

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

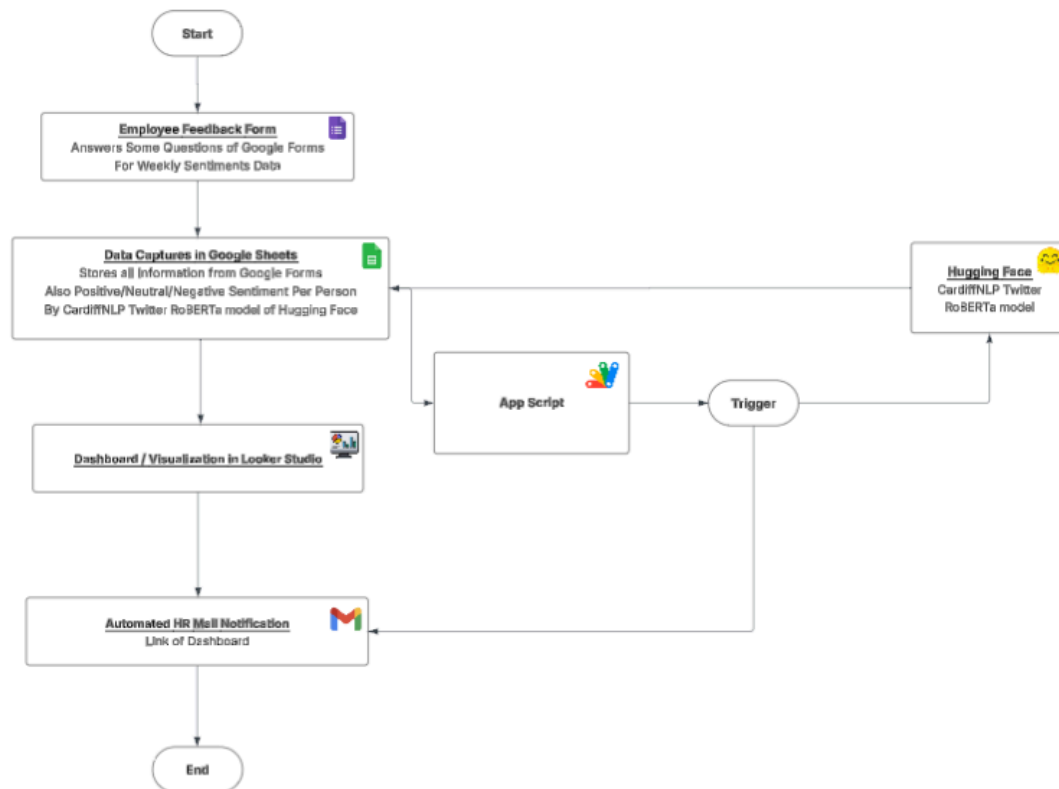


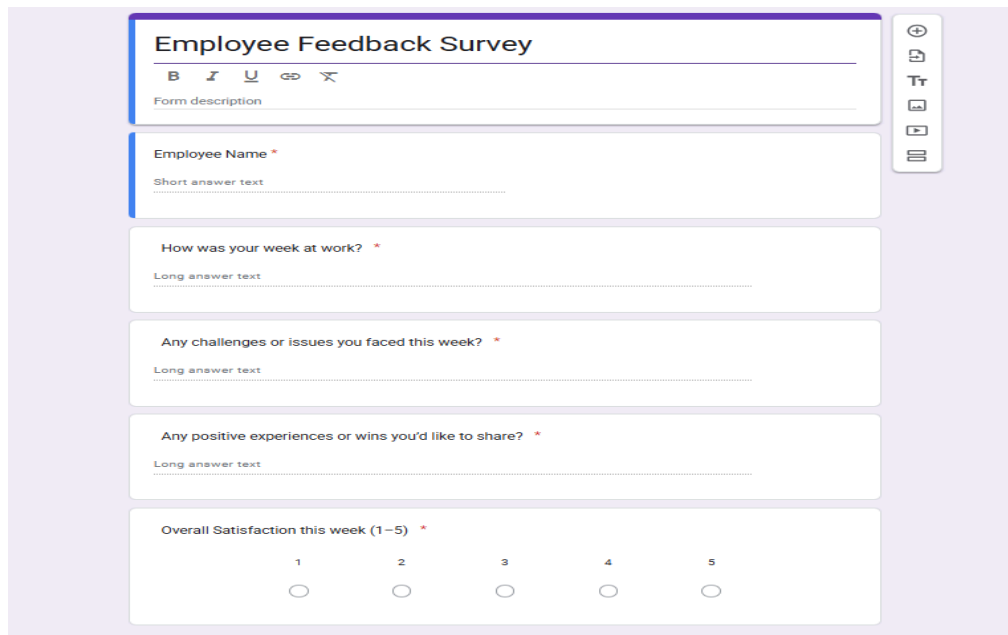
Fig.4.1 Entire Flow chart

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).



The image shows a Google Form titled "Employee Feedback Survey". The form includes a title bar with a description field and a toolbar with icons for adding sections, text, checkboxes, and images. The form contains five questions:

- Employee Name ***: A short answer text field.
- How was your week at work? ***: A long answer text field.
- Any challenges or issues you faced this week? ***: A long answer text field.
- Any positive experiences or wins you'd like to share? ***: A long answer text field.
- Overall Satisfaction this week (1–5) ***: A multiple choice question with five radio button options labeled 1, 2, 3, 4, and 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.

Form Responses	Timestamp	Employee Name	How was your week at work?	Challenges Faced	Positive Experiences	Overall Satisfaction	Sentiment Week	Week
2	10/5/2025 13:01:49	Sneha Reddy	Felt stressed due to deadlines.	Project milestones were missed.	Minimal, nothing notable.	2	NEGATIVE	1
3	10/5/2025 13:03:09	Pooja Nair	Very productive and smooth.	Minimal issues.	Completed all tasks on time and got good feedback.	5	POSITIVE	1
4	10/5/2025 13:04:09	Ravi Kumar	Felt appreciated for my work this week.	None significant.	Team recognized my contributions.	4	POSITIVE	1
