MAVEN MARKET

Problem Statement

In today's data-driven environment, businesses rely on actionable insights to make informed decisions. However, this particular organization was facing multiple data visibility and analysis challenges:

- Sales data was fragmented across different years, regions, and store types, making it difficult to identify trends.
- There was no proper segmentation of customers based on gender, occupation, education, or loyalty card status.
- The company had limited insight into product attributes (e.g., low fat, recyclable) and their contribution to overall performance.
- Store-level analysis across different countries, states, and regions was manual and time-consuming.
- Managers lacked a real-time, consolidated view of business performance to guide strategic and operational decisions.

Tools Used

Below are the tools and technologies utilized throughout the project, each playing a specific role in building the dashboard:

- **Power BI Desktop**: The primary tool used for creating interactive dashboards and visual reports.
- **Power Query Editor**: Used for data cleaning, transformation, merging queries, and shaping raw datasets before loading them into the data model.
- **DAX (Data Analysis Expressions)**: Utilized to build custom calculated columns, measures, KPIs, and implement time-based logic such as running totals and year-over-year (YOY) growth analysis.

Project Brief

The objective of this project was to create a comprehensive **Power BI dashboard** that would help business users understand:

- How sales are performing across time, geography, and store types
- Who the customers are and what segments are most valuable
- Which product types and brands are driving performance
- Where there are opportunities for operational efficiency and marketing targeting

Scope of Work:

- Import and clean raw datasets
- Build a data model with appropriate relationships
- Create calculated measures using DAX
- Develop multiple dashboard views focused on:
    - Sales overview
    - Customer analysis
    - Product analysis
    - Regional/store performance
    - Trend analysis over time

Customer & Demographic Analysis

- Total Customers: **10,281**
- Gender Breakdown: Female – **5,097**, Male – **5,184**
- Occupation Distribution:
    - **Professional**: 3,382 customers
    - **Skilled Manual**: 2,650
    - **Manual**: 2,583
    - **Management**: 1,461
    - **Clerical**: 205
- Education Distribution:
    - Majority had **Partial High School** or **High School Degrees**
- Membership Cards:
    - **Bronze**: 6K (55%)
    - Others: Silver, Normal, Golden – smaller share

Sales Analysis

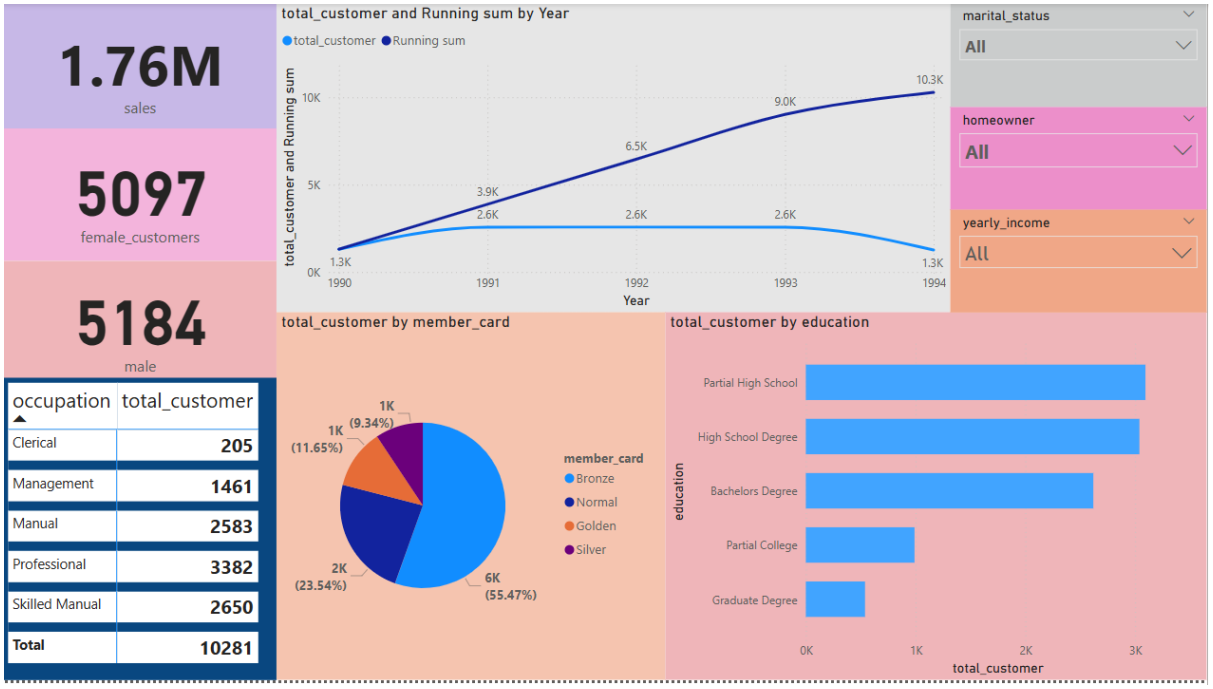
- **Total Sales**: ₹1.76M
- Sales by Year:
    - 1997: ₹0.57M
    - 1998: ₹1.20M (strong growth)
- Sales by Month:
    - Peak: **December** (₹177K)
    - Lowest: **April** (₹138K)
- Sales by Region:
    - Top: **North West** (₹0.85M)
    - Lowest: **Central West** (₹0.01M)
- Sales by Country:
    - **United States**: ₹1.18M (66%)
    - **Mexico**: ₹0.48M (27%)
    - **Canada**: ₹0.11M (6%)

