Data Modelling & DAX

Data Modelling

Primary Key

Product	Customers	Territories
Dimension Table	Dimension Table	Dimension Table

Transactional Data

Sales	Returns
Foreign Key	
Fact Table	Fact Table

Product

1 — Primary Key

1. Product_id
2. Product_name
3. Model Name
4. Color
5. Price
6. Description

Customer

customer_id [P.K]

Sales [Trxn Record]

*
1. Customer_id
2. Product_id — Foreign Key
3. Order_id
4. Sales
5. Qty Sold

1 : M Cardinality
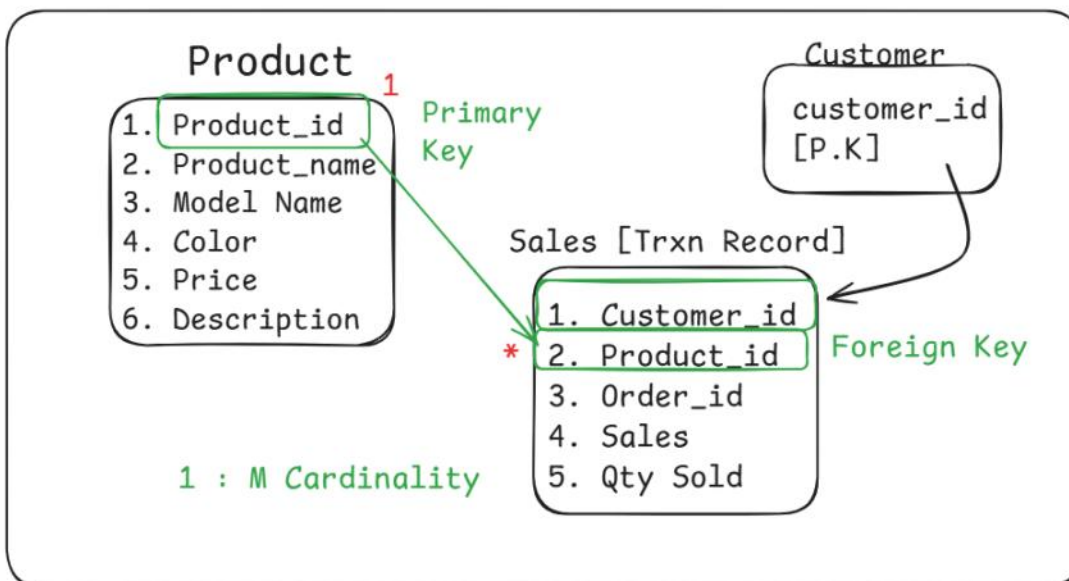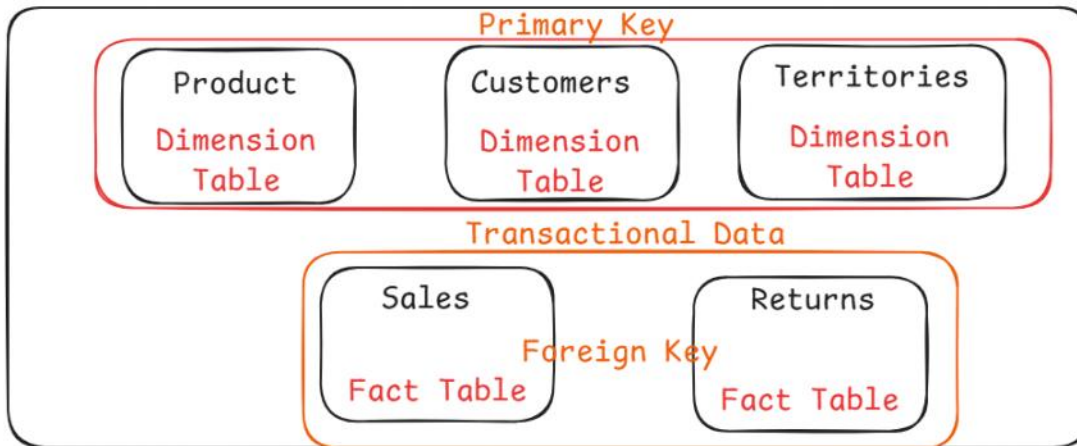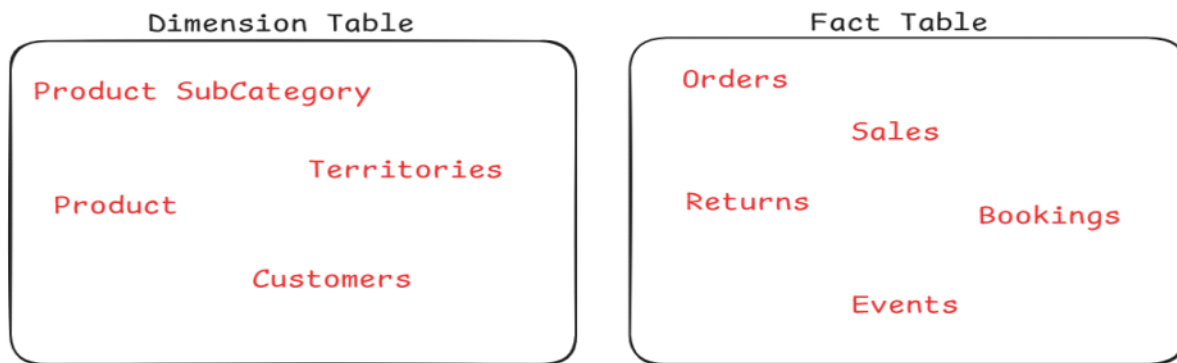
What is Dimension Table

