Software Requirements Specification

For

Safe Home Security System

Version 1.0 approved

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

2. Overall Description

2.1 Product Perspective

*Our project is titles **Safe Home,** it is a product which originates from **Home Management Products,** . Our product provides homeowners or small businesspeople a system where they can control home security, home surveillance, devices and appliances. The user or owner can turn off his/her AC, close or open windows of any room, check for air quality, and many more. It is a low cost product.*

2.2 Product Functions

- *Homeowner can arm/disarm the system*
- *Homeowner can access the system via internet*
- *Homeowner can open activate alarms and sensors also he can monitor sensors to avoid any particular conditions*
- *Homeowner can open the door, for example if a house cleaner or housekeeper comes and homeowner is not at home and he has to open the doors, than he can do it simply by accessing the system via internet.*
- *Homeowner can respond to alarms made by the systems and sensors*
- *Homeowner can encounter an error condition caused by the or sensors*
- *System Administrator can reconfigure sensors and related system features of sensors*

2.3 User Classes and Characteristics

- **Homeowners:** Homeowner interact with system in two roles, one is homeowner where he can arm/disarm the system, and the other is system administrator where he can change settings of the system. Basically, homeowner is not a technical person but a little knowledge would be necessary for administrating the system

- **Small-businesspeople:** Small-businesspeople are those who are running a small business. Here the owner of the business does not require much knowledge of the system a manual will guide him. Owner can assign the role of which we call homeowner previously to his manager etc., keeping the role of administrator on him.

2.4 Operating Environment

The system will operate in house; it has to be access to the internet or Ethernet. Devices, like sensors or other appliances has to be connected to the system in order to be fully functional. The system has dependencies like sensors it is attached to, appliances it is connected with and other functionality it is required to perform.

2.5 Design and Implementation Constraints

- *The safe home will not be facilitating more than a limited amount of sensors and appliances*
- *when you connect the system to the internet, than you can face malicious activities*
- *Every time the user has to access the system, he has to be connected to the internet, without internet, he/she cannot access the system.*
- *If an action is not being performed and system is not ready, than homeowner will have to do it manually*
- *system requires a specific space of 100mm*100mm to fit in*
- *The actions a homeowner perform, are dependent on sensors and appliances, if any appliance of sensors fail, it will effect the system to perform wrong operations. For example if user wants to check quality of air, than if the sensor which is monitoring air quality gives wrong value, the system will show that value to the observer.*
- *Safe home will only be available in few languages*
- *Safe home is required to perform a refresh a operation daily, to check whether all the devices are working fine.*

2.6 User Documentation

- *A user will be provided with a user manual or user guide*
- *owner of the product will also have a documentation too with some technical terminologies which help user to understand the system if he is interested to maintain the system on his own without calling for a technician every time.*

2.7 Assumptions and Dependencies

SafeHome depends on other devices i.e. motion sensors, sound detectors, system dependent doors and windows, internet or ethernet and other appliances. On the other SafeHome does not carry any assumptions.

3. System Features

3.1 Use Cases

Use Case: Access Safe Home via web
Primary Actor: Homeowner
Goal in context: To access the Safe home system when homeowner cannot reach control panel of Safe home
Precondition: Safe home is configured in real space at home
Trigger: The homeowner decides to access Safe home but he is not at home
Scenario:
Homeowner opens web browser
Homeowner launch website of SafeHome
Homeowner enters username and password.
After authentication, homeowner can access the system.
Exceptions:
Homeowner has selected “stay” but he is accessing via web
Homeowner entered wrong username, and he is asked to reenter username
Homeowner entered wrong password, and he is asked to reenter password
Homeowner has access to control panel and can do whatever he’s supposed to
Priority: Essential, must be implemented
When available: First increment
Frequency of use: less frequent
Channel of actor: Web browser
Secondary actors: Null
Channels of secondary actors: Null
Open Issues: Website might not respond sometimes low speed internet can cause issues

Use Case: Login on online/web portal
Primary Actor: Homeowner
Goal in context: to control SafeHome via web portal
Precondition: SafeHome is configured in real space at home
Trigger: homeowner launches a web browser to access SafeHome via web
Scenario:
Homeowner opens web browser
Homeowner visits website of SafeHome.co than he enters login credentials
If credentials are, correct than homeowner has the access
Exceptions:
If homeowner entered right username and password than he has the access to SafeHome
If he entered wrong credentials than he is asked to reenter credentials
Priority: Essential, must be implemented
When available: First increment
Frequency of use: less frequent
Channel of actor: web browser
Secondary actors: Null
Channels of secondary actors: Null

Open Issues: Web might not respond that sometimes website must respond to correct password and username every time

Use Case: Validate username and password
Primary Actor: Homeowner
Goal in context: validate password and username when user try to access SafeHome, it can be access via control panel on online portal
Precondition: SafeHome must be installed on site and should be working fine
Trigger: when user tries to login via control panel or web
Scenario:
User launches web browser or he goes to login through control panel
He enters his username homeowner enters his password
Homeowner click sign-in/login button.
Exceptions:
If homeowner entered correct username and password, If he tried to login via control panel he will have access to control panel, instead he logged in via web portal than he can control SafeHome via web portal
If homeowner provided wrong credentials than he will have to reenter
Priority: Must be implemented
When available: first increment
Frequency of use: most frequent use
Channel of actor: Control panel/ web portal
Secondary actors: administrator
Channels of secondary actors: control panel
Open Issues: passwords should saved at a safe place and encrypted as well, is there any implementation in this regard?

Use Case: create profiles
Primary Actor: SafeHome administrator
Goal in context: to assign roles to different people
Precondition: SafeHome should be installed on site
Trigger: when administrator want to create a profile or assign some role
Scenario:
Administrator has to login to SafeHome administrator should go to profiles tab
Administrator has to click on create new profile tab
Administrator can assign roles
Exceptions:
Administrator has to enter a unique title for a person, if the role is already assigned than he might have to assign another role to that person or he has to remove the previous person.
Priority: isn't essential
When available: Third increment
Frequency of use: only when new profiles are to be created
Channel of actor: Control panel or web
Secondary actors: NULL
Channels of secondary actors: NULL
Open Issues: administrator cannot assign homeowner role to more than one person a profile cannot be created without any role

Use Case: Update user profiles
Primary Actor: Administrator
Goal in context: to keep profiles up-to-date
Precondition: Use profile must exist, which has to be updated
Trigger: when administrator decides to update an existing use profile
Scenario:
Administrator has to login to the system
Administrator has to go to profiles tab
Administrator has to select the profile that has to be updated
Administrator should make changes.
Administrator has to apply/save those changes by clicking on save/apply button
Exceptions:
Profile must exist there should at least one change, administrator has to make at least one change
Priority: is not essential
When available: Third increment
Frequency of use: very few time
Channel of actor: Control panel/web
S**econdary actors:** Every profile user
Channels of secondary actors: web/control panel
Open Issues: if administrator try to deselect all the roles and than try to save the profile, there will bean error “cannot save profile with no roles” administrator cannot update username

Use case: login as a family member

Actor: Family member (co-owner)
Goal in context: Family member wants to access the system and can monitor sensors but can't change the setting of system.
Preconditions: Homeowner made profiles of family members so that only those members can access the system.
Scenario:

- → Family member logs onto Safe Home website.
- → Family member enters his user ID and password.
- → System validates the user's credentials.
- → If user enters valid credentials then system displays menu buttons of major functions.
- → If user enters an invalid credentials unintentionally system asks for reentry for a limited number of times.
- → If user forgets his password he clicks "forget password" button on login page.
- → After login, a Family member can perform specific tasks like monitoring sensors.

Exceptions:

- → Login credentials are invalid.

- → No input tries remain but still co-owner unable to login.
- → Homeowner has not made family members profiles.

Priority: Essential, must be implemented
When available: Increment in which administrator/homeowner can create/update family members' profiles.
Frequency of use: Few times per month
Channel to actor: Via internet (web browser)
Post-conditions:

- → After login, user can monitor sensors.
- → User can update his profile (change his username or any other credentials).
- → After monitoring the system, checks all sensors and current situation,
- → User logged out from website.

Use case: Reset password

Primary actors: Homeowner, Co-owner, Admin
Goal in context: After login, homeowner wants to reset his password
Preconditions: profile of user (homeowner/co-owner) is already registered on the system. Contact of homeowner should be stored on system server.

Scenario:

- → User wants to login system.
- → User forgets his password.
- → User selects "forget password".
- → To confirm user is homeowner/co-owner or Admin, System asks for a phone number or email id.
- → If an email or phone number is valid, system sends a verification code to that contact.
- → After verification of contact through code, system asks for a new password.
- → User enters new password and then re-enter for confirmation.
- → System validates new password.
- → After changing the password, homeowner logins.
- → User performs major functions that are provided by system.

Exceptions:

- → For login, no input tries remain so system may be locked.
- → User enters an invalid phone number or email.
- → While entering a new password, User entered invalid credentials.

Priority: Essential, must be implemented
When available: First increment
Frequency of use: Few times in months
Channel to actor: Via internet (web browser)
Post-conditions:

- → When the password reset, User logins.
- → To access system, the next time user enters an ID and a new password.

Use case: activate/deactivate sensors
Primary Actor: Homeowner
Goal in context: After login, the homeowner can activate/deactivate sensors via web portal or control panel.

Preconditions:

- → Homeowner logged on safe home website.
- → System validated user's credentials.
- → After logged in user can see major functions buttons.
- → Sensors are placed at home at required positions.

Scenario:

- → System displays major functions buttons.
- → Homeowner selects "configure sensors" button.
- → Homeowner selects "type of sensors".
- → Homeowner selects specific sensor from sensors list.
- → System displays specifications of that sensor.
- → Homeowner can see buttons in end.
- → System displays status of sensor (activated or deactivated).
- → If homeowner wants to activate sensor he clicks on activate button.
- → If homeowner wants to deactivate sensor he clicks on deactivate button.
- → Status of sensors is set according to user.

Exceptions:

- → Login credentials are invalid.
- → Sensors are not placed at home.
- → Homeowner wants to deactivate sensor which is already not active.
- → Homeowner wants to activate sensor which is already active.
- → Recently activated sensor is not operating.

Priority: Essential, must be implemented
When available: First increment
Frequency of use: many times, per day
Channel to actor: Via internet (web browser) or control panel.
Secondary actor: sensors
Channel to secondary actor: hardwired and radiofrequency interfaces

Post-conditions:

- → After activate/deactivate sensors, the homeowner observes sensors.
- → Activated sensors are operating.

Use case: equip new sensor

Primary Actor: Homeowner, Admin
Goal in context: After login, homeowner can equip new sensor to system.

Preconditions:

→ Homeowner/Admin can access website by entering an ID and password .
→ System validated user's credentials.
→ Sensors are placed at home at required positions.
→ New sensor that we want to add must be placed in home

Scenario:

→ System displays major functions buttons.
→ User selects "configure sensors" button.
→ User selects "specific type of sensors".
→ In particular types of sensors list, system displays "equip sensor" button
→ User clicks "equip sensor" button.
→ System asks for specifications of that sensor.
→ Homeowner can see buttons in end.
→ System displays status of sensor (activated or deactivated).
→ If homeowner wants to activate sensor he clicks on activate button.
→ If homeowner wants to deactivate sensor he clicks on deactivate button.
→ Status of sensors is set according to user.

Exceptions:

→ Login credentials are invalid.
→ New sensor that user wants to add to system is not placed at home.
→ New sensor is not operating after activation.
→ Sensor is not placed in required position.
→

Priority: Essential, must be implemented
When available: second increment
Frequency of use: Few times per month
Channel to actor: Via internet (web browser)
Secondary actor: sensors
Channel to secondary actor: hardwired and radiofrequency interfaces

Post-conditions:

→ Status of new sensor is settled according to user.
→ User observes working of sensors.
→ Recently added sensor started working.
→ Activated sensors are operating.

Use case: unequip sensor

Actor: Homeowner, Admin
Goal in context: After login, homeowner can add dismantle useless sensor.

Preconditions:

→ Administrator accesses website by entering an ID and password or he can access control panel.
→ System validated user's credentials.
→ After logged in user can see major functions buttons.
→ Sensors are placed at home at required positions.

