Power BI

The Complete Guide

Power BI Desktop

What the Desktop application is perfect for

Workflow of Power BI Desktop

Power BI Desktop

Data preparation	Data modelling	Data visualization

Query Editor	→	Relationship View	Data View	→	Report View
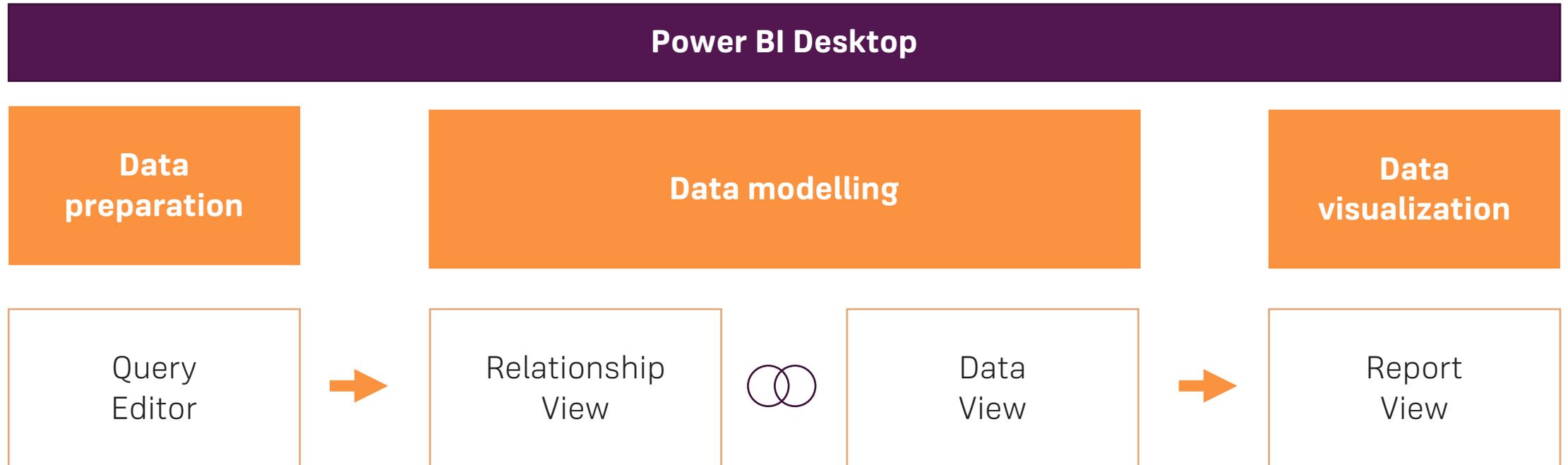
The Query Editor

How we import and prepare our data

Power BI Desktop – Query Editor

Power BI Desktop

Data preparation

Data modelling

Data visualization

Query Editor → Data View ⊙ Relationship View → Report View
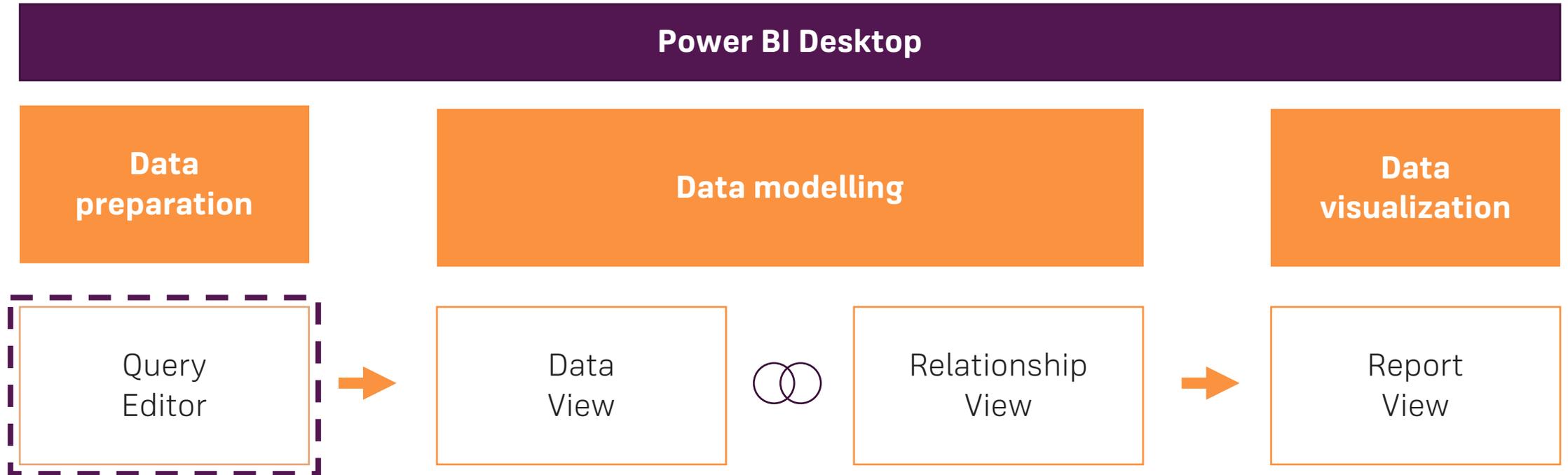
The Star Schema

FACT TABLE **VS** DIM TABLE

The Star Schema

Products
- **IdentifierProd**
- ProductType
- PricePerUnit
- CostperUnit

Time
- **IdentifierDate**
- Year
- Quarter
- Month
- Week
- Day

FACT TABLE

Sales
- **IdentifierProd**
- **IdentifierDate**
- **IdentifierCust**
- **IdentifierGeo**
- UnitsSold
- TotalSales
- TotalCost

