Classic Automobile

Problem Statement

- The company is experiencing inconsistent sales trends across different regions and months. There's a need to identify the key drivers of sales fluctuations and determine which products and markets are contributing most significantly to revenue growth or decline.
- Despite having a large customer base, the company lacks clarity on customer value segmentation and purchasing behavior. This makes it difficult to target marketing efforts and improve average revenue per customer.
- Inventory levels show imbalance with some products overstocked while others frequently run out. The company needs better demand forecasting and stock optimization to reduce holding costs and avoid stockouts.
- Although revenue is high, the company seeks to improve overall profitability by identifying low-margin products and managing order fulfillment efficiency. Understanding which products and customer segments drive the most profit is critical.
- Order processing shows delays and inconsistencies, with a small percentage of late deliveries and unresolved statuses. Enhancing order tracking, status resolution, and on-time performance is necessary to maintain customer satisfaction.
- Several customers have outstanding dues, impacting cash flow and financial stability. A system to monitor overdue payments and take proactive measures for recovery is required.

Tools Used

Microsoft Excel

Used for data storage, manipulation, and initial analysis. Excel served as the foundation for compiling and organizing the raw automobile sales, customer, inventory, and financial data.

Power Query

Power Query was used for data cleaning, transformation, and loading (ETL). It allowed for the automation of data import, filtering, merging, and reshaping operations.

Power Pivot

Power Pivot enabled the creation of data models and relationships between different datasets. It also supported the development of advanced calculated fields to power the dashboards.

DAX (Data Analysis Expressions)

DAX formulas were used to build calculated columns and complex measures for performance metrics, profitability analysis, customer segmentation, and order summaries within Power Pivot.

Project Process Brief

1. Data Collection & Preparation

Gathered raw datasets related to product sales, customer details, inventory status, and financial transactions. Cleaned and standardized data using Power Query, removing inconsistencies, duplicates, and formatting issues. Merged multiple data sources to create a unified and analysis-ready dataset.

2. Data Modeling

Built relationships between different data tables using Power Pivot to create a robust data model. Defined hierarchies, keys, and lookups for seamless navigation and accurate aggregations.

3. DAX Calculations

Developed complex DAX measures to calculate KPIs like:

- Total Revenue
- Profit Margin
- Average Order Value
- Inventory Turnover
- Customer Segmentation

Created calculated columns to enhance business intelligence and deeper insights.

4. Dashboard Development

Designed multiple dashboards in Excel using pivot tables, pivot charts, and slicers for interactivity. Key dashboards included:

- Sales Performance
- Customer Insights
- Inventory Management
- Order & Financial Tracking

5. Review & Optimization

Validated results and visualizations with expected business logic. Optimized data model for faster refresh and better performance. Ensured dashboards were user-friendly and visually consistent.

1. Sales Performance Dashboard Report

Overview:

This dashboard provides a holistic view of sales performance across different products, regions, timeframes, and offices.

Key Metrics:

- Total Revenue: ₹96,04,190.61
- Profit Margin: 39.84%
- Top Sales Region: USA (Highest sales region by color intensity)
- Top Office by Sales: Office with ₹30,83,761.58 (32%)
- Best Performing Month: November (₹1967.32k)

Insights:

- Top Product: 1992 Ferrari 360 Spider Red (₹276.84k)
- Sales by Region: Dominated by the USA followed by Europe and Australia.
- Monthly Sales Trend: Peak in November, likely due to holiday season or campaign.
- Quarterly Sales: Q4 is strongest with ₹3687.45k, indicating seasonal demand.

2. Customer Insights Dashboard Report

Overview:

This dashboard focuses on customer revenue segmentation, behavior, and performance.

Key Metrics:

- Total Revenue: ₹96,04,190.61
- Total Customers: 98
- High Value Customers: 82
- Avg. Revenue per Customer: ₹98,001.95

Insights:

- Top Customer by Revenue: EURO+ Shopping Channel (₹820,689.54)
- Top AOV Customer: zSUPER SCALE INC.
- Customer Segmentation:
- Very High: 32
- High: 50
- Low: 16
- Monthly Active Customers: Spiked in November (63 active), suggesting campaign or seasonal effect.

3. Inventory Management Dashboard Report

Overview:

This dashboard provides insights into inventory status, product lines, and stock levels.

