Driving Growth & Customer Loyalty: A Data-Driven Strategy for OmniMart

Executive Briefing & Strategic Recommendations

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Executive Summary: At a Glance

Objective:
To uncover actionable business insights from OmniAction's retail dataset using a structured exploratory data analysis approach.

Dataset Overview:

1. Transaction-level retail data including product, customer, quantity, price, and date fields

2. Covers multiple product categories and customer segments

3. Enables analysis of revenue, satisfaction, and behavioral trends

Analytical Approach:

- Data Cleaning & Quality Assessment
- Descriptive Intelligence Gathering
- Advanced Pattern Recognition
- Statistical Deep Dive
- Strategic Recommendation Synthesis

Agenda: Our Analytical Journey

To showcase the systematic, multi-phase strategy used to extract meaningful insights from OmniAction's retail dataset.

Data Foundation & Quality Assessment

Objective: Ensure data reliability and completeness
Key Activities:
- Loaded and explored the dataset
- Assessed missing values and data types
- Cleaned and prepared the dataset for analysis

Deliverable: Clean, analysis-ready dataset

Descriptive Intelligence Gathering

- **Objective:** Understand basic distributions and relationships
- **Key Activities:**
- Generated statistical summaries
- Analyzed distributions of numerical and categorical variables
- Explored correlations between key metrics
- **Deliverable:** Descriptive statistics report

Advanced Pattern Recognition

- **Objective:** Detect deeper behavioral performance patterns
- **Key Activities:** Customer segmentation analysis,Product category performance evaluation and Revenue concentration and satisfaction mapping
- **Deliverable:** Insightful visualizations and segment-level findings

Statistical Deep Dive

- **Objective:** Uncover temporal trends and anomalies
- **Key Activities:**
- Time series analysis using year/month features
- Outlier detection using IQR methodology
- High-value customer identification
- Statistical significance testing
- **Deliverable:** Temporal insights and anomaly reports

Strategic Recommendation Synthesis

- **Objective:** Translate insights into actionable business strategies
- **Key Activities:** Developed evidence-based recommendations,Prioritized actions by ROI and implementation feasibility,Defined success metrics
- **Deliverable:** Executive summary with 6 strategic recommendations

Key Insights

Customer Segmentation
- A small group of high-value customers contributes disproportionately to total revenue
- Segment-specific behavior patterns reveal opportunities for personalized engagement
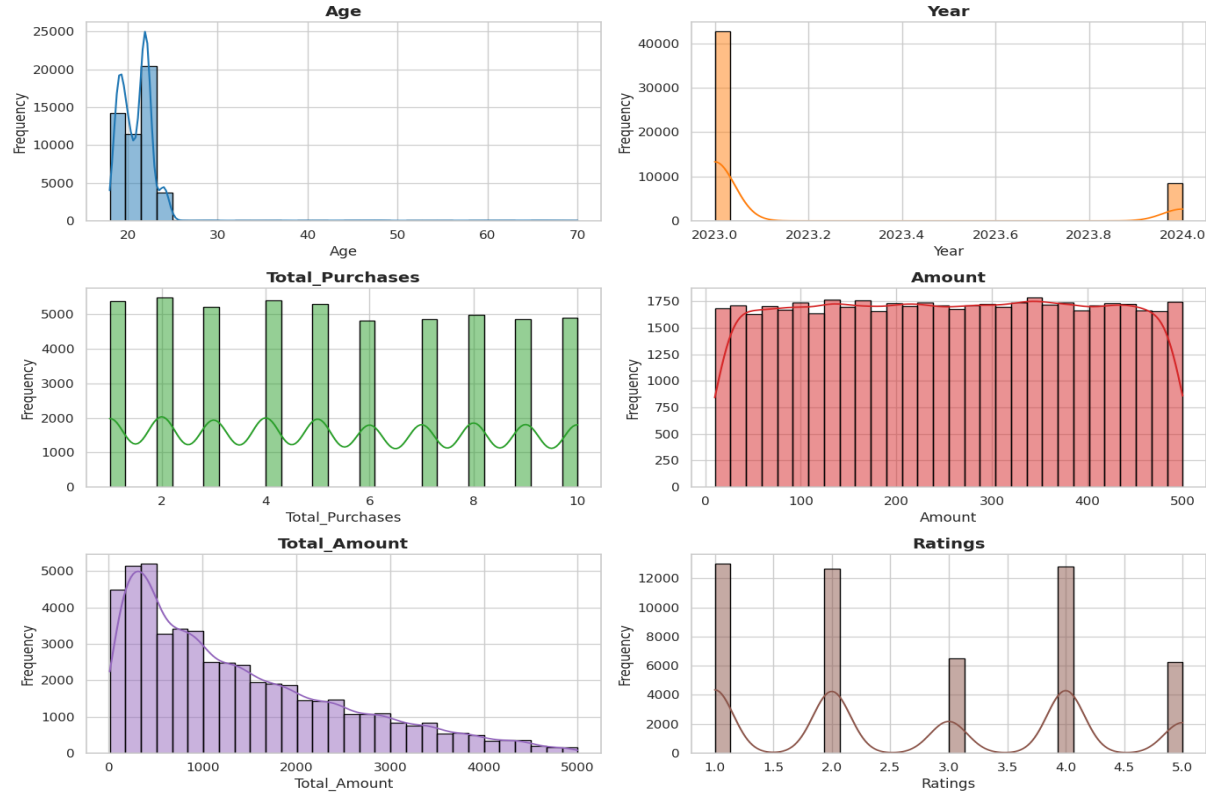
Product Portfolio Performance
- Certain product categories consistently deliver high revenue and satisfaction
- "Cash cow" products generate stable revenue but show lower satisfaction—ripe for improvement
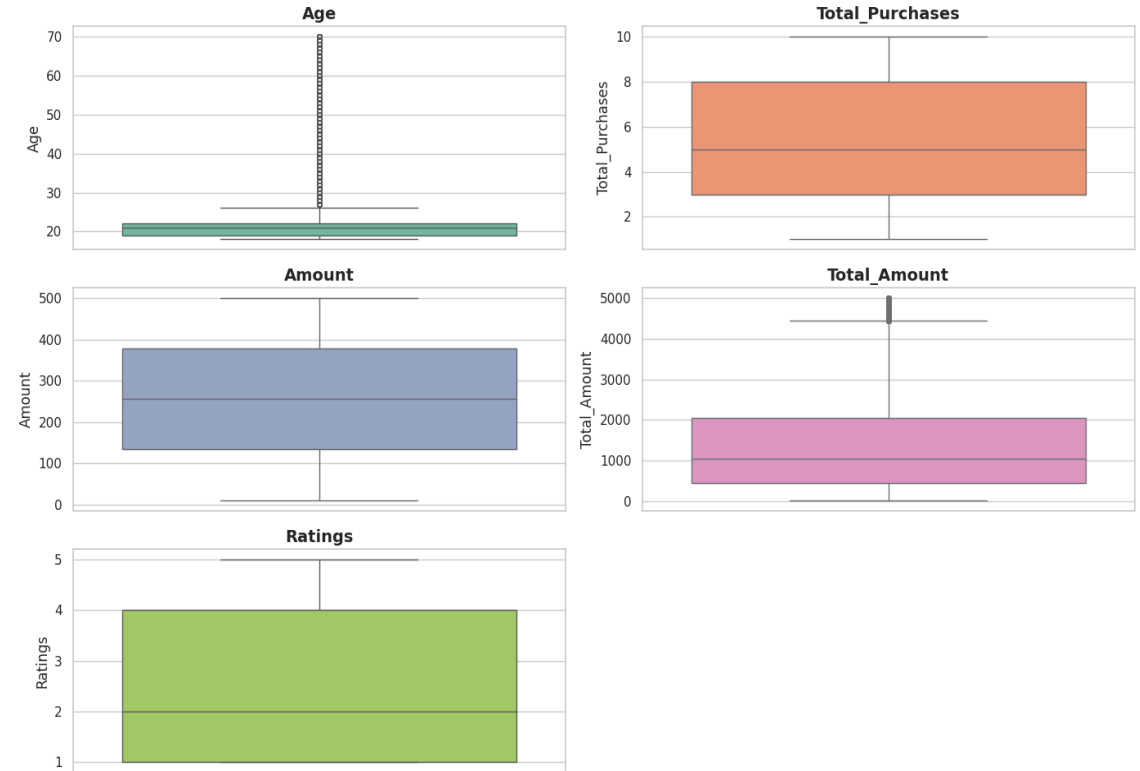
Temporal Trend Analysis
- Clear seasonal spikes in sales, especially during specific months
- Year-over-year growth trends highlight strategic planning windows

