

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	06 May 2023
Team ID	NM2023TMID21277
Project Name	Project - A Reliable Energy Consumption Analysis System For Energy-Efficient Appliances

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No	Functional Requirement	Sub Requirement
FR 1	Data collection	Collect and store data on energy consumption and related factors, such as global active power, global reactive power, voltage, and sub-metering.
FR 2	Data pre processing	Tasks such as data cleaning, handling missing values, outlier detection, and normalization. This ensures the data is in a suitable format for training and analysis.
FR 3	Training ML models	Training of different models should to learn the patterns and relationships between energy consumption and the associated factors.
FR 4	Prediction and forecasting	Predicting global active power and potentially performing time series analysis for forecasting energy usage over specific time periods, such as the next few months.
FR 5	Analysis and insights	Identifying peak demand periods, detecting seasonal variations, and uncovering correlations between energy usage and factors like weather conditions or occupancy patterns.
FR 6	Recommendations and optimization	Suggesting energy-saving practices, adjusting appliance usage schedules, or promoting the adoption of energy-efficient technologies.
FR 7	Visualization and reporting	Generating charts, graphs, and reports that allow users to easily interpret and gain insights from the energy consumption analysis.
FR 8	Query handling	Users should be able to ask questions, seek clarification, and receive appropriate responses based on the available information and analysis.
FR 9	Integration and scalability	Using of smart meters or weather APIs, to enhance the accuracy and coverage of the analysis. Additionally, the project should be

		scalable to handle larger datasets and accommodate future data growth.
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Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The system has an intuitive user interface and user-friendly features for easy navigation and efficient interaction.
NFR-2	Security	Provides robust user authentication, and access control mechanisms to safeguard sensitive energy consumption data.
NFR-3	Reliability	The system consistently generates accurate energy consumption analysis and ensure minimal downtime or system failures
NFR-4	Performance	The system delivers fast responses and handles large data volumes efficiently to provide timely and efficient energy consumption analysis
NFR-5	Availability	Ensures high availability of the system and provides reliable access to energy consumption analysis capabilities.
NFR-6	Scalability	The system easily scales to accommodate growing data volumes and user demands without compromising performance or functionality.