5	10/5/2025 13:04:56	Arjun Rao	Average week.	Minor technical issues.	Helped a teammate with one task.	3	NEUTRAL	1
6	10/5/2025 13:05:45	Neha Das	It was okay, nothing special.	Some delays in project communication.	Few tasks went smoothly.	4	NEUTRAL	1
7	10/5/2025 13:24:17	Arjun Patel	Overwhelmed with tasks.	Collaboration issues slowed progress.	Got help from one colleague.	2	NEGATIVE	1
8	10/5/2025 13:25:07	Priya Sharma	Workload was too high.	Missed deadlines and miscommunication.	None significant.	1	NEGATIVE	1
9	10/5/2025 13:25:03	Rohit Verma	Stressful and tiring.	Unexpected project changes.	Colleague helped on one task.	3	NEGATIVE	1
10	10/5/2025 13:26:53	Anjali Mehta	Not very productive.	Too many meetings disrupted focus.	Finished one task successfully.	2	NEGATIVE	1
11	10/5/2025 13:27:42	Karan Singh	Frustrating at times.	Conflicting instructions from management.	Some appreciation from a colleague.	3	NEGATIVE	1
12	10/5/2025 13:33:48	Sneha Reddy	Struggling with deadlines.	Project delays due to unclear instructions.	Minimal, just small progress on one task.	2	NEGATIVE	2
13	10/5/2025 13:36:29	Arjun Patel	Overloaded and tired.	Multiple urgent tasks at once.	None significant.	1	NEGATIVE	2
14	10/6/2025 15:57:58	Priya Sharma	Deadlines still remain stress.	Miscommunication among team members.	Finished one small task successfully.	3	NEUTRAL	2

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.

