"Smart View – An AI -Powered Visualization, Reviewing & Recommendation App "

Mrs. M A Shaikh
Department of Computer Technology
K. K Wagh Polytechnic Nashik Presented By

Ms. Kalyani K Pawar
Department of Computer Technology
K. K Wagh Polytechnic Nashik

Ms. Krutika A Nathe
Department of Computer Technology
K. K Wagh Polytechnic Nashik

Ms. Pratiksha V Pingle
Department of Computer Technology
K. K Wagh Polytechnic Nashik

Ms. Srushti S Patil
Department of Computer Technology
K. K Wagh Polytechnic Nashik

------------------------------------****------------------------------------

Abstract— In the dynamic mobile application ecosystem, user reviews will significantly influence app quality, user retention, and market success across platform such as Google Play Store. smartview will be an AI-powered sentiment analysis and visualization system that will transform unstructured user feedback into actionable insights for developers. The system will incorporate a custom multiplatform web scraper to collect reviews, ensuring a rich and updated dataset. Using Natural Language Processing (NLP) preprocessing, irrelevant elements such as emojis, stop words, and noise will be filtered out to retain meaningful textual data for analysis. At its core, smartview will integrate advanced sentiment classification techniques. Traditional supervised learning models such as Logistic Regression, Naïve Bayes, and Support Vector Machines (SVM) will be combined with deep learning approaches like Long ShortTerm Memory (LSTM) networks to enhance contextual understanding and will achieve high classification accuracy. This will enable the system to categorize reviews into Positive, Negative, or Neutral sentiments while adapting to evolving linguistic trends in user opinions.

Furthermore, Smartview will incorporate an intelligent recommendation engine. By analyzing aggregated feedback, the system will automatically generate suggestions for improvement. For instance, if a significant portion of users will highlight dissatisfaction with graphics, the system will recommend targeted enhancements to address this concern. By unifying review collection, AI-driven sentiment analysis, visualization, and recommendation, smartview will empower developers with data-driven decision-making capabilities. This will lead to improved app performance, higher user satisfaction, and a competitive edge in the rapidly evolving mobile app marketplace.

Keywords: Sentiment Analysis, Machine Learning, Deep Learning, Natural Language Processing,LSTM, Google Play Store Reviews, Data Visualization, User Feedback, Multi-App Analysis, AIPowered Dashboard

1. INTRODUCTION

In today's competitive mobile app market, user satisfaction is essential for an app's success. With millions of apps on platforms like Google Play Store, developers must monitor user reviews to improve quality and retain users. However, analyzing large volumes of text reviews manually is difficult and inefficient.

Sentiment Analysis, a Natural Language Processing (NLP) technique, helps classify reviews as positive, negative, or neutral. The Smartview project is an AI-based system that automatically collects app reviews, cleans the data, analyzes sentiment, and provides insights. It uses machine learning models like Logistic Regression, Naïve Bayes, SVM, and deep learning models like LSTM for accurate analysis.

Smartview also provides an interactive dashboard with charts and trends to help developers understand user feedback easily. These visualizations enable developers to quickly identify common complaints, track sentiment changes over time, and understand which features users appreciate the most. By transforming raw textual feedback into meaningful visual insights, developers can make faster and more informed decisions.

Another important advantage of the Smartview system is its ability to handle reviews from multiple applications simultaneously. Instead of analyzing a single app, the system can compare user feedback across different apps or app versions. This helps developers understand market trends, identify competitors' strengths and weaknesses, and improve their own applications accordingly.

Moreover, the system incorporates intelligent recommendation mechanisms that highlight the most frequent issues mentioned in reviews. For example, if a large number of users complain about slow performance or frequent crashes, the system will detect this pattern and suggest focusing on performance optimization. Such automated insights help reduce the time required for manual analysis and support developers in prioritizing improvements.

The integration of machine learning, deep learning, and visualization tools makes Smartview a powerful platform for app review analysis. By providing clear insights into user opinions, the system helps organizations improve app quality, increase user engagement, and enhance overall customer satisfaction.

