Automated Sentiment Reporting System

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1.Introduction to Problem Statement

In most organizations, employee feedback is collected manually through surveys or informal discussions, making it difficult for HR teams to track changes in employee satisfaction and sentiment over time.
 Traditional feedback methods often lack automation, leading to delays in analyzing responses and identifying workplace issues.

As a result, HR departments spend considerable time manually sorting through comments to understand whether employees are satisfied, neutral, or dissatisfied. Moreover, generating weekly reports and insights requires additional effort and time, which reduces the overall efficiency of the feedback management process.

To overcome these limitations, this project introduces an **Automated Sentiment Reporting System** — a fully automated solution that collects employee feedback, analyzes sentiments using Natural Language Processing (NLP), and visualizes the results in real time. The system eliminates manual effort, ensures accurate sentiment classification, and automatically delivers insights to HR, enabling quick decision-making and proactive action.

2.Objectives

Automate employee feedback collection using Google Forms integrated with Google Sheets for seamless data flow.

Analyze sentiments automatically through an NLP model to classify responses as Positive, Neutral, or Negative.

Visualize weekly insights in Looker Studio with dynamic charts and filters for HR review.

Automate report delivery by emailing the updated dashboard link to HR after all responses are received.

Track week-wise sentiment trends to help HR identify improvements or concerns in employee satisfaction

3.Tools and Technologies Used

Google Forms – For collecting weekly employee feedback responses.

Google Sheets – For storing form responses and automating sentiment tagging.

Google Apps Script – For backend automation, API integration, and email notifications.

Hugging Face API – For sentiment analysis using the *cardiffnlp/twitter-roberta-base-sentiment-latest* NLP model.

Looker Studio (Google Data Studio) – For creating interactive dashboards and visualizations.

Gmail Integration – For automatically sending the updated report link to HR.

4.Flowchart/System Architecture
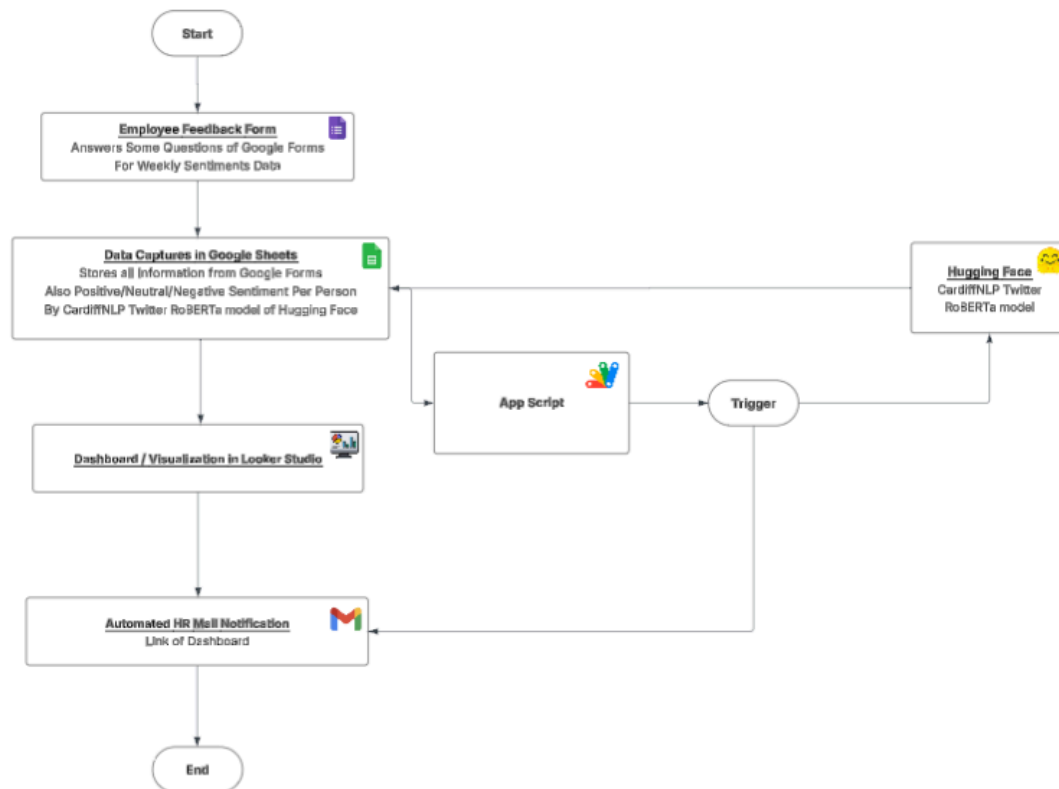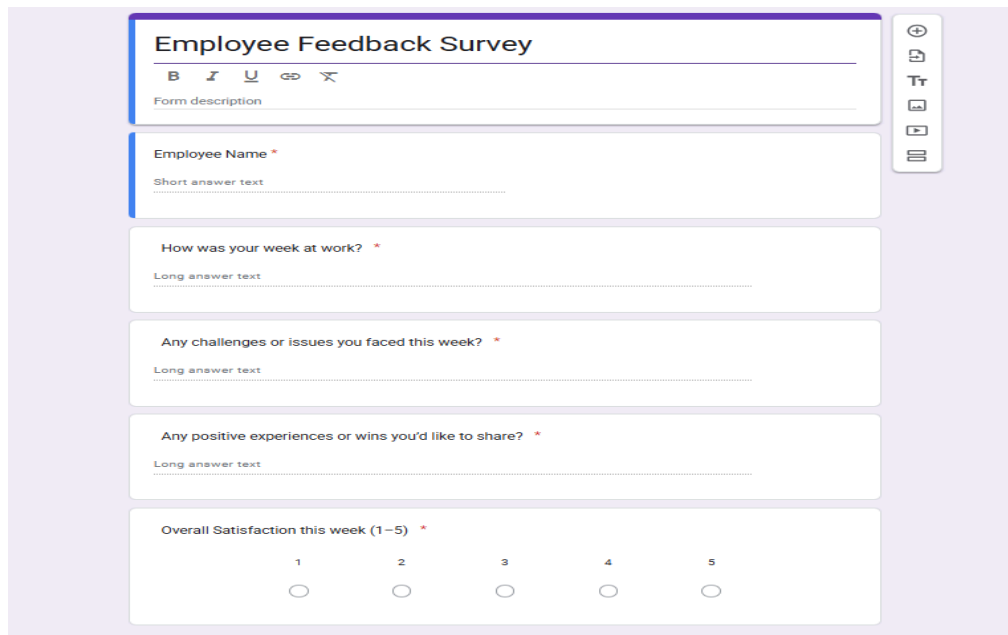
Fig.4.1 Entire Flow chart

