

Global Superstore Sales Data

DAX (Data Analysis Expressions) in Power BI enables calculations and data analysis in reports, allowing users to create custom measures, calculated columns, and tables for data summarization, filtering, and transformation.

1. Types of DAX Functions

- **Aggregate Functions:** Summarize data.
 - **SUM(), AVERAGE(), etc.**
- **Logical Functions:** Conditional logic.
 - **IF(), SWITCH(), etc.**
- **Text Functions:** Manipulate text.
 - **CONCATENATE(), LEFT(), RIGHT(), etc.**
- **Time Intelligence Functions:** Work with dates.
 - **DATEADD(), TOTALYTD(), etc.**
- **Filter Functions:** Modify data.
 - **FILTER(), ALL(), etc.**
- **Mathematical Functions:** Perform calculations.
 - **ROUND(), ABS(), etc.**

2. How DAX Works

- **Measures:** Dynamic calculations.
- **Calculated Columns:** New data added to tables.
- **Calculated Tables:** Tables generated from existing ones using DAX.

3. Example of DAX Formula:

Measure Example (Total Sales):

Total Sales = SUM(Sales[Amount])

This measure will calculate the sum of all sales amounts.

4. Detailed Description of the Global Superstore Sales Dataset

The Global Superstore Sales dataset offers insights into customer behavior, sales performance, shipping, and profitability.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	City	State	Country	Postal Code
2	6598	US-2012-158330	12-11-2012	18-11-2012	Standard Class	SC-20725	Steven Cartwright	Consumer	Tegucigalpa	Francisco Morazán	Honduras	
3	35654	CA-2014-162565	12-12-2014	12-12-2014	Same Day	RR-19315	Ralph Ritter	Consumer	Aurora	Illinois	United States	60505
4	15893	ES-2013-3667448	24-06-2013	01-07-2013	Standard Class	TH-21235	Tiffany House	Corporate	Lucerne	Lucerne	Switzerland	
5	32102	CA-2011-134513	01-11-2011	07-11-2011	Standard Class	RA-19915	Russell Applegate	Consumer	Denver	Colorado	United States	80219
6	6232	US-2014-146556	02-04-2014	07-04-2014	Standard Class	FM-14365	Fred Hopkins	Corporate	Panama City	Panama	Panama	
7	19565	IT-2013-5108540	28-08-2013	30-08-2013	First Class	BE-11455	Brad Eason	Home Office	Aschaffenburg	Bavaria	Germany	
8	7986	MX-2014-101406	18-12-2014	21-12-2014	First Class	DA-13450	Diana Arnett	Home Office	León	León	Nicaragua	
9	23650	IN-2012-55618	12-12-2012	18-12-2012	Standard Class	MG-17695	Maureen Gnade	Consumer	Belgaum	Karnataka	India	
10	40847	CA-2012-60864	03-05-2012	06-05-2012	First Class	NF-18595	Nicole Fjeld	Home Office	San Jose	California	United States	95123
11	48368	NI-2011-900	06-04-2011	10-04-2011	Standard Class	AS-90	Adam Shillingsburg	Consumer	Lagos	Lagos	Nigeria	
12	51190	TU-2013-1610	13-06-2013	17-06-2013	Second Class	JS-5940	Joni Sundaesam	Home Office	Kars	Kars	Turkey	
13	37725	CA-2013-143714	24-05-2013	28-05-2013	Standard Class	CC-12370	Christopher Conant	Consumer	Philadelphia	Pennsylvania	United States	19120
14	46656	CM-2012-6440	13-12-2012	15-12-2012	First Class	BP-1230	Benjamin Patterson	Consumer	Yacoude	Centre	Cameroon	
15	13402	ES-2014-3240614	16-09-2014	20-09-2014	Second Class	BB-10990	Barry Blumstein	Corporate	Placenza	Emilia-Romagna	Italy	
