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Fully Dressed Use Cases:

Use Case UC1: Geofencing

Primary Actor: App User

Stakeholders and interests:

Real Estate Company/Landscaping Company - in terms of land usage and landscaping

Preconditions: App user is identified and authenticated

Success guarantee: Preferences are saved. Users are able to manually disarm and arm the system based on their location, or set preferences to allow for the system to automatically disarm or arm based on the user's location.

Main success scenario:

1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user is able to select the plot of land that is being monitored.
3. Once a section is selected, the user can select arm or disarm depending on what functionality they are interested in.
4. If a user would like to automate the arming or disarming of a system, the user can set up an additional step to set a specific time interval when they would like to arm or disarm the system.

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry.
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.

Special requirements

1. User authorization responds within 5 seconds 90% of the time.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.

Use Case UC2: Event Logging

Primary Actor: App User

Stakeholders and interests:

Real Estate Company

Weather Company

Security System (Ex: Vintage Security Company)

Preconditions: App user is identified and authenticated

Success guarantee: Preferences are saved. Users are able to log on to the system, view past alerts including a log of all security events this includes past alerts, system status (arming and disarming of system).

Main success scenario:

1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user is able to view a log of past event history.
3. A user is able to filter past events based on time constraints (selection of specific days and times).
4. If a user would not like to receive real-time alerts (including weather alerts), the user can choose to toggle settings to receive no notifications when these alerts occur.

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry.
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.
2. Weather Alert is not received or unviewable
   a. System signals error that weather alert was not able to be viewed and that the system should be rebooted, in order for alerts to be further viewed.

Special requirements

1. User authorization responds within 5 seconds 90% of the time.
2. Real-time weather alerts, once sent, should be available to be viewed within 10 seconds 95% of the time.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.
2. If a user has trouble rebooting the system, the user can call a contact number and have a representative navigate the user to reboot the system, or provide ownership that allows for the representative to take control of the system and provide the update on their end.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.
2. The user can open and view an unlimited number of past event logs from a specified amount of time.

Use Case UC3: User Authentication

Primary Actor: App User

Stakeholders and interests:

Primary User

Preconditions: App user is identified

Success guarantee: Preferences are saved. Users are able to log on to the system.

Main success scenario:

1. The user enters in their account information (username and password).
2. Users can choose to enable 2 factor authentication, to ensure additional security within their system.
3. When successfully logged in to the system, the user is able to navigate through the system.

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry.
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.
2. Invalid User Authentication
   a. System signals error that user authentication code is invalid. Users can choose to push a code again, and enter in the new code in the system.

Special requirements

1. User authorization responds within 5 seconds 90% of the time.
2. User authentication occurs within 10 seconds 90% of the time.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.

2. The user can choose to select a checkmark that indicates if they would like to be logged into the system without allowing for additional authentication for 3 days.

Use Case UC4: Surveillance

Primary Actor: App User

Stakeholders and interests:

Camera installment company

Preconditions: App user is identified and authenticated, cameras are installed and function as intended

Success guarantee: Preferences are saved. Users are able to turn on and off cameras on different parts of their property. They can manually do this within the system based on their location, or set preferences to allow for the system to automatically do so.

Main success scenario:

1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user is able to view different angles and viewpoints of their property.
3. Once a specific section of the property is selected, the user can choose to view past camera footage, turn on camera footage, or turn off camera footage.
4. If a user would like to automate when the camera footage should be turned on the user can set up an additional step to set a specific time interval when they would like for the certain footage to start.

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry.
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.
2. Camera malfunctions
   a. Camera signals error if battery is low.
   b. Users can choose to reinstall the camera by placing a new battery, or choose to call the camera installment company to resolve the issue.

Special requirements

1. The camera quality should be of high-resolution to be able to identify objects in both daylight and night.
2. The User authorization responds within 5 seconds 90% of the time.

3. The load time of viewage of past camera footage should be within 10 seconds 85% of the time.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.
2. If a user is having trouble reinstalling a camera on their property, the user can contact the camera installment company and have a representative navigate the user on next steps.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.

Use Case UC5: Smart Heating and Cooling

Primary Actor: App User

Stakeholders and interests: Heating and Air Conditioning Company

Preconditions: App user is identified and authenticated. User has already set up preferred temperatures.

Success guarantee: Preferences are saved. Users are able to log on to the system. Users are able to manually change temperature settings or set preferences to allow the system to automatically regulate the temperature based on the preference.

Main success scenario:

1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user is able select what rooms to control the temperature for and monitor.
3. Once a section is made, the user can activate specific modes, such as cooling and heating, if they are interested.
4. If a user would like to automate the heating or cooling of a system, the user can set up an additional step to set a specific time period when they would like the system to monitor and adjust the temperature to match their preferences.

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry.
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.
2. Heating and Cooling Systems Malfunctions

      a. Heating and cooling system signals error if the system malfunctions from loss of power or the physical heating and cooling unit breaks down.

      b. Users can choose to call the heating and cooling system company to resolve the issue which will involve representatives to visit the site and diagnose the problem.

Special requirements

1. The heating and cooling system should self-regulate the temperature so it does not overheat.
2. The User authorization responds within 5 seconds 90% of the time.
3. User authentication occurs within 10 seconds 90% of the time.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.
2. If a user is having trouble reinstalling a heating and cooling unit on their property, the user can contact the heating and cooling system company and have a representative guide the user on next steps.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.
2. The user can change the time periods an unlimited number of times of the 24 hour day.

Use Case UC6: Audio Visual Systems

Primary Actor: App User

Stakeholders and interests: Audio Visual Systems Company, Electric Company

Preconditions: App user is identified and authenticated. Lighting units and audio systems are installed and turned on.

Success guarantee: Preferences are saved. Users are able to log on to the system. Users are able to manually change audio and visual settings, or set preferences, like time periods, to allow the system to automatically activate the system.

Main success scenario:

1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user is able select what rooms to control the audio and visual settings for.
3. Once a section is made, the user can activate specific modes, such as different light brightnesses and colors, or audio levels, if they are interested.

4. If a user would like to automate the audio and visual settings of their smart home, the user can set up an additional step to set a specific time period when they would like the system to adjust the audio and visual settings to match their preferences.