In conclusion, Smartview aims to bridge the gap between raw user feedback and actionable development strategies. By automating review collection, performing accurate sentiment classification, and presenting results through an interactive dashboard, the system provides a comprehensive solution for understanding user opinions in the mobile application ecosystem.

2. LITERATURE SURVEY

1)   G. Eser and C. Sahin (2024) present a study leveraging transformer-based models for sentiment analysis and rating prediction on app reviews. Their work highlights the effectiveness of advanced transformers in capturing contextual nuances of user feedback, resulting in higher accuracy compared to traditional machine learning methods. This research underscores the growing role of transformer architectures like BERT and GPT in enhancing sentiment classification tasks, especially in the app review domain.

2)   M. S. Islam and K. M. Alam (2024) introduce BangDSA, a comprehensive Bangla language sentiment dataset, alongside a novel feature metric called SkipBangla-BERT. Their approach combines dataset creation with tailored transformer-based models to improve sentiment analysis accuracy for Bangla text, addressing the scarcity of resources for underrepresented languages. This work significantly contributes to expanding NLP capabilities beyond English-centric datasets.

3)   M. Rodriguez-Ibanez et al. (2023) provide a systematic review of sentiment analysis techniques applied to social media platforms. They categorize existing methods, highlight challenges like data heterogeneity and noise, and discuss trends in the adoption of deep learning and hybrid approaches. Their comprehensive analysis emphasizes the importance of domain-specific

adaptations to improve the reliability of sentiment models in social media contexts.

4) Joshi, Rana, and Gandotra (2023) apply machine learning algorithms to perform sentiment analysis on Amazon product reviews. Their study evaluates multiple classification techniques, demonstrating that supervised learning methods can effectively distinguish positive and negative sentiments in customer feedback. This practical application reinforces the relevance of sentiment analysis in e-commerce and consumer behavior analytics.

5) N. R. Bhowmik, M. Arifuzzaman, and M. R. H. Mondal (2022) explore sentiment analysis on Bangla text using an extended lexicon dictionary combined with deep learning algorithms. Their hybrid approach improves sentiment classification performance by integrating rule-based lexicons with neural network models, addressing linguistic complexities in Bangla. This study advances sentiment analysis capabilities for regional languages with limited annotated data. The reviewed literature highlights the rapid development of sentiment analysis techniques using machine learning, deep learning, and transformer-based models. Recent studies demonstrate that advanced models such as BERT and other transformer architectures significantly improve the accuracy of sentiment classification by capturing contextual information in user reviews. Several researchers have also focused on developing datasets and techniques for regional languages, addressing the challenge of limited linguistic resources.

3. PROBLEM DEFINITION

In the rapidly growing mobile application ecosystem, millions of users share feedback through play store reviews. These reviews contain valuable insights about application performance, usability, bugs, and user satisfaction. However, the enormous volume of reviews generated daily makes it extremely difficult for developers to manually analyze and interpret this feedback effectively. Traditional manual review analysis is time-consuming, inefficient, and prone to human error, which may lead to delayed identification of critical issues affecting user experience.

Although several sentiment analysis techniques exist, many current systems lack an integrated approach that combines automated review collection, accurate sentiment classification, meaningful visualization, and actionable recommendations in a single platform. Furthermore, conventional machine learning models often struggle to capture contextual meaning in user-generated text, especially when dealing with informal language, abbreviations, and evolving user expressions commonly found in app reviews.

Therefore, there is a need for an intelligent system that can automatically collect large volumes of app reviews, preprocess the textual data, accurately classify sentiments using advanced machine learning and deep learning techniques, and present the results in an intuitive visual format. Such a system should also assist developers by identifying common issues and providing data-driven recommendations to improve application quality and user satisfaction.

The Smartview system aims to address these challenges by integrating automated data collection, Natural Language Processing (NLP), machine learning, deep learning models, and interactive visualization tools to transform unstructured user feedback into actionable insights for developers.

