Enhancing the Quality of Amazon Reviews

While Safeguarding User Privacy Preferences

A Data-Driven Approach to Boost Purchase Confidence and Seller Credibility

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Summary

Value Proposition

Highlight key benefits like improved review quality, increased customer confidence, and actionable insights for sellers.

Outcome

Present a clear roadmap for implementing these tools and the expected impact on Amazon's review system and marketplace integrity.

Objective

Demonstrate how leveraging key analysis and predictive modeling on Amazon reviews can improve customer trust and enhance the shopping experience.

Assumptions + POC

In this project, we classified customer reviews based on rating scores, where ratings of 1 and 2 were treated as negative reviews and ratings of 4 and 5 as positive reviews. Ratings of 3 were excluded from the analysis due to their tendency to be ambiguous, often containing both positive and negative sentiments.

Understanding Customer Reviews and Ratings

Guidelines for customer reviews and ratings:

Leveraging Customer Reviews for Enhanced Quality and Improved Accuracy

Only customers who have spent at least $30 or completed at least 3 transactions on Amazon in the past 12 months are eligible to submit ratings and reviews. ★

Accuracy comparison : Positive Phrases x Negative Phrases

To empower Amazon customers and sellers with a powerful, data-driven tool that highlights the ***key*** top positive and negative phrases from verified reviews, enabling faster and more confident purchasing decisions.

- Deliver an impactful snapshot of product sentiment directly to customers and sellers.

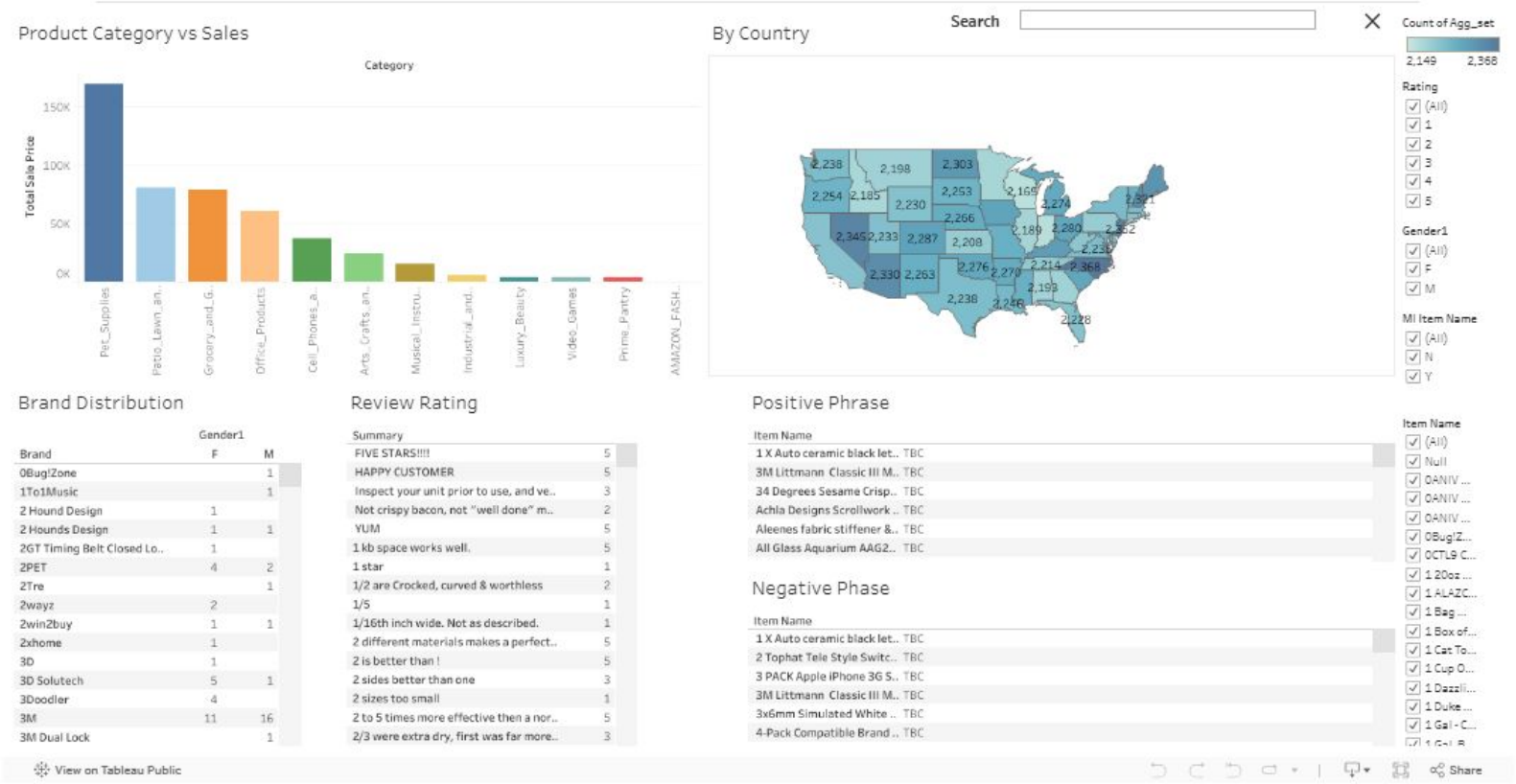
- Focusing on verified, trustworthy reviews, we provide an intuitive tool that helps users quickly determine product quality and relevance.