16	34922	CA-2014-113530	20-05-2014	22-05-2014	Second Class	BC-11125	Becky Castell	Home Office	San Francisco	California	United States	94109
17	35017	CA-2013-151155	21-12-2013	25-12-2013	Standard Class	AB-10255	Alejandro Ballentine	Home Office	Jackson	Mississippi	United States	39212
18	12657	ES-2014-2959093	28-08-2014	02-09-2014	Standard Class	CM-11935	Carlos Meador	Consumer	Hamm	North Rhine-Westphalia	Germany	
19	19435	ES-2014-5886915	09-08-2014	10-08-2014	First Class	BE-11410	Bobby Elias	Consumer	Madrid	Madrid	Spain	
20	28391	IN-2014-10020	30-11-2014	04-12-2014	Standard Class	AH-10075	Adam Hart	Corporate	Darbhanga	Bihar	India	
21	17541	ES-2014-3691479	10-06-2014	12-06-2014	First Class	FM-14365	Fred Hopkins	Corporate	Palma de Mallorca	Balearic Islands	Spain	
22	47627	NI-2014-6120	29-10-2014	02-11-2014	Standard Class	JF-5295	Jason Fortune	Consumer	Ibadan	Oyo	Nigeria	
23	27864	ID-2011-76884	17-10-2011	23-10-2011	Standard Class	HF-14995	Herbert Flentye	Consumer	Manila	National Capital	Philippines	
24	39107	CA-2013-134334	14-02-2013	15-02-2013	First Class	DK-13090	Dave Kipp	Consumer	Clinton	Maryland	United States	20735
25	28635	IN-2012-21871	19-01-2012	19-01-2012	Same Day	LO-17170	Lori Olson	Corporate	Kendari	Sulawesi Tenggara	Indonesia	
26	11432	ES-2014-5334183	04-08-2014	07-08-2014	Second Class	AA-10315	Alex Avila	Consumer	Garforth	England	United Kingdom	
27	50	MX-2014-100783	06-05-2014	10-05-2014	Standard Class	MG-18205	Mitch Gastineau	Corporate	Medellán	Antioquia	Colombia	
28	14968	ES-2012-3495013	23-08-2012	25-08-2012	First Class	KL-16555	Kelly Langkin	Corporate	Ipswich	England	United Kingdom	
29	13178	ES-2012-4869643	01-06-2012	06-06-2012	Second Class	TZ-21580	Tracy Zic	Consumer	Hamburg	Hamburg	Germany	
30	42507	PL-2013-10	21-05-2013	26-05-2013	Standard Class	CL-1890	Carl Ludwig	Consumer	Warsaw	Masovia	Poland	
31	32911	US-2013-113509	16-03-2013	20-03-2013	Standard Class	PL-18925	Paul Lucas	Home Office	Philadelphia	Pennsylvania	United States	19143
32	21970	ID-2012-74630	08-06-2012	10-06-2012	Second Class	SB-20185	Sarah Brown	Consumer	Changwon	Gyeongsangnam	South Korea	

Figure 1 : Global Superstore Sales Dataset

i. Overview

- **Purpose:** Captures transactions from a fictional "Global Superstore" to analyze sales operations and customer segmentation.
- **Structure:**
 - **Rows:** Unique orders.
 - **Columns:** 24 fields covering orders, customers, locations, products, sales metrics, and shipping.

ii. Key Columns

- **Row ID:** Unique index for entries.
- **Order ID:** Identifies each order for product grouping.
- **Order Date:** Date of order placement for time-series analysis.
- **Ship Date:** Date of shipment for delivery efficiency.
- **Order Priority:** Indicates priority level (Low, Medium, High, Critical) for shipping performance analysis.

Customer and Segment Details

- **Customer ID / Name:** Identifies individual customers for profitability analysis.
- **Segment:** Classifies customers into:
 - **Consumer:** Individual customers.
 - **Corporate:** Business buyers.
 - **Home Office:** Small businesses/home offices.

This segmentation reveals trends across customer types.