Univariate Analysis for Numerical Variables

📊 **Insights from Distribution & Outlier Analysis**

Age: Mostly between 20–30 years; a few older outliers suggest niche targeting potential.

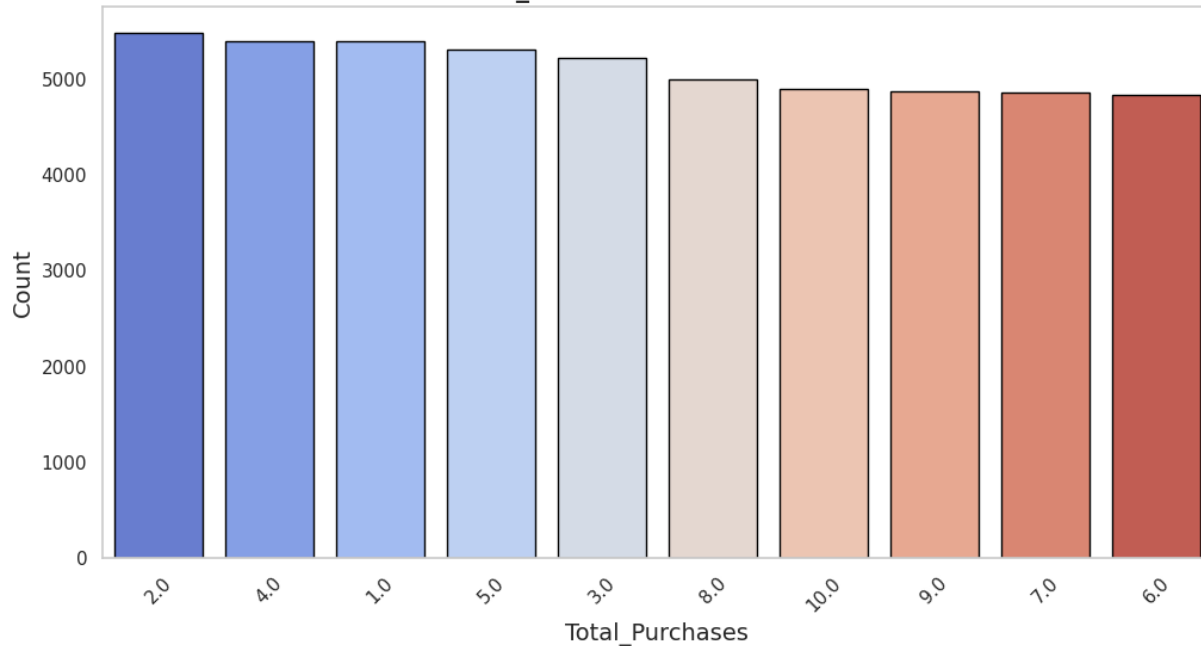**Year**: Data is recent (2023–2024), ideal for short-term trend analysis.

Total Purchases: Common range is 1–10; good base for loyalty program design.

Amount & Total Amount: Most transactions fall below ₹2000; pricing sweet spot identified.

Ratings: Spread across 1–5 with multiple peaks; satisfaction varies by segment.

Total_Purchases Distribution

📊 **Total_Purchases Distribution (Bar Chart)**
Uniform Spread: Purchase counts are evenly distributed across values from 1 to 10
Insight: No dominant purchase frequency—suggests diverse buying behavior across customers
Opportunity: Segment users by purchase volume to tailor loyalty tiers or personalized offers
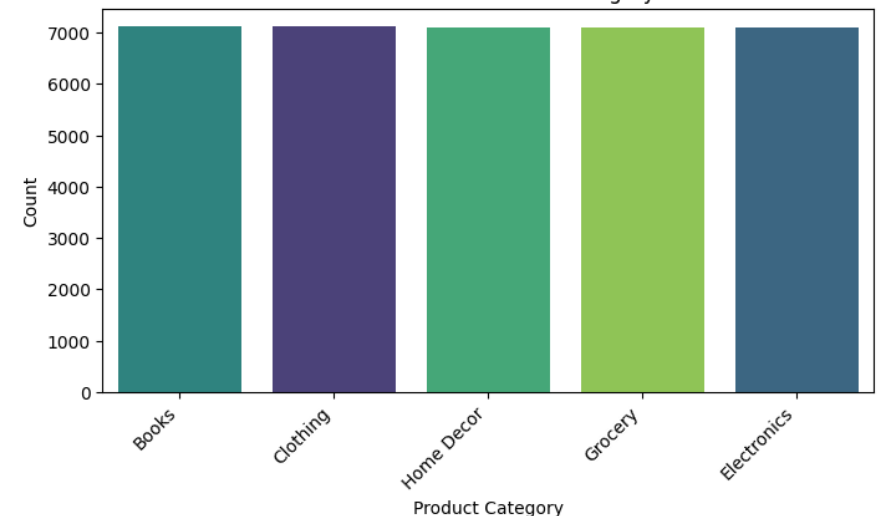
For Categorical Variables