DIM TABLE

Customers
- **IdentifierCust**
- FirstName
- SecondName
- Age
- Gender

SalesPoint
- **IdentifierGeo**
- Continent
- Country
- City

Our Project – Current structure

Population-Combined

- Country-ID
- Country
- Year
- AgeGroup
- Gender
- Population

Out Project turned into a Star Schema

DIM TABLE

Region
- Country-ID
- Country
- Region

FACT TABLE

Population
- Country-ID
- AgeGroup-ID
- Year
- Gender
- Population

DIM TABLE

Age
- AgeGroup-ID
- AgeGroup
- Category

Query: Duplicate vs. Reference
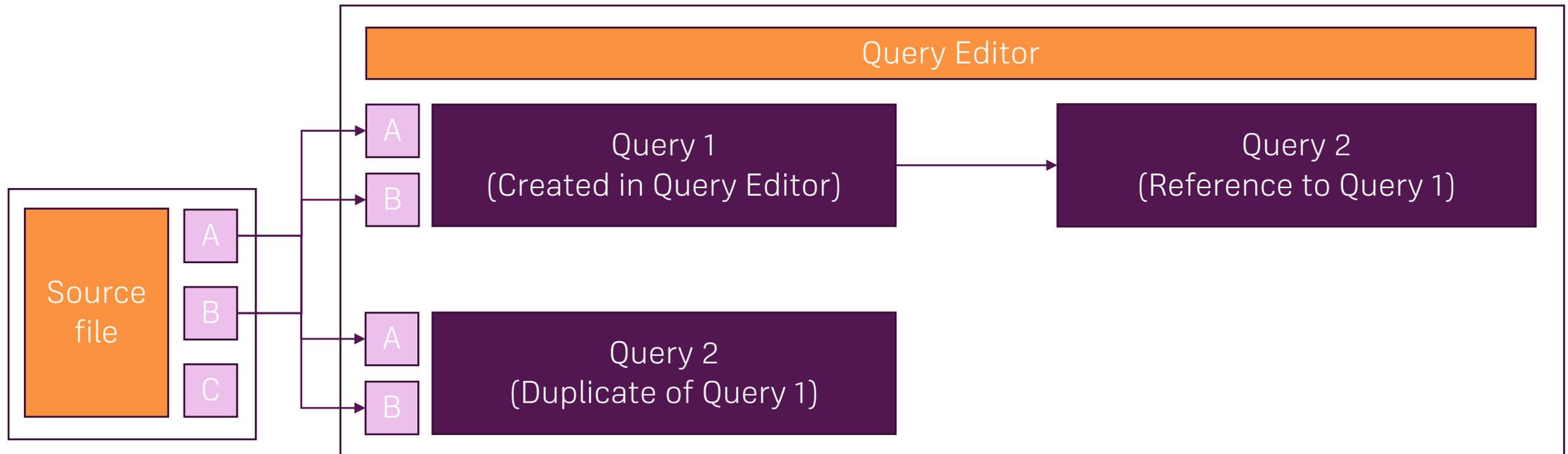
Merge Queries - Join Kind

Separate Queries

Query 1 LEFT		Query 2 RIGHT	
ID	Sales	ID	Region
A	10	A	USA
B	50	BB	Europe
C	20	C	Asia

Merged Queries

Outer

	LEFT				RIGHT		
	ID	Sales	Region		ID	Region	Sales
	A	10	USA		A	USA	10
	B	50	n/a		BB	Europe	n/a
	C	20	Asia		C	Asia	20

FULL

ID	Sales	Region
A	10	USA
B	50	n/a
C	20	Asia
BB	n/a	Europe

Anti

	LEFT				RIGHT		
	ID	Sales	Region		ID	Region	Sales
	B	50	n/a		BB	Europe	n/a

Inner

ID	Sales	Region
A	10	USA
C	20	Asia

Import data into the data model

Source files

Import data
Query 1
Query 2

Data preparation

Query Editor

Default =
Enable load is
set for **all queries**

Query 1 &
Query 2 are
loaded into the
data model

Data model

Data View/Report View

Import data
Query 1
Query 2

Data preparation

Query Editor

Enable load is
**only selected
for Query 1**

Query 1 is
loaded into the
data model

Data model

Data View/Report View
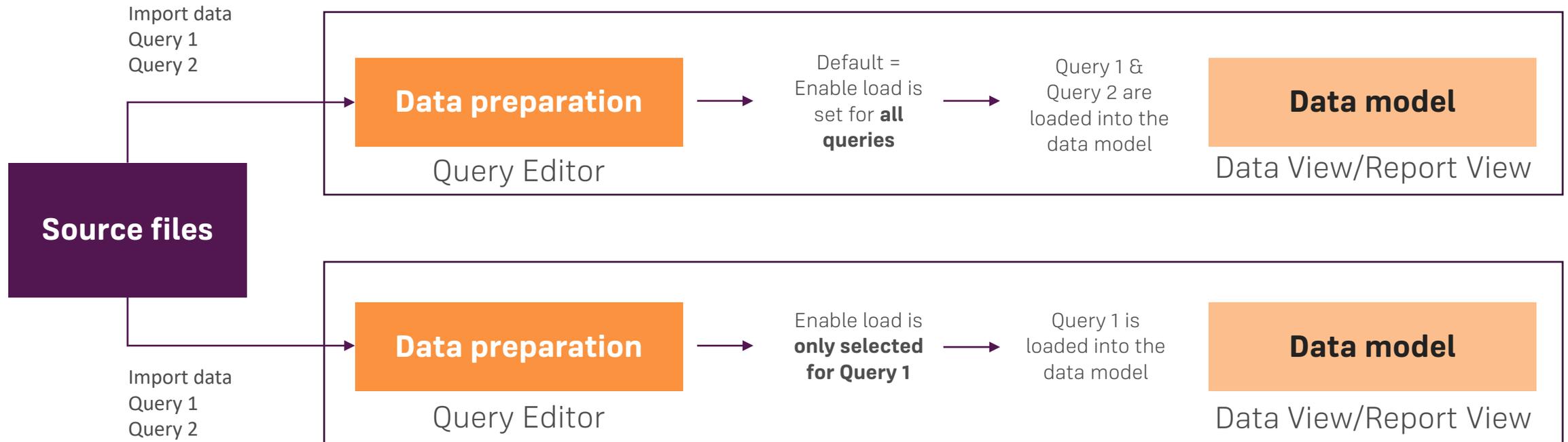
Data View & Relationships

