Smart Social Media Dashboard with Live Sentiment Analysis

1. Introduction

The **Smart Social Media Dashboard with Live Sentiment Analysis** is an end-to-end data analytics and machine learning project designed to monitor, analyze, and visualize real-time social media data. The system fetches live tweets, performs sentiment analysis using a trained ML model, stores data in a database, and displays insights through an interactive dashboard.

This project simulates an **industry-level social media analytics platform** used by marketing, brand monitoring, and data analytics teams.

2. Project Objectives

- Collect live social media data in real time
- Analyze public sentiment using Machine Learning
- Visualize key performance metrics dynamically
- Provide dark/light mode adaptive UI
- Store historical data for future analysis
- Build a scalable and modular analytics system

3. System Architecture

Workflow:

1. **Live Data Fetching** – Tweets fetched using Twitter API (or simulated data)
2. **Text Preprocessing** – Cleaning tweets (removing URLs, symbols, stop words)
3. **Sentiment Prediction** – ML model predicts Positive / Negative / Neutral sentiment
4. **Database Storage** – Tweets stored in MySQL
5. **Dashboard Visualization** – Streamlit dashboard displays metrics & charts

4. Technologies Used

Programming & Libraries

- Python
- Pandas, NumPy
- Scikit-learn (ML model)
- Plotly (interactive charts)
- Streamlit (dashboard UI)

Database

- MySQL

Machine Learning

- Logistic Regression
- TF-IDF Vectorization

5. Dataset Description

- **Dataset Name**: 1600000.processed.noemoticon.csv
- Reduced dataset used due to system limitations
- Balanced Positive & Negative samples
- Tweets labeled for sentiment classification

6. Machine Learning Model

Model Details

- Algorithm: Logistic Regression
- Vectorization: TF-IDF
- Training Size: Reduced & balanced dataset
- Accuracy Achieved: ~77%

Model Output

- Positive
- Negative
- Neutral (logic-based extension)

The trained model and vectorizer are saved and reused for real-time predictions.

7. Live Sentiment Analysis Logic

- Incoming tweets are cleaned
- Passed to trained ML model
- Sentiment label predicted instantly
- Used for metrics, charts, and alerts

8. Dashboard Features

Key Metrics

- Total Tweets
- Positive / Negative / Neutral counts
- Platform follower statistics

Visualizations

- Pie Chart: Sentiment Distribution
- Line Chart: Tweets Over Time
- Bar Chart: Followers by Platform

UI Features

- Dark / Light Mode Toggle
- Glassmorphism charts (transparent background)
- Auto refresh every 30 seconds
- Manual refresh button

9. Database Integration

MySQL Table

- tweet
- sentiment
- created_at

Benefits:

- Persistent storage
- Historical trend analysis
- Scalable data management

10. Performance & Optimization

- Dataset reduction to avoid system crash
- Streamlit caching for efficient refresh
- Rate limit handling for API calls

11. Industry Relevance

This project aligns with real-world industry use cases:

- Brand reputation monitoring
- Marketing campaign analysis
- Customer feedback analysis
- Social listening platforms

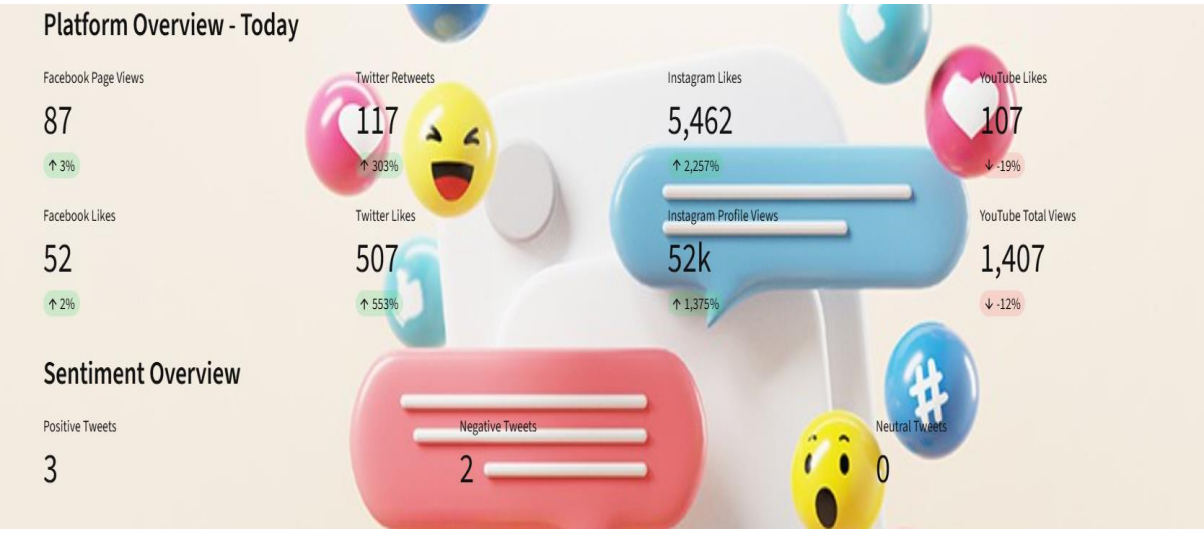
It demonstrates **end-to-end data analytics, ML integration, and dashboarding**, which is highly valued in data analytics and data science roles.

