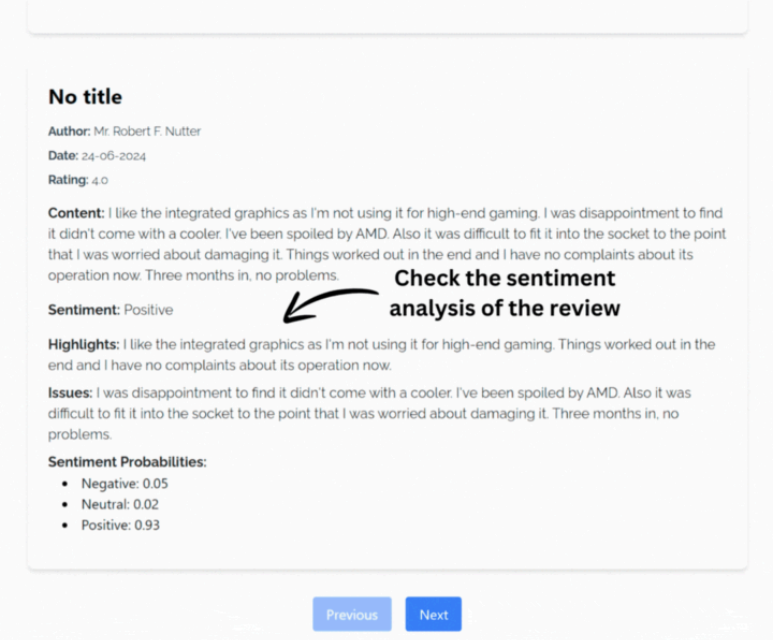
PS-11

Intel Products Sentiment Analysis from Online Reviews

Effortless Review Analysis and Insights

SRM Institute of Science and Technology
Team - INCOGNITO
github



Team members and contribution:

Sujal Limje

- Backend development
- BERT model training
- Data extraction.

Kanishk Reddy

- Frontend development
- Data pre-processing
- Backend integration

MENTORS :

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Problem Statement

- Modern businesses often struggle to analyze customer reviews effectively.
- Extracting insights from large volumes of text data is time-consuming and requires advanced techniques.
- Manual analysis of reviews can lead to human errors and inconsistencies.
- Businesses need to stay updated with evolving customer sentiments to remain competitive.
- There is a need for a solution that can automatically analyze sentiments and visualize trends over time.

Unique Idea Brief (Solution)

Our project addresses the challenge of extracting meaningful insights from large volumes of customer reviews. By leveraging advanced Natural Language Processing (NLP) techniques, our solution automates the sentiment analysis process, highlighting key aspects of each review and offering actionable insights to businesses.

- Automated review analyzer leveraging state-of-the-art NLP techniques.
- Provides sentiment analysis for customer reviews (positive, neutral, negative).
- Highlights positive and negative parts of each review.
- Offers improvement tips based on negative aspects.
- Generates visual word clouds of frequently mentioned terms.
- Visualizes past trends in review sentiments.

