Ecommerce Performance Analytics

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Role: Aspiring Data Analyst

Project Period: October 2025

Tools Used: Excel/CSV, Power BI, Power Query, Data Modelling, DAX Calculations.

1. Project Overview:

This project, “Ecommerce Performance Analytics”, explores sales performance across various regions, customers, and products to identify key growth opportunities and operational inefficiencies. Power BI was used to design an interactive dashboard for tracking revenue, profit, orders, and returns. The purpose is to provide data-driven insights for improving sales strategy and customer engagement.

2. Objective:

The main objective of this project is to develop a Power BI dashboard that analyzes e-commerce sales data to extract insights about product performance, regional trends, and profitability. Key goals include calculating monthly revenue, margin, and return percentages using DAX, and creating visuals that empower business decision-making.

3. Significance:

Data analytics plays a vital role in optimizing e-commerce operations. This project demonstrates how business intelligence tools like Power BI transform raw data into actionable insights. It highlights how organizations can make informed decisions on product promotions, pricing, and inventory management using interactive data visualization.

4. Data Dictionary:

Datasets	Key Columns
Sales	Customer ID, Date, Product Id, Quantity, Revenue, Transaction Id
Customers	Age, Age Category, Annual Average Spend, Customer Id, Customer Name, Gender, Other Members in Family, State
Products	Brand, Category, Cost Price, Product, Product Id, Selling Price
Returns	Return Id, Transaction Id, Return Date, Quantity

5. Step-by-Step Process (ETL to Dax Calculation):

Step 1: Importing Data

1. Open Power BI Desktop.
2. Click Home → Get Data → Text/CSV.
3. Browse and select the datasets.
4. Load them into Power BI using Transform Data to clean before loading

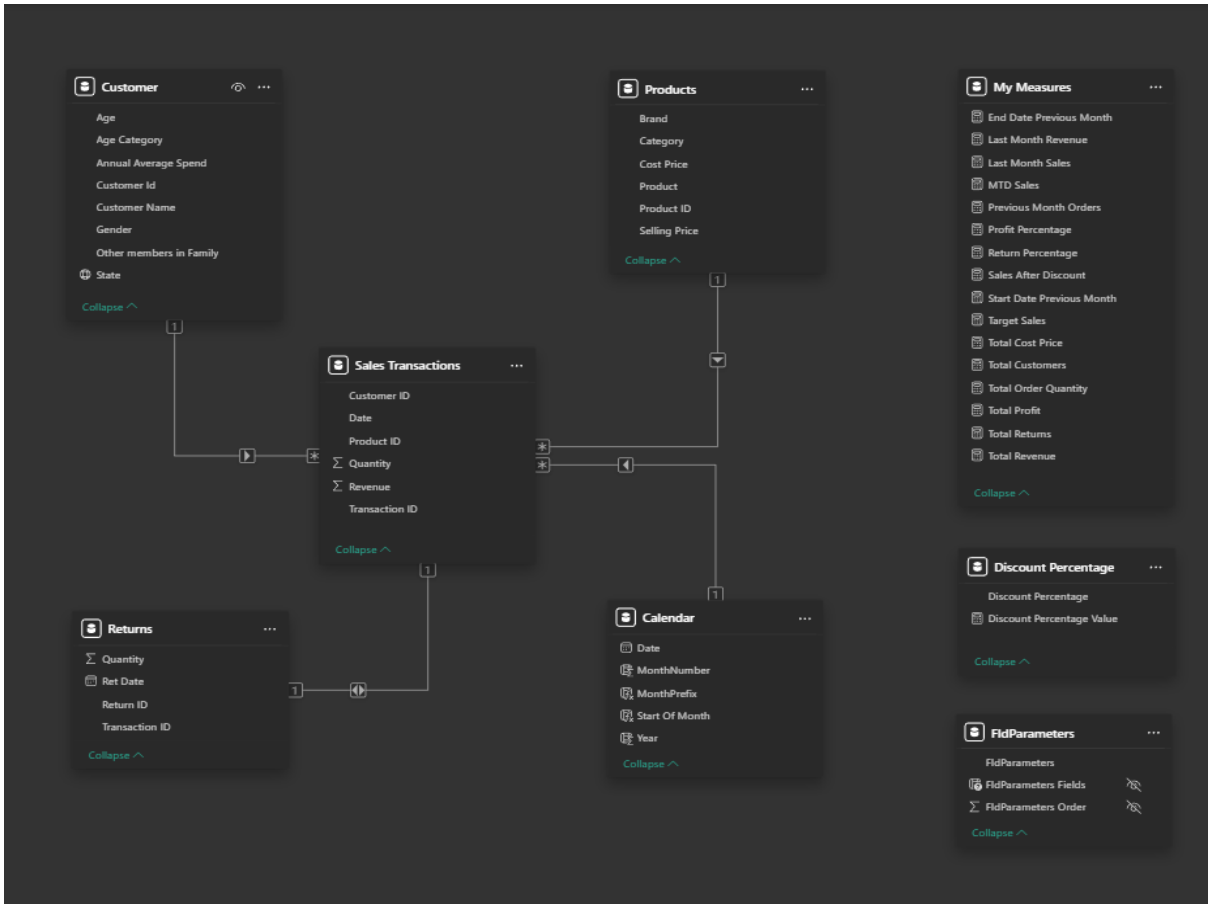
Purpose: Ensures every file is connected properly and ready for transformation before modelling.