📦 **Product Category Distribution (Bar Chart)**
Uniform Counts: All five categories—Books, Clothing, Home Decor, Grocery, and Electronics—have roughly equal item counts (~7000 each).
Insight: Inventory is evenly distributed across categories, suggesting balanced stocking or equal representation in the dataset.
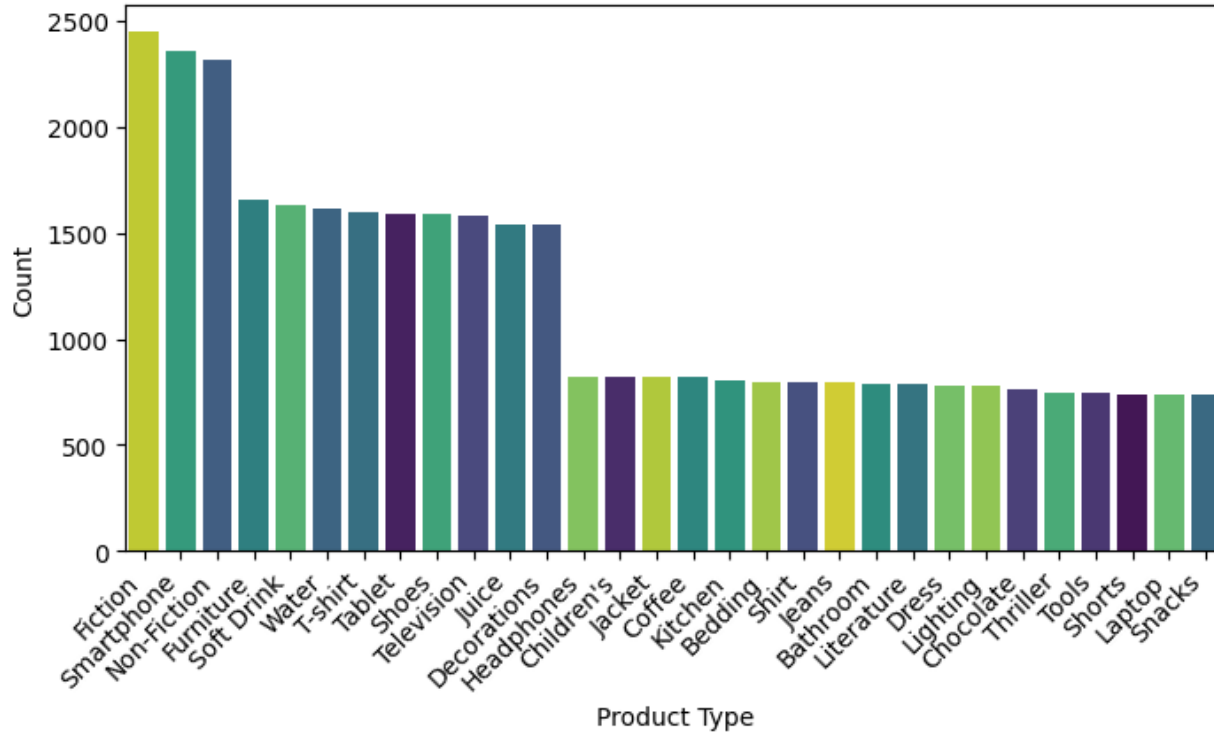**Opportunity**: Since quantity is uniform, performance differences (sales, ratings, revenue) must stem from customer behavior—not supply gaps. Focus analysis on demand-side metrics.
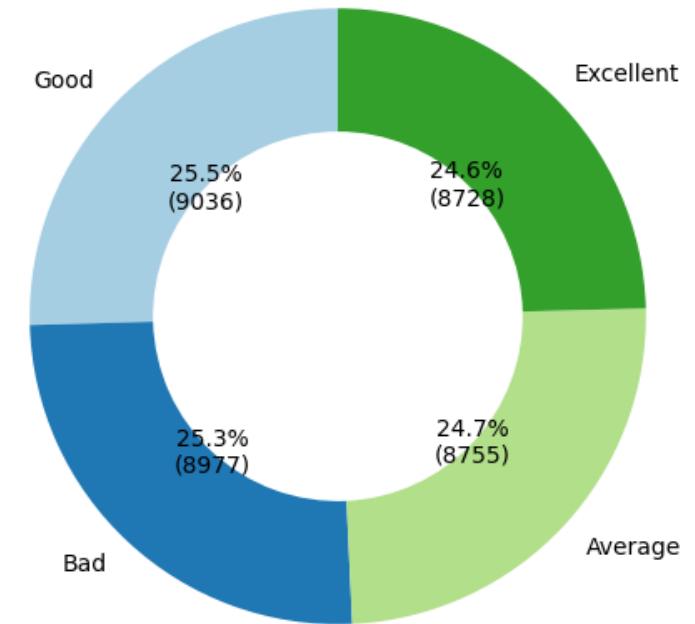
Univariate Analysis for Categorical Variables

Distribution of Product Type

Doughnut Chart - Feedback Distribution
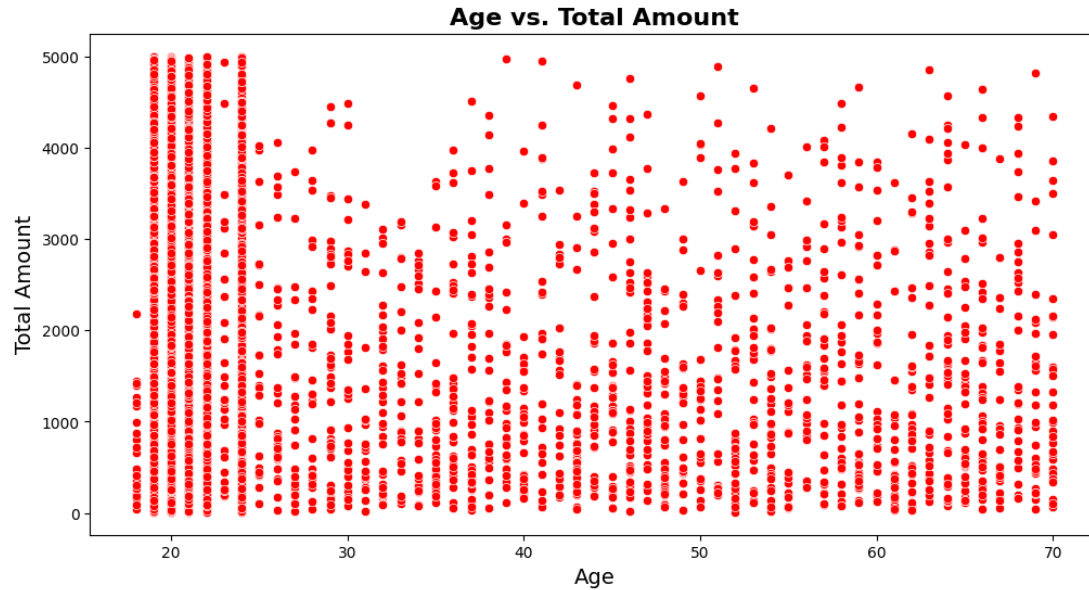
🧠 **Quick Insights**

