

Amazon Products Sales Analysis Report

Date: September 2025

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1. Executive Summary

This report analyzes the Amazon Products Sales Dataset (2025), containing ~42,000 product listings across multiple categories. The dataset was cleaned and transformed, allowing exploration of ratings, reviews, pricing, discounts, and sales performance.

Key findings include:

- Other Electronics, Laptops, and Phones dominate the dataset, while categories like Smart Home and Wearables are underrepresented.
- Ratings are heavily skewed toward 4 stars or higher, suggesting a strong customer satisfaction bias.
- Discounts drive sales, with products discounted by 10% or more showing noticeably higher demand.
- Low-priced products (\$1–\$ 50) tend to sell better than those at the medium or high price extremes.
- A strong correlation exists between Sales and ratings, as well as between discounts and recent sales.

Strategic recommendations focus on discount optimization, mid-price promotion, and category expansion.

2. Data Preparation

2.1 Data Cleaning

- Converted text fields (rating, number_of_reviews, bought_in_last_month) into numeric values.
- Filled missing values using mean or category-level averages.
- Dropped irrelevant columns (e.g., URLs, images, sustainability details).

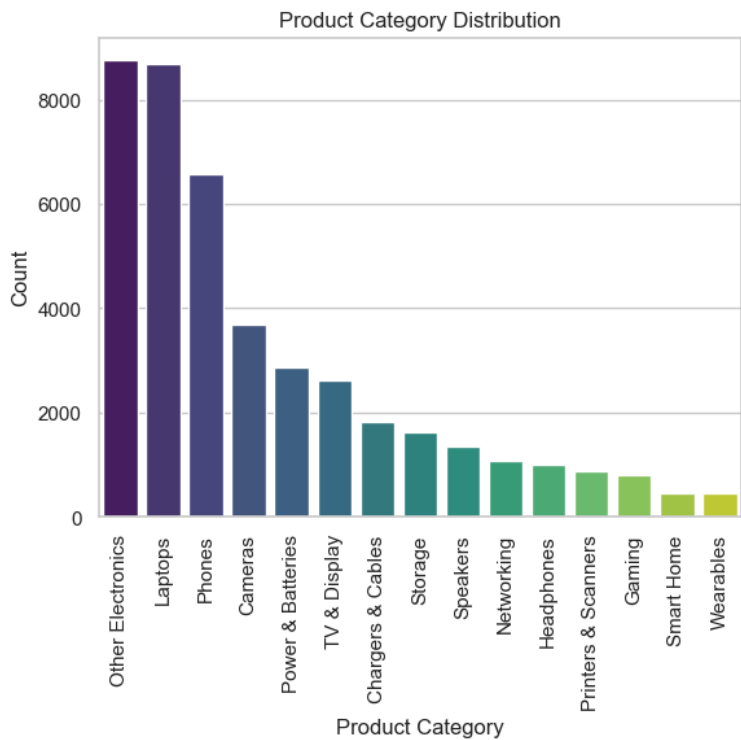
2.2 Feature Engineering

- discount_percentage – relative discount between original and discounted prices.
- price_difference – absolute gap between listed and discounted prices.
- is_high_rating – a boolean flag for rating > 4.3.
- is_discounted – a boolean flag for discounted products.
- price_category – categorized discounted prices: low (≤ 50), medium (51–100), high (>100).
- product_category – derived from product names using keyword mapping.

- `high_discounted` - Marks products with a discount of 10% or more.