Step 2: Data Transformation (Power Query Editor)

1. Open Power Query Editor – click Transform Data on the Home ribbon.
2. Inspect each dataset to verify column names, data types, and null values.
3. After verifying, click Close & Apply to load cleaned tables into Power BI.

Purpose: The Power Query Editor acts as your ETL tool (Extract → Transform → Load). A well-structured ETL process ensures your visualizations are reliable.

Step 3: Data Modelling



1. Go to Model View (left sidebar).
2. Create relationships:
    - Sales [Customer ID] → Customers [Customer ID]
    - Sales [Product ID] → Products [Product ID]
    - Sales [Order ID] → Returns [Order ID]
3. Confirm all relationships are One-to-Many (→).

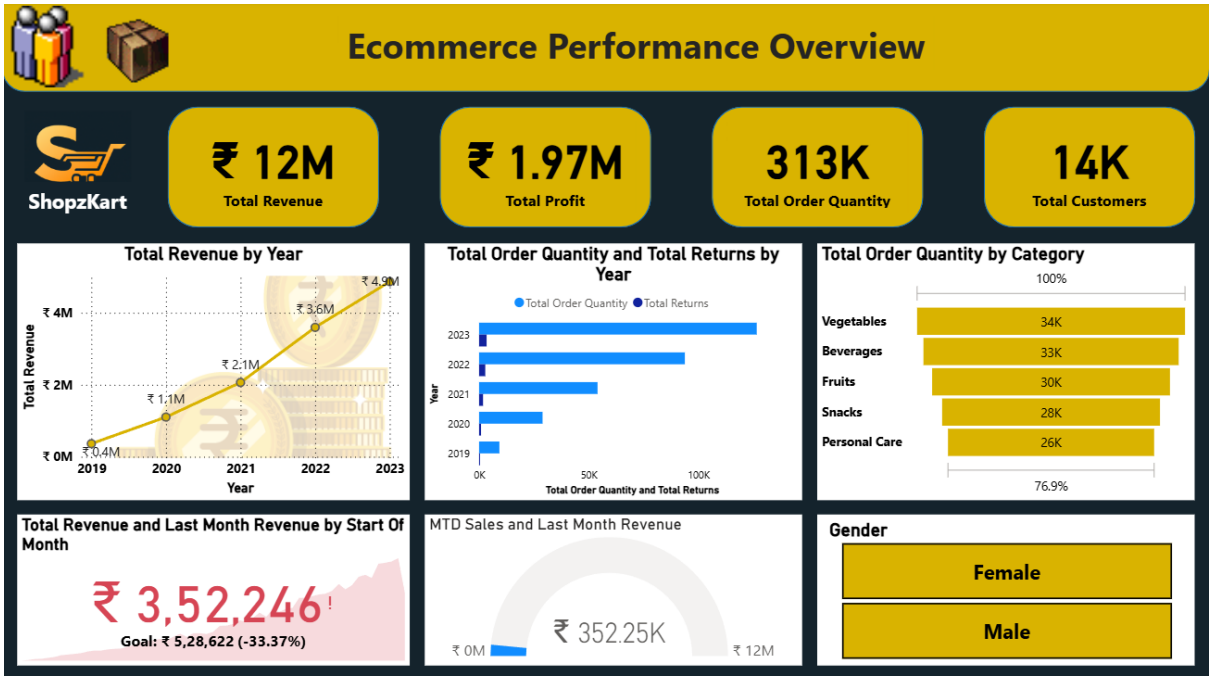
Step 4: Creating Measures (DAX Calculations)

