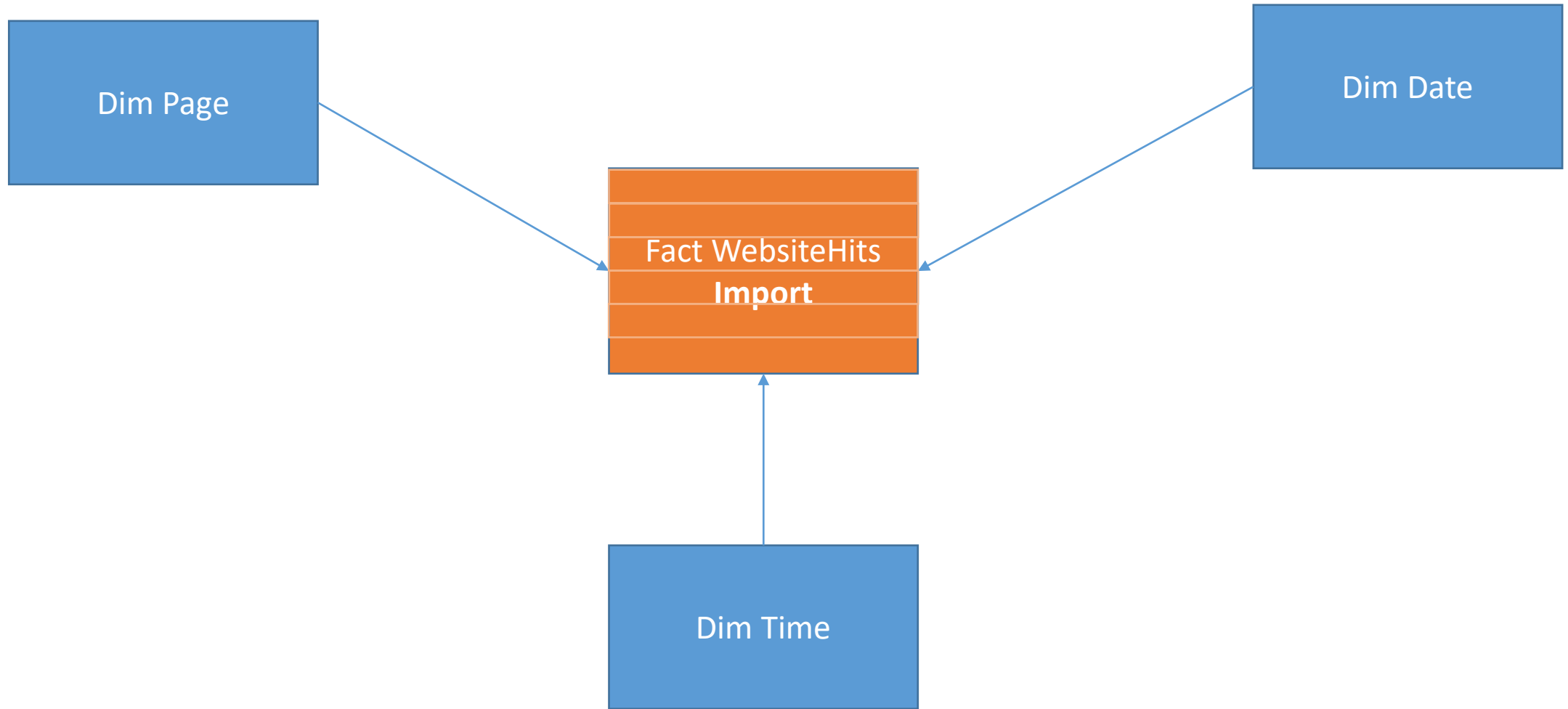
DQ over AAS and PBI Datasets

Things to know!

- Currently in Public Preview
- Does NOT need Premium! 😊
- Avoid High Cardinality cross island joins
- Chain of up to 3 datasets allowed
- Underlying RLS is supported, but not cross Island
- User needs new 'Build' permission on underlying Dataset
- Works on Azure Analysis Services, NOT on-prem (yet...)



