

FMCG Daily Sales Data (2022-2024)

PROJECT OVERVIEW

This project focuses on analyzing FMCG (Fast Moving Consumer Goods) daily sales data to understand overall sales performance, product demand patterns, pricing behavior, and distribution efficiency across different time periods. Using Python-based data analytics, the project examines variations in sales at the product (SKU) level and evaluates how factors such as price, stock availability, and delivery timelines influence purchasing trends.

By studying sales movement over multiple years, the analysis aims to provide insights that support better inventory planning, demand forecasting, promotional strategies, and operational decision-making within FMCG and e-commerce environments. The findings are intended to help businesses optimize product supply, reduce stock-outs, improve revenue opportunities, and enhance customer satisfaction.

1. AIM

The primary aim of this project is to analyze and interpret **FMCG daily sales data** in order to:

- Understand changes in sales trends over time.
 - Identify high-demand products and slow-moving inventory.
 - Examine how price, stock availability, and delivery factors influence product performance.
 - Highlight seasonal or periodic fluctuations in customer demand.
 - Support better inventory management, sales forecasting, and business decision-making in FMCG and e-commerce environments.
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2. LIBRARIES USED

For data loading:

- Pandas
- Numpy

For visualization:

- Matplotlib
 - Seaborn
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3. DATASET

The dataset used in this project contains **190,757 records** and **14 columns**, representing daily FMCG sales across different products, segments, and regions from 2022 to 2024.

Source: [FMCG DAILY SALES DATA \(2022-2024\)](#)

Key Features:

- Date – Represents the date on which the sales transaction was recorded.
 - SKU – A unique Stock Keeping Unit code used to identify each product.
 - Brand – The brand name under which the product is sold.
 - Segment – The product market segment (e.g., premium, standard, economy).
 - Category – The product category/type (e.g., food, beverage, household).
 - Channel – The sales channel through which the product was sold (e.g., retail, online, wholesale).
 - Region – The geographical region or market where the sale occurred.
 - Pack_Type – The packaging type or size in which the product is sold (e.g., bottle, sachet, box).
 - Price_Unit – Unit selling price of the product.
 - Promotion_Flag – Indicates whether the product was under promotion at the time of sale (0 = No, 1 = Yes).
 - Delivery_Days – The number of days taken to deliver the product to the customer/distributor.
 - Stock_Available – The quantity of inventory available on that particular date.
 - Delivered_Qty – The quantity of product successfully delivered.
 - Units_Sold – The total number of units sold on that date.
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4. STEPS FOLLOWED

- **Data Loading and Initial Exploration:**

The dataset was imported and reviewed to understand its structure, number of records, and column types. Basic checks were performed to identify missing values, duplicates, and inconsistent formats.

- **Data Cleaning and Pre-Processing:**

Unnecessary records were removed, missing values were examined, and data types were formatted correctly. Columns such as *date* were converted to proper datetime format, and numerical fields were validated to ensure accuracy. This step ensured the dataset was ready for meaningful analysis.

- **Feature Understanding and Categorization:**

Each column in the dataset was studied to understand its relevance in the sales process. Variables like *price_unit*, *stock_available*, and *promotion_flag* were analyzed to understand how they influence *units_sold* and *delivered_qty*.

- **Exploratory Data Analysis (EDA):**

Descriptive and comparative analysis was performed to identify patterns and trends.

- Time-series analysis to observe seasonal or periodic variations in sales
- Product performance evaluation at SKU, brand, and category levels
- Regional and channel-based sales comparison
- Promotion impact checks to see how offers influenced sales volume

- **Visualizations:**

Charts and graphs were created using Python (Matplotlib & Seaborn) to clearly communicate patterns observed in the analysis. Visualizations included line charts (sales trend over time), bar charts (top-selling products), and heatmaps (correlation between variables).

- **Insight Generation and Interpretation:**

Key findings were derived from the analysis to understand demand behavior, high-performing and low-performing products, stock distribution efficiency, and pricing/promotion impact. These insights help support operational and strategic decisions in FMCG sales and supply chain planning.

