



Sales & Customer Analytics for

Amazon Marketplace

Tools: SQL • Power BI

Presented by: Juhi Shriwastav

EXECUTIVE SUMMARY – Project at a Glance




This project analyzes product sales, pricing strategies, and customer behavior on the Amazon Marketplace using SQL, Power BI, and synthetic data modeling.

Key findings include:

- 60%+ revenue came from Electronics, the most profitable category
- High discounts don't always drive sales. some products with over 50% discount sold less than 10 units.
- A small group of reviewers (0.82%) contributed the majority of reviews, which may skew perception.
- Categories like Electronics received the most negative reviews, highlighting areas for product quality or service improvement.

ABOUT

Amazon Marketplace



Amazon is one of the largest e-commerce platforms in India, offering millions of products across electronics, fashion, home goods, and more.

It operates on a high-volume, high-competition model where pricing, customer reviews, and product visibility heavily influence sales.

Customers can browse products, compare prices, leave reviews, and make repeat purchases, creating a large volume of behavioral and transactional data.

PROBLEM STATEMENT

In a dynamic e-commerce environment like Amazon, understanding how pricing, product performance, and customer engagement impact business success is essential for stakeholders.

These factors drive strategic decisions across marketing, inventory, and revenue planning.

This project aims to investigate patterns in product sales, discount effectiveness, and user behavior using real and simulated retail data.

Success metrics include: total revenue, units sold, discount efficiency, average customer rating, and engagement frequency.

RESEARCH OBJECTIVES

THIS STUDY EXPLORES BUSINESS PATTERNS IN SALES, PRICING, AND USER BEHAVIOR USING SQL AND POWER BI.

1 Product Performance



- Identify top products & categories by revenue
- Explore rating impact on sales

2 Pricing & Discounts



- Detect products with high discounts but low sales
- Analyze discount effectiveness on conversions

3 Customer Behavior



- Discover most engaged users via reviews
- Segment insights for dashboard & decision-making

HYPOTHESIS



1. Higher-rated products sell more

→ Disproved. Several top-rated products had low sales, visibility and category mattered more.

2. A few categories dominate revenue


→ Proved. Electronics alone contributed over 82% of total revenue.

3. Most reviews come from a small group of users

→ Disproved. Top 10 users contributed just 0.82% of reviews, review activity was widely distributed.

4. Heavy discounts lead to higher sales

→ Disproved. 17% of products with 50%+ discounts still sold under 10 units.



DATA OVERVIEW

- This project uses a dataset called “**Amazon**”, sourced from Kaggle, which includes product names, pricing, categories, discounts, customer ratings, and review details
- From that raw table, I created two structured tables, one focused on product-level details, and one capturing user reviews and customer sentiment
- To enable deeper, business-relevant analysis, I also built a **synthetic orders table** that includes order_id, order_date, and units_sold
- The original dataset didn’t include transaction data, but business metrics like revenue trends, sales performance, and buying behavior depend on it, so I designed the missing structure to make the analysis complete

ANALYSIS AND FINDINGS

Which products generate the highest total revenue for Amazon?

- The analysis involved calculating revenue by joining the products and orders tables, using the formula:
units_sold × discounted_price
- Electronics generates 81% of total revenue. All of the top 5 revenue-generating products came from the Electronics category, showing a clear dominance of this segment in total revenue share.

product_name	category	total_units_sold	total_revenue_million
Redmi Note 11 (Horizon Blue, 6GB RAM, 64GB S...	Electronics	7989	103.85
Redmi 126 cm (50 inches) 4K Ultra HD Android S...	Electronics	3092	102.03
Redmi 9A Sport (Carbon Black, 2GB RAM, 32GB ...	Electronics	14287	92.85
Redmi 108 cm (43 inches) 4K Ultra HD Android S...	Electronics	3343	90.26
MI 108 cm (43 inches) 5A Series Full HD Smart A...	Electronics	2983	74.57

Do higher-rated products sell more on Amazon?

- The dataset was evaluated for patterns between product ratings and units sold. Products were grouped by product_id and compared on two metrics: average rating and units_sold.
- There is no consistent correlation between high rating and its sales volume. Several products with 4.8+ ratings had low sales, while some top-selling items were rated below 4.0, indicating that rating alone does not drive purchasing behavior.