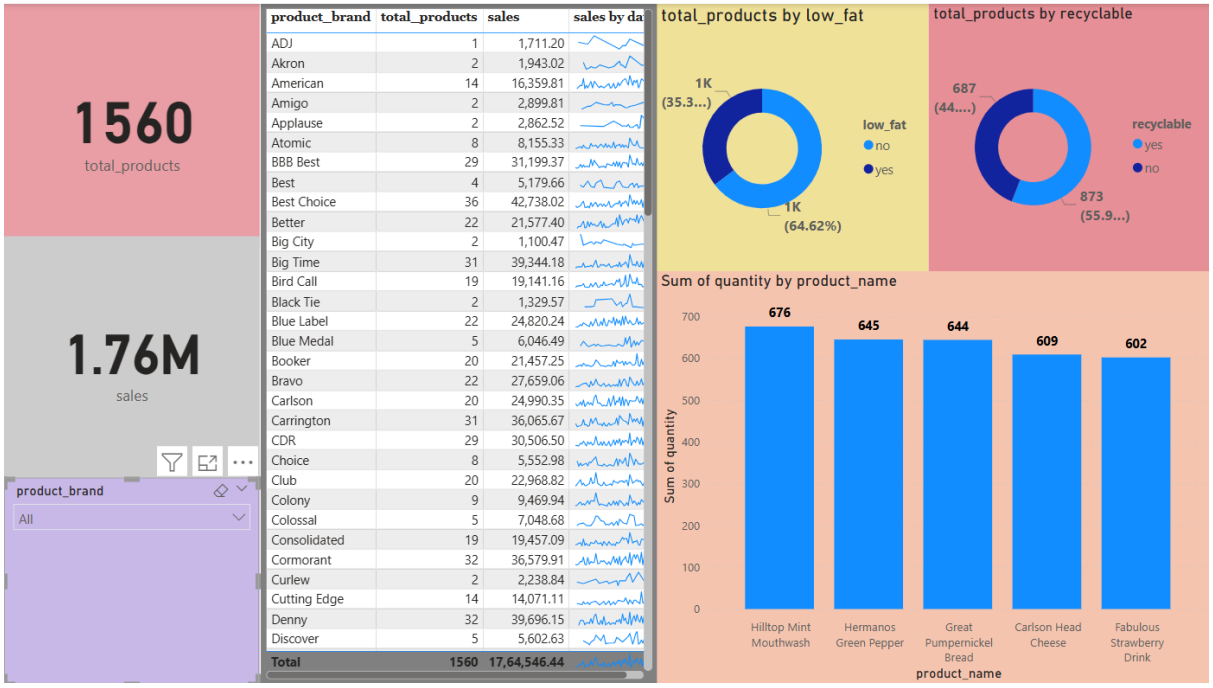
Product Performance Analysis

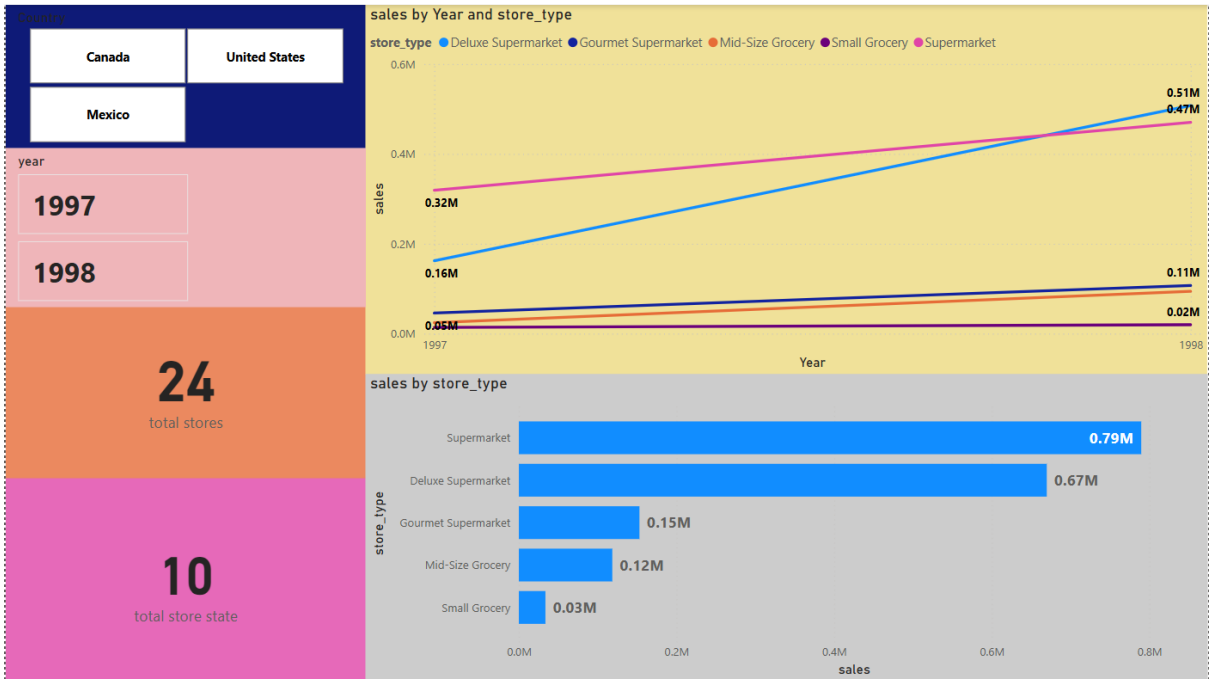
- Total Products: **1,560**
- Low Fat Products: **64.6%**
- Recyclable Products: **55.9%**
- Top Products by Quantity:
    - Hilltop Mint Mouthwash (676 units)
    - Hermano's Green Pepper (645 units)
    - Great Pumpernickel Bread (644 units)
- Sales by Brand:
    - Leading brands include **Blue Medal**, **Carrington**, **Bravo**, and **Best**

