Project Guide: Al-Powered Variance Report Automation using n8n + Gemini

Problem Statement

Manually comparing data from two systems (daily CSV email vs Postgres DB) is time-consuming and errorprone. The goal is to **automate the comparison**, detect mismatches, and generate a professional **Variance Report** in Google Docs.

What This Automation Does

- Extracts a **CSV file** from daily incoming email
- Setches matching data from Postgres DB
- Uses Gemini Al Agent to compare datasets intelligently
- III Identifies variance in row count, column names, totals, and city-wise values
- Shares the report via Google Drive and sends the link

Tools Used

Tool Purpose

n8n Automation platform to connect all steps

Gmail Receive the CSV via email

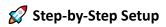
Postgres DB Fetch data for comparison

Gemini (LLM) Compare datasets and generate markdown

Google Docs Create and store variance reports

Google Drive Share the document via link

Workflow Overview



- Use Gmail → Watch Email node in n8n.
- Filter for emails with a CSV attachment (new system data).

Step 2: Extract CSV Data

- Use the "Read Attachment" node.
- Store the CSV content for AI comparison.

Step 3: Fetch DB Data

- Use Postgres DB node.
- Write SQL to fetch comparable old system data.

Step 4: Prepare Al Agent

- Tool: Google Gemini via AI Agent node.
- Configure with:
 - System Message (see next section)
 - User Prompt (CSV and DB as strings)
 - Output Format: Strict JSON

Step 5: System Message Prompt (Use This)

You are an AI Agent in n8n.

Your task is to compare two datasets:

- 1. emailData (CSV from mail)
- 2. dbData (Postgres query)

You will:

- Compare total row counts
- Compare column counts and column names
- Compare total values of a numeric column (overall and per city)

You must return a VALID JSON OBJECT with this exact structure:

{ "docTitle": "...", "docBodyMarkdown": "...", "summary": "...", "overallVariance": {...}, "cityVariance": [...] }

IMPORTANT:

- DO NOT output any explanation or extra text.
- Return only the JSON object in the exact format.

Step 6: Convert AI Output to Google Doc

- Create a new document with the title and markdown body.
- Use Google Docs to create + update content.

Step 7: Share and Respond

- Use Google Drive to make the doc public or accessible via link.
- Send reply email with report link using Gmail.

6 Final Output

- Email with variance report shared as a Google Doc link.
- III Al-powered smart comparison.
- No manual logic writing AI does the heavy lifting.
- Professional reporting with structured summaries.

Rey Highlights

- Handles data cleaning, comparison, and formatting
- Plug-and-play system for any variance workflow
- Built entirely on no-code tools (n8n + Gemini + Google)