

AMAZON ELECTRONICS ANALYTICS

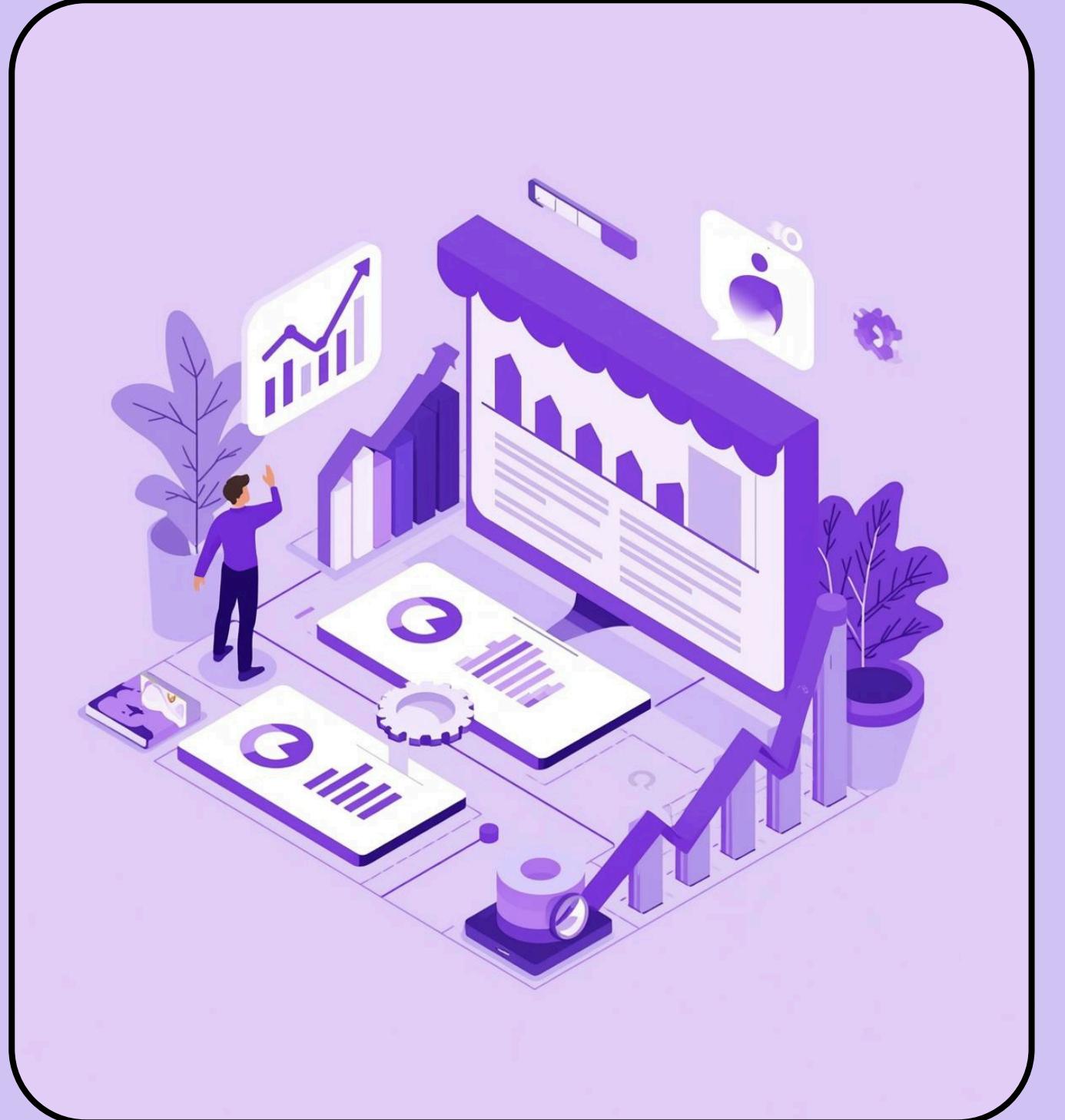
Optimizing Product Visibility & Sales Performance

Sector: E-Commerce

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Context & Problem Statement

PROBLEM STATEMENT

How do pricing, promotional strategies, and visibility factors drive product demand in Amazon's electronics category?

