YT SENTIMENT EXPLORER

Presenting By:

Sai Preetham, Manjunath

Prasanna, Vinith

OUTLINE

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INTRODUCTION

- In the digital age, social media platforms generate vast amounts of user-generated content. YouTube, being one of the largest video-sharing platforms, hosts millions of videos with billions of comments.
- Our project focuses on **automated sentiment analysis of YouTube comments** to classify them into **Positive, Neutral, or Negative** categories. By leveraging **Natural Language Processing (NLP) techniques**, this tool extracts and processes comments to provide a sentiment-based summary of a given video.

EXISTING PROJECT

- The existing project for analysing YouTube comments are limited in functionality and efficiency. Moreover, it is constrained by the following issues:
  - Limited Comment Extraction
  - Lack of Scalability
  - Inability to Save Results
  - User Experience Constraints

PROPOSED PROJECT

- The scope of this project is defined to ensure that it provides a comprehensive solution for fetching, analyzing, and reporting YouTube video comments. The In-Scope Features are,
  - YouTube Comment Extraction
  - Flexible Comment Limit
  - Data Storage
  - Sentiment Analysis

COMPARISON

Feature	Existing Project	Proposed Project
Comment Extraction	**one video at a time**	**multiple videos**
Max Comments Limit	**100 comments per video**	**thousands of comments**
Scalability	Not scalable for **large datasets**	**large-scale sentiment analysis**
Data Storage	No option to **save** comments	**CSV format**
Reporting & Insights	No detailed **summary reports**	**detailed sentiment distribution reports**
User Experience	Lacks **customization options**	**define comment count and filename**