-It contains unique elements in it. Referring to the P.K

What is Fact Table

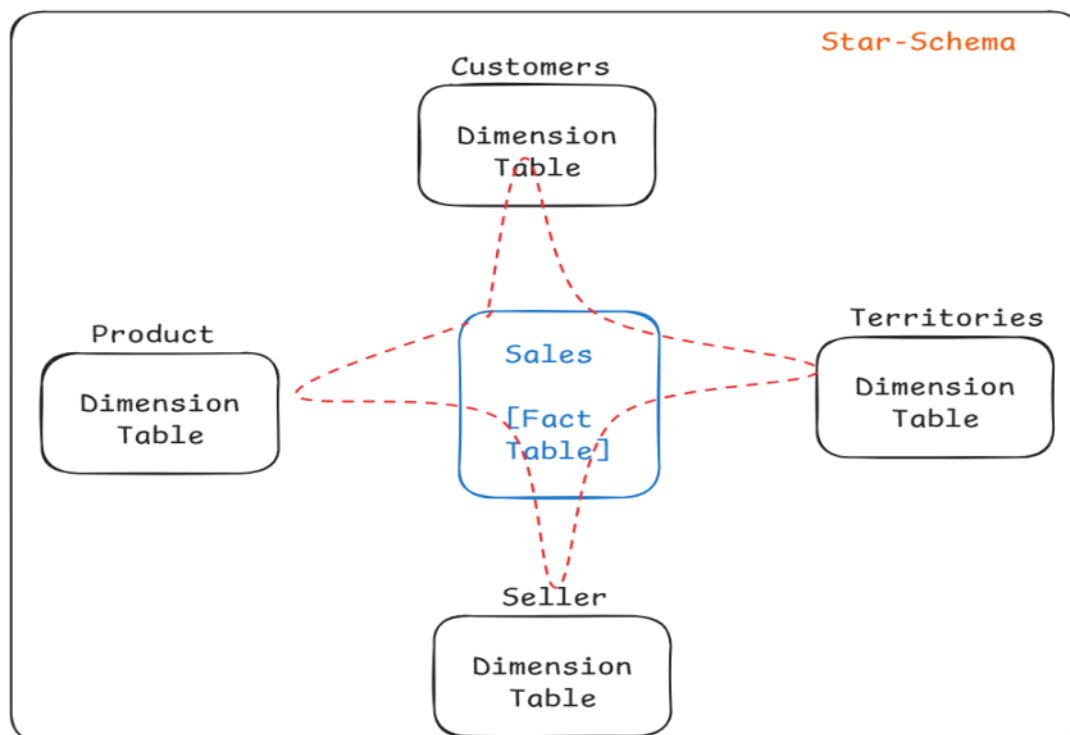-It stores Transactional Records and have Foreign key in it.