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry.
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.
2. Light bulbs or fixtures malfunction
   a. Audio system signals error if the system malfunctions from loss of power or the physical heating or if the physical light fixtures, or bulbs, burn out.
   b. Users can choose to call the audio and visual system company or electric company to resolve the issue which will involve representatives to visit the site and diagnose the problem.

Special requirements

1. The User authorization responds within 5 seconds 90% of the time.
2. User authentication occurs within 10 seconds 90% of the time.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.
2. If a user is having trouble reinstalling an audio and visual unit on their property, the user can contact the audio and visual system company and have a representative guide the user on next steps.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.
2. The user can change the time periods an unlimited number of times of the 24 hour day.

Use Case UC7: Digital Assistant

Primary Actor: App User

Stakeholders and interests: Primary user, Digital assistant company (like Amazon for Alexa), Internet service provider company

Preconditions: App user is identified and authenticated. Digital assistant is installed, set-up by user, and turned on.

Success guarantee: Preferences are saved. Users are able to log on to the system. Users are able to manually change the digital assistant settings or set preferences to allow the digital assistant to give better suited answers or complete tasks accordingly.

Main success scenario:

1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user is able to select what rooms to give access to the digital assistant and navigate the digital assistant system.
3. Once a section is made, the user can activate specific modes, such as standby or active, if they are interested.

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry.
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.
2. Digital Assistant Malfunctions
   a. Digital assistant system signals error if the system malfunctions from loss of power or WIFI connectivity.
   b. Users can choose to call the digital assistant company or internet service provider to resolve the issue which will involve representatives to visit the site and diagnose the problem.

Special requirements

1. The digital assistant should be able to recognize audio commands from all parts of the room it is put in, meaning it should have capable hearing or audio detection systems.
2. The digital assistant should have access to the internet and its hosting service (like Amazon for Alexa and all Amazon related services) to conveniently serve its user when asked questions or given requests.
3. The User authorization responds within 5 seconds 90% of the time.
4. User authentication occurs within 10 seconds 90% of the time.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.
2. If a user is having trouble reinstalling a digital assistant on their property, the user can contact the digital assistant company and have a representative guide the user on next steps.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.
2. The user can change the room access selections an unlimited number of times of the 24 hour day.

Use Case UC8: Smart Bathroom

Primary Actor: App User

Stakeholders and interests: Plumbing company

Preconditions: App user is identified and authenticated. User has set up temperature preferences and bathroom appliance settings preset.

Success guarantee: Preferences are saved. Users are able to log on to the system. Users are able to manually change temperature settings or set preferences to allow the system to automatically regulate the temperature based on the preference for their shower or bath experience.

Main success scenario:

1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user is able select what rooms to control the temperature for and monitor.
3. Once a section is made, the user can activate specific modes, such as cold showers, hot showers, or baths, if they are interested.
4. If a user would like to automate the smart bathroom system, the user can set up an additional step to set a specific time period when they would like the system to prepare their shower or bath for them.

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry.
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.
2. Smart Bathroom Systems Malfunctions
   a. Smart bathroom system signal error if the system malfunctions from loss of power, water pipe malfunctions, or water heat breaks down.
   b. Users can choose to call the smart bathroom system company to resolve the issue which will involve representatives to visit the site and diagnose the problem.

Special requirements

1. The smart bathroom system should be able to monitor the temperature of a shower or bath they are preparing and ensure it is within the temperature the user requested.
2. The User authorization responds within 5 seconds 90% of the time.
3. User authentication occurs within 10 seconds 90% of the time.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.
2. If a user is having trouble reinstalling a smart bathroom unit on their property, the user can contact the smart bathroom system company and have a representative guide the user on next steps.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.
2. The user can change the time periods an unlimited number of times of the 24 hour day.

Use Case UC9: Window Blinds and Shades Control

Primary Actor: App User

Stakeholders and interests: Window companies to install automated blinds

Preconditions: App user is identified and authenticated, User has set up the times when blinds should automatically close and open

Success guarantee: Preferences are saved. Users can go into the app and change preferences when necessary.

Main success scenario:

1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user is able enter the time periods of when they would like the blinds to open on specific days or everyday. They will have to enter AM/PM.
5. The user is able to change the preference the next day or anytime later on.

Extensions

1. Invalid User Account Information
   a. System provides an error and rejects the entry of the user into the account
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.
   2. Window blinds malfunctions

      c.   Window blinds tube will signal error if the battery is low.

      d.   Users can replace the battery in the tube.

Special requirements

1. User authorization responds within 5 seconds 90% of the time.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.
2. If the battery has been changed and the system still does not work, the user can call a number and get maintenance assistance.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.
2. The user can change the time periods an unlimited number of times of the 24 hour day.

Use Case UC10: Automated Garage Door Control

Primary Actor: App User

Stakeholders and interests: Garage companies

Preconditions: App user is identified and authenticated

Success guarantee: Users can go into the app and change preferences when necessary.

Main success scenario:

1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user is able to view the status of the garage: open, closed, opening, closing.
3. There will be a button for the user to either choose open or close to control the garage.

Extensions

1. Invalid User Account Information
      a.   System provides an error and rejects the entry of the user into the account
      b.   If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.

  2. Garage door malfunctions
      a.   Garage door will signal error if cannot open/close when controlled to do so
      b.   Users can call the garage door installment company to resolve the issue.

Special requirements

1. User authorization responds within 5 seconds 90% of the time.
2. Garage motion occurs within 10 seconds 90% of the time it is controlled.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.
2. If the garage door is not working properly, the user can call a number and get maintenance assistance.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.
2. The user can control the garage an unlimited number of times of the 24 hour day.

Use Case UC11: Outside/Yard Light Sensors

Primary Actor: App user

Stakeholders and interests: Company that specializes in motion-activated technology

Preconditions: App user is identified and authenticated, lights are installed where the user wants them to be outside the home

Success guarantee: Everytime a light is lit, the app will be notified. Users can choose how long the light should stay lit for after it detected motion.