Key Metrics:

- Inventory Value: ₹3,05,34,316.23
- Available Stock Units: 555,131
- Total Products: 110

Insights:

- Top Product Line by Stock: Classic Cars (39%)
- Products with Low Stock:
- The Mayflower (737 units)
- 2002 Yamaha YZR M1 (600 units)
- Products with High Stock:
- 2002 Suzuki XREO (9997 units)
- 1995 Honda Civic (9772 units)
- Balanced Inventory Needed: Consider reducing stock of high-volume products and restocking fast-selling items.

4. Order Management Dashboard Report

Overview:

This dashboard tracks the flow and status of customer orders including delivery efficiency, order volume, and product category trends.

Key Metrics:

- Total Orders: 326
- Average Order Value: ₹29,460.71
- Average Delivery Days: 3.76

Order Status:

- Shipped: 97%
- Resolved: 2%
- Cancelled: 1%

Delivery Timeliness:

- Before Time: 96%
- On Time: 2%
- Late: 1%
- In Progress: 1%

Insights:

- Monthly Orders Trend: Peak observed in November (~30 orders), indicating seasonal spikes.
- Order Status by Month:
  - Highest orders were shipped in November and October.
  - Minimal cancellations and resolutions—reflecting strong process control.
- Product Line Orders:
  - Top Ordered: Classic Cars
  - Other Popular Lines: Vintage Cars, Motorcycles
  - Least Ordered: Trains

5. Profitability and Financials Dashboard Report

Overview:

This report presents financial health, cost structure, and profitability of products and product lines.

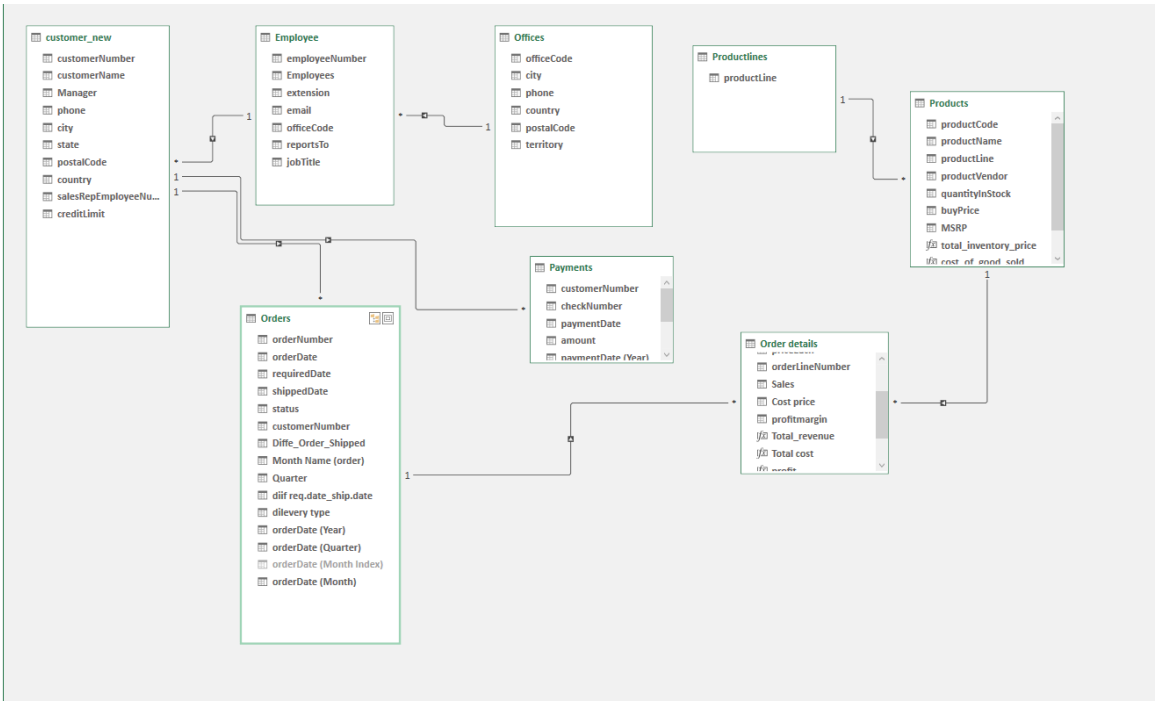
Key Metrics:

- Total Orders: 326
- Total Revenue: ₹96,04,190.61
- Total Cost: ₹57,78,310.36
- Profit: ₹38,25,880.25
- Profit Margin: 39.84%