Create new measures under a "📊 My Measures" table:

Measure Name	Dax Formula
End Date Previous Month	EOMONTH ([Start Date Previous Month], 0)
Last Month Revenue	CALCULATE ([Total Revenue], DATEADD('Calendar'[Date], -1, MONTH))
Last Month Sales	CALCULATE ([Total Revenue], DATESBETWEEN ('Sales Transactions'[Date], [Start Date Previous Month], [End Date Previous Month]))
MTD Sales	CALCULATE ([Total Revenue], DATESMTD ('Sales Transactions'[Date]))
Previous Month Orders	CALCULATE ([Total Order Quantity], DATEADD ('Calendar'[Date], -1, MONTH))
Profit Percentage	DIVIDE (([Total Revenue] - [Total Cost Price]), [Total Cost Price], 0)
Return Percentage	DIVIDE ([Total Returns], [Total Order Quantity], 0)
Sales After Discount	SUM ('Sales Transactions'[Revenue]) - (SUM ('Sales Transactions'[Revenue]) * 'Discount Percentage'[Discount Percentage Value])
Start Date Previous Month	IF (MONTH (TODAY ()) <> 1, DATE (YEAR (TODAY ()), MONTH (TODAY ())-1,1), DATE (YEAR (TODAY ())-1,12,1))
Target Sales	[MTD Sales] + ([Last Month Sales] *.1)
Total Cost Price	SUMX ('Sales Transactions', 'Sales Transactions'[Quantity] * RELATED (Products [Cost Price]))
Total Customers	COUNTA (Customer [Customer Id])
Total Order Quantity	SUM ('Sales Transactions'[Quantity])
Total Profit	[Total Revenue] - [Total Cost Price]
Total Returns	SUM (Returns [Quantity])
Total Revenue	SUM ('Sales Transactions'[Revenue])

Purpose: DAX measures make reports dynamic and scalable. Instead of static calculations, DAX ensures automation across filters and dates.