Scenario:

→ System displays major functions buttons.
→ Homeowner/Admin selects "configure sensors" button.
→ Homeowner/Admin selects "specific type of sensors".
→ Homeowner/Admin selects specific sensor from sensors list.
→ System displays specifications of that sensor.
→ Homeowner sees buttons in end.
→ System displays status of sensor (activated or deactivated).
→ System also displays "unequip sensor" button.
→ Sensor deactivated automatically.
→ Status of sensors is set according to user.
→ Selected sensor stopped working.

Exceptions:

→ Login credentials are invalid.
→ Sensor that user wants to dismantle does not exist.
→ User wants to unequip that sensor which is concerning other sensors.
→ By unequipping sensor, other sensors are not operating perfectly fine.

Priority: Essential, must be implemented
When available: second increment
Frequency of use: Few times per month
Channel to actor: Via internet (web browser)
Secondary actor: sensors
Channel to secondary actor: hardwired and radiofrequency interfaces

Post-conditions:

→ Homeowner/Admin observes sensors.
→ After dismantling the sensor, other sensors are correctly working.

USE CASE: Monitor sensor
Primary Actor: Homeowner

Goal in context: To check the functionality of safe home monitor sensor when the Homeowner wants to observe distortion.
Precondition: safe home is shaped and launched in real space.
Trigger: homeowner wants to observe any out siding disturbance but he is not at home.
Scenario:

- → homeowner visits website of safe home
- → Then he enters login credentials
- → Checks the condition of monitor sensor whether any unknowing change has occurred.
- → If monitor detects new distortion than sensor sense it and show it to homeowner.
- → If certain conditions has changed than it's definitely something which is sensed by monitor sensor, might be any unauthorized access.
- → if homeowner checks the monitor sensor and noticed some change so there is an interruption towards safe home.

Exceptions:

- → homeowner visits website of safe home
- → Then he enters login credentials
- → Checks the condition of monitor sensor whether any unknowing change has occurred.
- → If monitor detects new distortion than sensor sense it and show it to homeowner.
- → If certain conditions has changed than it's definitely something which is sensed by monitor sensor, might be any unauthorized access.
- → if homeowner checks the monitor sensor and noticed some change so there is an interruption towards safe home.
- → If there is no certain changings and homeowner does not notice any change in monitor sensor part so there is no remodeling.

Priority: conditions and essentials must be noticed thoroughly.
When available: new increment
Frequency of use: when there is notification of certain modification.
Channel of actor: control panel
Secondary actors: administrator
Channels of secondary actors: control panel
Open issue:

- → low speed internet can cause issue
- → Panel might not respond and not keeps record of alert sometime.

USE CASE: Set alarm
Primary actor: homeowner
Goal in context: to secure safe home via alarm alert
Precondition: safe home is configured in real space.
Trigger: homeowner decides to shield the safe home either he is not at home.
Scenario:

- → Homeowner opens safe home site
- → Homeowner checks the alarm notification about safe home.
- → Homeowner configures many actions for alarm setting, might be it a ping out, might be it's an alarming or threat click regarding safe home.

Exceptions:

- → Homeowner has signed in notification but sometimes it's not pinging as well.
- → Safe home might have weak internet access, so notification not sent to homeowner.
- → After reminding or alarming notification, homeowner does not check it in a while.

Priority:
Essentials must be configured, set and implemented.
When Available:
Prior boost or supplement
Frequency of use:
Much frequently being used
Channel of actor:
Control panel or web
Secondary actors:
Homeowner Administrator
Channel of secondary actors:
Control panel
Open issues:
Homeowner cannot check required notification regarding security alarm.
Homeowner could not set proper alert notifications.

USE CASE: Create security zone
Primary actor: Safe home administrator
Goal in context: To provide security to safe home
Precondition: Safe home must be configured in real space or web.
Scenario:

- → When user tries to access the safe home UN authorizedly.
- → User goes to login through control panel or site.
- → He enters his username and correct password.
- → Goes to his specified and unrestricted domains of safe home without any interruption.

Exceptions:

- → If safe home administrator enter into wrong domain which is restricted for him.
- → There is a chance to enter wrong password and conditions are not fulfill.
- → By accessing that site, there might be non-true or UN authentic error which may cause damage to safe home security.

Priority: It must be implemented and essential.
When available: First increment
Frequency of use: Most frequent use
Channel of actor: Web browser and control panel
Secondary actors: Null
Channels of security actors: Null
Open issues:

- → Website might not respond sometime.
- → User might be entered in restricted domains.
- → Website might not respond to rising issues which may damage.

USE CASE: Reconfigure Security Zone
Primary Actor: Safe home administrator
Goal in Context: To keep safe home secure and shielded
Precondition: Safe home is composed in real space
Trigger: Safe home administrator decides to access safe home through precautionary actions it must be protected.
Scenario:

- → Administrator opens web browser.
- → Administrator goes to required domain or required specific area of safe home and changes the configured security zone of safe home.
- → Safe home administrator notice the faults of safe home security zone and tries to rebuild this phase specifically.
- → Tries to update the authentication rules for safe home access.

Exceptions:

- → Safe home administrator has selected rebuild the zone but reconfiguration is not acted in that while.
- → Safe home administrator has set wrong conditions for security resetting.
- → Conditions might be matched by old ones and updating does not work specifically.
- → Administrator has access to control panel but domains are not set for specific users which is not good practice.

Priority: Essential and must be implemented.
Already used security rules must be scanned.
When available: First increment
Frequency of use: Frequently used and whenever need arises regarding security.
Channel of actor: Control panel or web
Secondary actors: Homeowner
Channels of secondary actors: Control panel
Open issues:

- → There might be wrong hit directions.
- → Redesigned patterns are not understandable by new user of safe home.
- → Selection of domains is not preferred.

Use Case: Activate/Deactivate Security Zone
Primary Actor: Homeowner
Goal In context: To activate/deactivate security zone
Preconditions: SafeHome must be installed on site and should be accessible via browser
Trigger: The homeowner want to activate/deactivate the existing security zone
Scenario:

- → Homeowner open web browser
- → Homeowner access the website
- → Homeowner enter the username and password
- → After verification homeowner will allowed to enter the system
- → Homeowner will select the security
- → Homeowner select update security
- → Homeowner select the security zone

→ Homeowner can either activate or deactivate the security zone.

Exceptions:

→ Homeowner enter wrong username or password from 1 to 3 times: homeowner can renter the username and password
→ Homeowner enter wrong username or password 4rth time. Homeowner have to wait for 30 seconds to login again.
→ If homeowner forgot the password, he or she can reset the password.
→ Homeowner has access to system ,he can do whatever he want's

Priority: Essential, must be implemented
When available: First Increment
Frequency of use: Less frequent
Channel of actor: Web Browser
Secondary Actor: Administrator
Channel of secondary actors: Web Browser
Open issue:

→ Low internet speed can cause issue
→ Website can go down sometime
→ Panel can respond a little slow

Use Case: Select & Monitor Particular Camera
Primary Actor: Homeowner
Goal In context: To monitor any camera if needed
Preconditions: Cameras must be in working state
Trigger: The homeowner wants to see any particular portion of the house

Scenario:

→ Homeowner open web browser
→ Homeowner access the website
→ Homeowner enter the username and password
→ After verification homeowner will allowed to enter the system
→ Homeowner will select the Monitoring Option
→ Homeowner will select particular Camera whose he wants to monitor
→ Homeowner can perform any operation after analyzing the camera output.

Exceptions:

Homeowner may need to restart the system if a camera is not responding.

Priority: Needed when Owner feels some interruption
When available: First Increment
Frequency of use: Less frequent
Channel of actor: Web Browser
Open issue:

- → Low internet speed can cause delay
- → Camera may not respond

Use Case: Change the Movement of camera
Primary Actor: Homeowner
Goal In context: To change the direction of the camera
Preconditions: Cameras must have rotating heads and must be in working form.
Trigger: The homeowner wants to see any particular portion of the house

Scenario:

- → Homeowner open web browser
- → Homeowner access the website
- → Homeowner enter the username and password
- → After verification homeowner will allowed to enter the system
- → Homeowner will select the Activation/arm Option
- → Homeowner will select particular Camera whose direction he wants to change
- → Homeowner will set the new direction of the camera by rotating it.

Exceptions:

Home owner may access the wrong camera and change its position.

Priority: Needed if home owner found some place more important to focus then previous one.
When available: First Increment
Frequency of use: Less frequent
Channel of actor: Web Browser
Open issue:

- → Camera may not have range to the place where home owner wants it to focus
- → Camera may not respond due to technical issue

Use Case: Save a live clip of camera
Primary Actor: Homeowner
Goal In context: To store a particular clip of happenings
Preconditions: Cameras must be in working state and must attach to the storing device
Trigger: The homeowner wants to store the clip of a live camera
Scenario:

- → Homeowner open web browser
- → Homeowner access the website
- → Homeowner enter the username and password
- → After verification homeowner will allowed to enter the system
- → Homeowner will select the required camera

→ Homeowner will start recording of the live camera
→ Homeowner will store the recorded clip in his database.

Exceptions:

Home Owner's storage device may be short of storage.

Priority: Needed when Owner wants to record a particular clip
When available: First Increment
Frequency of use: Less frequent
Channel of actor: Web Browser
Open issue:

→ Storage device may have a bug.
→ Camera may not respond

Use Case: Encounter An error
Primary Actor: Homeowner
Goal In context: To check why the error occurs
Preconditions: System must be in activated form
Trigger: The homeowner wants to encounter the error in the system
Scenario:

→ Homeowner open web browser
→ Homeowner access the website
→ Homeowner enter the username and password
→ After verification homeowner will allowed to enter the system
→ Homeowner will analyze where the error encounters
→ Homeowner will analyze why the error encounters
→ Homeowner will fix the error.

Exceptions:

Homeowner may don't under the reason of error encounter

Priority: Needed when there comes an error in the system
When available: First Increment
Frequency of use: Less frequent
Channel of actor: Web Browser
Open issue:

→ Error can be in the hardware.
→ Error may not resolve without administration.

Use Case: Detect Alarming Situation
Primary Actor: Sensor
Goal In context: Contact Homeowner in case of emergency

Preconditions:
- → SafeHome must be configured
- → SafeHome must connect with all sensors
- → Alarm sensors must be configured and set
- → Email or cell phone of homeowner should be obtained already

Trigger: Sensor detect any alarming situation like fire, smoke, windows or doors opening etc. and contact the homeowner

Scenario:

- → Sensors detect the alarming situation
- → Sensors activate the alarm
- → Sensors send email or call to homeowner

Exceptions:
Alarm is not working
Homeowner is not picking the call
Priority: Essential, must be implemented
When available: First Increment
Frequency of use: Less frequent
Channel of actor: Email or Cell phone
Secondary Actor:
Channel of secondary actors:
Open issue:
Low internet speed can cause issue

Use Case: Help Menu
Primary Actor: Homeowner
Goal In context: To understand how to use SafeHome system and do things in it.
Preconditions: SafeHome must be installed on site and should be accessible via browser
Trigger: The homeowner want to understand the system
Scenario:
- → Homeowner open web browser
- → Homeowner access the website
- → Homeowner enter the username and password
- → After verification homeowner will allowed to enter the system
- → Homeowner will select the Help Menu

Exceptions:
Priority: Essential, must be implemented
When available: First Increment

Frequency of use: Less frequent
Channel of actor: Web Browser
Secondary Actor: Administrator
Channel of secondary actors: Web Browser

