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Getting Started

What & Why?

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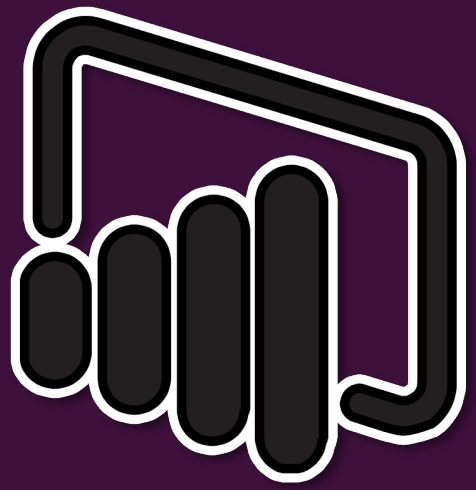
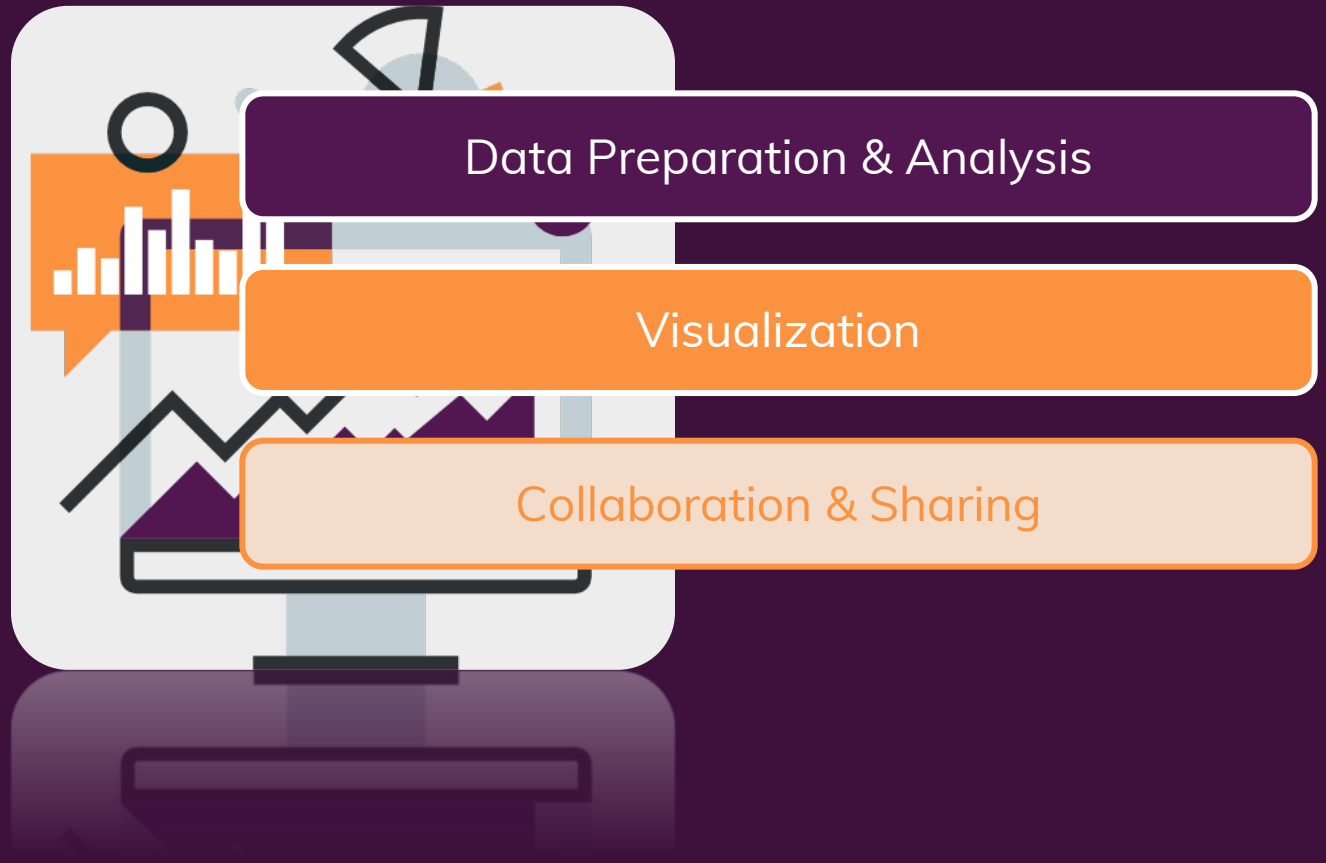
What is Power BI?



"A business analytics solution that lets you visualize your data and share insights across your organization. Connect to hundreds of data sources and bring your data to life with live dashboards and reports."

Three Core Areas



Understanding the Core Power BI Toolset

Power BI Desktop	Power BI Service (Pro)	Power BI Mobile
 Windows Only	Website Login	Mobile App
Datasets	Datasets	
Visuals	Visuals	
Reports	Reports	
	Dashboards	
	Collaboration	Access Anywhere
	Share Results	

Course Outline

Getting Started

Work locally in Power BI Desktop
- Prerequisites
- The Query Editor
- Analyzing Data
- Visualizing Data

Collaborate
- Power BI Service
- Power BI Mobile

Dive Deeper
- Additional Data Sources
- How to Stay Updated?

Master Power BI
- Bonus: Advanced Features
- Roundup & Next Steps

How to Get The Most Out Of This Course

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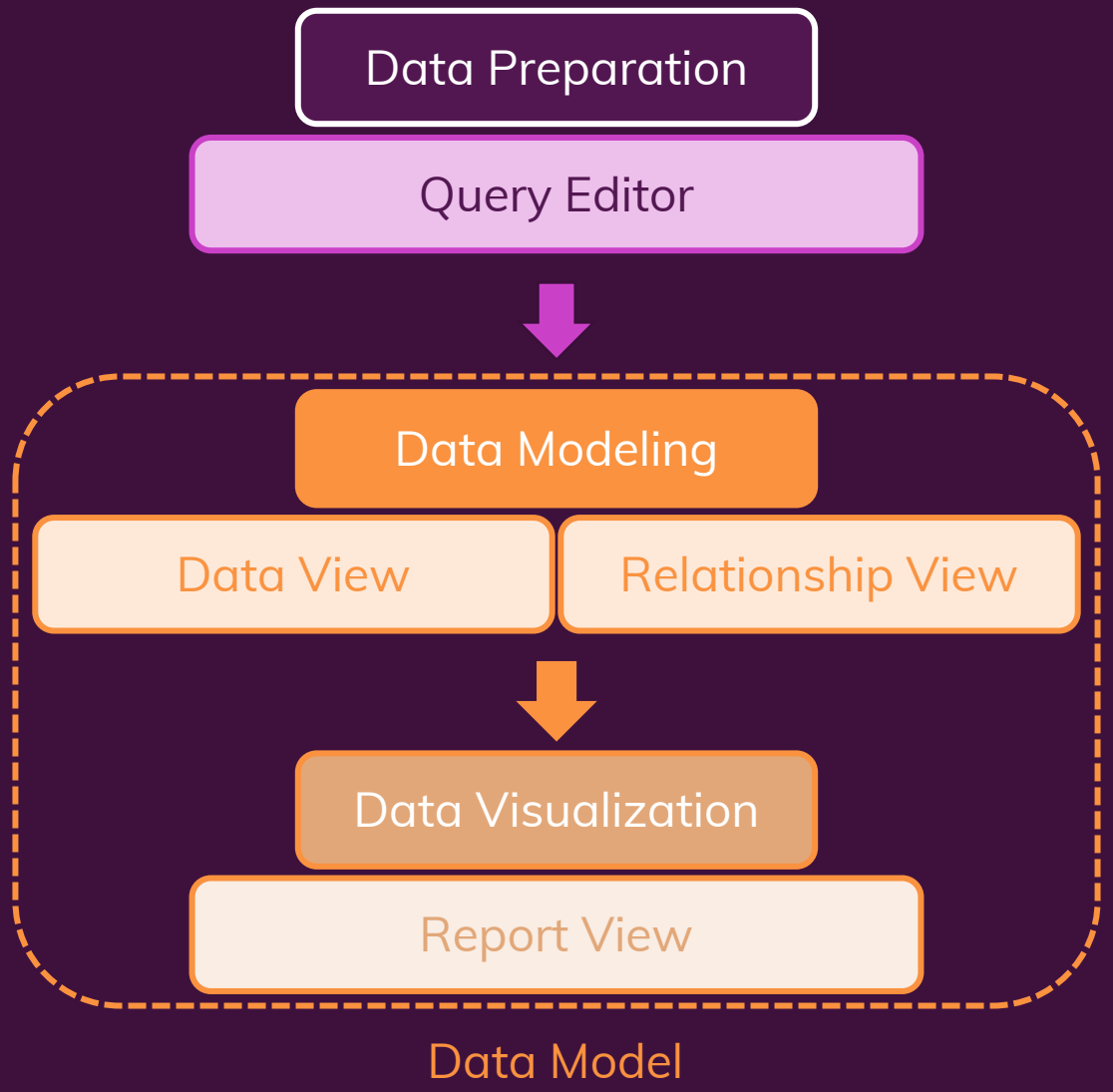
Power BI Desktop