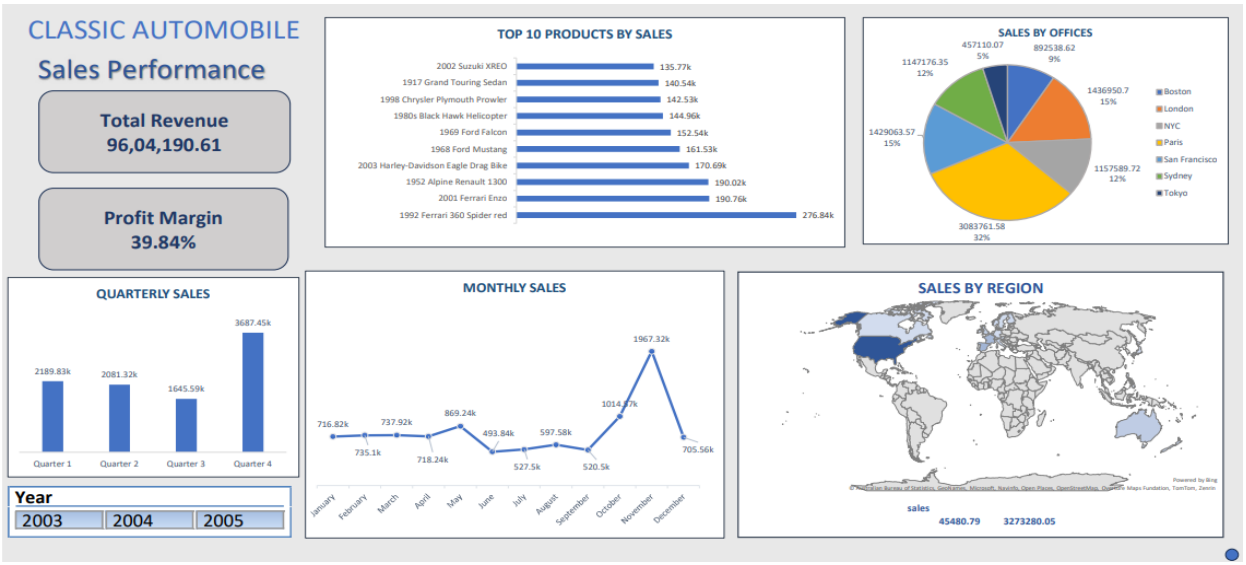
Insights:

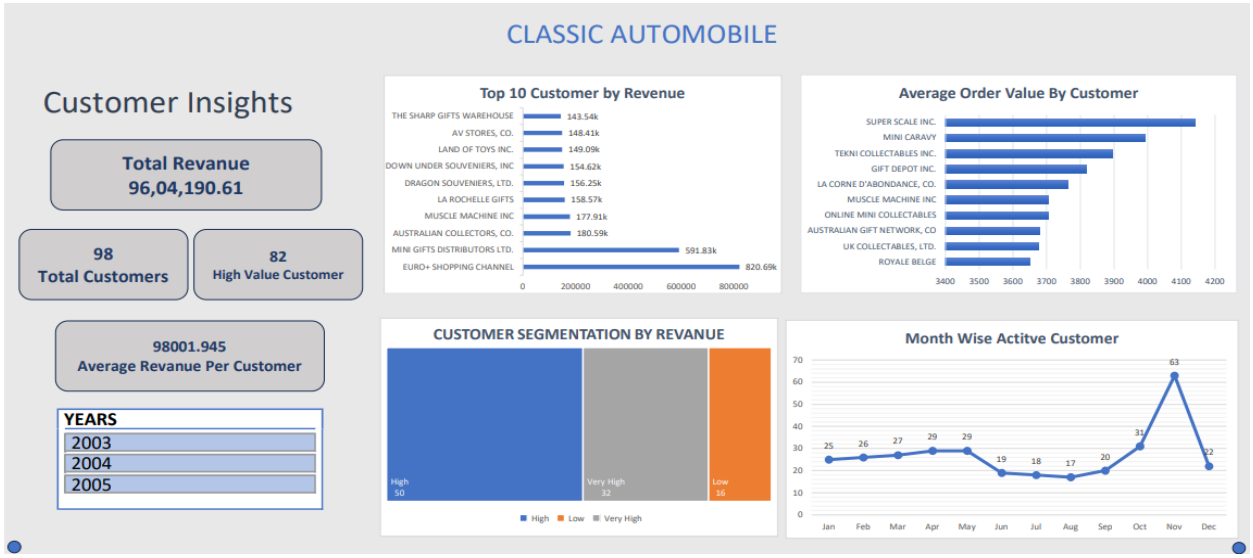
- Most Profitable Product: Ferrari 360 Spider Red (₹13,59,996.78)
- Top Profit by Product Line: Classic Cars (₹38,53,922.49)
- Overdue Payments:
    - Highest: EURO+ Shopping Channel (₹1,04,950.56)
    - Several customers with overdue > ₹40,000 require follow-up.
- Cash Flow Trend: Strong upward trend in Q4, with sharp increase in November and December.