Incremental Refresh



Incremental Refresh - Hybrid Table

Dim P

Dim Date

Granularity	Name	Row Count
Year	2011	295,489,717
Year	2012	297,678,498
Year	2013	295,575,442
Year	2014	292,477,875
Year	2015	297,780,469
Year	2016	294,060,081
Year	2017	300,419,682
Year	2018	296,541,108
Year	2019	292,787,420
Year	2020	299,273,979
Quarter	2021Q1	74,135,277
Month	2021Q104	24,939,498
Day	2021Q10501	820,805
Day	2021Q10502	826,885
Day	2021Q10503	821,043
Day-DirectQuery	2021Q10504-DQ	271,110
Total		3,063,898,887

Archived: **Import**

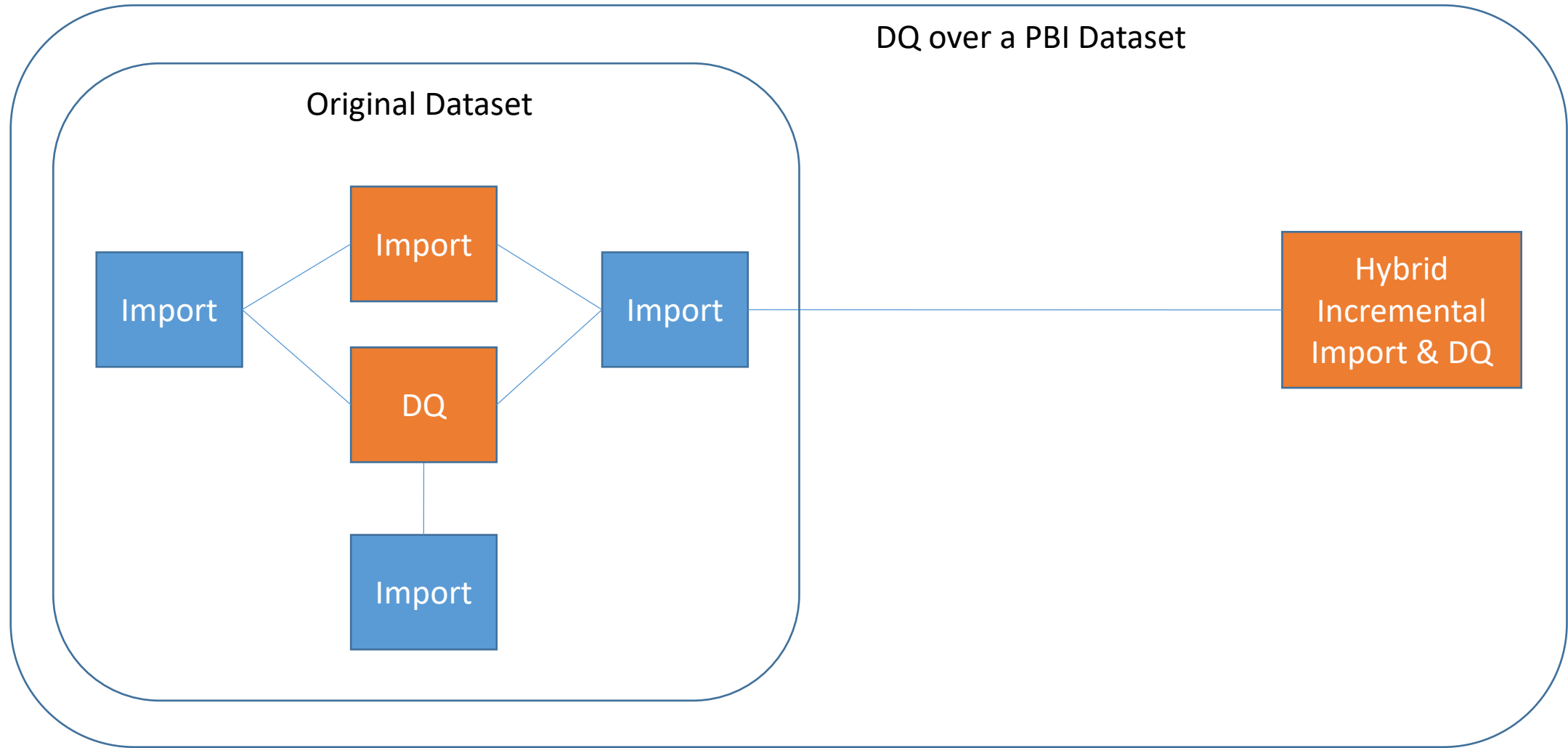
Incremental refresh: **Import**

Real time: **DirectQuery**

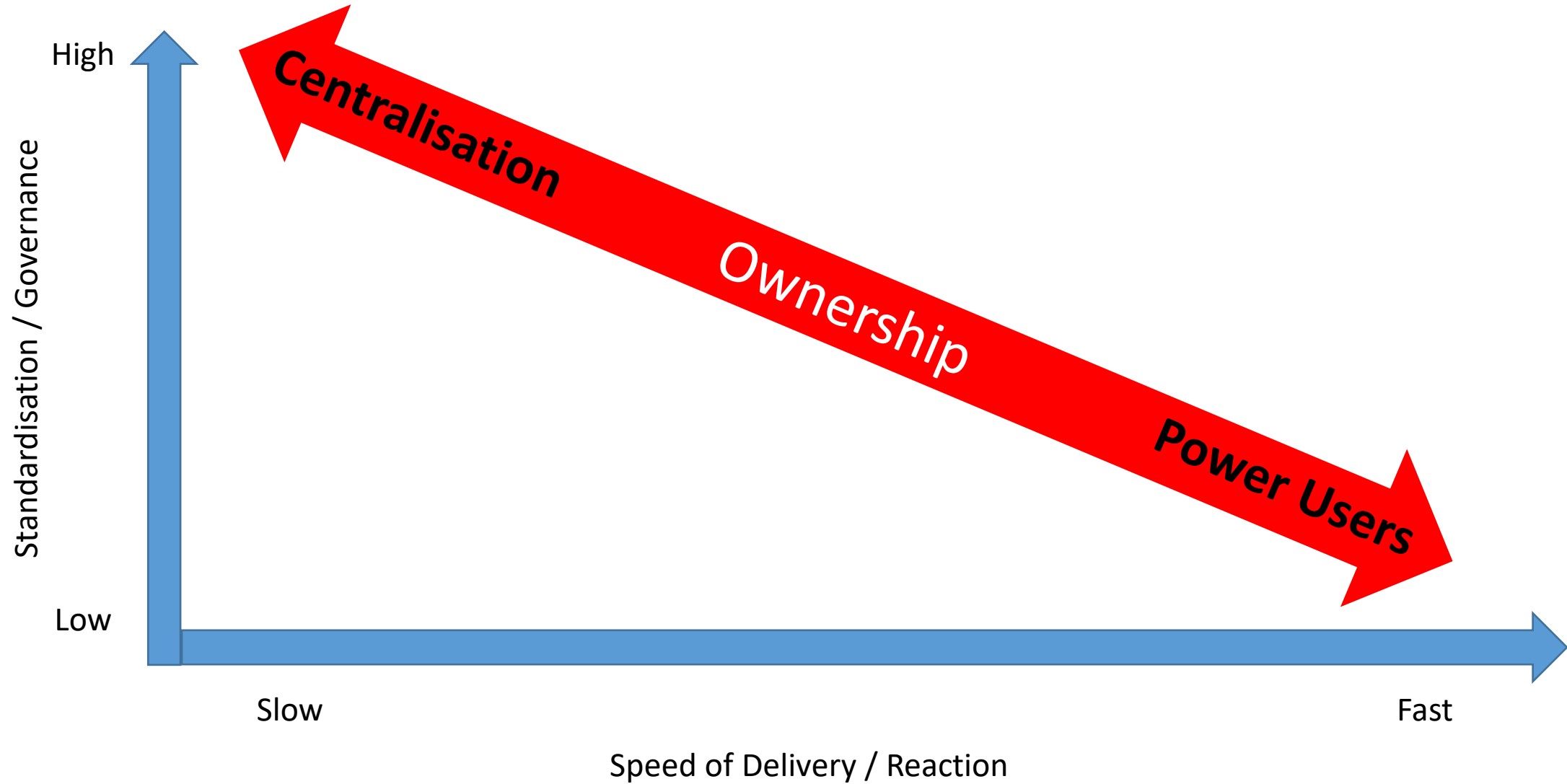
<https://powerbi.microsoft.com/en-us/blog/announcing-public-preview-of-hybrid-tables-in-power-bi-premium/>