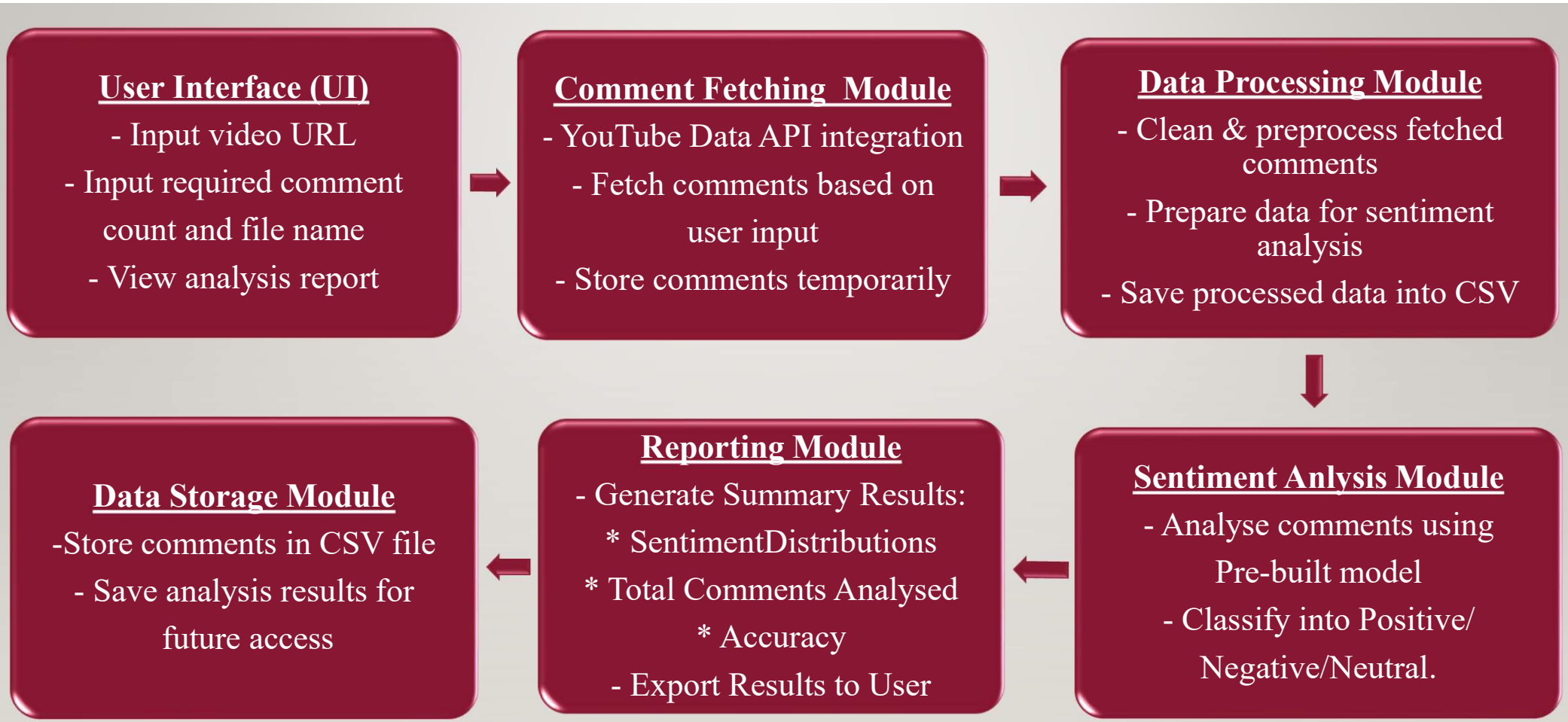


Fig: High-Level Architecture

PROJECT ANALYSIS

- System Analysis :

  System analysis is a critical phase of project development that involves understanding the functional and non-functional requirements, limitations of existing solutions, and the enhancements introduced in the proposed system.

- Hardware and Software Selection

HARDWARE REQUIREMENTS

Component	Specification
Processor	Intel Core i3 or higher / AMD Ryzen 5 or higher
RAM	Minimum 8 GB (16 GB recommended for large datasets)
Storage	Minimum 250 GB SSD (500 GB recommended for better performance)
Graphics	Integrated graphics sufficient (dedicated GPU optional)
Network	Stable internet connection for accessing YouTube API

SOFTWARE REQUIREMENTS

Component	Details
Operating System	Windows 8,10/11, macOS
Programming Environment	Visual Studio Code (or any preferred IDE)
Programming Language	Python 3.9 or later
APIs	YouTube Data API v3 for fetching comments
Libraries and Frameworks	Required Python libraries: -googleapiclient for API integration - pandas for data manipulation - nltk for sentiment analysis - matplotlib for data visualization - numpy for numerical computations
Browser	Google Chrome, Mozilla Firefox, or Microsoft Edge
Package Manager	pip (Python's package installer)

DESIGN

- Data Design: The data design defines how the system organizes and stores data during the fetching, analysis, and reporting processes.
  - Input Data
  - Raw Data
  - Processed Data
  - Output Data

DATA DEFINITION

- Input Fields

Field	Type	Description
Video URL	String	URL of the YouTube video
No. of Comments	Integer	Max. number of comments to fetch
File Name	String	Name of the CSV file to save comments

- Output Fields

Field	Type	Description
Video URL	String	URL of the given YouTube Video
Sentiment	String	Sentiment label: Positive, Negative, Neutral