Data Model:


customer_new
customerNumber
customerName
Manager
phone
city
state
postalCode
country
salesRepEmployeeNu...
creditLimit
Employee
employeeNumber
Employees
extension
email
officeCode
reportsTo
jobTitle
Offices
officeCode
city
phone
country
postalCode
territory
Productlines
productLine
Products
productCode
productName
productLine
productVendor
quantityInStock
buyPrice
MSRP
total_inventory_price
Payments
customerNumber
checkNumber
paymentDate
amount
Orders
orderNumber
orderDate
requiredDate
shippedDate
status
customerNumber
Diffe_Order_Shipped
Month Name (order)
Quarter
diif req.date_ship.date
dilevery type
orderDate (Year)
orderDate (Quarter)
orderDate (Month Index)
orderDate (Month)
Order details
orderLineNumber
Sales
Cost price
profitmargin
Total_revenue
Total cost

DASHBOARDS:

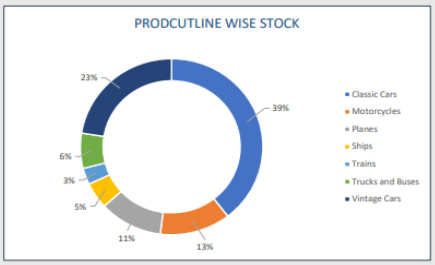

CLASSIC AUTOMOBILE
Sales Performance
Total Revenue
96,04,190.61
Profit Margin
39.84%
TOP 10 PRODUCTS BY SALES
2002 Suzuki XREO 135.77k
1917 Grand Touring Sedan 140.54k
1998 Chrysler Plymouth Prowler 142.53k
1980s Black Hawk Helicopter 144.96k
1969 Ford Falcon 152.54k
1968 Ford Mustang 161.53k
2003 Harley-Davidson Eagle Drag Bike 170.69k
1952 Alpine Renault 1300 190.02k
2001 Ferrari Enzo 190.76k
1992 Ferrari 360 Spider red 276.84k
SALES BY OFFICES
457110.07 5%
892538.62 9%
1147176.35 12%
1436950.7 15%
1429063.57 15%
1157589.72 12%
3083761.58 32%
Boston
London
NYC
Paris
San Francisco
Sydney
Tokyo
QUARTERLY SALES
2189.83k
2081.32k
1645.59k
3687.45k
Quarter 1
Quarter 2
Quarter 3
Quarter 4
MONTHLY SALES
716.82k
735.1k
737.92k
718.24k
869.24k
493.84k
527.5k
597.58k
520.5k
1014.77k
1967.32k
705.56k
January
February
March
April
May
June
July
August
September
October
November
December
SALES BY REGION
sales
45480.79
3273280.05
Year
2003
2004
2005