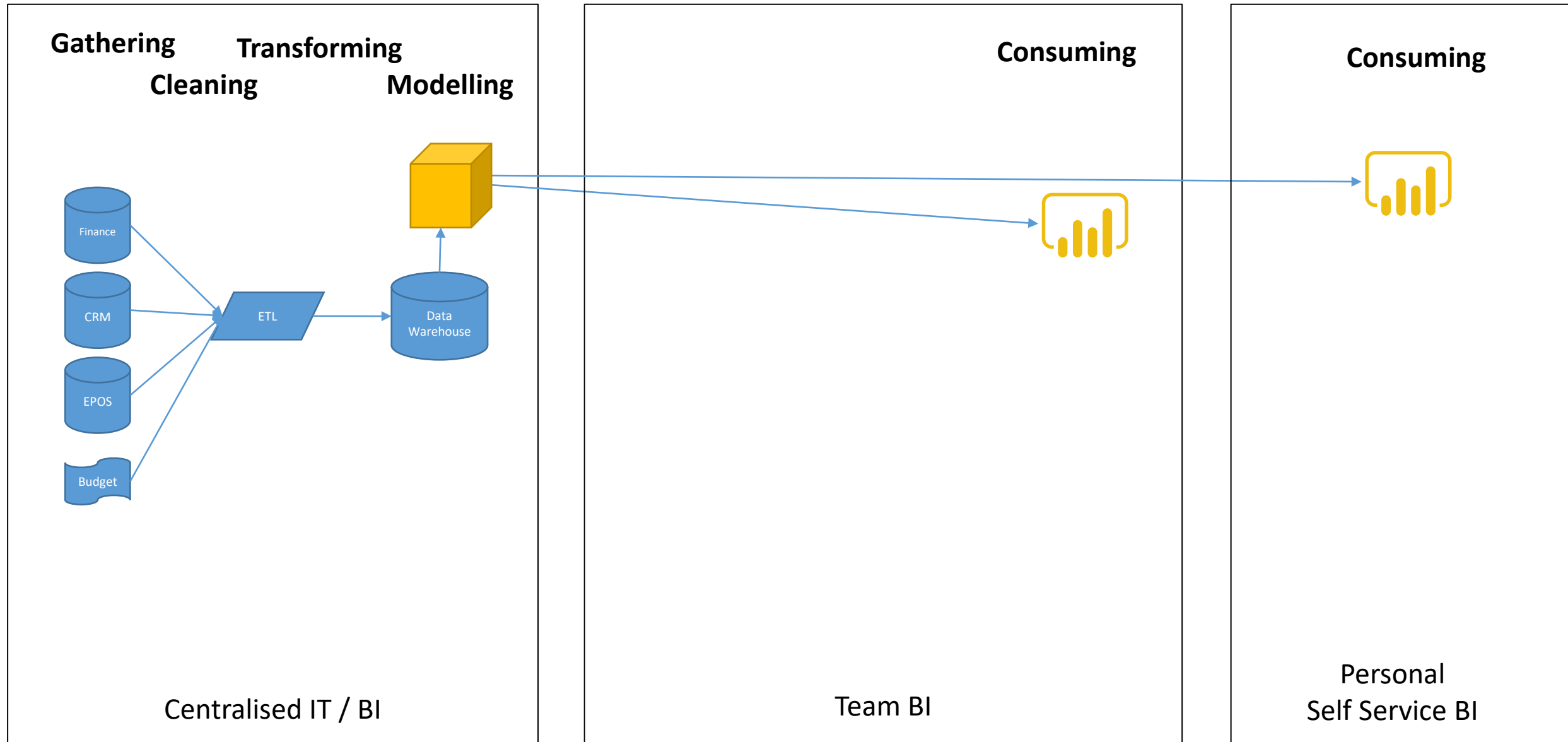
The Whole Picture!