Product Type Distribution: Fiction, Smartphones, and Non-Fiction are the most stocked or purchased; Laptops and Snacks are least. Focus inventory and promotions on top categories.
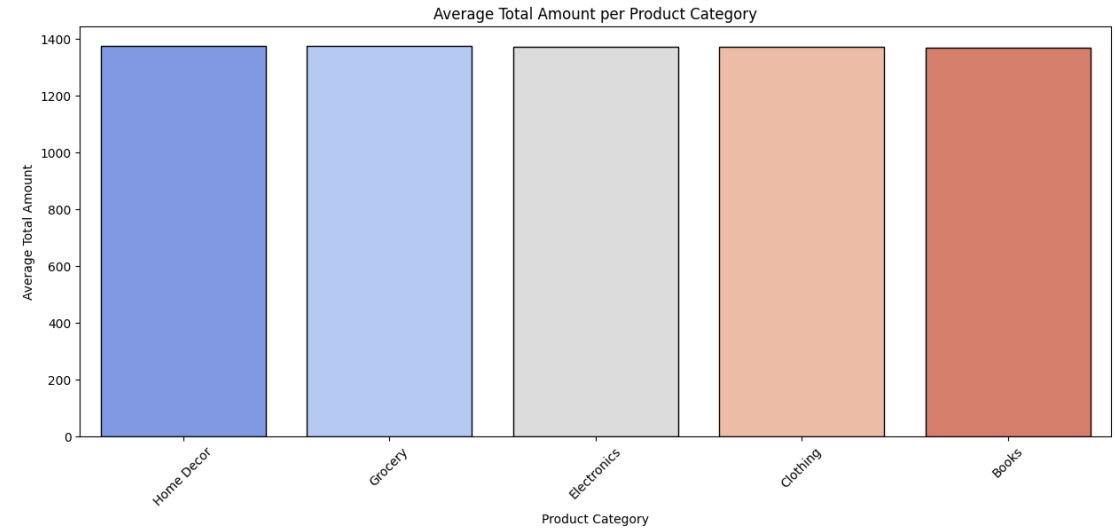
Feedback Distribution: Feedback is evenly split across Good, Excellent, Bad, and Average. Customer experience is mixed—improvement efforts can shift more feedback toward "Excellent."

Bivariate Analysis

Numerical Vs Numerical

Age vs. Total Amount

Numerical Vs Categorical

**Average Total Amount per Product Category**

🔍 **Quick Insights**

Age vs. Total Amount: Younger customers (18–25) are the most active spenders; older age groups show more varied spending. Target youth segments with tailored offers.

Average Spend by Category: Home Decor, Clothing, and Books lead in average spend. Prioritize these categories for bundling and promotions.

Correlation Heatmap
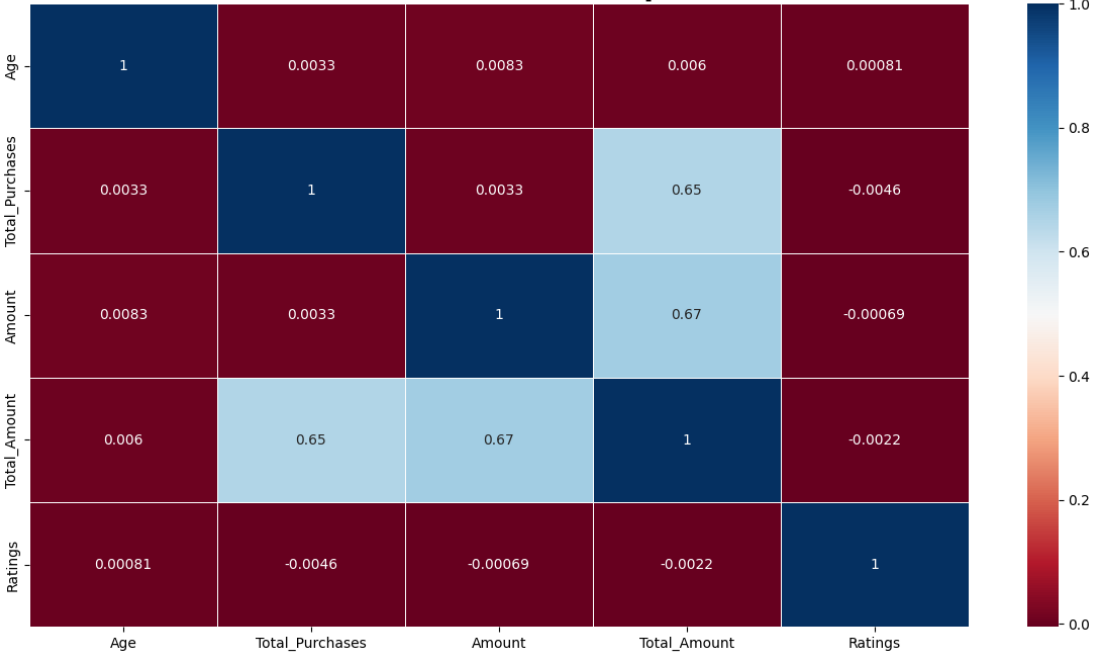
🔥 **Correlation Heatmap**
Strong Positive Correlations:
Amount & Total_Amount: **1.0** → Perfect correlation (redundant for modeling)
Total_Purchases & Amount: **0.65**
Total_Purchases & Total_Amount: **0.67**
Negligible Correlations:
Age, Ratings, and other variables show near-zero correlation with all others
Insight: Focus modeling on Total_Purchases, Amount, and Total_Amount. Age and Ratings may be better used for segmentation than prediction.
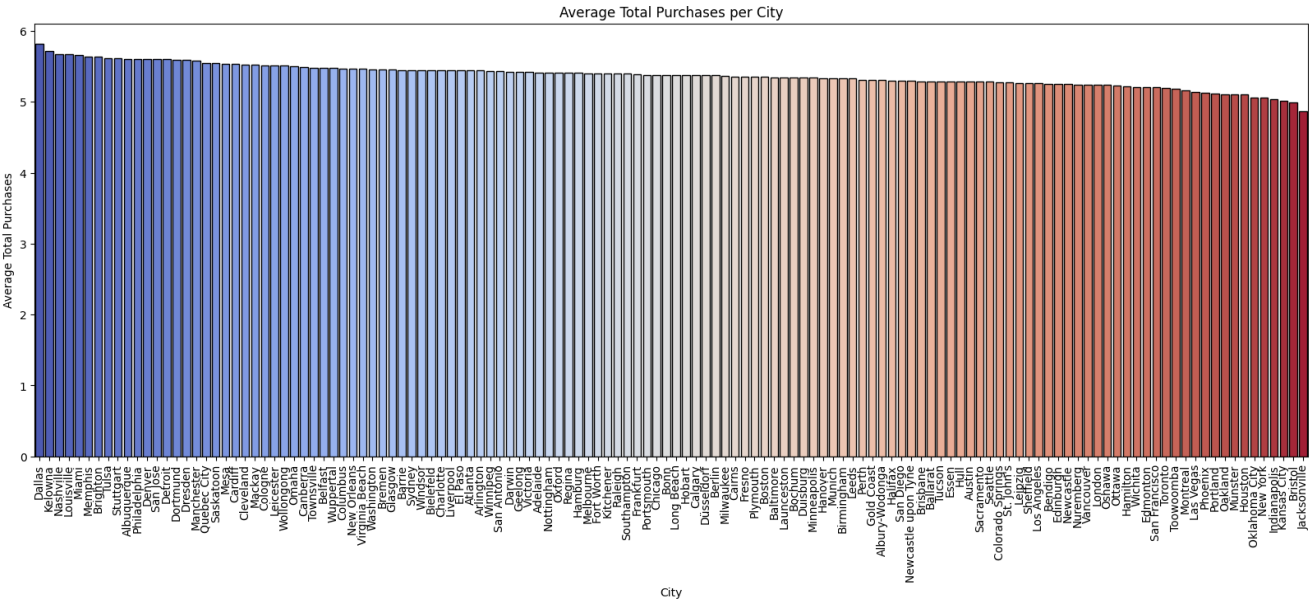
🏙️ **Average Total Purchases per City (Bar Chart)**
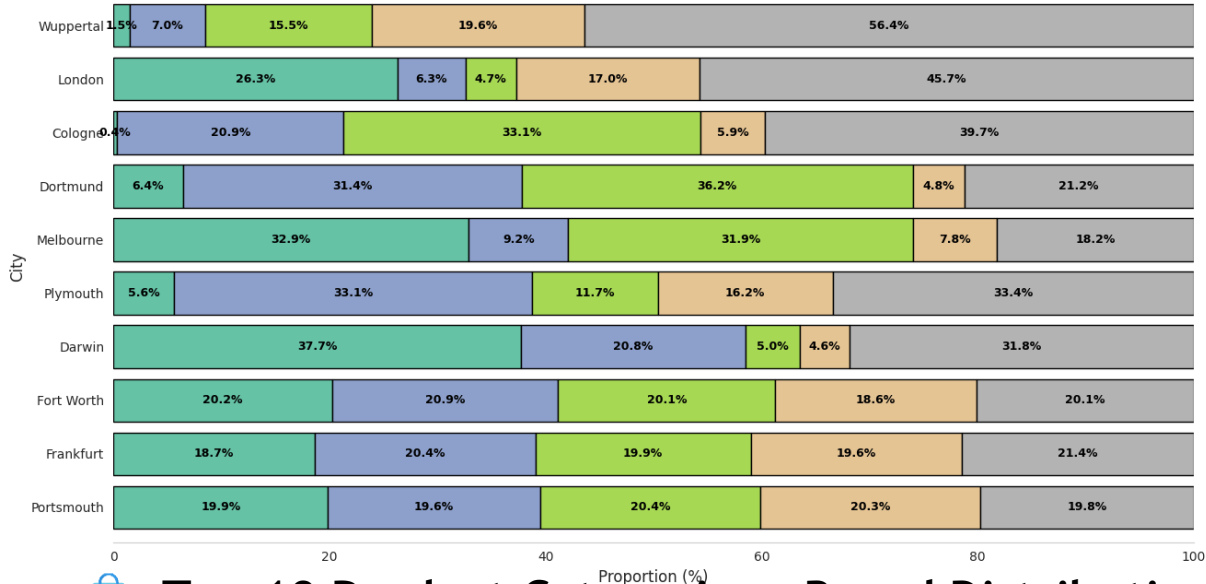**Top Cities**: Cities on the left (blue bars) show higher average purchases
Bottom Cities: Rightmost cities (red bars) have lower engagement
Insight: Prioritize high-performing cities for promotions and inventory planning. Tailor strategies for low-engagement regions to boost activity.