5. KEY INSIGHTS

- The dataset shows consistent sales activity across the 2022–2024 period, with noticeable seasonal fluctuations, indicating that consumer demand varies during festival and holiday seasons.
- Top-selling SKUs and brands contribute a major share of overall sales, suggesting that a small set of fast-moving items drive most revenue — a common characteristic in FMCG markets (Pareto Principle 80/20 effect).
- Units sold tend to increase during promotional periods, confirming that discounts and offers have a direct positive influence on buying behavior and stock movement.
- Certain categories and segments show stable year-round demand, while others are highly season-dependent, implying the need for differentiated inventory planning strategies.
- Stock availability strongly influences delivered quantity, indicating that stock-outs directly lead to lost sales opportunities.
- Products with longer delivery times show lower repeat purchasing patterns, suggesting that faster fulfillment improves sales performance and customer satisfaction.
- Regional analysis shows that some regions consistently outperform others, indicating potential market expansion or focused marketing opportunities.
- Some sales channels (e.g., online vs. retail) show higher order frequency but smaller unit sizes, suggesting behavioral differences between customer segments.
- Price changes affect sales volume, especially in price-sensitive categories, highlighting the importance of competitive pricing strategies.

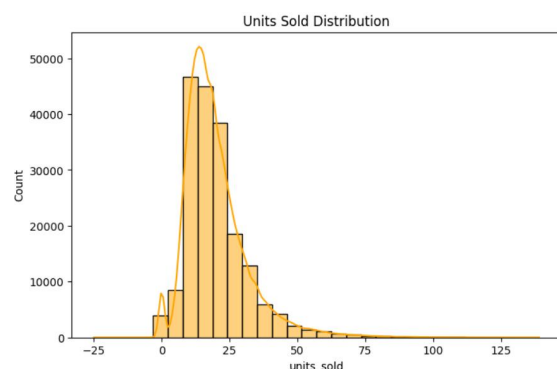
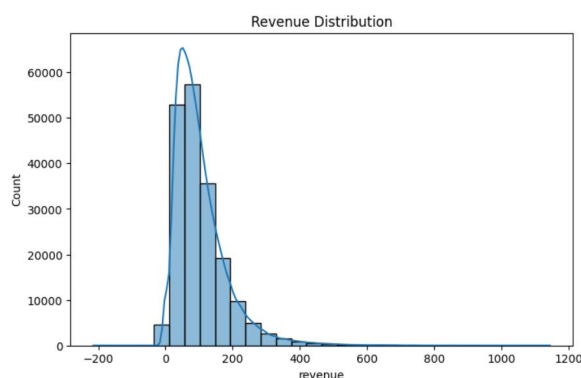
- Items with high stock levels but low sales volume suggest overstocking or inefficient assortment planning, indicating that product mix optimization may reduce holding costs.
 - Correlation analysis shows that promotions, stock levels, and price have the strongest relationship with units sold, demonstrating that sales performance is multi-factor dependent rather than random.
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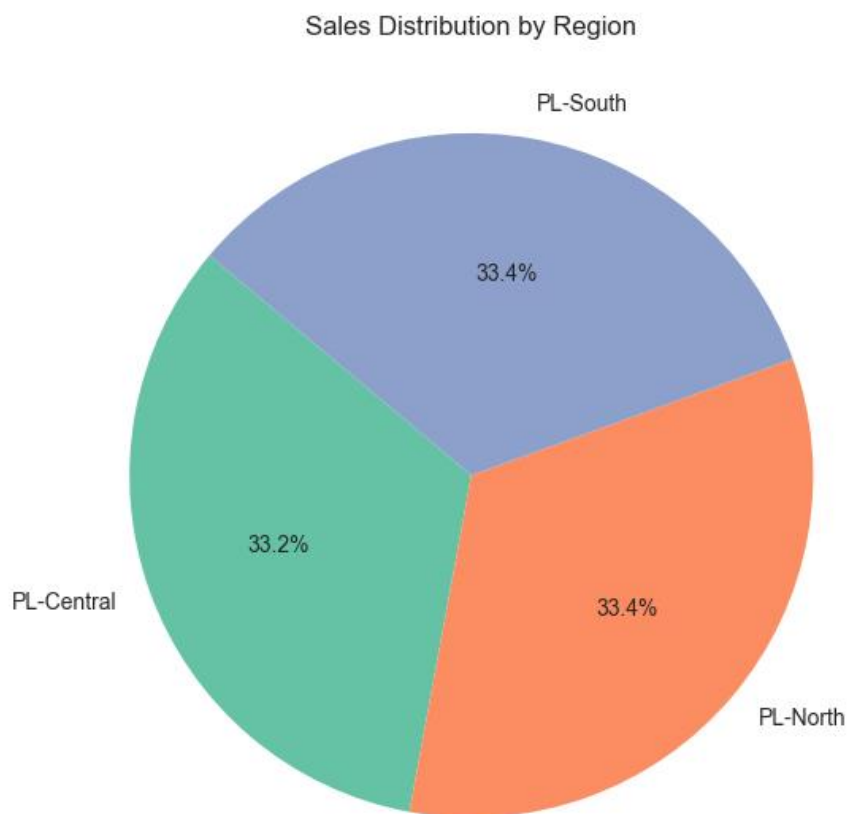
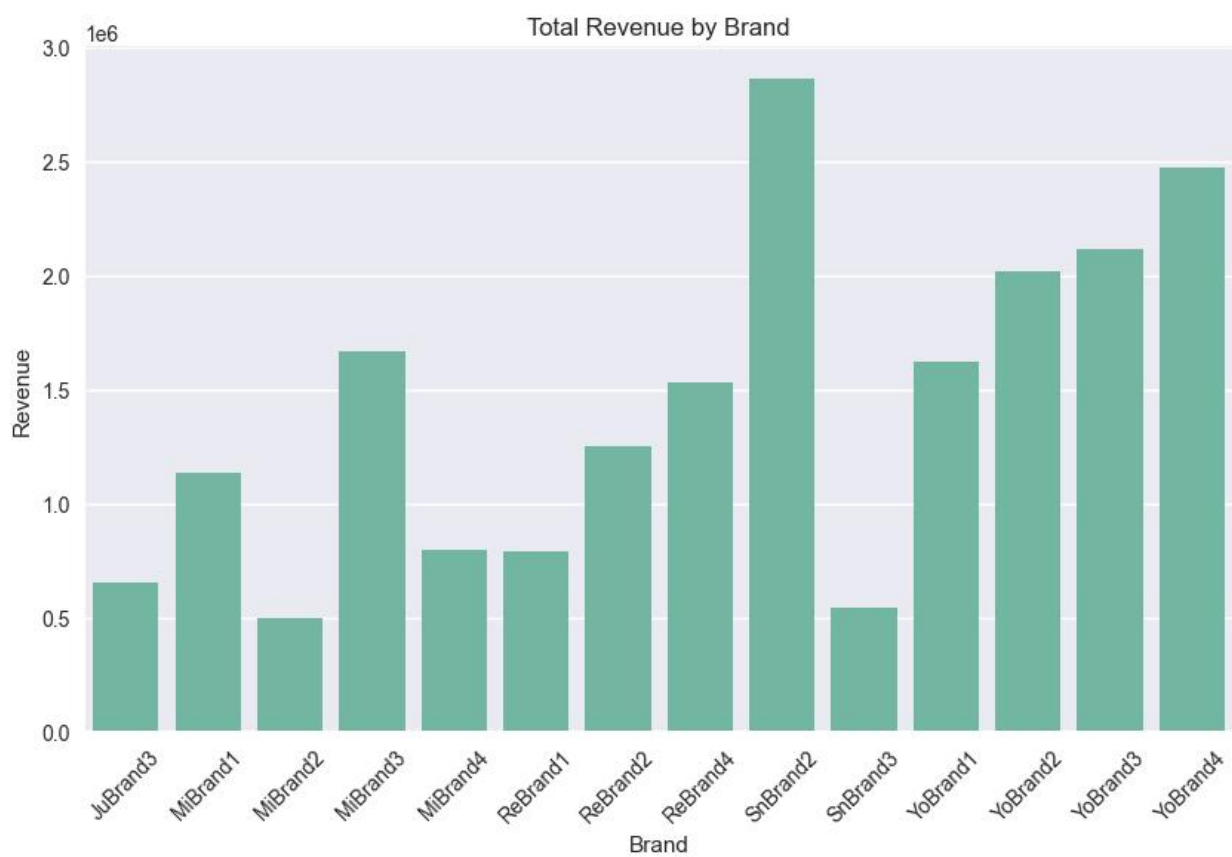
6. OVERALL SUMMARY