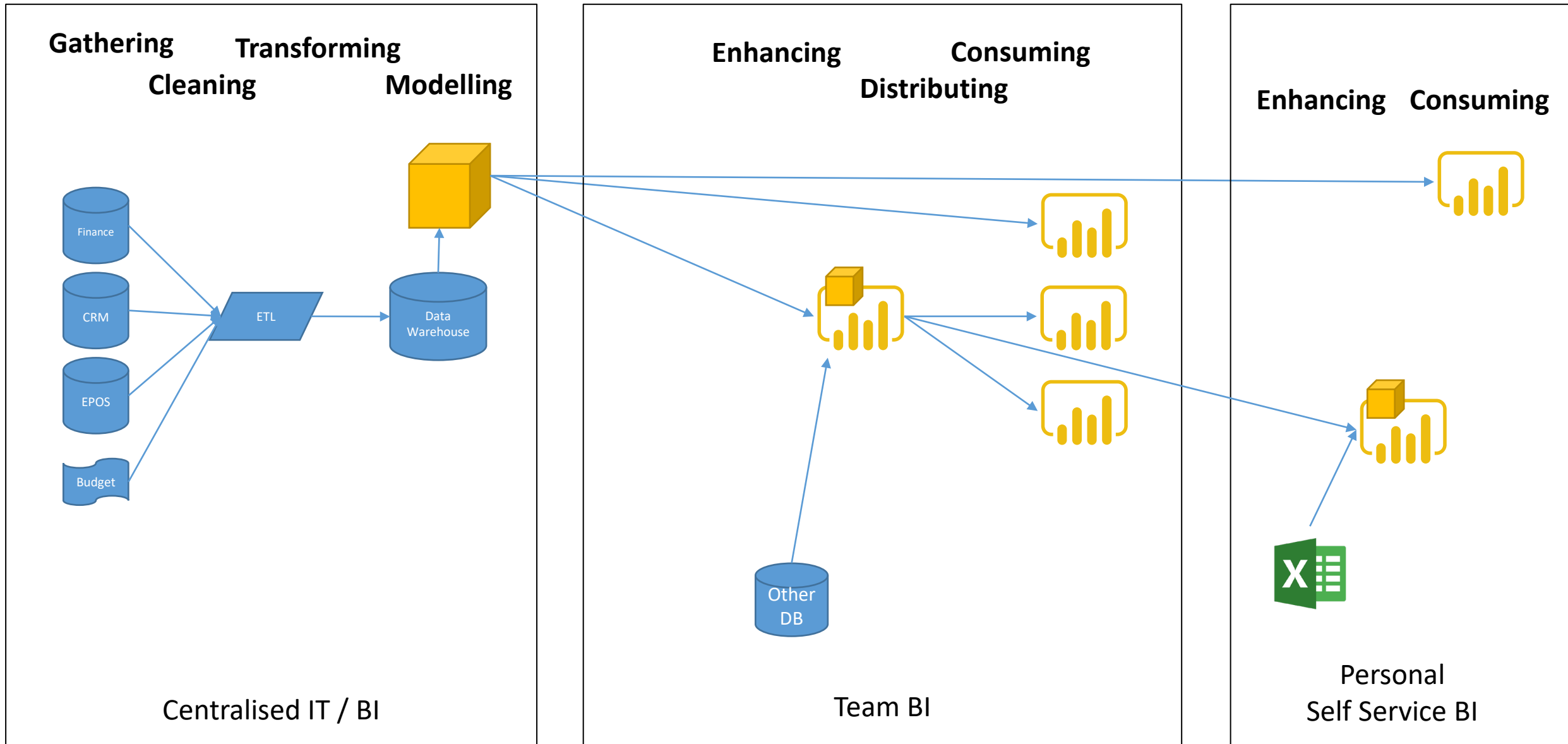
Ownership - Flexibility & Speed vs Governance