Main success scenario:

1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user can see the log for every light and when certain lights were lit because it detected motion.
3. The user can change the preferences for when the motion sensored lights need to work during the night and for how long the light should be on after it detected motion.
4. There will be a button for the user to either manually turn on or off certain lights.

Extensions

1. Invalid User Account Information
   a. System provides an error and rejects the entry of the user into the account
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.
2. Light sensor malfunctions
   a. Users can call the light installment company to resolve the issue.

Special requirements

1. User authorization responds within 5 seconds 90% of the time.
2. Light motion occurs within 5 seconds 90% of the time motion is detected.

Technology and data variation list

1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.
2. If the motion detector is not working properly, the user can call a number and get maintenance assistance.

Frequency of Occurrence
1. The user is open to log onto the system an unlimited number of times of the 24 hour day.
2. The user can control the lights an unlimited number of times of the 24 hour day.

Use Case UC12: Smart Gardening

Primary Actor: App User

Stakeholders and interests: Sprinkler companies and lawn care companies

Preconditions: App user is identified and authenticated, Lawn sprinklers are installed

Success guarantee: Everytime the sprinklers go off, users are notified. Users can go into the app and turn off/on sprinklers.

Main success scenario:
1. The user enters in their account information (username and password).
2. When successfully logged in to the system, the user can see the log for the sprinklers and when they were on throughout the day.
3. The user can change the preferences for the sprinklers and turn them off for a whole day or part of a day or turn them on during specific times of the days.

Extensions
1. Invalid User Account Information
    a. System provides an error and rejects the entry of the user into the account
    b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button.
2. Sprinklers malfunctions
    b. Users can call the sprinkler installment company to resolve the issue.

Special requirements
1. User authorization responds within 5 seconds 90% of the time.
2. Sprinklers occur within 5 seconds 90% of the time the preferences said to.

Technology and data variation list
1. If a user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system.

2. If the sprinklers are not working properly, the user can call a number and get maintenance assistance.

Frequency of Occurrence

1. The user is open to log onto the system an unlimited number of times of the 24 hour day.
2. The user can control the sprinklers an unlimited number of times of the 24 hour day.

Use Case UC13: Energy Efficiency

Primary Actor: App User

Stakeholders and interests: Energy service companies and energy regulators

Preconditions: App user is identified and authenticated and energy systems are installed and set up

Success guarantee: Preferences are saved. The user can save their preferences for each of the energy efficiency systems and then turn on these systems according to their convenience with their preferences being used

Main success scenario:

1. The user enters in their information
2. After successfully logging into the system, the user is able to view all the energy systems offered to them and turn it on
3. The user can change the system's default settings according to their preference and save their preferences as well.

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button

Special requirements

1. User authorization responds within 5 seconds 90% of the time

Technology and data variation list

1. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system
2. If the user has trouble installing the energy efficiency systems in their property, the user can call a contact number and have an employee come and get assistance from them

Frequency of Occurrence

1. The user can log onto the system an unlimited number of times of the 24 hour day

Use Case UC14: Personalized Profiles

Primary Actor: App User

Stakeholders and interests: Primary User

Preconditions: App user is identified and authenticated

Success guarantee: Preferences are saved. Users are able to enter their information to set up their personalized profiles and set up their own preferences for all the features in the smart home system and access their personal profiles whenever they want to

Main success scenario:

1. The user enters in their information
2. After successfully logging into the system, the user is able to view an icon to create their personal profile
3. The user is able to enter their specific preferences for the features included in the smart home system and save these preferences
4. The user is able to access their personal profile the next time they log onto the system

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button
2. Personal profile malfunctions
   a. When there are too many profiles in the system, the system signals that it is almost going to exceed its capacity

Special requirements

1. User authorization responds within 5 seconds 90% of the time
2. Personal profile is able to be accessed within 5 seconds 90% of the time it is trying to be accessed

Technology and data variation list

1. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system

Frequency of Occurrence

1. The user can log onto the system an unlimited number of times of the 24 hour day
2. The user can go change their preferences in their personal profile an unlimited number of times of the 24 hour day

Use Case UC15: Emergency Response

Primary Actor: App User

Stakeholders and interests: Fire department, paramedics, other first responders

Preconditions: App user is identified and authenticated. The system uses the user's location to save a few emergency service contact information.

Success guarantee: Contact information is saved. On top of contact information of nearby emergency responders already being saved, users can go into the app and add more contact information if they prefer to do so.

Main success scenario:

1. The user enters in their information
2. After successfully logging into the system, the user is able to view all the contact information of the emergency responders near to their location
3. The user is able to add more emergency responders that they prefer to also have to be able to contact quickly

Extensions

1. Invalid User Account Information
   a. System signals error and rejects the entry
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button
2. Emergency response malfunctions
   a. If a user is unable to add an emergency responder contact information because the location is too far, then an error would be displayed

Special requirements

1. User authorization responds within 5 seconds 90% of the time
2. Emergency responders are contacted 5 seconds 90% of the time they are being contacted by the system

Technology and data variation list

1. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system

Frequency of Occurrence

1. The user can log onto the system an unlimited number of times of the 24 hour day
2. The user can add the contact information of emergency responders an unlimited number of times of the 24 hour day

Use Case UC16: Pet Monitoring System

Primary Actor: App User

Stakeholders and interests: Primary user, pet owners, camera installment company

Preconditions: App user is identified and authenticated, cameras and other monitoring systems are installed and function as intended

Success guarantee: Preferences are saved. Users are able to turn on and off cameras and other monitoring systems as they wish to do based on their location, or set preferences for the system to turn on/off cameras/monitoring systems as they wish.

Main success scenario:

1. The user enters in their information
2. After successfully logging into the system, the user is able to view all the monitoring systems they can use to monitor their pets
3. The user can change the system's default settings according to their preference and save their preferences as well for each of the systems

Extensions

1. Invalid User Account Information
    a. System signals error and rejects the entry
    b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button
2. Monitoring system malfunctions
    a. When cameras/monitoring systems are low on battery, a signal is notified to the user so they can act accordingly

Special requirements

1. User authorization responds within 5 seconds 90% of the time
2. The camera has high quality to be able to view and monitor the pets easily

Technology and data variation list

1. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system
2. If the user has trouble installing the monitoring systems on their property, the user can contact a representative who will be able to assist them on the next steps

Frequency of Occurrence

1. The user can log onto the system an unlimited number of times of the 24 hour day

Use Case UC17: Status Report (Get real-time updates on your home's security and status)

Primary Actor: App User

Stakeholders and interests: Primary User, Home Security Companies

Preconditions: App user is identified and authenticated, Home security systems are installed and functioning.

