1. Use Cases Description

| Use Case ID: | 1 | | |
| --- | --- | --- | --- |
| Use Case Name: | Verify Login Credentials | | |
| Created By: | Heng Zeng Xi | Last Updated By: | Chong Zhi Hen |
| Date Created: | 29/08/2024 | Data Last Updated: | 6/11/2024 |

| Actor: | User (Initiating), Database |
| --- | --- |
| Description: | This use case verifies the login credentials of a user attempting to access the system. The user enters their username and password, and the system checks if these credentials are stored in the database. If the credentials are valid, the user is granted access to the system. If the credentials are invalid, the user is prompted to re-enter their credentials, initiate a password recovery process or create a new account |
| Preconditions: | The user must have an existing account with valid credentials stored in the database |
| Postconditions: | 1. The user is successfully authenticated and granted access to the system, proceeding to the main menu 2. The user is not authenticated, and the system displays an error message, prompting the user to try again or reset their password |
| Priority: | High |
| Frequency of Use: | 1-2 times per day |
| Flow of Events: | 1. User accesses the login page 2. User enters credentials 3. User submits the login form 4. System validates credentials with database 5. If valid, the system grants access and the user proceeds to the main menu. 6. If invalid, the system denies access and prompts for re-entry or password recovery. |

| Alternative Flows: | AF-S1: User enters incorrect credentials   1. The system detects that the username or password is incorrect 2. The system displays an error message: "Invalid username or password. Please try again." 3. The user is returned to the login page to re-enter their credentials. 4. Return to step 1   AF-S2: User leaves required fields empty   1. The system detects that one or more required fields are empty. 2. The system displays an error message: "Please enter both username and password." 3. The user is prompted to fill in the missing fields and resubmit the form. 4. Return to step 3   AF-S3: User selects 'Forgot Password'   1. User clicks the "Forgot Password" button. 2. System redirects the user to the password recovery process. 3. Return to the login process after password reset or when the user cancels the recovery process.   AF-S4:User Selects 'Create New Account'   1. User attempts to log in but does not have an existing account. 2. System displays an error message: "No account found with the entered credentials." 3. System provides the option: "Don't have an account? Create a new one." 4. User selects "Create New Account." 5. System redirects the user to the Register Account process. |
| --- | --- |
| Exceptions: | EX-S1: System unable to validate credentials due to connectivity issues   1. The system displays an error message: "Unable to verify credentials at this time. Please try again later." 2. The user is advised to try logging in again after some time or contact support |
| Includes: | Register Account |
| Special Requirements: | N/A |
| Assumptions: | N/A |
| Notes & Issues: | N/A |

| Use Case ID: | 2 | | |
| --- | --- | --- | --- |
| Use Case Name: | Register Account | | |
| Created By: | Heng Zeng Xi | Last Updated By: | Chong Zhi Hen |
| Date Created: | 06/09/2024 | Data Last Updated: | 6/11/2024 |

| Actor: | User (Initiating), Database, System |
| --- | --- |
| Description: | This use case describes the process by which a new user or admin creates an account in the system. It includes entering personal information and setting up security details. Admins can only create one account, and subsequent accounts are user-only. The registration page is accessed after navigating through the login selection screen, where the user or admin chooses their login type. |
| Preconditions: | 1. The user or admin does not have an existing account. 2. The login selection page is available, and the appropriate login type (User or Admin) has been chosen. 3. For admins, no existing admin account is registered. |
| Postconditions: | 1. A new account is created in the database. 2. The system redirects the user or admin to the login page. |
| Priority: | High |
| Frequency of Use: | As needed when new users join. |
| Flow of Events: | Login Selection Page:   1. The system displays a page with two options: User Login and Admin Login 2. The user or admin selects the appropriate option   User Flow:   * 1. The user selects the **User Login** button.   2. The system navigates to the **User Login page**, which includes a   **Register Account for New User** option.   * 1. The user clicks on **Register Account for New User**. |

