# **Use Cases**

| **Use Case ID:** | 1 | | | |
| --- | --- | --- | --- | --- |
| **Use Case Name:** | Verify Login Credentials | | | |
| **Created By:** | Heng Zeng Xi | | **Last Updated By:** | Phan Huu An |
| **Date Created:** | 29/08/2024 | | **Data Last Updated:** | 06/09/2024 |

| **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 or initiate a password recovery process. |
| **Preconditions:** | The user must have an existing account with valid credentials stored in the system 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: "Username and password fields cannot be empty." 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. |
| **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:** | N/A |
| **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:** | Tan Zhe Kai |
| **Date Created:** | 06/09/2024 | | **Data Last Updated:** | 06/09/2024 |

| **Actor:** | User (Initiating), Database |
| --- | --- |
| **Description:** | This use case describes the process by which a new user creates an account in the system. It includes entering personal information, setting up security details, and verifying email or mobile number. |
| **Preconditions:** | 1. The user does not have an existing account. 2. The user has access to the registration page. |
| **Postconditions:** | 1. A new account is created in the database. 2. The user receives a confirmation email or OTP, requiring verification to activate the account. |
| **Priority:** | High |
| **Frequency of Use:** | As needed when new users join. |
| **Flow of Events:** | 1. User navigates to the registration page. 2. User fills in required information, including name, email, and password. 3. User submits the registration form. 4. System checks for duplicate usernames or emails. 5. System sends a verification email or OTP to the user. 6. User verifies their email or enters OTP. 7. System confirms the account creation and directs the user to the 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: Email Already in Use   1. User fills out the registration form and enters an email address. 2. System checks the email and finds it is already associated with an existing account. 3. System displays an error message informing the user that the email is in use. 4. System offers options to the user: 5. To redirect to the login page for user authentication. 6. To navigate to the password recovery process if the user has forgotten their password. |
| **Exceptions:** | EX-S1: Failure to send verification email/SMS   1. The system displays an error message: "Unable to verify credentials at this time. Please try again later." 2. The user is advised to check their email address or 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:** | 05/09/2024 |

| **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 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. 4. User track and view monthly electricity bills. 5. User navigates to device management 6. 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. 2. System fails to load the selected feature due to a network or server error. 3. System displays an error message and prompts the user to retry or return to the main dashboard. 4. User retries or returns to the main dashboard. 5. 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:** | Verify Login Credentials, Changing of settings |
| **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 Updated:** | 06/09/2024 |

| **Actor:** | User (Initiating) |
| --- | --- |
| **Description:** | This use case begins when the user successfully logs into the application and loaded into the Dashboard page. It specifically covers the functionalities that allow users to manage and interact with their account settings and update personal information |
| **Preconditions:** | Users must be logged in and authenticated. |
| **Postconditions:** | Users can update personal details, change passwords, and set security preferences. |
| **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. Users update personal details such as name, address, or contact information. 3. User changes the account password. 4. User adjusts security settings or preferences.(2FA) 5. 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. 2. System prompts the user to save or discard changes before exiting. 3. If the user chooses to discard, the system does not save changes and returns the user to the previous menu. 4. If the user chooses to save, the system applies changes and then returns to the previous menu. 5. 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:** | Verify Login Credentials |
| **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 and System |
| --- | --- |
| **Description:** | This use case allows the user to customize 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:** | Verify Login Credentials |
| **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:** | 05/09/2024 |

| **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 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 press save to exit device management menu |
| **Alternative Flows:** | AF-S1: User want to edit a device power usage   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 on it and can change the value using the onscreen number pad 5. When they are okay with it they can press done on the number pad to remove the number pad 6. They can press save to exit device management menu   AF-S2: User want to edit a device usage duration   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 usage duration of a device, a list of pre selected duration will drop down for user to select 5. When they find the value closest to desired value, they can press on the number and it will remove the drop down and changing to the new value 6. They can press save to exit device management menu |
| **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:** | Heng Zeng Xi |
| **Date Created:** | 30/8/2024 | | **Data Last Updated:** | 06/09/2024 |

