# List of Requirements (Draft 2 ) + Conflicting Requirements

# **Team Composition**

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# **Updated List of Requirements**

1. The system shall be able to allow users to create an account by providing their email, username, and password through the system interface. Upon clicking the "Create Account" button, the system shall validate the input and display a confirmation message once the account is successfully created.

**Source:** Residential People, Small and Medium Enterprises **(**SMEs), Client (Sir Zeeshan)

1. The system shall be able to allow users to input the household size through an interface. Upon clicking the "Save" button, the system shall adjust the appliance usage accordingly by updating the schedules based on electricity rates.

**Source:** Residential People

1. The system shall be able to generate a clear and user-friendly prompt requesting users to input their electricity usage data. Upon submission, the system shall securely transmit the data using encryption and store it in a secure file. The system shall ensure data integrity and prevent unauthorized access by implementing appropriate security measures, such as access control and encryption.

**Source:** Residential People, SMEs, Commercial Buildings

1. The system shall be implemented as a desktop-based application and shall be compatible with Windows operating systems.

**Source:** Client (Sir Zeeshan), Software Engineer

1. The system shall have a simple user interface with readable text, clear labels for buttons, and basic navigation (e.g., home, appliance settings, schedule view). Tooltips or pop-up messages shall explain any non-intuitive features to users, including the use of readable typography and a uniform color scheme across all interfaces.

**Source:** Residential People, SMEs, Commercial Buildings

1. The system shall be designed in such a way that users should be able to enter the appliance name, the power factor, preferred usage period for at least ten appliances per household in one session.

**Source:** Residential People, SMEs

1. The system shall be able to monitor the amount of power consumed by any appliance registered in the system and produce the result for the user after every five seconds of entry.

**Source:** SMEs, Commercial Buildings

1. The system shall be able to display peak and off-peak hour time slots, along with the corresponding electricity tariffs, within 2 seconds after retrieving the data from the utility provider.

**Source:** Utility Providers, SMEs, Residential People

1. The system shall be able to allow users to select the type of appliance (e.g., refrigerator, washing machine) and its size (small, medium, large) through an interface. Upon clicking the "Save" button, the system shall adjust the power consumption forecasts accordingly based on the selected appliance type and size.

**Source:** Residential People, SMEs

1. The system shall be able to allow users to optimize appliance usage by scheduling appliances to operate during cost-effective time slots. These slots will be determined based on electricity tariffs for peak and off-peak hours, and the system shall notify users at least 15 minutes before a cost-effective slot begins.

**Source:** Residential People, SMEs, Utility Providers

1. The system shall be able to display a 24-hour schedule for optimum operation of all the appliances with a distinction between peak and off-peak within 3 seconds on the request of the user.

**Source:** Residential People, SMEs

1. The system shall be able to perform optimization of the appliance usage schedule, and the goal function shall be the minimization of electricity bills through the determination of the optimal time slots for appliance usage and, on average, achieve at least a 10% reduction in electricity costs, given Tariff data

**Source:** Client (Sir Zeeshan), SMEs, Utility Providers, Residential Users

1. The system shall be able to optimize appliance schedules to operate during periods of lower electricity tariffs, where feasible. Users who follow the recommended schedules should expect to see a potential reduction of up to 5% in their electricity costs.

**Source:** Residential People

1. The system shall be able to provide an appliance usage timetable within 10 seconds of providing requisite appliance information and electricity tariffs for reducing electricity costs charged according to peak and off-peak tariffs.

**Source:** Residential People, SMEs, Utility Providers

1. The system shall be able to maintain and provide the ability for the user to see historical information on the appliance schedule and the pertinent electricity cost for the last six months. The history must be retrievable within five seconds of the request being made.

**Source:** Commercial Buildings, SMEs, Utility Providers

1. The system shall be able to make a comparison of the current electricity use with data of the previous three months and produce the results within five seconds of the request.

**Source:** Commercial Buildings, SMEs

1. The system shall be able to allow users to provide feedback on the generated schedule through a designated feedback form, which includes options for rating the schedule (e.g., 1 to 5 stars) and leaving comments.

**Source:** Residential People, SMEs

1. The system shall be able to implement robust error handling by providing meaningful error messages to users in case of invalid inputs or system failures. In the event of an error, the system shall log the issue for further investigation and display a user-friendly notification explaining the problem.

**Source:** Software Engineer, Client (Sir Zeeshan)

1. The system shall be built with modular functions (e.g., separate functions for user authentication, appliance management, and scheduling). Each module should be well-commented and easy to update independently of other modules.

**Source:** Software Engineer

1. The system shall display a reminder message for users to review their appliance schedules daily when a schedule is updated.

**Source:** Residential People, SMEs

1. The system shall have a uniform theme with a light background and dark, readable text. Buttons, labels, and text fields shall use a consistent font style and size for clarity, with a color scheme designed to reduce eye strain.

**Source:** User Experience Designers, Residential People, Software engineer

1. The system shall implement exception handling to recover from unexpected errors, such as missing files or invalid formats, without crashing. It shall log the error details and display a user-friendly message (e.g., "An unexpected error occurred. Please restart the application.").

**Source:** User Experience Designer,Software Engineer, Client (Sir Zeeshan)

1. The system shall display clear error messages when users provide invalid inputs, such as incorrect appliance data. The messages shall suggest actions to correct the error.

**Source:** User Experience Designers, Software Engineer

1. The system shall display appropriate error messages when it encounters file handling issues, such as failure to read or write a file (e.g., "Error: Unable to read or write the file. Please check file permissions.").

**Source:** User Experience Designers, Software Engineer, Client (Sir Zeeshan)

# **2. Conflicting Requirements**

1. **Req 1.4:** The system shall be implemented as a desktop-based application and shall be compatible with Windows operating systems.

**Conflict:** Conflicting between initial desktop application focus and potential future requests for web or mobile compatibility.

1. **Req 1.12:** The system shall be able to perform optimization of the appliance usage schedule, and the goal function shall be the minimization of electricity bills through the determination of the optimal time slots for appliance usage and, on average, achieve at least a 10% reduction in electricity costs, given Tariff data.

**Conflict:** Conflicting between SMEs/Utility Providers aiming for a 10% cost reduction, while residential users might only achieve up to a 5% reduction.

1. **Req 1.15:** The system shall be able to maintain and provide the ability for the user to see historical information on the appliance schedule and the pertinent electricity cost for the last six months. The history must be retrievable within five seconds of the request being made.

**Conflict:** Commercial users need detailed historical data, but the last 6 months may be less relevant for residential users.

1. **Req 1.16:** The system shall be able to make a comparison of the current electricity use with data of the previous three months and produce the results within five seconds of the request.

**Conflict:** Conflicting between SMEs/Commercial Buildings (need real-time monitoring every 5 seconds) and Residential People (might not need this feature as frequently).