How we model our data

Power BI Desktop – Data Model

Power BI Desktop

Data preparation	Data modelling	Data visualization

| Query Editor | → | Data View | ⬤⬤ | Relationship View | → | Report View |
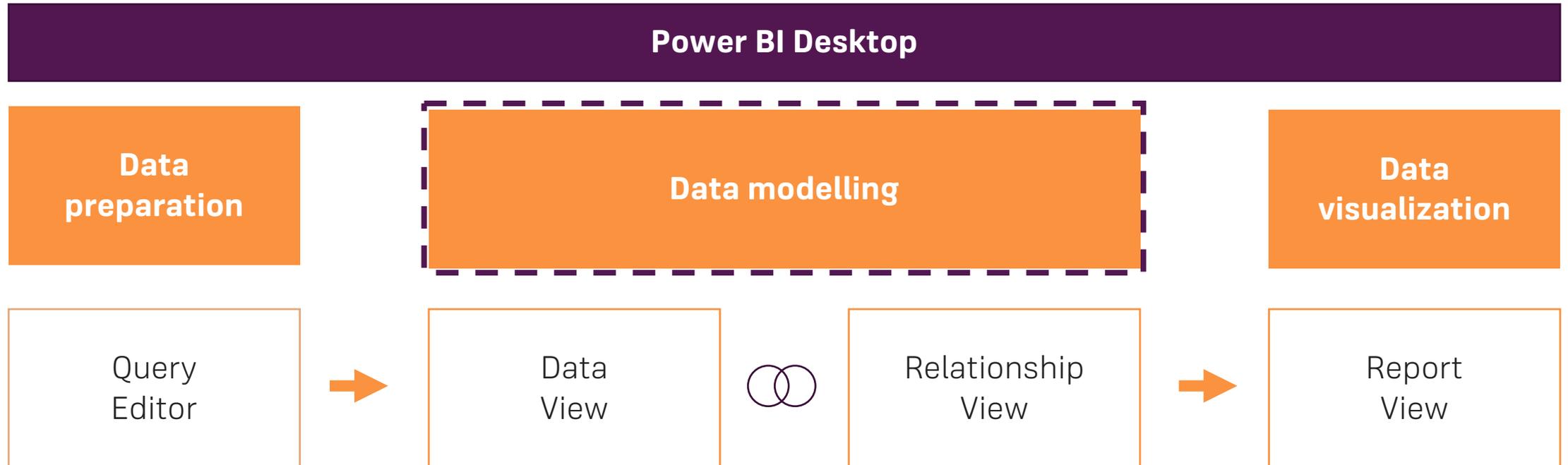
Query Editor vs. Data Model

Query Editor		Data Model
Connect to source files	≠	Add relationships
Clean data		Add calculated columns
Shape data		Add measures