SECTOR CONTEXT

Amazon's electronics category: 9,999 products analyzed
Highly competitive marketplace where:

- Similar products compete for visibility
- Customer decisions driven by ratings, reviews, pricing
- Platform visibility = sales success

Decision-Makers:

- Amazon category managers
- Third-party sellers
- Marketing & inventory teams

From Raw Data to Clean Insights

Platform: Kaggle

Domain: Amazon Electronics

Original Size: 42,000+ products

Cleaned Size: 9,999 products (final analysis set)

Time Period: Snapshot data (August 2025)

Text-to-Numeric Conversion

- Rating: "4.5 out of 5 stars" → 4.5
- Bought: "100+ bought in past month" → 100
- Reviews: Text format → Numeric

Missing Values

- 25.9% missing buy_box_availability → Standardized
- Missing badges → Replaced with "No Badge"
- Blank reviews/purchases → Converted to 0

Data Standardization

- Availability: Add to Cart / Currently Unavailable (2 categories) - Badge types: Consolidated into 7 main categories - Removed duplicates and inconsistent entries

Final Clean Dataset

9 Core Columns:

- 1.rating
- 2.number_of_reviews
- 3.bought_in_last_month
- 4.is_sponsored
- 5.is_best_seller
- 6.is_couponed
- 7.buy_box_availability
- 8.badges
- 9.price

KPI & METRICS FRAMEWORK

	KPI	Formula	Business Value
1	Average Price	AVERAGE(price)	Pricing level analysis Result: \$163.07
2	Average Rating	AVERAGE(rating)	Customer satisfaction Result: 4.45 ⭐
3	Average Reviews	AVERAGE(reviews)	Trust & engagement Result: 5,769
4	Median Reviews	MEDIAN(reviews)	Typical engagement Result: 860 !
5	Monthly Sales Velocity	AVERAGE(bought)	Demand measurement Result: 1,652 units

KEY INSIGHTS

Engagement Inequality

- Average Reviews: 5,769
 - Median Reviews: 860
- 6.7x gap indicates small % of products dominate engagement

Customer engagement follows a long-tail distribution, where a small subset of products captures disproportionate attention.

Ratings Show Low Differentiation

- Average Rating: 4.45
- Most products: 4.0–4.8 range

Rating variation across the category is minimal, indicating ratings act as a baseline requirement rather than a strong separator.

Pricing Is Heavily Right-Skewed

- Average Price: \$163
- Median Price: \$69.95

Premium-priced outliers significantly elevate the category average while most listings compete in mid-range segments.

ADVANCED ANALYSIS

Social Proof Depth Differentiates More Than Rating Score

Badge types share similar ratings (~4.44.6), but review counts differ substantially. Performance dispersion aligns more with review volume than marginal rating differences

Visibility Signals Align With Higher Purchase Averages

Sponsored and Best Seller listings show higher average purchase levels compared to baseline listings. Platform visibility mechanisms are associated with stronger performance clustering.

Operational Availability May Influence Performance Stability

- 74.1% Available
 - 25.9% Unavailable
- A significant portion of listings were unavailable at snapshot time, indicating potential operational volatility within the category.