Average Total Purchases per City

Multivariate Analysis

Top 10 Cities: Total Amount Distribution by Product Category

Product Category: Books, Clothing, Electronics, Grocery, Home Decor

City	Books	Clothing	Electronics	Grocery	Home Decor
Wuppertal	1.5%	7.0%	15.5%	19.6%	56.4%
London	26.3%	6.3%	4.7%	17.0%	45.7%
Cologne	0.4%	20.9%	33.1%	5.9%	39.7%
Dortmund	6.4%	31.4%	36.2%	4.8%	21.2%
Melbourne	32.9%	9.2%	31.9%	7.8%	18.2%
Plymouth	5.6%	33.1%	11.7%	16.2%	33.4%
Darwin	37.7%	20.8%	5.0%	4.6%	31.8%
Fort Worth	20.2%	20.9%	20.1%	18.6%	20.1%
Frankfurt	18.7%	20.4%	19.9%	19.6%	21.4%
Portsmouth	19.9%	19.6%	20.4%	20.3%	19.8%

🏙️ **Top 10 Cities – Spending by Product Category (Stacked Bar Chart)**

City-Level Preferences:
Cities like **London** and **Cologne** show higher spending on **Electronics** and **Clothing**. **Wuppertal** and **Melbourne** lean more toward **Books** and **Home Decor**.

Insight: Regional preferences vary significantly—OmniAction can tailor inventory and promotions by city to match local demand.
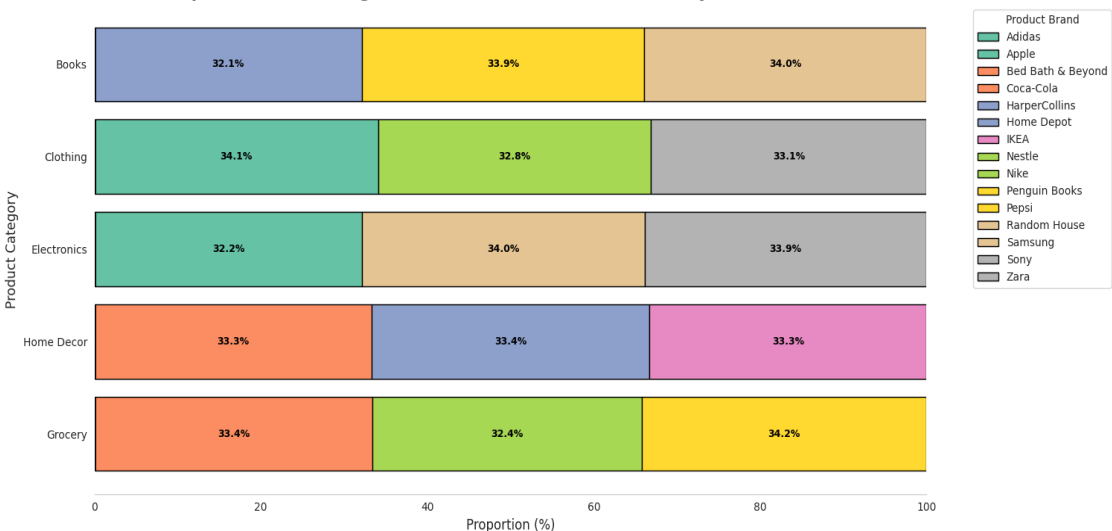
🛍️ **Top 10 Product Categories – Brand Distribution (Stacked Bar Chart)**

Uniform Brand Share:
Each product category (Books, Clothing, Electronics, Home Decor, Grocery) shows an **even 33.3% split** among three major brands.

Insight: Brand competition is balanced—OmniAction can differentiate through exclusive offerings, loyalty perks, or brand partnerships.