4. Diagrams

4.1 Use Case Diagrams

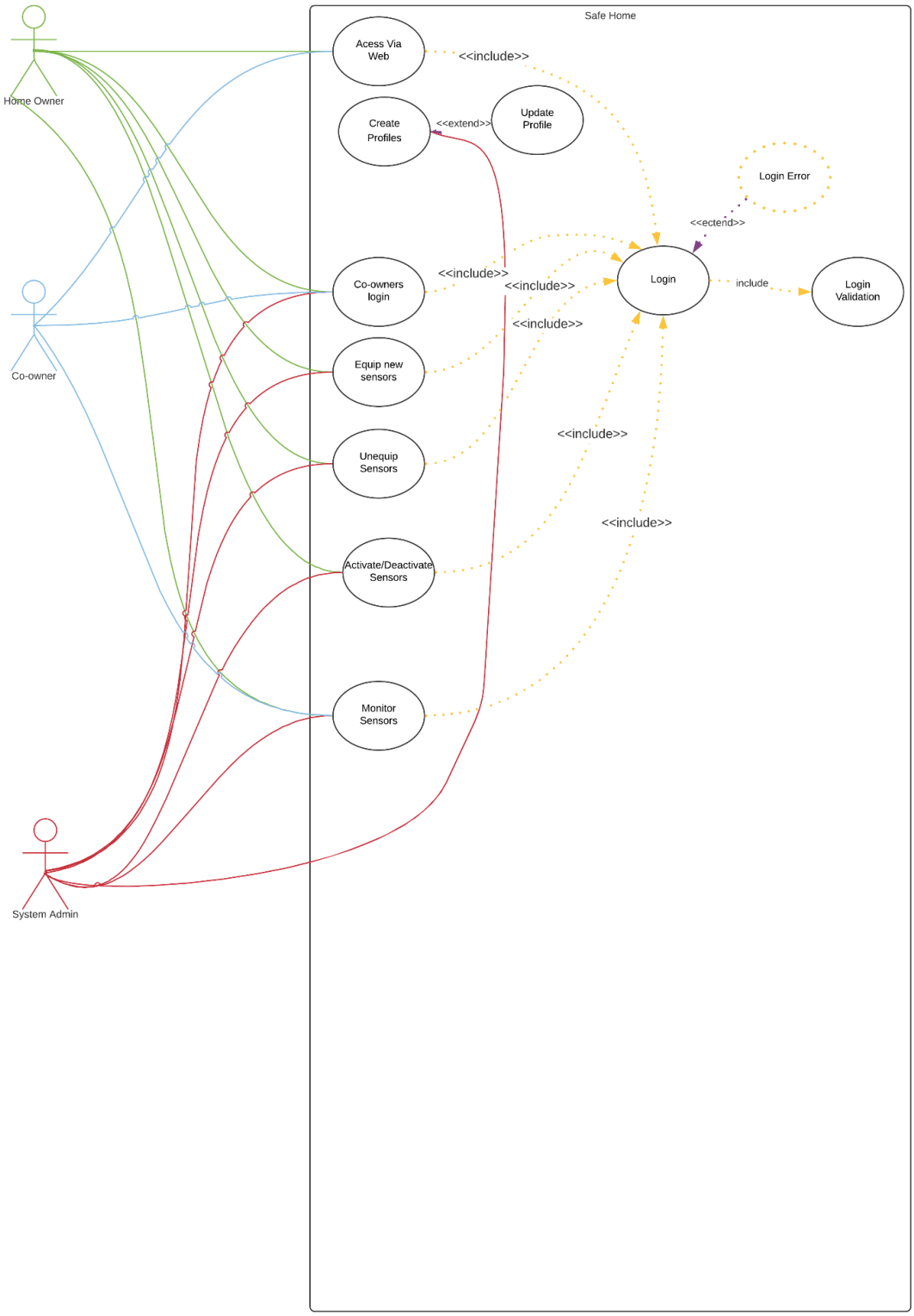


Figure 1 4.1.1: Use Case Diagram part 1

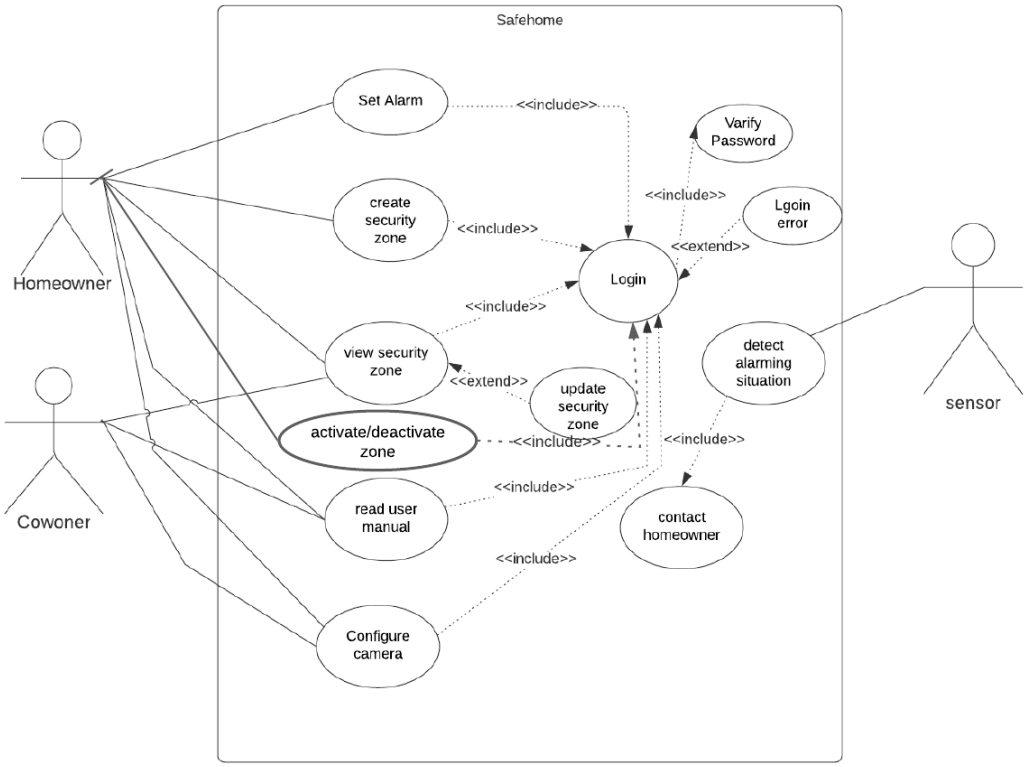


Figure 4.1.2: Use Case Diagram Part 2

4.2 State Diagrams

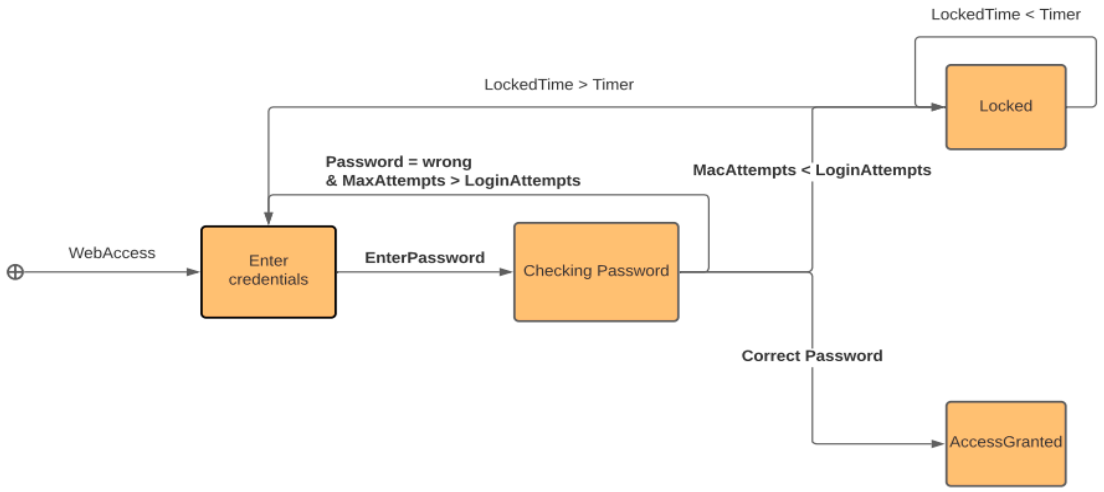


Figure 4.2.1: State diagram for login

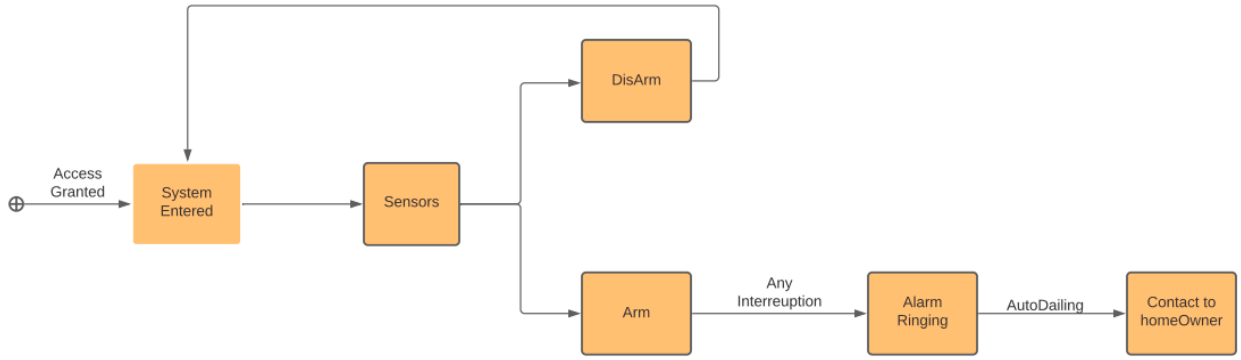


Figure 4.2.2: State Diagram for arm/disarm sensor