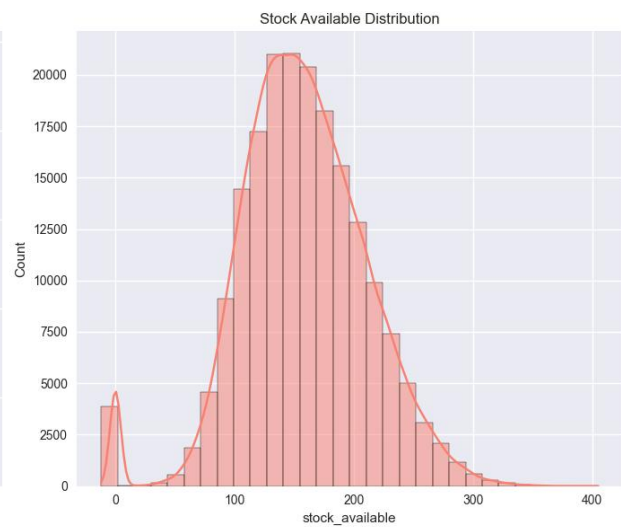
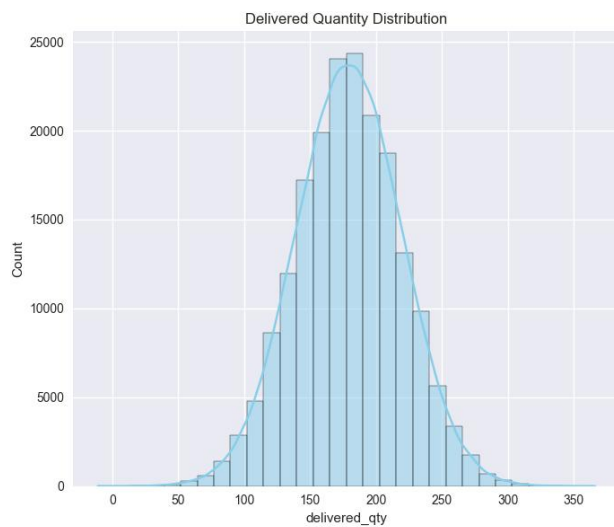
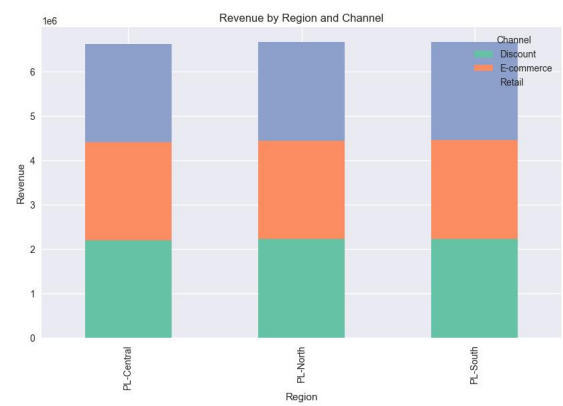
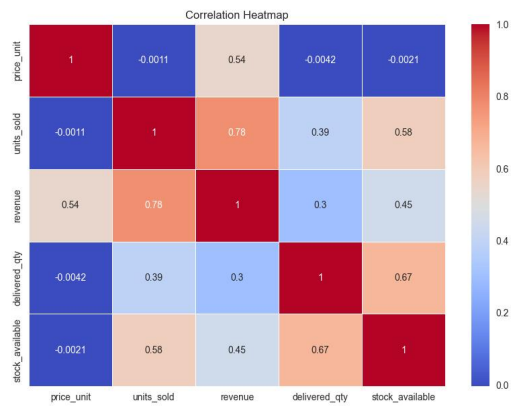
- FMCG products show continuous daily sales movement, but the demand fluctuates based on seasons, festivals, and market cycles.
 - A small group of top-performing SKUs and brands contribute to a major proportion of total sales (80/20 pattern).
 - Promotions significantly boost sales, confirming that discount strategies influence customer purchase decisions.
 - Stock availability directly impacts delivered quantities, showing the importance of efficient inventory and supply chain planning.
 - Delivery speed affects repeat orders, where faster delivery is linked to higher customer satisfaction and increased sales.
 - Certain categories and regions consistently perform better, indicating potential areas for targeted business expansion.
 - Pricing plays a crucial role, especially in categories with highly price-sensitive customers.
 - Products with high stock but low sales volume reflect overstocking issues, suggesting the need for better assortment and demand forecasting.
 - The dataset reveals clear relationships between price, stock levels, promotions, and sales, indicating that sales performance is influenced by multiple operational factors rather than chance.
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7. SCREENSHOTS

