**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

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| Date | 27 – June-2025 |
| Team ID | LTVIP2025TMID30752 |
| Project Name | Sustainable Smart City Assistant Using IBM Granite LLM |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

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| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | Anomaly Detection | |  |  | | --- | --- | |  | Upload .csv data for anomaly check |  |  |  |  | | --- | --- | --- | |  |  | System highlights unusual spikes in usage | |
| FR-2 | |  | | --- | |  |  |  | | --- | | Report Generation | | |  |  | | --- | --- | |  | Enter city name and KPIs |  |  |  |  | | --- | --- | --- | |  |  | Generate a sustainability report | |
| FR-3 | |  | | --- | |  |  |  | | --- | | Feedback Module | | |  | | --- | | Submit feedback via form |  |  |  |  | | --- | --- | --- | |  |  | Select feedback category (Water, Electricity, Roads, etc.) |  |  |  |  | | --- | --- | --- | |  |  | View submission success message | |
| FR-4 | |  | | --- | |  |   Chat Assistant | |  |  | | --- | --- | |  | Ask questions through AI-powered assistant |  |  |  |  | | --- | --- | --- | |  |  | Receive human-like responses from IBM WatsonX | |
| FR-5 | |  | | --- | |  |  |  | | --- | | Eco Tips Generator | | |  | | --- | | Enter sustainability-related keyword |  |  |  |  | | --- | --- | --- | |  |  | Receive AI-generated eco tips | |
| FR-6 | KPI Forecasting | |  | | --- | | Upload .csv KPI data (e.g., Water/Energy Usage) |  |  |  |  | | --- | --- | --- | |  |  | View forecasted values (e.g., next month’s consumption) | |

**Non-functional Requirements:**

Following are the non-functional requirements of the proposed solution.

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | The system should have a clean, intuitive interface (via Streamlit) that is easy for both citizens and city administrators to navigate, regardless of technical expertise. |
| NFR-2 | **Security** | All sensitive data such as API keys and credentials will be securely managed using environment variables. User-uploaded data will be processed temporarily and not stored permanently unless authorized. |
| NFR-3 | **Reliability** |  The system should function consistently without crashing under standard usage scenarios. Modules (chat, forecasting, feedback) should produce stable and expected outputs.   |
| NFR-4 | **Performance** | The assistant should process text queries and data uploads efficiently, with minimal lag. LLM queries should respond within a reasonable timeframe (~2–5 seconds depending on load). |
| NFR-5 | **Availability** |  The application should be accessible online (or locally) at any time during demo or production hours with minimal downtime.   |
| NFR-6 | **Scalability** | The system should support the integration of new modules (e.g., smart traffic, waste management) and additional datasets or cities without major architectural changes. |