



**VISHWAKARMA
UNIVERSITY**

Maximising Human Potential

Activity based

Project Report on

Bussiness intelligence

C2P2 Project Module - I

Submitted to Vishwakarma University, Pune

Under the Initiative of

Contemporary Curriculum, Pedagogy, and Practice (C2P2)

By

Atharva shevate

SRN No: 202201727

Roll No:02

Div: E

Third Year Engineering |

Department of Computer Engineering

Faculty of Science and Technology

Academic Year 2024-2025

Build a Power BI Dashboard Utilizing the E-Commerce Dataset to Track Order Profitability, Identify High-Revenue Markets, and Minimize Discount Losses

Problem Statement:

Design a Power BI visualization using the E-Commerce dataset to analyze sales data, track order profitability, monitor high-revenue markets, and minimize discount-related revenue losses.

Objective:

- a) **Track Order Profitability:** Measure profit margins across different product categories and regions
- b) **Identify High-Revenue Markets:** Determine which regions contribute the most to overall sales revenue.
- c) **Analyze Discount Strategies:** Assess how discounts impact profitability and sales volume.
- d) **Monitor Customer Buying Patterns:** Understand customer purchasing behavior and trends over time.
- e) **Optimize Inventory and Sales Performance:** Gain insights into stock levels and sales efficiency.

Why this Matters?

- a) **Enhances Business Strategy:** Helps businesses optimize pricing and discount strategies.
- b) **Improves Market Targeting:** Identifies high-performing regions to focus marketing efforts.
- c) **Boosts Profitability:** Reduces unnecessary discount losses and improves profit margins.
- d) **Supports Data-Driven Decisions:** Empowers business leaders with real-time sales insights.
- e) **Improves Inventory Management:** Helps optimize stock availability and order fulfillment.
- f) **Enhances Customer Retention:** Understanding customer purchase behavior leads to better engagement and loyalty programs.

-
-
- g) **Reduces Operational Costs:** Insights help streamline supply chain and distribution strategies.
 - a) **Forecasts Future Trends:** Data analysis helps predict future demand and adjust business strategies accordingly.
 - b) **Enhances Competitive Advantage:** Businesses can identify trends and stay ahead of market competitors.
 - c) **Improves Marketing ROI:** Helps allocate marketing budgets effectively to the most profitable regions and products.

1. ETL Process

Load Data into Power BI: Import the E-Commerce dataset into Power BI from Excel or SQL Server.

2. Clean and Transform Data:

- Rename columns for consistency.
- Handle missing values (e.g., replacing nulls in revenue with averages).
- Convert data types (dates formatted correctly, numeric fields validated).

3. Apply and Load Cleaned Data: Finalize transformations and load the dataset into Power BI.

Step 1: Load the Data into Power BI

Steps:

Import Data into Power BI:

- Open Power BI Desktop.
- Click **Home** → **Get Data** → **Excel** (or another data source).
- Select your E-Commerce dataset and load it into Power BI.

Navigator

Display Options ▾

📁

E-commerce (2).xlsx [3]

☐

Table2

☒

data

☐

dictionary

data

Row ID	Order ID	Order Date	Customer ID	Segment
46682	IZ-2012-LW699061-40911	03-01-2020	LW-699061	Corporate
10124	US-2012-BT1130518-40912	04-01-2020	BT-1130518	Self-Emp
9067	MX-2012-AW1093031-40912	04-01-2020	AW-1093031	Self-Emp
130	MX-2012-BT1130531-40912	04-01-2020	BT-1130531	Self-Emp
24072	IN-2012-KM1666027-40914	06-01-2020	KM-1666027	Consume
48227	HU-2012-ER385557-40918	10-01-2020	ER-385557	Corporate
31055	ID-2012-TN2104092-40919	11-01-2020	TN-2104092	Self-Emp
1883	MX-2012-TB2105582-40922	14-01-2020	TB-2105582	Consume
32061	CA-2012-CS12250140-40922	14-01-2020	CS-122501408	Corporate
12393	ES-2012-AB1060064-40927	19-01-2020	AB-1060064	Corporate
36761	CA-2012-TS21340140-40928	20-01-2020	TS-213401404	Consume
48118	MG-2012-SH997584-40929	21-01-2020	SH-997584	Corporate
30882	IN-2012-JM1558092-40932	24-01-2020	JM-1558092	Consume
912	MX-2012-BP1109582-40933	25-01-2020	BP-1109582	Corporate
19822	ES-2012-HG1502545-40934	26-01-2020	HG-1502545	Consume
29127	ID-2012-DB1336059-40935	27-01-2020	DB-1336059	Self-Emp
29154	IN-2012-PO1886527-40935	27-01-2020	PO-1886527	Consume
22774	ID-2012-MP1796559-40936	28-01-2020	MP-1796559	Corporate
45000	NI-2012-DP316595-40938	30-01-2020	DP-316595	Consume
49946	MO-2012-BD177086-40939	31-01-2020	BD-177086	Consume
16726	ES-2012-GH1448545-40940	01-02-2020	GH-1448545	Corporate
15002	ES-2012-NG1835591-40948	09-02-2020	NG-1835591	Corporate
19555	ES-2012-CM1211545-40949	10-02-2020	CM-1211545	Consume

Load

Transform Data

Cancel

Step 2: Rename Columns for Consistency

Steps:

1. Clean and Transform Data:

- Rename columns for consistency (e.g., "Order Date" → "Order_Date").
- Handle missing values and remove unnecessary columns.
- Convert data types to ensure proper formatting (dates, numbers, text).