6. Data Insights & Recommendations:

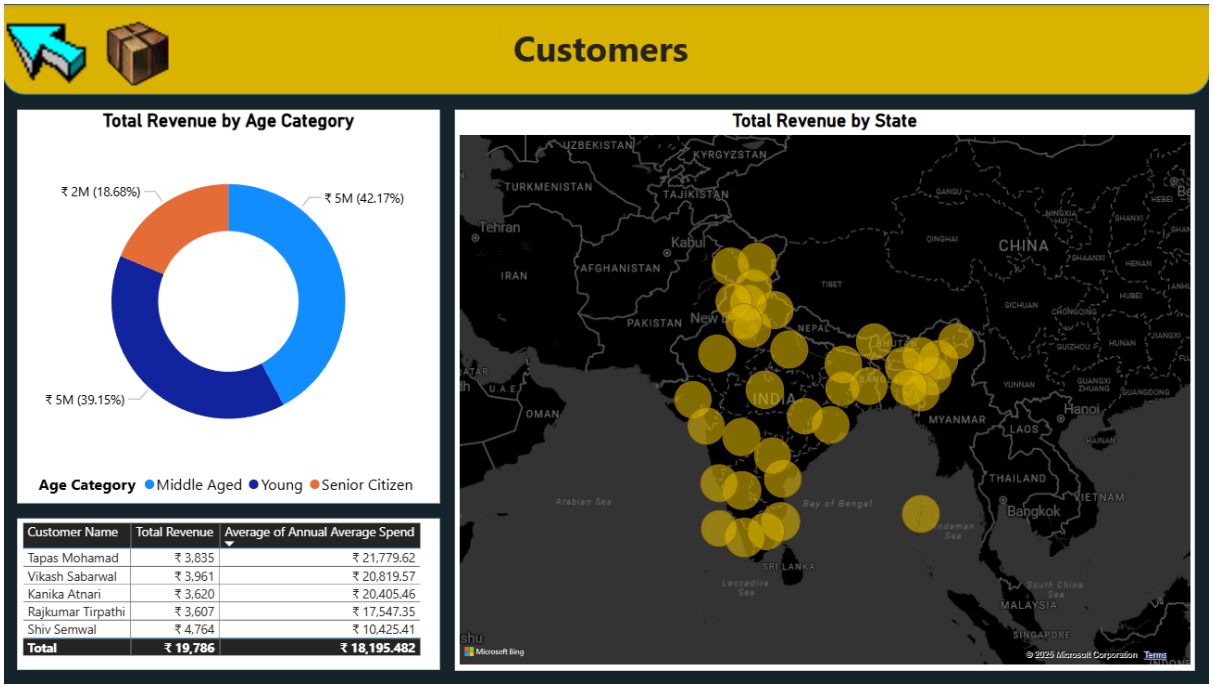


Insights:

- From 2019 to 2023, There is decline in total revenue on a regular a basis in terms of YOY% growth as compared to previous years. For Example; In 2020, Total Revenue is increase by 275% compared to 2019; But In 2023, Total Revenue is increased by increase by 136% compared to 2022. It means, there is 51% drop in YOY% total revenue in 2023 compared to 2019 which is little bit alarming.
- Total Returns to Total Order Quantity ratio is decreasing as it is second lowest compared to previous years which is 2.75% in 2023 & first lowest is 2.00% in 2019. It means company doing good in quality control and correct product delivery.
- Customers are mostly ordering the daily need products such as vegetables, beverages, fruits, snacks and personal care.

Recommendations:

- Ecommerce company need to revisit their sales and marketing strategies.
- Ecommerce company can do more better in terms of returns to order quantity by reducing it from 2.75% to keep it under 2% by improving logistic operations & optimizing quality control.
- Ecommerce company need to keep healthy amount of stock of daily need products to avoid products shortage which is important to increase sales or revenue growth.



Insights:

- Middle aged & young peoples significantly contributing in the overall revenue.
- Mostly customers from Region of North India, South India, East India and North East are contributing to the total revenue. But that's not the same case with customers from Central and West India.

Recommendations:

- Ecommerce company can generate much better revenue in the products which are relevant to young and middle age people.
- Ecommerce company need to make lots of efforts to involve customers from Central and West India region.

Insights:

- Beverages contribution is quite large to the total revenue which is significant; For Example, beverages are generating the revenue of almost 2 million rupees whereas other category products are generating the revenue of on an average 0.7 to 0.8 million rupees per product category.
- Red wine, Non-Veg and Ground Nuts are most profit generating products.

Recommendations

- Company need to look upon the other product category apart from beverages to improve revenue.
- Company have to think upon the sales strategies to increase profit in other products apart from red wine, non-veg and groundnuts.

7. Key Learnings & Skills Demonstrated:

Skills	Demonstrated Through
ETL using Power Query	Data cleaning, standardization and transformation.
Data Modelling	One-to-many relationships and star schema creation.
Dax Mastery	Calculated measures, MTD/YTD metrics, and ratios.
Visualization	KPI dashboards, trend analysis, category comparisons.
Data Insight	Action-oriented recommendations and reasoning.

8. Conclusion:

The Ecommerce Performance Analytics project demonstrates the power of Power BI in deriving actionable insights from transactional data. The dashboard highlights revenue trends, customer behaviours, and product performance metrics that help guide marketing and operational strategies. By using DAX measures and visual storytelling, the report effectively communicates how data-driven decisions can enhance profitability and customer engagement.