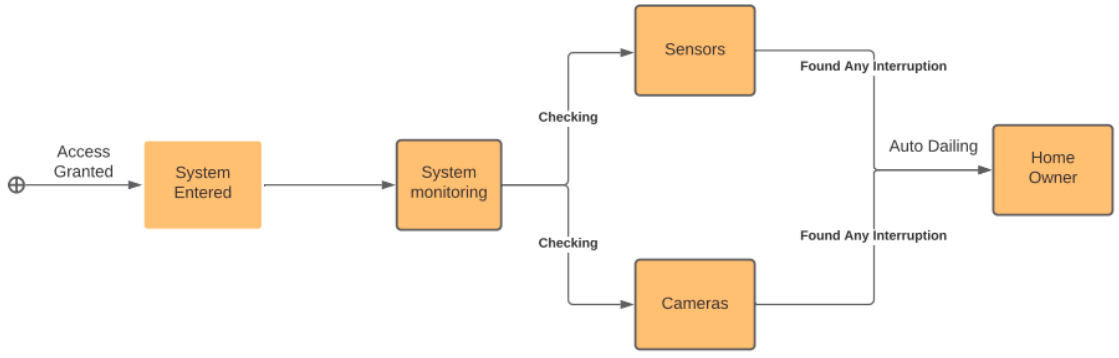


Figure 4.2.3: State Diagram for monitor sensors

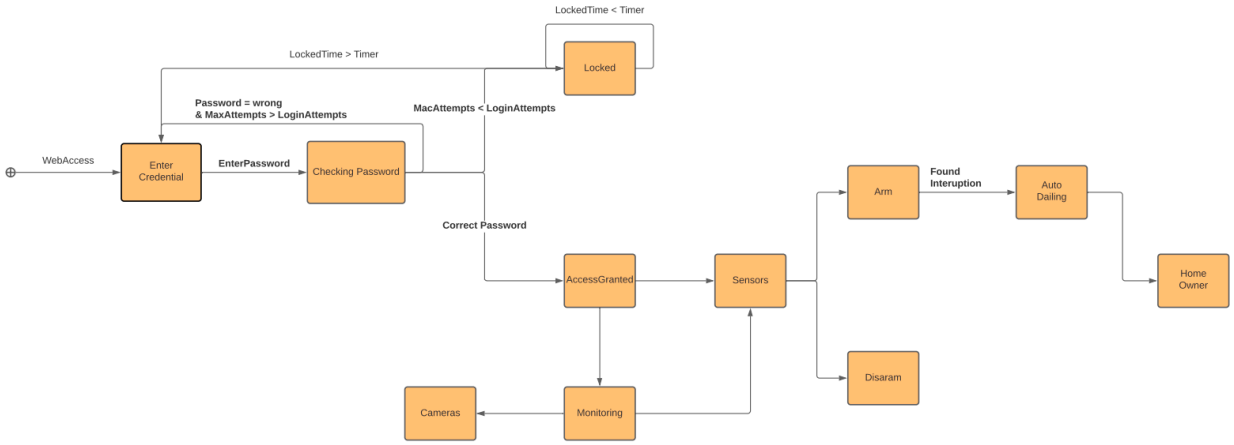


Figure 4.2.4: State Diagram of overall system

4.3 Swimlane Diagrams

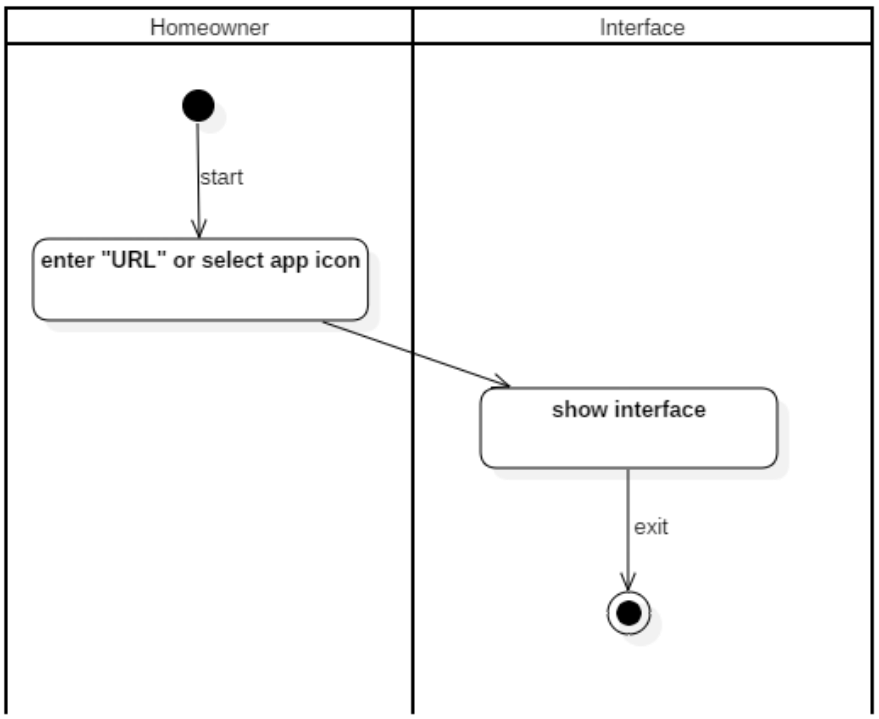


Figure 2: Swimlane Diagram Acessing Web

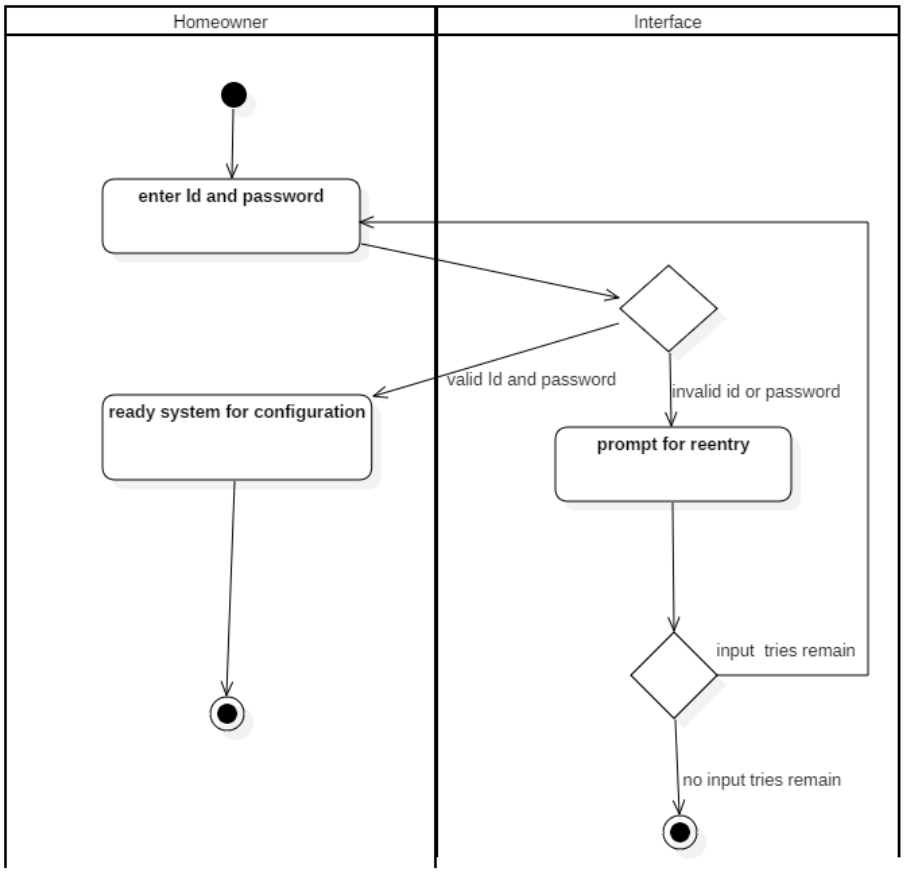