Top-rated product with low-selling

product_id	rating	total_units_sold
B09ZHCJDP1	5	1
B0BP7XLX48	5	1
B0BQRJ3C47	5	0
B0B53DS4TF	4.8	345
B0BQ3K23Y1	4.8	2
B0BR4F878Q	4.8	5301
B09WN3SRC7	4.7	453
B0B23LW7NV	4.7	553
B0BLC2BYPX	4.7	3
B0BM4KTNL1	4.7	1

Low-rated product with High-selling

product_id	rating	total_units_sold
B07GQD4K6L	4.1	36255
B014I8SX4Y	4.4	35197
B014I8SSD0	4.4	25811
B071Z8M4KX	4.1	22019
B07KSMBL2H	4.4	18857
B01DEWVZ2C	4.1	17374
B08HVJCW95	4.3	16471
B09GFM8CGS	4.1	14287
B07GPXXNNG	4.1	14003
B01DF26V7A	4.1	13827

Are products with high discounts converting to higher sales?

- To test whether deep discounts lead to higher product sales, we filtered products offering more than 50% discount and analyzed their corresponding units_sold. The dataset joined product and order data to surface underperformers despite aggressive pricing
- 17% of products offering 50%+ discounts still sold fewer than 10 units, proving that steep discounts do not ensure high conversions.

product_name	category	discount_percent	total_units_sold	rating
LAPSTER 12pcs Spiral Cable Protectors for Char...	Electronics	90	7	4.4
Croma 3A Fast charge 1m Type-C to All Type-C ...	Computers&Accessories	87	2	3.9
SHREENOVA ID116 Plus Bluetooth Fitness Smar...	Electronics	86	9	2.8
Lapster 5 pin mini usb cable, usb b cable,camer...	Computers&Accessories	85	8	4
Electvision Remote Control for led Smart tv Com...	Electronics	83	9	3.8
Caldipree Silicone Case Cover Compatible for 20...	Electronics	82	1	4.3
Aqua d pure Active Copper 12-L RO+UV Water ...	Home&Kitchen	80	3	4.5

Which users show the highest engagement based on review activity?

- To identify Amazon's most active users, we joined reviews and orders datasets and counted the number of reviews per user. Review count is used as a proxy for engagement, especially for repeat buyers or loyal customers.
- The top 10 most active reviewers contributed just 0.82% of all reviews, highlighting a highly distributed engagement pattern.

user_id	user_name	review_count
AE55KTFVNXYPD5FPYWP2OUPPEYNPQ	Sethu madhav	22
AG5DWPD54QGSLWJ6QUFERLPNAX4Q	E.C.GEORGE	22
AEBWA5I4QFCA3P3OBEPMELBGN4GQ	Akash Thakur	20
AECPFYFQVRUWC3KGNLJIOREFP5LQ	ArdKn	20
AHMGAC6QM62UXNEOCZIHLSXPP2Q	Burger Planet	20
AHIKJUDTVJ4T6DV6IUGFYZ5LXMPA	\$@ [TO\$]-	20
AF355FTXYAKFH5NYP RTE7SL3WO3Q	Aditya Kumar	20
AEAMIR3CMSA32IDEINSJKHRNANTA	indrajyoti d.	20
AFHROSCGIXUPV3FYQ7H5QOD46Q7Q	Justice ✨	20
AFC3FFC5PKFF5PMA52S3VCHOZ5FQ	S.ARUMUGAM	18

Which categories generate the highest revenue per unit sold on Amazon?

- A Common Table Expression (CTE) was used to calculate total_revenue and total_units_sold by category. A derived metric, Revenue per Unit Sold, was then computed to identify the most margin-efficient categories.
- Top-performing categories like Electronics and Car & Motorbike generated the highest revenue per unit, signaling strong pricing power and profitability.

category	total_revenue	revenue_per_unit
Electronics	2680483010	3777.21
Car&Motorbike	219866	2339
Home&Kitchen	301440451.63	2104.38
Computers&Accessories	270045568.45	919.25
Health&PersonalCare	315549	899