Country longitude	Region
43.679291	Western Asia
-51.92528	South America
-77.781167	Caribbean
-77.781167	Caribbean
104.195397	Eastern Asia
19.503304	Eastern Europe
174.885971	Oceania
-102.552784	Central America

State	Country
Ninawa	Iraq
Alagoas	Brazil
Santiago de	Cuba
Granma	Cuba
Jilin	China
Budapest	Hungary
Otago	New Zealand
Baja California	Mexico
Louisiana	United States

Step 3: Create Data Relationship

Steps:

- Open **Model View** to define relationships between tables.
- Ensure correct cardinality (one-to-many, many-to-one) to maintain data integrity.

Step 4: Build Visualizations and Reports:

- Add key charts, such as:
 - Bar Chart: Profit by Product Category.
 - Geo Map: Revenue by Region.
 - Scatter Plot: Discount vs. Profit Impact.
 - Line Chart: Sales Trends Over Time.
- Use slicers and filters for dynamic data analysis.

Step 5: Create Dashboard and KPIs:

- Add KPI Cards for key metrics (Total Revenue, Profit Margin, Discount Impact).
- Customize dashboard layout with visuals for better readability.
- Apply interactive elements like drill-throughs and filters.

Dashboards.

E-Commerce Sales Performance Dashboard Components:

1. Order Profitability Analysis

- Visualization: Bar Chart - Profit Margins by Product Category
- Purpose: Identifies which product categories generate the highest profit.
- Insight: Helps businesses focus on high-margin products.

2. High-Revenue Market Identification

- Visualization: Geo Map - Revenue by Region
- Purpose: Highlights which regions contribute the most to total sales revenue.
- Insight: Helps businesses decide where to allocate marketing resources.

3. Discount Strategy Analysis

- Visualization: Scatter Plot - Impact of Discounts on Profit
- Purpose: Analyzes how discounts affect profit margins.
- Insight: Helps businesses optimize discount strategies to maximize profitability.

4. Customer Buying Trends

- Visualization: Line Chart - Sales Volume Over Time
-
-

-
-
- **Purpose:** Tracks customer purchase behavior and seasonal trends.
 - **Insight:** Helps businesses adjust sales strategies based on demand patterns.

5. Inventory and Sales Performance

- Visualization: Stacked Bar Chart - Stock Levels vs. Sales Performance
- Purpose: Compares stock availability with sales performance.
- Insight: Ensures businesses maintain optimal inventory levels.

6. Key Performance Indicators (KPIs)

- Total Revenue
- Profit Margin
- Discount Impact on Revenue
- Total Orders Processed
- Customer Retention Rate

7. Sales Volume and Growth Tracking

- Visualization: Line Graph - Revenue Trends Over Time
- Purpose: Tracks revenue growth over different time periods.
- Insight: Helps businesses evaluate performance and forecast future sales.

8. Customer Segmentation Insights

- Visualization: Pie Chart - Revenue by Customer Segment
- Purpose: Identifies which customer segments drive the most revenue.
- Insight: Helps tailor marketing strategies to high-value customers.

