E-COMMERCE SALES, PROFIT & CUSTOMER INTELLIGENCE DASHBOARD

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1. INTRODUCTION

This project presents a complete Power BI solution designed to analyze e-commerce business performance across sales, profitability, customer behavior, and customer segmentation. The goal of the project is to create a unified analytical environment that supports decision-making at multiple levels of the organization—executive, marketing, operations, and customer management.

The dashboard is structured into three interconnected pages, each addressing different analytical needs. Together, they form a clear narrative that helps stakeholders understand what is happening in the business, why it is happening, and what actions can be taken.

2. DATASET OVERVIEW

The dataset contains transactional, customer, product, and date information. Each table plays a specific role:

- Fact_sales: Contains order-level sales transactions including OrderID, CustomerID, ProductID, OrderDate, SalesAmount, Profit, Quantity, Channel, and Payment details.

- Dim_customers: Holds demographic and profile information such as CustomerID, CustomerName, City, State, SignupDate, and Customer Segment.

- Dim_products: Stores product attributes including ProductID, ProductName, Category, and Subcategory.

- Dim_Date: A complete date dimension used for time intelligence calculations.

The dataset (1000–2000 rows) is designed to simulate a realistic e-commerce business environment.

3. DATA CLEANING AND TRANSFORMATION (POWER QUERY)

Before modeling, significant data preparation was performed in Power Query:

- Incorrect data types were corrected, ensuring numeric fields, dates, and text fields had proper formatting.

- Missing values in non-critical fields were replaced using business rules, while rows with missing CustomerID or ProductID were removed to maintain relational integrity.

- Duplicate transactions were identified and removed.

- Additional derived fields were introduced such as Year, Month, Quarter, and Month-Year to support time-based reporting.

- Text fields were standardized by trimming, cleaning, and normalizing case to improve consistency across visuals.

This stage ensures that the data entering the model is accurate, consistent, and ready for analytical operations.

4. DATA MODELING (STAR SCHEMA)

A star schema was implemented to support analytical reporting:

Dim_Customers ■■

■■■ Fact_Sales ■■■ Dim_Date

Dim_Products ■■■

This structure was chosen because:

- It simplifies filtering and slicing.

- It enhances DAX performance.

- It prevents circular dependencies.

- It provides clarity for future enhancements.

Relationships:

- Fact_sales[CustomerID] → Dim_customers[CustomerID]

- Fact_sales[ProductID] → Dim_products[ProductID]

- Fact_sales[OrderDate] → Dim_Date[Date]

5. DAX MEASURES (BUSINESS AND TECHNICAL LOGIC)

DAX measures were created to transform raw numbers into business metrics. A few key examples:

Total Sales = SUM(Fact_sales[SalesAmount])

This defines the total revenue generated.

Total Profit = SUM(Fact_sales[Profit])

This highlights profitability.

Total Orders = DISTINCTCOUNT(Fact_sales[OrderID])

Used to measure order volume.

Avg Order Value = DIVIDE([Total Sales], [Total Orders])

Describes customer spending behavior.

Customer LTV = CALCULATE([Total Sales], REMOVEFILTERS(Dim_Date))

Represents lifetime value by removing date filters.

Repeat Customers % uses a summarized table to identify customers placing more than one order in the selected time period, helping measure retention.

Each measure supports a specific business question and contributes to actionable insights.

6. DASHBOARD PAGE SUMMARIES

PAGE 1 – SALES & PROFIT ANALYSIS

This page provides a high-level overview of business performance. KPIs such as Total Sales, Total Profit, Total Orders, and Average Order Value establish the company's current financial position. The sales trend visual highlights performance fluctuations over time, helping identify peak seasons. Category- and region-wise breakdowns reveal strong and weak areas, allowing managers to prioritize resources effectively.

PAGE 2 – CUSTOMER & SEGMENT ANALYSIS

This page shifts focus to customer behavior. KPIs such as Total Customers, New Customers, Active Customers, ARPU, and Repeat Customer Percentage give insight into customer engagement and loyalty. Sales by Segment visual clarifies how different customer groups contribute to revenue. The Top 20 Customers table highlights the most valuable customers, supporting targeted marketing. State-level performance provides geographical insights.

PAGE 3 – CUSTOMER DETAIL (DRILLTHROUGH)

A drillthrough-enabled page shows detailed information about a selected customer. By right-clicking any customer on Page 2, the user navigates to this page to view their lifetime value, order count, spending trend, and complete order history. This page is essential for understanding individual customer behavior and helps businesses tailor personalized campaigns.

7. KEY BUSINESS INSIGHTS

Across the dashboards, several important insights emerged:

- Premium customers generate the highest spending, making them a key target group.

- Repeat customers contribute a major portion of revenue, indicating strong retention potential.

- Profitability varies significantly across product categories, revealing opportunities to adjust product strategy.

- New customer acquisition peaks during seasonal periods, confirming the importance of promotional campaigns.

- Certain states outperform others, indicating where marketing investments may yield the highest return.

These insights collectively support more informed decision-making.

8. TECHNICAL ENHANCEMENTS AND UX DESIGN

To create a professional and intuitive dashboard:

- A custom theme was created to maintain consistency.

- Soft shadows and clean layout were used to modernize UI.

- A gradient background enhanced the user experience.

- Slicer sync improved usability across pages.

- Dynamic drillthrough added interactivity and depth.

9. FINAL SUMMARY

This project demonstrates a complete Power BI lifecycle—from raw data to insights. It showcases practical skills in data cleaning, modeling, DAX, visualization design, user experience optimization, and business insight generation. The dashboard serves as a powerful analytical tool and a strong portfolio piece for demonstrating data analytics capability.