- Fostering more confident purchase decisions and ultimately improving the shopping experience.

Puppia Dog Harnesses

Condition	Positive Bigram	Weight	Negative Bigram	Weight
Amazon Verified Leverage	easy put	**9.23**	large dog	**4.24**
	perfect fit	**8.31**	small medium	**4.17**
Amazon Verified	easy put	6.46	large dog	2.89
	perfect fit	5.26	way big	2.44

Tableau Dashboard (Link)



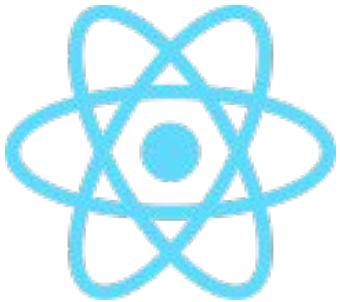
Web Application - Amazon Product Review Analysis

Tech Stack :

- React
- CSS (Sass)
- Tableau API (embedded)
- npm libraries: tableau, sass, react-router-dom, axios
- Express.js

Future:

- Complete backend
- Full interactive form for all web-page components
- Enhanced user inputs for selections

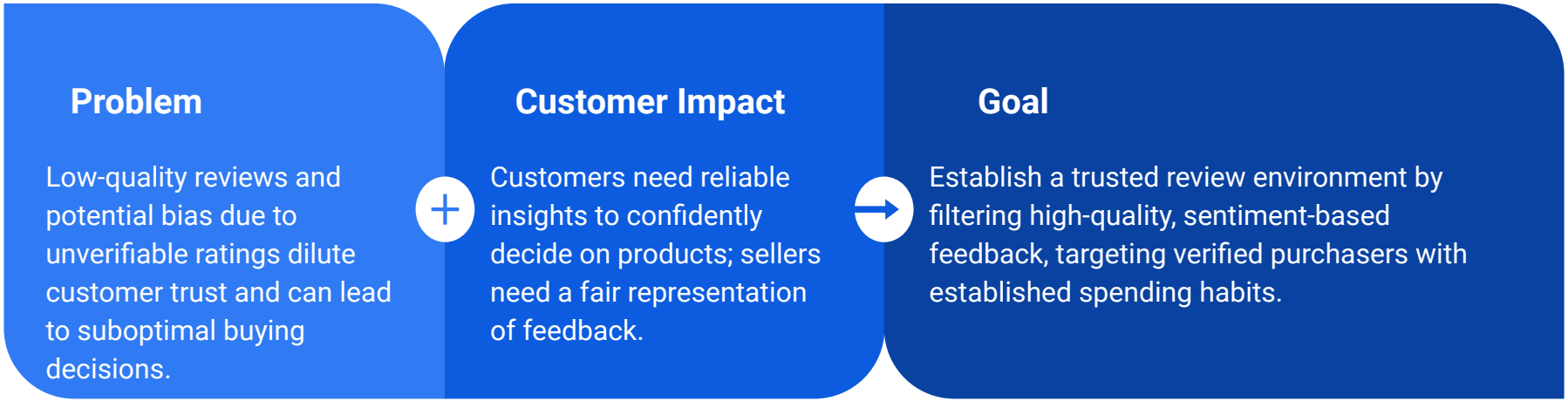


Github: https://github.com/matthewjung04/brainstation-industry-project.git

Thank you

Appendix

Challenges


Problem
Low-quality reviews and potential bias due to unverifiable ratings dilute customer trust and can lead to suboptimal buying decisions.
Customer Impact
Customers need reliable insights to confidently decide on products; sellers need a fair representation of feedback.
Goal
Establish a trusted review environment by filtering high-quality, sentiment-based feedback, targeting verified purchasers with established spending habits.