Location Information

- **City / State / Country / Postal Code:** Provides geographical context for regional analysis and sales comparisons.

- **Market / Region:**
 - **Market:** Broad areas (e.g., APAC, EMEA).
 - **Region:** Specific areas (e.g., South, West).

These fields enable regional sales performance tracking.

Product and Category Data

- **Product ID / Name:** Unique product identifiers.
- **Category / Sub-Category:** Groups products (e.g., Furniture, Technology) for:
 - Sales and profit analysis by category.
 - Identification of best-selling and low-performing sub-categories.

Sales and Profitability Metrics

- **Sales:** Revenue from orders for performance analysis.
- **Quantity:** Units sold per product to identify high-volume items.
- **Discount:** Discounts applied, analyzing their impact on profit margins.
- **Profit:** Net profit from orders, crucial for:
 - Profitability analysis at various levels.
 - Identifying profitable customers, products, or regions.

Shipping Information

- **Ship Mode:** Delivery methods (e.g., Standard, First Class) for analyzing preferences and delivery trends.
- **Shipping Cost:** Costs incurred for shipping, useful for identifying high expenses and their impact on profits.

5. Why This Dataset is Valuable for Business Analysis

Insights include:

- **Operational Efficiency:** Shipping performance and order prioritization.
 - **Customer Behavior:** Preferences by segment and region.
 - **Sales Trends:** Identifying valuable customers, products, and regions.
 - **Product Optimization:** Recognizing top and low-performing categories.
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6. List of Dax Function Which I have used for this dataset :

1st DAX Function: "Average Discount"

Dax Formula : Average Discount = AVERAGE('Orders'[Discount])

This function calculates the mean discount across all orders, providing insight into the average discount offered to customers.

Function Used – AVERAGE:

- Calculates the arithmetic mean of values in the specified column.
- Uses the 'Orders'[Discount] column, which contains discount percentages.
- Sums all discount values and divides by the total number of records for the overall average.

Card Visual Setup:

- A Card Visual displays this value prominently, highlighting the average discount as a key metric.

2nd Column Chart: Average Discount by Region

Dax Formula : Average Discount = AVERAGE('Orders'[Discount])

Calculates the mean discount percentage across orders to identify regional discount variations.

Function Used – AVERAGE:

- Computes the average from the 'Orders'[Discount] column.

Purpose: Analyze regional discount strategies to determine if adjustments are needed for sales effectiveness.

Why Use a Clustered Column Chart?

- Visual Comparison
- Clear Insights

Benefits:

- Optimize Performance, Redirect Resources and Inform Sales Strategy

3rd Line Chart: Average Shipping Cost Over Time

DAX Formula:

Average Shipping Cost = AVERAGE('Orders'[Shipping Cost])

Purpose:

Calculates the average shipping cost for all orders, visualized in a line chart to track fluctuations and identify patterns or operational changes.

Function Used – AVERAGE:

- Computes the mean of the 'Orders'[Shipping Cost] column by summing costs and dividing by the number of orders.

Why Use a Line Chart?

- Trend Visualization, Time Series Analysis

Benefits:

- Cost Control, Seasonal Adjustments and Profitability Insight
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4th Profit per Customer

DAX Formula:

Profit per Customer = CALCULATE(SUM('Orders'[Profit]), ALLEXCEPT('Orders', 'Orders'[Customer ID]))

Purpose:

Calculates total profit generated by each customer, allowing identification of the most profitable customers using a Clustered Column Chart.

Detailed Breakdown:

- CALCULATE: Changes the context for calculations, summing 'Orders'[Profit] for each customer.
- ALLEXCEPT ('Orders', 'Orders'[Customer ID]): Removes all filters except for Customer ID, isolating profit per customer.

Benefits of Visualization:

- Identify Key Customers, Target High-Value Customers, Analyze Profit Distribution and Operational Insights

Why Use a Clustered Column Chart?

