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**Aim: Case study based Project**

This guide through a real-world case study using Power BI. The project will involve data modeling, transformation, and analysis using DAX commands to solve business problems. By the end of this lab, students should be able to apply their Power BI and DAX skills in a practical context.

1. **Part A**

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| **1. Case Study Introduction**  **Scenario: Sales Performance Dashboard for AmazingMartEU**  You are tasked with creating an interactive dashboard in Power BI to help management analyze sales performance, product demand, and profitability across various regions for AmazingMartEU. The dashboard should provide insights into total sales, product categories, customer segments, and profit margins. Management is particularly interested in tracking sales trends, identifying top-performing regions and products, and analyzing profitability by product category.  **Dataset Description: AmazingMartEU Sales Data**  The dataset contains transactional and product-level data for a retail company, AmazingMartEU, focused on sales across various regions in Europe. It is divided into two primary sheets:   1. ListOfOrders: This sheet contains order-level information, including:    * Order ID: Unique identifier for each transaction.    * Order Date and Ship Date: Dates related to when orders were placed and shipped.    * Customer Name, City, Country, Region, and Segment: Details about the customer and their location, along with the market segment they belong to (e.g., Consumer, Corporate).    * Ship Mode: Shipping methods like Economy or Priority used for delivering the order. 2. OrderBreakdown: This sheet provides details about the products in each order, including:    * Product Name, Category, and Sub-Category: Information about the items sold.    * Sales: The sales revenue generated from each product.    * Profit: The profit made from each sale.    * Quantity: The number of units sold for each product.    * Discount: Discounts applied to the products.   This data allows for in-depth analysis of sales performance, customer behavior, product demand, and regional sales trends across Europe.  **Dataset Overview:**  **2. Data Loading and Preparation**  In this step, load the ListOfOrders and OrderBreakdown datasets into Power BI using the “Get Data” function. Ensure that the data types are properly assigned in the Power Query Editor: for instance, Order Date should be formatted as a date, while Sales and Profit should be numeric. Validate the dataset by removing any erroneous or redundant rows. Lastly, set up relationships between the Order ID fields in the two tables to ensure accurate cross-referencing for analysis.  Dataset name: AmazingMartEu2Geo    **3. Data Transformation**  Clean and structure the data to enhance its usability for analysis. Begin by removing rows with missing Sales, Profit, or Customer ID values. Create a calculated column in the OrderBreakdown table for Total Sales using the formula: Total Sales = Quantity \* Sales. Next, filter the data to include only transactions from the last two years for relevance. Aggregate and summarize data across various dimensions, such as Product Category, Region, and Customer Segment, to facilitate advanced analysis and visualizations.  **Task:**   * Clean the data by removing any errors or missing values.        * Create necessary calculated columns and tables for better analysis.       **3.DAX Calculations :**  **a.** **costprice = OrderBreakdown[Sales]-OrderBreakdown[Profit]**    **b.** **actualprice = OrderBreakdown[Sales]-(OrderBreakdown[Sales]\*OrderBreakdown[Discount])**      **c. max order**    **d. min order:**    **e. max delivery duration**    **Key DAX Formulas:**   1. costprice = OrderBreakdown[Sales]-OrderBreakdown[Profit] 2. actualprice = OrderBreakdown[Sales]-(OrderBreakdown[Sales] \* OrderBreakdown[Discount]) 3. averagesales = AVERAGE(OrderBreakdown[actualprice]) 4. MAX\_ORDERS = MAX(ListOfOrders[Country]) 5. maxdelivery dates = MAX(ListOfOrders[DELIVERY DURATION]) 6. MIN\_ORDERS = MIN(ListOfOrders[Country])   **Data Visualization:**        **6. Project Questions and Deliverables**  **Project Questions:**   1. **1. What is the average profit margin across all products?** 2. The average **Profit Margin** can be calculated by comparing **Total Profit** against **Total Sales**. From the data, the margin indicates the overall profitability across all product categories, helping to understand how much profit is made per sale. Typically, a higher profit margin shows more efficient pricing or cost control.     **2. Which product categories contribute the most to total sales?**  From the dataset, **Furniture** and **Office Supplies** appear to contribute significantly to **Total Sales**. Furniture, with higher price points, drives a larger portion of revenue, while Office Supplies, though lower-priced, are sold in higher volumes, contributing heavily to overall sales.    **3. What is the distribution of sales by shipping mode?**  The dataset shows that most sales are shipped via **Economy** mode, followed by **Priority** and **Economy Plus**. This distribution highlights customer preference for budget shipping options, which could influence decisions about shipping strategies and logistics.    **4. How do discounts affect profitability?**  The dataset reveals that higher **Discounts** often result in reduced **Profit**, particularly in product categories like **Office Supplies** where the margins are already lower. Excessive discounting erodes profitability, making it crucial to balance discount levels with profit goals.    **5. How does customer location impact sales performance?**  Regions like **North** and **Central** have the highest sales volume, with countries like **United Kingdom** and **France** generating the most revenue. This geographic distribution can help target marketing efforts and inform decisions about inventory and customer support locations. |