Structure + prepare data

Analyse data

Power BI Desktop – Data Model

Power BI Desktop		
Data preparation	**Data modelling**	**Data visualization**
Query Editor	Data View → Relationship View	Report View
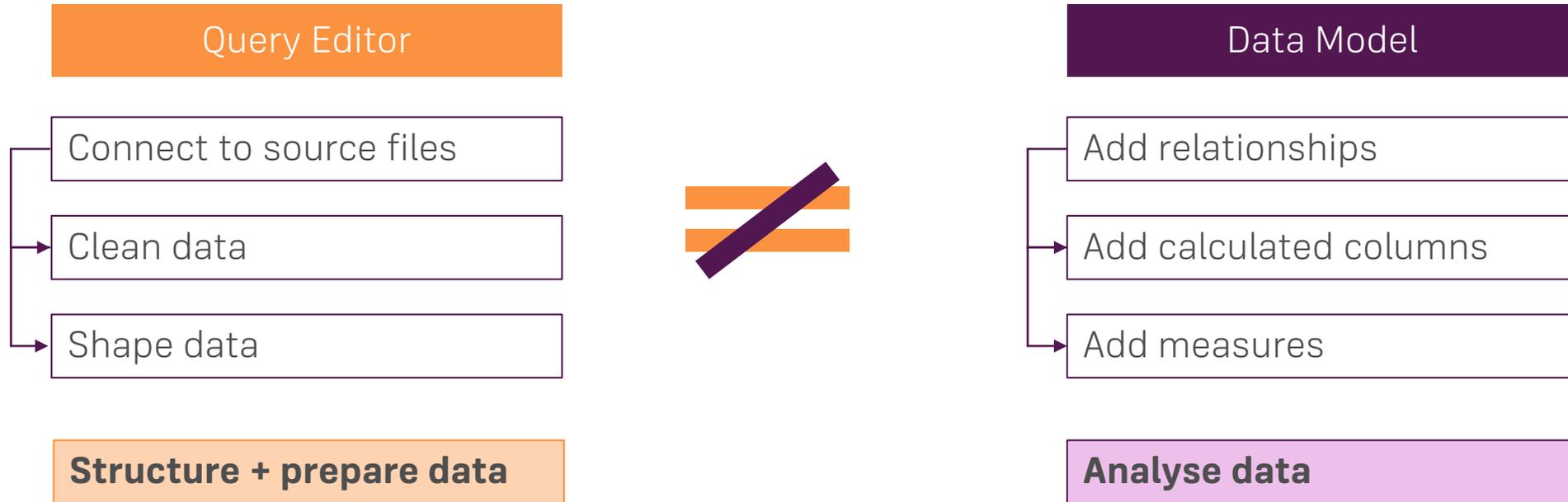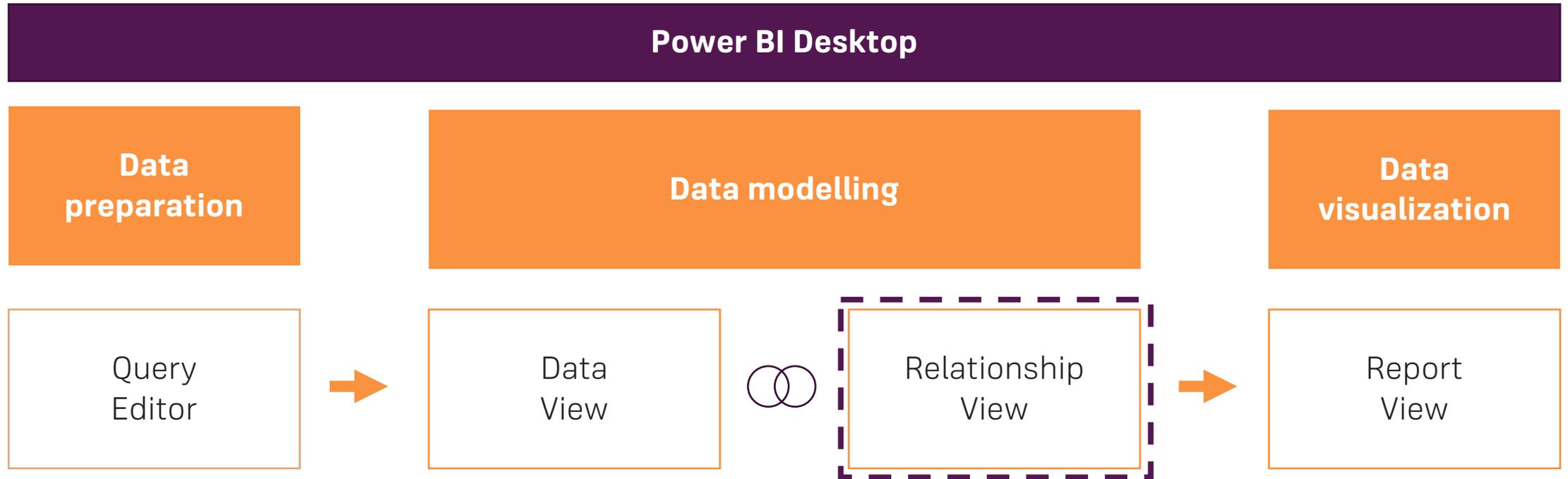
Let's bring our Data Model to live

Cardinality

Cross Filter Direction

Active Properties

= „Type of relationship"

One to many (1:*) & Many to one (*:1)

Customers

ID-Customer	FirstName	SecondName
1	Maximilian	Schwarzmueller
2	John	Meyer
3	Linda	Belle
4	Manuel	Lorenz

Orders

ID-Order	OrderDate	ID-Customer
A	01 Jan 2017	1
B	08 Jan 2017	2
C	15 Jan 2017	1
D	25 Jan 2017	1
E	05 Feb 2017	3
F	15 Feb 2017	4

Each customer is unique

Each customer can have multiple orders

One to one (1:1)

ID-Passport	Valid	Issued	FirstName	SecondName	Country
1	2025	2005	Maximilian	Schwarzmueller	Germany
2	2019	1999	John	Meyer	USA
3	2017	1997	Linda	Belle	Japan

Passport

ID-Passport	Valid	Issued
1	2025	2005
2	2019	1999
3	2017	1997

Person

ID-Passport	FirstName	Second Name	Country
1	Maximilian	Schwarzmueller	Germany
2	John	Meyer	USA
3	Linda	Belle	Japan

Power BI Desktop – Data Model

Power BI Desktop			
Data preparation	**Data modelling**		**Data visualization**
Query Editor	Data View	Relationship View	Report View
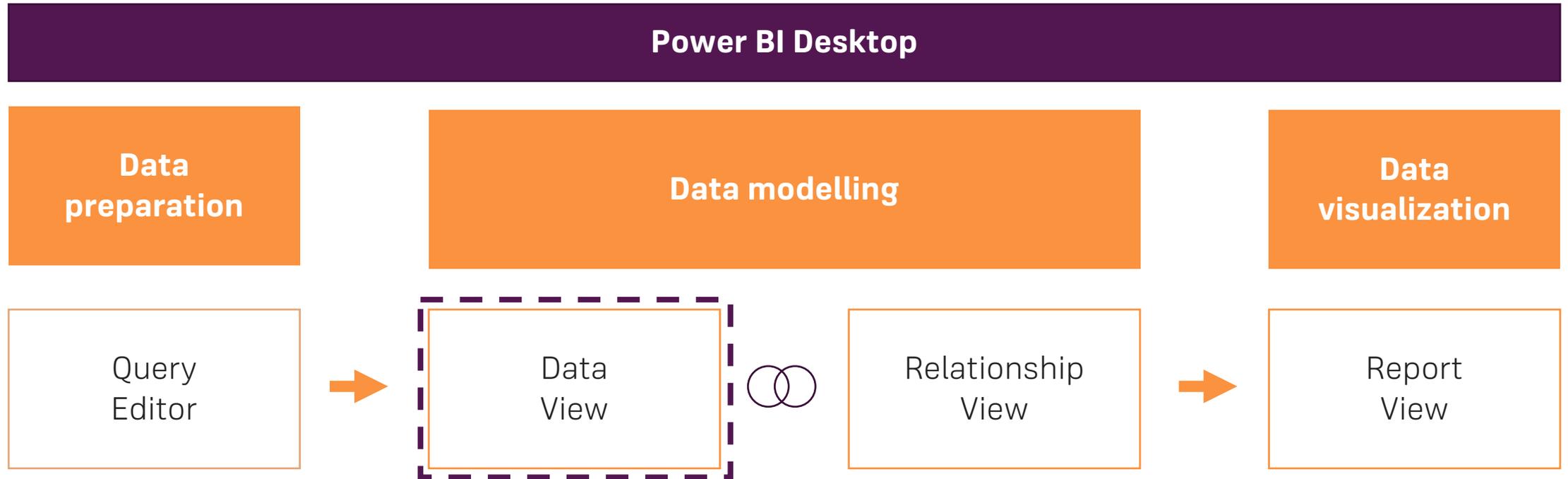
One tool – Two languages

