

Project Design Phase-II Technology Stack (Architecture & Stack)

Date	17 February 2026
Team ID	LTVIP2026TMIDS24224
Project Name	Gemini Historical Artifact Description System
Maximum Marks	4 Marks

Technical Architecture (3-Tier Cloud Architecture)

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Architecture Type: Cloud-based 3-Tier Architecture

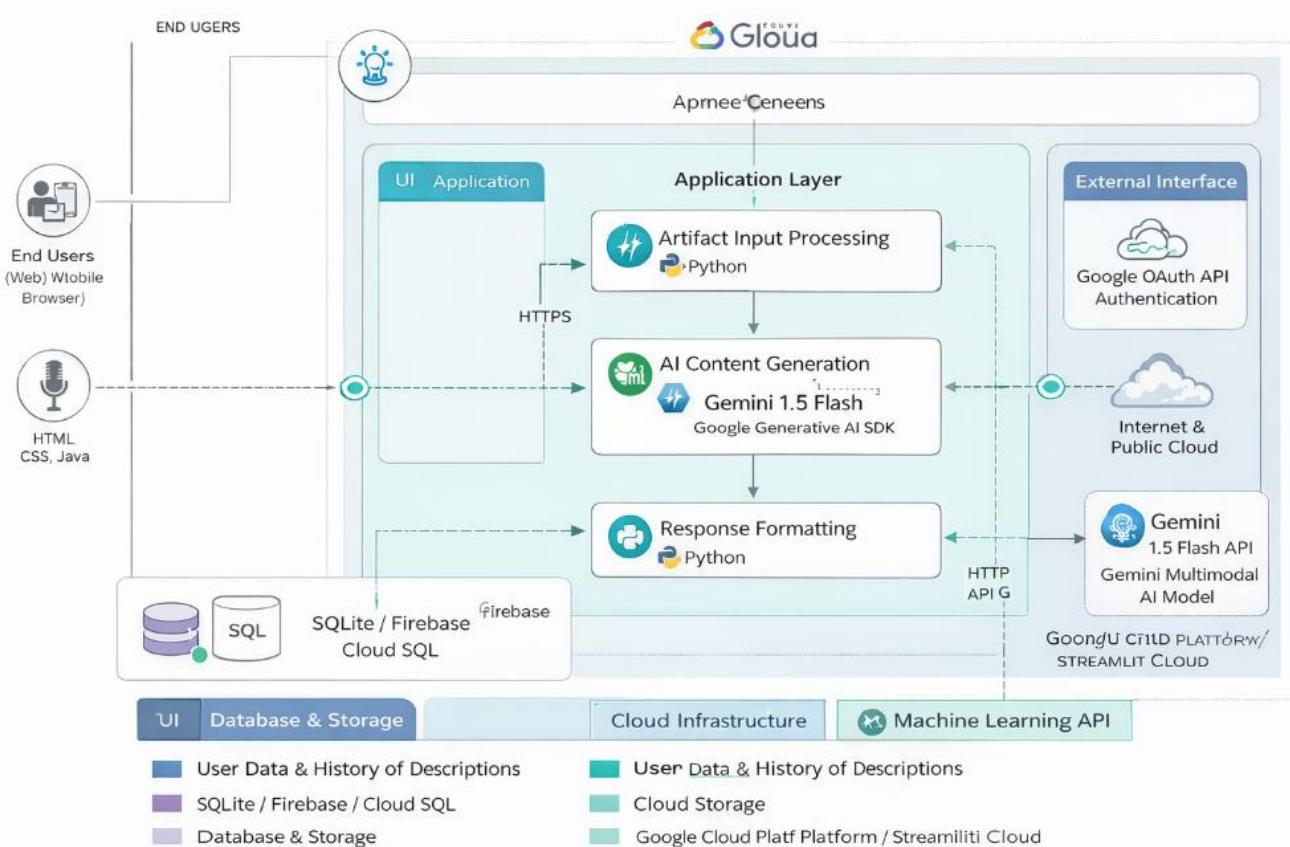


Table-1: Components & Technologies

S.No	Component	Description	Technology
1	User Interface	Web-based interface where users enter artifact name or upload image	Streamlit, HTML, CSS
2	Application Logic-1	Handles user input validation and request processing	Python

S.No	Component	Description	Technology
3	Application Logic-2	Generates prompts and interacts with AI model	Google Generative AI SDK
4	Application Logic-3	Processes and formats AI response	Python
5	Database	Stores user data and history of generated descriptions	SQLite / MySQL
6	Cloud Database	Cloud-hosted structured storage	Firebase Firestore / Cloud SQL
7	File Storage	Stores uploaded artifact images	Local File System / Cloud Storage
8	External API-1	AI model API for content generation	Gemini 1.5 Flash API
9	External API-2	Authentication services	Google OAuth API
10	Machine Learning Model	Generates artifact descriptions and analyzes images	Gemini Multimodal AI Model
11	Infrastructure (Server / Cloud)	Application deployment environment	Streamlit Cloud / Google Cloud Platform

Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1	Open-Source Frameworks	Frameworks used for rapid web development	Streamlit, Python
2	Security Implementations	Password encryption, secure API keys, authentication control	HTTPS, OAuth 2.0, SHA-256 Hashing
3	Scalable Architecture	3-tier cloud-based design allowing scaling of application and API services	Cloud Deployment, Microservices Architecture
4	Availability	Application hosted on cloud with minimal downtime	Streamlit Cloud / GCP
5	Performance	Fast AI response handling, optimized prompt design	Cloud Infrastructure, API Optimization