Figure 3 4.3.2: Swimlane Diagram for Login and validation

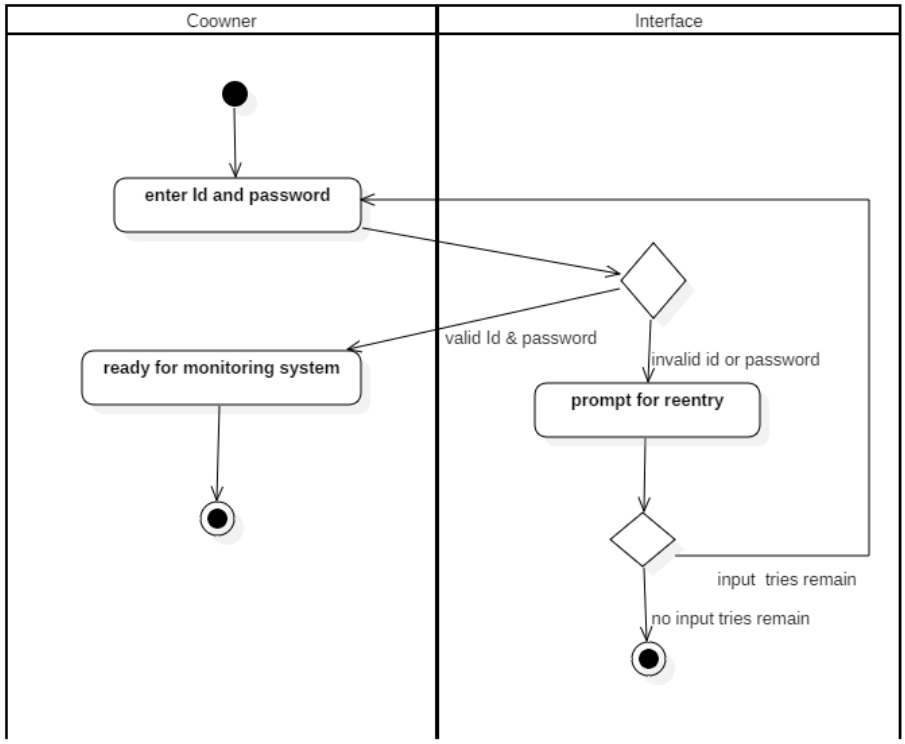


Figure 4 Swim lane Diagram CO-OWNER LOGIN

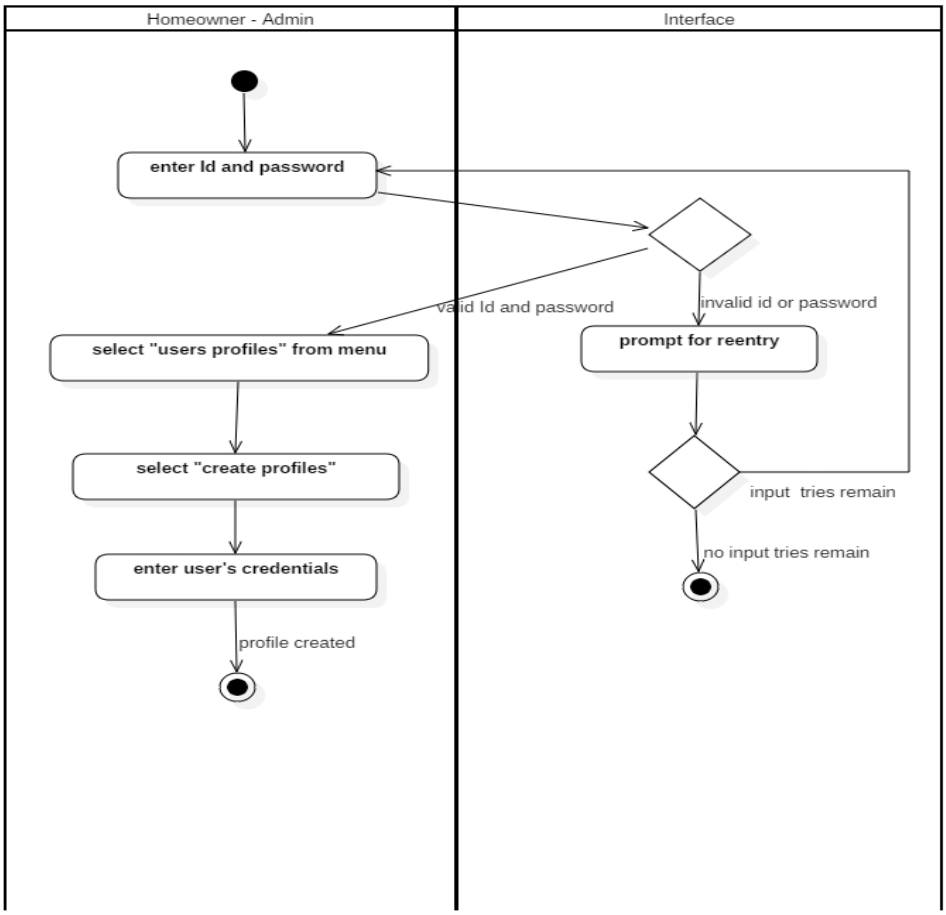


Figure 4.3.4: Swimlane Diagram for create profiles

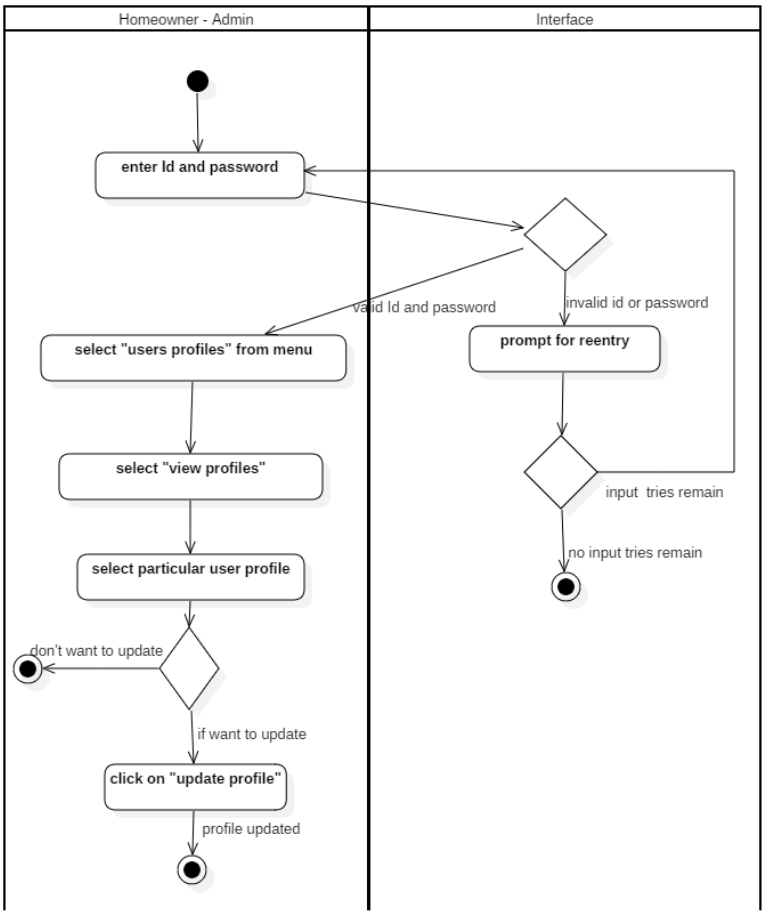


Figure 4.3.5: Swimlane Diagram for view/update profiles

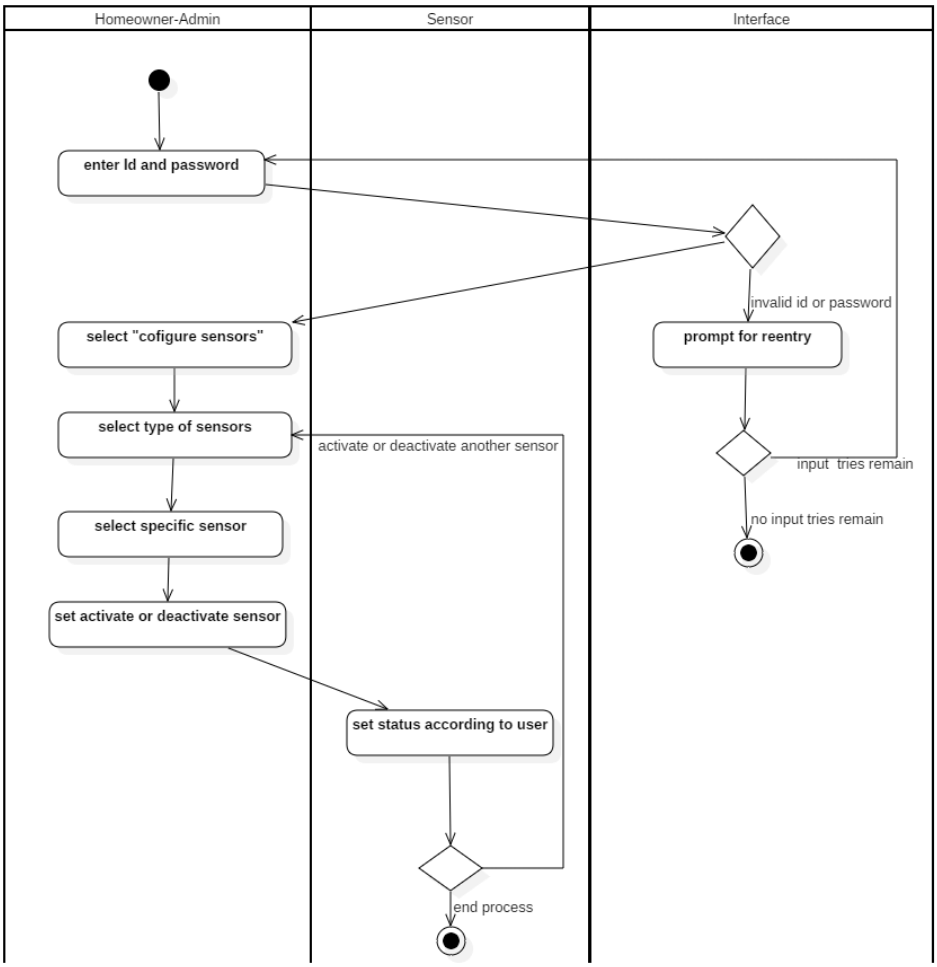