Dimension Table

Product SubCategory

Territories

Product

Customers

Fact Table

Orders

Sales

Returns

Bookings

Events

Schema's

1. Star Schema
2. Snowflake Schema

Star ⭐ - Atleast 1 Fact connected with multiple Dimension Table

Star-Schema

Customers
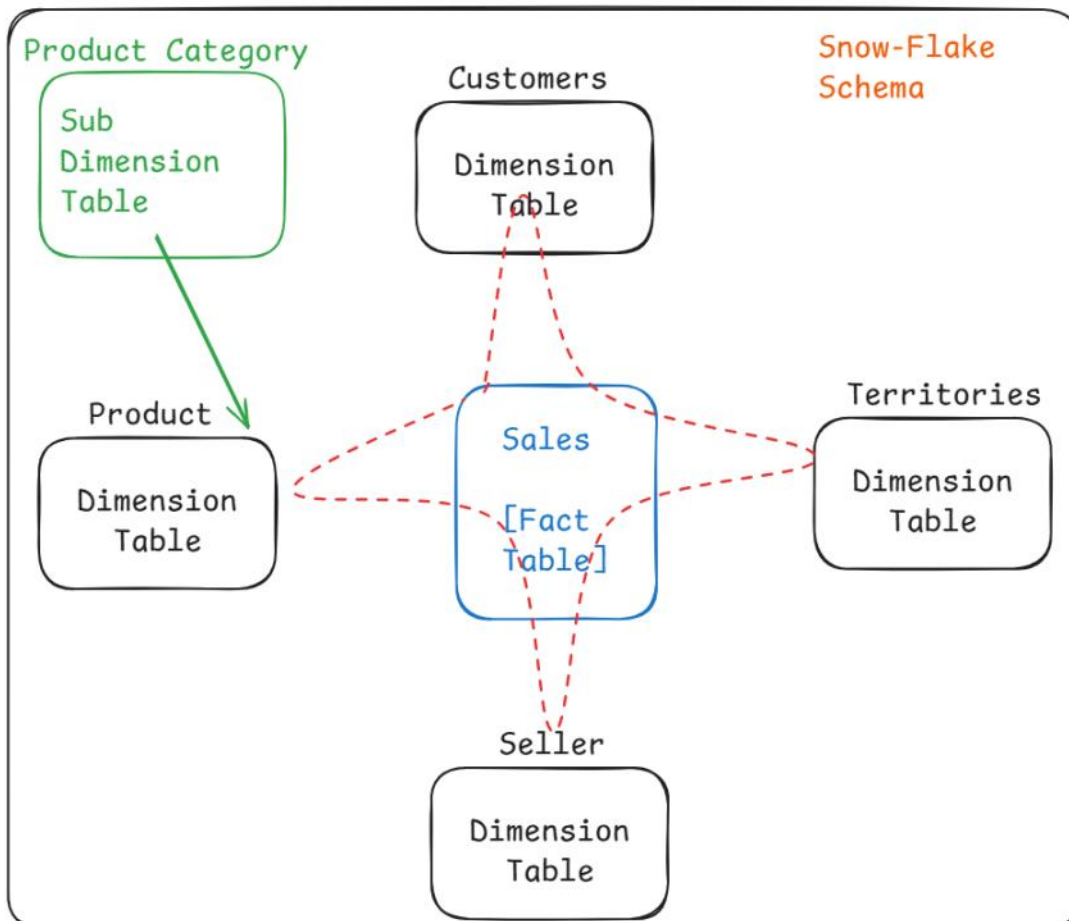Dimension Table

Product
Dimension Table

Sales
[Fact Table]

Territories
Dimension Table

Seller
Dimension Table

SnowFlake - Its an extended part of star-schema + Sub-Dimensional Table

Any Table which don't have a direct connection with Fact Table.