Exploring the Desktop Application

Module Overview

- How to Use the Attached Project Files
- Power BI Desktop Workflow
- Exploring the Data Model
- The Query Editor Interface
- Recommended Settings

Understanding the Workflow



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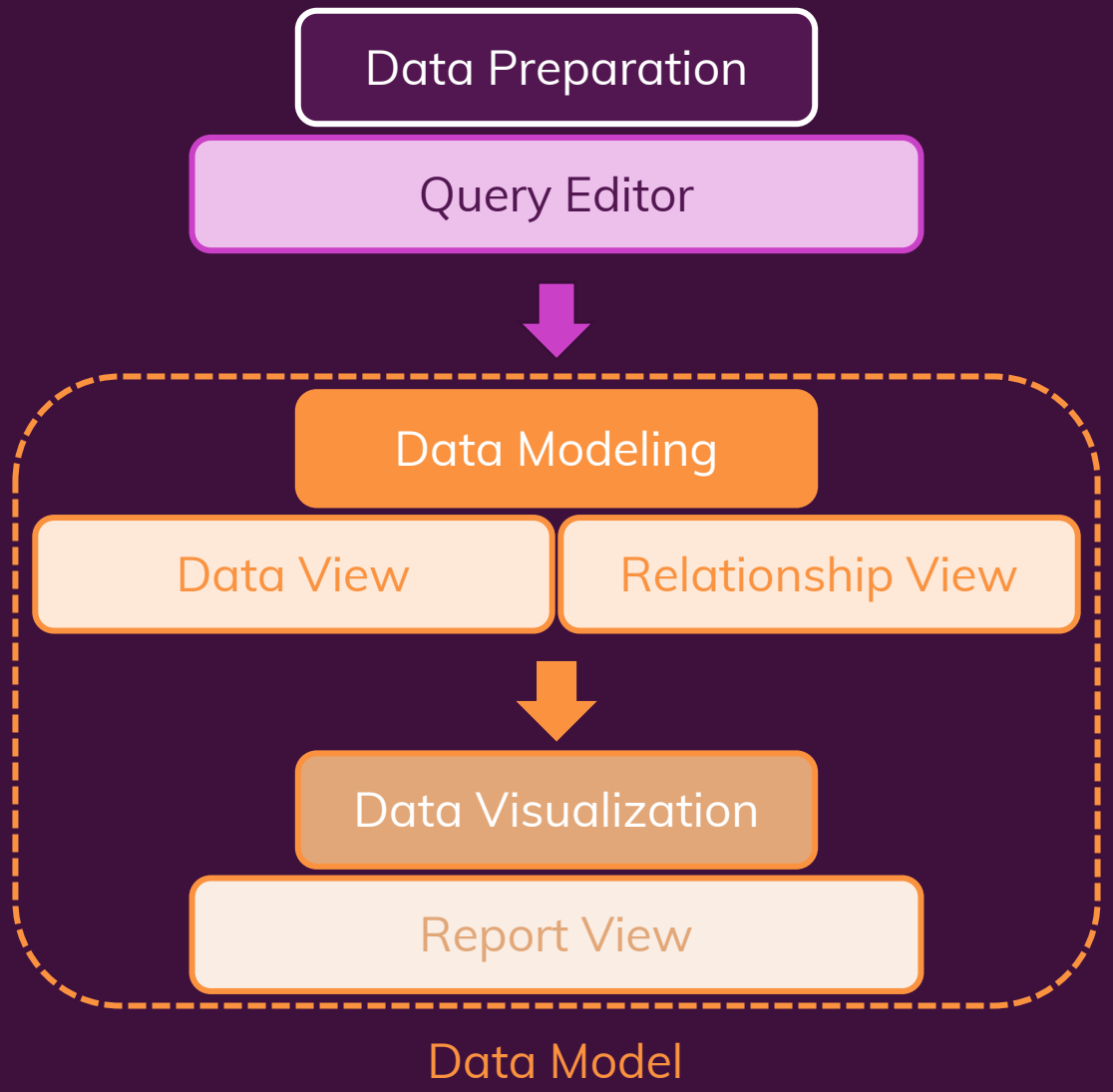
Diving Into The Query Editor

Preparing our Dataset

Module Overview

- Connecting Power BI Desktop to Files
- Editing Rows & Columns
- Appending & Merging Queries
- Creating a Data Schema (Star Schema)
- Conditional Columns & Mathematical Operations

Understanding the Workflow



Understanding Append

Query 1

New Query

Query 2

Country	Revenue	Cost	Year
Country	Revenue	Cost	Year
Germany	108	-20	2014
Germany	108	-22	2015
Germany	105	-25	2016
Country	Revenue	Cost	Year
Germany	116	-24	2017
Germany	116	-25	2018
Germany	120	-25	2018
Germany	122	-27	2019

Column amount and names must be equal in initial queries!

Pivoting & Unpivoting

Product	2018	2019	2020
Apple	10	12	13
Banana	23	25	21

Attribute

Value

Pivot

Unpivot

Product	Attribute	Value
Apple	2018	10
Apple	2019	12
Apple	2020	13
Banana	2018	23
Banana	2019	25
Banana	2020	21

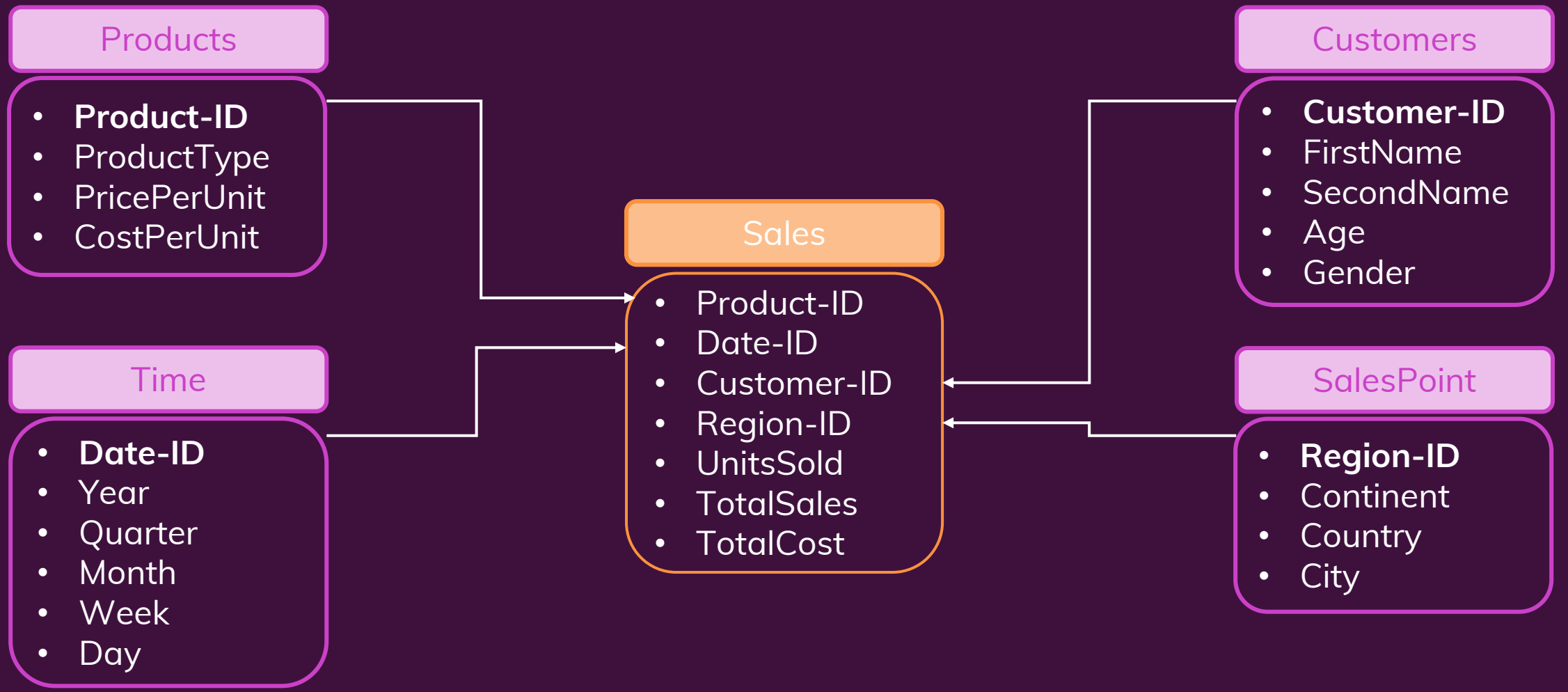
What we Achieved so Far & How to Continue

- Source File Connection
- Row & Column Operations
- Filters, Formatting, Error Handling
- Appending Queries
- Pivoting & Unpivoting
- Splitting Columns
- Basic Cleaning & Shaping ✓

