Sentimental Analysis Dashboard On Social Media

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***Abstract*— Mental health is a crucial aspect of people's lives, and its neglect in some industries can impact work performance. Many people are dissatisfied with their work environment, which can affect the company's performance if it's not comfortable or causes problems. The dashboard will visually display the sentiment of customer feedback on social media, showing the percentage of positive, negative, and neutral sentiment, and highlighting common topics and keywords. This technique can analyze a person's emotions and opinions, helping to detect their mental health status or the problems they're facing. Sentiment analysis can be used to evaluate various types of content, including customer messages, online reviews, and social media posts. The project will utilize Natural Language Processing (NLP) and deep learning techniques such as LSTM model to achieve maximum accuracy in sentiment analysis.**

Keywords—Sentiment Analysis, Social Media, NLP, Deep Learning, LSTM, Emotion Detection, Machine Learning, Dashboard.

I. INTRODUCTION

Social media platforms have become an essential space for people to express their opinions, share experiences, and provide feedback. Analyzing the massive amount of data generated daily on these platforms is challenging but vital for understanding public opinion, improving customer satisfaction, and addressing organizational concerns. This project develops a sentiment analysis dashboard that employs advanced NLP and deep learning techniques to classify social media feedback into positive, negative, or neutral sentiments. The results are presented in an interactive dashboard, offering insights into mental health and consumer behavior for better decision-making.

II.PROBLEM STATEMENT

In the digital age, organizations struggle to analyze the vast amount of social media data to gain meaningful insights into public perception and feedback. Existing solutions lack user-friendly interfaces for visualizing sentiment trends. This project aims to address these gaps by providing an accurate and interactive sentiment analysis dashboard.

III. LITERATURE REVIEW

1.1 Sentiment Analysis of Consumer Reviews Using Deep Learning

Deep learning-based LSTM models have shown promising results for sentiment analysis of consumer reviews, delivering superior performance in metrics such as accuracy, precision, recall, and F1-score. These models help businesses gain insights from customer reviews, enabling product and service improvements.

However, existing literature lacks significant exploration of alternative deep learning architectures, such as transformers, for consumer review sentiment analysis.
Authors: Amjad Iqbal, Rashid Amin, Javed Iqbal, Roobaea Alroobaea, Ahmed Binmahfoudh, Mudassar Hussain (2022)

1.2 Sentiment Analysis of Persian Movie Reviews Using Deep Learning

In Persian sentiment analysis, deep learning outperforms traditional methods. Stacked bidirectional LSTM and 2D-CNN models achieved high accuracies of 95.61% and 89.76%, respectively, on Persian movie review datasets. These models highlight the effectiveness of deep learning in handling non-English languages. However, there is limited research on Persian sentiment analysis using deep learning, indicating potential for further exploration.
Authors: Kia Dashtipour, Mandar Gogate, Ahsan Adeel, Hadi Larijani, Amir Hussain (2021)

1.3 A Deep Neural Network-Based Approach for Sentiment Analysis of Movie Reviews

A seven-layer deep neural network was implemented for movie review sentiment analysis, achieving an accuracy of 91.18%, recall of 92.53%, F1-score of 91.94%, and precision of 91.79%. The study demonstrates that adding more layers and testing with diverse datasets could further enhance classification accuracy, emphasizing the potential for deep neural networks in sentiment analysis tasks.
Authors: Kifayat Ullah, Anwar Rashad, Muzammil Khan, Yazeed Ghadi, Hanan Aljuaid, Zubair Nawaz

1.4 Sentiment Analysis Based on IMDB Aspects from Movie Reviews Using SVM

This study utilized an SVM classifier for sentiment analysis of IMDb movie reviews, achieving an accuracy of 79%, precision of 75%, and recall of 87%. SVM proves effective for text classification tasks, though its performance is generally outpaced by deep learning models. Future research could incorporate additional features, such as film genres, to improve sentiment analysis accuracy and relevance.
Authors: Nur Ghaniaviyanto Ramadhan, Teguh Ikhlas Ramadhan

IV. OBJECTIVE

1. **Understanding Human Sentiments:** The main goal is to recognize and characterize people's moods and feelings with various forms of data: face and voice, text and biometric data.
2.**Enhancing Human-Computer Interaction:** Emotion detection is a means of enhancing the human-an environment interface introducing capability for capturing the mood of a user.
3. **Applications in Mental Health:** Emotion detection can help to track the condition of the patient's psyche to work out the material for a therapist, as well as help identify the likelihood of an emotional breakdown.
4. **Personalization:** In the areas such as marketing, customer relations, and entertainment it is possible to create an individual environment because the technology can analyse the emotional response of the user.
5. **Social Robotics and AI:** Introducing emotion detection feature to robots and AI will improve their empathetic communication and can be effective in sectors such as: care giving, teaching and therapy.
6. **Research and Development:** Emotion detection helps to enrich the existing knowledge of the emotional expression and perception field in psychology, neuroscience and artificial intelligent systems.
7. **Ethical Considerations:** Some of the areas where one needs to know the ethical issues to guide the development of the Emotion detection technology includes.

