EPPS 6323 Proposal: Forecasting User Sentiment Shifts in Mobile Apps

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Background

Understanding how users perceive an app is crucial for business success. App reviews provide direct insight into user sentiment, reflecting whether users love the current version, see room for improvement, or have encountered issues severe enough to cause them to uninstall it.

Apps must evolve to stay competitive by adding features that help users complete tasks more efficiently or delightfully. However, introducing change can also trigger an initial backlash. Psychological research suggests that people often resist change, which may explain why major design updates sometimes receive negative reactions.

Moreover, a single negative review might represent a larger group of users who experienced similar issues but did not leave feedback. Thus, common complaints can serve as early warning signs of broader user dissatisfaction.

Software development teams and product managers can stay ahead of the curve by tracking changes in sentiment, user pain points, and evolving expectations. Analyzing an app's release history can reveal patterns in how users react to significant updates, allowing teams to forecast potential backlash in future releases.

This project focuses on extracting actionable insights from Apple App Store reviews to identify usability issues and track shifts in user sentiment over time. The ultimate goal is to predict changes in overall user satisfaction and anticipate predictable drops in sentiment related to app updates.

Research Question

How can we forecast shifts in overall user sentiment for a mobile app by analyzing the temporal patterns in its user reviews, specifically by examining the balance of positive versus negative comments and the frequency of key usability complaints about app release dates? This study's dependent variable is the aggregate sentiment score or average star rating computed for each defined period between app updates. In contrast, the independent variables include review polarity, frequency of specific usability complaint keywords, and overall review volume during these intervals. By segmenting the review data into periods bounded by app updates and applying sentiment analysis, I aim to predict whether user satisfaction will increase or decrease following new releases.

Methods

- **Data Collection:**
  - Retrieve the unique app ID using the iTunes Lookup API based on the app name.
  - Harvest user reviews and metadata (user IDs, timestamps, star ratings) using Apple's public RSS feed, parsing the "link" array to determine pagination.
- **Data Processing and Analysis:**
  - Apply natural language processing (NLP) to assign sentiment scores to each review and extract keywords related to usability issues.
  - Aggregate sentiment scores and keyword frequencies for time periods defined by app release dates.
- **Forecasting:**
  - Develop a time-series forecasting model (e.g., using ARIMA, Prophet, or an LSTM-based model) to predict future overall sentiment based on historical trends and key predictors (e.g., review volume, frequency of complaints).
- **Evaluation:**
  - Validate the forecasting model by comparing predictions with actual sentiment shifts observed post-update and refine the model as necessary.