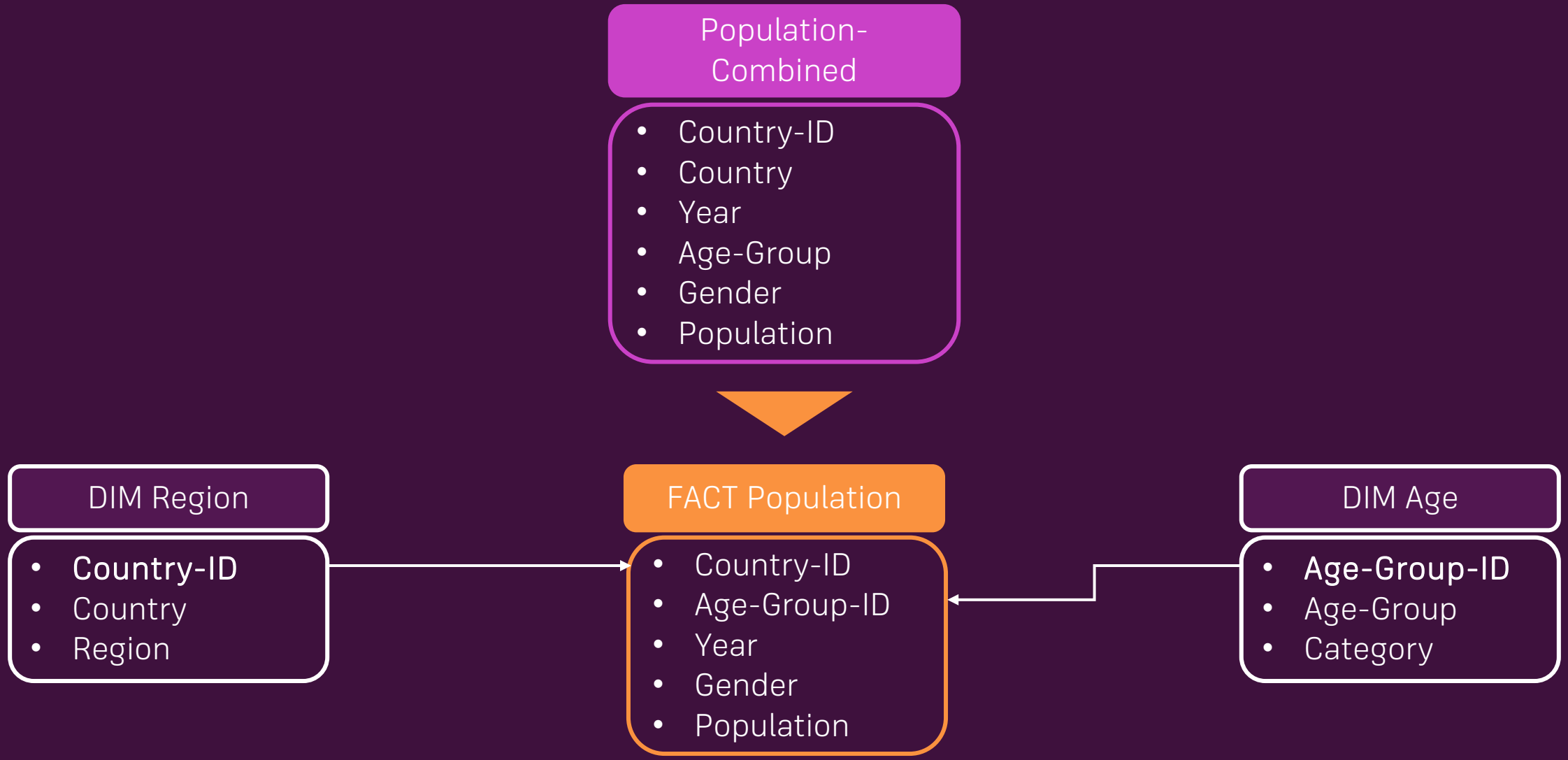
Develop & Implement our own Data Model

The Star Schema

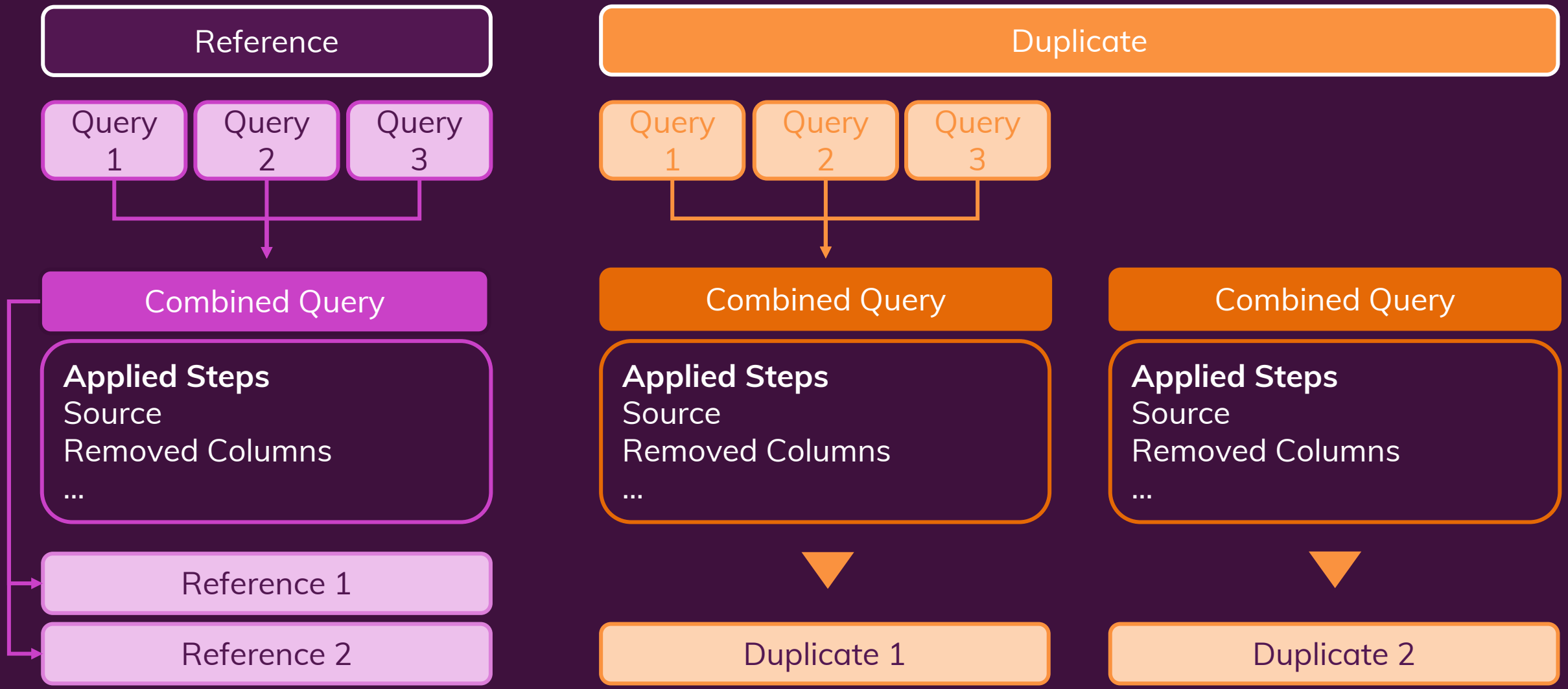
DIM TABLE VS FACT TABLE



Current Project Structure & Star Schema



Reference vs Duplicate



Merging Queries Theory

Query 1

Customer ID	Product	Price
1	TV	599
7	Notebook	1.699
1	Phone	999

Query 2

Customer ID	Name
1	Max
7	Manuel

Merge

Query 1 + Query 2

Customer ID	Product	Price	Name
1	TV	599	Max
7	Notebook	1.699	Manuel
1	Phone	999	Max