Figure 4.3.6: Swimlane Diagram for activate/deactivate sensors

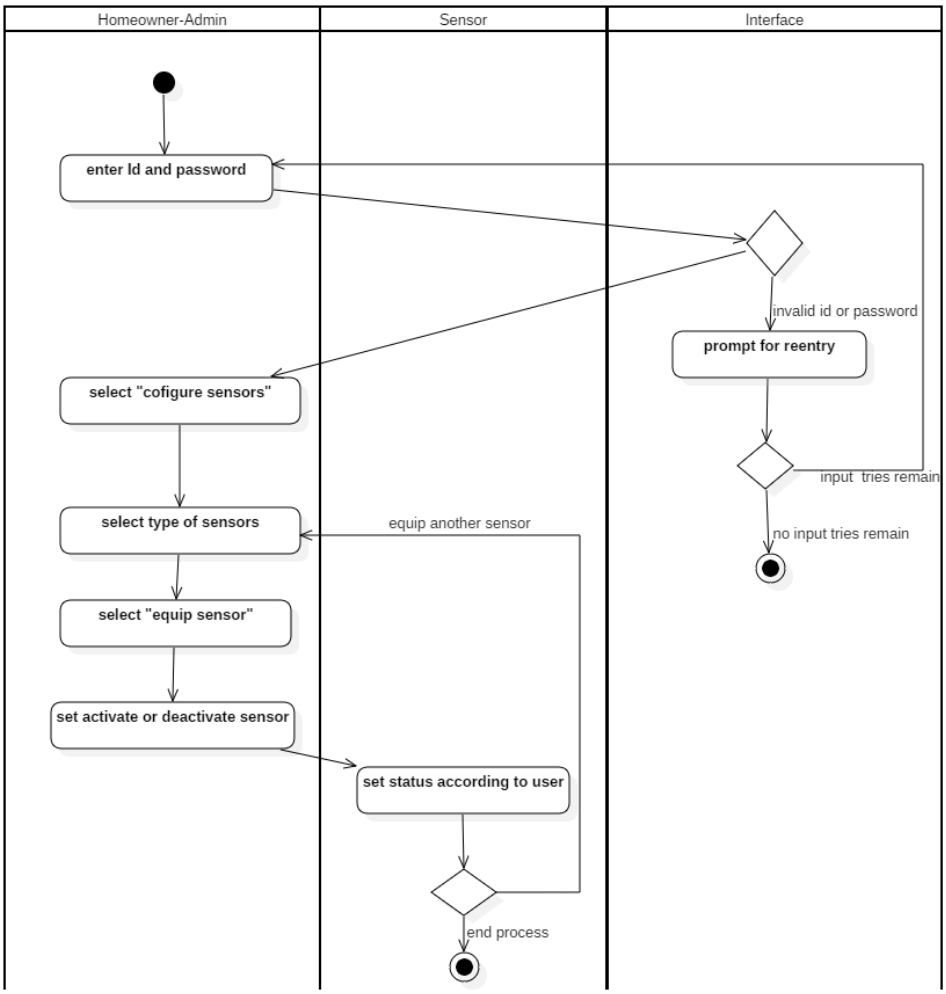


Figure 5 Swim lane Diagram for equip sensors

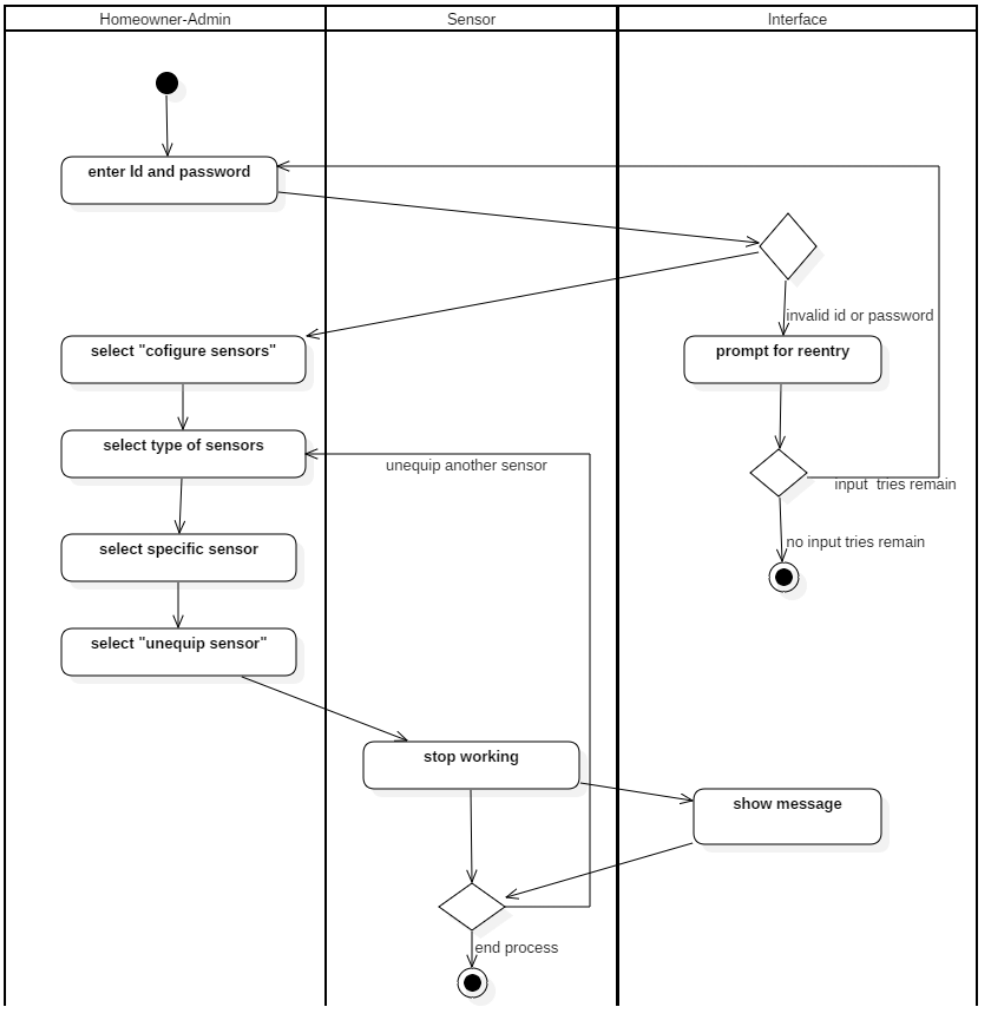


Figure 6 Swimlane Diagram for unequip sensors

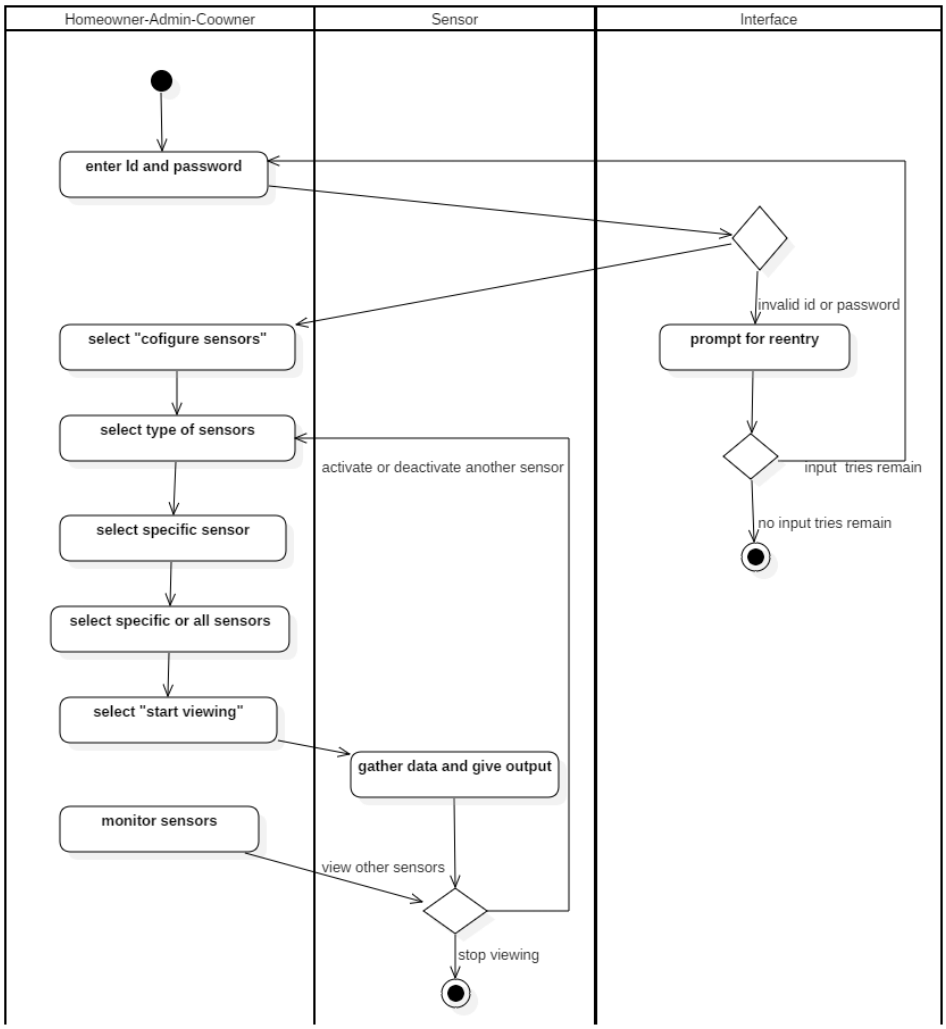


Figure 4.3.9: Swimlane Diagram for monitor sensors

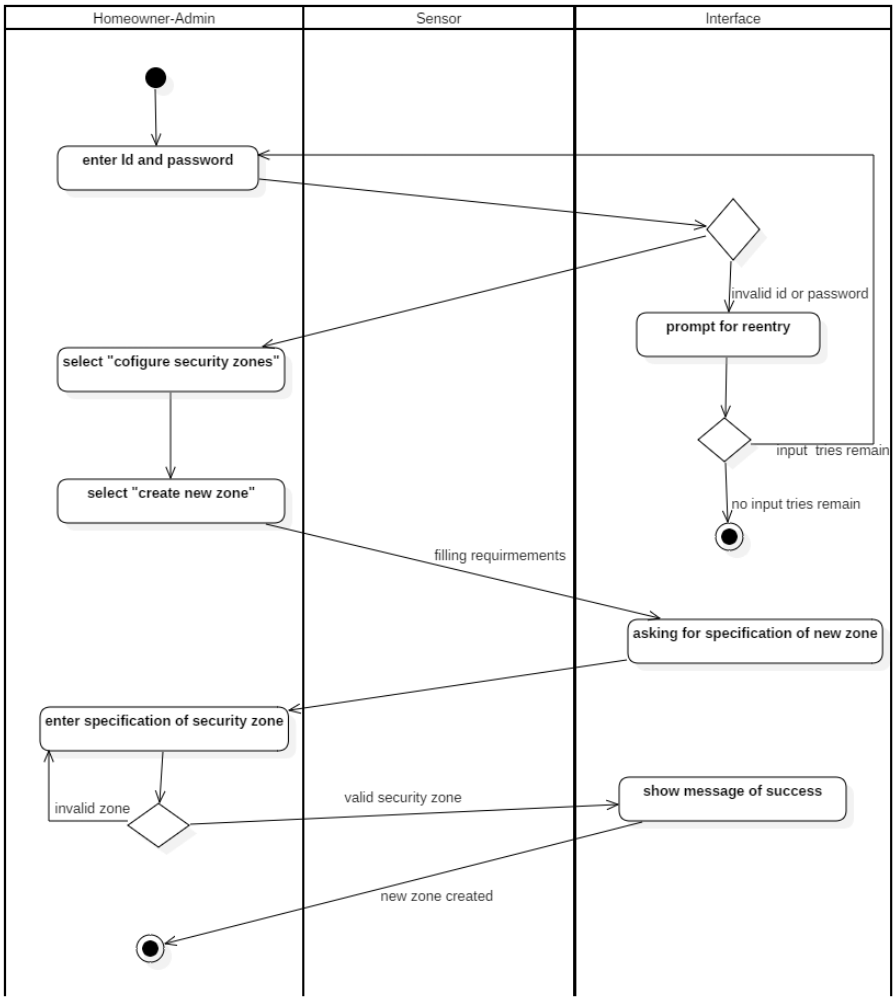