Description

Power Query Formula Language
Data transformation

Data Analysis Expression Language
Analytical data calculation
Comparable to Excel functions

Application areas

M-Language

Independent from each other

DAX-Language

Prepare your data before you load them into the data model

Create formulas for an in-depth analysis in the Data View

Course interim conclusion

M

OR

DAX

Calculated Columns vs. Measures

Perform an operation that generates **results for each row** of your table ▶ Calculated Column

Return a **single result** of a calculation or an aggregated value (e.g. Averages) ▶ Measure

Report View

Let's create beautiful charts and tables

Power BI Desktop – Report View

| Power BI Desktop		
Data preparation	**Data modelling**	**Data visualization**

Query Editor → Data View ⬭⬭ Relationship View → Report View
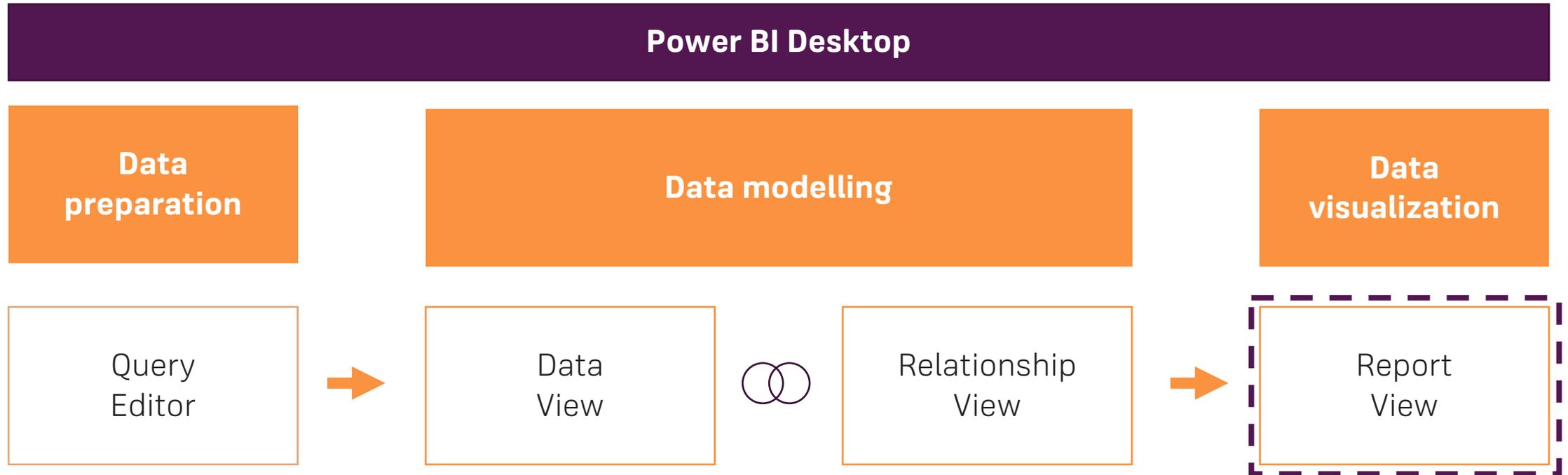
Power BI Service & Power BI Mobile