|  | 1. The user fills in the required information, including name, username, password and email. 2. The user submits the registration form. 3. The system checks for duplicate usernames. 4. If the username is unique, the system creates a new user account and redirects the user to the **User Login page**.   Admin Flow:   * 1. The admin selects the **Admin Login** button.   2. The system navigates to the **Admin Login page**, which includes a **Register Admin Account** option.   3. The admin clicks on **Register Admin Account.**   4. The admin fills in the required information, including name, username, password and email.   5. The system checks if an admin account already exists   6. If an admin account already exists, the system shows a message: **"**Admin account already exists. Please contact the admin for further access."   7. If no admin account exists, the system creates a new admin account and redirects the admin to the Admin Login page**.** |
| --- | --- |
| Alternative Flows: | AF-S1: User Decides to Cancel Registration   1. User navigates to the registration page. 2. At any point before submitting the form, the user decides not to continue. 3. User exits the registration page without saving any data. 4. System discards any input data and does not create an account.   AF-S2:Username Already in Use   1. The user or admin fills out the registration form and enters a username. 2. The system checks the username and finds it is already associated with an existing account. 3. The system displays an error message informing the user or admin that the username is in use. |
| Exceptions: | EX-S1: Failure to Create Account   1. The system fails to create the account due to a technical issue. 2. The system displays an error message: **"Unable to create an account at this time. Please try again later."** 3. The user or admin is advised to try again later. |
| Includes: | N/A |

| Special Requirements: | N/A |
| --- | --- |
| Assumptions: | N/A |
| Notes & Issues: | N/A |

| Use Case ID: | 3 | | |
| --- | --- | --- | --- |
| Use Case Name: | Navigating Dashboard | | |
| Created By: | Heng Zeng Xi | Last Updated By: | Chong Zhi Hen |
| Date Created: | 04/09/2024 | Data Last Updated: | 06/11/2024 |

| Actor: | Users |
| --- | --- |
| Description: | This use case begins once the user is logged into the application. It allows the user to navigate through various features of the dashboard, such as viewing electricity usage, tracking estimated monthly bills, and monitoring individual appliances. |
| Preconditions: | Users must be logged in and authenticated. |
| Postconditions: | Users can access different functionalities from the dashboard related to energy management. |
| Priority: | High |
| Frequency of Use: | Multiple use per week |
| Flow of Events: | 1. User logs in and is directed to the dashboard 2. User views general electricity usage of all connected appliances. 3. User views the individual appliance's electricity usage details after pressing at the top right of Power Usage. 4. User view estimated monthly electricity bills. 5. User navigates to device management 6. User manage notification settings 7. User navigates to other sections or logs out. |
| Alternative Flows: | AF-S1: User attempts to access a non-responsive feature.   1. User selects a feature from the dashboard. |

|  | 1. System fails to load the selected feature due to a network or server error. 2. System displays an error message and prompts the user to retry or return to the main dashboard. 3. User retries or returns to the main dashboard. 4. Return to step 1.   AF-S2: User changes mind about viewing details.   1. User is in a specific section accessed from the dashboard. 2. User decides not to make any changes or entries and wishes to return to the main dashboard. 3. User selects the option to return to the main dashboard without making any changes. 4. System navigates the user back to the main dashboard. 5. Return to step 1. |
| --- | --- |
| Exceptions: | EX-S1: User not logged in   1. The system detects that no user is currently logged in and displays an error message: "You are not logged in. Please log in to continue accessing the dashboard." 2. The system prompts the user to log in by redirecting them to the login page |
| Includes: | Changing Personal Information, Changing of settings, Manage Notification, Device Management |
| Special Requirements: | N/A |
| Assumptions: | Users are able to log in. |
| Notes & Issues: | N/A |

| Use Case ID: | 4 | | |
| --- | --- | --- | --- |
| Use Case Name: | Changing Personal Information | | |
| Created By: | Heng Zeng Xi | Last Updated By: | Phan Huu An |
| Date Created: | 29/08/2024 | Data Last | 06/09/2024 |

|  |  | Updated: |  |
| --- | --- | --- | --- |

| Actor: | User (Initiating) |
| --- | --- |
| Description: | This use case begins when the user successfully logs into the application and is loaded into the Dashboard page. It covers functionalities allowing users to manage and interact with their account settings, specifically for updating personal information such as username, email address, and  password. |
| Preconditions: | Users must be logged in and authenticated. |
| Postconditions: | Users can update personal details (username, email address) and change their password. |
| Priority: | High |
| Frequency of Use: | 1 to 2 times |
| Flow of Events: | 1. User navigates to the account settings in the dashboard after successful login. 2. User selects the option to update personal details (username, email address). 3. User changes the account password. 4. User saves changes and logs out or continues using the app. |
| Alternative Flows: | AF-S2: User decides not to update personal details   1. User navigates to update personal details but decides not to make any changes. 2. User selects the option to go back or exit without saving. 3. System does not make any changes and returns the user to the main account settings menu. 4. Return to step 1.   AF-S3: User decides against changing the password   1. User selects the change password option but decides not to proceed. 2. User chooses to cancel or go back. 3. System cancels the password change process and retains the current password. 4. Return to step 1.   AF-S5: User navigates away before saving changes   1. While making changes in any account settings, the user navigates |