Category-wise KPI view for decision-making

- This SQL view aggregates core business metrics at the category level, enabling quick visibility into sales performance across segments.
- Metrics Included:
 - Total Revenue
 - Total Units Sold
 - Average Rating
 - Average Discount %
 - Total orders

category	total_revenue_millions	units_sold	average_discount	average_rating	total_orders
Electronics	2680.48	709,646	0.5	4.08	490
Home&Kitchen	301.44	143,244	0.4	4.04	448
Computers&Accessories	270.05	293,768	0.53	4.15	375
MusicalInstruments	5.42	7,504	0.46	3.9	2
OfficeProducts	1.83	6,486	0.12	4.31	31
Health&PersonalCare	0.32	351	0.53	4	1
Car&Motorbike	0.22	94	0.42	3.8	1
HomeImprovement	0.22	740	0.57	4.25	2
Toys&Games	0.15	1,024	0	4.3	1

Stored Procedure: GetTopProductsByRevenue()

- Encapsulated logic to retrieve top revenue-generating products
- The procedure simplifies repeated revenue analysis by returning the top N products based on total revenue.
- Execution: **CALL GetTopProductsByRevenue(5);**

product_name	total_revenue	units_sold	avg_rating
Redmi Note 11 (Horizon Blue, 6GB RAM, 64GB S...	103849011	7989	4.1
Redmi 126 cm (50 inches) 4K Ultra HD Android S...	102032908	3092	4.2
Redmi 9A Sport (Carbon Black, 2GB RAM, 32GB ...	92851213	14287	4.1
Redmi 108 cm (43 inches) 4K Ultra HD Android S...	90257657	3343	4.2
MI 108 cm (43 inches) 5A Series Full HD Smart A...	74572017	2983	4.2

SALES & CUSTOMER INSIGHTS

Sales & Product Performance

This dashboard highlights top-selling products, discount strategy, and revenue efficiency by category.

