

CritiqueCortex

Track : Development

Team Members :

Sanil Arun Chawla (schawla7)

Yujie Miao (yujiem4)

[Functions and Users]

Tool Definition:

Type: A browser extension that seamlessly integrates with popular e-commerce platforms.

Detailed Functions:

Review Aggregation:

This function detects when a product page is loaded and extracts all relevant review data (e.g., review text, ratings, metadata) using web scraping or API calls. It inputs raw HTML or API responses and outputs a structured dataset (e.g., JSON) of cleaned reviews.

LLM Summarization:

This function processes the aggregated reviews using a large language model. It inputs the structured review dataset and produces a concise text summary outlining the main pros and cons, overall sentiment, and recurring themes.

Interactive Querying:

This function enables users to ask follow-up questions about the reviews. It takes the user's natural language query and the review dataset as input constructs a dynamic prompt and outputs a targeted, context-aware response generated by the LLM.

Aspect-Based Summarization:

This function organizes reviews by specific product aspects (like battery life or durability). It inputs the review dataset, identifies common elements using NLP techniques, and outputs mini-summaries for each identified aspect.

Target Users:

- **Shoppers:** Consumers seeking quick insights to make informed purchase decisions without reading through hundreds of reviews.
- **Product Researchers & Reviewers:** Individuals who require efficient aggregation and analysis of consumer feedback.

- **Market Analysts:** Professionals tracking customer sentiment and product performance trends over time.

[Significance]

- **Addressing a Real Pain Point:**
Consumers often face information overload on e-commerce sites due to numerous, unstructured reviews, leading to decision fatigue and misinterpretation of product quality. This tool consolidates review data into actionable insights, helping users make informed purchasing decisions more efficiently.
- **Broader Impact:**
By enhancing transparency and trust in online reviews, the tool promotes more informed consumer behavior and could drive improvements in product feedback analysis industry-wide.

[Approach]

Development Strategy:

- **Architecture & Implementation:**
 - **Frontend:**
 - Build the Chrome extension interface using HTML, CSS, and JavaScript/TypeScript.
 - Utilize browser APIs for dynamic DOM parsing and data extraction.
 - **Backend/Data Processing:**
 - Develop lightweight server-side components (using Python with Flask or Node.js) if needed for more intensive processing.
 - Process review data locally in the extension wherever possible to minimize latency.
 - **LLM Integration:**
 - Leverage a hosted LLM API (such as GPT-4) with engineered prompts for summarization, sentiment analysis, and natural language querying.
 - Implement asynchronous API calls with caching to mitigate rate limits and reduce response time.

[Evaluation]

- **User Testing:**
 - Conduct surveys and usability sessions with online shoppers and product researchers to assess the clarity, accuracy, and overall utility of the summaries and interactive query features.
- **Automated Metrics:**
 - Utilize evaluation metrics such as ROUGE to compare LLM-generated summaries against manually curated benchmarks.

[Timeline]

- **Weeks 1-2:**
 - Develop core functionality for review extraction, text cleaning, and basic summarization.
- **Weeks 3-4:**
 - Integrate the LLM API for advanced summarization and implement aspect-based analysis and interactive querying features.
- **Week 5-6:**
 - Refine UI/UX design, perform cross-site compatibility testing, and optimize caching and performance, followed by final testing.

[Task Division]

- **Yujie Miao (Frontend & Integration):**
Develop the Chrome extension interface, implement DOM parsing for review extraction, design the user-friendly UI/UX, and lead user testing sessions.
- **Sanil Arun Chawla (Backend & LLM/Data Processing):**
Handle review aggregation via web scraping/API integration, integrate the LLM API for summarization and interactive Q&A, develop aspect-based analysis and suspicious review detection modules, and manage performance optimizations.