4. Proposed Working

i. Review Data Collection

The system first collects user reviews from mobile application platforms such as the Google Play Store using a customized web scraping module. The scraper extracts review text, ratings, timestamps, and other relevant information to create a structured dataset.

ii. Data Storage

The collected reviews are stored in a structured format such as CSV or a database. This organized dataset becomes the input for further analysis.

iii. Data Preprocessing

The raw review text is cleaned using Natural Language Processing (NLP) techniques. This step includes removing emojis, punctuation, stop words, special characters, and other irrelevant elements to improve the quality of the data.

iv.   Text Normalization

The cleaned text is processed through tokenization, lowercasing, and stemming or lemmatization to standardize the textual data and prepare it for sentiment analysis.

v.   Feature Extraction

Important textual features are extracted using techniques such as TF-IDF or word embeddings. These features convert textual reviews into numerical format so that machine learning models can process them.

vi.   Sentiment Classification

The processed data is analyzed using machine learning algorithms such as Logistic Regression, Naïve Bayes, and Support Vector Machines (SVM). Additionally, a deep learning model using Long Short-Term Memory (LSTM) is applied to capture contextual relationships in the text and improve classification accuracy.

vii.   Sentiment Categorization

Based on the trained models, each review is classified into one of three categories: Positive, Negative, or Neutral.

viii.   Data Visualization

The analyzed results are presented through an interactive dashboard. Various visualization techniques such as bar charts, pie charts, and sentiment trend graphs help developers easily understand user opinions.

ix.   Recommendation Generation

The system analyzes aggregated feedback to identify frequently mentioned issues or suggestions. Based on this analysis, it automatically generates recommendations for developers to improve their applications.

x.   Insight Delivery to Developers

Finally, the system provides developers with clear insights and actionable feedback, enabling them to enhance application quality, improve user experience, and make data-driven development decisions.

5. RESULT & ANALYSIS

The SmartView system was evaluated using more than

10,000 user reviews collected from the Google Play Store

through a web scraping approach. After preprocessing the

text using NLP techniques such as tokenization, stopword

removal, and lemmatization, the dataset was used to train

and test an LSTM-based sentiment analysis model.

The model achieved an accuracy of about 89% with good

precision and recall, showing that deep learning can

effectively understand user opinions in mobile app

reviews. The visualization dashboard displayed sentiment

distribution using bar charts, pie charts, and trend graphs,

which helped identify common user complaints, bug and feature requests over time. For example, negative

sentiment spikes after app updates highlighted technical

issues that developers could address quickly. However,

some limitations were observed, such as difficulty in

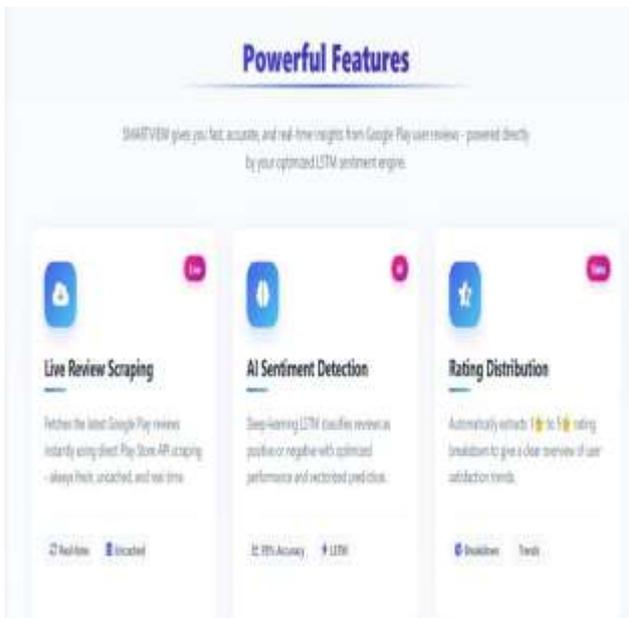detecting sarcasm, handling mixed or neutral reviews, and