5.Implementation

Assumption : For this project, we have assumed a total of **10 employees** in the organization. Once **10 responses** are submitted, the system automatically sends the summarized sentiment report to the HR via email. When the **next 10 responses** are received, they are considered as data for the **next week**, and a new updated report is again sent automatically to HR. This cycle continues for each subsequent week.

5.1 Employee Feedback Submission

- Employees fill out the **Google Form** every week.

- Form contains fields: Employee Name, How was your week?, Challenges Faced, Positive Experiences, Overall Satisfaction (1–5).

Fig.5.1.1 Employee Feedback Form

5.2 Data Capture in Google Sheets

- All form responses are automatically captured in the linked Google Sheet.
- A *Week* column is auto-filled using an Apps Script trigger based on submission date.
- *Positive*, *Neutral*, and *Negative* columns are automatically updated by the Apps Script.

Fig.5.2.1 Stored Responses from Google Forms

5.3 Dashboard / Visualization in Looker Studio

Google Sheet is connected as a **data source**.
Dashboard shows:

- **Pie chart**: Positive, Neutral, Negative count & percentage.

- **Bar chart**: Overall Satisfaction distribution.

- **Table**: Employee Name, Sentiment, Reason, Overall Satisfaction.

Week slider to filter weekly data.

Most Satisfied Employee of the Week , Most Dissatisfied Employee of the Week Person and the Record Count in form of Scorecard.
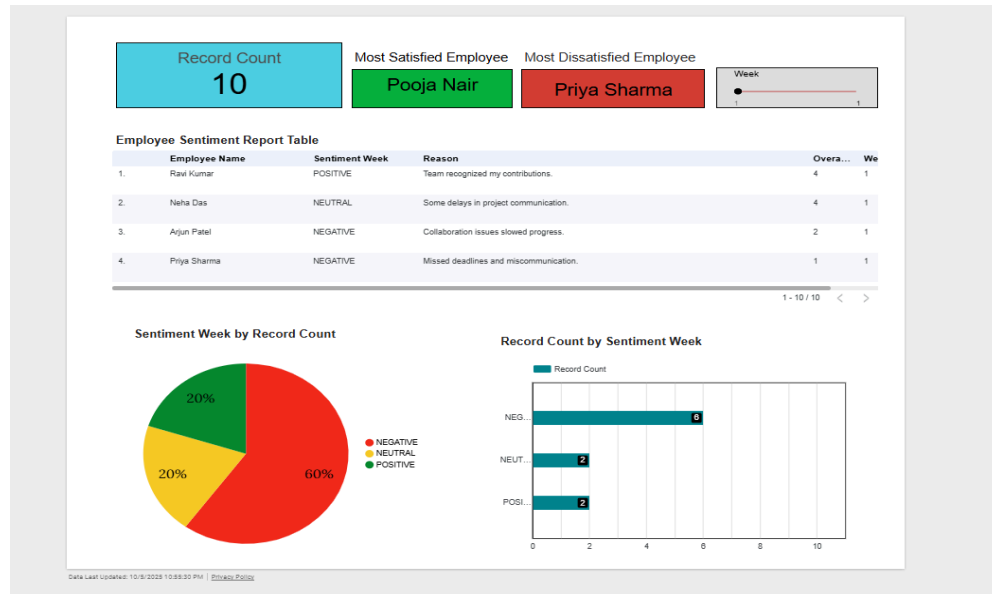

Fig.5.3.1 Dashboard for Sentiment Analysis

5.4 Automated HR Mail Notification

- Trigger checks the **number of responses** for the week (10 employees).

