

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

Date	13 May 2023
Team ID	NM2023TMID17415
Project Name	Project on 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 (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Easy and intuitive registration process. Email verification with a unique verification link. Secure and reliable delivery of registration emails. Prompt delivery of registration emails. Clear indication of email confirmation status. Option to resend verification email. User-friendly email content with clear instructions. Effective error handling and user guidance. Compatibility with various email providers. Respect for privacy and data protection regulations.
FR-2	User Confirmation	Send confirmation emails with unique confirmation links or codes. Ensure reliable delivery of confirmation emails. Validate the confirmation link or code provided by the user. Activate the user's account upon successful confirmation. Track and display the confirmation status for each user. Provide an option to resend the confirmation email. Handle errors during the confirmation process and guide users appropriately. Implement expiration period for confirmation links or codes. Create user-friendly and informative email content for confirmation. Log and audit confirmation activities for security and compliance.
FR-3	Data Collection and Data Analysis	Collect energy consumption data from sensors installed on appliances. Support integration with various types of sensors such as smart plugs, smart meters, or in-line energy meters. Ensure accurate and reliable data collection from the sensors. Utilize data science techniques such as statistical analysis, machine learning, and data visualization to analyze the collected energy consumption data.

		<p>Provide insights into energy usage patterns, identify energy-efficient appliances, and calculate energy consumption metrics.</p> <p>Generate reports or visualizations to present the analysis results in a clear and understandable manner.</p>
FR-4	Energy Efficiency Recommendations	<p>Based on the data analysis, provide personalized recommendations for optimizing energy usage.</p> <p>Suggest specific actions or changes to appliance usage patterns that can lead to energy savings.</p> <p>Take into account the unique characteristics and preferences of each household or business when providing recommendations.</p>
FR-5	Real-time Monitoring and Feedback	<p>Provide real-time monitoring of energy consumption for appliances.</p> <p>Offer feedback to users on their current energy usage, allowing them to make immediate adjustments to their energy consumption habits.</p>
FR-6	Integration and Compatibility	<p>Integrate with existing home automation systems or smart home platforms to gather additional data and enhance functionality.</p> <p>Be compatible with a wide range of appliances and sensor devices to ensure broad applicability and adoption.</p>
FR-7	Maintenance and Updates	<p>Provide provisions for regular maintenance, including sensor calibration, database optimization, and bug fixes.</p> <p>Allow for easy updates to incorporate new features, improvements, and compatibility with emerging technologies.</p>

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	<p>The system should have a user-friendly interface, making it intuitive and easy to navigate for users of varying technical expertise.</p> <p>It should provide clear instructions and visualizations to help users understand energy consumption patterns and make informed decisions.</p>
NFR-2	Security	<p>The system should implement robust security measures to protect user data and ensure privacy.</p>

		It should have mechanisms in place to authenticate users, encrypt sensitive data, and prevent unauthorized access.
NFR-3	Reliability	The system should implement robust security measures to protect user data and ensure privacy. It should have mechanisms in place to authenticate users, encrypt sensitive data, and prevent unauthorized access.
NFR-4	Performance	The system should include monitoring and logging capabilities to track system performance, identify issues, and gather usage analytics. It should generate logs for troubleshooting purposes and enable administrators to monitor system health and performance metrics.
NFR-5	Availability	The system should aim for high availability to ensure uninterrupted access to energy consumption analysis for users. The system should strive for a high uptime percentage, minimizing any planned or unplanned downtime. It should be designed with redundancy and failover mechanisms to mitigate the impact of hardware or software failures. Have a disaster recovery plan in place to quickly restore the system in case of catastrophic events.
NFR-6	Scalability	The system should be designed to handle increasing amounts of data as the user base grows. It should scale seamlessly to accommodate additional appliances, sensors, and users without compromising performance.