

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

Date	27 June 2025
Team ID	LTVIP2025TMID21064
Project Name	Citizen AI – Intelligent Citizen Engagement Platform
Maximum Marks	4 Marks

Technical Architecture

The Citizen AI system is built using FastAPI and Python on Google Collab, integrated with the IBM Granite LLM via Hugging Face for real-time response generation. It features a simple web interface, in-memory processing, and optional support for cloud storage and external APIs. The architecture is modular, scalable, and deployable via public links for 24x7 access.

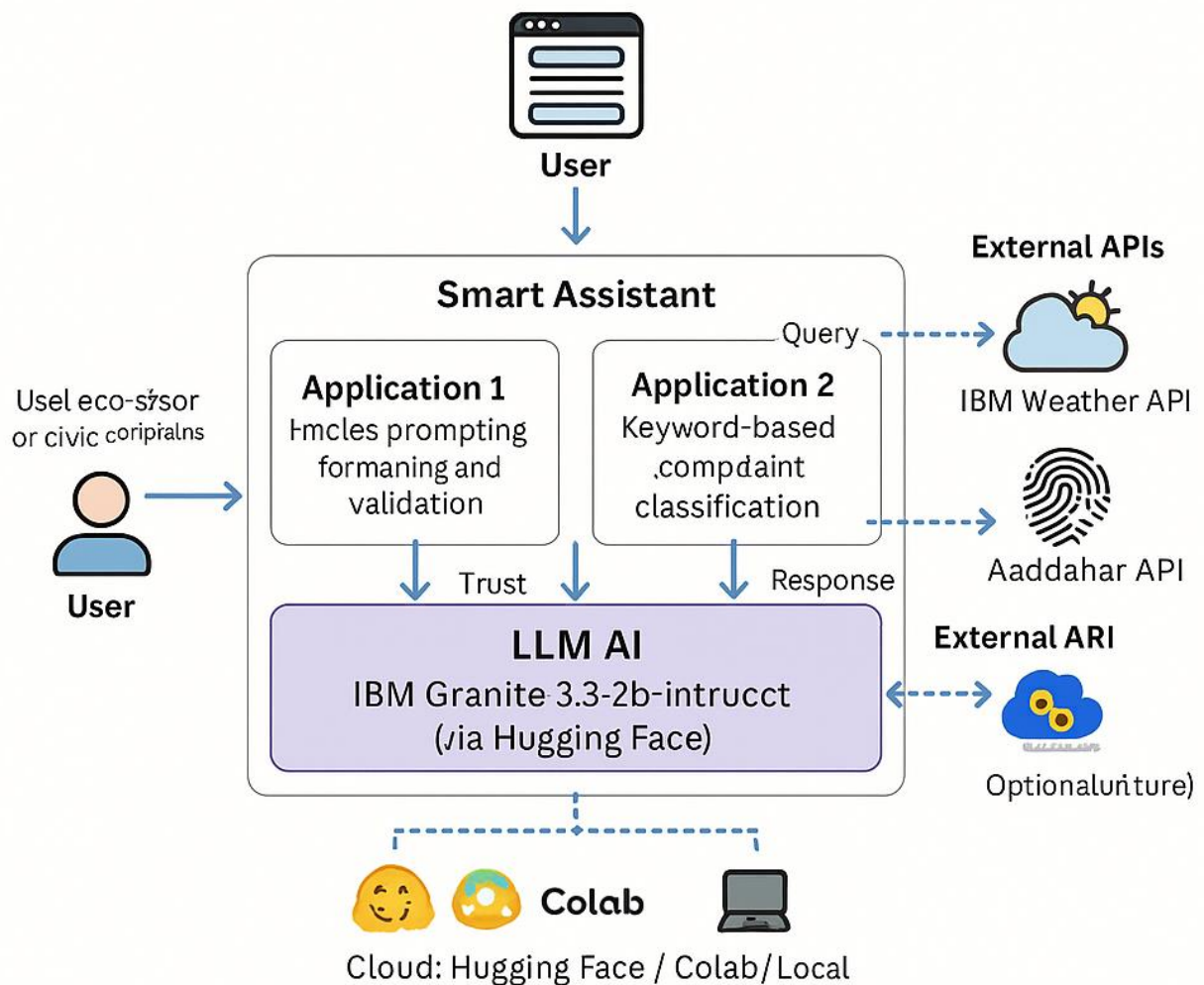


Table-1 : Components & Technologies

S. No	Component	Description	Technology
1	User Interface	Web UI interface allowing users to enter queries and complaints	HTML, CSS (served via Collab or FastAPI)
2	Application Logic-1	Handles prompt formatting and input validation	Python
3	Application Logic-2	Classifies sentiment from feedback and handles response formatting	Python
4	Application Logic-3	LLM-based response generation for user eco-queries and civic issues	IBM Granite 3.3-2b-instruct via Hugging Face API
5	Database (Temporary)	In-memory structured prompt-response handling	Python Dictionaries
6	Cloud Database (Optional)	Logs for user queries and feedback to enable monitoring in future	IBM Cloud / Firebase (future scope)
7	File Storage	Local script memory used during runtime (temporary); future scope includes PDF/image support	Local Filesystem
8	External API-1 (Optional)	Integrate IBM Weather API to answer environmental or weather-related citizen queries	IBM Weather API
9	External API-2 (Optional)	Aadhaar integration for user identity verification during sensitive complaint submission (optional)	Aadhaar API
10	Machine Learning Model	Pre-trained LLM model that understands and generates contextual replies	IBM Granite via Hugging Face
11	Infrastructure (Cloud)	Hosted via public URL from Google Collab using FastAPI + Ngrok; scalable to Hugging Face Spaces	Google Collab / Hugging Face / Localhost

Table-2: Application Characteristics

S. No	Characteristics	Description	Technology
1	Open-Source Frameworks	Entire system is built using open-source tech and APIs	Python, FastAPI, Colab, Hugging Face Transformers
2	Security Implementations	No login now; future scope includes OAuth, JWT for API access, encrypted data	SHA-256 (planned), Flask Login (planned)
3	Scalable Architecture	Modular backend supports plug-and-play APIs and components	2-tier (UI + Backend); scalable to 3-tier
4	Availability	System is hosted on Colab or Hugging Face and available 24x7 via public URL	Hugging Face Spaces / Google Colab