Product Category

Sub Dimension Table

Customers
Dimension Table

Snow-Flake Schema

Product
Dimension Table

Sales
[Fact Table]

Territories
Dimension Table

Seller
Dimension Table

ProductCategoryKey	CategoryName
1	Bikes
2	Components
3	Clothing
4	Accessories

Table view

P.K

ProductSubcategoryKey	SubcategoryName	ProductCategoryKey
1	Mountain Bikes	1
2	Road Bikes	1
3	Touring Bikes	1
4	Handlebars	2
5	Bottom Brackets	2
6	Brakes	2
7	Chains	2
8	Cranksets	2
9	Derailleurs	2
10	Forks	2
11	Headsets	2
12	Mountain Frames	2
13	Pedals	2
14	Road Frames	2
15	Saddles	2
16	Touring Frames	2
17	Wheels	2
18	Bib-Shorts	3
19	Caps	3
20	Gloves	3
21	Jerseys	3
22	Shorts	3
23	Socks	3
24	Tights	3
25	Vests	3
26	Bike Racks	4
27	Bike Stands	4

P.K

F.K

Dimension Table

Territories ···
- Continent
- Country
- Region
- SalesTerritoryKey

Collapse ∧

Customers ···
- Σ AnnualIncome
- BirthDate
- CustomerKey
- CustomerName
- EducationLevel
- EmailAddress
- Gender
- HomeOwner
- MaritalStatus
- Occupation
- Σ Phone_number
- Σ TotalChildren

Collapse ∧

Products ···
- ModelName
- ProductColor
- Σ ProductCost
- ProductDescription
- ProductKey
- ProductName
- Σ ProductPrice
- ProductSize
- ProductSKU
- ProductStyle
- ProductSubcategoryKey

Collapse ∧

ProductSubcategories ···
- ProductCategoryKey
- ProductSubcategoryKey
- SubcategoryName

Collapse ∧

ProductCateogory ···
- CategoryName
- ProductCategoryKey

Collapse ∧

Sub-Dimension

Filter Flow will always flow in Downstream Direction

SalesRecord ···
- CategoryName
- CustomerKey
- Order Type
- OrderDate
- Σ OrderLineItem
- OrderNumber
- Σ OrderQuantity
- ProductKey
- ProductName

Collapse ∧

Returns ···
- ProductKey
- ReturnDate
- Σ ReturnQuantity
- TerritoryKey

Collapse ∧

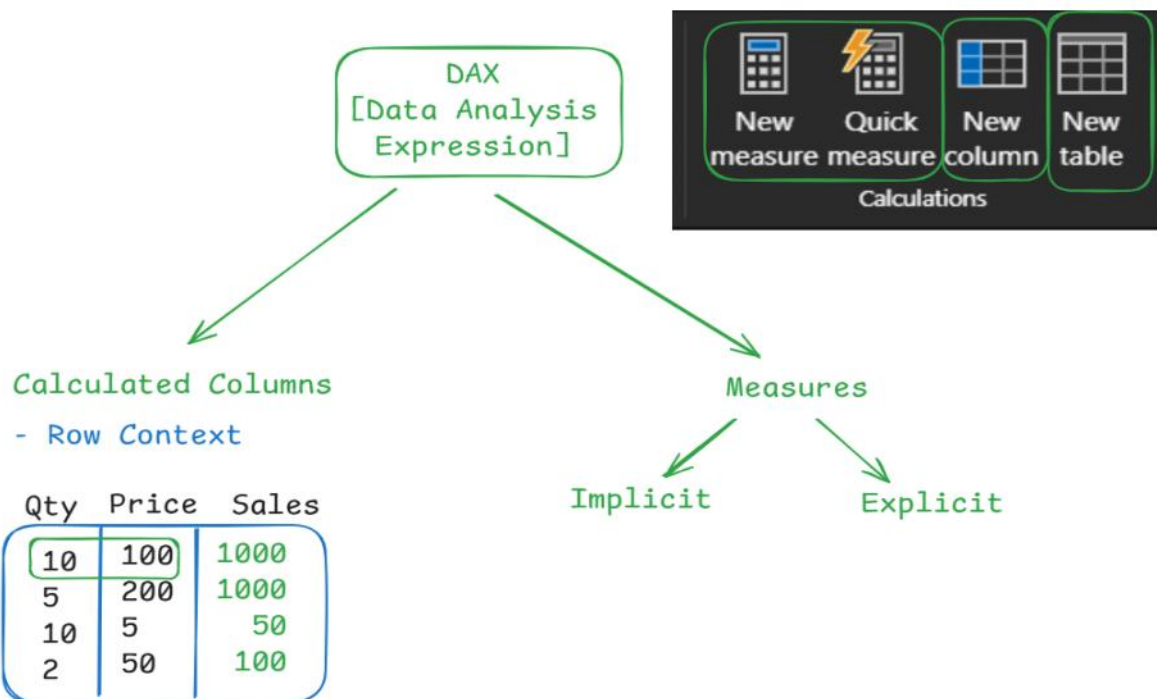**Dimension Table is placed above Fact Table**