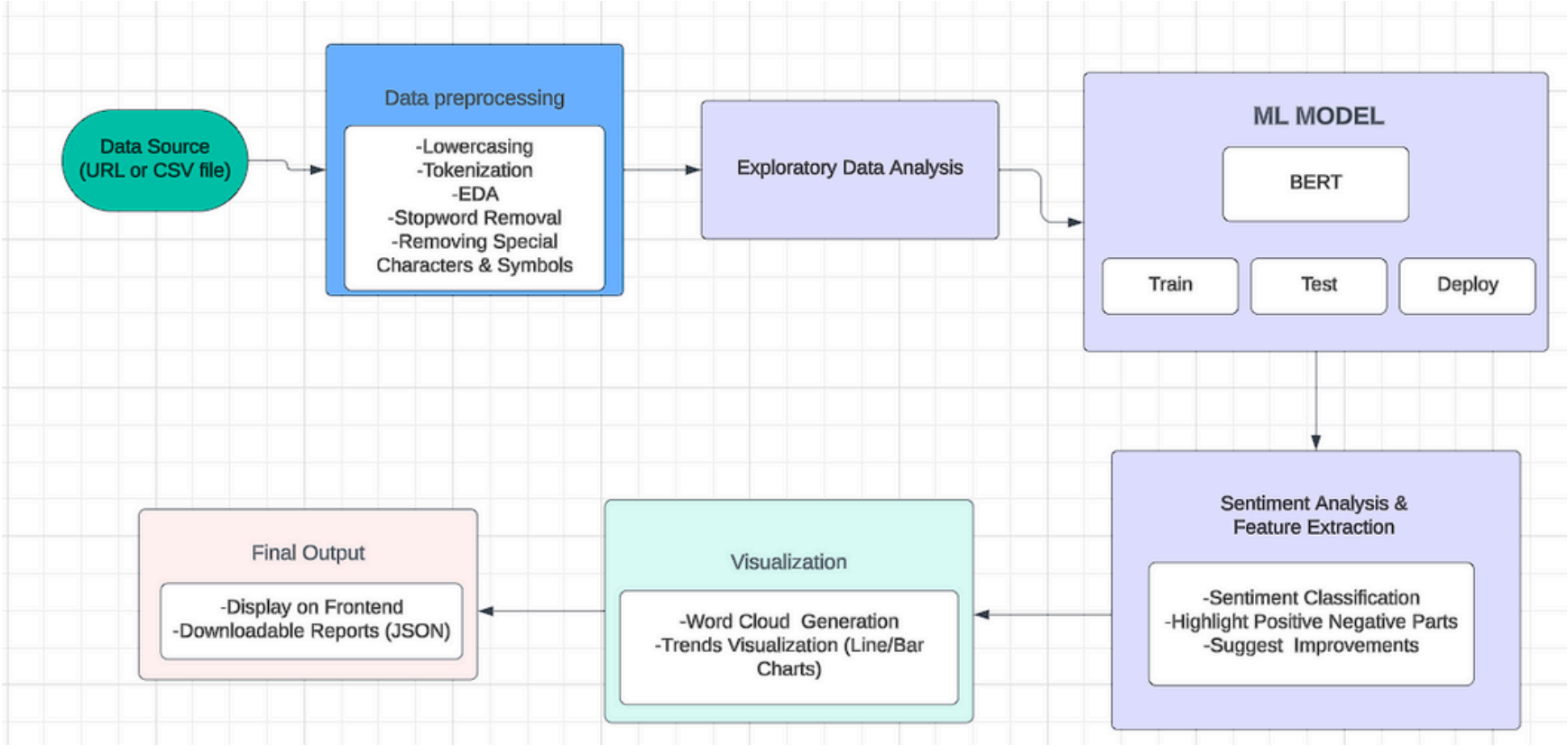
Features Offered

- **Automated Sentiment Analysis:** Uses BERT to classify reviews as positive, neutral, or negative. Highlights positive and negative parts and suggests improvements.
- **Word Cloud Generation:** Visualizes frequently mentioned words in reviews to identify common themes.
- **Past Trends Visualization:** Graphs review sentiments over time to track changes in customer perception.
- **CSV Upload:** Allows batch processing and analysis of large datasets through CSV file uploads.
- **Downloadable Reports:** Provides analyzed data in JSON format for further analysis and record-keeping.