Figure 4.3.10: Swimlane Diagram for Create new zone

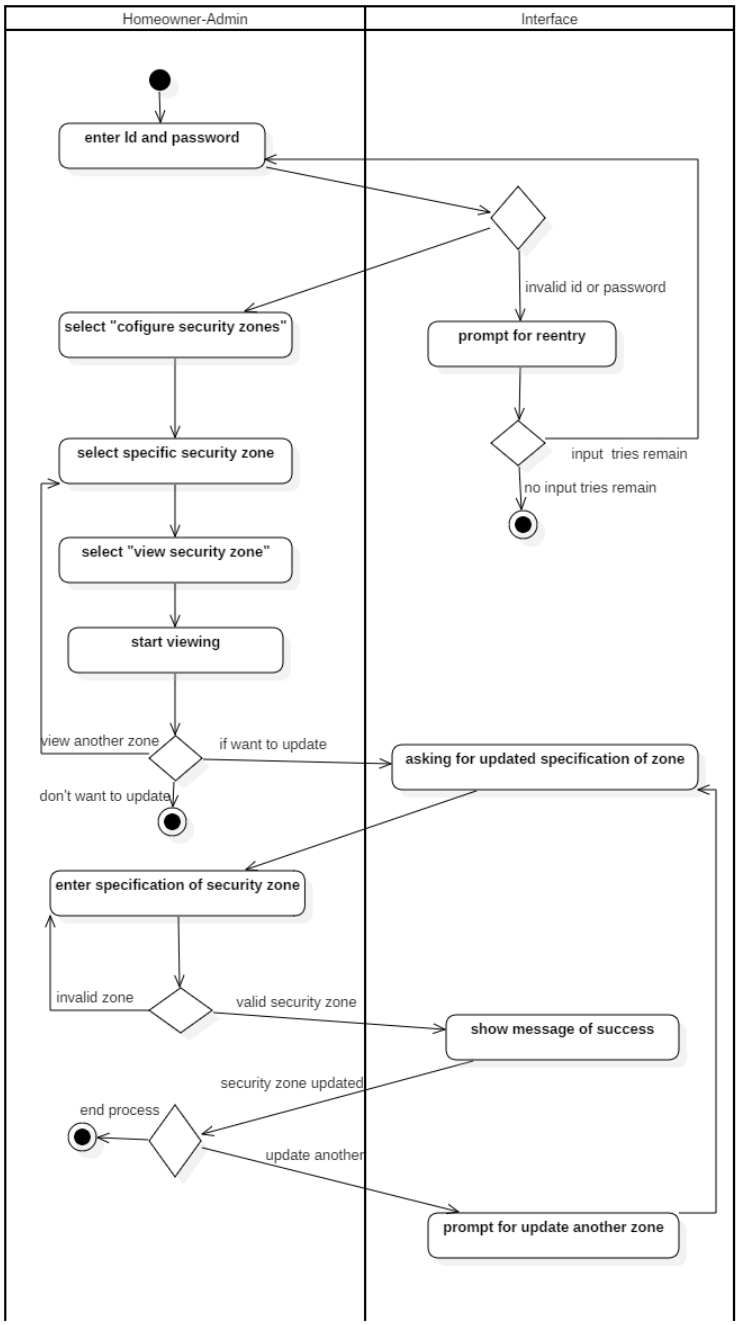


Figure 7: Swim lane Diagram for view/update zone

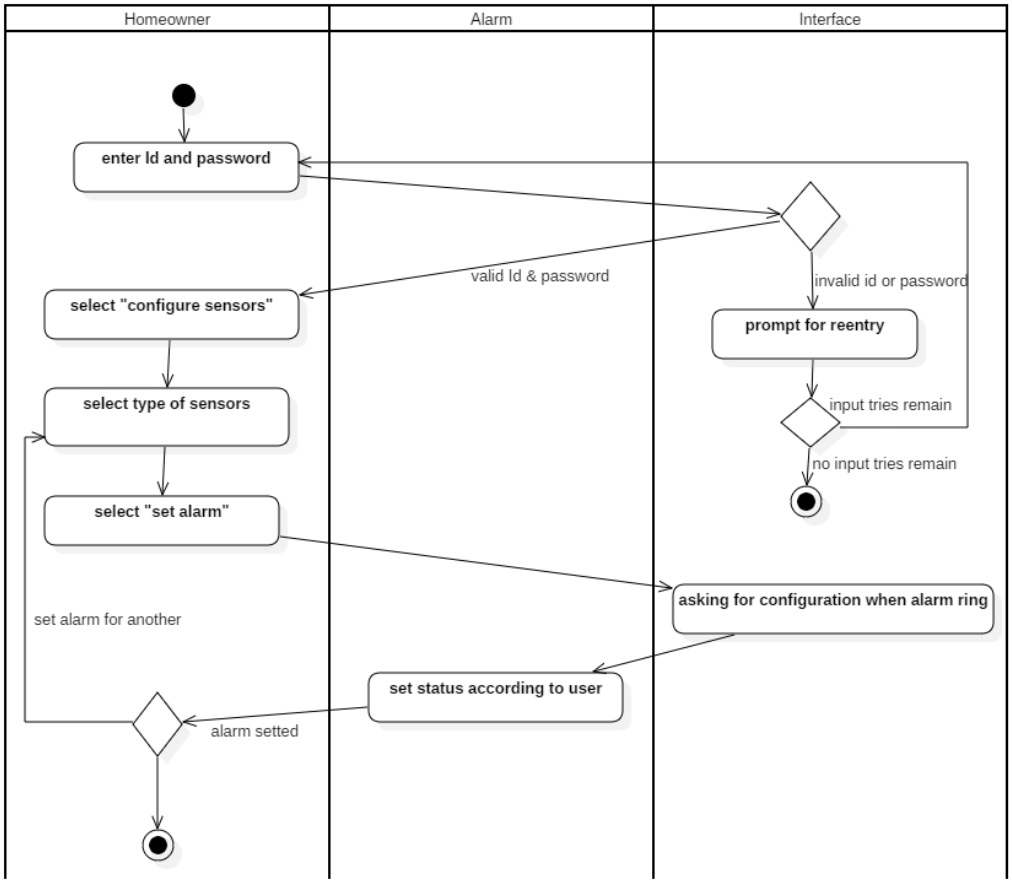


Figure 8 Swim lane Diagram for set alarm

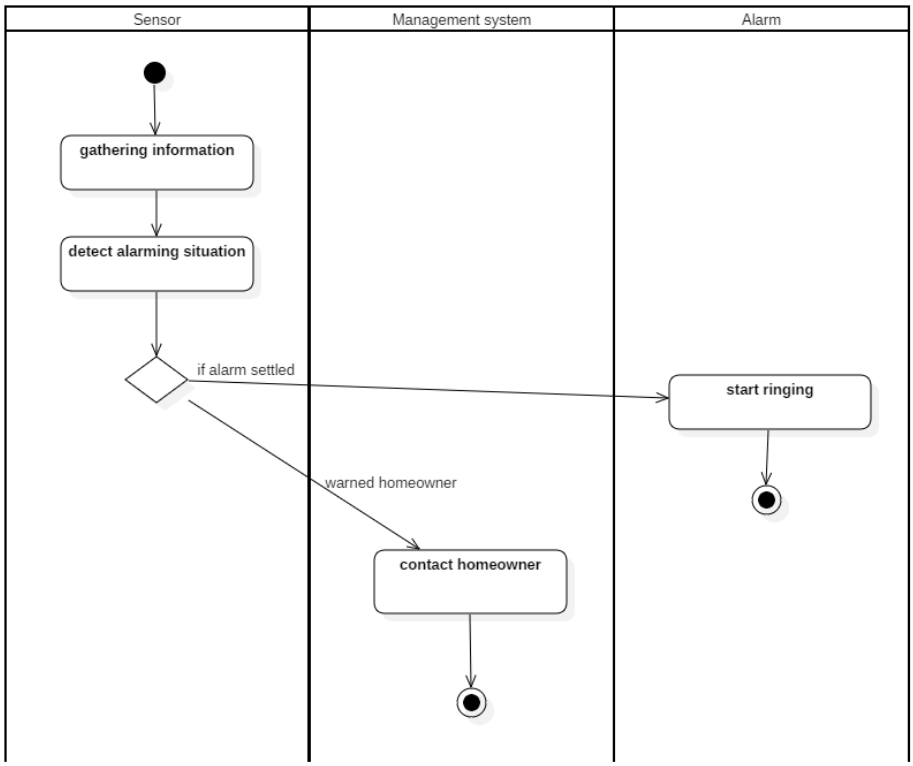


Figure 9 Swim lane Diagram for set alarm

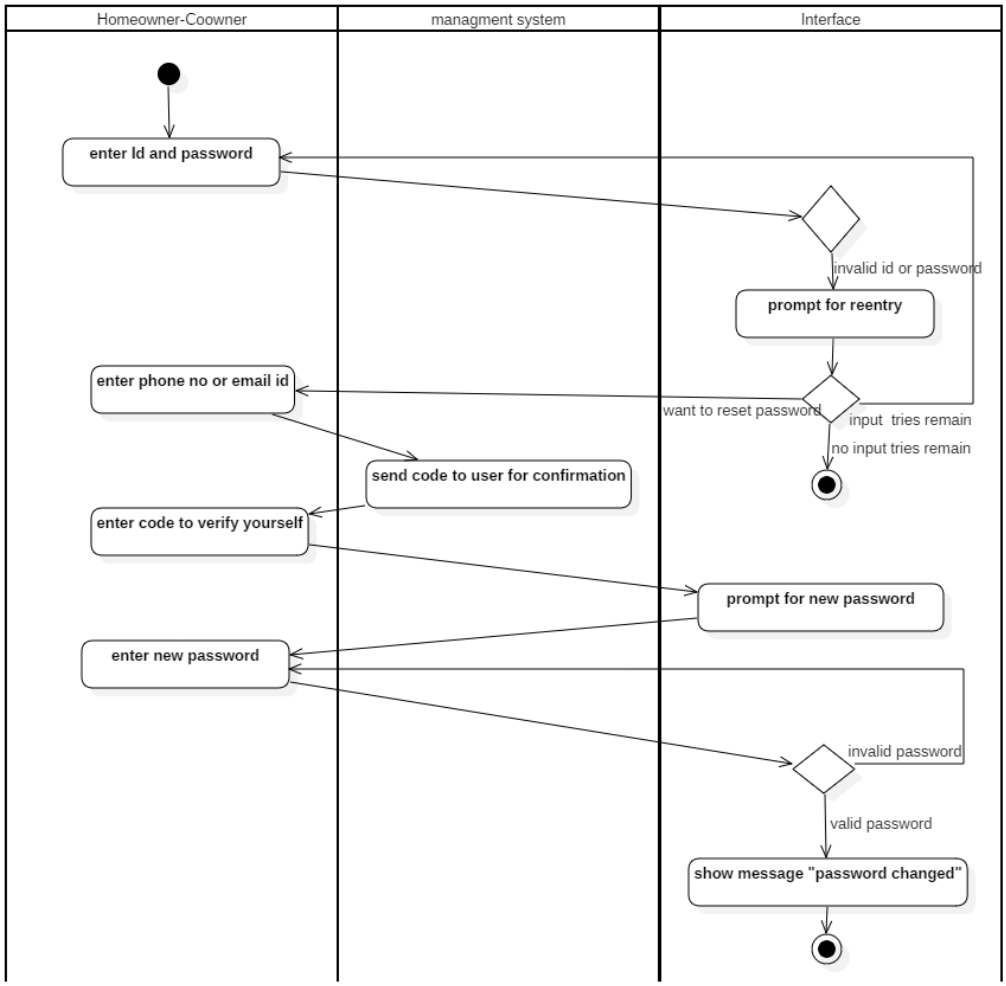