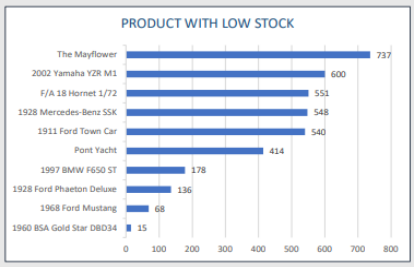

CLASSIC AUTOMOBILE
Customer Insights
Total Revanue
96,04,190.61
98
Total Customers
82
High Value Customer
98001.945
Average Revanue Per Customer
YEARS
2003
2004
2005
Top 10 Customer by Revenue
THE SHARP GIFTS WAREHOUSE 143.54k
AV STORES, CO. 148.41k
LAND OF TOYS INC. 149.09k
DOWN UNDER SOUVENIERS, INC 154.62k
DRAGON SOUVENIERS, LTD. 156.25k
LA ROCHELLE GIFTS 158.57k
MUSCLE MACHINE INC 177.91k
AUSTRALIAN COLLECTORS, CO. 180.59k
MINI GIFTS DISTRIBUTORS LTD. 591.83k
EURO+ SHOPPING CHANNEL 820.69k
0
200000
400000
600000
800000
Average Order Value By Customer
SUPER SCALE INC.
MINI CARAVY
TEKNI COLLECTABLES INC.
GIFT DEPOT INC.
LA CORNE D'ABONDANCE, CO.
MUSCLE MACHINE INC
ONLINE MINI COLLECTABLES
AUSTRALIAN GIFT NETWORK, CO
UK COLLECTABLES, LTD.
ROYALE BELGE
3400
3500
3600
3700
3800
3900
4000
4100
4200
CUSTOMER SEGMENTATION BY REVANUE
High
50
Very High
32
Low
16
High
Low
Very High
Month Wise Actitve Customer
25
26
27
29
29
19
18
17
20
31
63
22
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