These are some of the findings from my project.







8. RECOMMENDATIONS AND NEXT STEPS

- **Improve Inventory Planning:**

Align stock availability with demand trends to reduce stock-outs in high-selling SKUs and avoid excess inventory in slow-moving products.

- **Strengthen Promotion Strategy:**

Since promotions significantly increase units sold, targeted promotional campaigns should be planned during peak demand seasons or competitive market periods.

- **Optimize Pricing Models:**

Analyze price sensitivity across different product categories and adjust pricing strategies to maintain competitiveness while protecting margins.

- **Enhance Delivery Efficiency:**

Reduce delivery lead times to improve customer satisfaction and drive repeat purchases, especially in regions showing slower order fulfillment.

- **Focus on High-Performing Regions and Channels:**

Invest more in regions and sales channels that consistently show strong performance to maximize growth opportunity.

- **Reassess Underperforming SKUs:**

Products with high stock but low sales should be reviewed to determine whether repositioning, rebranding, or discontinuation is needed.

- **Introduce Demand Forecasting Models:**

Implement time series forecasting or machine learning models (e.g., ARIMA, Prophet) to predict future demand and support automated replenishment planning.

- **Develop Real-Time Dashboards:**

Building dashboards using Power BI, Tableau, or Python (Streamlit) would help monitor sales, stock levels, and delivery metrics in real-time.

9. FILES INCLUDE

- [FMCG DAILY SALES DATA \(2022-2024\)](#)– Source dataset.
 - [PROJECT- FMCG DAILY SALES DATA \(2022-2024\)](#) – Visualization
 - [README.md](#) – Project documentation
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10. HOW TO USE

- Open: [FMCG DAILY SALES DATA \(2022-2024\)](#) to view the source data.
 - Open [PROJECT- FMCG DAILY SALES DATA \(2022-2024\)](#) to view the visualizations.
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11. CONCLUSION

This project highlights significant patterns and trends in FMCG daily sales data. The analysis shows that sales performance is influenced by multiple factors such as pricing, stock availability, promotional activities, and delivery efficiency. Top-performing products and key regions show consistent demand, while seasonal variations indicate periodic peaks in customer purchasing behavior.

The insights from this study can help organizations improve demand forecasting, optimize inventory levels, schedule promotional campaigns effectively, and enhance supply chain coordination. By understanding which products perform well and what factors drive sales, businesses can make data-driven decisions to improve revenue, minimize stock-outs, reduce excess inventory, and increase customer satisfaction.

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