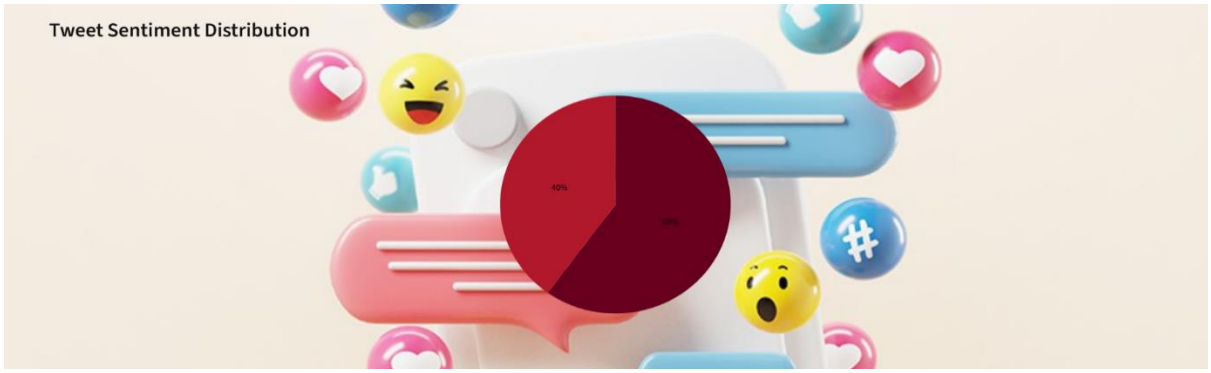
12. Limitations

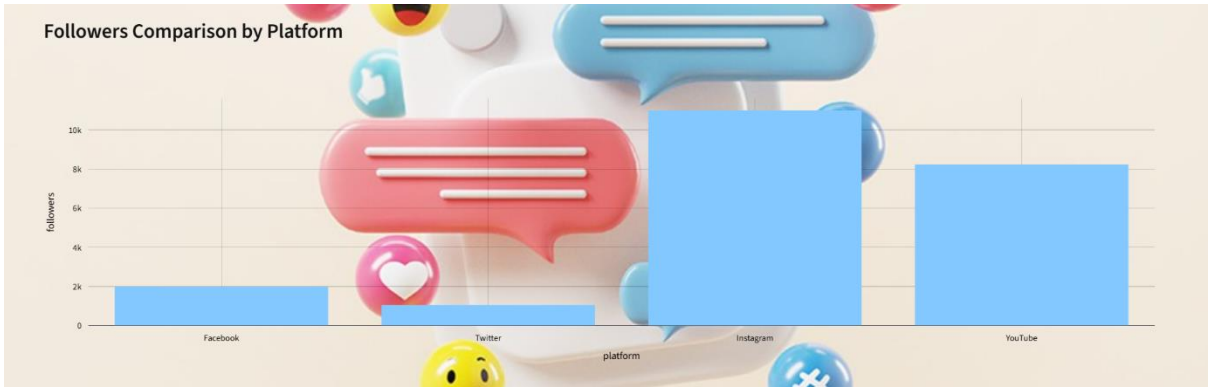
- Uses simulated data for non-Twitter platforms
- Limited to local deployment
- Neutral sentiment derived logically