Understanding “Join Kind“

LEFT QUERY

ID	Sales
A	10
B	50
C	20

RIGHT QUERY

ID	Region
A	USA
BB	Europe
C	Asia

OUTER

LEFT

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

FULL

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

RIGHT

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

ANTI

LEFT

ID	Sales	Region
B	50	n/a

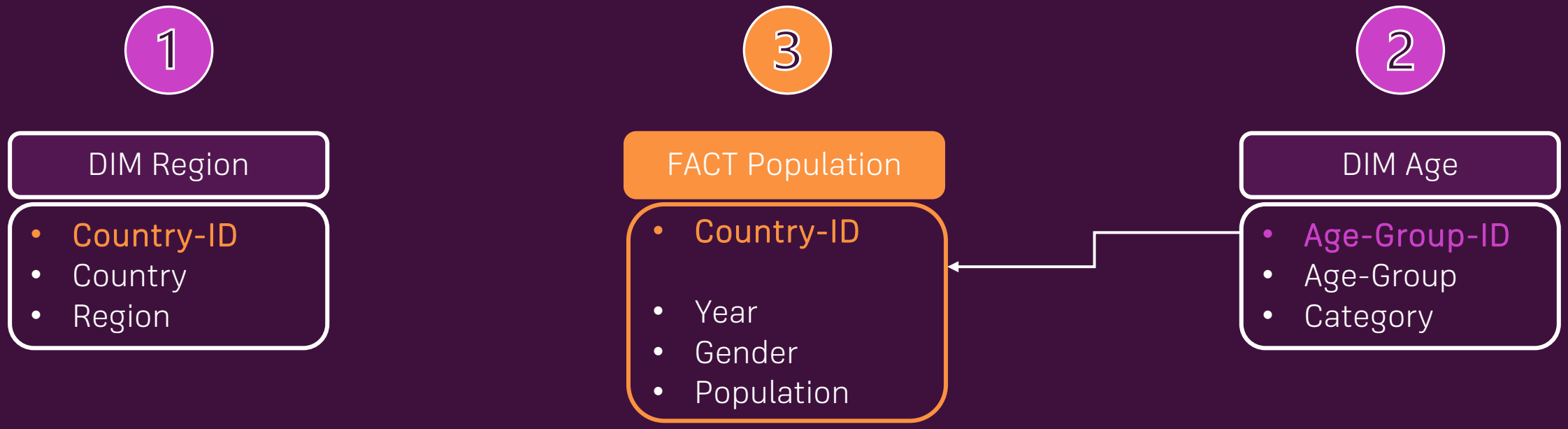
RIGHT

ID	Region	Sales
BB	Europe	n/a

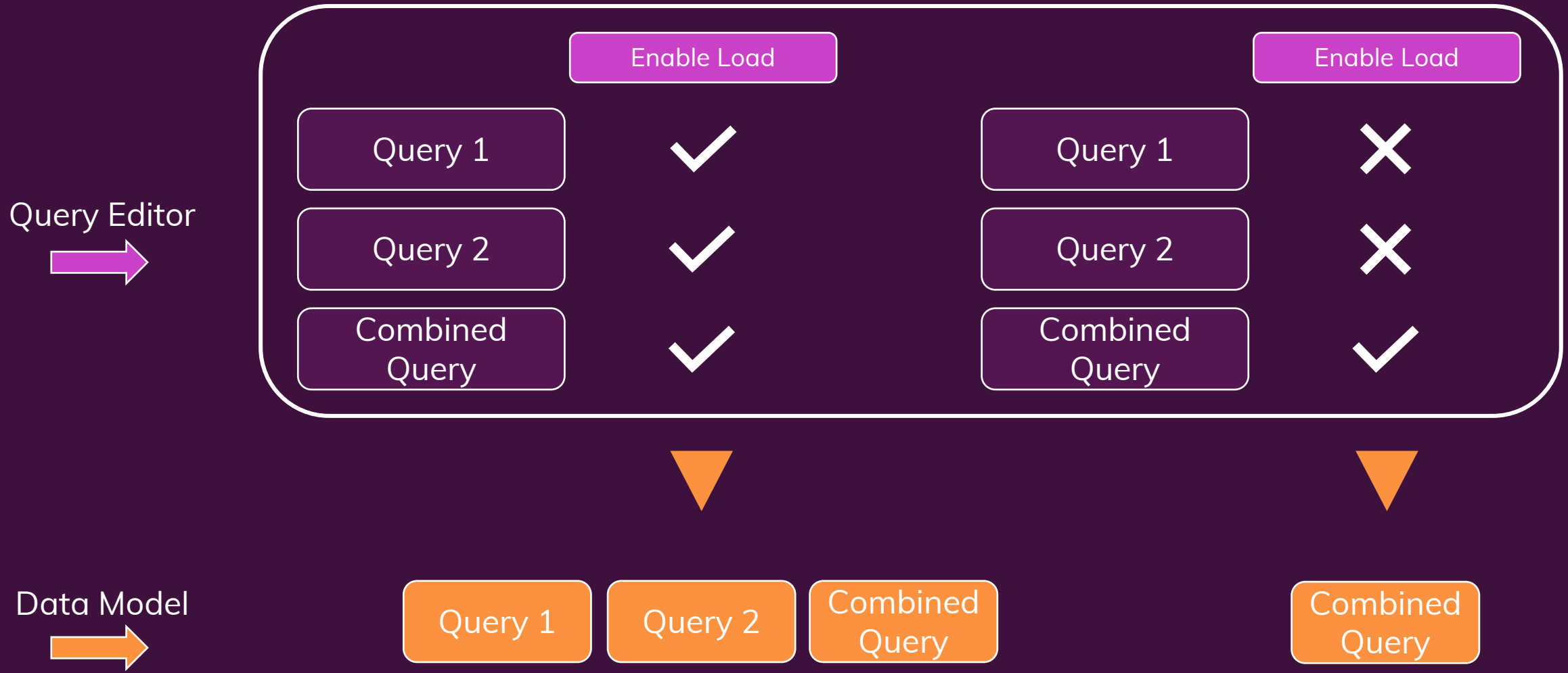
INNER

ID	Sales	Region
A	10	USA
C	20	Asia

Completing our Star Schema



Understanding “Enable Load“



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Module Summary

- File Connections
- Row & Column Operations
- Filters, Formatting, Error Handling
- Appending & Merging Queries
- Pivoting & Unpivoting
- Splitting Columns & Extracting Values
- Data Schemas (Star Schema)
- Duplicates vs References
- Working with Indexes
- Entering Data Manually
- Conditional Columns & Mathematical Operations
- Project Organization (Groups) & Performance Optimization

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Data View & Relationships

Diving Deeper Into Data Analysis

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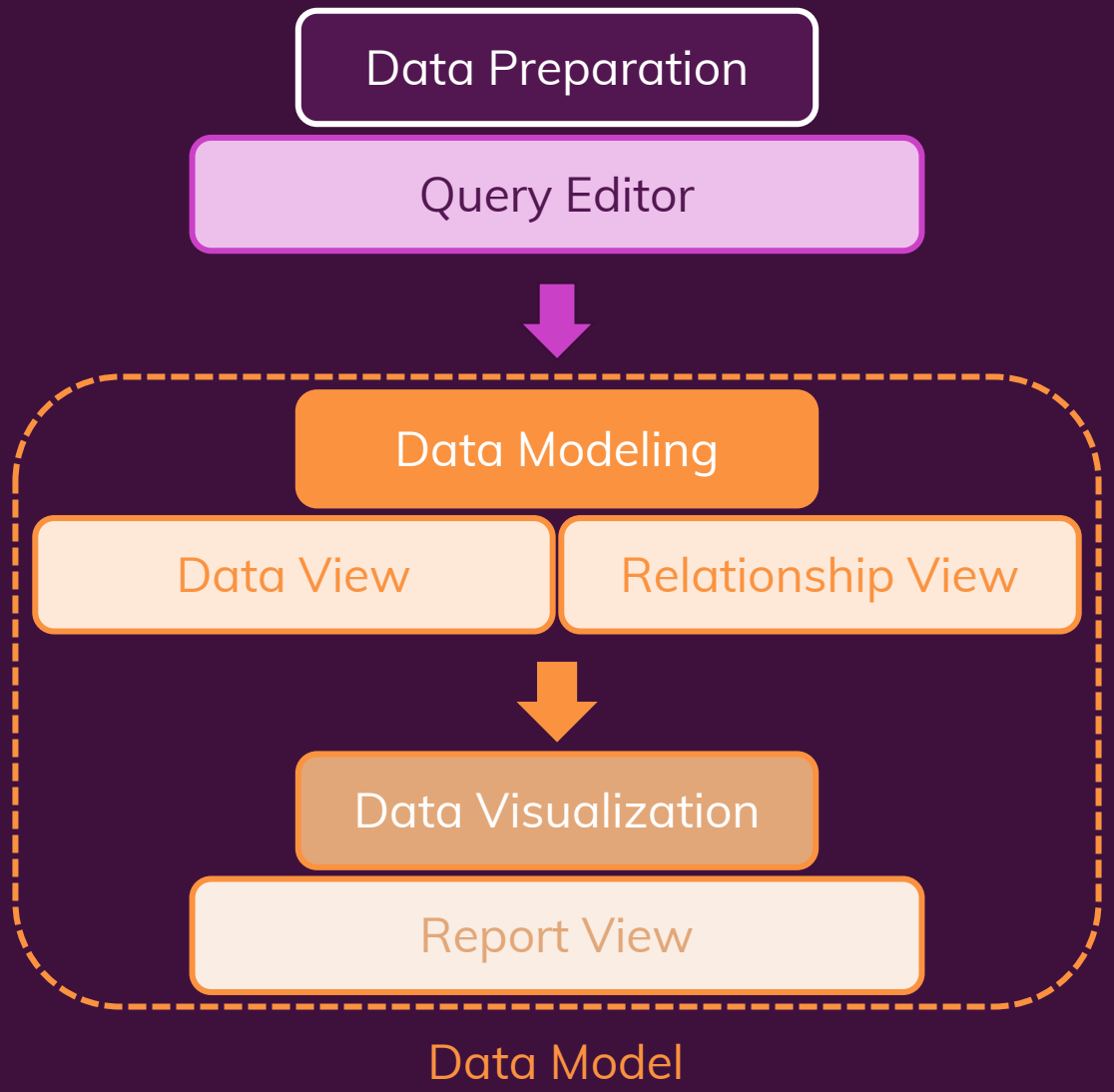
Module Overview