| **Actor:** | User, Database |
| --- | --- |
| **Description:** | This use case is for users to add a new device. This allows a new device to be added to the list of user devices |
| **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 then press on the duration of use 8. A drop down of preselected values will appear and user select the value closest to the duration they want 9. The drop down will close. 10. User will press ADD to add the new device |
| **Alternative Flows:** | EX-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 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. The User presses the box on power usage and an onscreen number pad will appear to allow them to key in the value. 8. When they are okay with it they can press done on the number pad to remove the number pad 9. User will then press on the duration of use 10. A drop down of preselected values will appear and user select the value closest to the duration they want 11. The drop down will close. 12. User will press ADD to add the new device   EX-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 others 5. The drop down will close and the keyboard will appear 6. User will then key in the device name and presses done 7. The value of Power Usage will be empty 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. A drop down of preselected values will appear and user select the value closest to the duration they want 12. The drop down will close. 13. User will press ADD 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:** | Electrical Consumption Calculation | | | |
| **Created By:** | Zhi Hen | | **Last Updated By:** | Heng Zeng Xi |
| **Date Created:** | 30/8/2024 | | **Data Last Updated:** | 06/09/2024 |

| **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 and more. |
| **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. Press "Save" to start the energy consumption calculation. 3. System calculates total energy usage based on updated device parameters. 4. Upon calculation completion, the dashboard refreshes to display new values and graphs showing energy distribution. 5. Receive a confirmation notification and automatically return to the main dashboard. |
| **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. User presses "Calculate" to see the immediate impact of the changes on the estimated energy consumption. 4. The system recalculates the values based on the new inputs. 5. The dashboard updates to reflect the new calculation results. 6. If satisfied, the user presses "Save" to finalise the changes, or continues to adjust parameters if further refinement is needed. 7. Return to step 1 |
| **Exceptions:** | EX-S1: System unable to calculate due to missing data   1. User presses "Calculate" but has not completed all necessary input fields. 2. The system checks for completeness and finds missing data. 3. An error message is displayed, instructing the user to enter all required information. 4. User returns to the input fields to complete the missing data and then reinitiates the calculation.   EX-S2: System error during calculation process   1. User presses "Calculate" after entering all required data. 2. A system error occurs during the calculation, unrelated to user input (e.g., server error, timeout). 3. The system displays a generic error message suggesting the user to try again later. 4. Users may attempt to recalculate immediately or return to the dashboard to try again at a later time. |
| **Includes:** | Device Management |
| **Special Requirements:** | N/A |
| **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:** | 9 | | | |
| --- | --- | --- | --- | --- |
| **Use Case Name:** | Report Generation | | | |
| **Created By:** | Zhi Hen | | **Last Updated By:** | Heng Zeng Xi |
| **Date Created:** | 05/09/2024 | | **Data Last Updated:** | 06/09/2024 |

| **Actor:** | User |
| --- | --- |
| **Description:** | This use case allows the user to generate and view reports based on their historical energy consumption. Reports can include detailed usage statistics, comparisons with previous periods, and graphical representations of data to aid in understanding consumption trends. |
| **Preconditions:** | 1. User has logged into with their account 2. Historical data on energy consumption is available. |
| **Postconditions:** | 1. User will be able to change settingsA report based on the selected parameters is generated and displayed to the user 2. The user can export the report to external formats such as PDF |
| **Priority:** | Medium |
| **Frequency of Use:** | Monthly or as needed |
| **Flow of Events:** | 1. User navigates to the "Reports" section via the main dashboard or menu. 2. Users select the type of report they wish to generate (e.g., daily, monthly, yearly consumption). 3. User selects additional parameters such as time frame, type of data visualisation (chart, graph, table), and comparison metrics. 4. The system processes the request and generates the report based on the specified parameters. 5. The report is displayed to the user with options to download or export. 6. Users can choose to generate another report or return to the dashboard. |
| **Alternative Flows:** | AF-S1: User wants to regenerate a previously generated report   1. User navigates to the "Reports" section. 2. Users access the "History" tab where previously generated reports are listed. 3. User selects a report from the list and chooses the option to regenerate. 4. The system fetches the data for the same parameters as the original report and displays the updated report. 5. Users can then download or share the regenerated report.   AF-S2: User modifies the data visualisation type   1. User selects to generate a report as usual by setting the desired parameters. 2. Before finalising, the user selects the option to change the visualisation type (e.g., from bar chart to line graph). 3. The system updates the report preview with the new visualisation. 4. User reviews the updated visualisation and proceeds to generate the full report with the chosen settings. |
| **Exceptions:** | EX-S1: No data available for the selected period   1. User selects a date range for the report and proceeds to generate it. 2. The system attempts to fetch data for the specified period but finds no records. 3. The system displays an error message indicating no data is available for the chosen period. 4. Users are prompted to select a different date range or to try again later.   EX-S2: System error during report generation   1. User sets the parameters for the report and initiates the 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. |
| **Includes:** | Navigating Dashboard |
| **Special Requirements:** | N/A |
| **Assumptions:** | N/A |
| **Notes & Issues:** | N/A |