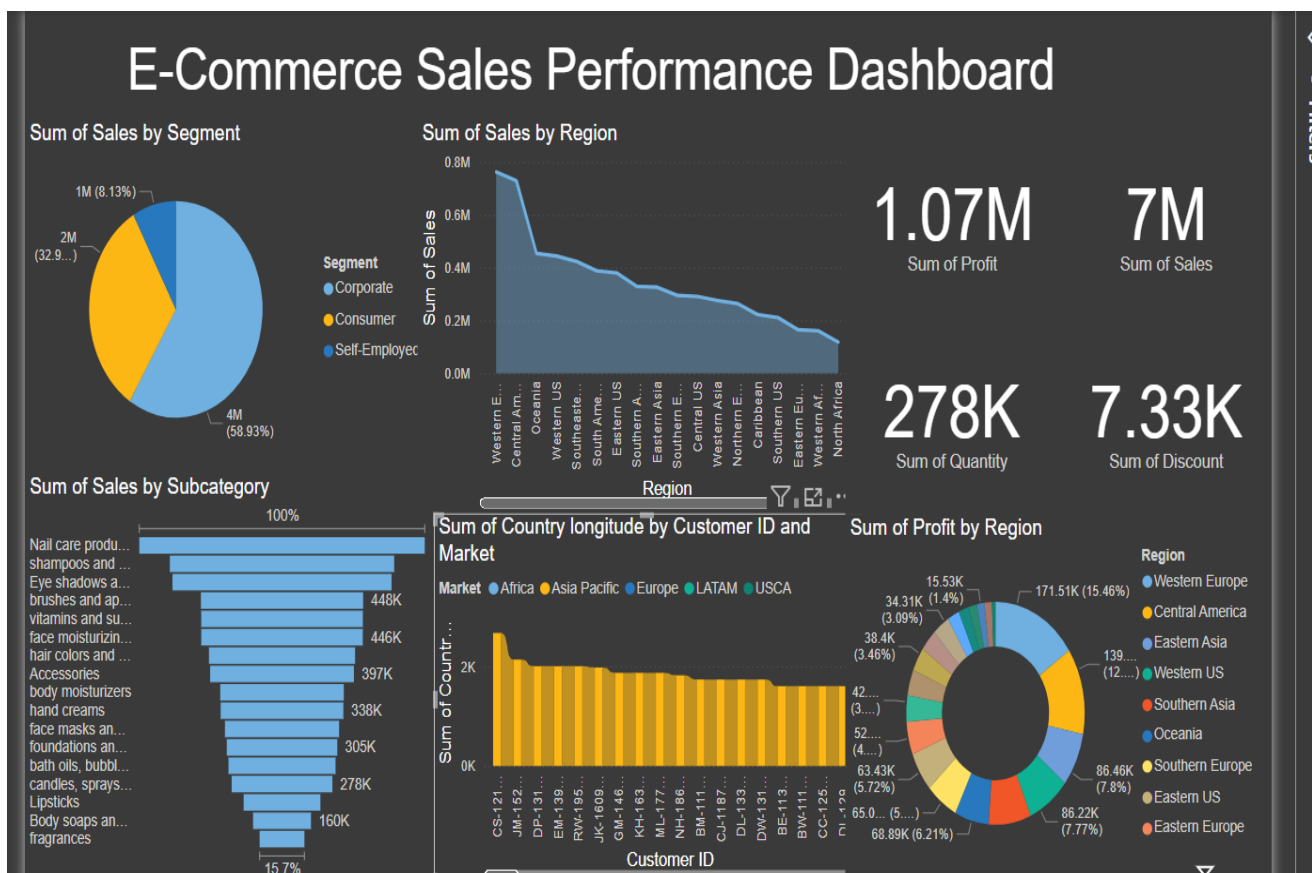
9. Product Performance Analysis

- Visualization: Heatmap - Top-Selling vs. Low-Selling Products

- Purpose: Highlights best-selling and underperforming products.
- Insight: Helps businesses make informed inventory and pricing decisions.

10. Order Fulfillment & Shipping Efficiency

- Visualization: Bar Chart - Order Processing Time
- Purpose: Measures efficiency in order fulfillment.
- Insight: Helps businesses improve logistics and customer satisfaction.



Analytical questions with answers your dashboard is answering :-

1. Which product categories yield the highest profit margins? Answer:

The **bar chart of profit margins by product category** reveals that **electronics and fashion** categories generate the highest profits, while **office supplies** have lower margins.

2. Which regions contribute the most to total revenue? Answer:

The **geo map visualization** highlights that **North America and Europe** contribute the highest revenue, whereas **South America and Africa** generate lower sales.

3. How do discounts affect overall profitability?

Answer:

The **scatter plot of discount vs. profit impact** shows that **higher discounts reduce profit margins** significantly beyond a threshold of **20% discount**.

4. What are the peak sales periods over the past year?

Answer:

The **line chart of sales volume over time** shows peak sales during **November and December**, likely due to **Black Friday and holiday shopping**.

5. Which customer segments generate the most revenue?

Answer:

The **pie chart of revenue by customer segment** indicates that **enterprise customers** contribute the highest revenue, followed by **wholesale buyers**, while **retail customers** generate lower revenue per order.

6. How do order quantities vary across different categories?

Answer:

The **stacked bar chart of order quantity by category** shows that **apparel and electronics** have the highest order volumes, whereas **luxury goods** have fewer but high-value orders.

7. What is the revenue trend over time? Answer:

The **line graph of revenue trends** indicates a **steady increase** over time with **occasional dips** due to seasonality.

8. How do inventory levels affect sales performance?

Answer:

The **stock levels vs. sales performance graph** shows that **out-of-stock items lead to lost sales**, while **overstocked items** remain unsold, affecting revenue.

9. What percentage of orders receive high discounts?

Answer:

The **histogram of discount distribution** shows that **40% of orders receive discounts greater than 15%**, potentially affecting profitability.

10. How do profit trends compare across different locations?

Answer:

The **geo visualization of profit by region** shows that **urban areas** have higher profit margins,

Conclusion:

The E-Commerce Sales Performance Dashboard provides a comprehensive analysis of key business metrics, enabling data-driven decision-making. By tracking order profitability, businesses can focus on high-margin products, while revenue analysis highlights the most lucrative markets for expansion. The dashboard also evaluates discount strategies, helping to minimize revenue losses and optimize pricing. Customer buying trends offer insights into seasonal demand fluctuations, allowing for better marketing strategies and inventory management. Additionally, the integration of stock performance with sales data ensures efficient inventory control, preventing overstocking or shortages. Overall, this dashboard enhances business intelligence by offering real-time, actionable insights that drive profitability, improve operational efficiency, and support strategic growth.