We finished our work locally, what now?
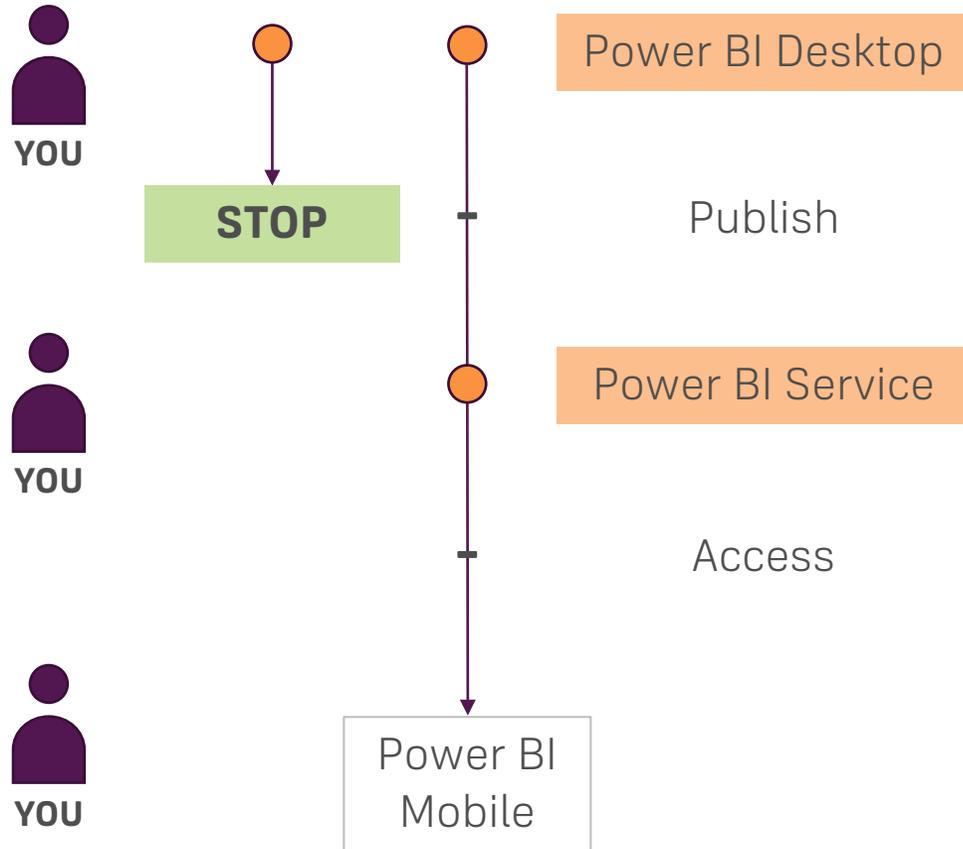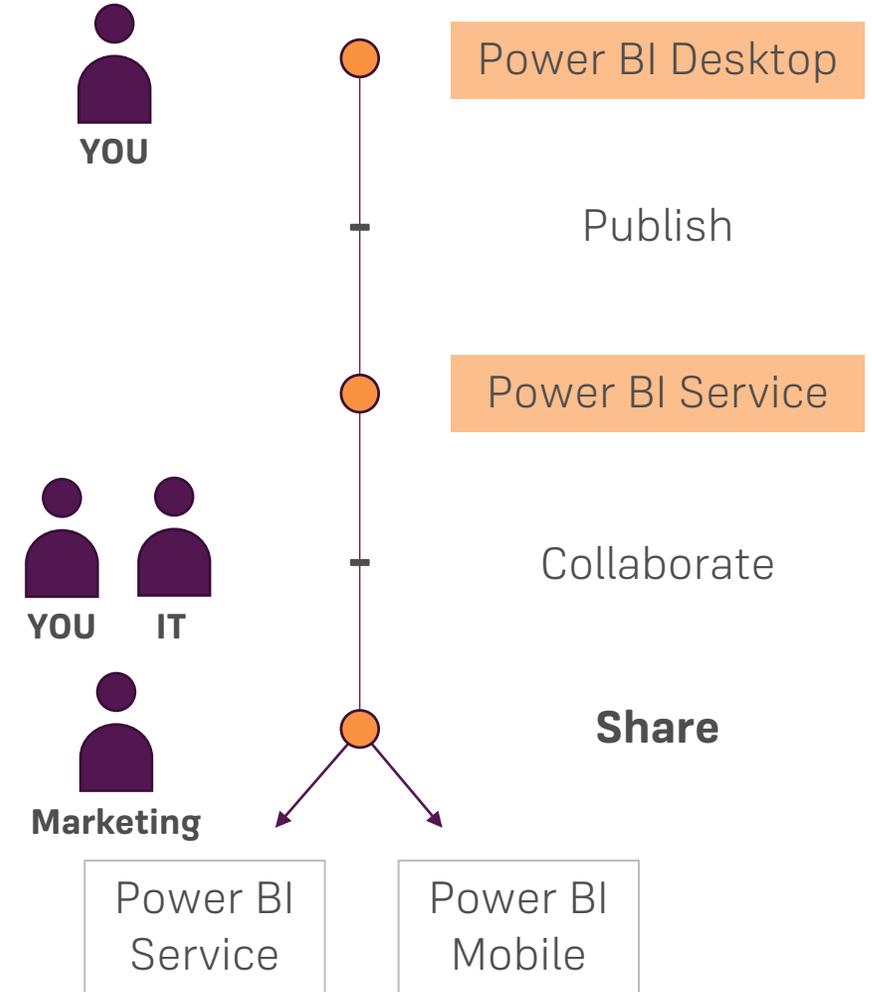
# Questions to be answered

How can we **publish** our data to Power BI Service?

How can we **collaborate** in Power BI Service?

How can **we share data** and specify **what** we want to share?

Changes in 2017

Until 31 May

Power BI Free	Power BI Pro
Personal users	Collaboration

01 June 2017

- Access to all Pro Databases
- Increased Workspace Storage
- Improved refresh-rates