- Understanding Relationships
- M Language vs DAX
- DAX Introduction
- Calculated Columns vs Measures
- Categorizing Data

Another Look at the Workflow



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Query Editor vs. Data Model

- Query Editor
- File Connection
- Clean Data
- Shape Data
- Prepare & Structure Data

≠

- Data Model
- Relationships
- Calculated Columns
- Measures
- Analyse Data

Diving Into Relationships

Cardinality → Relationship Type

Cross Filter Direction

Active Properties

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

Each Customer is Unique

Orders

ID-Order	OrderDate	ID-Customer
A	01 Jan 2020	1
B	08 Jan 2020	2
C	15 Jan 2020	1
D	25 Jan 2020	1
E	05 Feb 2020	3
F	15 Feb 2020	4

Each Customer can have Multiple Orders

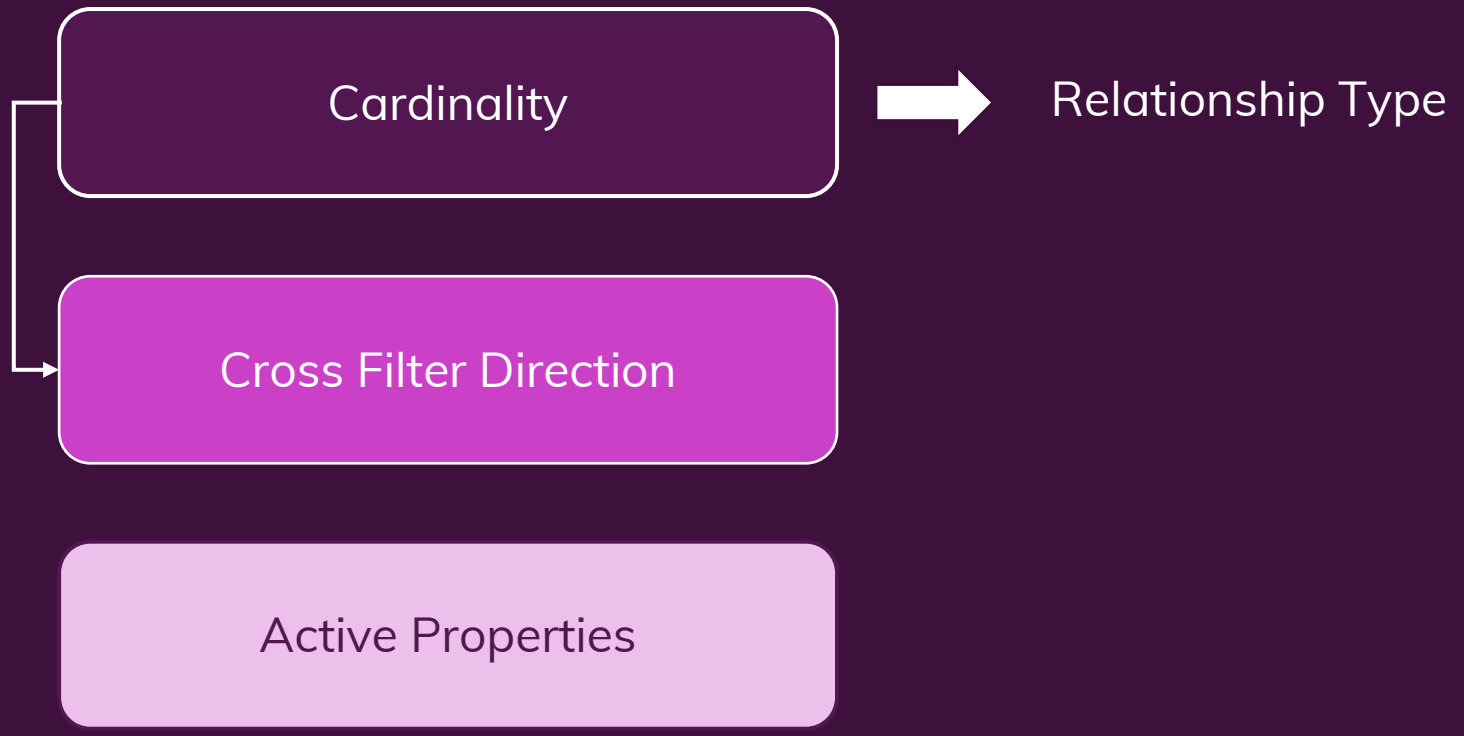
One to one (1:1)

ID-Passport	Valid	Issued	FirstName	SecondName	Country
1	2025	2005	Maximilian	Schwarzmueller	Germany
2	2021	1999	John	Meyer	USA
3	2027	1997	Linda	Belle	Japan

ID-Passport	Valid	Issued
1	2025	2005
2	2021	1999
3	2027	1997

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

Diving Into Relationships



Diving Into Relationships

Cardinality → Relationship Type

Cross Filter Direction

Active Properties

One Tool - Two Languages

	Description	Where to Apply
M	Power Query Formula Language	Data Preparation
	Data Transformation	Before Data Model
DAX	Data Analysis Expression Language	Create Insights
	Analytical Data Calculations	In Data Model
	Comparable to Excel Functions	

DAX Basics

DAX Reference (Official Docs) — https://docs.microsoft.com/en-us/dax/

Syntax — `Formula = …`

Data Types — `String` `Number`

Operators — `+` `-`

Functions — `CONCATENATE()`

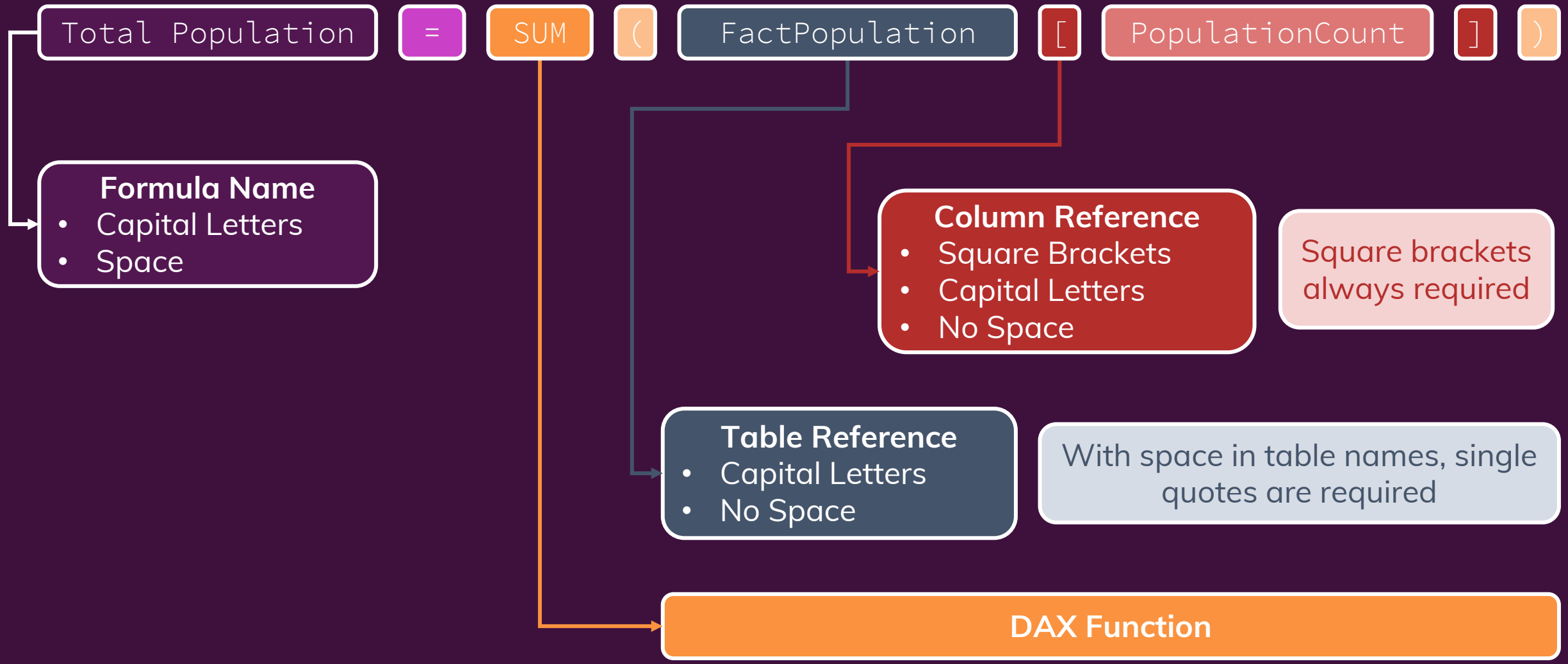
Basics

Advanced

DAX Statements — `DEFINE` `EVALUATE` `ORDER BY` `VAR`

DAX Queries

DAX Syntax – Core Rules



DAX Data Types

String (Text)	“The DAX Basics“	
Whole & Decimal Numbers	564	949.59
Boolean	TRUE	FALSE
Date/Time	January 1st 2020	
Currency		
Blank (NA)		