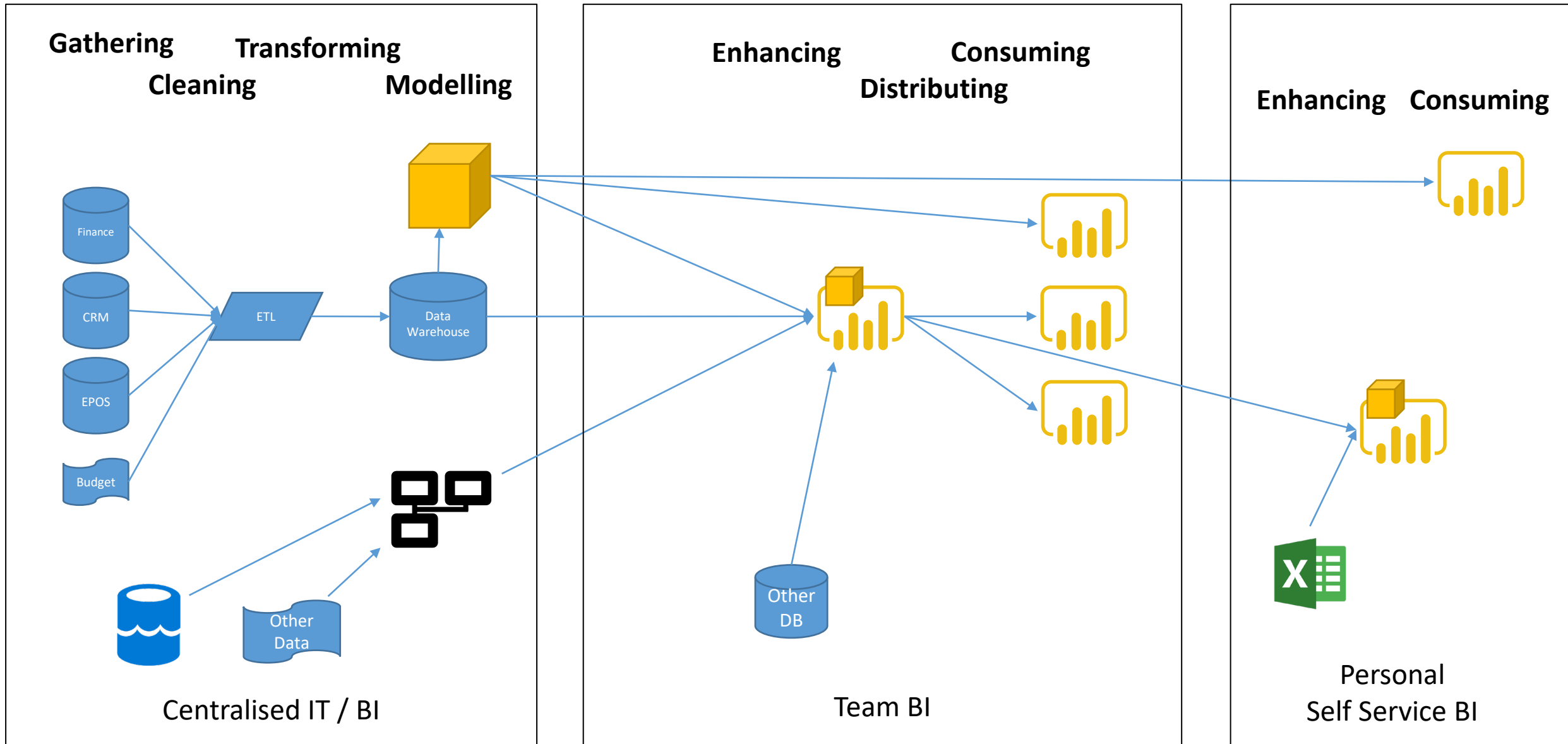
Multi-Layered Power BI Data Management



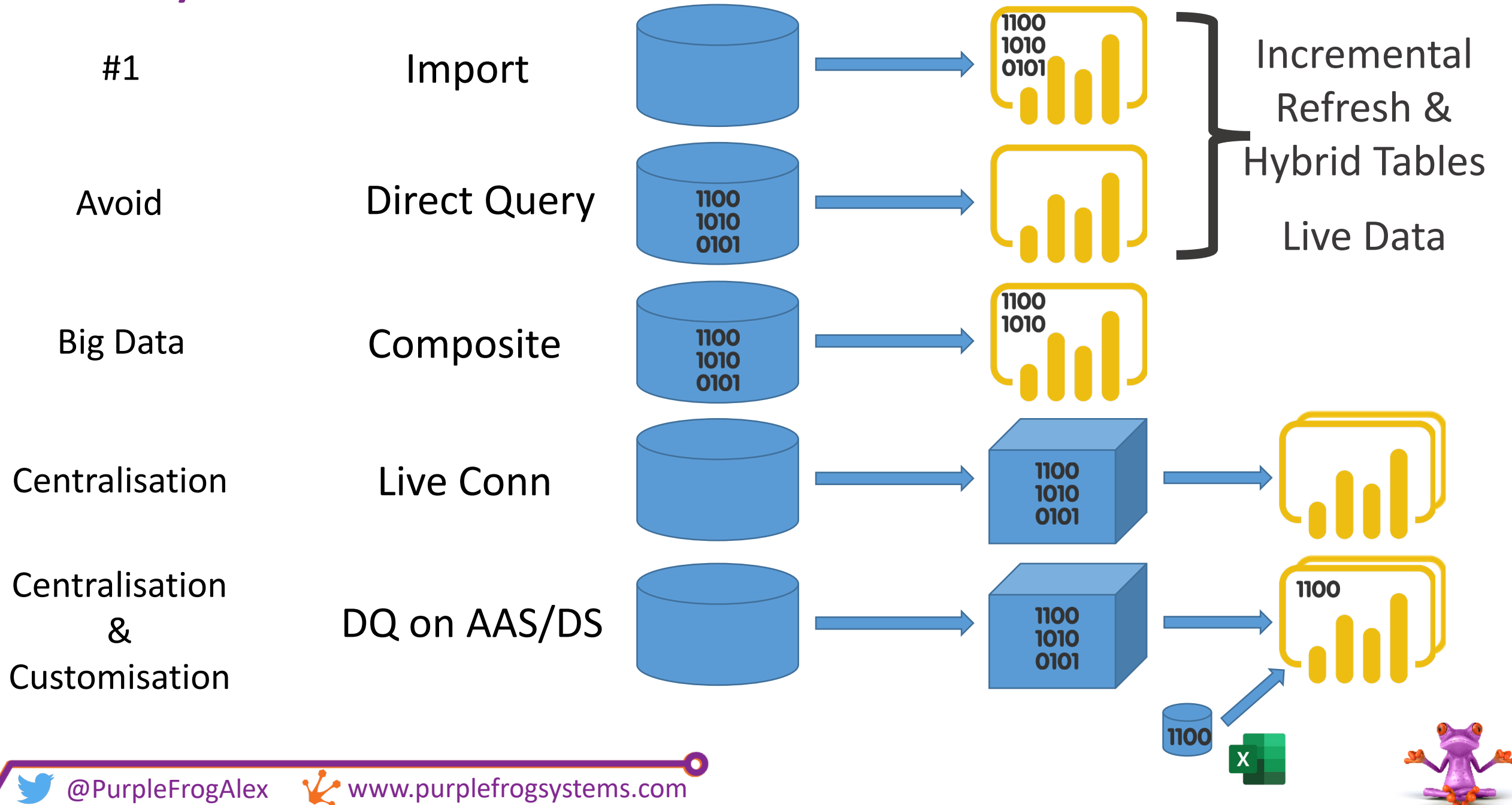
Multi-Layered Power BI Data Management



Multi-Layered Power BI Data Management



Summary



Power BI Composite Models



Questions?

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