|  | away from the page without saving.   1. System prompts the user to save or discard changes before exiting. 2. If the user chooses to discard, the system does not save changes and returns the user to the previous menu. 3. If the user chooses to save, the system applies changes and then returns to the previous menu. 4. Return to step 1. |
| --- | --- |
| Exceptions: | EX-S1: User not logged into their account   1. The system prompts the user to log in by redirecting them to the login page |
| Includes: | N/A |
| Special Requirements: | N/A |
| Assumptions: | User is able to log in |
| Notes & Issues: | N/A |

| Use Case ID: | 5 | | |
| --- | --- | --- | --- |
| Use Case Name: | Manage Notification | | |
| Created By: | Heng Zeng Xi | Last Updated By: |  |
| Date Created: | 04/09/2024 | Data Last Updated: |  |

| Actor: | User, System |
| --- | --- |
| Description: | This use case allows the user to customise notification settings within the app, deciding which events they receive notifications for, and how (e.g., via email, push notifications). |
| Preconditions: | 1. The user must be logged into their account. 2. The user must have access to the notifications settings page. |

| Postconditions: | 1. The user's notification settings are updated in the system. 2. The system starts sending notifications based on the new settings. |
| --- | --- |
| Priority: | Medium |
| Frequency of Use: | 1-2 times per month |
| Flow of Events: | 1. User logs in and accesses the settings menu. 2. User navigates to the notification settings section in the dashboard. 3. User selects or deselects the types of notifications they wish to receive and chooses the delivery method (e.g., email, mobile push). 4. User saves changes. The system confirms the update. 5. System applies the new settings immediately and schedules notifications as per the user’s preferences. |
| Alternative Flows: | AF-S1: User abandons changes   1. User navigates to notification settings, makes changes, but decides to leave the page without saving. 2. System prompts the user to save or discard changes. If discarded, no changes are applied. 3. Return to step 2   AF-S2: System fails to save settings   1. System detects a technical error while trying to save the user's notification settings. 2. The system informs the user of the error and suggests trying again later 3. Users are given options to 'Retry' or 'Cancel'. 4. If the user chooses 'Retry', the system attempts to save again. 5. If the user chooses 'Cancel', or if the 'Retry' fails repeatedly, user will return to step 2 |
| Exceptions: | EX-S1: System outage or connectivity issues   1. If the system cannot access the database to update settings or if there is a service disruption, the user is informed of the inability to process changes at this time. |
| Includes: | N/A |
| Special Requirements: | Security Considerations:   1. Any changes to notification settings should be securely transmitted and stored to prevent unauthorised access or leaks of user preferences. |

| Assumptions: | Stable Internet Connection:  1. Assumes that users have a stable internet connection to access and modify notification settings without interruptions. |
| --- | --- |
| Notes & Issues: | N/A |

| Use Case ID: | 6 | | |
| --- | --- | --- | --- |
| Use Case Name: | Device Management | | |
| Created By: | Heng Zeng Xi | Last Updated By: | Chong Zhi Hen |
| Date Created: | 04/09/2024 | Data Last Updated: | 06/11/2024 |

| Actor: | User |
| --- | --- |
| Description: | This use case is for users to manage their devices. Users will be able to see which appliances they have added, average power consumption and duration of use. |
| Preconditions: | 1. User has logged in and pressed on manage my devices |
| Postconditions: | 1. User can see, edit, add and remove the devices |
| Priority: | Medium |
| Frequency of Use: | 1-2 times per month |
| Flow of Events: | 1. User press on manage my devices 2. They are able to view and edit the list of devices, along with the power usage and duration 3. They can see more of list by scrolling up and down 4. They can use back or press on dashboard to go back to dashboard |
| Alternative Flows: | AF-S1: User want to edit a device details   1. User press on manage my devices |