DAX Operators

Arithmetic	Comparison	Logical	Text concat.
+	=	&&	&
-	==	||	
*	>	IN	
/	>=		
^	<>		

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DAX Core Functions

Text	`CONCATENATE("I Love Power","BI")`	I Love PowerBI
Information	`ISNUMBER(2020)`	TRUE
Logical	`IF([Population]>100000,"Big","Small")`	Big / Small
Math	`ROUND(352.867,2)`	352.87
Statistical	`AVERAGE(Dim-Fact[Population])`	
Filter	`FILTER(Dim-Fact[Year]=2020)`	
Date & Time	`CALENDAR(DATE(2000,01,01),DATE(2020,12,31))`	

Calculated Columns vs Measures

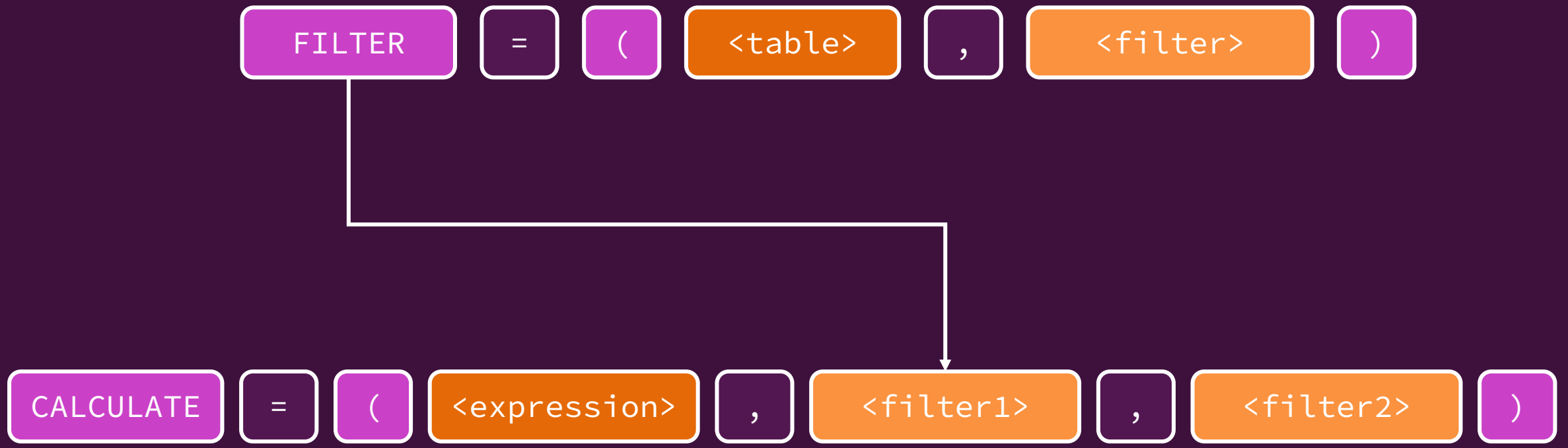
Calculated Column

"Perform an operation that generates results for each row of your table"

Measure

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

FILTER & CALCULATE



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Module Summary

- Query Editor vs Data Model
- Relationships
- Cardinality, Cross-Filter-Direction & Active Properties
- M vs DAX
- DAX Basics - Theory
- DAX Basics - Calculated Columns
- Calculated Columns vs Measures
- DAX Basics - Measures
- Combining Measures
- Categorizing Data

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Report View

Diving Into Charts, Tables & More

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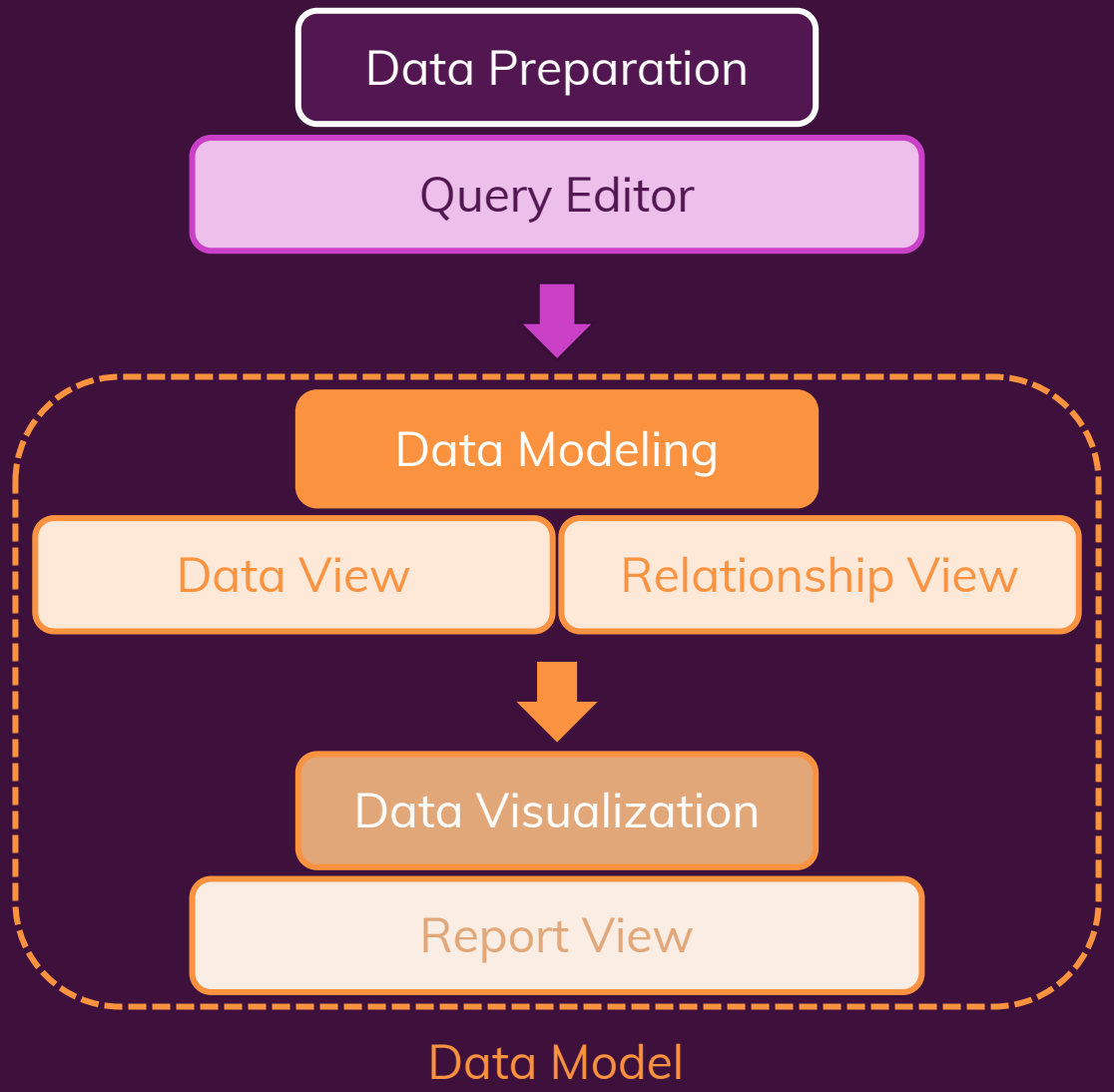
Module Overview