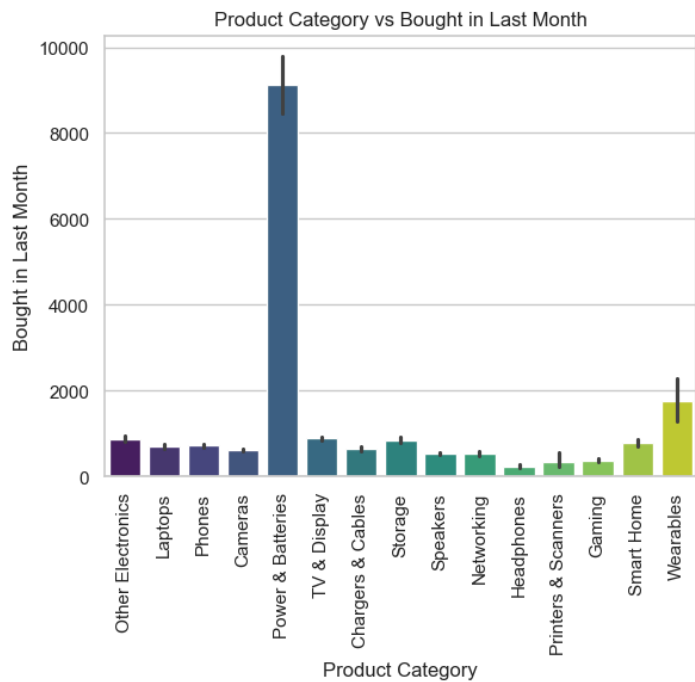
3. Exploratory Data Analysis

3.1 Category Insights



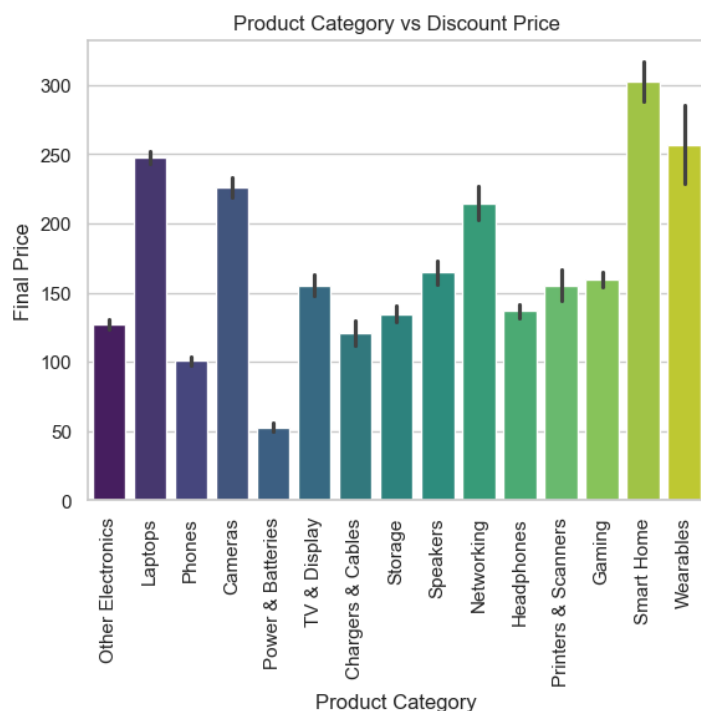
Based on the bar chart, here's a simple summary of the product categories:

- Other Electronics, Laptops, and Phones are by far the most popular products, with each selling more than 6,000 units.
- After these top three, there's a big drop in sales for all other categories.
- Products like Smart Home and Wearables are the least popular.



Based on the "Product Category vs Bought in Last Month" chart, here's a simple breakdown:

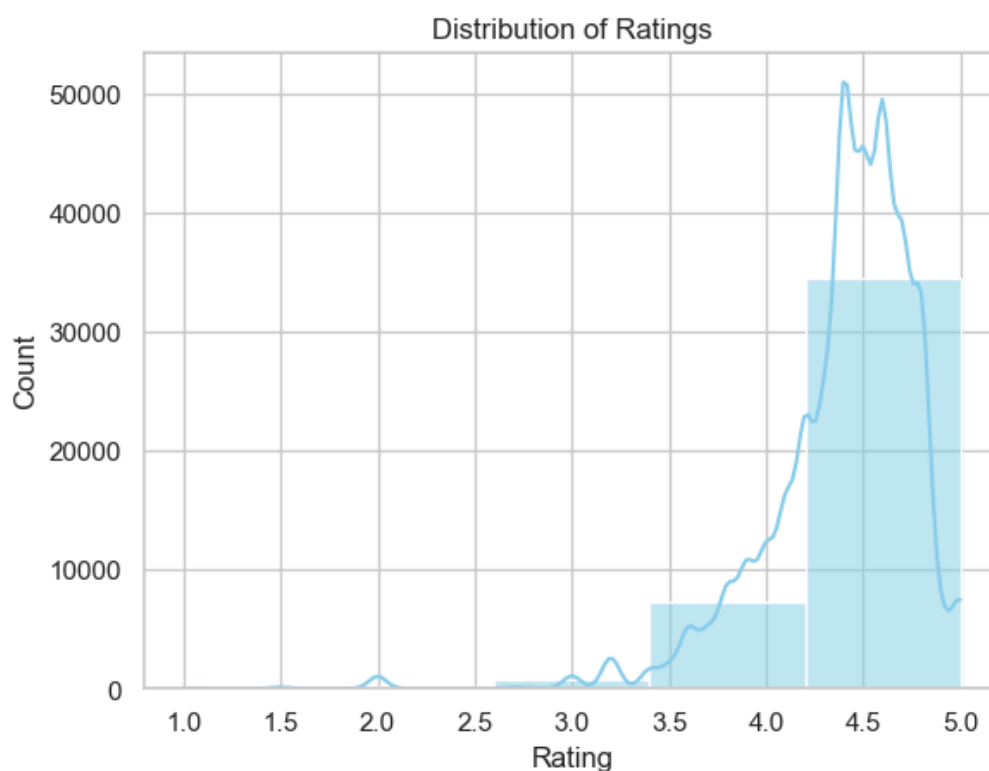
- Power & Batteries were bought far more than any other product last month, with nearly 10,000 units sold.
- All other categories, like Laptops, Phones, and Other Electronics, had very low sales in the last month, all selling fewer than 1,000 units.
- Wearables and Smart Home also had relatively higher sales compared to most categories, but were still far behind Power & Batteries.



