MINI PROJECT

SUPERMARKET SALES ANALYSIS

1. Problem Statement:

- The supermarket chain aims to enhance its operational efficiency, customer satisfaction and profitability by analysing transactional data collected across multiple branches. The dataset includes detailed records of customer demographics, product purchases, pricing and sales performance.

2. Source Dataset Link:

https://www.kaggle.com/datasets/faresashraf1001/supermarket-sales (2024)

3. Features Description:

Feature	Description
Customer ID	Unique identifier for each customer
Customer Type	Classification of customer (Member/Normal)
Gender	Gender of the Customer (Male/Female)
Branch Location	Store branch where the transaction occurred
Product ID	Unique identifier for each product
Product Name	Category of the purchased product
Quantity	Number of units purchased
Unit Price	Price per unit of the product
Product Amount	Total cost before tax
Invoice ID	Unique identifier for transaction
Tax 5%	Tax applied to the product amount
Sales Amount	Final billed Amount
Profit Income	Profit earned from the transaction
Rating	Customer satisfaction rating
Date	Date of the transaction

Time	Time of the transaction
Profit Margin	Percentage of profit relative to sales
Payment	Mode of payment used (Cash, Credit card, E-Wallet)
Rating Range	Grouped rating categories
Time Range	Categorized time slot (Morning, Afternoon, Evening, Night)

4. Data Transformation and Cleaning:

Insights From Raw Data:

❖ Observation:

- Sales performance by branch, city, product name, or time.
- Customer behavior by type, gender, and payment method.
- Profitability using profit income and product amount.
- Satisfaction trends using rating (e.g., do certain branches or product name get better reviews).

❖ Possible Transformation Needed:

- Changed data types (e.g., currency, date, time, whole number).
- Use proper function (product name , payment method).
- Create calculated column for profit margin.
- Ensure keys were correctly linked for relationship (customer ID, product ID).
- Merge the branch and location column into single column.
- Replace value of payment method (Ewallet).

Steps Done in the Cleaning Process:

- **Standardizing Formats:** Adjusted column formats as per data type requirements.
- **Date Column Conversion**: The original Date column was stored as text. It was successfully converted into a proper Date data type using the Date(), Text(), Right(),

Left() ,Mid() ,Find() functions in Excel, enabling accurate time-based analysis monthly trends.

- **Rating Column Categorization**: The Rating column, which contains customer satisfaction scores out of 10, was transformed into rating ranges for easier interpretation. Ratings were grouped into categories such as:
    - Low (0 - 4.9)
    - Medium (5 - 7.9)
    - High (8 - 10).
- **Time Column Classification:** The Time column was categorized into time-of-day segments to identify peak shopping hours. The classification included:
    - Morning (06:00 - 11:59)
    - Afternoon (12:00 - 17:59)
    - Evening (18:00 - 21:59)
    - Night (22:00 - 05:59)
- **Branch and Location Merge:** A new column was created by merging the Branch and City fields to form a unified location identifier (e.g., Alex - Yangon). This merged field enhances geographic analysis by combining branch-level and city-level insights, allowing for clearer comparisons across regions in dashboards and reports.
- **Calculated Fields:**
    - Profit Margin: Profit income / Sales.
    - Discount 10% : Unit price / Quantity /(1-0.1).

