

Citizen AI – City Analysis and Citizen Services Assistant

Project Documentation

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## **1.1 Introduction**

In today's world, smart cities need technology to help their residents. People want quick access to information about safety, accidents, and government services. Officials also need tools to process data easily.

The **Citizen AI** project is designed to solve this problem by providing real-time information through an AI assistant. It helps citizens with safety details and answers their questions about city services.

## **1.2 Project Objective**

The main goals of this project are:

- Provide safety information like crime and accident data.
- Help citizens by answering questions about government services.
- Summarize government policies for easy understanding.
- Give users a simple interface to interact with AI.

## **1.3 Project Overview**

### **Purpose:**

The Citizen AI project aims to assist both citizens and city officials by giving instant responses, safety alerts, and helpful information through a user-friendly platform.

### **Key Features:**

- Natural conversation interface using AI.
- City analysis with crime and accident statistics.
- Policy summarization for government rules.
- Query response for public service questions.
- Interactive dashboard with Gradio.

## 1.4 Technology Architecture

**Frontend:** Built using Gradio to create an easy-to-use interface.

**Backend:**

- Uses Python libraries like Transformers and PyTorch.
- Integrated with IBM's Granite model for text generation.

**How it Works:**

- Users ask questions or request information.
- The AI processes the query and gives responses.
- City analysis is shown with data and statistics.

**Main Functions:**

- `generate_response(prompt)` – Answers user questions.
- `city_analysis(city_name)` – Gives safety-related data.
- `citizen_interaction(query)` – Responds to queries on services.

## 1.5 Setup Instructions

**Requirements:**

- Python 3.8 or above
- Google Colab with T4 GPU (preferred)
- Libraries: transformers, torch, gradio

**Steps to Setup:**

1. Open Google Colab.
2. Set the runtime to GPU (T4 preferred).
3. Install necessary libraries using `!pip install transformers torch gradio -q`.
4. Paste the project code into the notebook.

5. Run all cells to launch the app.
6. Access the link provided to use the interface.

## 1.6 Folder Structure

app/                – Backend logic  
app/api/           – API routes  
ui/                – Frontend components  
smart\_dashboard.py – Main script  
granite\_llm.py    – Model integration  
document\_embedder.py – Embedding and document search

## 1.7 Running the Application

1. Launch Google Colab.
2. Run the installation commands.
3. Start the Gradio dashboard.
4. Use the **City Analysis** tab to explore safety data.
5. Use the **Citizen Services** tab to ask questions.

## 1.8 API Documentation

### Available Functions:

- **generate\_response(prompt):** Generates replies based on user input.
- **city\_analysis(city\_name):** Provides crime and safety data.
- **citizen\_interaction(query):** Answers service-related questions.

## 1.9 Authentication&Security

Future versions can include:

- Token-based authentication (JWT, API keys).
- OAuth2 integration.
- Role-based permissions for admins and users.

## 1.10 User Interface Description

- **City Analysis Tab:** Users enter a city name and view safety data.
- **Citizen Services Tab:** Users ask questions about services and receive answers.
- **Output:** Results are shown in clear text fields.

## 1.11 Testing Process

- **Unit Testing:** Test each function separately.
- **API Testing:** Check responses for sample inputs.
- **Manual Testing:** Validate features by using the interface.
- **Edge Cases:** Handle wrong city names or empty queries.

## 1.12 Known Issues

- Requires stable internet connection.
- AI results may not always be accurate.
- Works better with real-time data integration.

## 1.13 Future Enhancements

- Add real-time city data feeds.
- Improve AI with forecasting and analytics.
- Support multiple languages.
- Create a mobile application.

## 1.14 Conclusion

The **Citizen AI** project shows how artificial intelligence can make city services more accessible and safer. It helps both citizens and officials by providing quick and accurate information. This project is a step toward smarter cities in the future.