Project
Design
Phase-I
Solution
Architecture

Date	4 May 2023
Team ID	NM2023TMID06353
Project Name	A Reliable Energy Consumption Analysis System for Energy-Efficient Appliances
Maximum Marks	4 Marks

Solution Architecture Diagram:
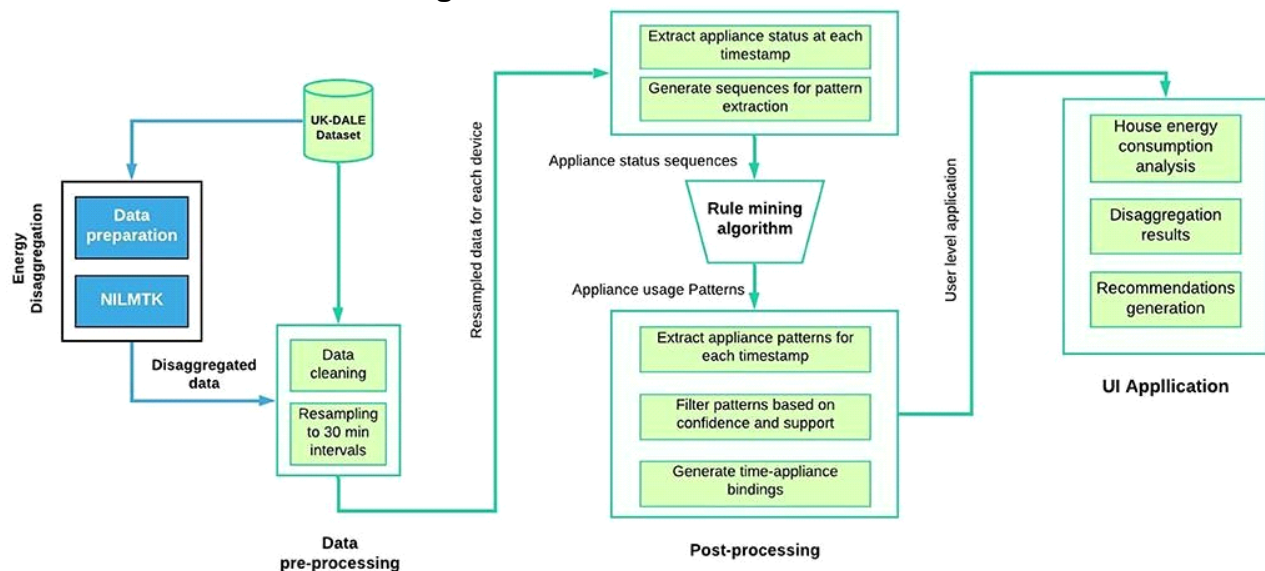
Solution Architecture:

The architecture for "A Reliable Energy Consumption Analysis System for Energy-Efficient Appliances" would consist of several layers of components that work together to collect, process, and analyze energy consumptiondata from appliances. Here is a high-level overview of the architecture:

• **Data Collection Layer:** This layer would include smart plugs that can be plugged into the wall outlet and connected to the appliance to monitor its energy consumption. The smart plugs would collect data on energyconsumption and send it to the next layer in the architecture.

• **Data Processing Layer**: This layer would include a gateway device that would act as a hub for the smart plugs. The gateway device would collect data from each plug and send it to the cloud-based server for analysis.The gateway device would also provide a secure connection between the smart plugs and the cloud-based server.

• **Data Analysis Layer:** This layer would consist of a cloud-based server that would be responsible for storing and processing the data collected from the smart plugs. The server would use machine learning algorithms to analyze the data and provide energy consumption insights to the user. The server would also provide a secureconnection between the mobile app and the user's data.

 • **User Interface Layer:** This layer would include a mobile app and web portal that would provide the user withaccess to the energy consumption analysis. The user would be able to view real-time energy consumption data,historical energy consumption patterns, and energy efficiency recommendations. The user could also control the smart plugs remotely through the app.

 • **Reporting Layer:** This layer would provide data analytics and reporting features to help the user understandtheir energy consumption patterns and identify areas where they could improve energy efficiency. The system could also generate reports that provide insights into energy consumption patterns and energy efficiency recommendations.

COMPONENTS INVOLVED :

• **Smart Plugs:** The system would use smart plugs that can be plugged into the wall outlet and connected tothe appliance to monitor its energy consumption. The smart plugs would communicate wirelessly with the system's gateway device.

 • **Gateway Device:** The gateway device would be responsible for collecting data from the smart plugs and sending it to the cloud-based server for analysis. The gateway device would also provide a secure connectionbetween the smart plugs and the cloud-based server.

• **Cloud-Based Server:** The cloud-based server would be responsible for storing and processing the data collected from the smart plugs. The server would use machine learning algorithms to analyze the data andprovide energy consumption insights to the user.

 • **Mobile App and Web Portal:** The mobile app and web portal would provide the user with access to the energy consumption analysis. The user would be able to view real-time energy consumption data, historical energy consumption patterns, and energy efficiency recommendations. The user could also control the smartplugs remotely through the app.

• **Analytics and Reporting**: The system would also provide data analytics and reporting features to help the user understand their energy consumption patterns and identify areas where they could improve energy efficiency. The system could also generate reports that provide insights into energy consumption patterns andenergy efficiency recommendations.