

**Citizen AI Chatbot - Technology Stack**

<b>Date</b>	<b>26 June 2025</b>
<b>Team ID</b>	LTVIP2025TMID32134
<b>Project Name</b>	Citizen AI Chatbot
<b>Maximum Marks</b>	4 Marks

**Technical Architecture Components**

S.No	Component	Description	Technology
1.	User Interface	Multilingual chat interface (Web/WhatsApp)	Gradio, React.js
2.	Application Logic-1	Query processing & routing	Python (Flask)
3.	Application Logic-2	Speech-to-text for voice queries	IBM Watson Speech-to-Text
4.	Application Logic-3	Intent detection & response generation	IBM Granite-3B model
5.	Database	Government service knowledge base	IBM Cloudant (NoSQL)
6.	Cloud Database	Citizen query logs	IBM Db2
7.	File Storage	PDF templates (forms, checklists)	IBM Cloud Object Storage
8.	External API-1	Aadhaar verification	UIDAI API
9.	External API-2	Sentiment analysis	IBM Watson NLP
10.	Machine Learning Model	Hindi-English translation	IBM Watson Language Translator
11.	Infrastructure	Scalable deployment	IBM Cloud Kubernetes

**Application Characteristics**

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	UI development & API integration	React.js, Flask

S.No	Characteristics	Description	Technology
2.	Security Implementations	Data encryption & access control	AES-256, IBM Cloud IAM
3.	Scalable Architecture	Microservices with auto-scaling	Kubernetes, Docker
4.	Availability	Multi-zone deployment with load balancing	IBM Cloud Load Balancer
5.	Performance	1000+ queries/sec with Redis caching	Redis, CDN (Akamai)

*[End of template - No additions or deletions]*

**Reference Architecture:**

[IBM AI-Powered Chatbot Patterns](#)

**Key:**

- **Frontend:** Gradio for prototyping, React for production
- **Backend:** IBM Cloud-native services
- **AI:** IBM Watson/Granite for NLP tasks