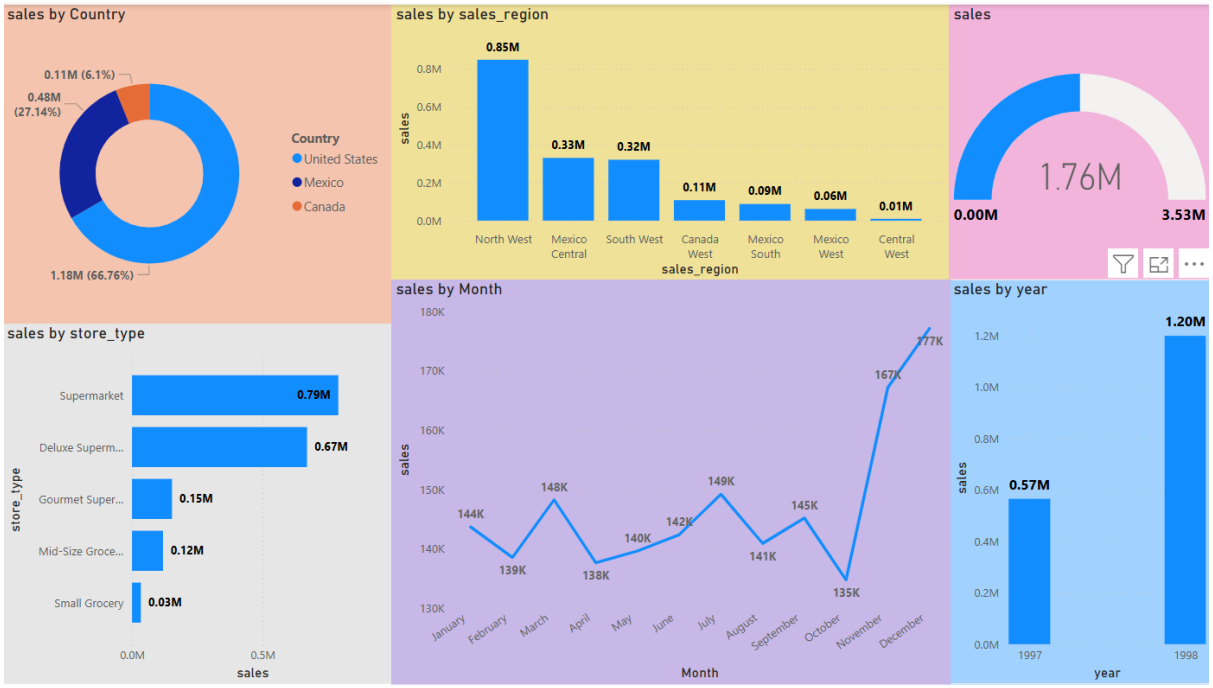
Store Performance

- **Total Stores: 24 across 10 states**
- **Store Types:**
    - **Supermarket: ₹0.79M**
    - **Deluxe Supermarket: ₹0.67M**
    - **Others: Gourmet Supermarket, Mid-Size Grocery, Small Grocery**


1.76M
sales
5097
female_customers
5184
male
occupation
total_customer
Clerical 205
Management 1461
Manual 2583
Professional 3382
Skilled Manual 2650
Total 10281
total_customer and Running sum by Year
total_customer
Running sum
total_customer and Running sum
Year
marital_status
All
homeowner
All
yearly_income
All
total_customer by member_card
member_card
Bronze
Normal
Golden
Silver
1K (9.34%)
1K (11.65%)
2K (23.54%)
6K (55.47%)
total_customer by education
Partial High School
High School Degree
Bachelors Degree
Partial College
Graduate Degree
education
total_customer


1560
total_products
1.76M
sales
product_brand
All
product_brand
total_products
sales
sales by da
ADJ 1 1,711.20
Akron 2 1,943.02
American 14 16,359.81
Amigo 2 2,899.81
Applause 2 2,862.52
Atomic 8 8,155.33
BBB Best 29 31,199.37
Best 4 5,179.66
Best Choice 36 42,738.02
Better 22 21,577.40
Big City 2 1,100.47
Big Time 31 39,344.18
Bird Call 19 19,141.16
Black Tie 2 1,329.57
Blue Label 22 24,820.24
Blue Medal 5 6,046.49
Booker 20 21,457.25
Bravo 22 27,659.06
Carlson 20 24,990.35
Carrington 31 36,065.67
CDR 29 30,506.50
Choice 8 5,552.98
Club 20 22,968.82
Colony 9 9,469.94
Colossal 5 7,048.68
Consolidated 19 19,457.09
Cormorant 32 36,579.91
Curlew 2 2,238.84
Cutting Edge 14 14,071.11
Denny 32 39,696.15
Discover 5 5,602.63
Total 1560 17,64,546.44
total_products by low_fat
low_fat
no
yes
1K (35.3...)
1K (64.62%)
total_products by recyclable
recyclable
yes
no
687 (44....)
873 (55.9...)
Sum of quantity by product_name
Sum of quantity
676
645
644
609
602
Hilltop Mint Mouthwash
Hermanos Green Pepper
Great Pumpernickel Bread
Carlson Head Cheese
Fabulous Strawberry Drink
product_name