Success guarantee: Preferences are saved. Users can log in to the app and receive real-time updates on their home's security status, including alerts for any suspicious activity or breaches.

Main success scenario:

1. The user enters their login information (username and password).
2. Upon successful login, the user is presented with a real-time status report of their home's security.
3. The user can view alerts, camera feeds, and sensor data to monitor their home. They have the option to set preferences for the type of alerts and notifications they want to receive.

Extensions

1. Invalid User Account Information
   b. System signals error and rejects the entry
   c. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button
3. Security system malfunctions
   a. When cameras or sensor systems are not active, the user so they can act accordingly.

Special requirements

3. User authorization responds within 5 seconds 90% of the time
4. The status report is quick and automatically sends in periodic intervals but can also be manually requested.

Technology and data variation list

3. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system
4. If the user has trouble installing the monitoring systems on their property, the user can contact a representative who will be able to assist them on the next steps

Frequency of Occurrence

2. The user can receive manually requested status reports an unlimited number of times.

Use Case UC18: Voice Control (Voice assistant integration for hands-free control)

Primary Actor: App User

Stakeholders and interests: Primary User, Voice Assistant Companies

Preconditions: App user is identified and authenticated, Voice assistant devices are installed and operational.

Success guarantee: Preferences are saved. Users can utilize voice commands to control various aspects of their smart home system, such as lighting, temperature, and security.

Main Success Scenario:

The user enters their login information (username and password).

1. The user enters their login information (username and password).
2. Upon successful login, the user can issue voice commands to control their smart home system.
3. The voice assistant responds to commands for adjusting lights, thermostats, security systems, and other compatible devices.

Extensions

4. Invalid User Account Information
   a. System signals error and rejects the entry
   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button
5. Voice communication system malfunctions
   a. When communication with the voice control system stops working, troubleshooting tasks are taken in order to bring the system back to full operation.

Special requirements

5. User authorization responds within 5 seconds 90% of the time
6. Voice assistant recognition and response should be near-instantaneous.

Technology and data variation list

5. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system
6. If the user has trouble connecting their voice assistant device to the smart home system for integrated voice control, they can contact a representative who can assist them.

Frequency of Occurrence

3. The user can issue voice commands to the system an unlimited number of times within a 24-hour day.

Use Case UC19: Smart Appliances (Control smart appliances for added convenience)

Primary Actor: App User

Stakeholders and interests: Primary User, Appliance Manufacturers

Preconditions: App user is identified and authenticated, Smart appliances are installed and operational.

Success guarantee: Preferences are saved. Users can control their smart appliances, such as refrigerators, ovens, and washing machines, to improve convenience and efficiency.

Main success scenario:

4. The user enters their login information (username and password).
5. Upon successful login, the user can access and control their smart appliances through the app.
6. They can adjust settings, schedule operations, and receive status updates for their appliances.

Extensions

6. Invalid User Account Information
    a. System signals error and rejects the entry
    b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button
7. Appliance communication system malfunctions
    a. When communication signals to smart appliances stop working, troubleshooting tasks are taken in order to bring the system back to full operation.

Special requirements

7. User authorization responds within 5 seconds 90% of the time
8. Specific smart appliances have a limited range to activate them remotely, such as ovens in order to avoid fire hazards.

Technology and data variation list

7. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system
8. If the user has trouble integrating the smart appliances with the smart home system, the user can contact a representative who will be able to assist them.

Frequency of Occurrence

4. The user can control smart appliances an unlimited number of times within a 24-hour day.

Use Case UC20: Water Leak Detection (Sensors that detect water leaks. Shut off water to prevent damage)

Primary Actor: App User

Stakeholders and interests: Primary User, Home Security and Maintenance Companies

Preconditions: App user is identified and authenticated, Water leak detection sensors are installed and functioning.

Success guarantee: Preferences are saved. Users can monitor for water leaks, receive alerts in case of detection, and remotely shut off the water supply to prevent damage.

Main success scenario:

1. The user enters their login information (username and password).
2. Upon successful login, the user can view the status of water leak detection sensors.
3. If a leak is detected, the user receives real-time alerts.
4. The user has the ability to remotely shut off the water supply to prevent further damage.

Extensions

8. Invalid User Account Information
    a. System signals error and rejects the entry
    b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button
9. Sensor system malfunctions
    a. When sensors malfunction and are not able to detect anything at all, the user is prompted with the option to preemptively shut off water until sensors are fixed or leave everything as is.

Special requirements

9. User authorization responds within 5 seconds 90% of the time
10. A certain threshold for the water leak must be met to automatically shut off all water; otherwise, notify the owner of a very minor leak and urge the user to make repairs before it becomes a problem.

Technology and data variation list

9. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system
10. If the user has trouble attaching the sensors to main water pipes, the user can contact a representative who will be able to assist them.

Frequency of Occurrence

5. The water leak detection system is fully operational 24 hours a day and the user has the ability to manually turn water off whenever they want, even if there are no leaks.

Use Case UC21: Access Control (Know who enters your home and when)

Primary Actor: App User

Stakeholders and interests: Primary User, Surveillance and Security Companies

Preconditions: App user is identified and authenticated, Sensors are installed at all possible entrances and exits.

Success guarantee: Preferences are saved. Users are notified whenever someone enters or exits their home according to their preferences.

Main Success Scenario:

1. The user enters their login information (username and password).
2. Upon successful login, the user can set their preferences for at what conditions (time, day of week, entrance, etc) that they would like to be notified when somebody enters/exits their home.
3. After saving their preferences, they can view it on their profile and now whenever someone enters/exits their home according to those preferences, they will get a notification.

Extensions

1. Invalid User Account Information
    a. System signals error and rejects the entry
    b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button
2. Surveillance/Security system malfunctions
    a. When communication with the sensors of the surveillance system stops working, troubleshooting tasks are taken in order to bring the system back to full operation.