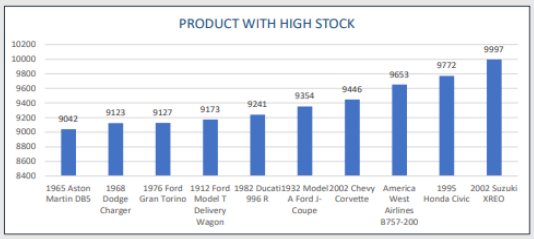
CLASSIC AUTOMOBILE

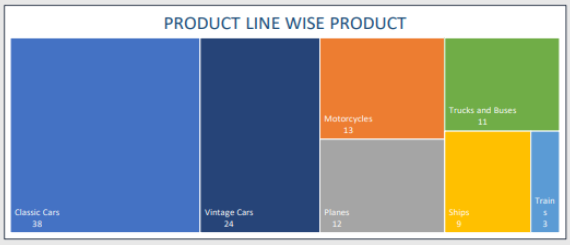
Invantory Managment

INVENTORY VALUE
30534316.23
AVAILABLE STOCK
555131
TOTAL PRODUCTS
110





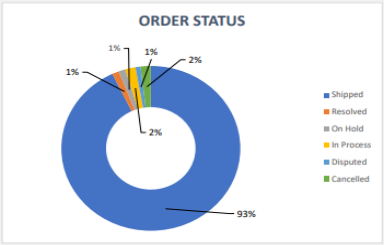


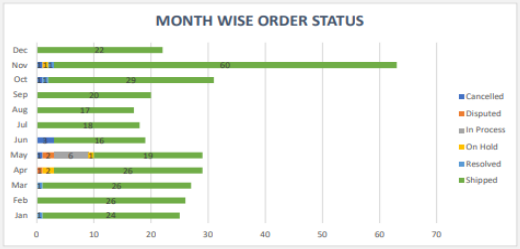


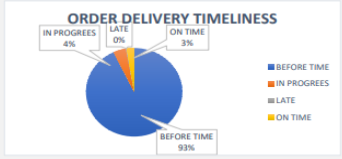
CLASSIC AUTOMOBILE

Order Managment

TOTALORDERS
326
Average Order Value
29460.71
AVERAGE DELIVERY DAYS
3.76



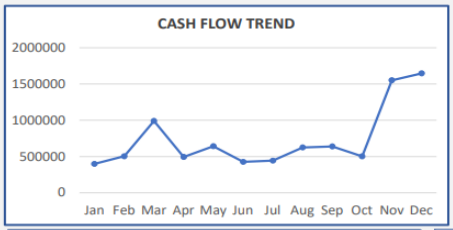


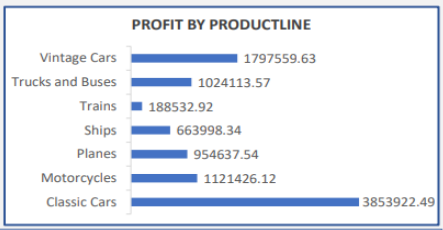


orderDate (Year)		
2003	2004	2005

CLASSIC AUTOMOBILE

TOTAL ORDERS	TOTAL REVANUE	TOTAL COST	PROFIT	PROFIT MARGIN
326	96,04,190.61	57,78,310.36	38,25,880.25	39.84%



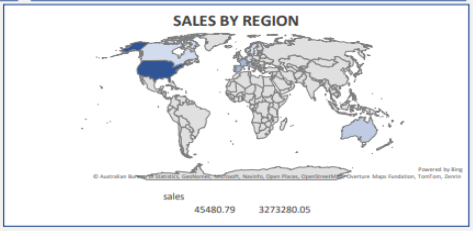


OVERDUE PAYMENT

CUSTOMER	DUE AMOUNT
EURO+ SHOPPING CHANNEL	104950.56
THE SHARP GIFTS WAREHOUSE	83984.89
SALZBURG COLLECTABLES	52420.07
GIFTS4ALLAGES.COM	50806.85
UK COLLECTABLES, LTD.	45443.54
SCANDINAVIAN GIFT IDEAS	44167.09
TEKNI COLLECTABLES INC.	43525.04
SOUVENIERS AND THINGS CO.	42251.51
LA ROCHELLE GIFTS	41623.44
LAND OF TOYS INC.	41445.21
GIFTSFORHIM.COM	37769.38
L'ORDINE SOUVENIERS	35362.26
EXTREME DESK DECORATIONS, LTD	23627.44
VOLVO MODEL REPLICAS, CO	23014.17
KELLY'S GIFT SHOP	22963.6
DANISH WHOLESALE IMPORTS	21638.62
AUSTRALIAN COLLECTABLES, LTD	10945.26
PETIT AUTO	8597.73
MINI GIFTS DISTRIBUTORS LTD.	7639.1
DIECAST CLASSICS INC.	5849.44
HANDJI GIFTS& CO	2326.18

TOP 5 PROFITABLE PRODUCT

PRODUCT	UNIT SOLD	REVANUE	PROFIT
1952 Alpine Renault 1300	961	190017.96	95282.58
1968 Ford Mustang	933	161531.48	72579.26
1992 Ferrari 360 Spider red	1808	276839.98	135996.78
2001 Ferrari Enzo	1019	190755.86	93349.65
2003 Harley-Davidson Eagle Drag Bike	985	170686	81031.3



payment (Year)		
2003	2004	2005

YEARS		
2003	2004	2005

Project Outcome:

The completion of the Classic Automobile Business Dashboard project delivered significant insights and operational improvements across multiple business functions. The outcomes are summarized below:

1. Improved Sales Visibility

Enabled the identification of high-performing products, regions, and time periods. Provided a clear view of monthly, quarterly, and yearly sales trends for better forecasting.

2. Enhanced Customer Understanding

Segmented customers by revenue contribution and order patterns. Highlighted high-value customers and their behavior to support targeted marketing strategies.

3. Optimized Inventory Management

Identified overstocked and understocked products for better inventory control. Improved stock rotation and demand planning through real-time stock analytics.

4. Profitability Insights

Highlighted the most and least profitable products and categories. Supported margin improvement efforts by correlating product performance with cost metrics.

5. Efficient Order & Delivery Monitoring

Monitored order lifecycle and flagged delays, cancellations, or disputes. Improved customer satisfaction with timely insights into order and delivery performance.

6. Stronger Financial Control

Tracked overdue payments and customer dues, aiding in better cash flow management. Enabled proactive follow-ups with clients to recover pending payments.

Problems Faced:

1. **Data Inconsistencies Across Sources**
   Several datasets contained inconsistencies such as missing values, different formats, and duplicate entries. Cleaning and standardizing data was time-consuming.

2. **Complex Data Relationships**
   Building proper relationships between multiple tables in Power Pivot was challenging initially, especially when keys were missing or poorly defined.

3. **Performance Issues with Large Data Models**
   Handling large datasets and applying multiple DAX calculations led to performance lags and slow refresh times in Excel.

4. **Difficulty in Writing Advanced DAX Measures**
   Complex KPIs required advanced DAX knowledge. Understanding context transitions, filter behavior, and time intelligence functions was difficult at first.

5. **Limited Visualization Options in Excel**
   Excel dashboards have limitations in terms of advanced interactivity and aesthetics compared to tools like Power BI.

Key Learnings:

1. **Mastery of Data Cleaning with Power Query**
   Gained strong proficiency in transforming and merging datasets using Power Query's GUI and M language.

2. **Understanding Data Modeling Principles**
   Learned the importance of clean relational data models and proper key identification for accurate data analysis.

3. **Efficiency with DAX**
   Improved skill in writing DAX expressions for time-based analysis, ranking, segmentation, and dynamic metrics.

4. **Dashboard Design Thinking**
   Understood how to build user-friendly dashboards that are both insightful and performance-optimized using Excel tools.

5. **Real-World Business Insight Development**
   Developed the ability to turn raw data into meaningful business insights for sales, inventory, and financial decisions.