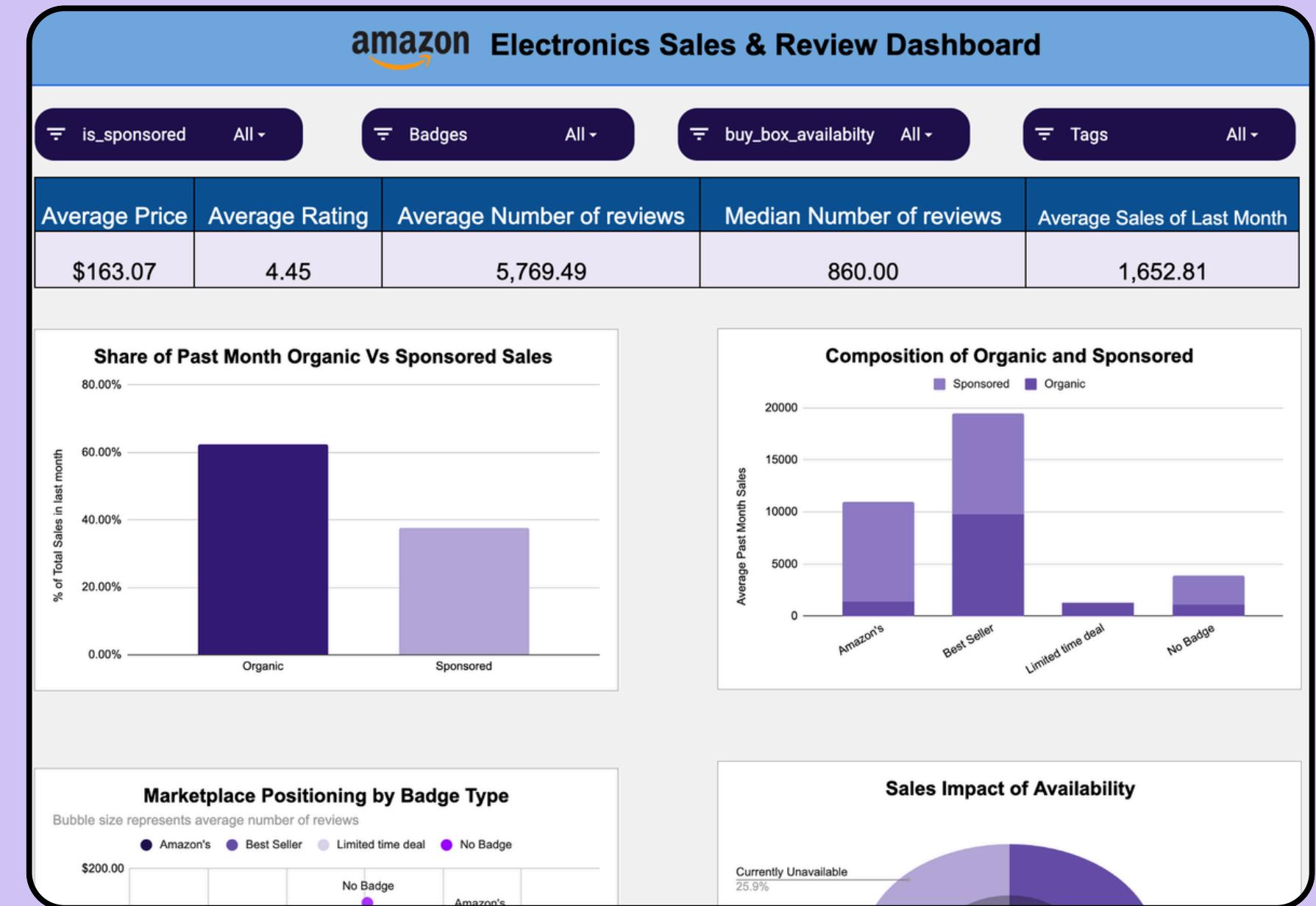
Dashboard Walkthrough

Executive View

- KPIs: Avg Price (\$163), Avg Rating (4.45), Avg Demand (1,652)
- Availability split: 74% available vs 26% unavailable

Operational View

- Sponsored vs Organic performance
- Demand by badges
- Rating distribution
- Price segmentation
- Filters: Sponsored, Buy Box, Badges, Tags



Prioritize Review Depth Growth (Not Marginal Rating Improvement)

RECOMMENDATIONS

Why:

- Ratings are tightly clustered (4.0–4.8, Avg 4.45).
- Review counts are highly uneven (Avg 5,769 vs Median 860 → 6.7× gap).
- Performance differentiates more by review volume than rating variation.

Recommendation:

Focus on structured post-purchase review generation to increase review depth, especially for high-rating products with low engagement.