|  | 1. They are able to view the list of devices, along with the power usage and duration 2. They can see more of list by scrolling up and down 3. When they want to edit the power usage of a device, they press edit. 4. They will be moved to a menu where they can change the Name, Power Usage, duration(hours) and duration(minutes) 5. When they are okay with it they can press the save device. 6. They can use back or press on dashboard to go back to dashboard   AF-S2: User want to discard while editing   1. User press on manage my devices 2. They are able to view the list of devices, along with the power usage and duration 3. They can see more of list by scrolling up and down 4. When they want to edit the power usage of a device, they press edit. 5. They will be moved to a menu where they can change the Name, Power Usage, duration(hours) and duration(minutes) 6. The user can use back or press on the Discard option. 7. They can use back or press on dashboard to go back to dashboard |
| --- | --- |
| Exceptions: | EX-S1: Missing value   1. If the user tries to press save when there is missing value it will warn the user and stop the user from saving. |
| Includes: | Adding New Device, Electrical Consumption Calculation |
| Special Requirements: | Default power usage value   1. There should be a button for user to return a device power usage to the default value |
| Assumptions: | The devices all draw power from the power grid. |
| Notes & Issues: | N/A |

| Use Case ID: | 7 | | |
| --- | --- | --- | --- |
| Use Case Name: | Adding New Device | | |
| Created By: | Zhi Hen | Last Updated By: | Zhi Hen |

| Date Created: | 30/8/2024 | Data Last Updated: | 06/11/2024 |
| --- | --- | --- | --- |

| Actor: | User, Database |
| --- | --- |
| Description: | This use case allows users to add a new device to their list of devices. The app already has predefined values for common devices, such as average power consumption, stored in the database. The user selects a device from a list (e.g., fridge, air conditioner, microwave), and the system automatically calculates the device’s power usage based on these predefined values. The database will store the newly added device in the user’s list. |
| Preconditions: | User is in the manage devices menu |
| Postconditions: | The device will be added to the list of devices |
| Priority: | Medium |
| Frequency of Use: | Everytime the user need to add a device |
| Flow of Events: | 1. User presses on the + button the manage devices menu 2. A new menu pop out with Device, Power Usage and Duration of use 3. User first press on device and a drop down of common appliances will appear 4. User will press on the device they want to add 5. The drop down will close and the device user has selected will appear 6. The value of Power Usage will change to the default value of the appliance 7. User will key in device name 8. User will then key in the value for the duration of use 9. User will press Add Device to add the new device 10. The system stores the device information in the database. |
| Alternative Flows: | AF-S1: User know the power usage value   1. User presses on the + button the manage devices menu 2. A new menu pop out with Device, Power Usage and Duration of use 3. User first press on device and a drop down of common appliances will appear |

|  | 1. User will press on custom 2. The drop down will close 3. The value of Power Usage will change to 0 4. User will key in device name 5. The User presses the box on power usage and an onscreen number pad will appear to allow them to key in the value. 6. When they are okay with it they can press done on the number pad to remove the number pad 7. User will then press on the duration of use 8. User will then key in the value for the duration of use 9. User will press Add Device to add the new device   AF-S2: User device is not on default devices list   1. User presses on the + button the manage devices menu 2. A new menu pop out with Device, Power Usage and Duration of use 3. User first press on device and a drop down of common appliances will appear 4. User will press on the custom 5. The drop down will close 6. The value of Power Usage will be 0 7. User will key in device name 8. The User presses the box on power usage and an onscreen number pad will appear to allow them to key in the value. 9. When they are okay with it they can press done on the number pad to remove the number pad 10. User will then press on the duration of use 11. User will then key in the value for the duration of use 12. User will press Add Device to add the new device |
| --- | --- |
| Exceptions: | EX-S1: The power usage entered is too large   1. The system displays an error message that Power usage exceeds the maximum limit of watts. 2. The user is advised to adjust the power usage value to a valid range and attempt to add the device again. |
| Includes: | Device Management |

| Special Requirements: | User is already in the manage my device menu |
| --- | --- |
| Assumptions: | We have default power consumption value using the database |
| Notes & Issues: | N/A |

| Use Case ID: | 8 | | |
| --- | --- | --- | --- |
| Use Case Name: | Remove Device | | |
| Created By: | Tan Zhe Kai | Last Updated By: | Zhi Hen |
| Date Created: | 20/09/2024 | Data Last Updated: | 06/11/2024 |