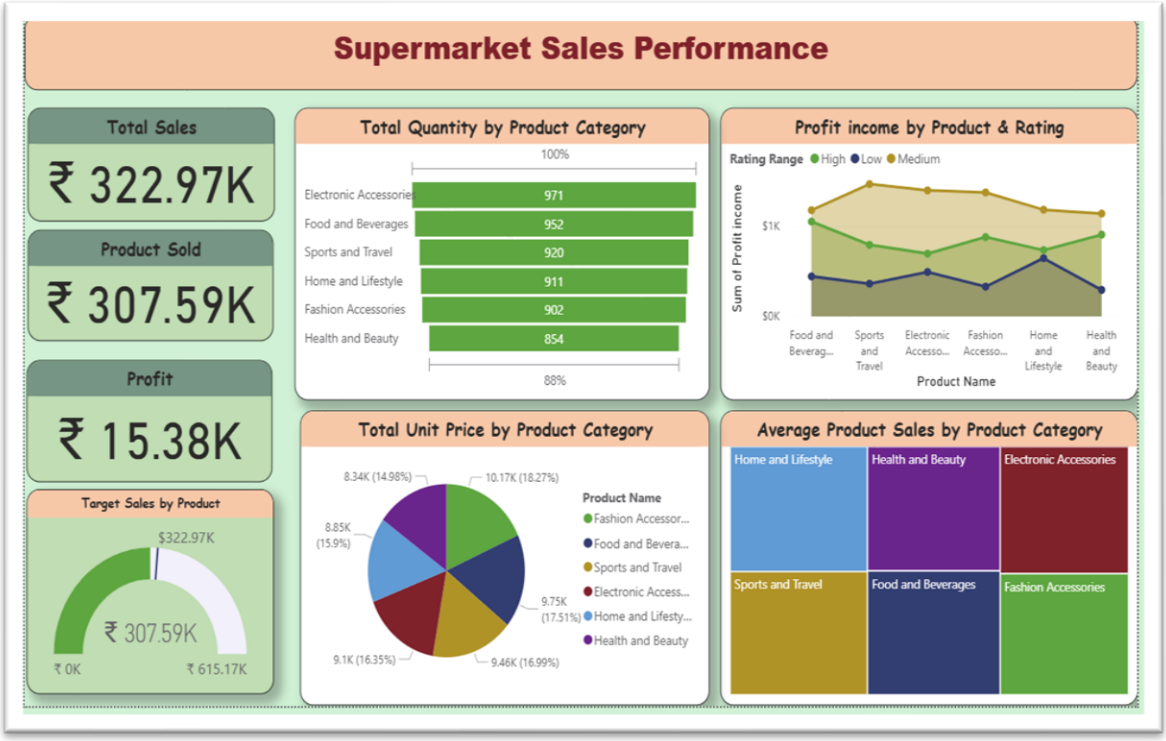
POWER BI REPORT

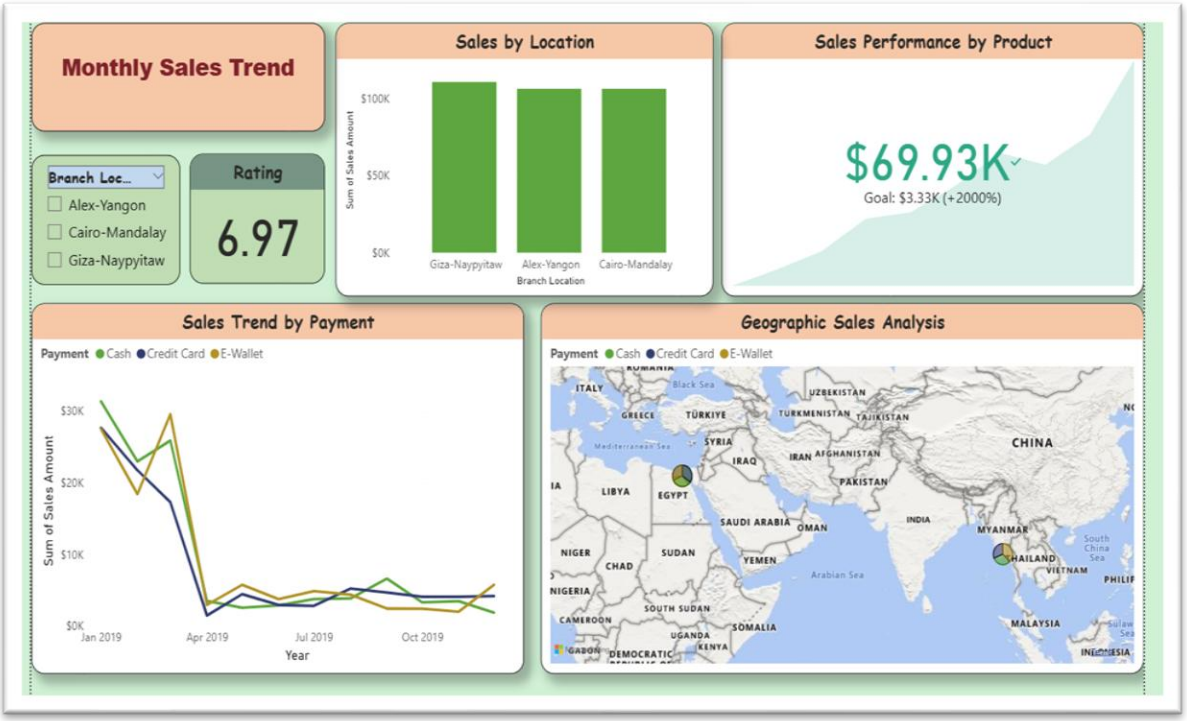
PURPOSE:

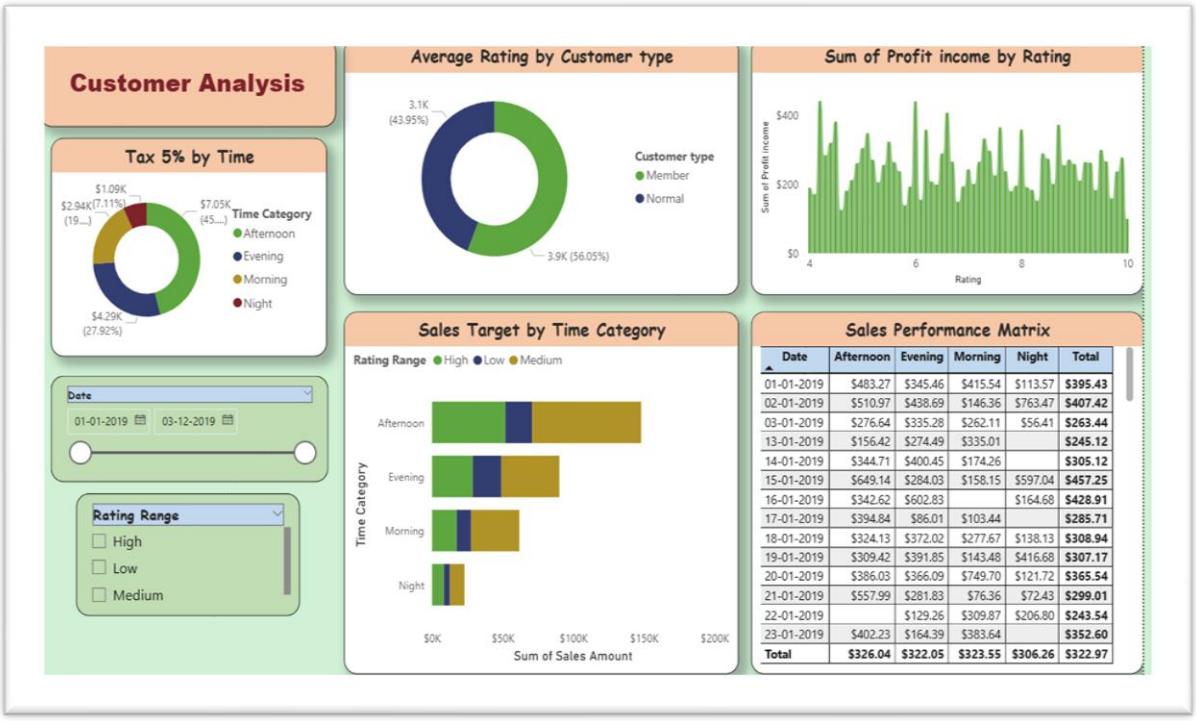
These transformations make your dataset cleaner, smarter, and more insightful so your dashboard can deliver actionable business intelligence. They support better decision-making in areas like:

- Sales strategy
- Customer engagement
- Operational efficiency
- Location performance
- Product optimization.

