POWER BI – DAX

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DAX

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DAX – Data analysis Expressions

a. It is formula language which drive Power BI

b. Two ways of using Dax

    i. Calculated Columns - create new column

    ii. New Measures – no new column created but they can be used in Report View for creating visualizations

Calculated Column

Allows to create new, formula based columns to the tables	There is no A1 Style, it refers to the entire column/tables	They generate new value for each row and they are visible in data view
They understand row context. They are useless for aggregation like SUM, Average etc.	Used if we want static, fixed value in each row of the table	They do not understand filtered context so we do aggregation it returns the same value in all the rows.

Measures

They are used to create new calculated **VALUES**

Refers to entire column or table

They are not visible in tables. They are used in Report View.

This is similar to Calculated field in Excel Pivot Tables

They are evaluated based on Filter context which means that they change when the field or the filters around them change.

Used when single row is not going to give us the answer. We will have to aggregate it.

Three Ways of Adding Columns & Measures

Option 1 – In Report View - from modelling tab – new measure and new column

Option 2 – Data View – right click on any column and New Measure or New Column

Option 3 – Right click on the table in Report view and select New Measure or New column

Implicit and Explicit Measures

1. Implicit measures – they are created when we drag and drop a numerical field in the value part of the visual and manually select aggregation.

    - They can only be used only in specific visualization and can't be referred anywhere else.

2. Explicit measures – they are created using DAX functions to define calculated columns or measures

    - They are created as measures in the table and hence can be referred in other calculations.

Exercise

- Create in Sales Table
    - Total Qty (measure)

- Create in Returns Table
    - Total Return Qty (Measure)
    - % Return (Measure)

- Create in Product Table
    - ProductProfit i.e. Price-cost (calculated column)

DAX Syntax

MEASURE NAME

- *Note: Measures are always surrounded in 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

- Calculated columns don't always use functions, but measures do:
  - In a **Calculated Column**, =Transactions[quantity] returns the value from the quantity column in each row (*since it evaluates one row at a time*)

  - In a **Measure**, =Transactions[quantity] will return an *error* since Power BI doesn't know how to translate that as a single value (*you need some sort of aggregation*)

Note: This is a "fully qualified" column, since it's preceeded by the table name -- table names with spaces must be surrounded by single quotes:

- *Without a space: **Transactions**[quantity]*
- *With a space: **'Transactions Table'**[quantity]*

Arithmetic Operators in Power BI

Arithmetic Operators	Meaning	Example
+	Addition	2+7
-	Subtraction	7-2
*	Multiplication	5*6
/	Division	10/5
^	Exponent	2^3

Comparison Operators in Power BI

Comparison Operators	Meaning	Example
=	Equal To	[City]="Boston"
>	Greater than	[Quantity]>100
<	Less than	[Quantity]<100
>=	Greater than or equal to	[Unit Price]>=3
<=	Less than or equal to	[Unit Price]<=3
<>	Not equal to	[Country]<>"China"

Text/Logical Operator

Text/Logical Operator	Meaning	Example
&	Concatenates two values	[City]&" "&[State]
&&	Creates AND condition	([State]="NY" && [Quantity]>10)
|| (Double Pipe)	Creates OR condition	([State]="NY" || [State]="MA")
IN	Created OR condition based on list	'Store Lookup'[State] IN {"MA", "NY", "CT"}