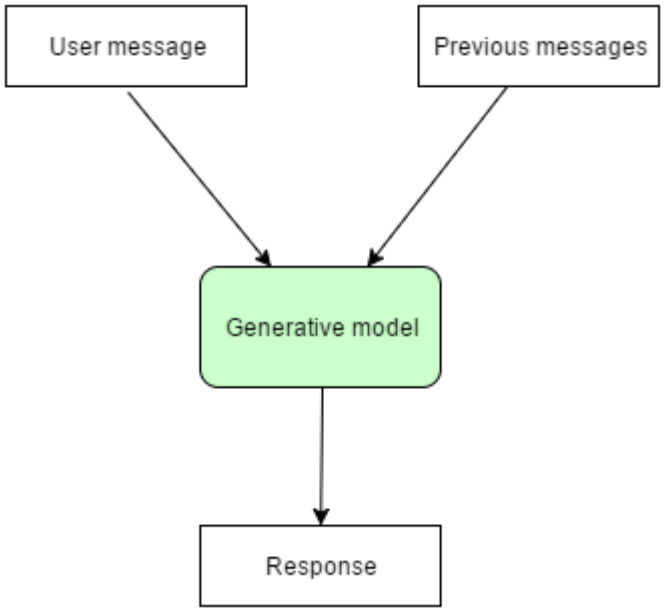
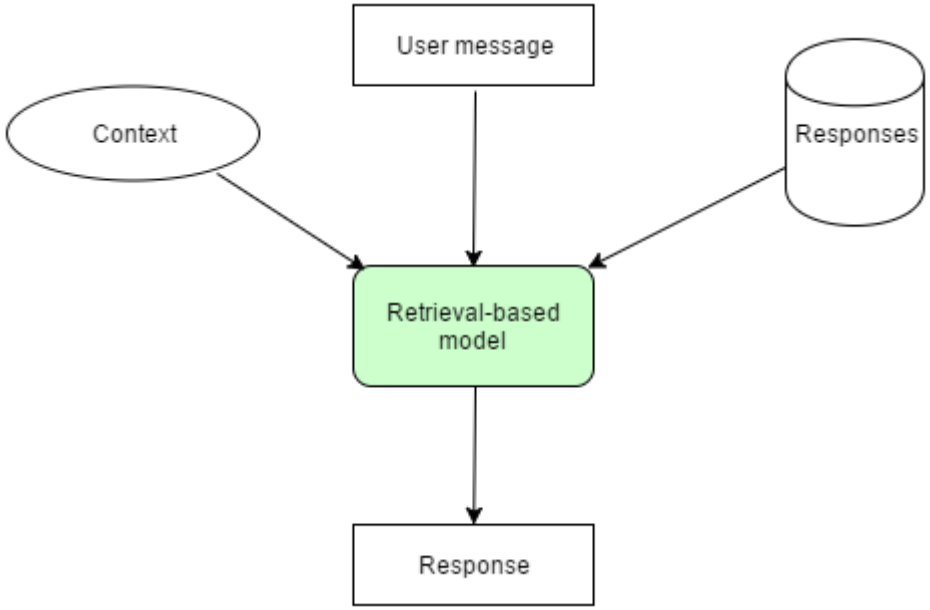
Project Design Phase-II

3.4Technology Stack (Architecture & Stack)

Date	31 Janaury 2025
Team ID	LTVIP2025TMID32100
Project Name	Citizen AI
Maximum Marks	4 Marks





Technical Architecture:

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

S.No	Component	Description	Technology
1.	User Interface	Chatbot interface for user interaction (issue reporting, Q&A).	**Gradio**, HTML, CSS.
2.	Application Logic-1	Handles routing, query preprocessing, response formatting	**Python**, FastAPI
3.	Application Logic-2	AI model interaction and natural language understanding	**IBM Granite 3.3**, Hugging Face Transformers

4.	Application Logic-3	Query classification and response generation logic	Python-based logic & custom intents
5.	Database	Optional storage for FAQs, schemes, issue categories	JSON files / SQLite (optional)
6.	Cloud Database	For storing user queries, feedback, issue logs (future scope)	IBM Cloudant, Firebase (optional)
7.	File Storage	Storing logs, screenshots (if uploaded), or static JSON files	Local Filesystem / IBM Object Storage (future)
8.	External API-1	To fetch area-specific government service information (future)	e-Seva / RTI APIs (future integration)
9.	External API-2	(Optional) To verify user or connect to citizen services	Aadhar API, etc.
10.	Machine Learning Model	Understand and respond to user queries in natural language	IBM Granite Model / Fine-tuned Transformers
11.	Infrastructure (Server / Cloud)	Deployed via Google Colab; can migrate to IBM Cloud or local host	**Google Colab**, IBM Cloud, Local/VM, Docker

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Frameworks and tools used to build the platform	Gradio (Python), FastAPI, Hugging Face Transformers
2.	Security Implementations	Application-level security (basic for now, expandable)	Token-based access, HTTPS (when deployed), basic auth Future: OAuth2, IAM, OWASP practices
3.	Scalable Architecture	Modular backend, pluggable AI, potential for microservices and API gateways	Microservices-friendly: FastAPI + AI Models separated
4.	Availability	Can be deployed to cloud, supports scaling through containerization and serverless platforms	IBM Cloud, Docker, Cloud Foundry (optional)
5.	Performance	Optimized for fast inference using lightweight models, Gradio sessions cached	GPU-enabled Colab, Caching in FastAPI (future), Preloaded responses