# **Customer Segmentation Analysis**

## Definition:

Customer segmentation involves categorizing a customer base into specific groups based on common traits like demographics, behaviours, or interests.

Measures used in final dashboard:

1. TotalSales:
   * + Purpose: This measure computes the total sales by adding up all the values in the Sales column of the Orders table.
     + DAX Formula:

TotalSales = SUM(Orders[Sales])

1. TotalQuantity:
   * + Purpose: This measure calculates the total quantity of items (or units) from the Quantity column in the Orders table.
     + DAX Formula:

TotalQuantity = SUM(Orders[Quantity])

1. Total Profit:
   * + Purpose: This measure calculates the total profit by summing up all the values in the Profit column of the Orders table.
     + DAX Formula:

Total Profit = SUM(Orders[Profit])

1. Profit Margin:
   * + Purpose: This measure calculates the **profit margin** as a percentage or ratio of total profit to total sales. It ensures the calculation is robust by handling cases where TotalSales might be zero, preventing errors.
     + DAX Formula:

Profit Margin = DIVIDE([Total Profit],[TotalSales],0)

1. CustomerCount:
   * + Purpose: This measure calculates the total number of unique customers (based on Customer ID) in the Orders table.
     + DAX Formula:

CustomerCount = DISTINCTCOUNT(Orders[Customer ID])

1. AOVPerCustomer:
   * + Purpose: This measure calculates the **Average Order Value (AOV) per Customer**, which gives the average amount spent by each customer.
     + DAX Formula:

AOVPerCustomer = DIVIDE([TotalSales], [CustomerCount])

1. AOVPerOrder:
   * + Purpose: This measure calculates the **Average Order Value (AOV) per Order**, which shows the average value of each order placed.
     + DAX Formula:

AOVPerOrder = DIVIDE([TotalSales],DISTINCTCOUNT(Orders[Order ID]))

1. FirstPurchaseYear:
   * + Purpose: This measure calculates the **first purchase year** for each customer, meaning it identifies the year when each customer made their very first purchase.
     + DAX Formula:

FirstPurchaseYear = CALCULATE( YEAR(MIN(Orders[Order Date])),

    ALLEXCEPT(Orders, Orders[Customer ID]))

1. NewCustomers:
   * + Purpose: This measure calculates the number of **new customers** for a specific year, i.e., customers who made their first purchase in that year.
     + DAX Formula:
     + NewCustomers = CALCULATE(DISTINCTCOUNT(Orders[Customer ID]),

    Orders[FirstPurchaseYear] = SELECTEDVALUE(DateTable[Year]))

1. SPLY Sales:
   * + Purpose: This measure calculates **sales for the same period in the previous year**. It is often used for year-over-year (YoY) comparisons to track performance changes, such as revenue or sales growth.
     + DAX Formula:

SPLY Sales = CALCULATE([TotalSales],SAMEPERIODLASTYEAR('DateTable'[Date]))

1. Recency:
   * + Purpose: This measure calculates the **recency** of the most recent order, i.e., the number of days since the most recent order was placed. It helps you understand how recently a customer made a purchase.
     + DAX Formula:

Recency = DATEDIFF(MAX('Orders'[Order Date]), TODAY(), DAY)

1. RMF Score:
   * + Purpose: The **RMF Score** aggregates the three dimensions of RFM analysis into a single score, which can be used to rank customers based on their:

**Recency**: How recent their last purchase was.

**Frequency**: How often they make purchases (represented by Total Orders).

**Monetary**: How much they have spent (represented by Total Sales).

* + - DAX Formula:

RMF Score = [Recency] + [Total Orders] + [TotalSales]

1. Years Active:
   * + Purpose: This measure calculates the **number of years** a customer has been active based on the time between their first and last purchase.
     + DAX Formula:

Years Active = DATEDIFF(MIN('Orders'[Order Date]), MAX('Orders'[Order Date]), YEAR)

1. Purchase Frequency:
   * + Purpose: The measure calculates the average **purchase frequency** for a customer over their active years, essentially showing how many orders the customer places per year.
     + DAX Formula:

Purchase Frequency = DIVIDE([Total Orders], [Years Active], 0)

1. Customer Lifespan:
   * + Purpose: The **Customer Lifespan** measure calculates the average duration customers remain active, based on the time between their first and last purchase.
     + DAX Formula:

Customer Lifespan =

AVERAGEX(

    VALUES('Orders'[Customer ID]),

    DATEDIFF(

        MINX(FILTER('Orders', 'Orders'[Customer ID] = EARLIER('Orders'[Customer ID])), 'Orders'[Order Date]),

        MAXX(FILTER('Orders', 'Orders'[Customer ID] = EARLIER('Orders'[Customer ID])), 'Orders'[Order Date]),

        YEAR

    )

)

1. CLV:
   * + Purpose: This formula calculates the **Customer Lifetime Value (CLV)**, which provides an estimate of the total revenue a customer is expected to bring to the company throughout their entire relationship
     + DAX Formula:

CLV = [AOVPerOrder] \* [Purchase Frequency] \* [Customer Lifespan]

1. LastPurchaseDate:
   * + Purpose: This measure calculates the **most recent order date** for each customer, effectively identifying the date of the customer's last purchase.
     + DAX Formula:

LastPurchaseDate =

CALCULATE(

    MAX('Orders'[Order Date]),ALLEXCEPT('Orders', 'Orders'[Customer ID]))

1. IsChurned:
   * + Purpose: The **IsChurned** measure helps to classify customers as **"Churned"** or **"Active"** based on the recency of their last purchase, typically to identify customers who have not engaged with the business for an extended period
     + DAX Formula:

IsChurned =

IF(

    DATEDIFF('Orders'[LastPurchaseDate], TODAY(), MONTH) > 6,

    "Churned",

    "Active")

1. ChurnRate:
   * + Purpose: This formula calculates the **Churn Rate**, which is the proportion of customers who have been classified as "Churned" relative to the total number of distinct customers.
     + DAX Formula:

ChurnRate =

DIVIDE(

    COUNTROWS(FILTER('Orders', 'Orders'[IsChurned] = "Churned")),

    DISTINCTCOUNT('Orders'[Customer ID]))

Some Other DAX Formulas:(Haven’t used in dashboard)

* Avg Delivery Days = AVERAGE('Orders'[Delivery Days])
* Delivery Days = DATEDIFF('Orders'[Order Date], 'Orders'[Ship Date], DAY)
* MTD Sales = TOTALMTD(SUM('Orders'[Sales]), 'Orders'[Order Date])
* Profit Growth % = DIVIDE([Total Profit] - [SPLY Profit],[SPLY Profit],0) \* 100
* QTD Sales = TOTALQTD(SUM('Orders'[Sales]), 'Orders'[Order Date])
* Return Rate = DIVIDE(SUM('Orders'[Return Status]), COUNT('Orders'[Order ID]), 0)
* Return Status = RELATED('Returns'[Is Returned])
* Sales Growth % = DIVIDE( [TotalSales] - [SPLY Sales],[SPLY Sales],0) \* 100
* SPLY Profit = CALCULATE([TotalProfit],SAMEPERIODLASTYEAR('DateTable'[Date]))
* YTD Sales = TOTALYTD(SUM('Orders'[Sales]), 'Orders'[Order Date])