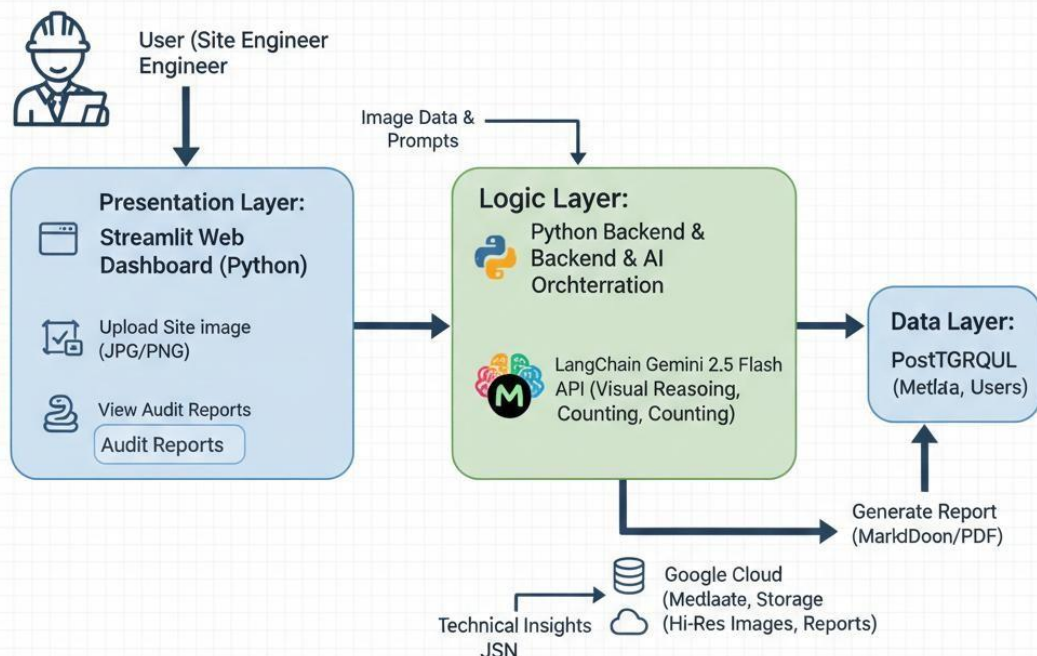


# Requirement Analysis Phase-II

## Technology Stack (Architecture & Stack)

Date	18 January 2026
Team ID	LTVIP2025TMID42151
Project Name	Advancing Nutrition Science Through Gemini AI
Maximum Marks	4 Marks

### Civil Engineering Insight Studio: Technical Architecture



#### Technology Stack



Streamlit (UI)



Gemini 25 Flash (AI Orchestration)



LangChain (DB GP Cloud)

Pandas

(DataFrames)

## 1. Technical Architecture Diagram

This diagram follows the provided guidelines by illustrating the demarcation between the local user environment (Field Engineer), the cloud-based AI processing layer (Google Gemini), and the central data storage.

**Table-1: Components & Technologies**

S.No	Component	Description +2	Technology +2
1	User Interface	Responsive Web Dashboard for image uploads and audit management.	Streamlit, HTML5, CSS3
2	Application Logic-1	Core backend logic for handling file uploads and report formatting.	Python 3.10
3	Application Logic-2	Multimodal data processing and prompt engineering.	LangChain / Google Generative AI SDK
4	Database	Relational storage for user profiles and project metadata.	PostgreSQL
5	Cloud Database	Fully managed database instance for global accessibility.	Google Cloud SQL / Supabase
6	File Storage	Storage for high-resolution site imagery and generated reports.	Google Cloud Storage (GCS) / AWS S3
7	Machine Learning Model	Visual reasoning model for structural member identification.	Google Gemini 2.5 Flash API
8	Infrastructure	Scalable cloud deployment for high availability.	Google Cloud Platform (GCP)

**Table-2: Application Characteristics**

S.No	Characteristics	Description +2	Technology +2
1	<b>Open-Source Frameworks</b>	Utilizes robust libraries for data manipulation and UI.	Streamlit, Pandas, NumPy
2	<b>Security Implementations</b>	Secure handling of API keys and encrypted user data.	OAuth 2.0, SSL/TLS, Python-dotenv
3	<b>Scalable Architecture</b>	Decoupled architecture separating the UI from the heavy AI reasoning.	3-Tier / Serverless Architecture
4	<b>Availability</b>	Ensures engineers can perform site walkthroughs 24/7.	Google Cloud Run (Auto-scaling)
5	<b>Performance</b>	Rapid AI inference and low-latency image validation.	Gemini Flash (Low-latency) / Redis Cache