Fact Table

MEET DAX

Data Analysis Expressions (commonly known as DAX) is the formula language that drives the Power BI front-end. With DAX, you can:

- Go beyond the capabilities of traditional spreadsheet formulas, with powerful and flexible functions built specifically to work with relational data models.

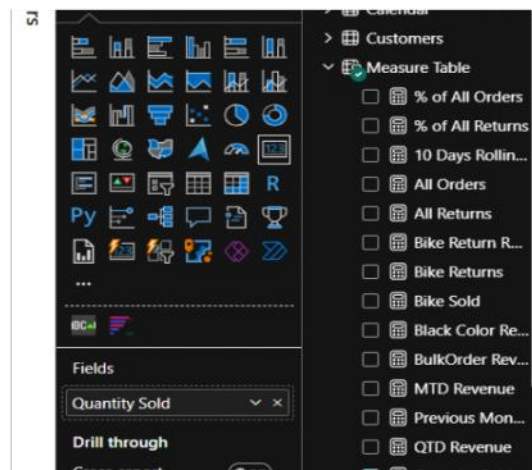- Add calculated columns (for filtering) and measures (for aggregation) to enhance data models.

Two ways to use DAX

Calculated Columns   Measures

DAX
[Data Analysis Expression]

New measure | Quick measure | New column | New table
Calculations

Calculated Columns
- Row Context

Qty	Price	Sales
10	100	1000
5	200	1000
10	5	50
2	50	100

Measures
Implicit   Explicit

$24.91M
Total Revenue

$10.46M
Total Profit

84K
Quantity Sold

Fields
Quantity Sold

Drill through

> Calendar
> Customers
∨ Measure Table
  ☐ % of All Orders
  ☐ % of All Returns
  ☐ 10 Days Rollin...
  ☐ All Orders
  ☐ All Returns
  ☐ Bike Return R...
  ☐ Bike Returns
  ☐ Bike Sold
  ☐ Black Color Re...
  ☐ BulkOrder Rev...
  ☐ MTD Revenue
  ☐ Previous Mon...
  ☐ QTD Revenue

```
1  ProductPrice = RELATED(
2      Products[ProductPrice]
3  )
```

