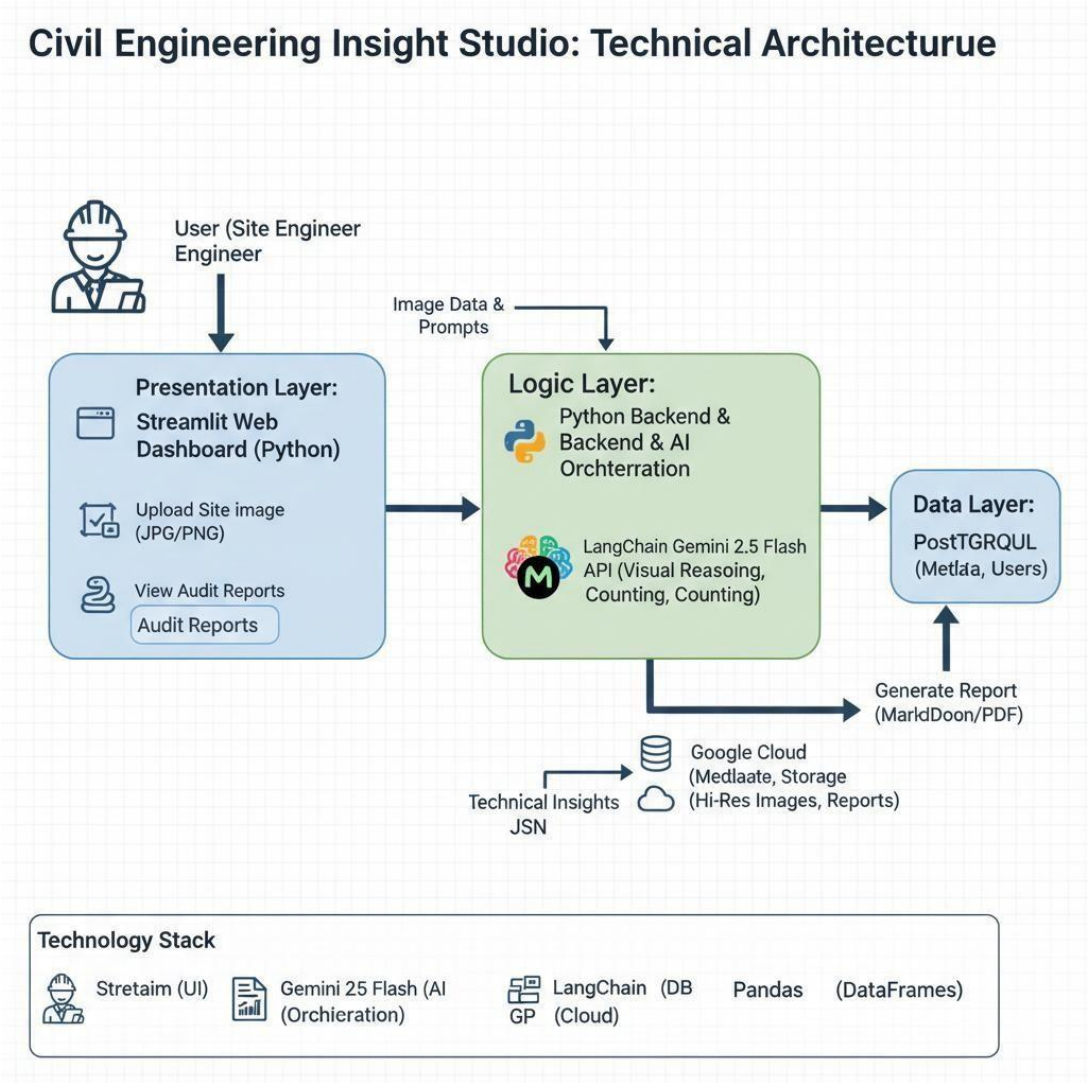
Requirement Analysis Phase-II

Technology Stack (Architecture & Stack)

Date	23 January 2026
Team ID	LTVIP2026TMIDS82617
Project Name	Advancing Nutrition Science Through Gemini AI
Maximum Marks	4 Marks



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	**Open-Source Frameworks**	Utilizes robust libraries for data manipulation and UI.	Streamlit, Pandas, NumPy
2	**Security Implementations**	Secure handling of API keys and encrypted user data.	OAuth 2.0, SSL/TLS, Python-dotenv
3	**Scalable Architecture**	Decoupled architecture separating the UI from the heavy AI reasoning.	3-Tier / Serverless Architecture
4	**Availability**	Ensures engineers can perform site walkthroughs 24/7.	Google Cloud Run (Auto-scaling)
5	**Performance**	Rapid AI inference and low-latency image validation.	Gemini Flash (Low-latency) / Redis Cache