| Actor: | User, Database |
| --- | --- |
| Description: | This use case allows users to remove an existing device from the list of devices. |
| Preconditions: | User is in the manage devices menu. |
| Postconditions: | The device will be removed from the list of devices |
| Priority: | Medium |
| Frequency of Use: | Anytime the user wishes to remove a device |
| Flow of Events: | 1. User clicks on the manage devices button. 2. User press on Remove option on the device 3. The device is removed from the list of devices and updates the database. |
| Alternative Flows: | AF-S1: User decides not to remove upon confirmation.   1. User clicks on the ‘Dustbin’ icon while editing device information. 2. The confirmation message pops up for the user to confirm removal of device. |

|  | 1. User clicks on cancel to not remove device. 2. The device information remains in the device list and database. |
| --- | --- |
| Exceptions: | EX-S1: System error when removing device.   1. User confirms to remove device on confirmation message pop-up. 2. System displays an error message for failure to remove device. 3. User has to acknowledge the error message by clicking on “Ok”. 4. System retains device information in the database. |
| Includes: | Device Management |
| Special Requirements: | User is already in the manage my device menu |
| Assumptions: | N/A |
| Notes & Issues: | N/A |

| Use Case ID: | 9 | | |
| --- | --- | --- | --- |
| Use Case Name: | Electrical Consumption Calculation | | |
| Created By: | Zhi Hen | Last Updated By: | Zhi Hen |
| Date Created: | 30/8/2024 | Data Last Updated: | 29/10/2024 |

| Actor: | User, Database |
| --- | --- |
| Description: | Using the parameters the User has provided, the app will calculate and give the user an overview of their energy consumption. They will be able to see an estimate of average energy consumption, which appliances are drawing the most electricity, the estimated electricity bill. |
| Preconditions: | User must have keyed in all of the required parameters and is on the device management menu |
| Postconditions: | The calculation is saved and displayed on dashboard |
| Priority: | Medium |

| Frequency of Use: | Everytime calculation is required |
| --- | --- |
| Flow of Events: | 1. Users navigate to the device management menu to review and adjust device parameters. 2. System calculates total energy usage based on updated device parameters. 3. User will go back to the dashboard 4. The dashboard refreshes to display new values and graphs showing the new energy distribution. |
| Alternative Flows: | AF-S1: User modifies parameters before final calculation   1. User navigates to the device management menu. 2. User adjusts one or more parameters related to the devices 3. The system recalculates the values based on the new inputs. 4. The dashboard updates to reflect the new calculation results. 5. If satisfied, the user can go back to the main menu. If not, the user can continue to adjust parameters if further refinement is needed. 6. Return to step 1 |
| Exceptions: |  |
| Includes: | Device Management |
| Special | N/A |

| Requirements: |  |
| --- | --- |
| Assumptions: | The power usage is calculated based on average consumption and does not account for when devices draw more power under load. |
| Notes & Issues: | N/A |

| Use Case ID: | 10 | | |
| --- | --- | --- | --- |
| Use Case Name: | Export Dashboard Report | | |
| Created By: | Zhi Hen | Last Updated By: | Tan Zhe Kai |
| Date Created: | 05/09/2024 | Data Last Updated: | 09/11/2024 |

| Actor: | User |
| --- | --- |
| Description: | This use case allows the user to generate and export a PDF file of the dashboard which displays their historical energy consumption. The report contains detailed device usage statistics, comparisons with the latest average household consumption, and graphical representations of data to aid in understanding consumption trends. Users can also share reports via email or social media, enabling efficient communication of energy data with others. |
| Preconditions: | 1. User has logged into with their account 2. Historical data on energy consumption is available. 3. External services (e.g. email) are accessible. |
| Postconditions: | User can view the dashboard report externally as a PDF file. |
| Priority: | Medium |
| Frequency of Use: | Monthly or as needed |
| Flow of Events: | 1. User navigates to the main dashboard. 2. User clicks on “Export PDF”. 3. The system processes the request and generates a dashboard PDF file. 4. The report is displayed to the user with options to download or export. 5. Users can choose to generate another report or return to the dashboard. 6. User selects the platform to share the report, and the system generates the file for sharing. |
| Alternative Flows: | AF-S1: User decides to not download/export report   1. After clicking on “Export PDF”, the report is generated and prompts the user to download or share to external platforms. 2. The user cancels the operation. 3. User returns to the dashboard. |

