Retail Performance & Sales Analytics

A Data-Driven Approach to Retail Analytics

Sector: Retail & Consumer Goods

Context & Problem Statement

Sector Context

The retail industry generates large volumes of transactional data across categories, items, discounts, and locations. Business decision-makers need actionable insights to monitor sales performance, optimize pricing strategies, and improve revenue growth.

Problem Statement

How can retail sales data be analyzed to identify revenue drivers, discount effectiveness, category performance, and seasonal trends to support data-driven business decisions?

Project Objective

To build an interactive retail analytics dashboard that helps stakeholders track revenue, customer purchasing behavior, discount impact, and product performance for strategic decision-making.

Key Deliverables:

- Interactive dashboard with real-time KPIs
- Category & product performance analysis
- Data-driven business recommendations

Data Engineering: Source to Sink

DATA SOURCE

Dataset: Retail Transactions
Records: 62,889 units sold
Period: 2022-2025
Format: Transactional CSV

DATA CLEANING

- Removed missing values
- Standardized formats
- Validated calculations
- Fixed data types
- No duplicates found

KEY COLUMNS

- Transaction ID
- Category & Item
- Price & Quantity
- Total Spent (₹)
- Discount Applied

Data Dictionary

Column	Type	Business Meaning
Transaction ID	Text	Unique transaction identifier
Category	Text	Product category
Price Per Unit	Currency (₹)	Unit selling price
Quantity	Number	Units purchased
Total Spent	Currency (₹)	Total bill value
Discount Applied	Boolean	Discount usage flag

DASHBOARD WALKTHROUGH

Yearly Revenue Comparison (Line Chart): Revenue is remarkably stable year-over-year, hovering between ₹465k and ₹499k from 2022 to 2024. 2024 was the strongest year on record (₹499,336), and looking closely at the data, revenue consistently peaks during December and January across all years.

Category Performance (Vertical Bar Chart): While sales are well-distributed, Butchers (₹197k) and Electric Household Essentials (₹192k) are the clear heavyweight categories. Conversely, staple categories like Milk Products and Patisserie sit at the bottom, suggesting customers come here more for higher-ticket items than daily groceries.

Discount Impact (Pie Chart): The business is not overly dependent on promotions. Roughly 66% of total revenue (₹979k) comes from full-price, non-discounted items, while discounted items make up the remaining 34% (₹493k). Customers are willing to pay full price.

Top 10 Products (Horizontal Bar Chart): The "Item 25" product line is the undisputed bestseller. Item_25_FUR is the top-grossing product overall (₹25,256), closely followed by Item_25_EHE and Item_25_BUT. Stocking these specific high-performing items is critical to maintaining revenue.
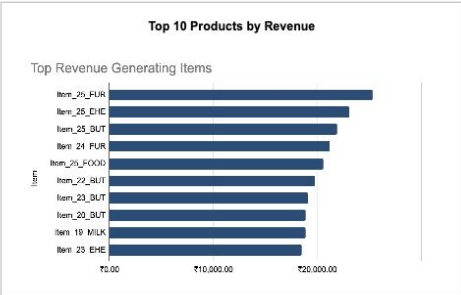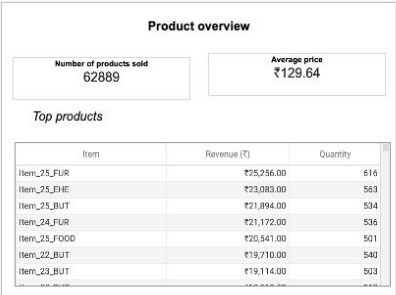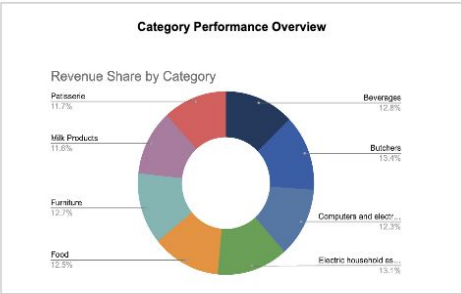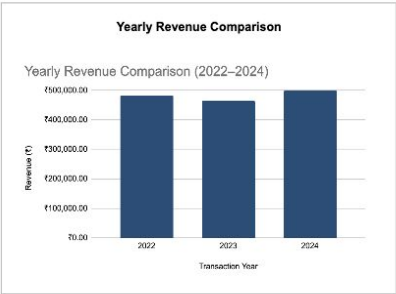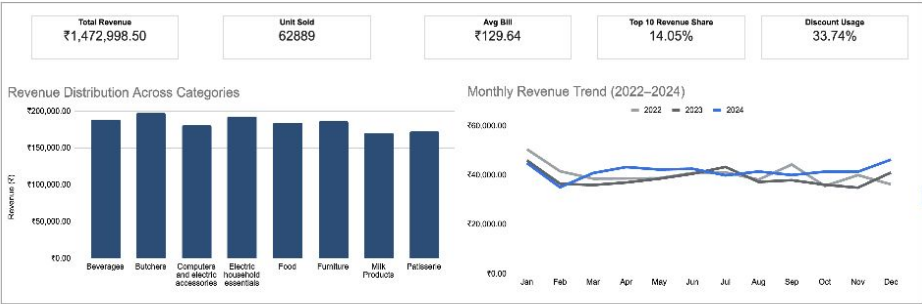
KPI & Metrics Framework