Total Revenue

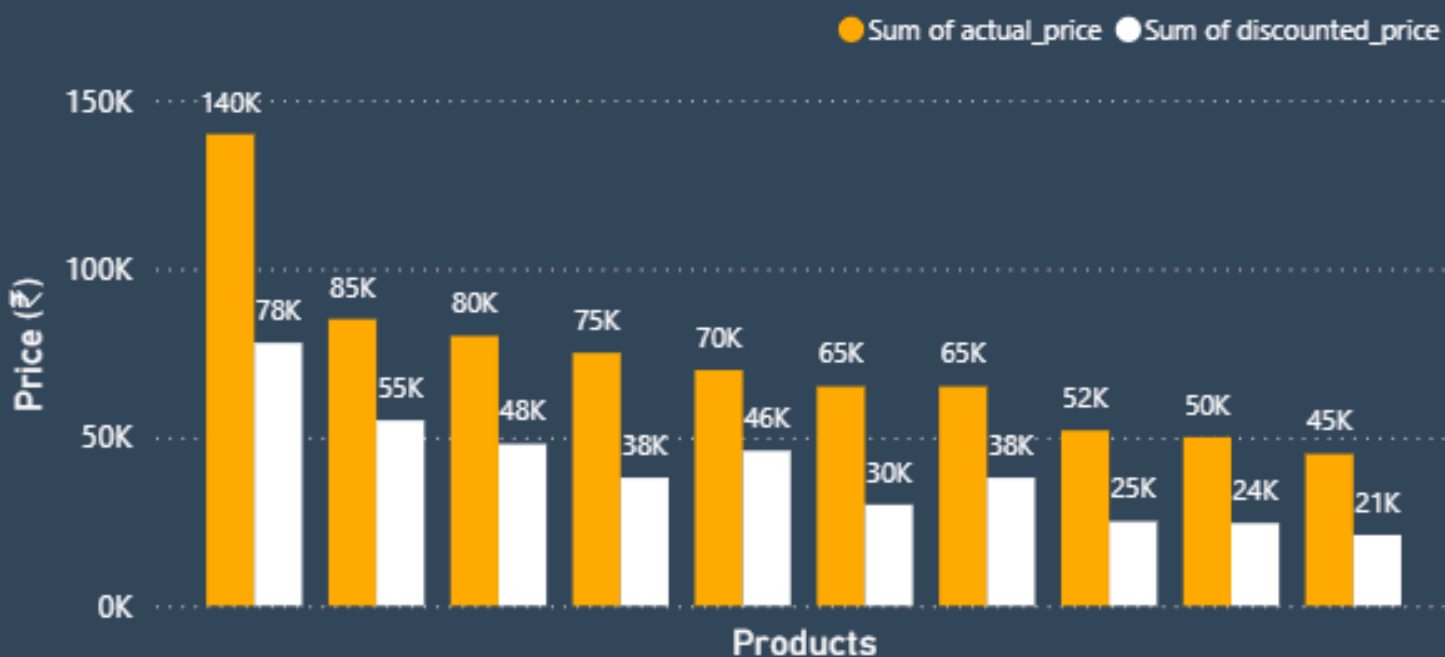
₹ 3,260M

Total Unit Sold

1163K



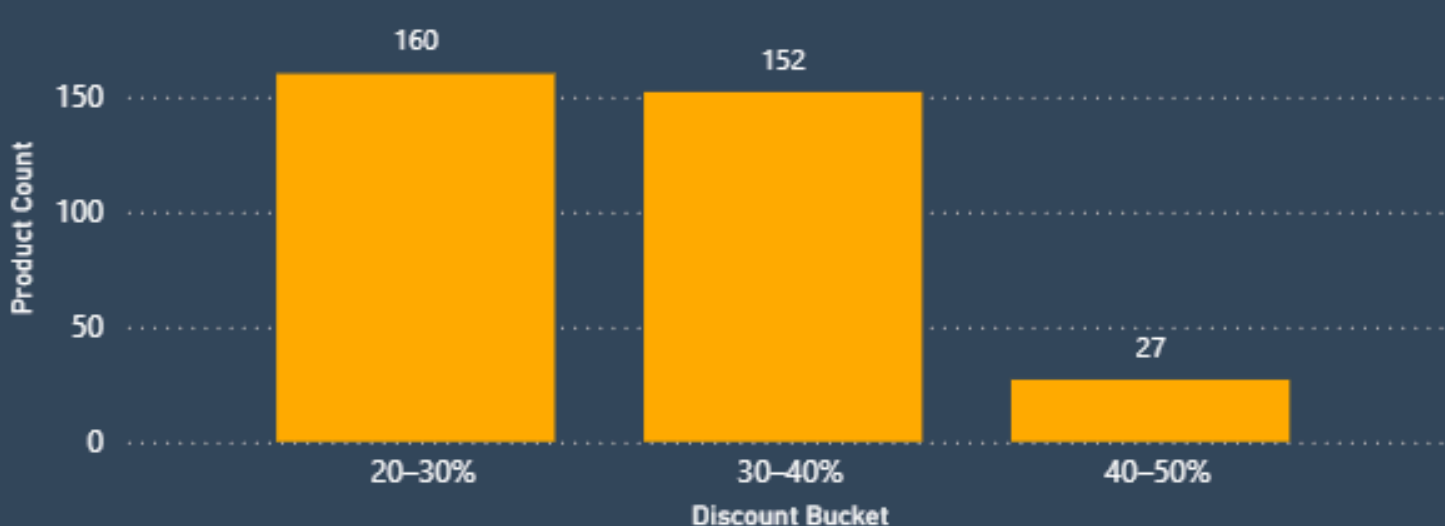
Price Comparison: Actual vs Discounted Price