| Exceptions: | EX-S1: System error during report generation   1. User initiates the report generation process. 2. A system error occurs, preventing the report from being generated. 3. The system displays an error message detailing the issue and possibly suggesting steps to resolve it or try again. 4. Users may attempt to regenerate the report or contact support if the issue persists.   EX-S2: Connection Failure Prevents Sharing   1. The user attempts to share the report via an external platform. 2. A connection failure occurs, preventing the sharing process. 3. The system displays an error message prompting the user to check their internet connection.   EX-S3: Insufficient Storage for File Export   1. The user attempts to export the report. 2. The system notifies the user that there is insufficient storage on their device and suggests freeing up space. |
| --- | --- |
| Includes: | Navigating Dashboard |
| Special Requirements: | N/A |
| Assumptions: | The user has active accounts on the selected sharing platforms |
| Notes & Issues: | N/A |

| Use Case ID: | 11 | | |
| --- | --- | --- | --- |
| Use Case Name: | Setting Up Energy Saving Goals | | |
| Created By: | Sanjeev | Last Updated | Heng Zeng Xi |

|  |  | By: |  |
| --- | --- | --- | --- |
| Date Created: | 13/09/2024 | Data Last Updated: |  |

| Actor: | User |
| --- | --- |
| Description: | This use case allows users to set personalized energy-saving goals and monthly energy budgets, monitor progress toward these goals, and receive recommendations to optimize their energy consumption and stay within their budget. |
| Preconditions: | 1. Users must be logged into the app. 2. Users have access to historical energy consumption data. 3. Users have set up energy-saving goals or a monthly energy budget. |
| Postconditions: | 1. The user's energy-saving goal and energy budget are saved in the system. 2. The system tracks and displays progress toward both the goal and the budget. 3. The system provides alerts when the user is close to exceeding their budget or reaching their energy-saving goals. 4. The system provides actionable recommendations to reduce energy consumption or stay within the budget. |
| Priority: | Medium |
| Frequency of Use: | Once per goal or when the user adjusts the goal. |
| Flow of Events: | 1. User navigates to the energy management section in the dashboard. 2. User sets a target energy-saving goal 3. User sets a monthly energy budget from the settings menu. 4. System saves both the goal and budget and starts monitoring the user's energy consumption. 5. System displays progress metrics for both the   energy-saving goal and budget on the dashboard.   1. System alerts the user when they are close to exceeding their energy budget or approaching their energy-saving goal. 2. System provides recommendations to reduce energy |

|  | consumption to stay within the budget and meet the energy-saving goal. |
| --- | --- |
| Alternative Flows: | AF-S1: User abandons the goal-setting process.  1. System discards the input and returns the user to the main dashboard.  AF-S2: User updates their energy-saving goal or budget mid-period.  1. System recalculates the energy consumption and updates the progress metrics. |
| Exceptions: | EX-S1: System error prevents the goal from being saved.  1. System displays an error message: 'Unable to save goal. Please try again later.' |
| Includes: | Energy Consumption Monitoring  Report Generation(View reports based on their historical energy consumption)  Manage Notifications (to notify users when they're close to meeting their goals) |
| Special Requirements: | N/A |
| Assumptions: | 1. Historical consumption data is available 2. Users will adjust their energy consumption to meet the set goals and stay within the budget. |
| Notes & Issues: | 1. Users may require clear instructions on setting realistic goals. 2. Accuracy of goal tracking depends on timely data from the appliances. |

| Use Case ID: | 12 | | |
| --- | --- | --- | --- |
| Use Case Name: | Comparing Energy Usage with Similar Households | | |
| Created By: | Sanjeev | Last Updated By: | Chong Zhi Hen |
| Date Created: | 13/09/2024 | Data Last Updated: | 3/11/2024 |

| Actor: | User, Database |
| --- | --- |
| Description: | This use case allows users to compare their energy consumption with that of similar households (e.g., same number of residents, same size home). |
| Preconditions: | 1. Users have registered their household details (e.g., number |