Country
Canada
United States
Mexico
year
1997
1998
24
total stores
10
total store state
sales by Year and store_type
store_type Deluxe Supermarket Gourmet Supermarket Mid-Size Grocery Small Grocery Supermarket
0.6M
0.4M
0.2M
0.0M
sales
0.51M
0.47M
0.32M
0.16M
0.11M
0.02M
0.05M
1997
1998
Year
sales by store_type
Supermarket
Deluxe Supermarket
Gourmet Supermarket
Mid-Size Grocery
Small Grocery
store_type
0.79M
0.67M
0.15M
0.12M
0.03M
0.0M
0.2M
0.4M
0.6M
0.8M
sales


sales by Country
0.11M (6.1%)
0.48M (27.14%)
1.18M (66.76%)
Country
United States
Mexico
Canada
sales by sales_region
0.8M
0.6M
0.4M
0.2M
0.0M
sales
0.85M
0.33M
0.32M
0.11M
0.09M
0.06M
0.01M
North West
Mexico Central
South West
Canada West
Mexico South
Mexico West
Central West
sales_region
sales
1.76M
0.00M
3.53M
sales by store_type
Supermarket
Deluxe Superm...
Gourmet Super...
Mid-Size Groce...
Small Grocery
store_type
0.79M
0.67M
0.15M
0.12M
0.03M
0.0M
0.5M
sales
sales by Month
180K
170K
160K
150K
140K
130K
sales
144K
139K
148K
138K
140K
142K
149K
141K
145K
135K
167K
177K
January
February
March
April
May
June
July
August
September
October
November
December
Month
sales by year
1.2M
1.0M
0.8M
0.6M
0.4M
0.2M
0.0M
sales
0.57M
1.20M
1997
1998
year

Problems Faced

Data Cleaning Issues

- Raw data had inconsistent values in categories like occupation, education, and product brand names.
- Extra spaces, duplicate values, and missing entries needed to be handled using Power Query.

Data Modelling Challenges

- Initial data lacked properly defined relationships.
- Star schema had to be manually structured to relate fact tables (sales, product, customer) with dimension tables.

Performance Bottlenecks

- Dashboard slowed down due to too many visuals and calculated measures.
- Optimization was done by minimizing visuals, disabling auto-date hierarchies, and using summarized tables.

Complex Business Logic

- DAX had to be used to calculate:
    - Running totals
    - Sales % change over time
    - Customer card share and filtering logic
    - Drill-through filters and dynamic visual behavior

Project Outcome

- Created a fully interactive and user-friendly dashboard.
- Delivered business visibility into key performance metrics across sales, product, region, and customer behaviour.
- Empowered decision-makers to:
    - Spot sales opportunities
    - Optimize product and inventory management
    - Plan region-specific marketing strategies
- Reduced reporting time from hours to seconds with real-time visual exploration.

Key Learnings

- **Power BI Expertise**: Strengthened skills in visual design, DAX functions, and model optimization.
- **Data Literacy**: Improved ability to clean, prepare, and model real-world business data.
- **Business Understanding**: Gained insights into how various departments (sales, marketing, operations) use data.
- **Storytelling with Data**: Learned how to translate complex datasets into clear, actionable visuals.
- **Problem Solving**: Developed critical thinking to troubleshoot relationships, filter logic, and performance issues.