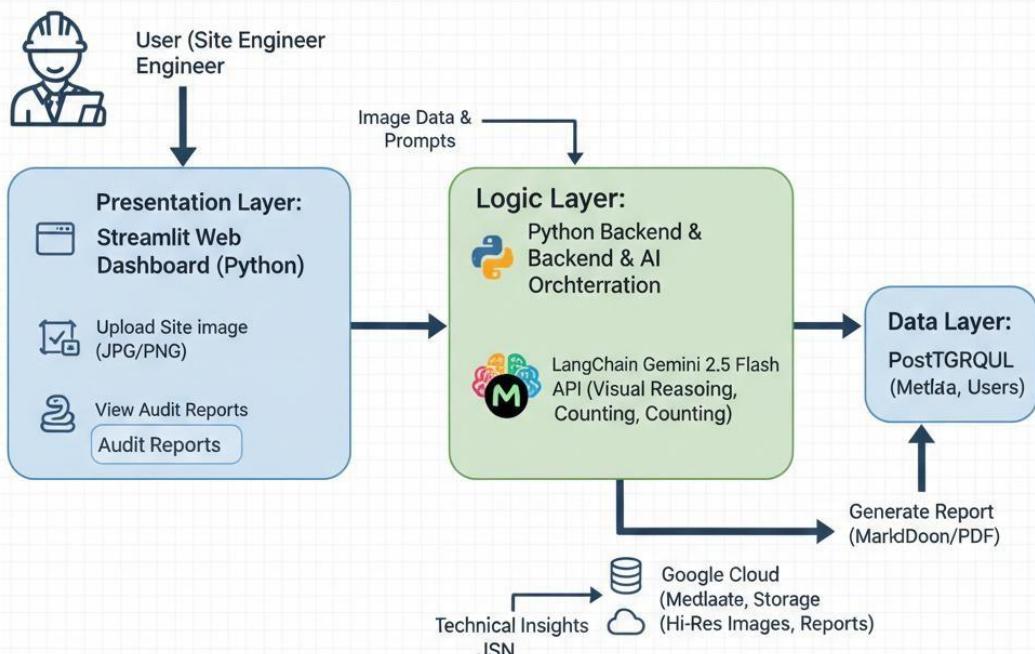


# Requirement Analysis Phase-II

## Technology Stack (Architecture & Stack)

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

### Civil Engineering Insight Studio: Technical Architecture



#### Technology Stack



Streamlit (UI)



Gemini 25 Flash (AI Orchterration)



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	<b>User Interface</b>	Responsive Web Dashboard for image uploads and audit management.	<b>Streamlit, HTML5, CSS3</b>
2	<b>Application Logic-1</b>	Core backend logic for handling file uploads and report formatting.	<b>Python 3.10</b>
3	<b>Application Logic-2</b>	Multimodal data processing and prompt engineering.	<b>LangChain / Google Generative AI SDK</b>
4	<b>Database</b>	Relational storage for user profiles and project metadata.	<b>PostgreSQL</b>
5	<b>Cloud Database</b>	Fully managed database instance for global accessibility.	<b>Google Cloud SQL / Supabase</b>
6	<b>File Storage</b>	Storage for high-resolution site imagery and generated reports.	<b>Google Cloud Storage (GCS) / AWS S3</b>
7	<b>Machine Learning Model</b>	Visual reasoning model for structural member identification.	<b>Google Gemini 2.5 Flash API</b>
8	<b>Infrastructure</b>	Scalable cloud deployment for high availability.	<b>Google Cloud Platform (GCP)</b>

**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