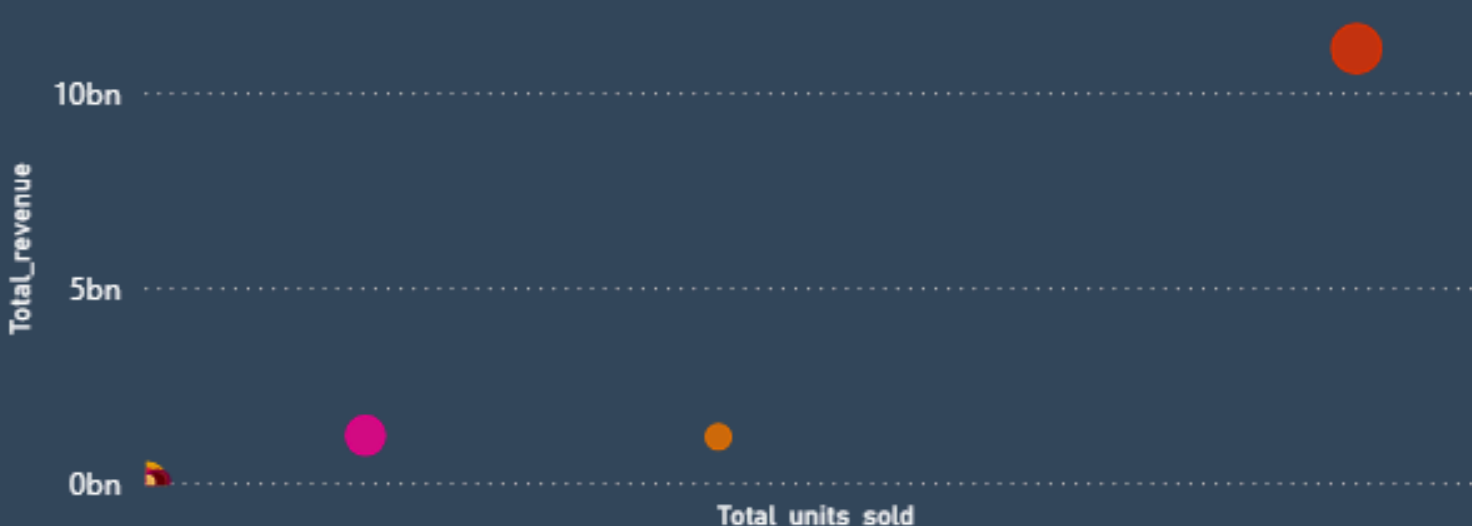
Top Products with 50% or Higher Discounts



Products Within Strategic Discount Range (20–40%)



Revenue vs Units Sold by Category



Customer and Experience Analysis



This dashboard highlights customer behavior through loyalty trends and review sentiment.