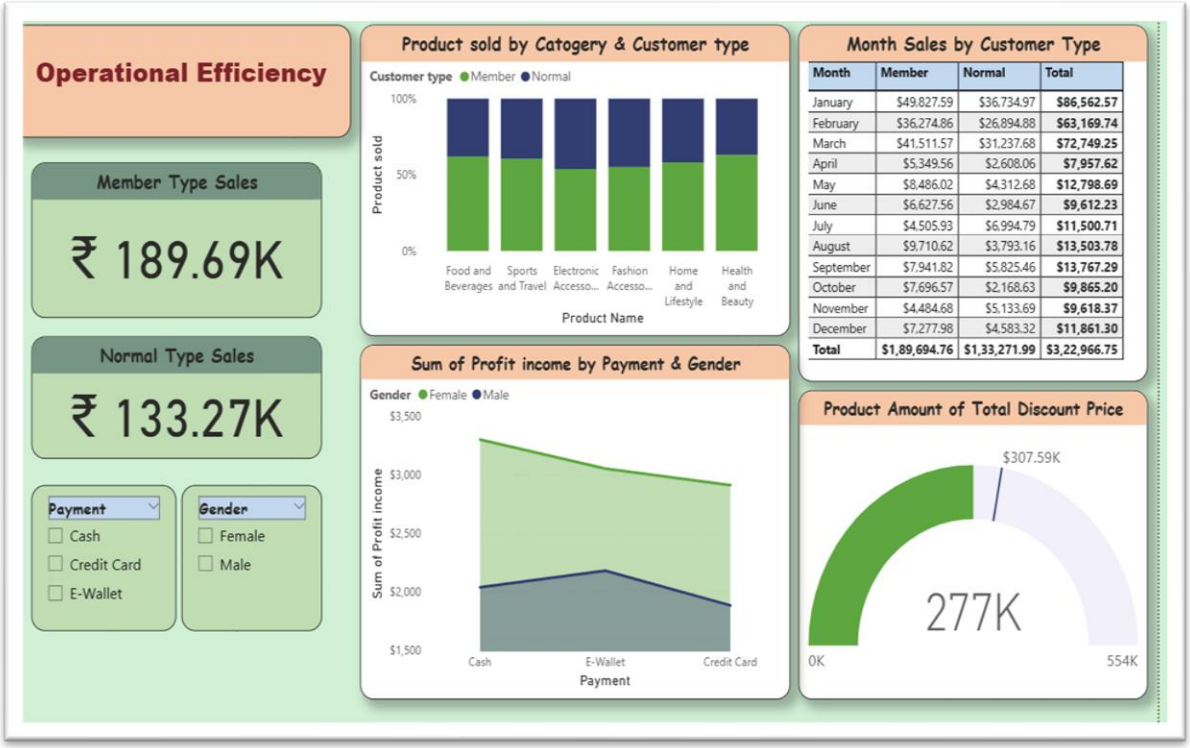
REPORT:







Date	Afternoon	Evening	Morning	Night	Total
01-01-2019	$483.27	$345.46	$415.54	$113.57	**$395.43**
02-01-2019	$510.97	$438.69	$146.36	$763.47	**$407.42**
03-01-2019	$276.64	$335.28	$262.11	$56.41	**$263.44**
13-01-2019	$156.42	$274.49	$335.01		**$245.12**
14-01-2019	$344.71	$400.45	$174.26		**$305.12**
15-01-2019	$649.14	$284.03	$158.15	$597.04	**$457.25**
16-01-2019	$342.62	$602.83		$164.68	**$428.91**
17-01-2019	$394.84	$86.01	$103.44		**$285.71**
18-01-2019	$324.13	$372.02	$277.67	$138.13	**$308.94**
19-01-2019	$309.42	$391.85	$143.48	$416.68	**$307.17**
20-01-2019	$386.03	$366.09	$749.70	$121.72	**$365.54**
21-01-2019	$557.99	$281.83	$76.36	$72.43	**$299.01**
22-01-2019		$129.26	$309.87	$206.80	**$243.54**
23-01-2019	$402.23	$164.39	$383.64		**$352.60**
Total	**$326.04**	**$322.05**	**$323.55**	**$306.26**	**$322.97**



INSIGHTS:

- **Customer Type vs Spending:** Compare average sales amount and profit between Members and Normal customers. Members might show higher loyalty or spend more frequently.
- **Gender Trends:** Analyze if purchasing patterns differ by gender e.g., product categories, payment modes, or time of visit.
- **Rating Range Analysis:** Group satisfaction levels (e.g., Low, Medium, High) to identify which segments are happiest and why.
- **Branch-Level Insights:** Compare product performance across branch location to identify regional preferences or inventory needs.
- **Date-Based Analysis:** Track trends over time daily, monthly to forecast demand or evaluate campaign impact.

- **Time- Based Analysis:** See if customer satisfaction varies by time of day maybe mornings are smoother than evenings.

- **Payment Mode Preferences:** Analyze payment to see which methods dominate great for optimizing checkout or offering incentives.

CONCLUSION:

- This transactional dataset provides a detailed snapshot of supermarket operations across multiple branches and cities. It captures customer demographics, product categories, financial metrics, and satisfaction ratings offering a rich foundation for business analysis.
- Understand customer behavior across Member vs Normal types, gender, and payment preferences.
- Evaluate product performance by analyzing sales, unit price, quantity, and profit income across different product names.
- Monitor financial health using metrics like product amount, profit margin percentage, and time.
- Identify operational trends by tracking sales across branches and location.
- Improve customer experience by correlating satisfaction ratings with product names, payment methods, and service timing.