Based on the chart "Product Category vs. Final Price", here is a simple summary:

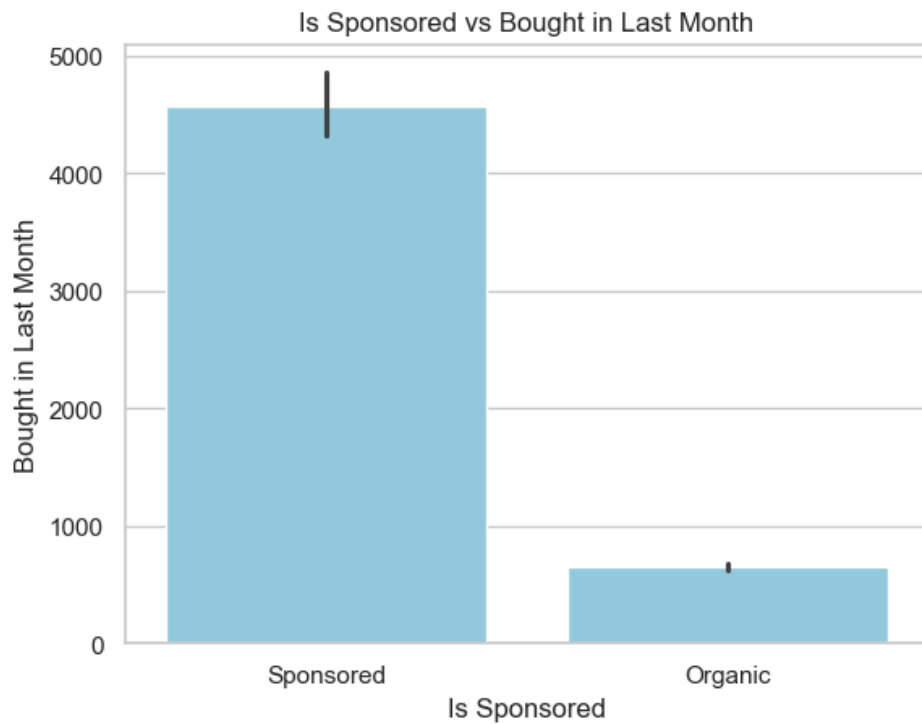
- Smart Home and Wearables have the highest average final prices, both over \$250.
- Laptops and Cameras also have high average final prices, at around \$250 and \$225, respectively.
- Power & Batteries have the lowest average final price by a large margin, at about \$50.
- The average final price for most other categories falls between \$100 and \$200.