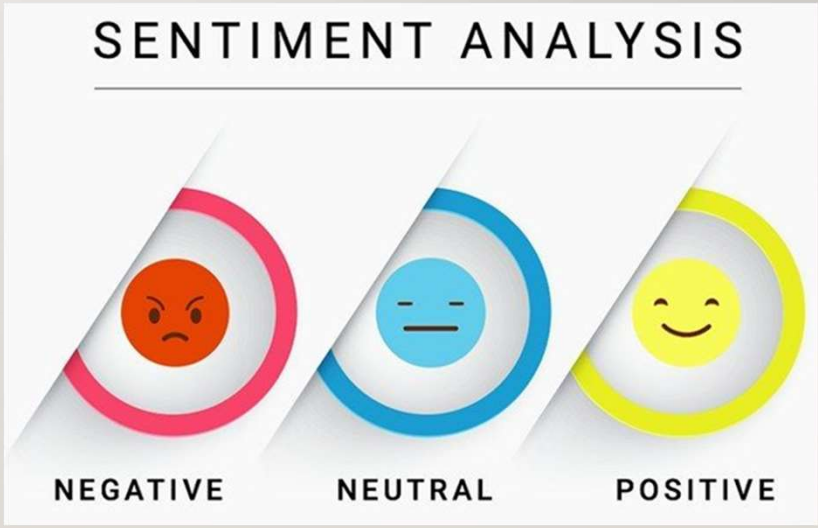
PROJECT FLOW

Flow of the YT Sentiment Explorer Project is as follows:

1. User Input
2. Extract Video URL
3. Fetch Comments
4. Perform Sentiment Analysis
5. Calculate Metrics
6. Save & Display Results
7. Download CSV File
8. Error Handling

SENTIMENT ANALYSIS PROCESS

- The sentiment analysis involves using natural language processing techniques to determine the sentiment of comments, categorizing them into positive, negative, or neutral.
- This process offers deeper insights into audience perception and emotions.



KEYWORD ANALYSIS

- In this project we use VADER (Valence Aware Dictionary and sEntiment Reasoner) is a rule-based sentiment analysis tool specifically designed for social media text, reviews, and comments.
- VADER has a predefined sentiment lexicon, which assigns words predefined sentiment scores.

➢ Lexicon-Based Sentiment Scoring

- VADER uses a predefined dictionary of words with associated sentiment scores. Each word in the comment is assigned a score:
- Positive words (e.g., "awesome", "love") → +ve score
- Negative words (e.g., "terrible", "hate") → -ve score
- Neutral words (e.g., "the", "video") → 0 score
- Example:

"This video is amazing!"

"amazing" has a high positive score → Overall sentiment: Positive

- VADER calculates a compound score between -1 (negative) to +1 (positive) based on the overall sentiment of the sentence.

