News Summarization and Text-to-Speech Application

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Project Overview

News Summarization and Text-to-Speech Application is a web-based application that fetches, processes, and analyzes recent news articles related to a given company. It performs sentiment analysis, topic extraction, and comparative news analysis. Additionally, it generates a Hindi Text-to-Speech (TTS) output summarizing the final sentiment. The application is built using Gradio and deployed on Hugging Face Spaces.

Project Setup

-Prerequisites

Python 3.8+

-Install dependencies using:

Pip install -r requirements.txt

-Run the project

Python app.py

Workflow

1. User enters a company name in the Gradio interface.
2. The system fetches 10 latest news articles using NewsAPI.
3. Sentiment analysis is performed using TextBlob.
4. Topics are extracted using YAKE (Keyword Extraction).
5. Articles are compared for sentiment distribution and coverage differences.
6. Common and unique topics across articles are identified.
7. Final sentiment analysis is performed.

8. The result is converted into Hindi speech using gTTS.
9. Results (JSON output + audio) are displayed in Gradio.

Models & API used

APIs Used

NewsAPI: Fetches latest news articles related to a given company.
Google Text-to-Speech: Converts text output to Hindi speech.

Models Used

1. TextBlob: Performs sentiment analysis (Positive, Negative, Neutral).
2. YAKE: Extracts key topics from articles.
3. SBERT (Sentence-BERT): Used for comparing article summaries.

User Interface & Output

This Project provides a user-friendly Gradio Interface that allows users to fetch the latest news about a specific company and analyze their sentiments,topics, comparative differences and audio files.

User Workflow:

1.Enter the company name in the input field.
2.Click the submit button.
3.The system fetches and process the latest news from NewsAPI
4.The interface displays:

- News Articles
- Comparative Sentiment Score
- Coverage Differences
- Topic Overlap
- Final Sentiment Analysis
- Hindi Audio

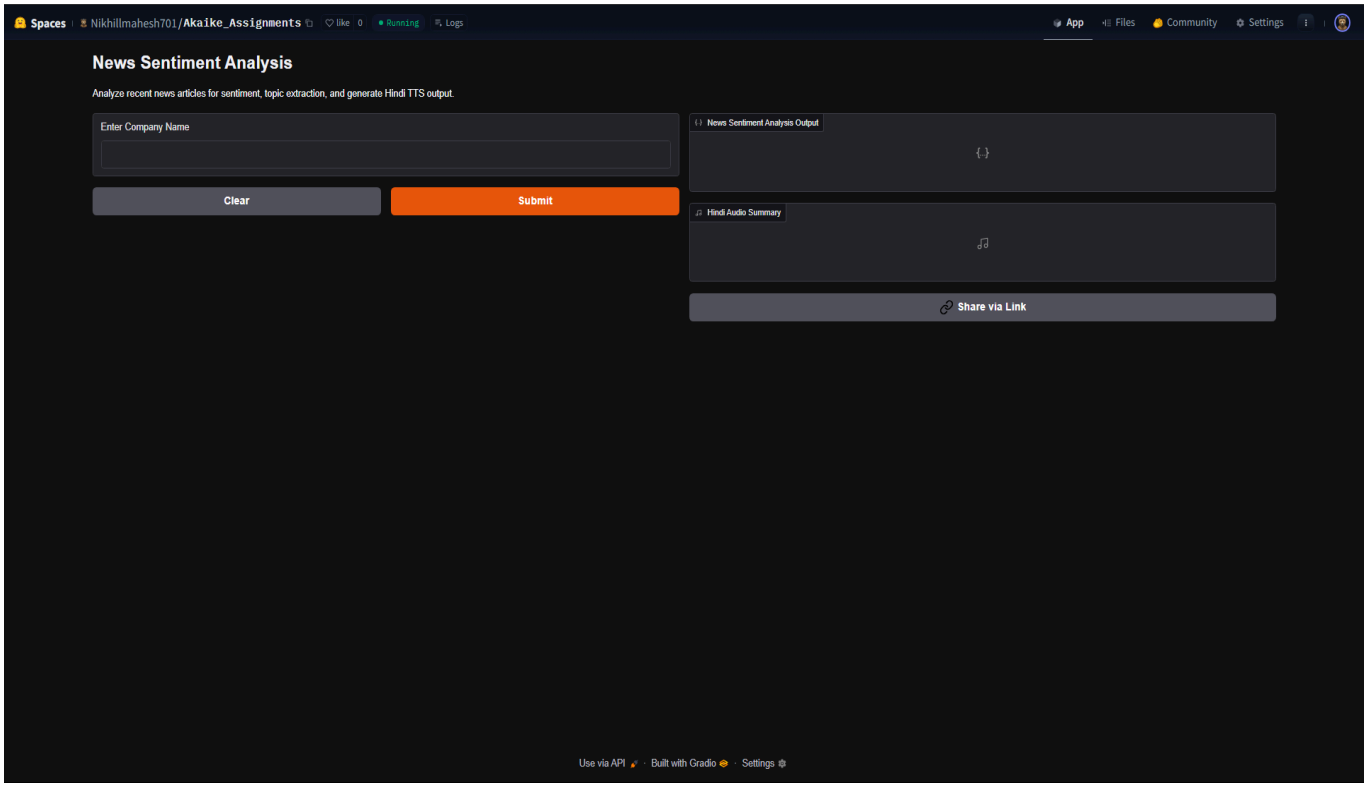

Figure1: News Sentiment Analysis

Deployment Information

The project is deployed on:
Hugging Face Space: [Hugging face spaces]

