Sales & Customer Performance Analytics (E-Commerce)

🔹 STEP 1: BUSINESS UNDERSTANDING (FOUNDATION)

What you must understand first

Power BI is **not about charts**, it is about **business decisions**.

Business Scenario

An **E-Commerce company** wants answers to these questions:

- How much **sales and profit** are we making?
- Are sales **growing or declining**?
- Which **products** perform best?
- Which **customers** generate the most revenue?
- Which **regions** contribute maximum sales?
- How is this month / year performing compared to **last year**?

Final Goal

Create an **interactive dashboard** that management can use to:

- Track KPIs
- Identify problems
- Take decisions

🔹 STEP 2: DATASET UNDERSTANDING (VERY IMPORTANT)

Tables Used in This Project

1 Sales Table (FACT TABLE)

- Contains **transaction-level data**
- Each row = one order
- Used for calculations (Sales, Profit, Quantity)

2 Customers Table (DIMENSION)

- Contains customer details
- Used for slicing and grouping sales

3 Products Table (DIMENSION)

- Contains product details
- Used for product-level analysis

Key Teaching Point

In real projects, **fact and dimension tables are always separate**
This is called **Star Schema**

🔹 STEP 3: LOADING DATA INTO POWER BI

Actions in Power BI

1. Open **Power BI Desktop**
2. Click **Get Data → Excel**
3. Select the dataset file
4. Select:
    - Sales
    - Customers
    - Products
5. Click **Transform Data**

Why "Transform Data"?

Because:

- Raw data is never perfect
- Cleaning is mandatory
- Direct loading causes wrong results

🔹 **STEP 4: POWER QUERY – DATA CLEANING**

Sales Table

Check and explain:

- OrderDate → Date type
- SalesAmount, Profit, Discount → Decimal
- Quantity → Whole number
- No blank OrderID

Customers Table

- CustomerID should not be blank
- Age → Whole number
- SignupDate → Date

Products Table

- CostPrice, SellingPrice → Decimal
- ProductID must be unique

Final Action

Click **Close & Apply**

Explain to students:
"Bad data = wrong dashboard = wrong decisions"

🔹 **STEP 5: WHY DATE TABLE IS REQUIRED**

Problem Without Date Table

Power BI's default date:

- Breaks YTD / MTD / QTD
- Gives incorrect time comparison

What Date Table Solves

- Correct time intelligence
- Consistent date filtering
- Accurate YoY growth

Rule: **Every professional Power BI project has a Date Table**

🔹 **STEP 6: CREATE DATE TABLE (DAX)**

Create New Table

```
DateTable =
ADDCOLUMNS(
  CALENDAR ( MIN(Sales[OrderDate]), MAX(Sales[OrderDate]) ),
  "Year", YEAR([Date]),
  "Month", FORMAT([Date], "MMM"),
  "Month No", MONTH([Date]),
  "Quarter", "Q" & FORMAT([Date], "Q"),
  "Year-Month", FORMAT([Date], "YYYY-MM"),
  "Week No", WEEKNUM([Date]),
  "Day", DAY([Date]),
  "Day Name", FORMAT([Date], "DDD"),
  "Is Weekend", IF(WEEKDAY([Date],2)>5,"Yes","No")
)
```

Mandatory Step

- Select DateTable
- Click **Mark as Date Table**
- Choose Date column

🔹 **STEP 7: DATA MODELING (MOST CRITICAL STEP)**

Relationships to Create

From (Many)	To (One)
Sales[CustomerID]	Customers[CustomerID]
Sales[ProductID]	Products[ProductID]
Sales[OrderDate]	DateTable[Date]

Relationship Settings

- Cardinality: **Many to One**
- Filter direction: **Single**
- Active: Yes

Explain to Students

- Fact table stays in center
- Dimension tables connect around it
- This is **Star Schema**

🔹 **STEP 8: MEASURES VS CALCULATED COLUMNS**

Calculated Column

- Calculated row by row
- Stored in memory
- Not dynamic

Measure

- Calculated at runtime
- Reacts to slicers
- Used for KPIs

Rule: **Always use Measures for KPIs**

🔹 **STEP 9: CREATE BASE MEASURES**

```
Total Sales = SUM(Sales[SalesAmount])

Total Profit = SUM(Sales[Profit])

Total Orders = DISTINCTCOUNT(Sales[OrderID])

Total Quantity = SUM(Sales[Quantity])

Total Customers = DISTINCTCOUNT(Customers[CustomerID])
```

Explain business meaning of each measure.