Reallocate Visibility to High-Quality Underexposed Products

RECOMMENDATIONS

Why:

- Engagement follows a long-tail structure.
- Badge and visibility signals align with higher performance dispersion.
- A small subset dominates attention.

Recommendation:

Identify high-rating, mid-price products with low review counts and selectively allocate sponsored visibility to break engagement concentration.



IMPACT & VALUE

- **Performance Is Driven by Social Proof, Not Rating Differences**

Ratings are tightly clustered (Avg 4.45).

Review depth varies significantly (5,769 vs 860 median; 6.7× dispersion).

Value: Improves decision clarity by shifting focus from rating optimization to managing review accumulation as the true performance driver.

- **Marketplace Structure Creates Concentration Dependency**

Engagement follows a long-tail distribution.

A small subset captures disproportionate attention.

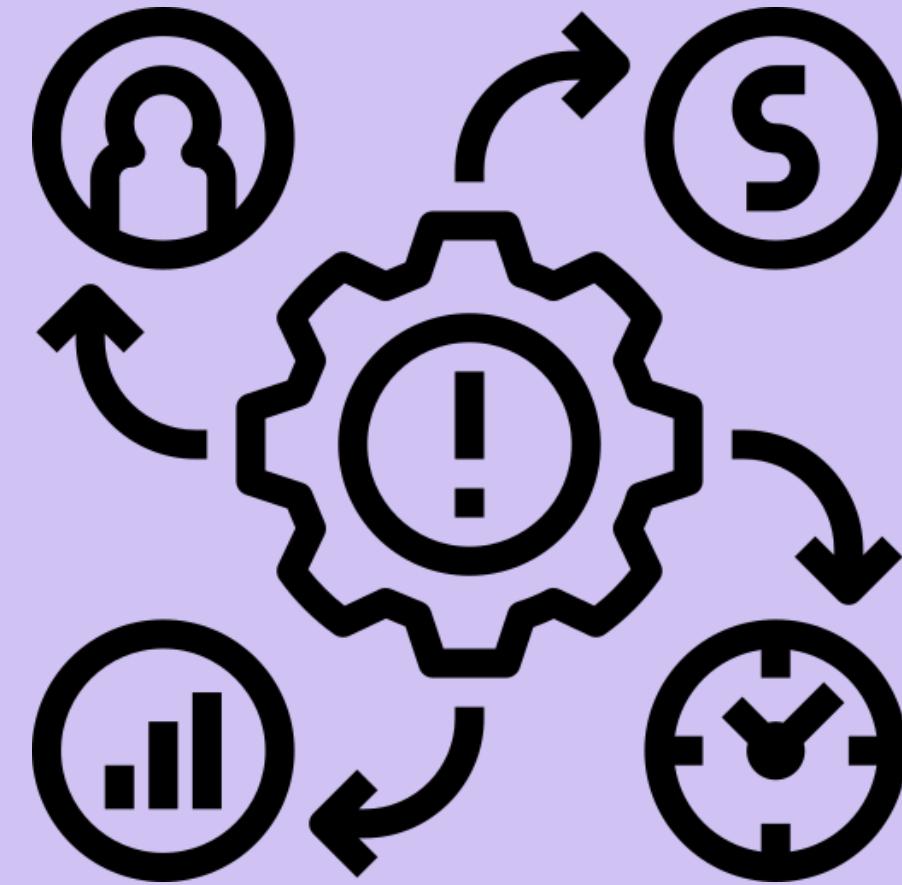
Value: Reveals structural dependency risk, enabling more balanced portfolio-level investment decisions.

- **Operational Stability Has Amplified Impact**

25.9% listings unavailable at snapshot time.

Demand is concentrated among fewer products.

Value: Highlights the importance of availability management in skewed demand systems to reduce amplified performance volatility.



LIMITATIONS & NEXT STEPS

Limitations

- Snapshot data (no historical trends)
- Demand is estimated, not actual sales
- No customer demographics or seasonality data

Next Steps

- Time-series demand analysis
- Category-level comparison
- Price optimization models
- Machine learning for demand prediction
- Integration with real sales and inventory data