Total Revenue	Units Sold	Avg Bill Value	Discount Usage
₹1.47M	**62,889**	**₹129.64**	**33.7%**

Why these KPIs Matter

📊 Revenue measures overall business health and growth trajectory

🏆 Average Bill identifies upselling and cross-selling opportunities

✓ Discount Usage evaluates promotional ROI and margin protection

📊 Category Revenue pinpoints high-performing segments for focus

Key Insights from Exploratory Data Analysis

1 **Balanced Revenue Distribution**

Revenue is well distributed across categories, with Butchers and Electric Essentials leading at ~13% each

2 **Limited Discount Impact**

Discounts show minimal impact on average basket value (₹0.37 difference): with discount ₹129.89 vs without ₹129.52

3 **Growth Recovery in 2024**

Revenue declined in 2023 (₹465K) but recovered strongly in 2024 (₹499K), showing business resilience

4 **Top Items Drive Revenue**

Items like Item_25_FUR and Item_25_EHE are highest revenue-generating products with major sales contribution

5 **Monthly Consistency**

Sales remain stable across months with minor peaks during festive and year-end periods

6 **Moderate Discount Usage**

Only 33.7% of transactions used discounts, suggesting strong regular pricing strategy

Analysis & Business Understanding

Analysis Performed

✔ Comparative Year-over-Year Growth Analysis (2022–2024)

✔ Contribution Analysis (Category Share %)
✔ Revenue Concentration Analysis (Top Product %)
✔ Discount Impact Assessment
✔ Category Segmentation Analysis

Root Cause Understanding

- Discounts have minimal effect on average bill value
- Revenue growth driven by product demand, not promotions
- High-performing categories provide revenue stability

KEY BUSINESS UNDERSTANDING

The business does not heavily depend on discounts for revenue growth, indicating strong product demand and stable pricing power. This suggests an opportunity to optimize discount strategy while maintaining revenue, thereby improving profit margins.

Dashboard Walkthrough

Executive View - Key Metrics at a Glance

Total Revenue	Units Sold	Avg Bill	Discount Usage
₹1,472,998	**62,889**	**₹129.64**	**33.7%**

Operational View - Detailed Analytics

Category Revenue Chart — Bar chart identifying top-performing segments

Monthly Trend Analysis — Line chart tracking seasonality and growth patterns

Top Items Ranking — Horizontal bar showing best-selling products

Discount Impact View — Comparison evaluating promotional effectiveness

Year Filter (Slicer) — Dynamic multi-dimensional filtering across Year, Category, and Discount — fully connected elements

Strategic Recommendations

1 **Optimize Discount Strategy**
Focus on targeted promotions instead of blanket discounting to protect profit margins

Savings — pending margin validation

2 **Focus on High-Revenue Categories**
Increase inventory and marketing for Butchers and Electric Essentials categories

Uplift-needs ROI data

3 **Product-Level Optimization**
Promote top-performing items through bundling and strategic upselling

Better basket via cross-sell

4 **Seasonal Sales Planning**
Leverage peak months with strategic campaigns and inventory planning

Stock Optimization

5 **Data-Driven Pricing**
Implement dynamic pricing for high-demand products using historical data

Directional - Cost Pending

Strategic Value Delivered

Business Impact

✓ Improved decision-making using real-time KPIs
✓ Better inventory planning through insights
✓ Optimized discount strategy for margins
✓ Identification of top revenue drivers
✓ Data-driven strategic planning capability

Estimated Directional Value

Revenue Increase
8-15%   *Through category focus*

Cost Optimization
5-10%   *Reduced discounting*

Monitoring Speed
60%   *Faster monitoring*

Why Stakeholders Should Approve This Project

This dashboard transforms raw transactional data into actionable business intelligence, enabling both strategic and operational retail decisions. It provides immediate visibility into performance drivers, identifies optimization opportunities worth ₹191K-₹368K annually, and establishes a scalable analytics foundation for future growth.

Limitations & Future Roadmap

⚠ Current Limitations

- No explicit profit column
- Limited customer demographics
- Partial 2025 data available
- Assumes consistent pricing

→ Future Enhancements

→ Profit & Margin Analysis

→ Customer Segmentation (RFM)

→ Sales Forecasting Models

→ Location-wise Performance

→ Predictive Analytics & ML

Project Strength Summary

This project demonstrates end-to-end data analytics capabilities: from data cleaning and validation, through KPI framework development and exploratory analysis, to interactive dashboard creation — all aligned with real-world retail decision-making needs. It showcases technical proficiency, business acumen, and the ability to translate data into actionable insights.

THANK YOU

Questions & Discussion

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