Code files present in:
Github Repository: [Github]

Example:

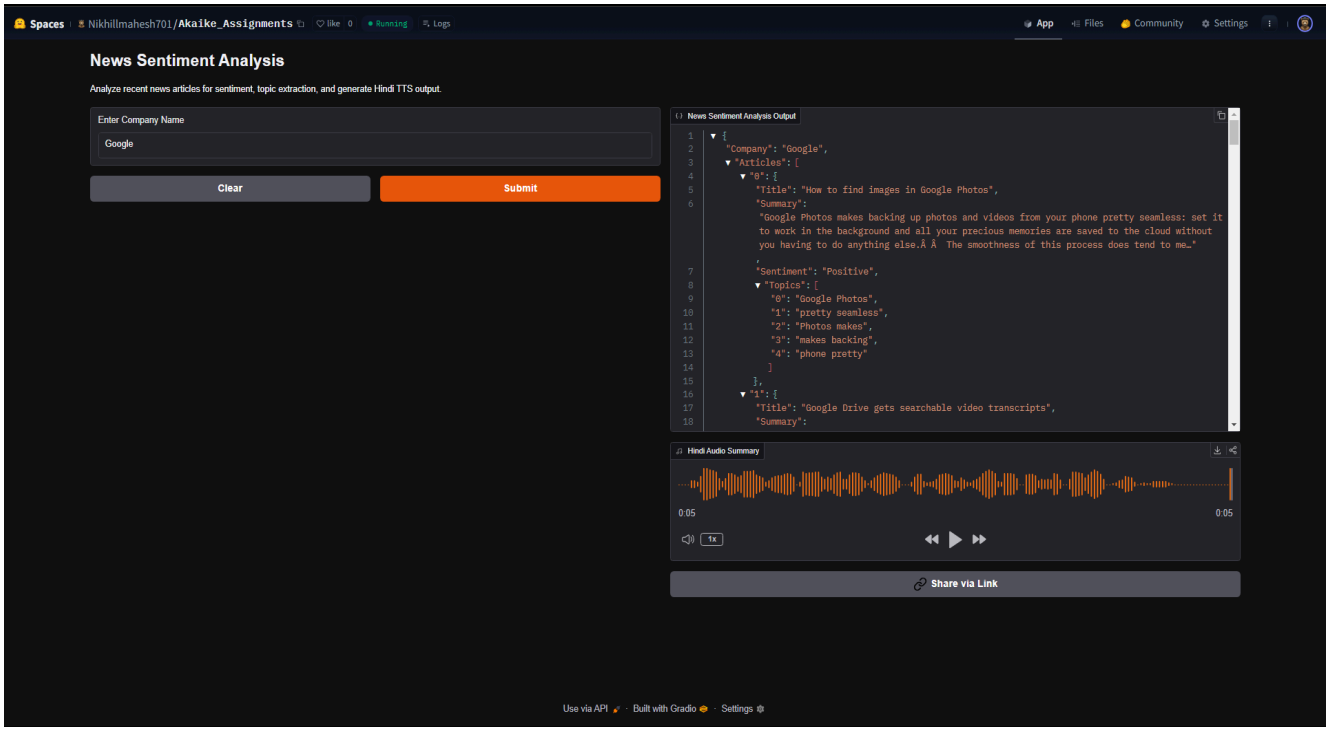

Figure2: Application Running on Hugging Face Space

Demo Video: [Demo]

Features

- Fetches the latest 10 news articles for a given company.
- Summarizes news articles if needed.
- Performs sentiment analysis (Positive, Negative, Neutral).
- Extracts topics from each article.
- Identifies common and unique topics across articles.
- Compares articles for differences in coverage and sentiment.
- Generates a final sentiment summary.

- Converts final sentiment text into Hindi audio.

- Displays JSON output and plays Hindi audio in the Gradio UI.

Assumptions & Limitations

Assumptions

- NewsAPI always returns relevant and recent news articles.

- TextBlob provides accurate sentiment classification.

- Topic extraction using YAKE is sufficient for capturing key themes.

Limitations

- NewsAPI may not always fetch the most recent articles.

- Summarization is dependent on article content quality.

- Sentiment analysis may not always capture sarcasm or context.

- The model does not generate custom news summaries, only extracts data.

Future Improvements

- Improve sentiment analysis by using a fine-tuned transformer model.

- Implement better topic modeling techniques like LDA or BERT-based models.

- Provide user options to fetch articles from multiple sources.

- Enhance UI/UX for better readability and usability.

- Optimize TTS output for better natural speech synthesis.