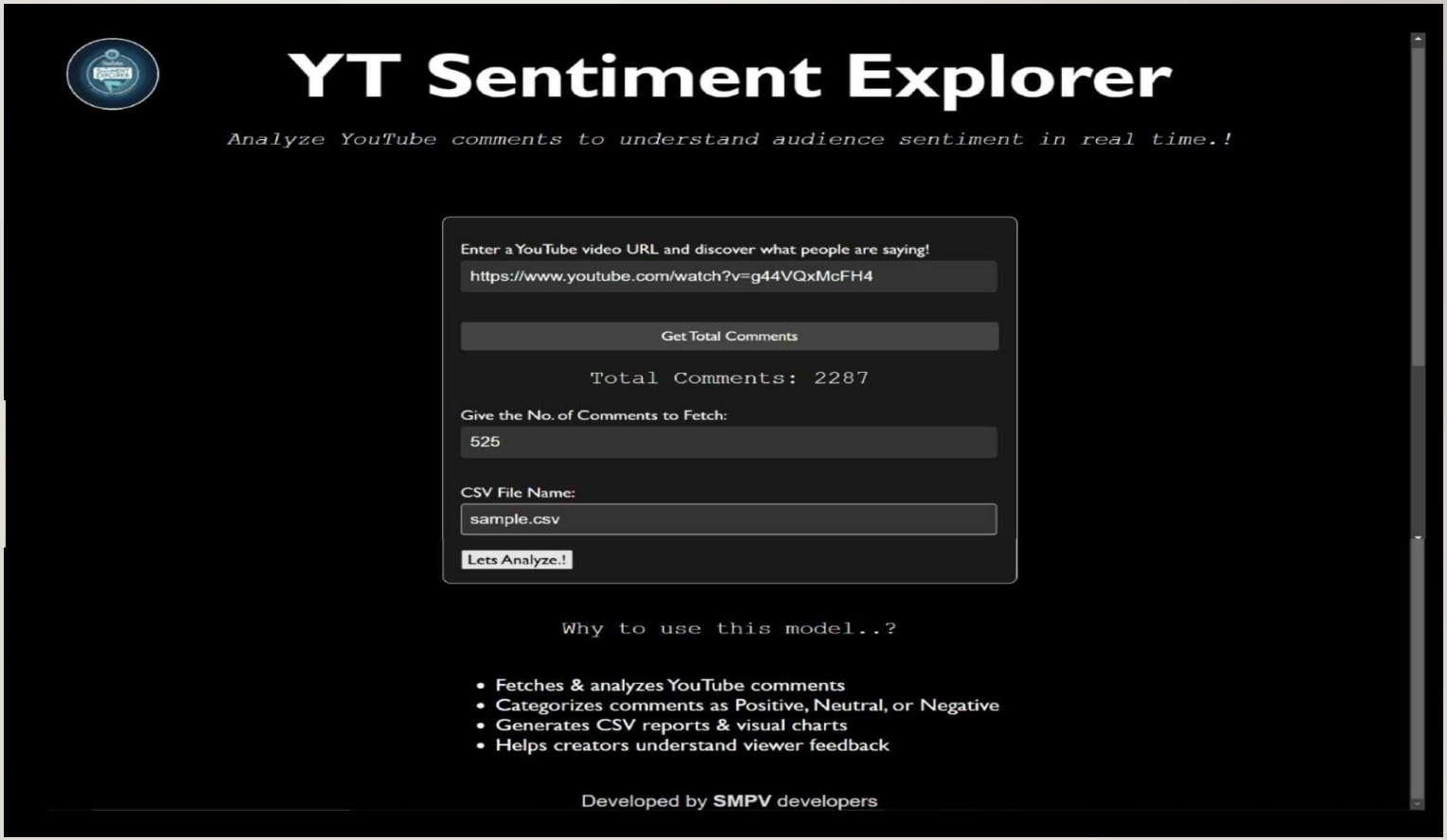
- Positive Sentiment → Compound score ≥ 0.05
- Negative Sentiment → Compound score ≤ -0.05
- Neutral Sentiment → Compound score between -0.05 and 0.05

Example:

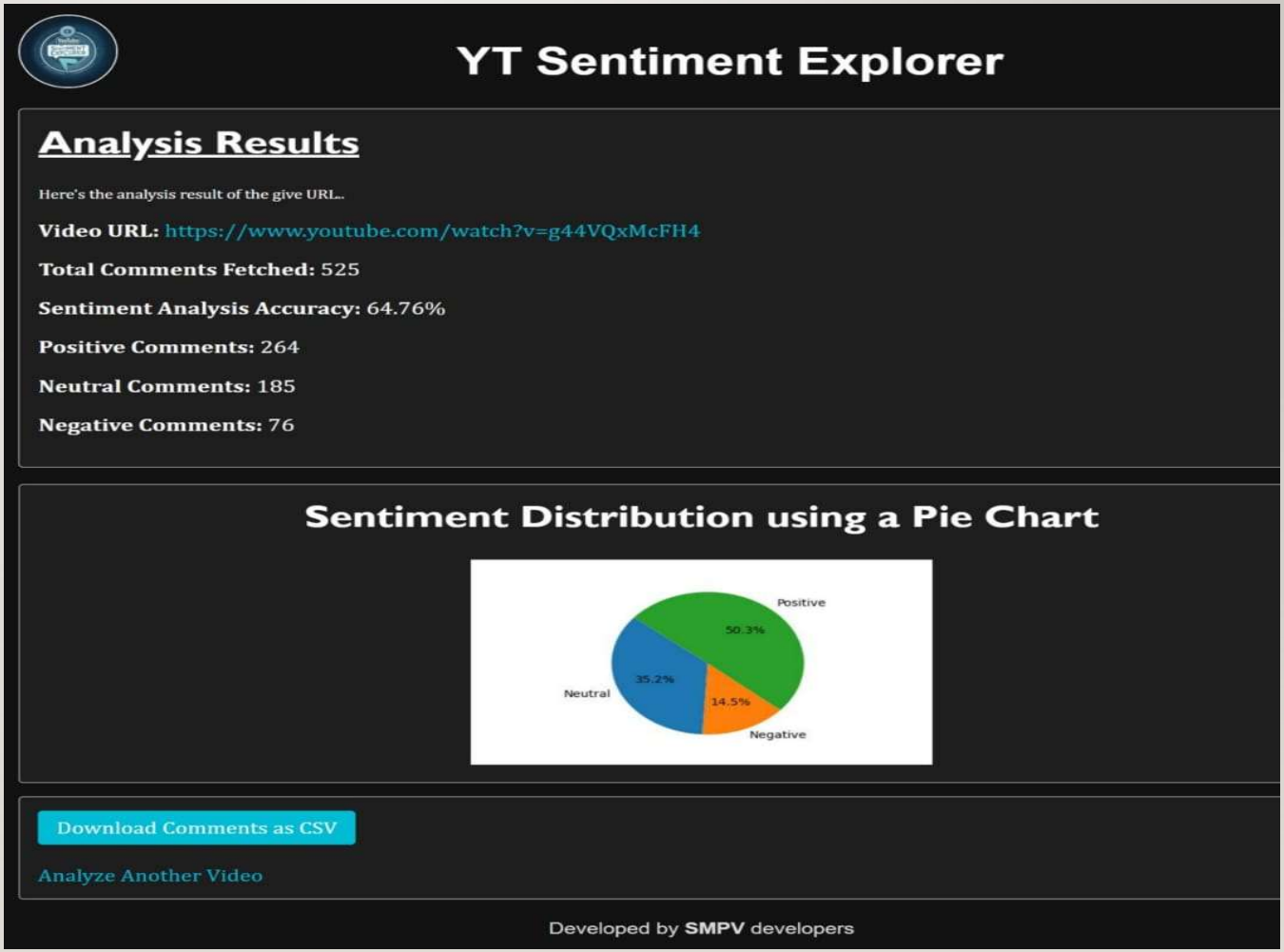
- "I love this video, it's fantastic!" → Positive (0.75)
- "This video is not great, it's boring." → Negative (-0.55)
- "This video is okay." → Neutral (0.0)

RESULTS

- Input Page



- Output Page


YT Sentiment Explorer
Analysis Results
Here's the analysis result of the give URL..
Video URL: https://www.youtube.com/watch?v=g44VQxMcFH4
Total Comments Fetched: 525
Sentiment Analysis Accuracy: 64.76%
Positive Comments: 264
Neutral Comments: 185
Negative Comments: 76
Sentiment Distribution using a Pie Chart
Positive
50.3%
Neutral
35.2%
14.5%
Negative
Download Comments as CSV
Analyze Another Video
Developed by SMPV developers

APPLICATIONS

- Content Creators & Influencers
- Digital Marketing & Brand Analysis
- Social Media Monitoring
- Customer Feedback Analysis
- Academic & Research Purposes

PROS AND CONS

➢ **Pro's**

- Audience Feedback Analysis
- Improved Content Strategy
- Brand Monitoring
- Data-Driven Decisions
- Time Efficiency

Con's

- Accuracy Issues
- Context Misunderstanding
- Bias in Training Data
- Overreliance on Automation
- Language Limitations

CONCLUSION

In conclusion, the YT Sentiment Explorer provides actionable insights for content creators, marketers, and community managers to harness the power of audience sentiments, enhance user engagement, and shape effective strategies for YouTube content development and management. The future work outlined will further improve the accuracy and utility of the analysis, making it an indispensable tool for content creators.

THANK YOU