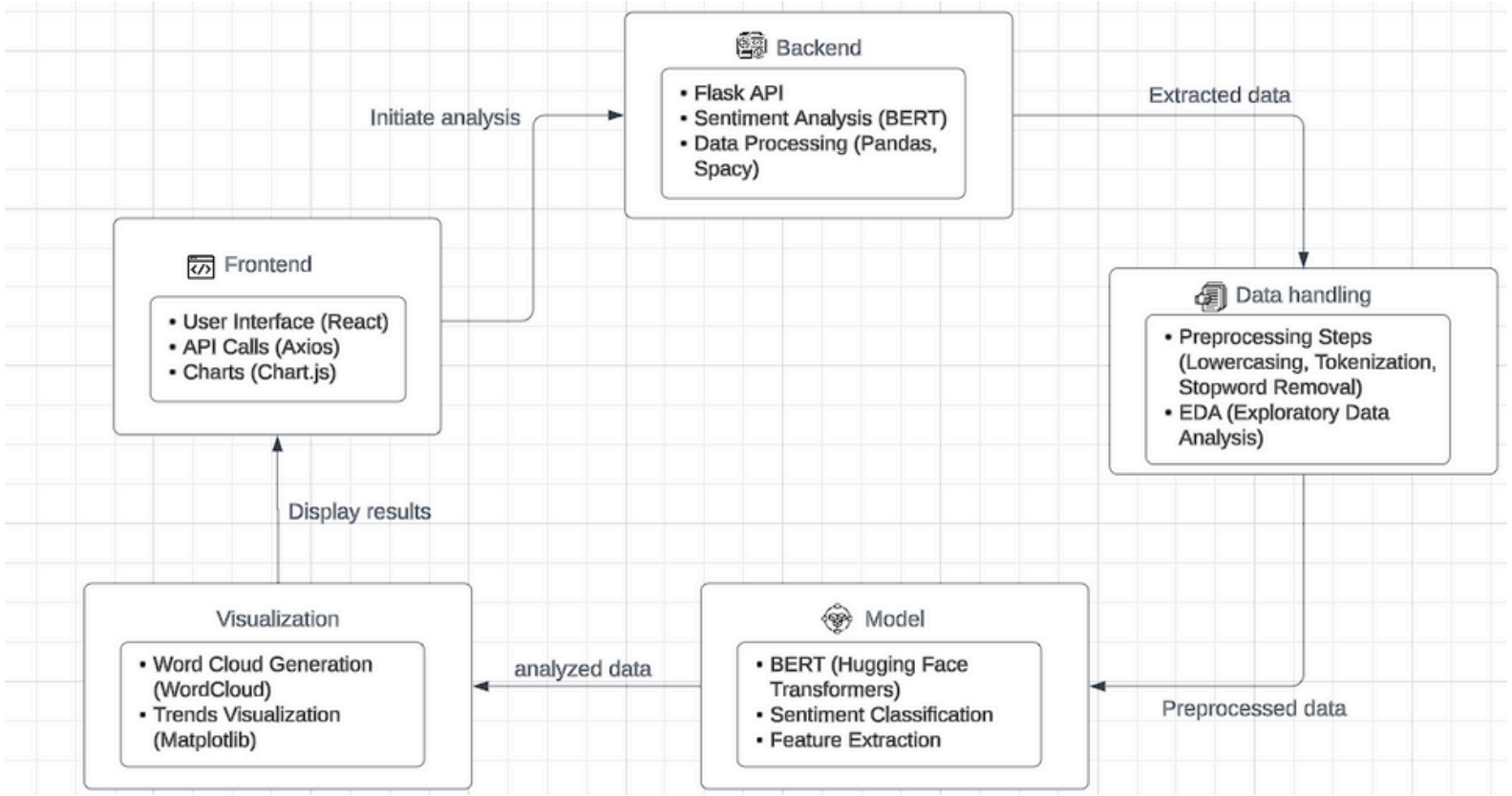
Methodology

- **Data collection:** ScraperAPI was used to extract around 2000 reviews, which were then stored in a CSV file for further analysis.
- **Data Preprocessing:** The reviews were converted to lowercase, tokenized into individual words, and had stopwords and special characters removed to ensure uniformity and relevance in sentiment analysis.
- **Feature extraction:** Utilizing the BERT model, the system classifies review sentiments, highlights positive and negative parts, and suggests improvements based on the analysis.
- **Visualization:** Include word clouds and sentiment trend graphs for easy interpretation

Process flow



Architecture Diagram



Technologies used

Frontend: • React • Axios • Chart.js	**Visualization:** • WordCloud • Matplotlib	**Data Handling:** • Pandas • Spacy • TextBlob
Backend: • Flask • Python • BERT • BeautifulSoup4 • Flask-CORS • Requests	**Model Training:** • PyTorch • HuggingFace Transformers • GPU Acceleration	

Conclusion

- Our project offers a comprehensive solution for analyzing and visualizing customer reviews.
- By leveraging advanced NLP techniques with the BERT model, it provides accurate sentiment analysis and highlights key aspects of reviews.
- The system not only generates insightful word clouds but also tracks sentiment trends over time, helping businesses understand and improve their products.
- With easy CSV uploads and downloadable reports, users can efficiently manage large datasets.
- The integration of a robust frontend and backend ensures seamless user experience and reliable performance.