|  | of residents, home size).  2. The app has access to anonymized consumption data from other users. |
| --- | --- |
| Postconditions: | A comparison of energy usage is displayed visually in the form of bar charts or pie charts on the dashboard. |
| Priority: | Medium |
| Frequency of Use: | Monthly or as needed. |
| Flow of Events: | 1. User navigates to the comparison section. 2. User selects the criteria for comparison (e.g., household size, location). 3. The system retrieves data from the database based on the selected criteria and gives relevant data on the dashboard. 4. The user views the data directly on the dashboard, making it easy to understand their energy usage relative to similar households |
| Alternative Flows: | AF-S1: No comparable data is available   1. If no data is available for the selected criteria, the system displays an error message: "No comparison data available. Please try different criteria (e.g no. of family members)." |
| Exceptions: | EX-S1: Database query fails.   1. System displays an error message and suggests the user try again later. |
| Includes: | 1. Energy Consumption Monitoring 2. Data Comparison Module |
| Special Requirements: | Integration with a data source of similar households. |
| Assumptions: | The system has sufficient comparison data |

|  |  |
| --- | --- |
| Notes & Issues: | 1. Availability of comparison data could be limited in certain regions. 2. Users may require an explanation of how the comparison is made to similar households. |

| Use Case ID: | 13 | | |
| --- | --- | --- | --- |
| Use Case Name: | Multi-User Account Management | | |
| Created By: | Sanjeev | Last Updated By: | Heng Zeng Xi |
| Date Created: | 13/09/2024 | Data Last Updated: | 15/10/2024 |

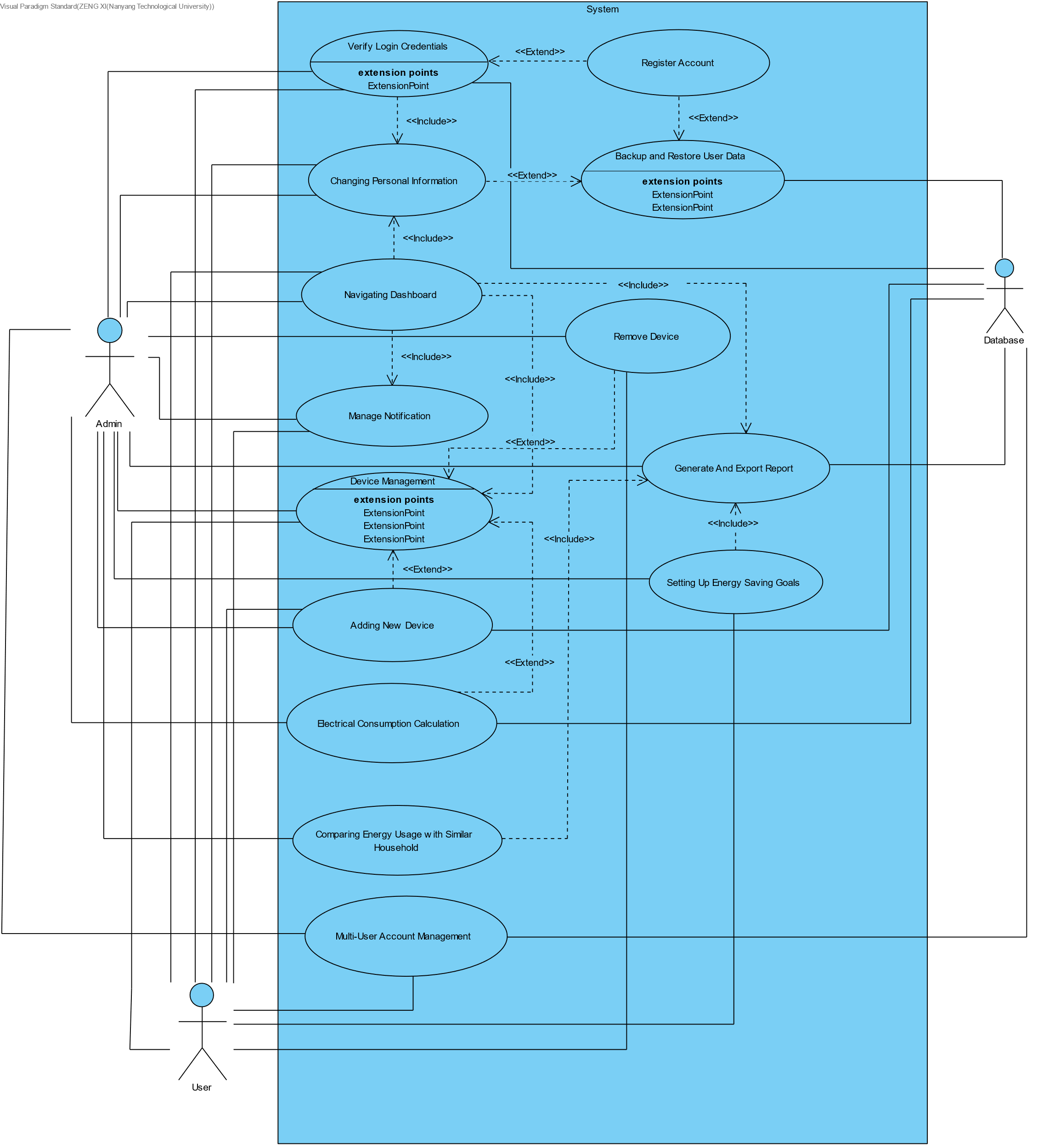
| Actor: | Primary User, Secondary Users |
| --- | --- |
| Description: | This use case allows households with multiple users to manage energy consumption through individual profiles under a shared account. Each user can manage their own appliances and view personalized energy tracking, while the primary user (admin) maintains control over overall account settings and user permissions. The system automatically assigns user roles: one admin account is created initially, and all subsequent accounts are automatically user accounts, managed by the admin. |
| Preconditions: | 1. A primary user has created an account. 2. Secondary users automatically become regular users upon account creation. |
| Postconditions: | 1. Multiple users within a household can manage their appliances and view personalised energy data. 2. The primary user maintains administrative control, such as adding or removing users and managing permissions. |
| Priority: | Medium |
| Frequency of Use: | As needed. |
| Flow of Events: | 1. Primary user (admin) navigates to the "Manage Users" section. 2. Primary user views the list of user accounts created under the shared household account. |