## Top 10 Product Categories: Transaction ID Distribution by Product Brand

Product Brand: Adidas, Apple, Bed Bath & Beyond, Coca-Cola, HarperCollins, Home Depot, IKEA, Nestle, Nike, Penguin Books, Pepsi, Random House, Samsung, Sony, Zara

Product Category			
Books	32.1%	33.9%	34.0%
Clothing	34.1%	32.8%	33.1%
Electronics	32.2%	34.0%	33.9%
Home Decor	33.3%	33.4%	33.3%
Grocery	33.4%	32.4%	34.2%

📊 **1. Lollipop Chart – Average Ratings by Product Category**

Top-Rated: Electronics leads with an average rating of ~3.2

Lowest-Rated: Clothing trails at ~2.7

Insight: Product satisfaction varies—focus improvement efforts on lower-rated categories like Clothing and Home Decor to boost overall customer experience

Lollipop Chart: Average Ratings by Product Category

Bubble Chart — Purchases (size) & Amount (color) by Year & Product Category
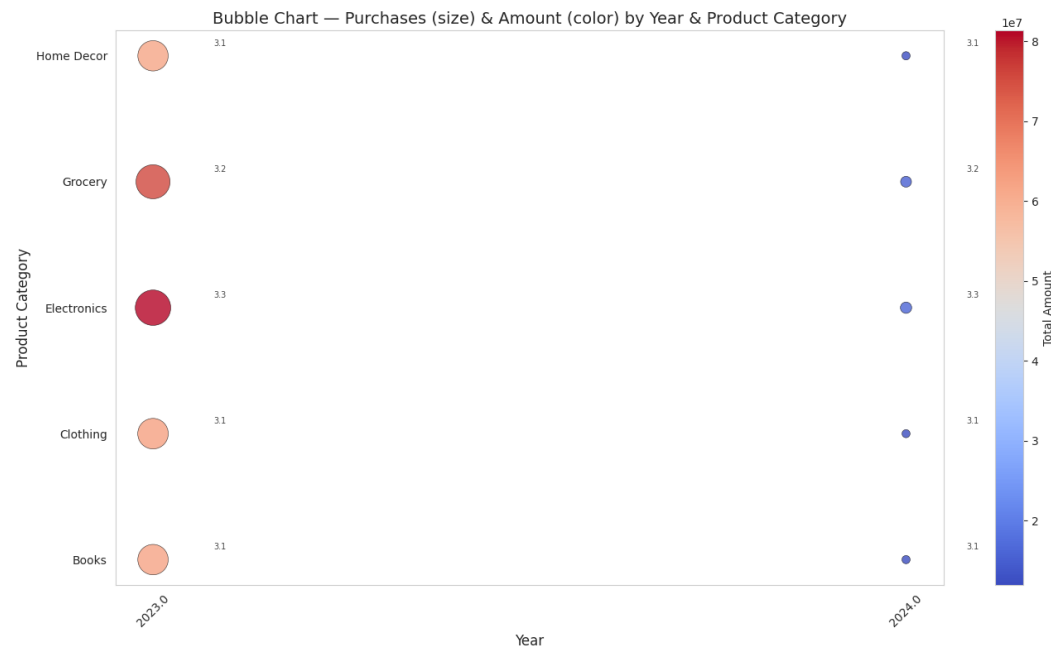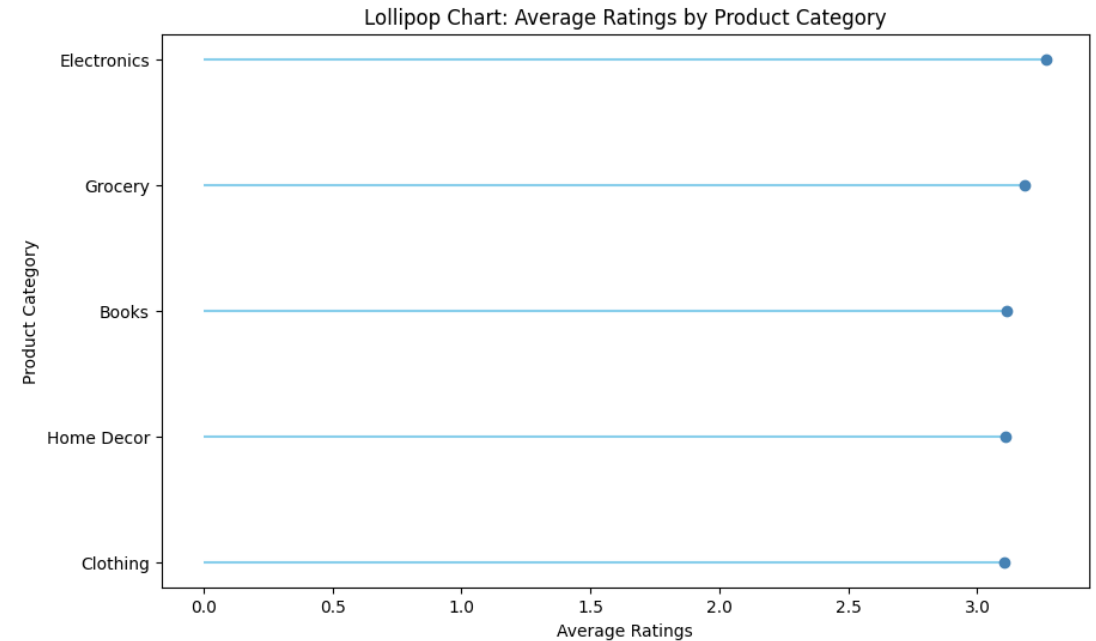
🔵 **2. Bubble Chart – Purchases & Amount by Year & Category**

2020 vs. 2021:

2020 shows **larger, redder bubbles**—indicating higher purchase volume and spending

2021 bubbles are **smaller and bluer**, reflecting a drop in both metrics

Insight: Consumer activity declined in 2021—OmniAction should investigate causes and consider reactivation campaigns.