Special requirements

1. The sensors should be able to operate at any hour.
2. Alerts should be sent to the user immediately within 2 seconds 90% of the time.

Technology and data variation list

1. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system
2. If the user has trouble installing their sensors to the smart home system, they can contact a representative from the surveillance/security company who can assist them.

Frequency of Occurrence

1. The user can log on to the system an unlimited amount of times at any time of the day.

2. The user can be notified of entrances as often as they would like according to their preferences.

Use Case UC22: Remote Controller (Manage your smart home from your smart phone)

Primary Actor: App User

Stakeholders and interests: Primary User

Preconditions: App user is identified and authenticated, All other features are set up and working successfully.

Success guarantee: Preferences are saved. Users can customize a remote with their most used features in the smart home to easily manage their smart home.

Main Success Scenario:

The user enters their login information (username and password).

4. The user enters their login information (username and password).

5. Upon successful login, the user can customize what features they'd like on their remote.

6. The user can then use the remote to make changes to their smartphone and access their most used features easily.

Extensions

3. Invalid User Account Information

   a. System signals error and rejects the entry

   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button

4. Malfunctions with any of the features

   a. If there is a communication error with any of the features, the user will be alerted about which feature is having a problem so the user can find the problem.

Special requirements

3. User authorization responds within 5 seconds 90% of the time

4. The smart home should be able to respond to the remote signals from anywhere and within 5 seconds 80% of the time and alert the user upon success.

Technology and data variation list

3. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system

4. If the user has trouble setting up their remote, they can contact a representative who can assist them.

Frequency of Occurrence

3. The user can use the remote controller whenever they log into the system an unlimited number of times a day. Multiple features on the remote, however, can not be completed at the same time.

Use Case UC23: Lock Control (Secure entry points to your home)

Primary Actor: App User

Stakeholders and interests: Primary User, Security and Locksmith Companies

Preconditions: App user is identified and authenticated, Locks are installed and operational.

Success guarantee: Preferences are saved. Users can lock and unlock different entrances and exits to their home whenever they'd like.

The user enters their login information (username and password).

7. The user enters their login information (username and password).

8. Upon successful login, the user can use controls to lock and unlock whichever the entrance/exit they'd like.

9. The locks on the entrances/exits will respond according to the user.

Extensions

5. Invalid User Account Information

   a. System signals error and rejects the entry

   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button

6. Lock system malfunctions

   a. When communication with the lock system stops working, the user is alerted of which lock is not working so troubleshooting can take place.

Special requirements

5. User authorization responds within 5 seconds 90% of the time

6. Locks should be able to unlock and lock relatively quickly within 6 seconds 80% of the time.

Technology and data variation list

5. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system

6. If the user has trouble connecting their locks to the smart home system, they can contact a representative who can assist them.

Frequency of Occurrence

4. The user can lock and unlock entrances/exits to their home whenever they'd like and an unlimited number of times.

Use Case UC24: "Live-in-lock" Control (Timers to control lights, A/C, TV, etc)

Primary Actor: App User

Stakeholders and interests: Primary User, Light Companies, A/C Companies, TV Companies

Preconditions: App user is identified and authenticated, Devices wanted for the live-in-lock control are compatible and operational.

Success guarantee: Preferences are saved. Users can use controls to set up a timer to turn on/off or adjust settings for their A/C, lights, TV, etc.

Main Success Scenario:

The user enters their login information (username and password).

10. The user enters their login information (username and password).

11. Upon successful login, the user can control their smart home system using timers.

12. The targeted feature will adjust according to the user's needs when the timer is done.

Extensions

7. Invalid User Account Information

   a. System signals error and rejects the entry

   b. If the error presented indicates the wrong password information, the user can create a new password or click the forgot password button

8. System malfunctions

   a. When communication with the targeted system stops working, troubleshooting tasks are taken in order to bring the system back to full operation and the user is alerted.