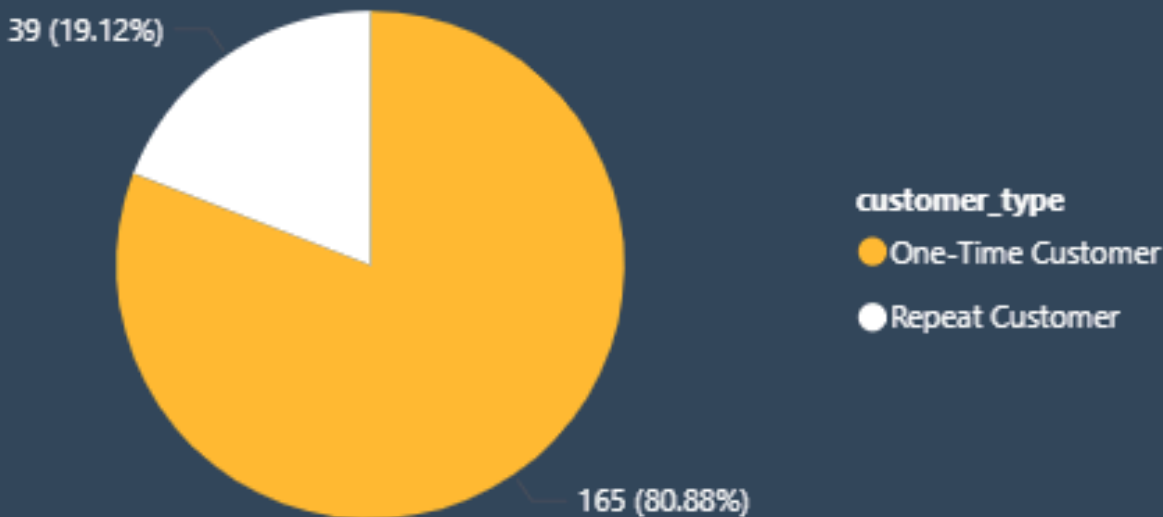
Number of Users

64.26K

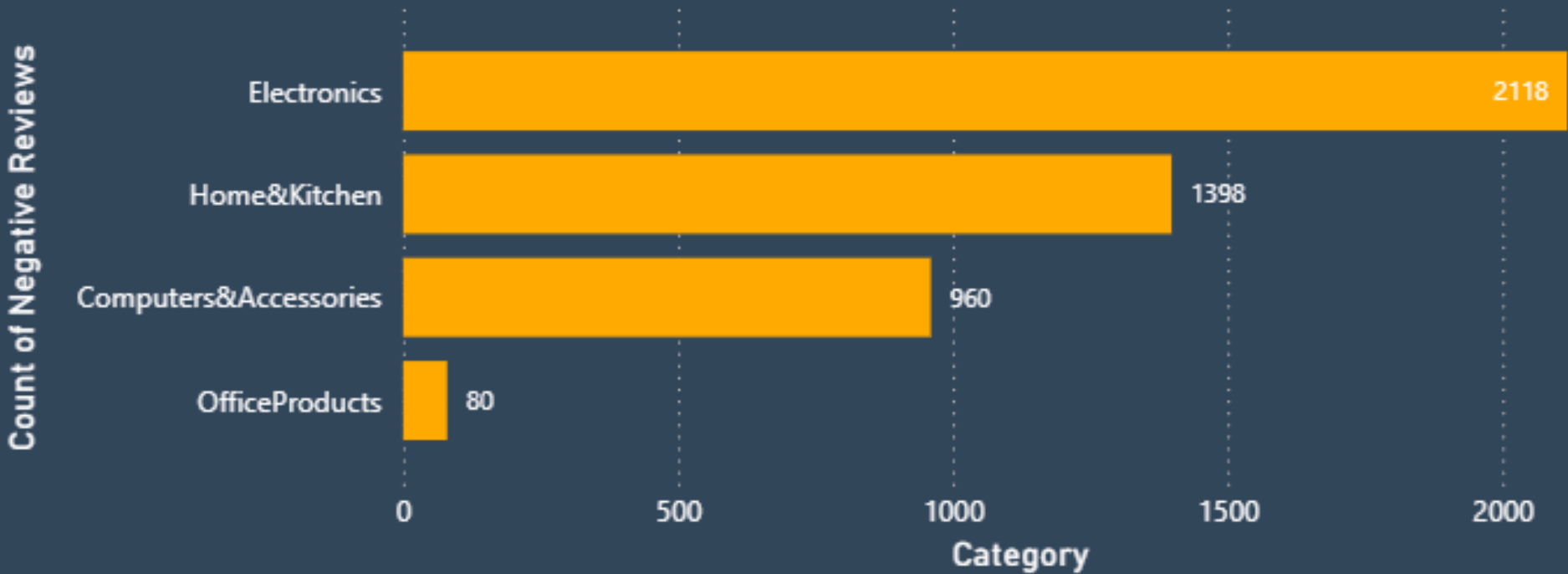
Average Rating

4.1

Customer Loyalty Breakdown



Categories with Most Negative Reviews



DASHBOARD 1: SALES & PRODUCT PERFORMANCE



- Total Revenue and Units Sold

Shows overall sales volume and total revenue generated across all products

- Top 10 Products Price Comparison

Compares original and discounted prices for the highest-selling products.

- High Discount Products

Highlights products with 50 percent or more discount but very low sales.

- Revenue vs Units Sold Scatter Plot

Shows how each product performed in terms of revenue and quantity sold.

- Product Distribution by Discount and Sales

Groups products into strategic bins based on discount percentage.



Dashboard 2: Customer and Experience Analysis

- Total Users and Average Rating

Displays total buyers and the average product rating across all purchases

- Customer Loyalty Distribution

Displays the ratio of returning versus new customers.

- Top Categories with Negative Reviews

Highlights which categories received the most poor ratings.

RECOMMENDATIONS



1. Invest more in the Electronics category.

It's driving over 82% of total revenue. This category should be prioritized in inventory planning and marketing campaigns.

2. Don't rely only on product ratings to predict sales.

Some highly rated products still had low unit sales. It shows that visibility and category relevance matter as well.

3. Discounts alone won't push products.


Even products with 50% or more discounts didn't sell in some cases around 17% of them barely moved. That shows discounts need to be paired with the right placement or targeting.

4. Most users don't leave reviews.

The top 10 users wrote less than 1% of all reviews. Maybe a small reminder or a thank-you coupon could help boost that number and get better customer feedback.

5. Grow with both volume and margin in mind.

Electronics is the top revenue driver by scale, but Computers & Accessories and Home & Kitchen offer strong revenue per unit. Balancing both can help increase overall profitability





THANK YOU!

Happy to connect!



juhiishriwastav@gmail.com



Juhi Shriwastav



<https://github.com/DA-Juhi>