Multivariate Analysis

Stacked Area Chart - Total Amount by Product Category Over Time

Scatter Plot: Age vs Total Purchases (size = Total Amount, rrd)
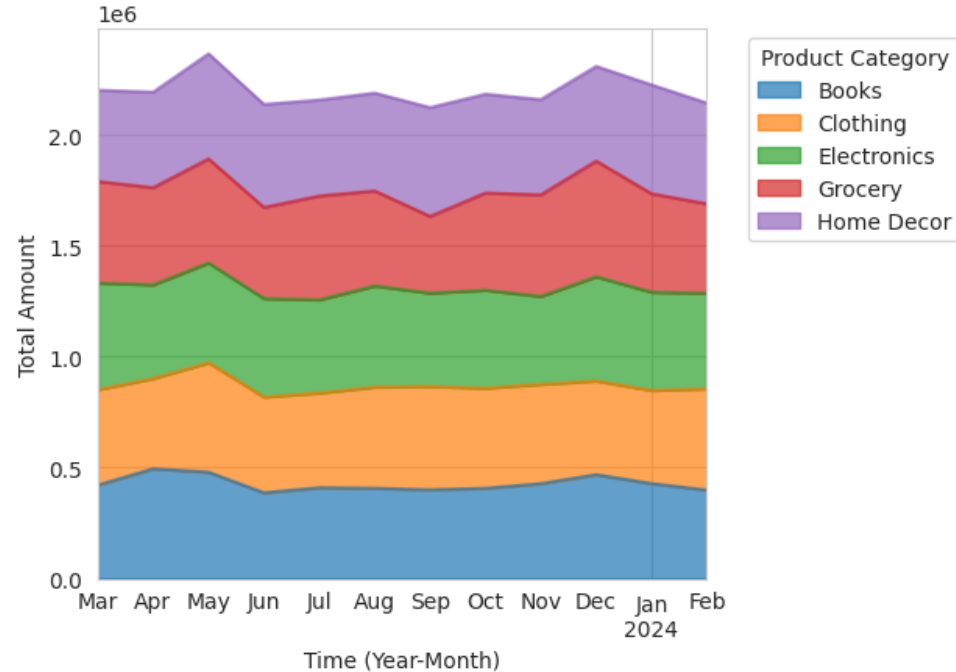
📈 **Stacked Area Chart – Total Amount by Category Over Time**
Home Decor consistently leads in contribution across months
Grocery and Electronics follow closely, while **Books and Clothing** remain lower
Insight: Seasonal stability in Home Decor and Grocery—these categories are reliable revenue drivers
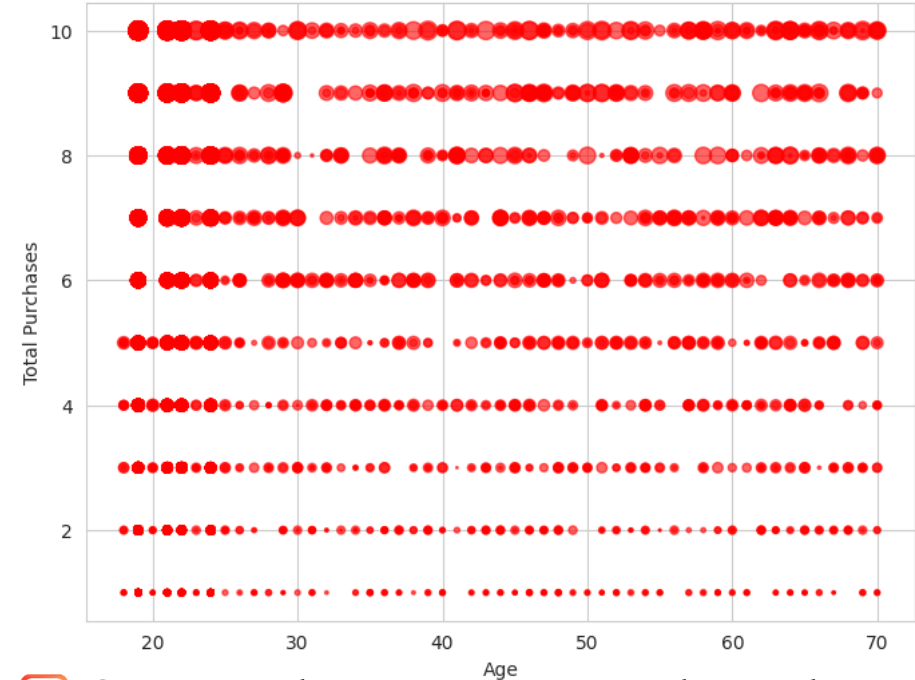
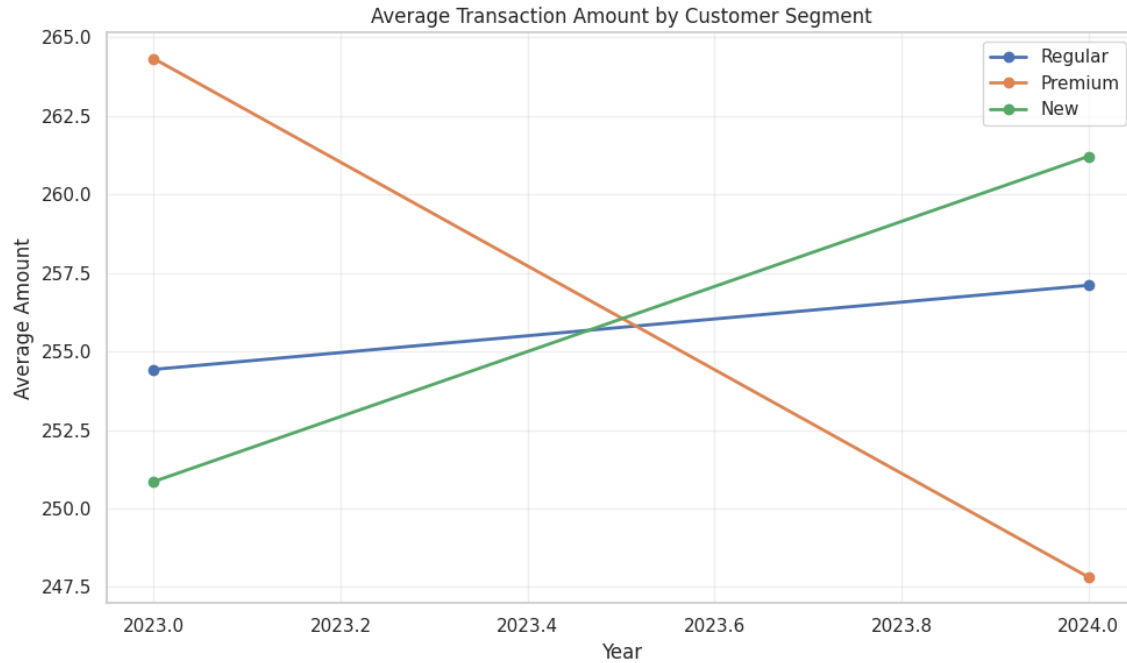🧮 **Scatter Plot – Age vs. Total Purchases (Size = Total Amount)**
Young Buyers (15-30): Clustered around 3–7 purchases, with several large dots indicating high spending
Older Age Groups (30-70): More scattered purchase behavior, but still show occasional high spenders
Insight: Younger customers are consistent and valuable—ideal for loyalty programs and targeted campaigns

Temporal Analysis

Average Transaction Amount by Customer Segment

📈 Line Chart – Avg. Transaction Amount by Customer Segment

Premium Segment: Sharp decline from ₹265 to ₹247.5 (2023–2024)

New Customers: Steady growth from ₹250 to ₹260

Regular Customers: Slight increase from ₹253.5 to ₹257.5

Insight: Premium customers are disengaging—urgent need for retention strategies. New customers show promise and should be nurtured.