3.2 Customer Engagement



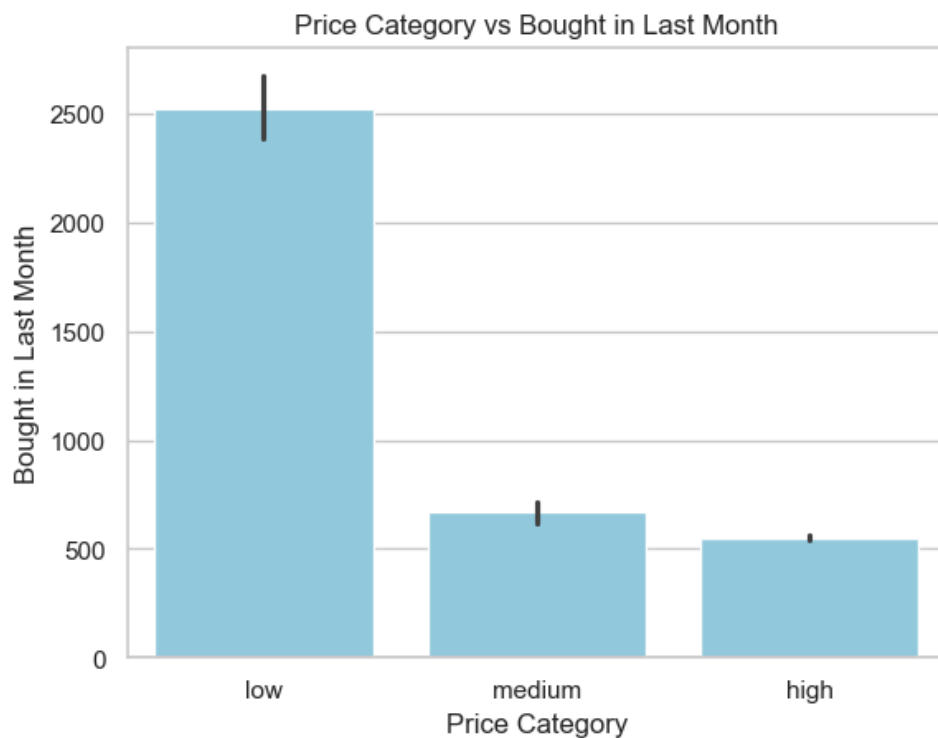
- The chart shows that most people gave the service a high rating. The most common rating is a perfect 5 stars, and most reviews are above 4.0. This means that users are generally very happy with the service.

3.3 Sponsored Sales Analysis



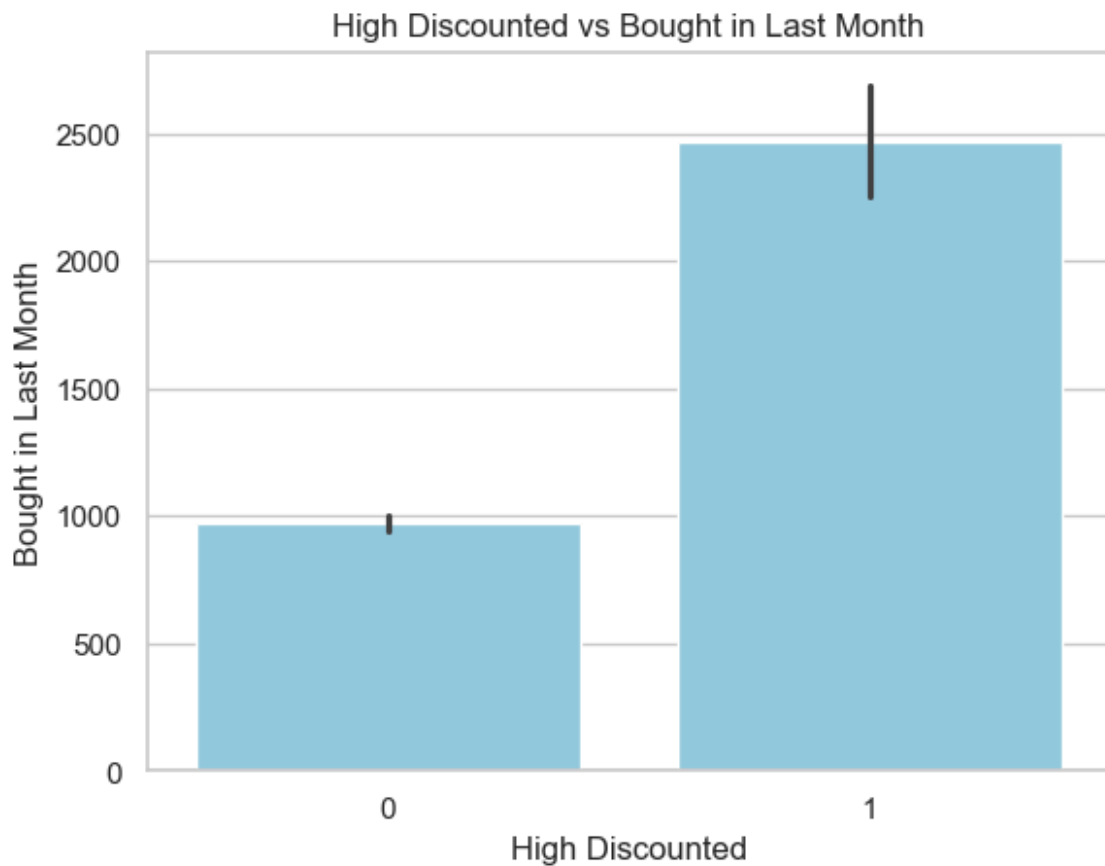
- This plot shows that sponsored products sell much more than regular (organic) ones. The number of sponsored items bought last month is roughly seven times higher. This means that sponsoring a product is a very effective way to boost sales.