Special requirements

7. User authorization responds within 5 seconds 90% of the time

8. The targeted home feature should respond to the timer within 5 seconds 90% of the time and notify the user upon success.
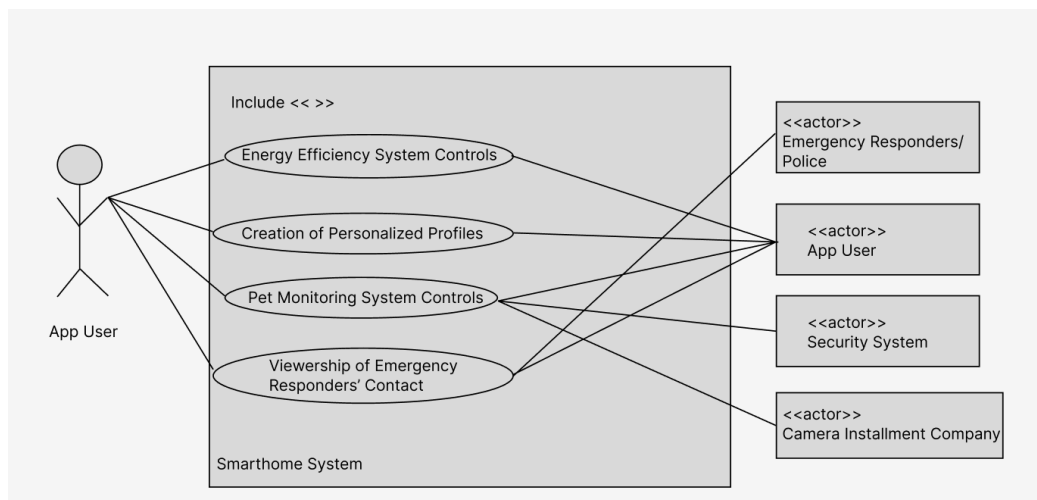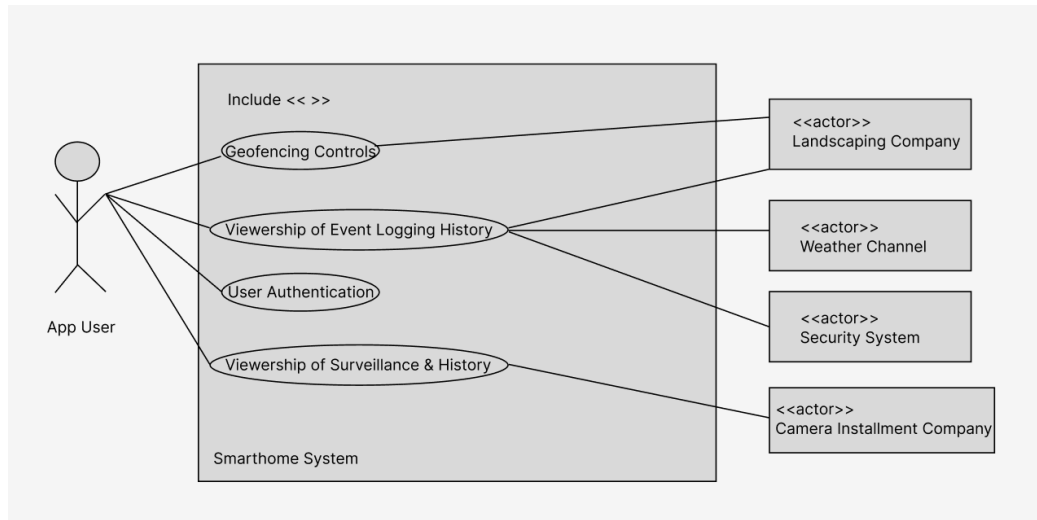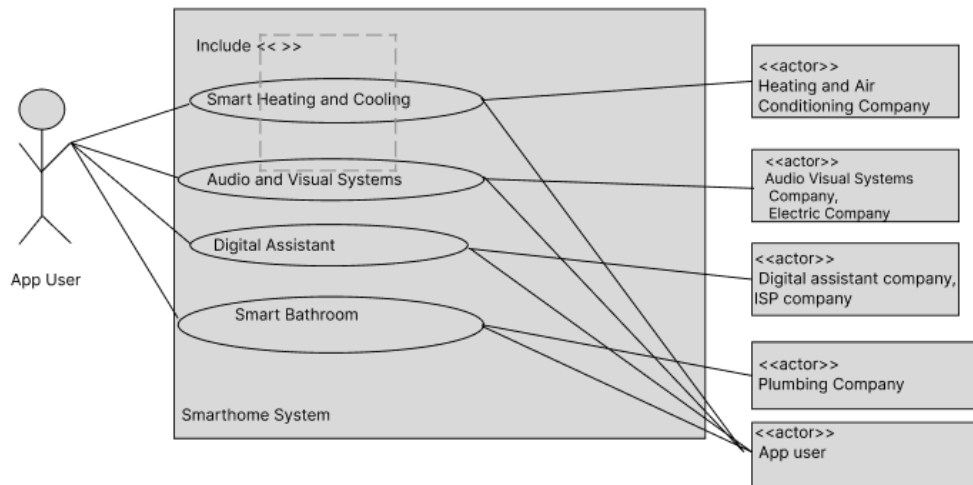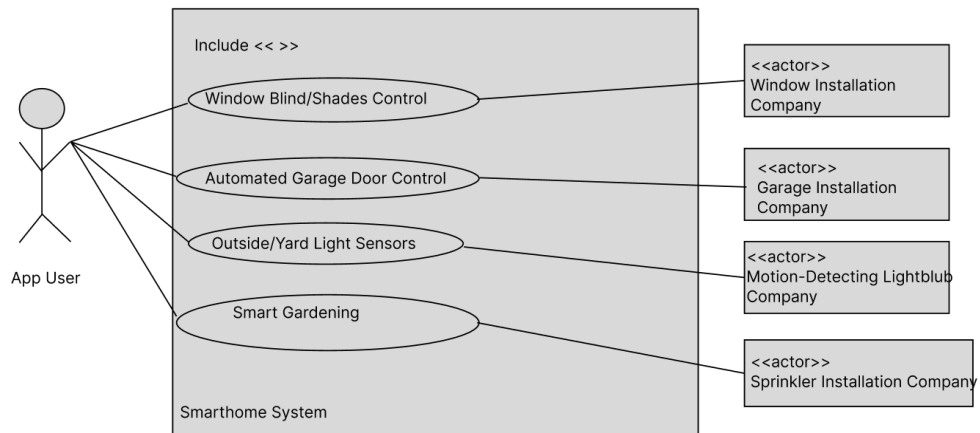
Technology and data variation list

7. If the user has trouble logging into the system, the user can call a contact number and have a representative navigate the user to log onto the system