Creating Visuals & Understanding Reports

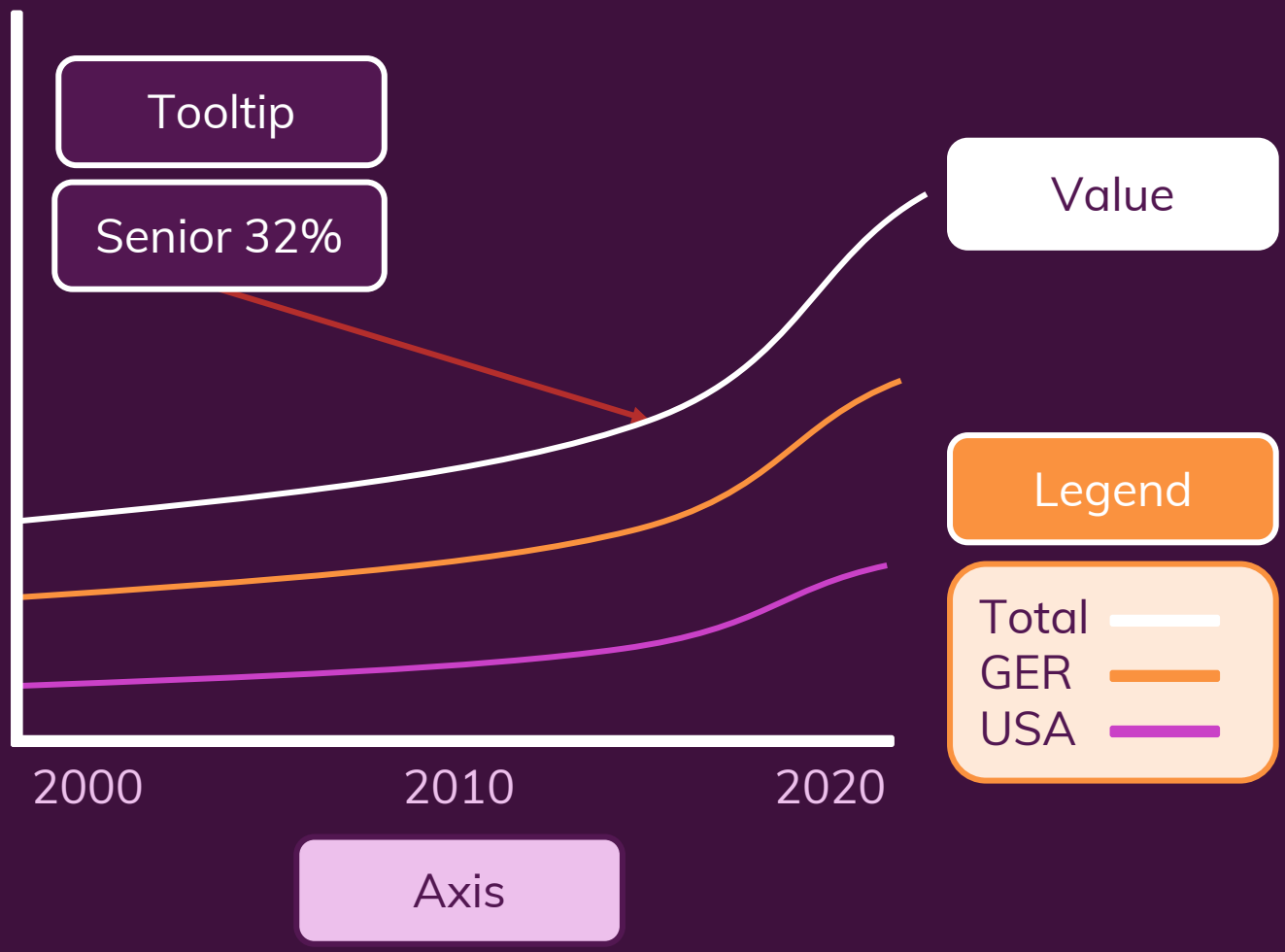
Filters, Hierarchies & Interactions

Chart Formatting

Another Look at the Workflow



Basic Visual Concepts



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Module Summary

- Basic Visual Concepts
- Line, Bar & Column Charts
- Tooltips & Interactions
- Hierarchies & Drill Mode
- Formatting of Visuals
- Report & Visual Themes
- The Slicer
- Filter Types
- Combined Visuals
- Custom Visuals

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Power BI Pro & Power BI Mobile

Going from Local Projects to the Cloud

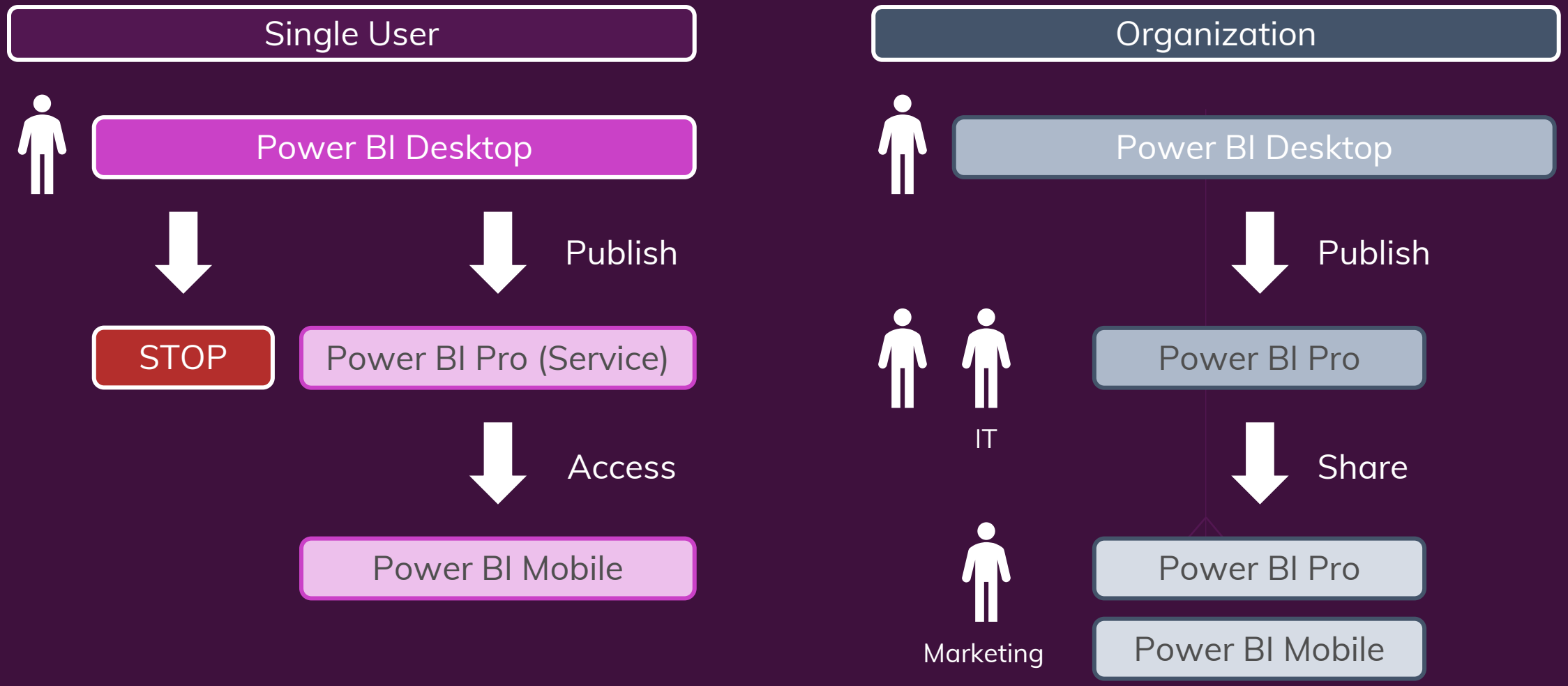
Module Overview

Publishing Projects from Power BI Desktop to Power BI Pro (Service)