Functional alignment with remaining differences in sharing and collaboration

+ Power BI Premium

Large Scale BI deployments
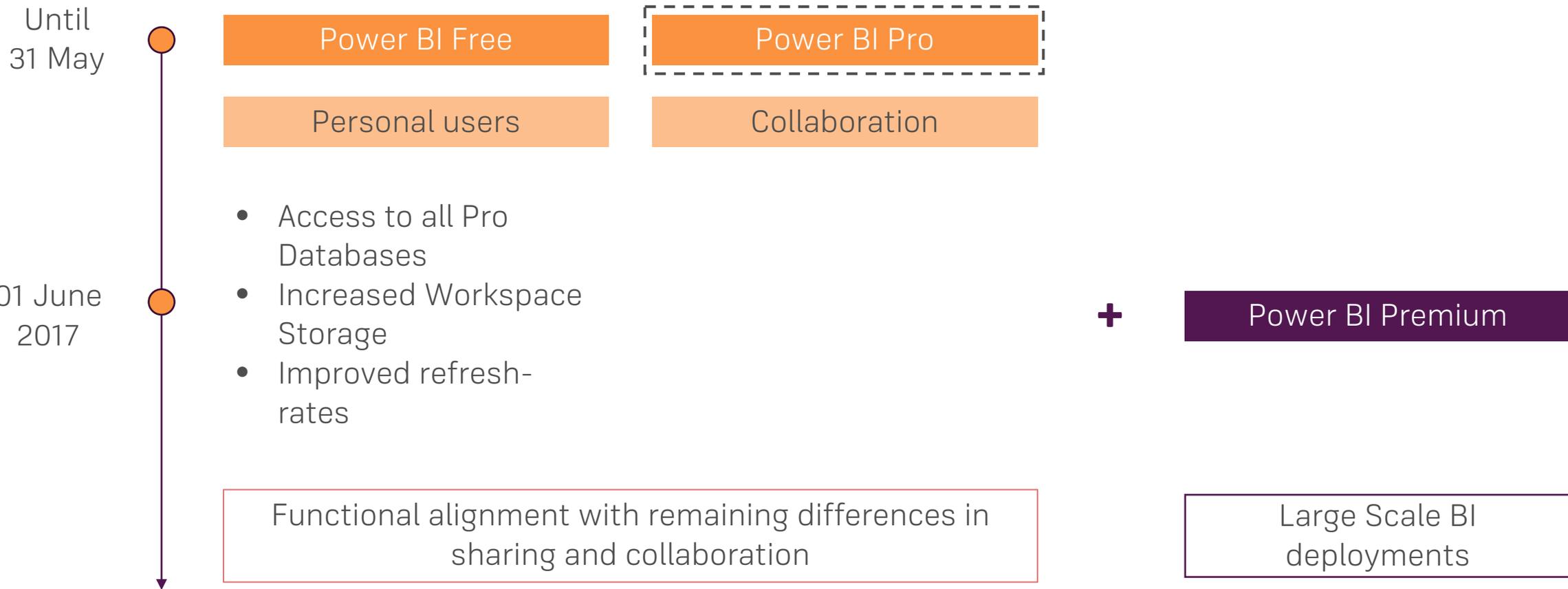
Publishing our project data to Power BI Service
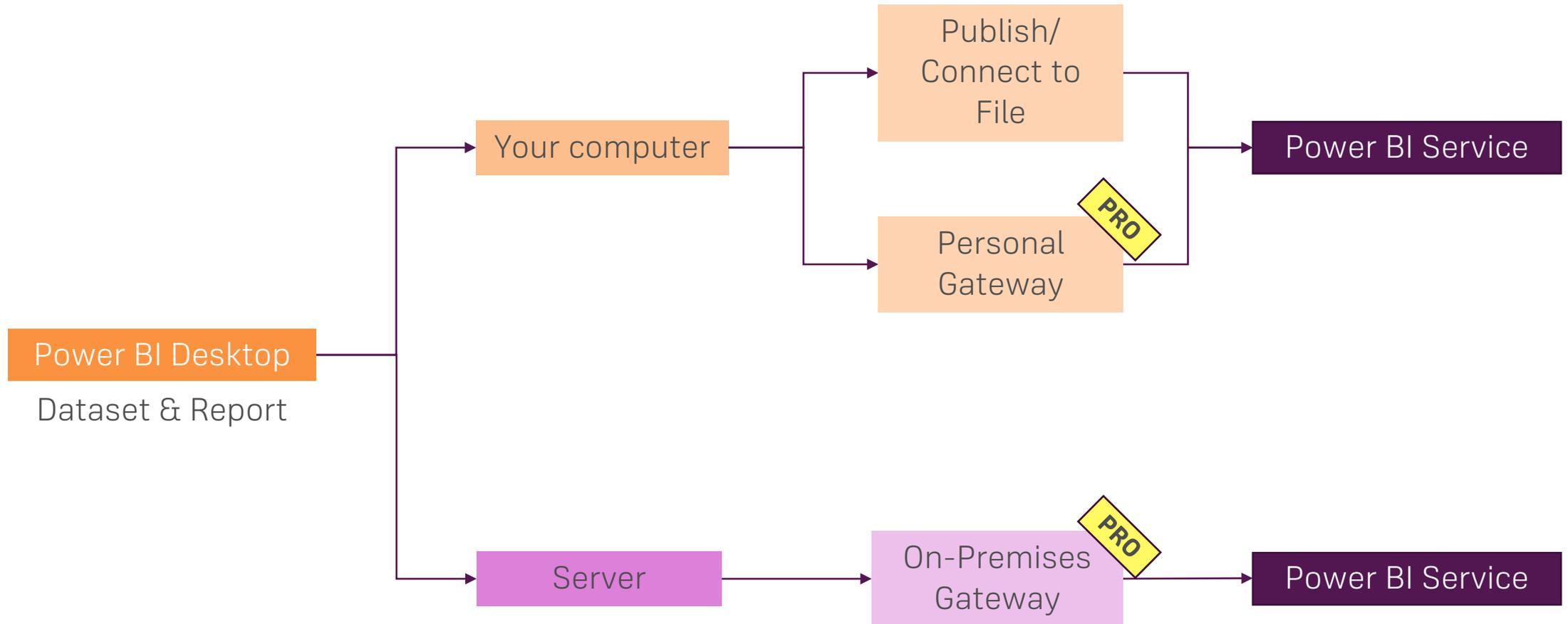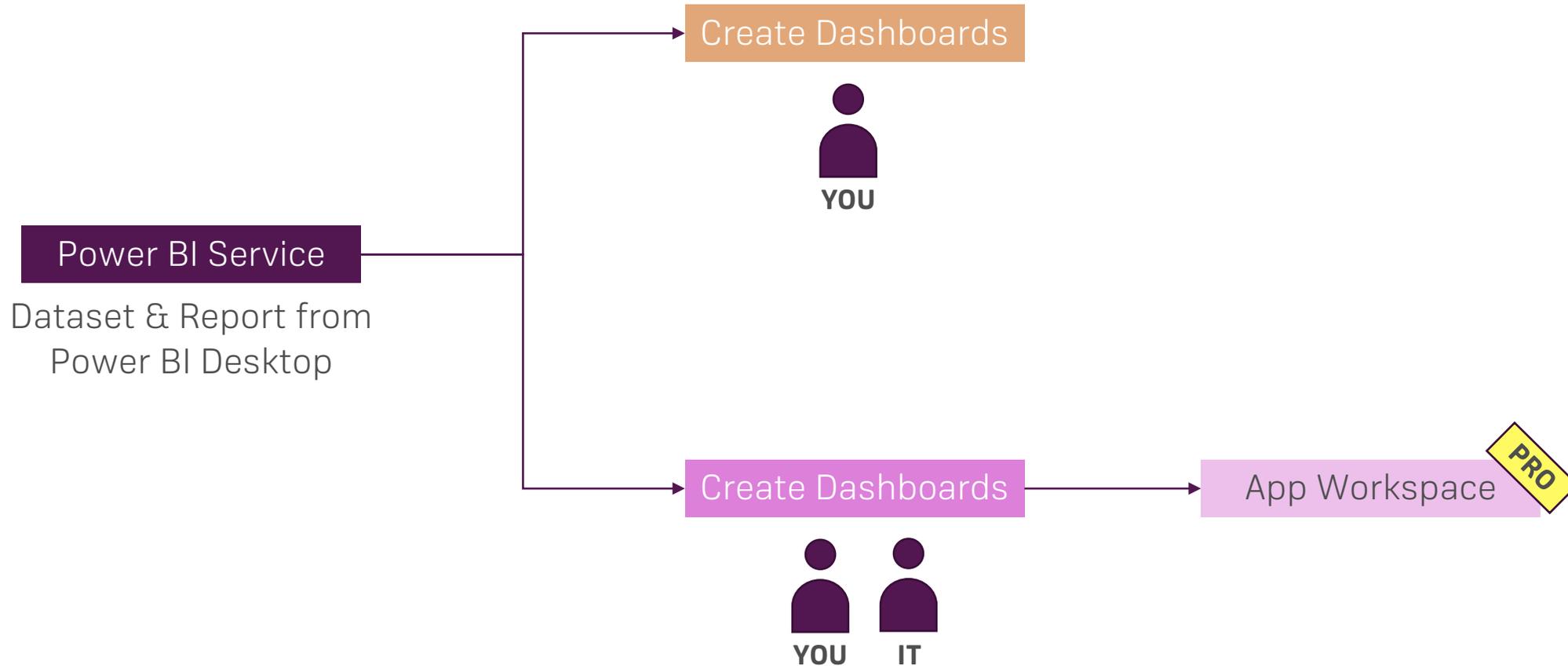
How can we share our results from the App workspace?