- Clear Comparison, Scalable
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5th Sales Contribution

DAX Formula:

Sales Contribution = DIVIDE(SUM(Orders[Sales]), CALCULATE(SUM(Orders[Sales]), ALL(Orders)))

Purpose:

Calculates the percentage contribution of a segment (e.g., Category or Region) to total sales, providing insight into each segment's performance.

Function Breakdown:

- SUM(Orders[Sales]): Total sales for the filtered segment.
- CALCULATE(SUM(Orders[Sales]), ALL(Orders)): Total sales for all orders, ignoring filters.
- DIVIDE: Safely performs division to return the percentage contribution.

Benefits:

- Performance Tracking, Resource Allocation and Strategic Decision-Making
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6th Sales December Filter

DAX Formula:

Sales December Filter = CALCULATE(SUM('Orders'[Sales]), FILTER('Orders', MONTH('Orders'[Order Date]) = 12))

Purpose:

Calculates total sales for December to analyze seasonal trends and performance.

Function Breakdown:

- CALCULATE: Adjusts context to sum only December's sales.
- FILTER: Includes only orders placed in December.

Why Used:

December sales are typically high due to holiday shopping, making it crucial to analyze this month's performance for evaluating promotional strategies.

Benefits:

- Campaign Effectiveness, Seasonal Planning and Product Focus
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7. Sales South Filter

DAX Formula:

Sales South Filter = CALCULATE(SUM(Orders[Sales]), Orders[Region] = "South")

Function Breakdown:

- SUM(Orders[Sales]): Sums total sales.
- Orders[Region] = "South": Filters for orders from the South region.
- CALCULATE: Applies the South region filter to modify context.

Purpose:

Calculates total sales for the South region, providing insights into its contribution to overall sales.

Benefits:

- Regional Optimization, Product Alignment and Comparison
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8. Selected Category Sales (Office Supplies)

DAX Formula:

Selected Category Sales = CALCULATE(SUM('Orders'[Sales]), FILTER('Orders', 'Orders'[Category] = "Office Supplies"))

Function Breakdown:

- SUM('Orders'[Sales]): Sums total sales.
- FILTER('Orders', 'Orders'[Category] = "Office Supplies"): Restricts data to "Office Supplies" category.
- CALCULATE: Applies the category filter and recalculates the sum.

Purpose:

Calculates total sales for the “Office Supplies” category to analyze its performance over time.

Benefits:

- Category Insights, Trend Analysis and Product Strategy
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9. YTD Sales (Year-to-Date)

DAX Formula:

YTD Sales = TOTALYTD(SUM('Orders'[Sales]), 'Orders'[Order Date])

Function Breakdown:

- SUM('Orders'[Sales]): Calculates total sales.
- TOTALYTD: Accumulates sales from the start of the year to the current date.

Purpose:

Calculates cumulative sales for the year, providing a running total.

Benefits:

- Goal Tracking, Seasonal Trends and Performance Management
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10. Total Quantity Sold

DAX Formula:

Total Quantity Sold = SUM('Orders'[Quantity])

Function Breakdown:

SUM('Orders'[Quantity]): Sums the total quantity sold across all orders.

Purpose:

Calculates total quantity sold, aiding in sales volume tracking.

Benefits:

- Inventory Management, Sales Trends and Promotions
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11. Month-to-Date (MTD) Sales

DAX Formula:

MTD Sales = TOTALMTD(SUM('Orders'[Sales]), 'Orders'[Order Date])

Function Breakdown:

- SUM('Orders'[Sales]): Sums current month sales.
- TOTALMTD: Accumulates sales for the current month up to the current date.

Purpose:

Calculates sales from the start of the month to the current date.

Benefits:

- Real-Time Monitoring, Adjust Strategies and Short-Term Goals

Final Thoughts

These DAX measures and visualizations help businesses to:

- Identify top contributors and underperformers.
- Monitor seasonal trends and regional variations.
- Track cumulative performance and monthly growth.
- Optimize product management based on sales volume.

