Project Design Phase-II
Data Flow Diagram & User Stories

Date	28 June 2026
Team ID	LTVIP2025TMID60548
Project Name	Sustainable Smart City Assistant Using IBM Granite LLM
Maximum Marks	4 Marks

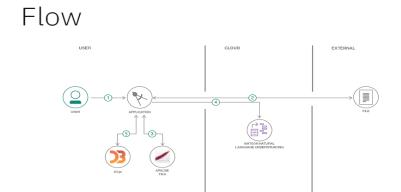**Data Flow Diagrams:**

⮔ **Key Entities:**

- Citizen (External Entity)

- City Administrator (External Entity)

- Streamlit Frontend

- FastAPI Backend

- IBM Granite LLM

- Pinecone Vector Store

- ML Models (Forecasting, Anomaly Detection)
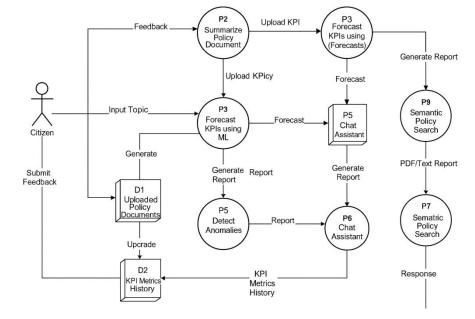
- Database (Feedback, KPI, Policy Docs)

 Data Flows:

- Citizens submit feedback → Stored in database

- Admin uploads KPI data → Sent to ML Model → Forecasts & anomalies returned

- Policies uploaded → Embedded → Stored in Pinecone → Searchable by LLM

- Eco Tips / Chat prompts → Sent to Granite LLM → Natural language response returned

- Dashboard retrieves processed KPI metrics → Streamlit displays data to user

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Example: (Simplified)

Flow

1. User configures credentials for the Watson Natural Language Understanding service and starts the app.
2. User selects data file to process and load.
3. Apache Tika extracts text from the data file.
4. Extracted text is passed to Watson NLU for enrichment.
5. Enriched data is visualized in the UI using the D3.js library.

User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Citizen	Feedback Submission	USN-1	As a citizen, I want to submit a complaint with a category so that I can report issues like water leaks or garbage.	Complaint is stored and tagged with category.	High	Sprint-1
Citizen	AI Chat Assistant	USN-2	As a citizen, I want to ask sustainability questions and get helpful replies using AI.	Granite LLM provides relevant AI responses instantly.	High	Sprint-1
Citizen	Eco Tips	USN-3	As a user, I want to receive eco-friendly tips based on keywords like plastic or solar.	AI returns relevant environmental tips in real time.	Medium	Sprint-2
Admin	KPI Upload & Forecasting	USN-4	As an admin, I want to upload water/energy data to get future KPI predictions.	Forecasted results are visualized on dashboard.	High	Sprint-1
Admin	Anomaly Detection	USN-5	As an admin, I want to detect abnormal spikes in city energy/water usage.	Outliers are detected and flagged clearly.	Medium	Sprint-2
Admin	Policy Summarization	USN-6	As an admin, I want to upload large policy files and get short summaries using AI.	LLM-generated summary appears below upload section.	High	Sprint-1
Admin & Citizen	Semantic Document Search	USN-7	As a user, I want to search through policies and find relevant sections easily.	Results are returned based on semantic similarity using Pinecone and LLM.	Medium	Sprint-2
Admin	Report Generator	USN-8	As an admin, I want to auto-generate city sustainability reports based on collected data.	Report content is created using LLM and downloadable.	Low	Sprint-1
School Teacher / Educator	AI Eco Awareness Tips	USN-9	As a teacher, I want to generate eco tips using keywords to educate students about sustainability.	AI returns clear and student-friendly eco tips based on topic input.	Medium	Sprint-2
Policy Analyst	Document Summarization	USN-10	As a policy analyst, I want to summarize lengthy policy files to focus on actionable insights.	IBM Granite LLM produces concise and structured summaries for long text documents.	High	Sprint-1
NGO Volunteer	Real-time KPI Monitoring	USN-11	As an NGO volunteer, I want to view real-time KPIs like air quality to plan awareness campaigns.	The dashboard shows accurate, updated sustainability metrics per zone/city	Medium	Sprint-2

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Smart City Project Manager	Anomaly Notifications	USN-12	As a project manager, I want to be alerted when abnormal resource usage occurs to take preventive action.	The system flags anomalies and provides quick alerts on dashboard or via email	High	Sprint-1