Power BI Service

Dashboard, Report & Dataset

Dashboard

Report

Dataset

Publish App

Report

Publish to Web
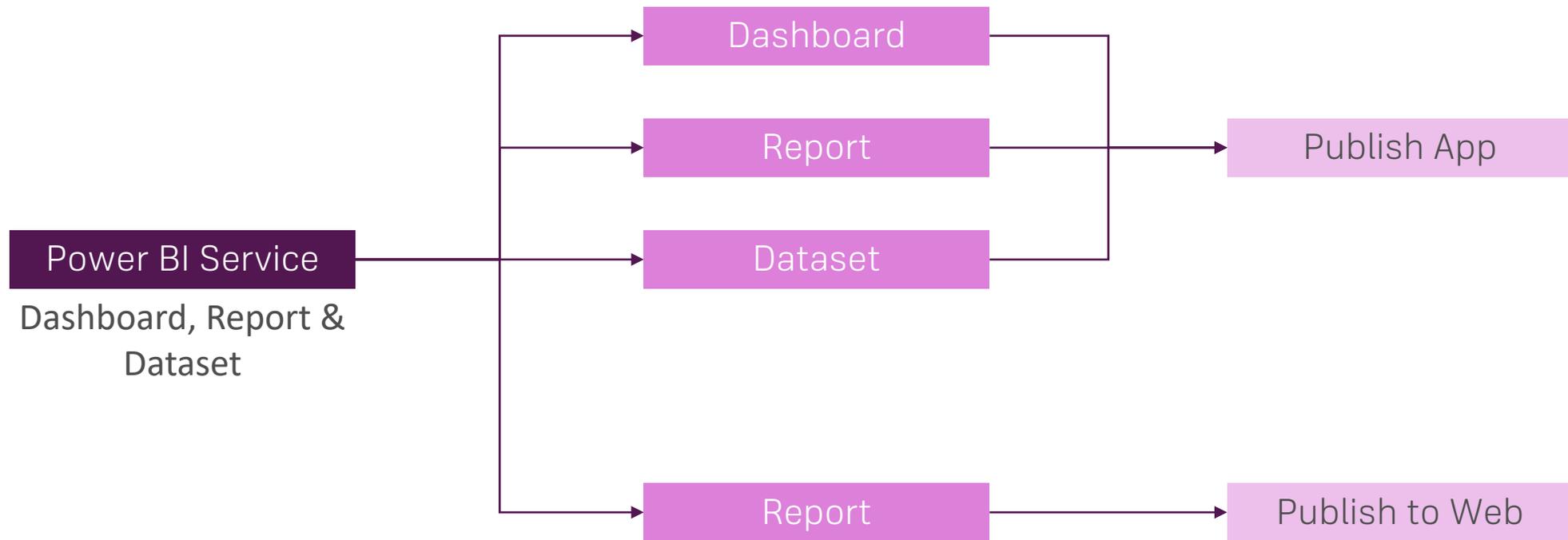
PRO Data **created** using **Pro features**, can only be **shared** with **Power BI Pro Users**!