V. METHODOLOGY

The proposed system consists of the following steps:

1. **Data Collection:** Social media data is collected from platforms like Twitter and datasets like IMDb and Social Media Sentiment Analysis.

2. **Preprocessing:** Text data is cleaned by removing special characters, emojis, hashtags, and user mentions. Tokenisation, padding, and encoding are applied to prepare the data for modeling.

3. **Model Training:** LSTM models are trained using preprocessed data. These models excel in understanding

the context of long sequences, improving sentiment classification accuracy.

4. **Dashboard Development:** The analysis results are visualized in a user-friendly interface, showing sentiment distributions and highlighting common trends and keywords.

5. **Model Evaluation**: LSTM models are optimized and evaluated using metrics like accuracy, precision, and F1-score to ensure reliable sentiment predictions.

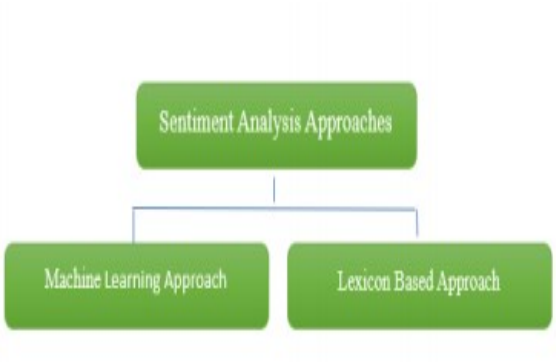

Fig.1 SA approaches

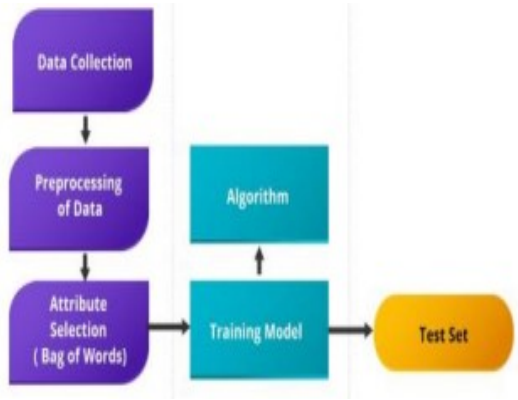

Fig.2 Steps Involved in Training a Classifier for Sentiment Analysis

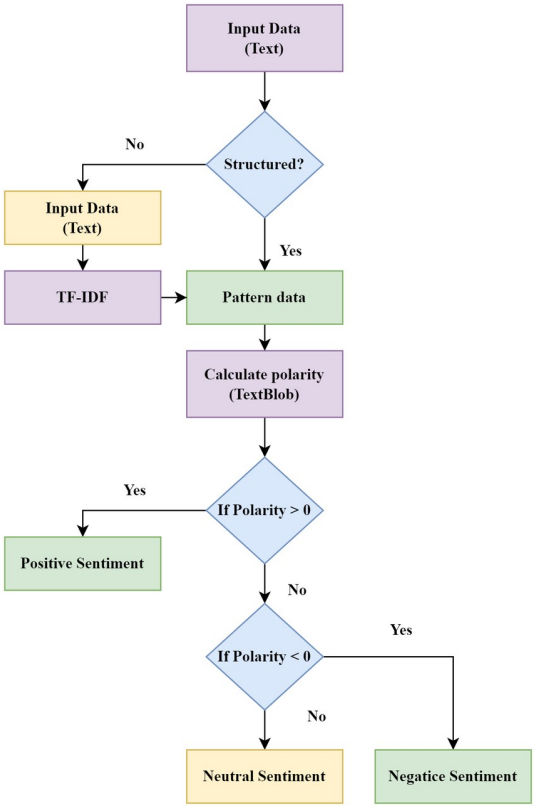

Fig.3 Process flowchart of SA

VI. RESULTS & DISCUSSIONS

The LSTM model was evaluated on various datasets:

- **IMDb Dataset:** Achieved an accuracy of 86%.
- **Twitter Dataset:** Achieved an accuracy of 93%.
- **Social Media Dataset:** Achieved an accuracy of 88%.

These results validate the effectiveness of the proposed system in classifying and visualizing sentiment data. The dashboard provides actionable insights for organizations and supports real-time monitoring.

VII. Conclusion & Future work

The Sentiment Analysis Dashboard effectively classifies and visualizes sentiments from social media feedback, providing actionable insights for mental health monitoring and organizational improvement.

In this project, we demonstrated sentiment analysis using an LSTM model for text data. Users express and share their opinions on various platforms, and manual analysis of such large datasets can be challenging. Pre-processed data from multiple sources was utilized to analyze sentiments, providing insights into people's opinions about products, services, social media trends, and organizational strategies.

Deep learning methods like LSTM achieved 86% accuracy on the IMDb review dataset, 93% on the

Twitter review dataset, and 88% on social media datasets. The dashboard features a user-friendly interface that visualizes sentiment (positive or negative) along with the probability score and a sentiment-related emoji.

In the future, this project can be expanded by incorporating different embedding models to handle a wider variety of datasets. Advanced models like transformers could be used to enhance accuracy and mitigate overfitting, while extending support for multilingual datasets and real-time sentiment tracking.

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