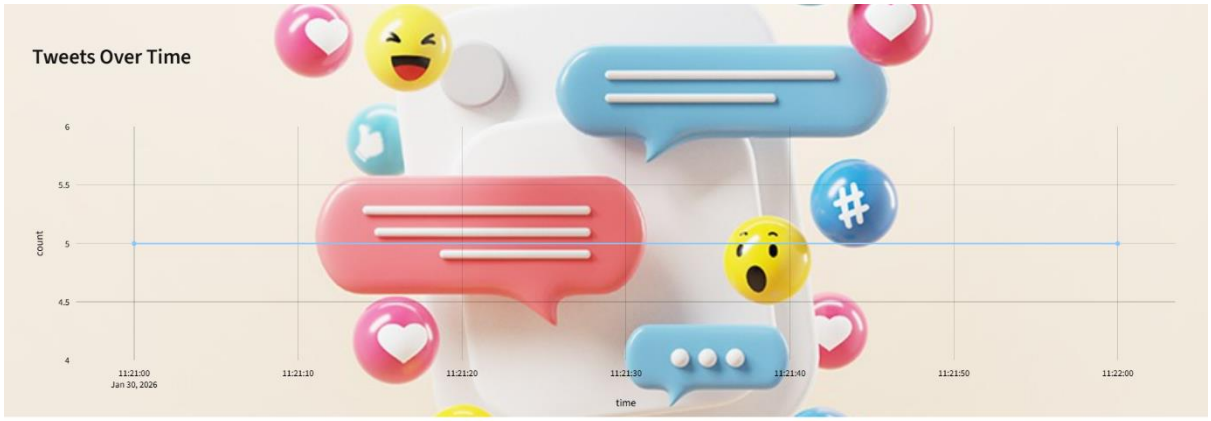
13.OutPut Screen

Light Model :



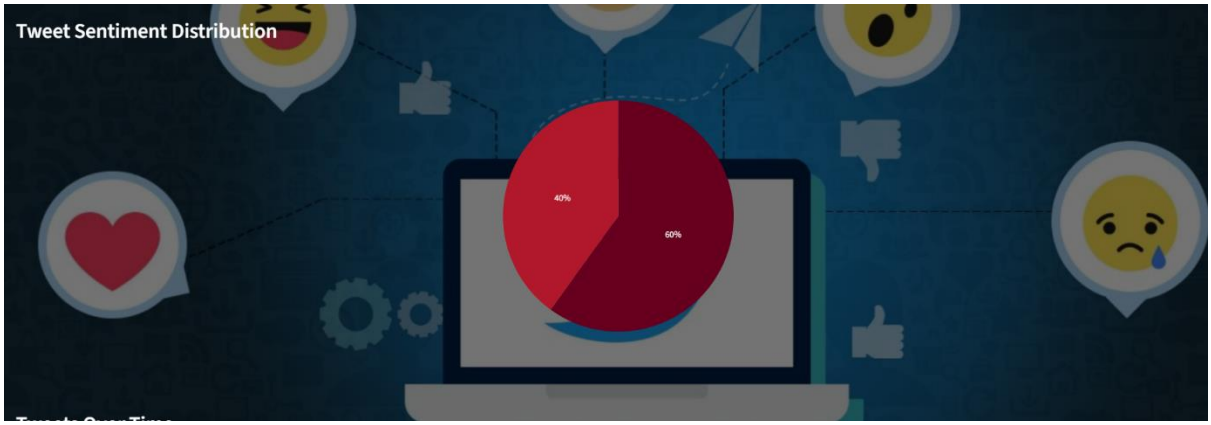

Tweet Sentiment Distribution
40%

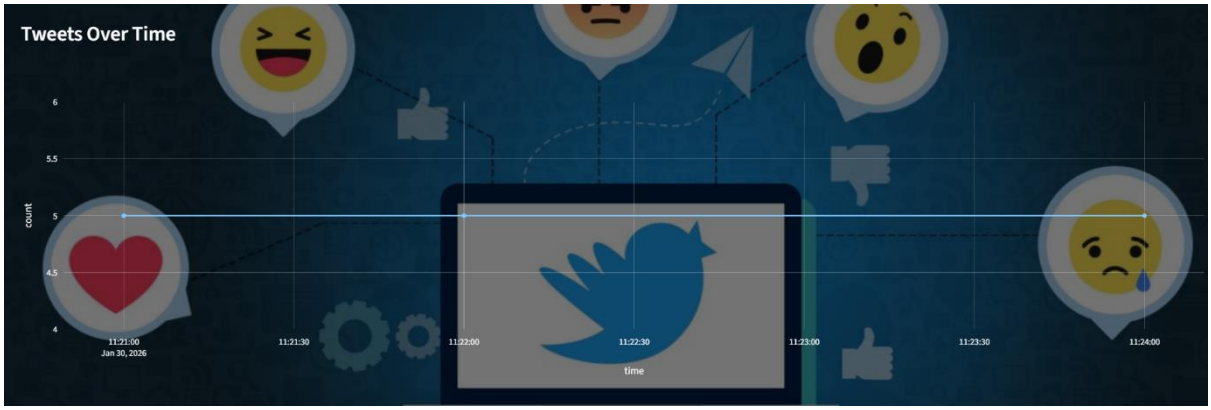

Followers Comparison by Platform
10k
8k
6k
4k
2k
0
followers
Facebook
Twitter
Instagram
YouTube
platform