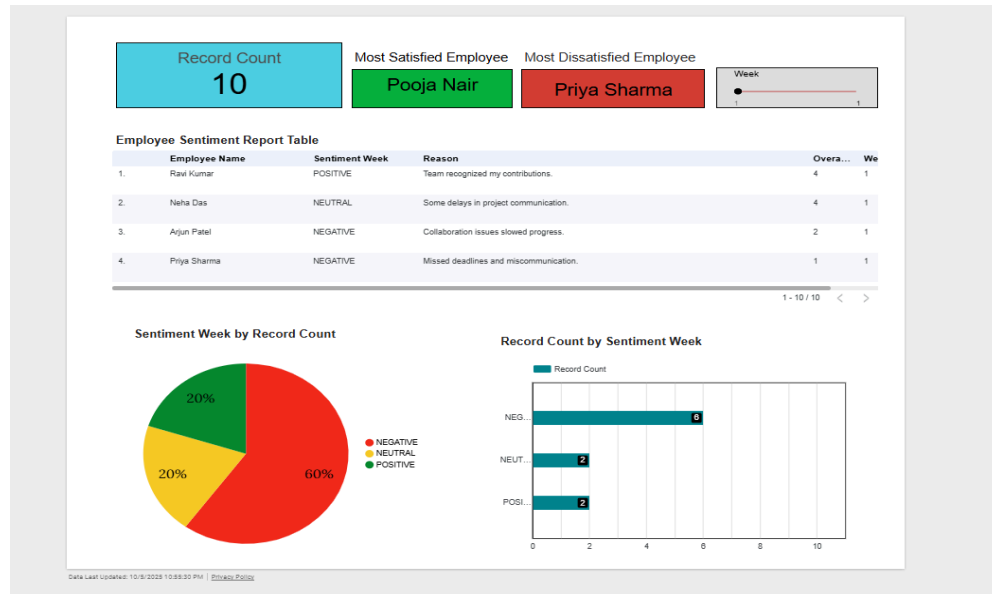


Fig.5.3.1 Dashboard for Sentiment Analysis

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.

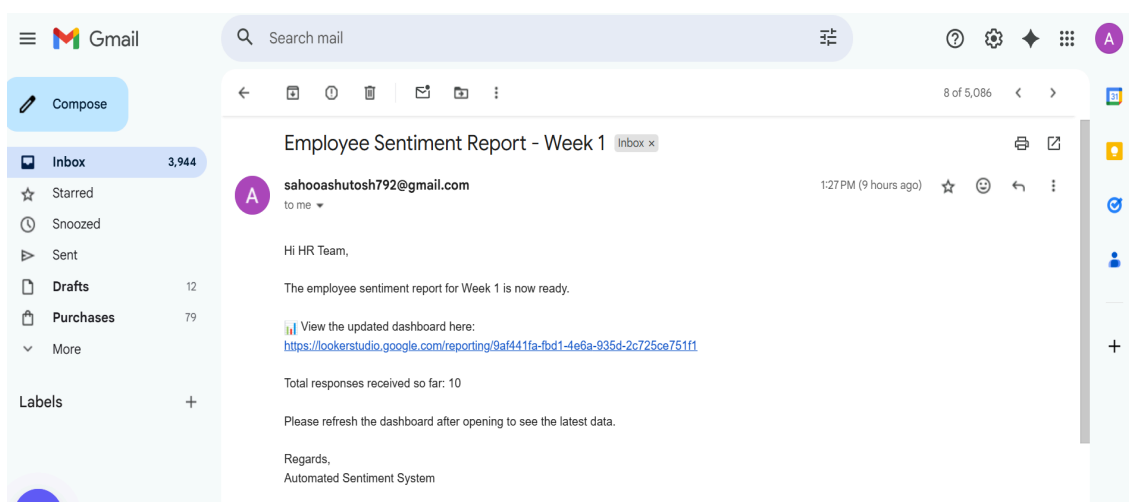


Fig.5.4.1 Automated Email to HR

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.