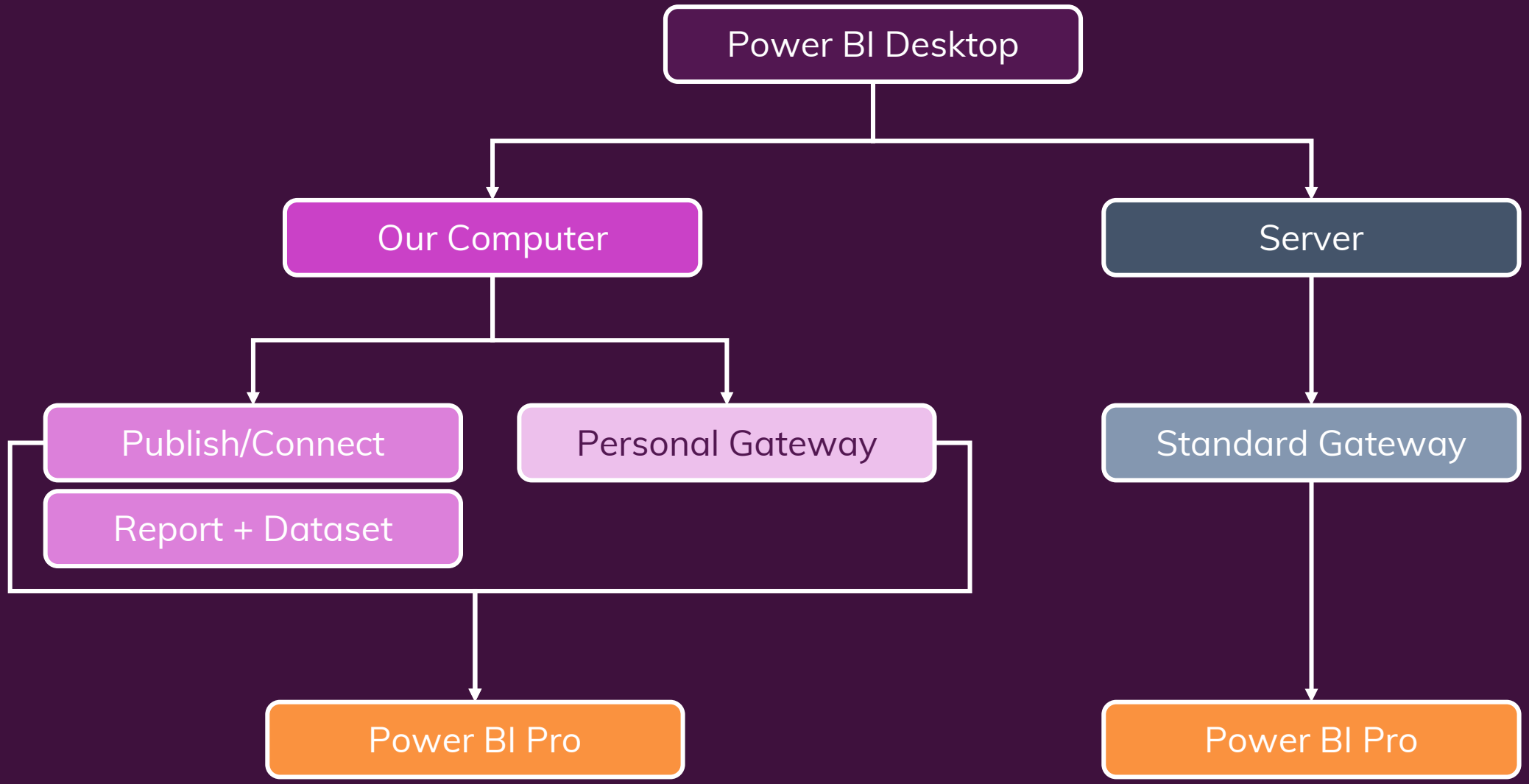
Collaborating in Workspaces

Sharing Data with Power BI Pro & Power BI Mobile

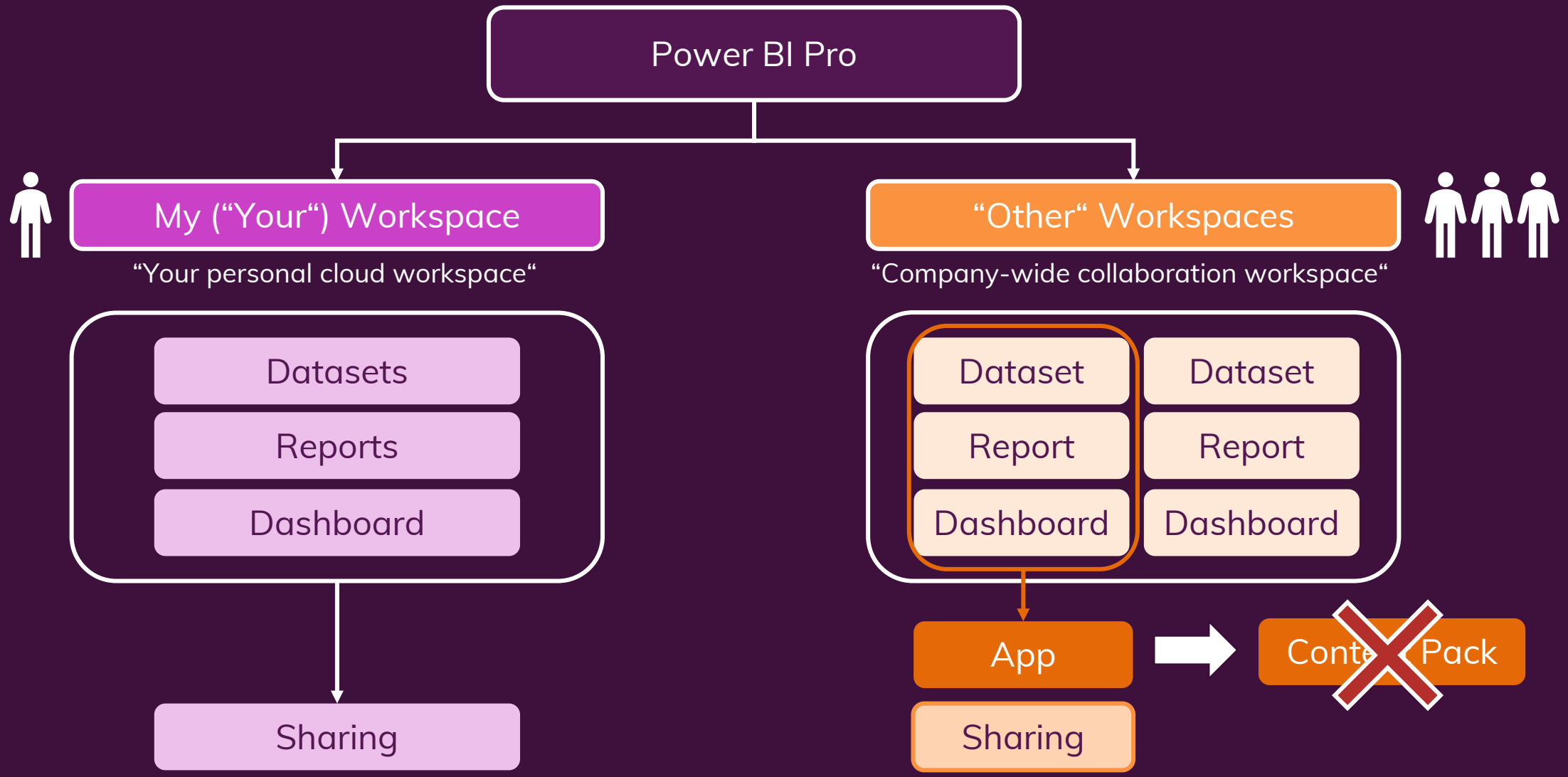
How to Continue



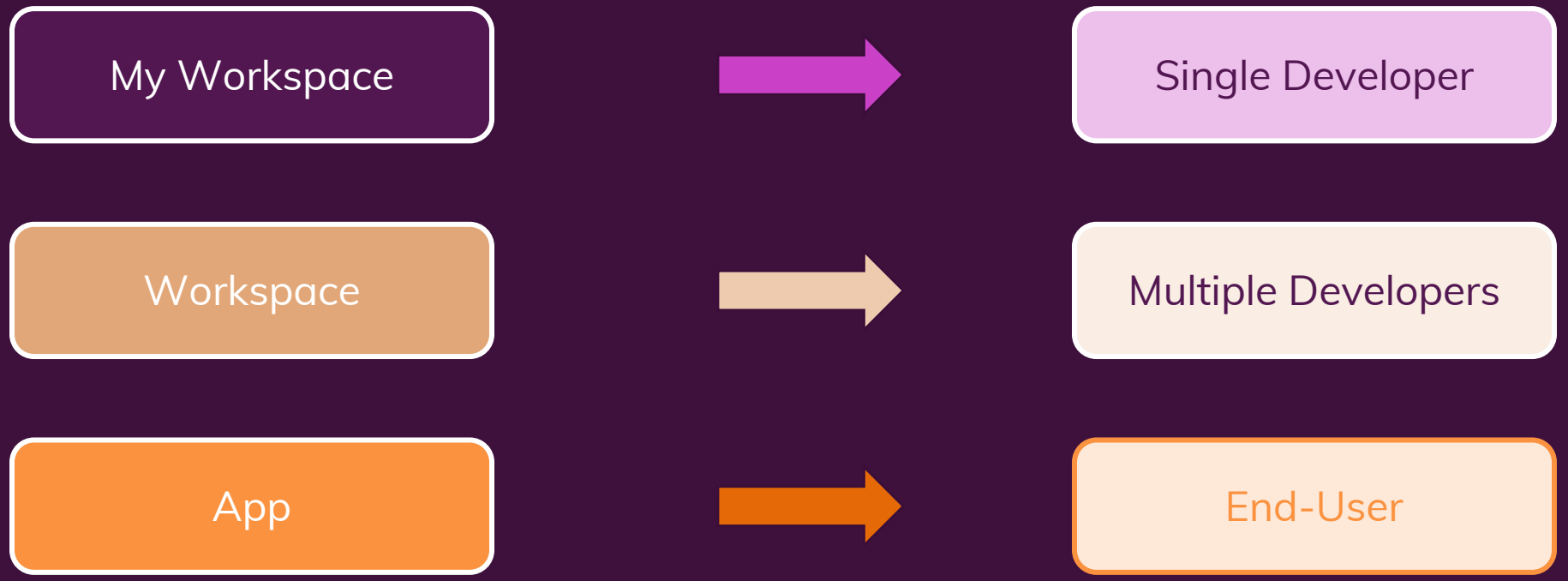
Publishing to Power BI Pro



Workspaces, Apps & Content Packs



Sharing Data: Workspace or App?



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Module Summary

- Free vs Pro vs Premium
- Power BI Pro Interface
- My Workspace
- Power BI Pro & Desktop Connection
- Datasets, Reports & Dashboards
- Data Refresh with Gateways
- Collaboration Workspaces & Apps
- Power BI Mobile

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Course Roundup

CONGRATULATIONS!

What you Learned...

Power BI Desktop	Power BI Pro & Mobile	Advanced
Data Preparation	Publish Data to Pro	SQL, JSON, REST APIs
Data Models	My Workspace	Creating Custom Visuals
Relationships	Workspaces (Collaborate)	Column from Examples
M & DAX	Apps	DAX Studio
Visuals & Reports	Access Anywhere	...

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… and How to Continue

- Repeat unclear Concepts
- Redo the Project on your own
- Create own Projects – the Web is full of Amazing Data to Discover
- Dive into the Official Docs
- Stay up-to-date