Understanding Customer Reviews and Ratings

Amazons guidelines:

1 - Only customers who have spent at least $50 on Amazon in the last 12 months can submit ratings and reviews.

2 - Before posting a review, we check if it meets our Community Guidelines. That includes our rules against creating, editing, and removing reviews in exchange for compensation.

3 - We check if the reviewer bought or used (e.g., streamed) the item on Amazon and paid a price available to most Amazon shoppers. If we confirm both, we label the review with Verified Purchase.

Assumptions:

In this project, we classified customer reviews based on rating scores, where ratings of 1 and 2 were treated as negative reviews and ratings of 4 and 5 as positive reviews. Ratings of 3 were excluded from the analysis due to their tendency to be ambiguous, often containing both positive and negative sentiments.

More from assumptions ….

We excluded 3-star ratings based on psychological insights from National Strategic, which suggest that 3-star reviews often reflect mixed or neutral emotions. Customers giving 3 stars tend to have lukewarm experiences, making it hard to categorize them as purely positive or negative.

The research highlights:

- Negative Bias: Dissatisfied customers often leave 1 or 2 stars to warn others or express frustration.
- Positive Reinforcement: Satisfied customers who were pleased with their experience tend to leave 4 or 5 stars.

Our classification aligns with these tendencies:

- 1 - 2 stars: Negative experiences.
- 4 - 5 stars: Positive experiences.
- 3 stars: Neutral, balanced viewpoints, making them unsuitable for clear categorization.

Reference: https://www.nationalstrategic.com/why-would-they-write-that-the-psychology-of-customer-reviews/

Accuracy comparison

The "Leverage" approach demonstrates a slight accuracy improvement of approximately 1%, representing a modest but meaningful enhancement in the model's ability to classify reviews accurately. Importantly, this improvement was achieved without sacrificing accuracy, validating that our modified approach both maintains and enhances the model's performance. This strengthens our results and provides a more precise and reliable outcome for our customers.

Metric	Amazon Verified ($50 Only)	Amazon Verified Leverage (≥$30 or ≥3 Transactions)
Overall Accuracy	85.67%	**86.25%**
Negative Precision	0.61	**0.69**
Neutral Precision	0.32	**0.42**
Positive Precision	0.90	0.89
Negative Recall	0.50	**0.49**
Neutral Recall	0.19	**0.12**
Positive Recall	0.96	0.98
Positive Class Stability	High precision and recall	High precision and recall
Neutral Class Challenge	Low recall, moderate precision	Slight improvement in precision

Accuracy comparison

- Overall Accuracy Improvement: The "Amazon Verified Leverage" condition achieved a slightly higher accuracy (86.25%) compared to the stricter $50-only verification (85.67%).

- Negative and Neutral Precision: The "Amazon Verified Leverage" method shows better precision in both negative (0.69 vs. 0.61) and neutral (0.42 vs. 0.32) classes.

- Positive Class Stability: The positive class remains robust in both cases, with high precision and recall, indicating a strong ability to identify positive sentiments accurately across both conditions.

- Neutral Class Challenge: Both models struggle with recall for the neutral class, but the "Leverage" method provides a slight improvement in precision.

Conclusions

Enhanced Verification: Adjusted Amazon's verification threshold to $30 or 3 transactions, resulting in a 1% accuracy improvement in sentiment classification.

Insightful Bigram Analysis: Extracted top positive and negative phrases, helping customers and sellers make quicker, data-driven decisions.

Interactive Dashboard: Built a Tableau dashboard and website for real-time review exploration, increasing accessibility for users.

Scalable Impact: Demonstrated a scalable model that strengthens trust and transparency in the Amazon marketplace through data-driven insights.