Power BI
Fundamentals

Alish Bista - 10/01/2025

Relationships

Relationships

The JOINt Family

- Tables link with each other with common keys (stored in fields)

- ***Common Relationships***: One-to-Many, Many-to-One

- ***Rare Relationships***: One-to-One, Many-to-Many

Customer Key	WWI Customer ID	Customer	Bill To Customer	Category	Buying Group	Primary Contact	Postal Code
0	0	Unknown	N/A	N/A	N/A	N/A	N/A
1	1	Tailspin Toys	Tailspin Toys (Head	Novelty Sho|	Tailspin Toys	Waldemar Fisar	90410
2	2	Tailspin Toys	Tailspin Toys (Head	Novelty Sho|	Tailspin Toys	Lorena Cindric	90216
17	17	Tailspin Toys	Tailspin Toys (Head	Novelty Sho|	Tailspin Toys	Adam Kubat	90416
18	18	Tailspin Toys	Tailspin Toys (Head	Novelty Sho|	Tailspin Toys	Isabelle Vodlan	90321
19	19	Tailspin Toys	Tailspin Toys (Head	Novelty Sho|	Tailspin Toys	Mithun Bhattachary	90303

Sale Key	City Key	Customer Key	Bill To Cus	Stock Iten	Invoice Date K	Delivery Date	Salespersc	WWI Invo	Descriptio	Package	Quantity	Unit Price	Tax Rate	Total Excl	Tax Amou	Profit	Total Inclu	Total Dry I	Total Chill	Lineage K
49265	41568	0	0	204	10/22/2013	10/23/2013	83	15189	DBA joke r	Each	6	13	15	78	11.7	51	89.7	6	0	11
49372	48937	0	0	173	10/22/2013	10/23/2013	83	15218	Developer	Each	6	13	15	78	11.7	51	89.7	6	0	11
50379	91464	0	0	174	10/28/2013	10/29/2013	70	15525	Developer	Each	6	13	15	78	11.7	51	89.7	6	0	11
57026	72808	19	1	149	12/5/2013	12/6/2013	86	17555	Ride on to	Each	3	230	15	690	103.5	255	793.5	3	0	11
57027	72808	19	1	43	12/5/2013	12/6/2013	86	17555	Shipping c	Each	100	1.05	15	105	15.75	50	120.75	100	0	11
56817	89450	20	1	82	12/4/2013	12/5/2013	19	17488	Furry anim	Pair	24	5	15	120	18	84	138	24	0	11

Transpose

Transpose

Rows To Columns...Columns To Rows

- Flip rows into columns and columns into rows

- Useful when data is sideways (months as rows instead of columns)

- First row doesn't automatically become headers - need to promote manually

- Works best with small, well-structured datasets

Pivot

Pivot

Pivot.Pivot...PIVOT!!!

- Turn long data into wide format (rows become columns)

- Select a column whose values will become new column headers

- Choose another column whose values will populate the new columns

- Aggregates data automatically (sum, count, average, etc.)

Unpivot

Unpivot

Reverse the Pivot

- Turn wide data into long format (columns become rows)

- Most commonly used transformation for Excel-style tables

- Fixes datasets where each month/year/ category is a separate column

- Creates two new columns: Attribute (old column names) and Value (the data)

Append

Append Queries

More of the Same

- Stack multiple tables with the same structure vertically

- Combine monthly files, regional data, or year-over-year datasets

- All tables must have matching column names and types

- Two options: Append as new query or append to existing

Merge

Merge

Something From Here...Something From There

- Join two tables based on matching columns (like VLOOKUP but better)

- Choose join type: Left, Right, Inner, Full Outer, etc.

- Brings related data from another table into the current one

- Expand only the columns needed after merge

Custom Columns

Custom Columns

Customized To Your Requirements

- Create calculated columns using the M language

- Access to functions not available in the ribbon

- Combine text, dates, and numbers with formulas

- Examples: Full Name from First + Last, Profit from Sales and Cost, or custom logic

Data Modeling

Data Modeling

You are the Architect

- The foundation of effective reports and dashboards

- Defines how tables connect and relate to each other

- Impacts performance, DAX calculations, and user experience

- Well-designed models enable accurate insights and fast queries

- Power BI favors star schema for optimal performance

Star

Star Schema

A Star Indeed

- Central fact table surrounded by dimension tables

- Dimensions are denormalized (flattened into single tables)

- Simple structure - easy to understand and query

- Better performance - fewer joins required

- Most common schema in Power BI

Snowflake

Snowflake Schema

Act Normal!

- Fact table with normalized dimension tables

- Dimensions split into multiple related tables

- More complex structure with additional layers

- Reduces data redundancy but requires more joins

- Common in application databases and traditional data warehouses. Less common in Power BI

Q&A