🔹 **STEP 10: BUSINESS KPI MEASURES**

```
Average Order Value =

DIVIDE([Total Sales], [Total Orders])

Profit Margin % =

DIVIDE([Total Profit], [Total Sales])

Returned Orders =

CALCULATE(

  [Total Orders],

  Sales[OrderStatus] = "Returned"
```

)

🔹 **STEP 11: TIME INTELLIGENCE MEASURES**

YTD Sales =

TOTALYTD([Total Sales], DateTable[Date])

MTD Sales =

TOTALMTD([Total Sales], DateTable[Date])

QTD Sales =

TOTALQTD([Total Sales], DateTable[Date])

Last Year Sales =

CALCULATE(

  [Total Sales],

  SAMEPERIODLASTYEAR(DateTable[Date])

)

Sales Growth % =

DIVIDE(

  [Total Sales] - [Last Year Sales],

  [Last Year Sales]

)

🔹 **STEP 12: ADVANCED DAX (INTERVIEW IMPORTANT)**

Product Rank =

RANKX(

  ALL(Products[ProductName]),

  [Total Sales]

)

Selected Region =

SELECTEDVALUE(Customers[Region], "All Regions")

Explain:

- CALCULATE changes filter context
- RANKX for Top/Bottom analysis
- SELECTEDVALUE for dynamic titles

🔹 **STEP 13: DASHBOARD – PAGE 1 (EXECUTIVE SUMMARY)**

Purpose

Quick business health check

Visuals

- KPI Cards:
    - Total Sales
    - Total Profit
    - Total Orders
    - Total Customers
    - Profit Margin %
- Line chart: Sales trend
- Slicers: Date, Region, Category

🔹 **STEP 14: DASHBOARD – PAGE 2 (SALES ANALYSIS)**

Visuals

- Sales by Category (Bar chart)
- Sales by Region / State
- Channel-wise Sales
- Monthly Sales Trend

Business Question

"Where is revenue coming from?"

🔹 **STEP 15: DASHBOARD – PAGE 3 (CUSTOMER ANALYSIS)**

Visuals

- Top Customers
- Customer Segment vs Sales
- Average Order Value by Region

Business Question

"Who are our best customers?"

Visual Creation (Top Customers):

Insert **Table** or **Bar Chart**

1. Add:
    - Customers[CustomerName]
    - Total Sales
2. Sort by **Total Sales (Descending)**
3. Apply **Top N filter**
    - Top = 10
    - By = Total Sales

Visual Creation (Customer Segment vs Sales)

1. Insert **Clustered Column Chart**

2. Axis:
    - Customers[CustomerSegment]
3. Values:
    - Total Sales
4. Turn on **Data Labels**

Visual Creation (Average order value by region)

1. Insert **Bar Chart**
2. Axis:
    - Customers[Region]
3. Values:
    -
4. Sort descending

🔹 **STEP 16: DASHBOARD – PAGE 4 (PRODUCT PERFORMANCE)**

Visuals

- Top & Bottom Products
- Profit vs Discount
- Brand contribution

Option A: Top 10 Products

1. Insert **Bar Chart**
2. Axis → Products[ProductName]
3. Values → Total Sales
4. Sort → Descending by Total Sales
5. Filters pane → ProductName
    - Top N → 10
    - By value → Total Sales

Option B: Bottom 10 Products

- Same steps
- Top N → **Bottom 10**

Best Visual: Scatter Chart (Profit vs Discount)

🔹 **Visual Creation (Step-by-Step)**

1. Insert **Scatter Chart**
2. X-Axis → Total Discount
3. Y-Axis → Total Profit

4. Details → Products[ProductName]
5. (Optional) Size → Total Sales
6. Turn on Data Labels (optional)

Visual Creation (Donut Chart – Step-by-Step)

1. Insert **Donut Chart**
2. Legend → Products[Brand]
3. Values → Total Sales
4. Turn on **Percentage Labels**
5. Sort by Total Sales (Descending)

Business Question

"Which products need attention?"

🔹 **STEP 17: INTERACTIVITY**

- Add slicers to all pages
- Enable cross-filtering
- Create drill-through page
- Add tooltips
- Use dynamic titles

🔹 **STEP 18: VALIDATION CHECKLIST**

✓ KPIs match across pages
✓ Slicers affect visuals
✓ Time intelligence works
✓ No inactive relationships

🔹 **STEP 19: PUBLISH TO POWER BI SERVICE**

1. Click **Publish**
2. Select workspace
3. Create dashboard
4. Pin visuals
5. Schedule refresh
6. Share with users