Aspect Sentiment Analyzer

ANALYSES DIFFERENT ASPECTS FROM CUSTOMER REVIEWS FOR BUSINESSES

Review Sense

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Target Market & Value propositions

Our solution is designed for businesses that require **detailed consumer sentiment insights** to optimize their **products, marketing, and customer experience**.

E-Commerce Platforms (Amazon, Flipkart, Shopify) - To enhance product recommendations based on customer sentiment trends.

Online Retailers - To adjust pricing, inventory, and marketing campaigns based on real-time customer sentiment trends.

Value propositions:

- Granular Insights for E-Commerce
- Go beyond star ratings to understand *what exactly* customers love or dislike.
- Data-Driven Business Decision Making

Motivation

- Traditional sentiment analysis provides overall polarity (Positive, Negative, Neutral).
- Business needs detailed insights into specific product attributes like price, quality, usability and durability.
- Understanding what customers like or dislike about a product helps in data driven decision making.
- E commerce platforms and brands need granular customer insights to improve product features and for better marketing strategies.

Solution

- This project uses the BERT model to perform both sentiment analysis and aspect-based categorization on Amazon product reviews and GPT-2 model generates sentiment score and justification.
- It extracts detailed insights by identifying not just the sentiment but also specific aspects like quality, price, and usability.
- The goal is to turn unstructured review data into actionable intelligence for product improvement and customer satisfaction.

Key winning features and Capabilities

1. Dual-Mode Analysis with BERT

- **Performs both sentiment classification and aspect-based categorization in one unified system.**
- Goes beyond overall sentiment to highlight specific product attributes (e.g., price, quality, usability).

2. Deep Contextual Understanding

- Uses **fine-tuned BERT models** for nuanced interpretation of customer language.
- Detects subtle cues and sentiment shifts that keyword-based models miss.

3. Scalable, End-to-End Architecture

- **Full-stack solution from data ingestion to dashboard visualization.**
- Handles massive datasets like Amazon reviews efficiently and securely.

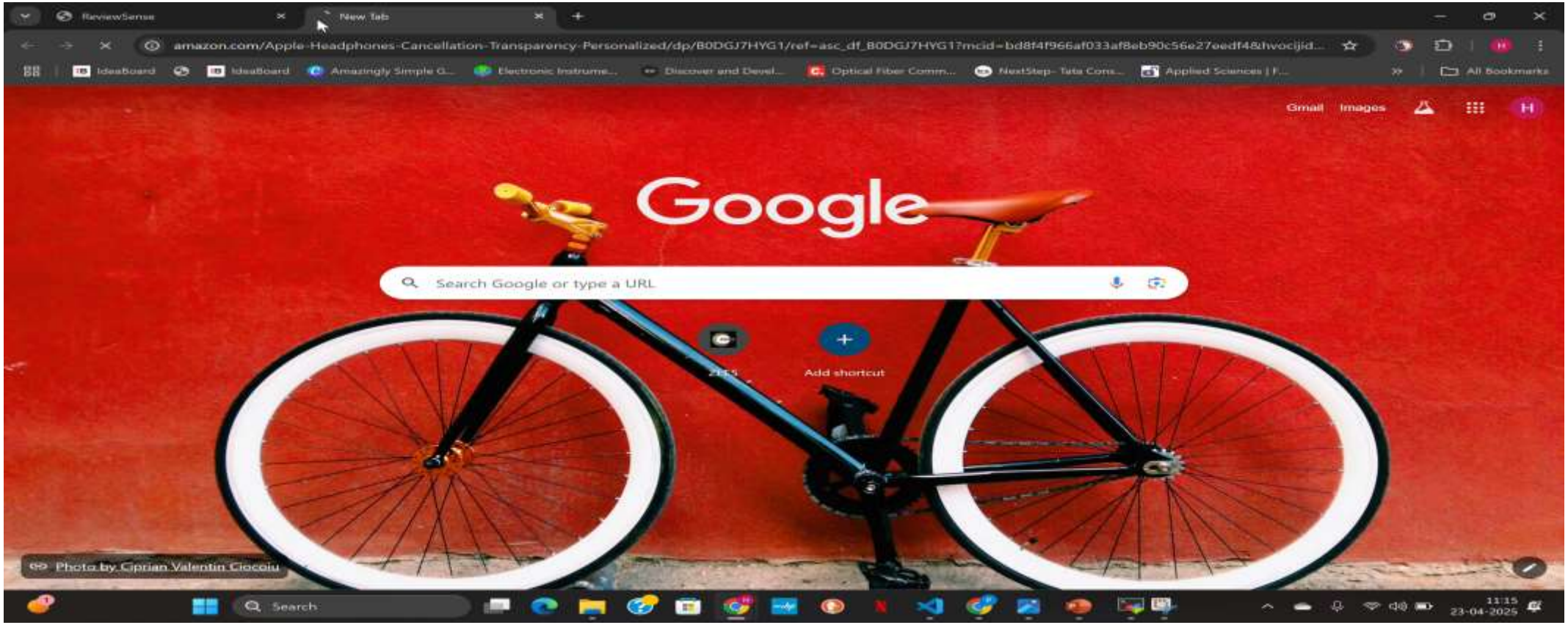
Justification

- Uses BERT for contextual analysis to accurately capture sentiment and product aspects.
- Uses GPT-2 to generate the sentiment score and Justification to display statistical result for multiple review analysis.
- Identifies both overall sentiment and specific attributes like quality, price, and usability.
- The system's modular design allows for easy scalability and adapts to new datasets. Provides actionable insights, enabling businesses to understand why customers feel a certain way.
- Helps drive better product and service decisions through targeted feedback analysis.

Current Status

- The initial prototype has trained ML Models which extracts Aspect and analyze sentiment which is placed in Azure storage account.
- The Flask app is integrated with Azure Functions, sending data to Databricks for sentiment and aspect-based analysis using a fine-tuned BERT model.
- A basic webpage dashboard is in place to display sentiment and aspect insights, with further refinement underway.
- Next steps involve optimizing the model, expanding product aspects, and enhancing the user interface for improved interactivity.

Demo Video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Business Model

- The revenue model for this project focuses on offering subscription-based services to e-commerce platforms and businesses.
- By providing advanced review analysis tools, companies can gain actionable insights into customer feedback, improving product development, marketing, and customer service.
- Additionally, API access to the sentiment and aspect-based analysis can be monetized, allowing businesses to integrate the tool into their existing systems.
- The service will also offer premium features like custom model fine-tuning and in-depth data visualizations for a higher tier of users.

Team Members

- Sai Muneesh Puligundla - Frontend, Flask, Azure function App.
- Vandana Recharla - Azure Databricks.
- Harshitha Chennappa - Machine Learning models , Deployment.

Conclusion

- The first step is to finalize the model development, optimizing the BERT-based sentiment and aspect analysis.
- Afterward, we'll validate the model's performance using a separate test set from the Amazon Product Review dataset to ensure accuracy and robustness.
- For market entry, we'll target small and mid-sized e-commerce platforms, offering a scalable solution via API integration and subscription plans.
- In the scale-up phase, we will expand the user base to larger enterprises, enhance the user interface, add customization options for specific industries, and introduce advanced analytics for deeper insights.
- As demand grows, we will focus on building partnerships and continuously improving the platform for long-term customer retention.

References

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THANK YOU