8. If the user has trouble setting up the timers for the smart home system, they can contact a representative who can assist them.
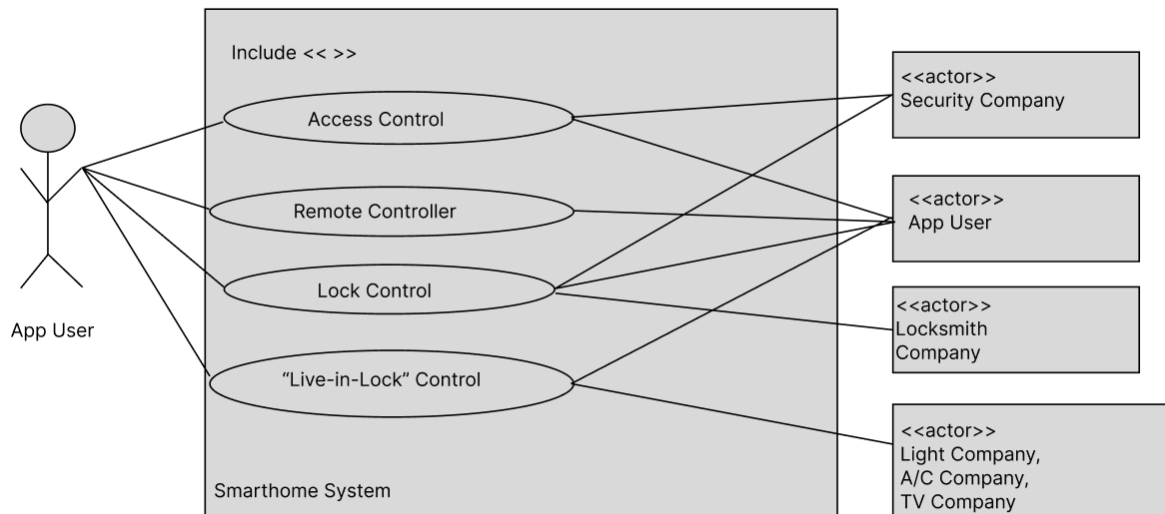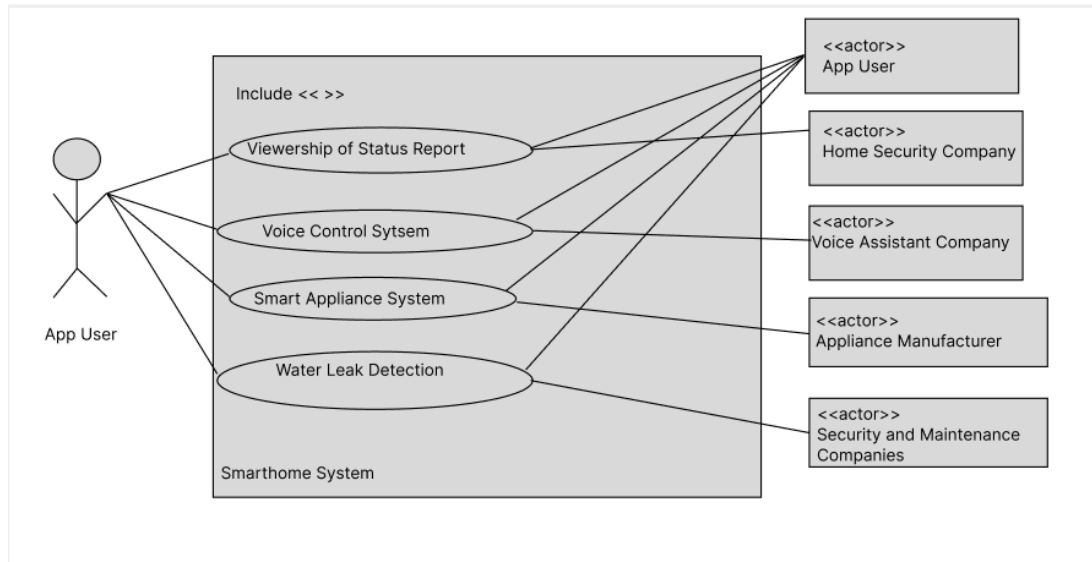
Frequency of Occurrence

5. The user can set a timer whenever they'd like, however, there can only be one timer per feature.
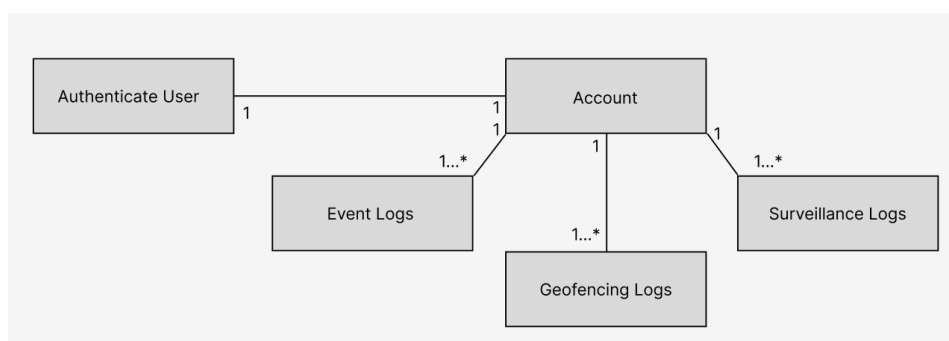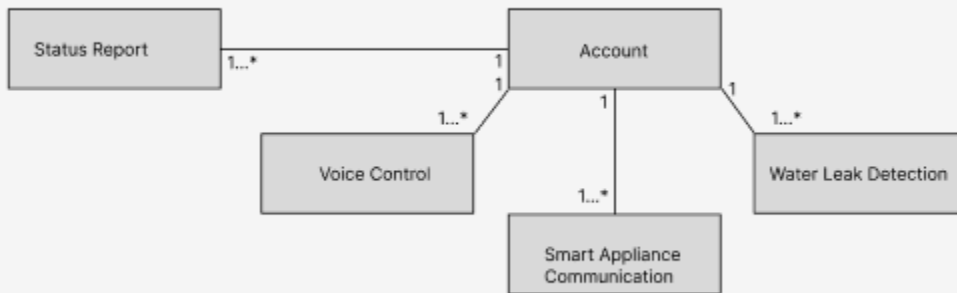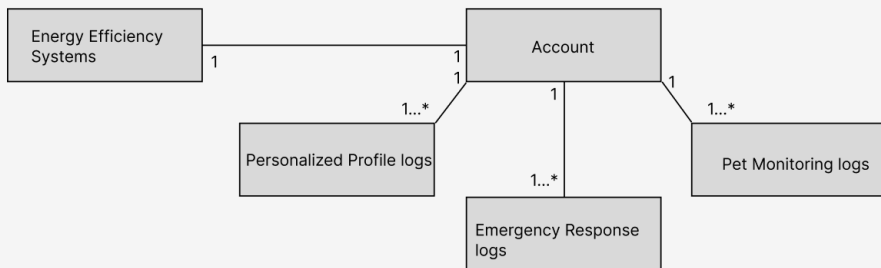
Use Case Diagrams:

Diagram 1: Smarthome System

App User

Smarthome System

Include << >>

- Window Blind/Shades Control → <<actor>> Window Installation Company
- Automated Garage Door Control → <<actor>> Garage Installation Company
- Outside/Yard Light Sensors → <<actor>> Motion-Detecting Lightblub Company
- Smart Gardening → <<actor>> Sprinkler Installation Company

Diagram 2: Smarthome System

App User

Smarthome System

Include << >>

- Smart Heating and Cooling → <<actor>> Heating and Air Conditioning Company
- Audio and Visual Systems → <<actor>> Audio Visual Systems Company, Electric Company
- Digital Assistant → <<actor>> Digital assistant company, ISP company
- Smart Bathroom → <<actor>> Plumbing Company