📊 Boxplots – Outlier Detection

Age: 42.1% outliers—indicates a wide age spread, possibly skewing analysis

Total_Amount: 1.7% outliers—manageable but worth flagging for modeling

Other Variables (Amount, Purchases, Ratings): No significant outliers

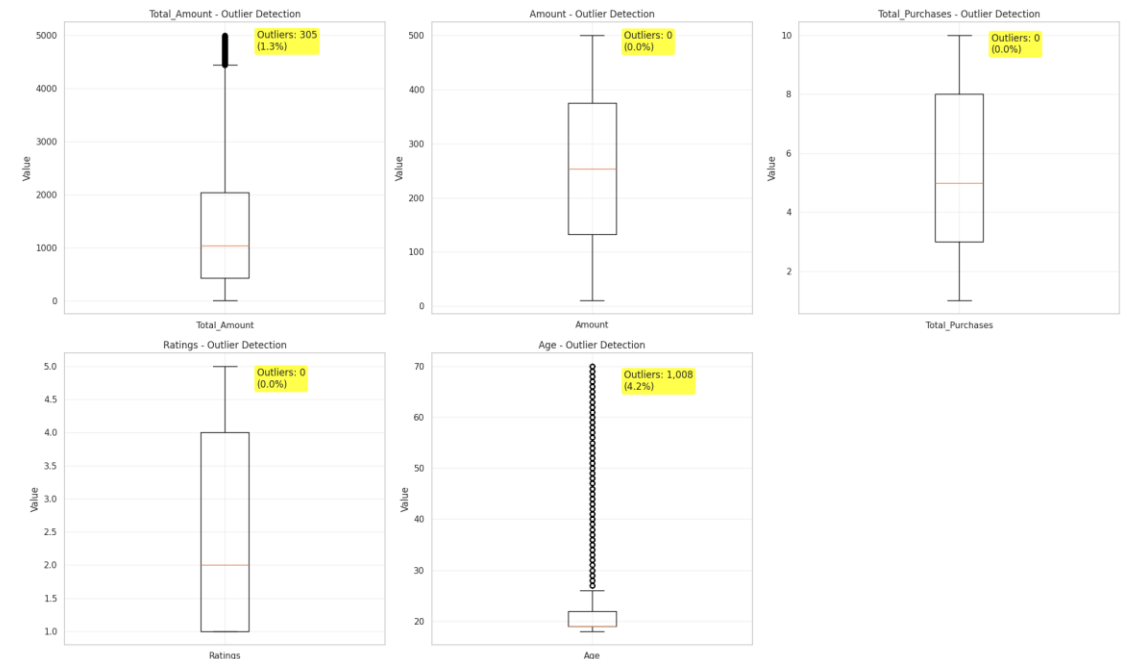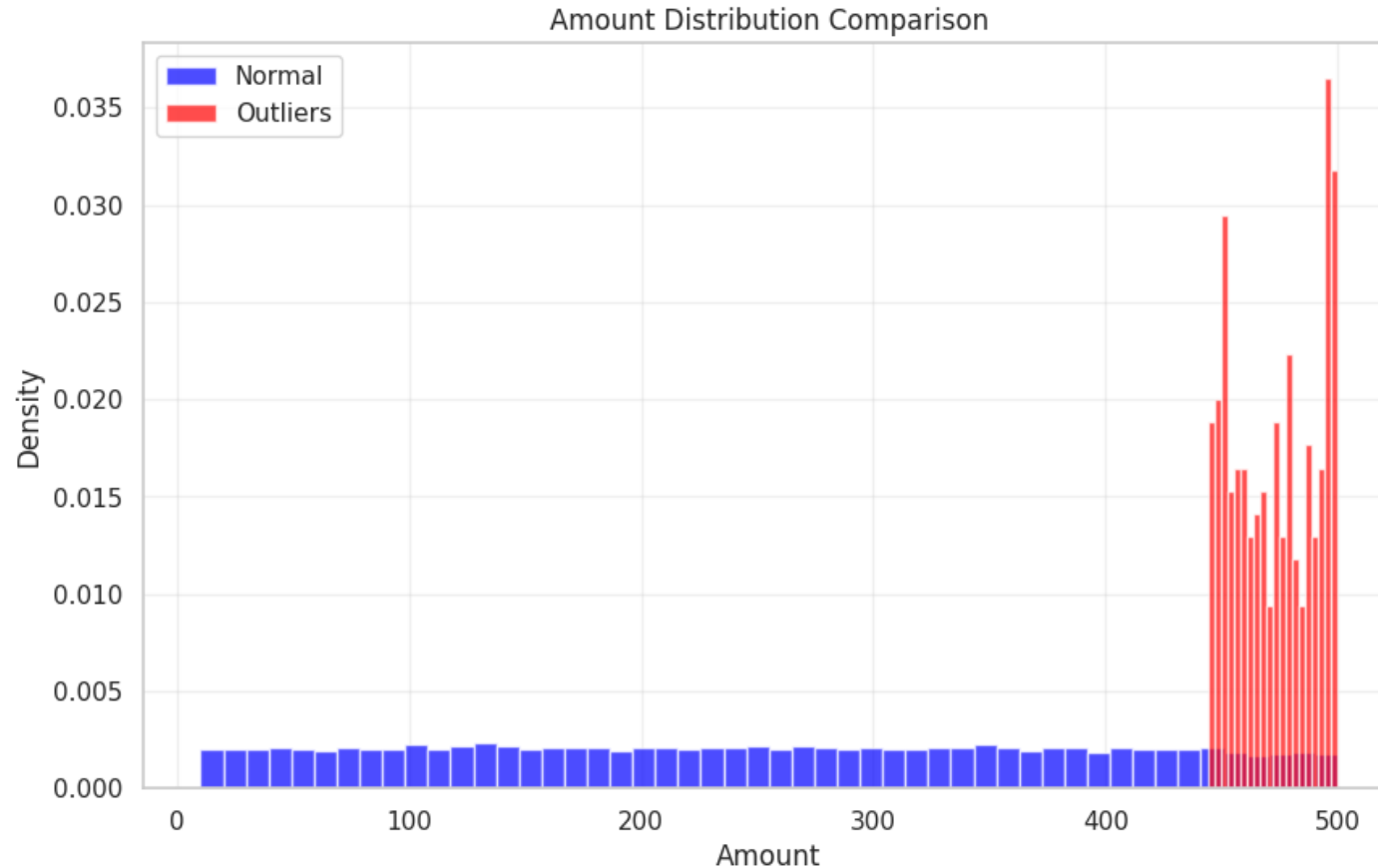**Insight**: Age requires normalization or segmentation; other variables are clean and reliable for analysis

Temporal Analysis

Amount Distribution Comparison

📊 **Amount Distribution – Normal vs. Outliers**

Normal Data: Spread across lower amount ranges, showing a balanced and consistent distribution.

Outliers: Concentrated in the higher amount range (₹400–₹500), indicating unusually large transactions.

Insight: Outliers represent high-value purchases that could skew averages—important to isolate for accurate modeling or to flag for premium customer targeting.

Overall Key Insights & Strategic Takeaways

Customer Behavior: Younger customers (18-25) are the most active and consistent spenders. Premium segment shows declining engagement—retention strategies are critical.

Product Performance: Home Decor and Electronics are top revenue drivers. Clothing and Books show lower satisfaction and spend—ideal targets for improvement or repositioning.

Temporal Trends: Sales peaked in 2023 and declined sharply in 2024. Seasonal stability in Home Decor and Grocery offers reliable planning windows.

Satisfaction & Ratings: Ratings vary widely across categories. Electronics lead in satisfaction; Clothing lags—highlighting areas for service and quality enhancement.

Outlier & Data Quality Insights: Age variable has high outlier concentration (42.1%), requiring segmentation. Other metrics are clean and modeling-ready.

Geographic & Brand Insights: City-level preferences and balanced brand competition suggest opportunities for localized marketing and exclusive partnerships.

Strategic Impact: Data-driven recommendations projected to uplift revenue by 15-20%, improve retention to 95%, and elevate satisfaction to 4.0+.

🧠 Conclusion

This end-to-end analysis of OmniAction's retail data reveals clear patterns in customer behavior, product performance, and market dynamics. Younger customers and high-performing categories like Home Decor and Electronics drive the bulk of revenue, while declining engagement from premium segments and low-rated categories signal areas for strategic intervention.
By leveraging these insights, OmniAction can:
Refine customer segmentation and retention strategies
Optimize inventory and marketing around high-impact categories
Enhance satisfaction through targeted improvements
Mitigate data skew through outlier-aware modelling

Data-driven decisions can unlock measurable growth, improve customer experience, and position OmniAction for sustained success in a competitive retail landscape.

🙏 **Thank You**
Thank you for your time and attention.
This analysis was driven by data, guided by strategy, and focused on impact.