|  | 1. The admin manages user roles and permissions, such as controlling who can add or modify appliances, or access household-wide energy data. 2. Each user can log in, add appliances, and view their own energy data while sharing the main household account. |
| --- | --- |
| Alternative Flows: | AF-S1: Primary user removes a secondary user.   1. The system removes the user’s profile and their appliances from the account. |
| Exceptions: | EX-S1: System encounters an error when managing users or updating permissions.   1. The system displays an error message and suggests retrying. |
| Includes: | 1. User Account Management 2. Device Management |
| Special Requirements: | The system must differentiate between primary and secondary user permissions. |
| Assumptions: | Multiple users in a household will benefit from managing their own appliances. |
| Notes & Issues: | Clear user roles (admin vs. regular users) may be necessary to prevent unauthorised changes. |

| Use Case ID: | 14 | | |
| --- | --- | --- | --- |
| Use Case Name: | Real-time data storage | | |
| Created By: | Sanjeev | Last Updated By: | Heng Zeng Xi |
| Date Created: | 13/09/2024 | Data Last Updated: | 17/09/2024 |

| Actor: | User, Database |
| --- | --- |
| Description: | This use case allows users to back up their energy data and settings to protect against data loss and recover from accidental deletions, ensuring continuous access to important information without interruptions. |
| Preconditions: | 1. Users must be logged in. 2. Database is available |
| Postconditions: | User energy data and settings are backed up to the local database and can be restored later. |
| Priority: | High |
| Frequency of Use: | As needed (e.g., after accidental data deletion or for data recovery). |

| Flow of Events: | 1. The user navigates to the "Backup and Restore" section in the settings. 2. The user selects the option to either back up or restore their data. 3. The system securely saves energy data and settings to the local database or retrieves data from it to complete the backup or restore process. 4. The system confirms the success of the backup or restore.   \* Change to |
| --- | --- |
| Alternative Flows: | AF-S1: User cancels the backup/restore process.   1. System stops the operation and reverts to the previous state. |
| Exceptions: | EX-S1: Connection error prevents the backup/restore process.   1. System displays an error message: "Unable to complete the backup/restore process. Please check your connection and try again." |
| Includes: | 1. Database Integration |
| Special Requirements: | Data encryption and integrity checks before saving to or restoring from the local database. |
| Assumptions: | Users may need to recover their data due to accidental deletions or system failures. |
| Notes & Issues: | 1. The system should securely encrypt all user data before saving to the local database. 2. Users may experience data inconsistencies if they restore data on a different device with incompatible settings. |



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