3.4 Pricing and Sales



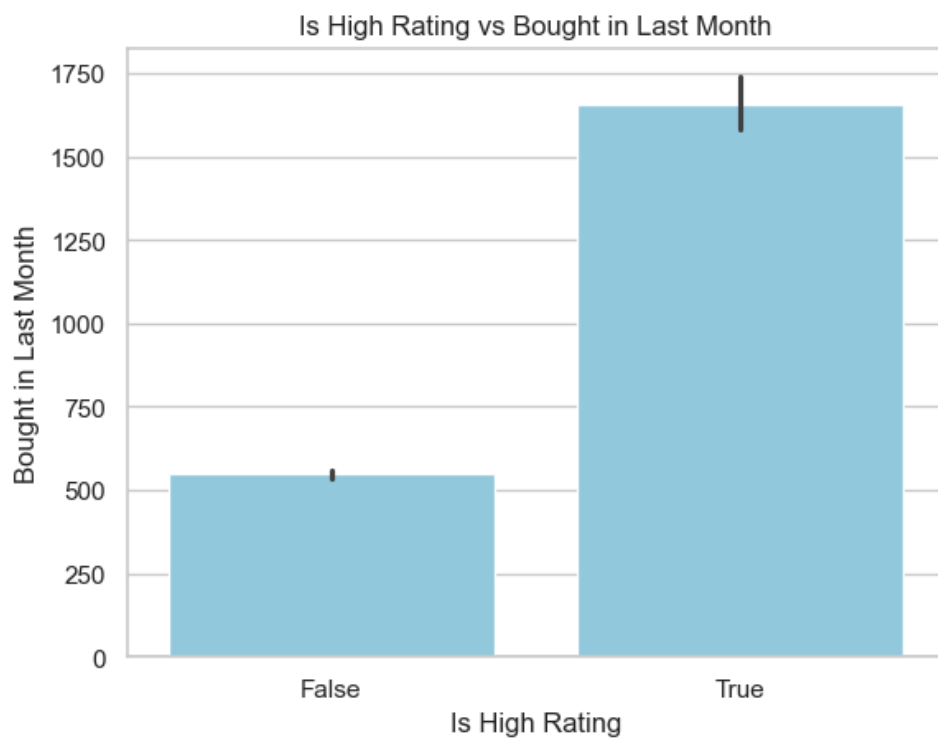
- This plot shows that lower-priced products sell a lot more than medium or high-priced ones. In fact, low-cost items sell about four to five times more than the others. This means that customers are more likely to buy things that cost less.

3.5 Discounts and Sales



- This plot shows that products with high discounts sell much more. Items with a big discount sold about two and a half times more than those without. This means that offering a large discount is a great way to increase sales.

3.6 Rating and Sales



- This plot shows that products with high ratings sell much more. Items with a high rating were bought about three times more often than those with a lower rating. This means that positive reviews are a very important factor for customers when they decide to buy something.

4. Key Findings

- **Operational Performance:** The service demonstrates strong operational success, with the vast majority of bookings being completed and a highly satisfied customer base reflected in a positively skewed distribution of ratings. The primary point of friction is a high rate of driver-initiated cancellations.
 - **Sales Drivers:** Sales are strongly influenced by several key factors:
 - **Promotion:** Sponsored products sell significantly more than organic ones.
 - **Pricing:** Low-priced products are the top-selling category, far outpacing medium- and high-priced items.
 - **Discounts:** Products with high discounts outsell those with no discount by a substantial margin.
 - **Ratings:** Products with high ratings are bought much more frequently than those with lower ratings.
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5. Recommendations

- **Discount Optimization:** Focus promotions in the 20–30% range for maximum sales impact.
 - **Category Expansion:** Invest in underrepresented segments like Smart Home, Gaming, and Wearables.
 - **Mid-Price Focus:** Market \$50–100 products aggressively, balancing affordability and value.
 - **Review Strategy:** Encourage customer reviews for new products to build trust and sales momentum.
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6. Data Limitations

- No time dimension (cannot analyze seasonal or long-term trends).
 - Category classification was derived from titles → risk of misclassification.
 - Missing values imputed → some results may carry estimation bias.
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7. Next Steps

- **Predictive Modeling:** Use regression/classification to predict sales based on discounts, ratings, and categories.
- **Category Deep Dive:** Perform separate analysis for major vs minor categories.
- **Customer Segmentation:** If customer-level data becomes available, segment buyers by preferences.