- Once all responses are in, Apps Script sends **dashboard link via email** to HR.
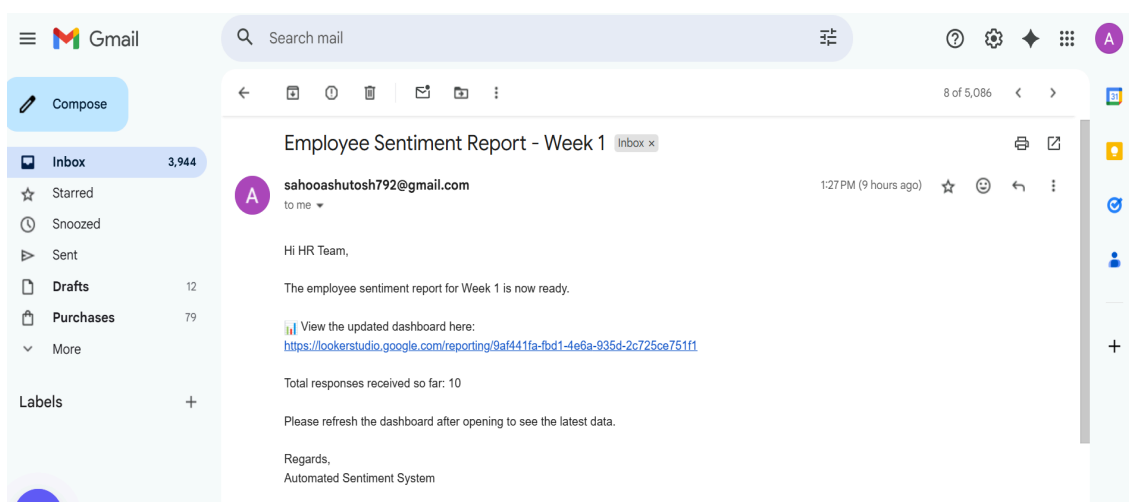
Fig.5.4.1 Automated Email to HR

5.5 Google Apps Script Implementation

- **Automated Workflow:** Integrates Google Forms, Sheets, Hugging Face API, and Gmail for complete automation.

- **Sentiment Analysis:** Uses *CardiffNLP Twitter RoBERTa Base Sentiment Model* of Hugging Face to classify feedback as positive, neutral, or negative.

- **Data Update:** Updates the Google Sheet automatically with new sentiment results after every response.

- **Email Automation:** Sends a summary report with sentiment stats and dashboard link to HR after every 10 responses.

- **Trigger-Based Execution:** Script runs automatically when new responses reach the defined count (10).

Conclusion

The **Automated Sentiment Reporting System** has proven to be an efficient and intelligent way to understand employee emotions in real time. By combining the simplicity of Google Forms and Sheets with the power of NLP sentiment analysis, the system automatically processes feedback, categorizes it into positive, neutral, or negative sentiments, and delivers clear insights through Looker Studio dashboards.

With every 10 responses, the HR team receives an updated and refreshed report, allowing them to track weekly mood trends without any manual work. This not only saves time but also ensures that employee concerns and satisfaction levels are continuously monitored. Ultimately, this system bridges the gap between employees and management — helping organizations create a more positive, transparent, and responsive workplace culture.