

Sales Performance Analysis for a Manufacturing Company

Objective:

Analyze the sales performance of a manufacturing company using the provided dataset. Create an interactive Power BI dashboard to provide insights into sales, profits, and other key metrics.

Dataset Overview

The dataset contains the following columns:

- **Segment:** Customer segment (e.g., Government, Midmarket).
- **Country:** Country where the sale occurred.
- **Product:** Product sold.
- **Discount Band:** Discount applied (e.g., None, Low, Medium, High).
- **Units Sold:** Number of units sold.
- **Manufacturing Price:** Cost to manufacture one unit.
- **Sale Price:** Price at which the product was sold.
- **Gross Sales:** Total sales revenue (Units Sold * Sale Price).
- **Discounts:** Total discounts applied.
- **Sales:** Net sales after discounts (Gross Sales - Discounts).
- **COGS:** Cost of Goods Sold (Units Sold * Manufacturing Price).
- **Profit:** Net profit (Sales - COGS).
- **Date:** Date of the sale.
- **Month Number:** Month number (1-12).
- **Month Name:** Name of the month.
- **Year:** Year of the sale.

Tasks for Students

Task 1: Data Preparation and Cleaning

1. **Import Data:** Load the dataset into Power BI.
2. **Data Cleaning:**
 - Check for missing values and handle them appropriately.
 - Ensure correct data types (e.g., Date, Currency).
 - Remove unnecessary columns (if any).

3. **Create a Date Table:** Build a date table with columns like Date, Month, Quarter, and Year for time-based analysis.

Task 2: Data Modeling

1. **Create Relationships:**
 - Build relationships between the main sales table and the date table.
2. **Optimize the Data Model:**
 - Ensure the model is normalized and efficient for analysis.

Task 3: DAX Calculations

Create the following measures using DAX:

1. **Total Sales:** Sum of the "Sales" column.
2. **Total Profit:** Sum of the "Profit" column.
3. **Average Discount:** Average of the "Discounts" column.
4. **Profit Margin:** $(\text{Total Profit} / \text{Total Sales}) * 100$.
5. **Year-over-Year Growth (YoY):** Compare sales or profit with the previous year.
6. **Top-Selling Product:** Product with the highest sales.

Task 4: Visualization and Dashboard Design

Create an interactive dashboard with the following visuals:

1. **KPIs:**
 - Total Sales, Total Profit, Profit Margin, Average Discount.
2. **Sales Trends:**
 - Line chart showing monthly sales and profit trends.
3. **Sales by Segment:**
 - Bar chart showing sales by customer segment (e.g., Government, Midmarket).
4. **Sales by Country:**
 - Map visual showing sales by country.
5. **Top-Selling Products:**
 - Table or bar chart showing the top 5 products by sales.
6. **Profit Analysis:**
 - Waterfall chart showing profit by product or segment.
7. **Filters:**
 - Add slicers for Year, Country, and Segment.

Task 5: Insights and Reporting

Answer the following business questions using the dashboard:

1. Which customer segment generates the highest sales and profit?
2. Which country contributes the most to total sales?
3. What is the trend in sales and profit over time?
4. Which product has the highest profit margin?
5. How do discounts impact sales and profit?
6. What is the year-over-year growth in sales and profit?
7. Which month has the highest sales and profit?
8. What is the average discount percentage applied across all sales?
9. Which product has the highest and lowest units sold?
10. How does profit vary by discount band?

Deliverables

1. **Power BI Report:** A fully functional .pbix file with interactive visuals.
2. **Documentation:** A brief document explaining:
 - The data cleaning and transformation steps.
 - The data model and relationships.
 - Key DAX measures and their logic.
 - Insights derived from the dashboard.
3. **Presentation:** A 10-minute presentation showcasing the dashboard, challenges faced, and solutions implemented.

Dashboard Layout

1. **Header Section:**
 - Title: "Sales Performance Dashboard."
 - Slicers: Year, Country, Segment.
2. **Top Section:**
 - KPIs: Total Sales, Total Profit, Profit Margin, Average Discount.
3. **Middle Section:**
 - Line chart: Monthly Sales and Profit Trends.
 - Bar chart: Sales by Segment.
4. **Bottom Section:**
 - Map visual: Sales by Country.
 - Table: Top-Selling Products.
 - Waterfall chart: Profit Analysis.

Challenges for Advanced Practice

1. **Advanced DAX:**

- Calculate running totals for sales and profit.
- Create a measure for cumulative year-to-date (YTD) sales.

2. **Drill-Through Pages:**

- Add a drill-through page for detailed product analysis.

3. **What-If Analysis:**

- Use the "What-If" parameter to simulate the impact of different discount levels on profit.