analyzing multilingual comments. Overall, the results

demonstrate that SmartView provides a reliable and

efficient solution for analyzing real-time user feedback
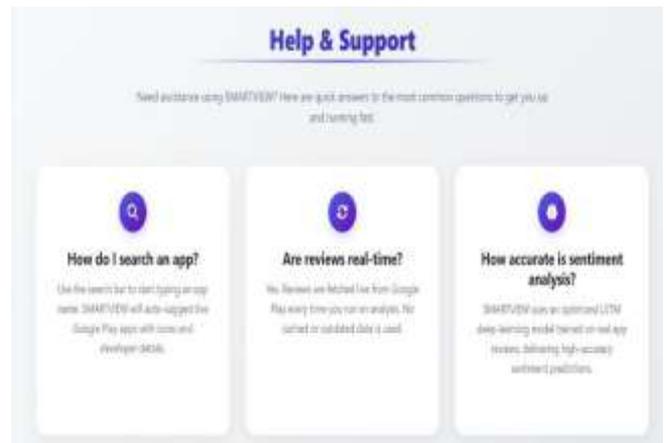
and supports developers in making data-driven

improvements to enhance application quality and user satisfaction.

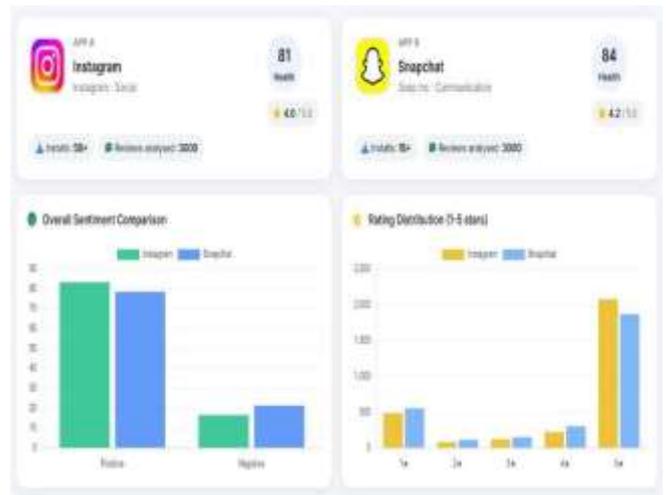Home Page

Features of Project

Help and Support

Smartview Demonstration

Sentiment Analysis

Rating Analysis Output

Rating Distribution and Overall Sentiment Comparison Outp

Issue Tagging Details Output

Two Application Comparison

Review Analysis Issues and Recommendation Output

6. Conclusion

In conclusion, the SmartView system provides an effective AI-powered solution for addressing the challenges of extracting, analyzing, and interpreting user feedback from mobile application platforms By integrating web scraping, NLP-based preprocessing, machine learning, and deep learning techniques, the system converts large volumes of unstructured user reviews into structured and meaningful insights.

The system includes an interactive visualization dashboard that helps users easily understand

sentiment trends and patterns within the collected reviews. In addition, the built-in recommendation engine connects user feedback with practical development improvements by identifying common issues and suggesting possible solutions. This allows developers to better understand user concerns and improve the overall quality and performance of their applications.

Unlike traditional review analysis tools that mainly focus on limited datasets or simple sentiment classification, SmartView provides a more comprehensive and scalable approach. It not only identifies user sentiments but also generates useful recommendations that support developers in making informed, data-driven decisions.

Overall, SmartView acts as a powerful and intelligent framework that helps developers enhance user satisfaction, improve application ratings, and remain competitive in the rapidly evolving mobile application marketplace.

7. REFERENCES

1. G. Eser and C. Sahin, "Sentiment analysis and rating prediction for app reviews using transformer based models," 2024.

2. M. S. Islam and K. M. Alam, "Sentiment analysis of bangla language using a new comprehensive dataset bangdsa and the novel feature metric skipbangla-bert," Natural Language Processing Journal, vol. 7, p. 100069, 2024.

3. M. Rodriguez-Ibanez, A. Casanez-Ventura, F. Castejon-Mateos, and P.-M. CuencaJimenez, "A review on sentiment analysis from social media platforms," Expert Systems with Applications, vol. 223, p. 119862, 2023.

4. Joshi, A., Rana, V., Gandotra, E. (2023). Sentiment Analysis on Amanzon Reviews using Machine Learning.

5. N. R. Bhowmik, M. Arifuzzaman, and M. R. H. Mondal, "Sentiment analysis on bangla text using extended lexicon dictionary and deep learning algorithms," Array, vol. 13, p. 100123, 2022