OrderNumber	ProductKey	CustomerKey	TerritoryKey	OrderLineItem	OrderQuantity	Order Type	CategoryName	ProductName	ProductPrice
SO73527	485	22161	4	3	3	Bulk Order	Accessories	Fender Set - Mountain	21.98
SO72945	223	25493	10	6	3	Bulk Order	Clothing	AWC Logo Cap	8.6442
SO71336	223	23841	4	6	3	Bulk Order	Clothing	AWC Logo Cap	8.6442
SO71145	464	23958	7	6	3	Bulk Order	Clothing	Half-Finger Gloves, M	23.5481
SO69218	462	16641	4	6	3	Bulk Order	Clothing	Half-Finger Gloves, S	23.5481
SO68324	466	16866	4	6	3	Bulk Order	Clothing	Half-Finger Gloves, L	23.5481
SO63613	223	20700	4	6	3	Bulk Order	Clothing	AWC Logo Cap	8.6442
SO61837	462	12198	1	6	3	Bulk Order	Clothing	Half-Finger Gloves, S	23.5481
SO59973	223	23930	10	6	3	Bulk Order	Clothing	AWC Logo Cap	8.6442
SO53918	462	25726	10	6	3	Bulk Order	Clothing	Half-Finger Gloves, S	23.5481
SO73854	484	23883	4	5	3	Bulk Order	Accessories	Bike Wash - Dissolver	7.95
SO73527	477	22161	4	5	3	Bulk Order	Accessories	Water Bottle - 30 oz.	4.99
SO72317	477	13734	4	5	3	Bulk Order	Accessories	Water Bottle - 30 oz.	4.99
SO72108	484	16352	9	5	3	Bulk Order	Accessories	Bike Wash - Dissolver	7.95
SO71324	484	17420	4	5	3	Bulk Order	Accessories	Bike Wash - Dissolver	7.95
SO70141	478	18225	1	5	3	Bulk Order	Accessories	Mountain Bottle Cage	9.99
SO69223	466	26663	9	5	3	Bulk Order	Clothing	Half-Finger Gloves, S	23.5481
SO69227	466	26633	4	5	3	Bulk Order	Clothing	Half-Finger Gloves, L	23.5481
SO69017	484	21476	4	5	3	Bulk Order	Accessories	Bike Wash - Dissolver	7.95
SO68920	484	26412	7	5	3	Bulk Order	Accessories	Bike Wash - Dissolver	7.95
SO68183	479	28404	8	5	3	Bulk Order	Accessories	Road Bottle Cage	8.99

DAX SYNTAX

MEASURE NAME

• Measures are always surrounded by brackets (i.e. [Total Quantity]) when referenced in formulas, so spaces are OK

Referenced
TABLE NAME

Referenced
COLUMN NAME

Total Quantity: = SUM(Transactions[quantity])

FUNCTION NAME

COMMON FUNCTION CATEGORIES

MATH & STATS Functions	LOGICAL Functions	TEXT Functions	FILTER Functions	TABLE Functions	DATE & TIME Functions	RELATIONSHIP Functions
Functions used for aggregation or iterative, row-level calculations	Functions that use conditional expressions (IF/THEN statements)	Functions used to manipulate text strings or value formats	Functions used to manipulate table and filter contexts	Functions that create or manipulate tables and output tables vs. scalar values	Functions used to manipulate date & time values or handle time intelligence calculations	Functions used to manage &modify table relationships
Common Examples: • SUM • AVERAGE • MAX/MIN • DIVIDE • COUNT/COUNTA • COUNTROWS • DISTINCTCOUNT	Common Examples: • IF • IFERROR • AND • OR • NOT • SWITCH • TRUE • FALSE	Common Examples: • CONCATENATE • COMBINEVALUES • FORMAT • LEFT/MID/RIGHT • UPPER/LOWER • LEN • SEARCH/FIND • REPLACE • SUBSTITUTE • TRIM	Common Examples: • CALCULATE • FILTER • ALL • ALLEXCEPT • ALLSELECTED • KEEPFILTERS • REMOVEFILTERS • SELECTEDVALUE	Common Examples: • SUMMARIZE • ADDCOLUMNS • GENERATESERIES • DISTINCT • VALUES • UNION • INTERSECT • TOPN	Common Examples: • DATE • DATEDIFF • YEARFRAC • YEAR/MONTH • DAY/HOUR • TODAY/NOW • WEEKDAY • WEEKNUM • NETWORKDAYS	Common Examples: • RELATED • RELATEDTABLE • CROSSFILTER • USERELATIONSHIP
Iterator Functions: • SUMX • AVERAGEX • MAXX/MINX • RANKX • COUNTX					Time Intelligence: • DATESYTD • DATESMTD • DATEADD • DATESBETWEEN	