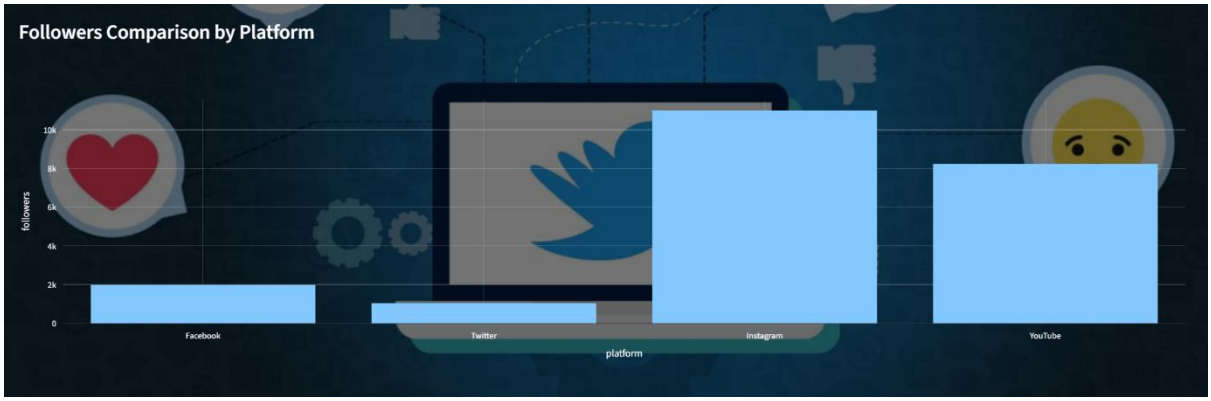

Tweets Over Time
6
5.5
5
4.5
4
count
11:21:00
Jan 30, 2026
11:21:10
11:21:20
11:21:30
11:21:40
11:21:50
11:22:00
time

Dard Model :


Refresh Tweets Now
Social Media Analytics Dashboard
Total Followers: 23,004
Facebook
1,987
↑ 12 today
Twitter
10
↑ 10 today
Instagram
11,000
↑ 1099 today
YouTube
8,239
↑ 144 today
Platform Overview - Today
Facebook Page Views
87
↑ 3%
Twitter Retweets
117
↑ 303%
Instagram Likes
5,462
↑ 2,257%
YouTube Likes
107
↓ -19%
Facebook Likes
52
↑ 2%
Twitter Likes
507
↑ 553%
Instagram Profile Views
52k
↑ 1,375%
YouTube Total Views
1,407
↓ -12%
Sentiment Overview
Positive Tweets
6
Negative Tweets
4
Neutral Tweets
0


Tweet Sentiment Distribution
40%
60%


Tweets Over Time
count
6
5.5
5
4.5
4
11:21:00
Jan 30, 2026
11:21:30
11:22:00
11:22:30
11:23:00
11:23:30
11:24:00
time


Followers Comparison by Platform
10k
8k
6k
4k
2k
0
followers
Facebook
Twitter
Instagram
YouTube
platform

14 . ML Predication :

```
Accuracy: 0.780125
              precision    recall  f1-score   support

           0       0.78      0.78      0.78      4000
           1       0.78      0.78      0.78      4000

    accuracy                           0.78      8000
   macro avg       0.78      0.78      0.78      8000
weighted avg       0.78      0.78      0.78      8000

Model and vectorizer saved
```

13. Future Enhancements

- Multi-platform API integration (Instagram, YouTube)
- Alert system for negative sentiment spikes
- User authentication
- Cloud deployment (AWS / GCP)
- Advanced NLP models (BERT)

14. Conclusion

The **Smart Social Media Dashboard with Live Sentiment Analysis** is a complete, well-structured, and industry-aligned project. It showcases practical skills in data analytics, machine learning, real-time data processing, database integration, and interactive visualization.

This project is suitable for:

- Academic submission
- Portfolio showcase
- Entry-level to mid-level industry demonstration