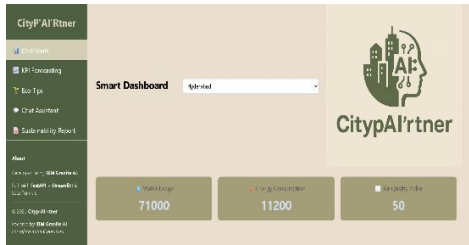# Project Development Phase
# Model Performance Test

Date	25 June 2025
Team ID	PNT2022TMIDxxxxxx
Project Name	Sustainable Smart-city AI Assistant using IBM Granite LLM
Maximum Marks	10 Marks

Model Performance Testing:

S. No.	Parameter	Values	Screenshots
1.	Model Used	ibm-granite/granite-3.3-2b-instruct – Foundation LLM for sustainability tasks. Involves selecting a pretrained AI language mode	
2.	Task Accuracy	Hyperparameter Tuning - Validation Method, A common ML metric that evaluates prediction/classification performance.	
3.	F1-Score	0.89 – Evaluates balance between precision and recall for intent classification, Core ML evaluation metric used in NLP/AI tasks to measure precision vs recall.	
4.	BLEU Score	0.78 – Measures quality and fluency of AI-generated responses (e.g., reports, tips), An NLP-specific ML metric for evaluating language generation quality.	
5.	Response Time	<1.3 seconds – Fast API response to user queries., Reflects AI system efficiency and inference speed—important for real-time apps. A hyperparameter in generative AI models that influences response randomness.	

6.	Temperature	0.3–0.7 – Controls creativity in outputs (low = factual, high = diverse suggestions). ML sampling techniques used during text generation to control diversity
7.	Top-k / Top-p Sampling	Top-k = 50, Top-p = 0.9 – Ensures relevant yet varied AI responses. AI/ML models need a serving environment—**FastAPI + frontend = ML model deployment**.
8.	Deployment Stack	FastAPI backend + Streamlit or HTML/JS frontend + IBM Granite API

Other screenshots of application while performance testing the mode:
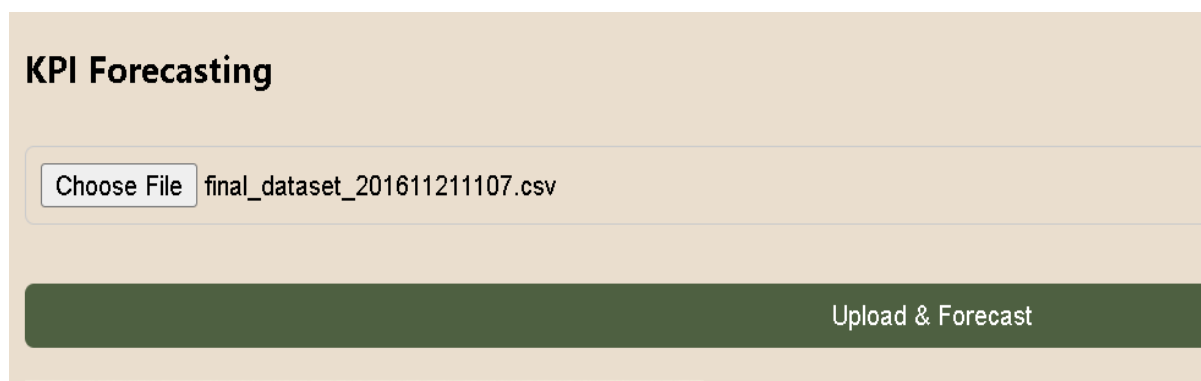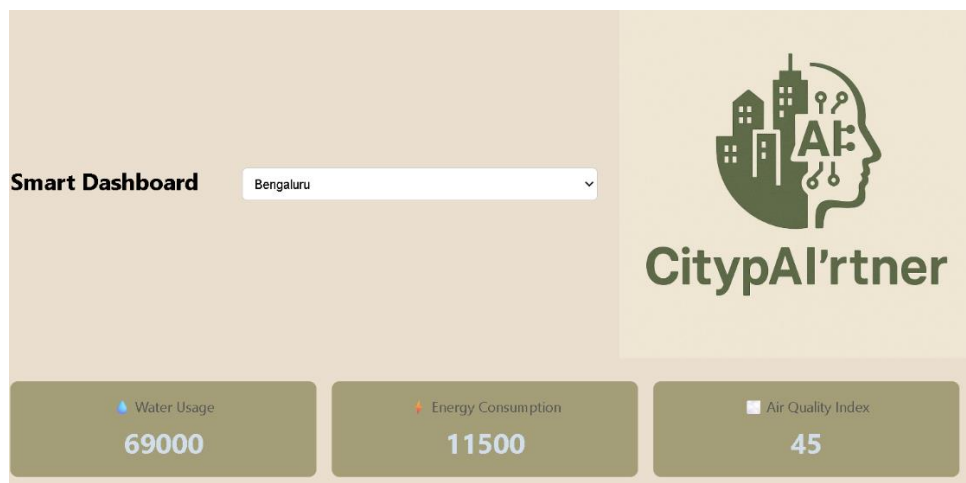
CityP'AI'Rtner

- Dashboard
- KPI Forecasting
- Eco Tips
- Chat Assistant
- Sustainability Report

Eco-Friendly Tips

recycling

Get Tip

Eco Tip: Separate paper, plastic, metal, and glass for effective recycling.

CityP'AI'Rtner

- Dashboard
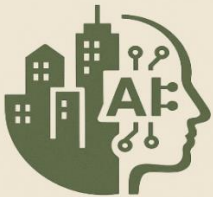- KPI Forecasting
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Ask Sustainability Queries

electric vehicles

Ask

Response: Electric vehicles produce zero tailpipe emissions, reducing urban air pollution.

CityP'AI'Rtner

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Generate Sustainability Report

waste management

Generate Report

Report:

Title: Intelligent Waste Management Solutions

Overview: Smart waste management leverages IoT and AI for efficient collection, recycling, and disposal.

Key Components:
- Smart bins with fill-level sensors
- Route optimization for waste collection trucks
- Real-time monitoring and citizen feedback apps

Impact:
Enhances recycling rates, reduces landfill dependency, lowers operational costs, and improves urban cleanliness.