<<actor>> App user

Conceptual Class Diagrams:

Diagram 1

- **Window Blinds Control** / Room number/label — 1...* — **Account** — 1
- **Account** 1...* — **Garage Control**
- **Account** 1...* — **Motion-Sensored Lights** / Yard/Pathway section
- **Account** 1 — 1...* **Sprinkler logs**

Diagram 2

- **Energy Efficiency Systems** 1 — 1 **Account**
- **Account** 1...* — **Personalized Profile logs**
- **Account** 1...* — **Emergency Response logs**
- **Account** 1 — 1...* **Pet Monitoring logs**

Diagram 3

- **Status Report** 1...* — 1 **Account**
- **Account** 1...* — **Voice Control**
- **Account** 1...* — **Smart Appliance Communication**
- **Account** 1 — 1...* **Water Leak Detection**

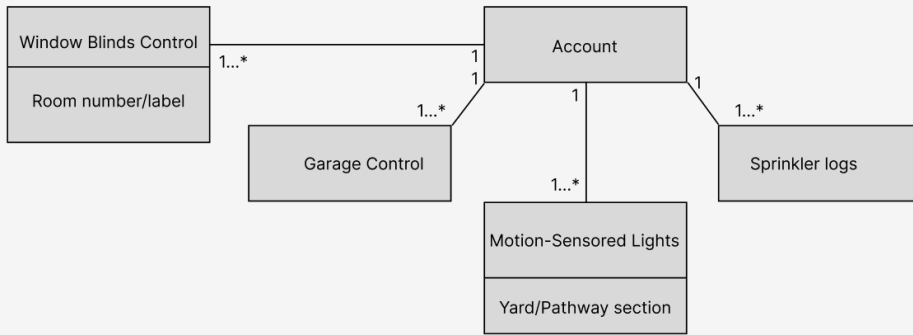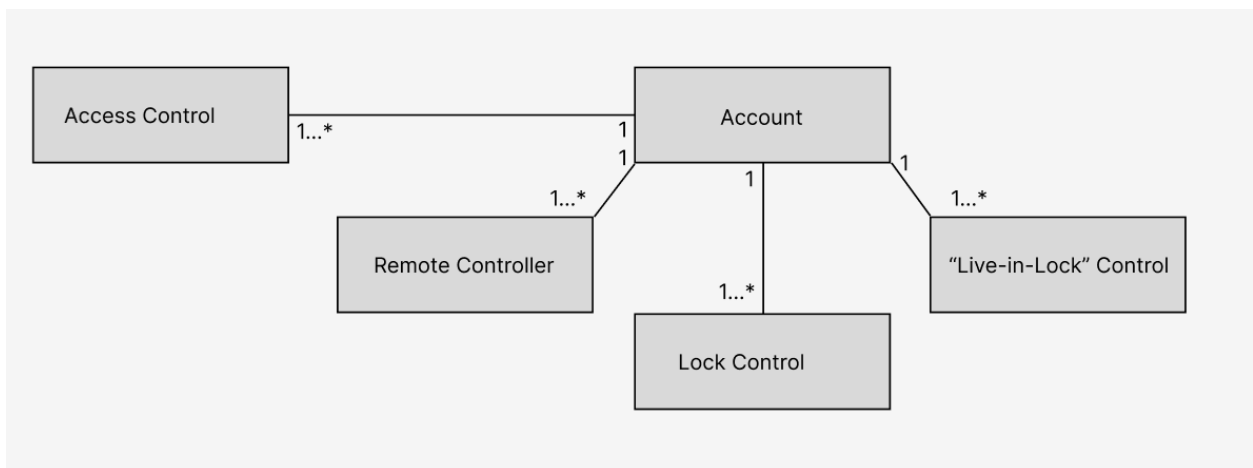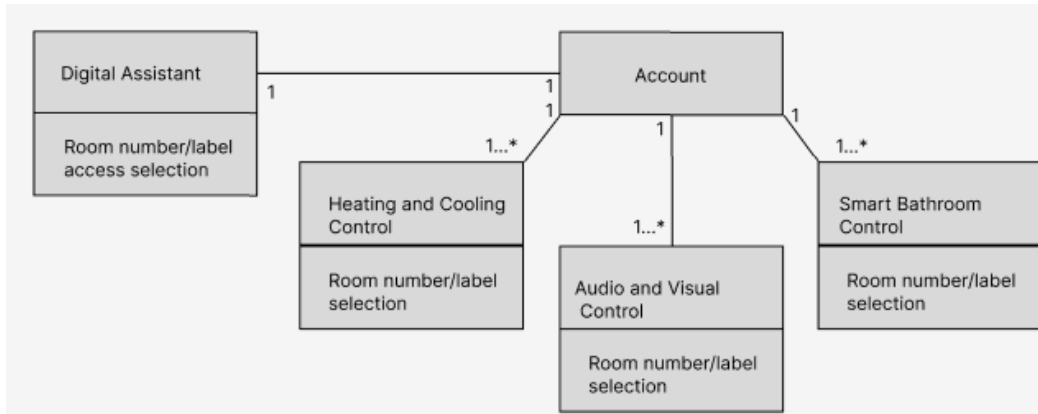**Supplementary specifications:**

1. One non-functional requirement related to the performance for our system is response time. Specifically, the system should state what the maximum response time is for alarm activation and other server requests.

2. One non-functional requirement is related to the accessibility of our system. The system's user interface should follow the Web Content Accessibility Guidelines so that the application/system can easily be used by people with disabilities.

3. One non-functional requirement is related to the system updates of our system. There will be a simple way to refresh and update the system and maintain the usability of the system with a simple click of a button.

4. One non-functional requirement is related to security and encryption standards of our system. The system should state what the maximum response time is for alarm activation and other secure server requests.

5. One non-functional requirement is related to compatibility. Our application must be compatible with the latest versions of web browsers, IOS software, and Android software.
6. One non-functional requirement is reliability. The smart home system should be able to operate consistently with few malfunctions and errors.

GitHub Repository Link:https://github.com/AsfandiyarK/CS3704Project-SmartHomeSystem.git