

Project Development Phase Model Performance Test

Date	10 February 2025
Team ID	LTVIP2025TMID34483
Project Name	Sustainable smart city assistant using IBM GRANTIE LLM
Maximum Marks	

Model Performance Testing:

Model Performance Testing Template for Smart City Assistant

S.No.	Parameter	Screenshot / Values
1	Data Rendered	e.g., source: traffic sensor logs, air quality feeds, waste pickup records. Include screenshot of loaded raw data table or map.
2	Data Preprocessing	e.g., applied steps—missing value imputation, normalization, geospatial coordinate transformation. Include screenshot of code or preview.
3	Utilization of Data Filters	e.g., date range filters, pollutant threshold filters, zone selection dropdowns. Screenshot of filtered dashboard view.
4	DAX Queries Used	e.g., SUM('Energy'[Usage]), CALCULATE() measures for peak demand. Provide screenshots of formula editor and results.
5	Dashboard Design	No. of Visualizations / Graphs – ____ e.g., 5 visuals: line chart (energy), bar chart (waste bins status), map, KPI cards, gauge.
6	Report Design	No. of Visualizations / Graphs – ____ e.g., 4 visuals: monthly summary, emissions trend, citizen request types pie chart, alert table.

Smart City's Context with IBM Granite LLM

- Data Rendered**
 - Inputs: real-time IoT feeds (e.g. traffic, waste, energy), historical population/environment data.
 - Use IBM Granite Geospatial models (e.g. *Granite-EarthObservation*, *WeatherClimate*) to process satellite or environmental time-series data ibm.com+5ibm.com+5newsroom.ibm.com+5ibm.com.
- Data Preprocessing**
 - Geospatial coordinate normalization, DAX-based unit conversions, timestamp alignment for sensors; doc data prepared for RAG pipelines.
- Utilization of Data Filters**
 - User interface allows filtering by ward, date/time, pollutant level.
 - Filters feed into Granite-backed queries to generate dynamic insights or alerts.
- DAX Queries Used**

- Examples:
 - $\text{TotalEnergy} = \text{SUM}(\text{Energy}[\text{Consumption_kWh}])$
 - $\text{AvgPM25} = \text{AVERAGE}(\text{AirQuality}[\text{PM2_5}])$
 - $\text{EnergyPerCapita} = \text{DIVIDE}(\text{TotalEnergy}, \text{Population}[\text{Count}])$

5. Dashboard Design

- Visual layout combining energy usage trends, real-time pollution map overlays, resource utilization gauges, and KPI summary cards.
- Leverages Granite's RAG capability to embed contextual explanations alongside visuals [ibm.com+1developer.nvidia.com+1](#).

6. Report Design

- Executive summaries: automated pages with charts (e.g., monthly emissions, citizen requests classified by urgency).
 - Granite generates text narratives explaining visuals, powered by instruction-tuned 3.0–3.2 models [reddit.com+10reddit.com+10ibm.com+10](#).
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