Figure 10 Swim lane Diagram for reset password

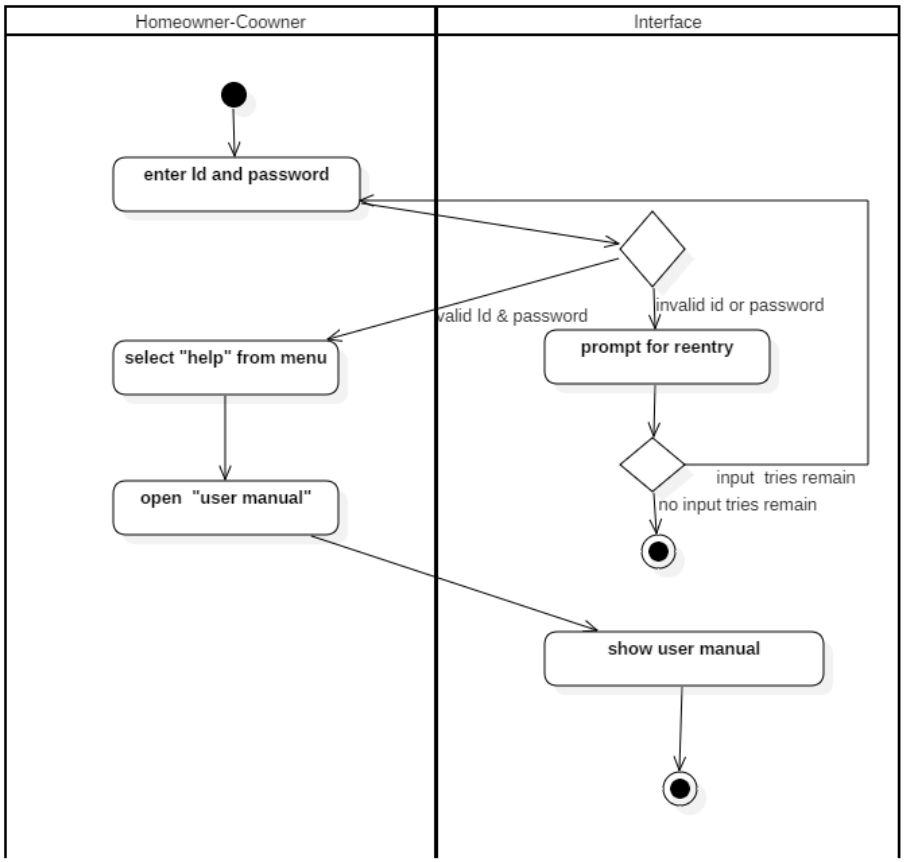


Figure 11 Swimlane Diagram for view user manual

4.4 Wireframes

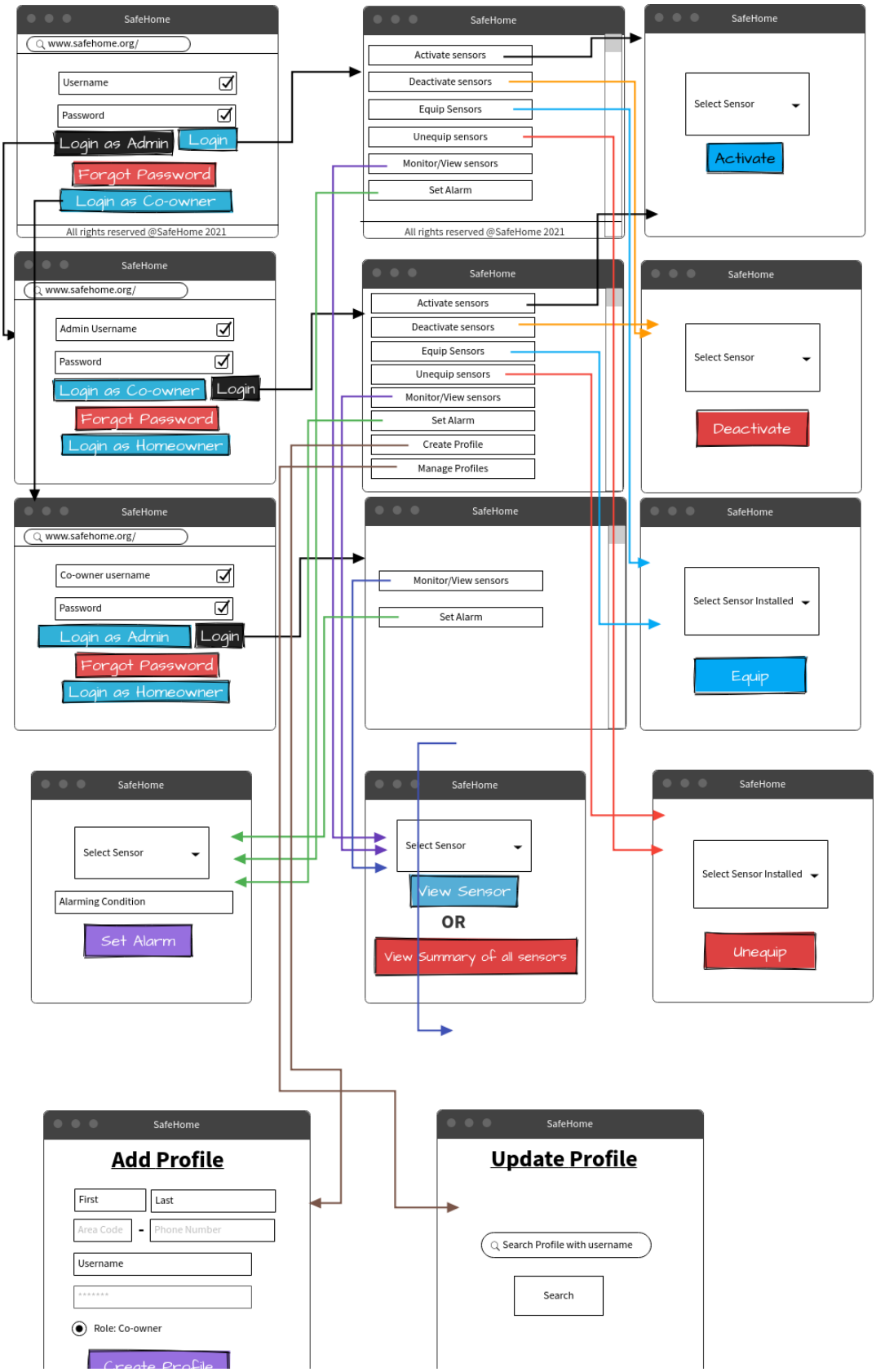
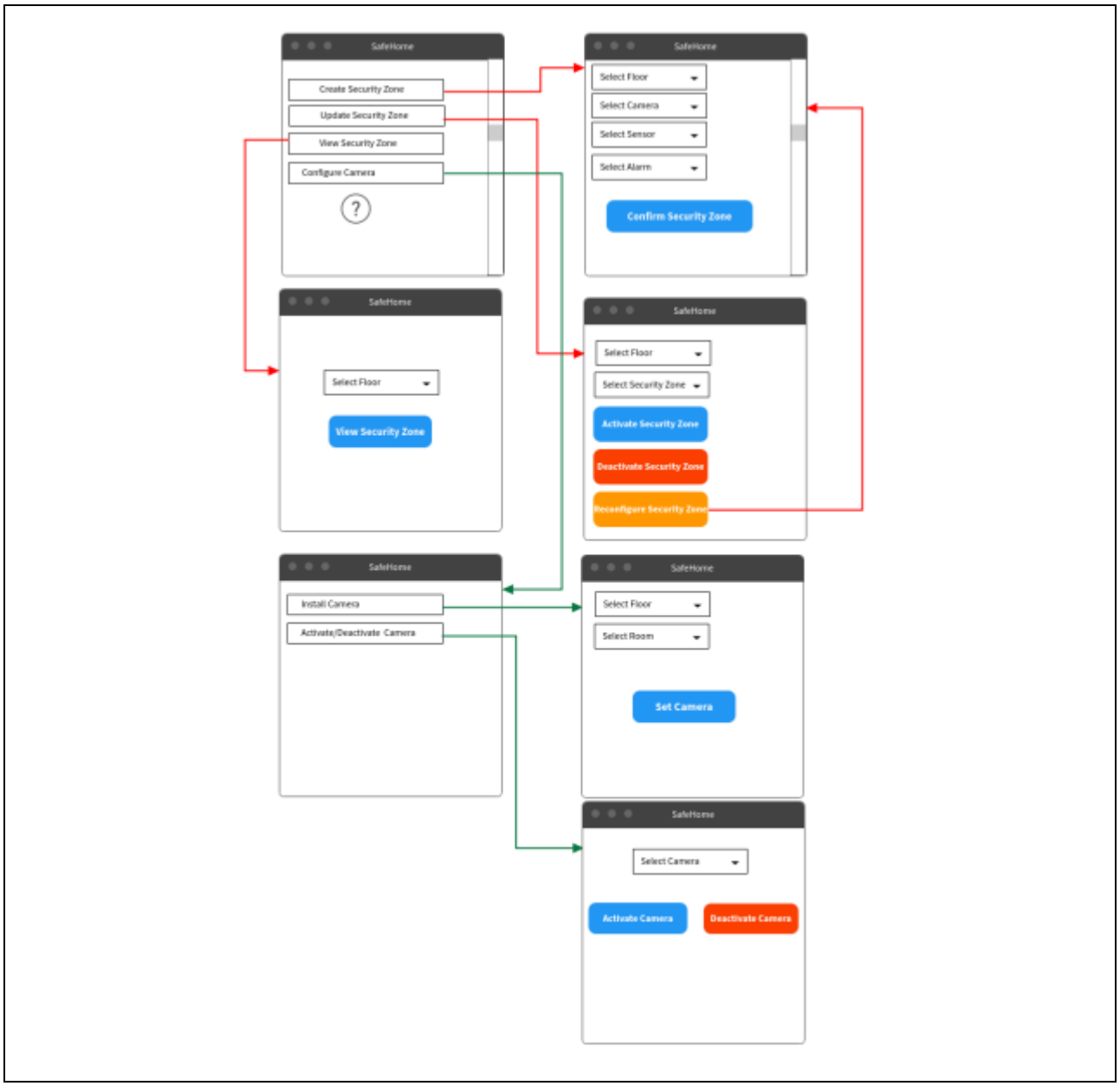
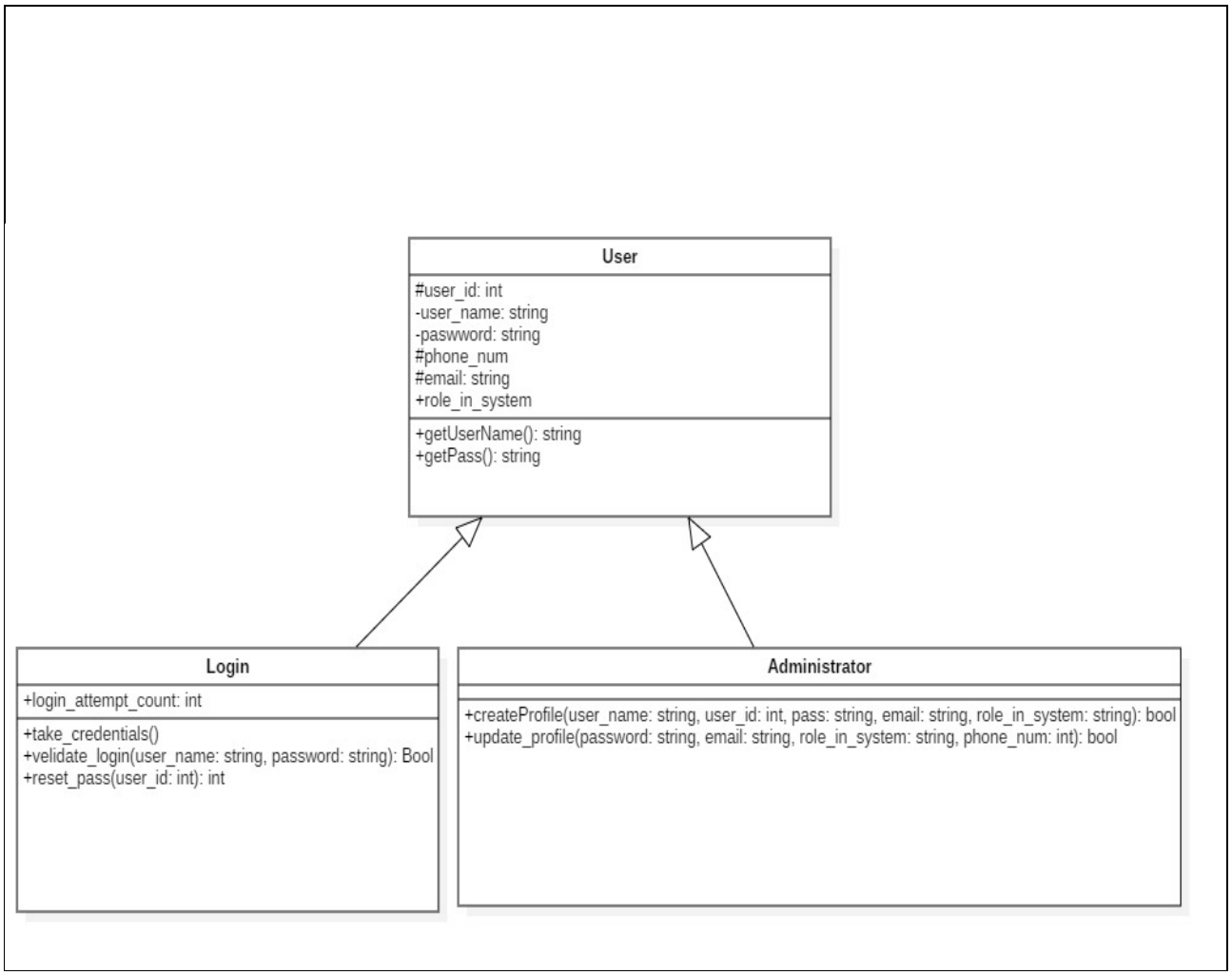
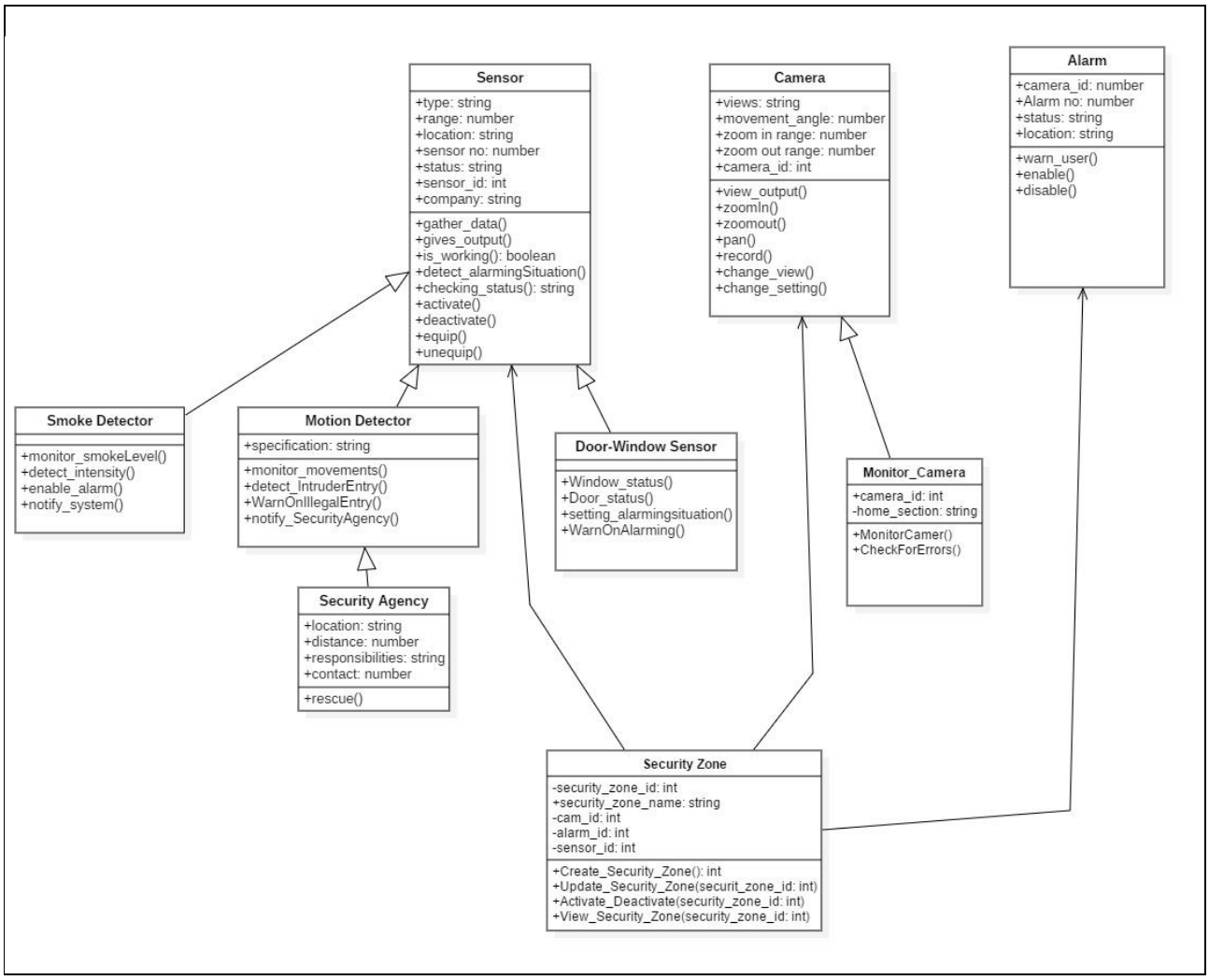


Figure 12.1 Wire Frames

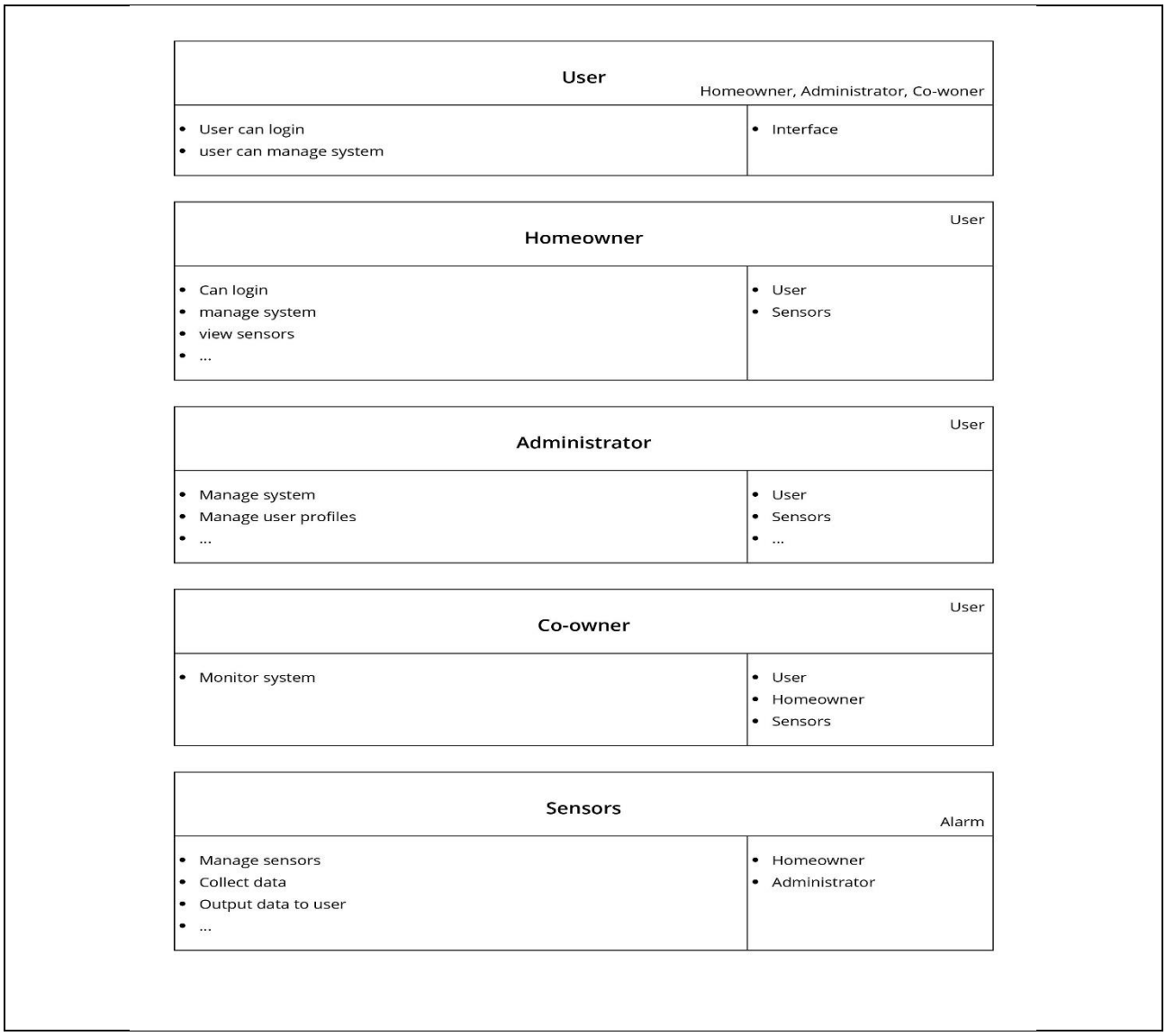


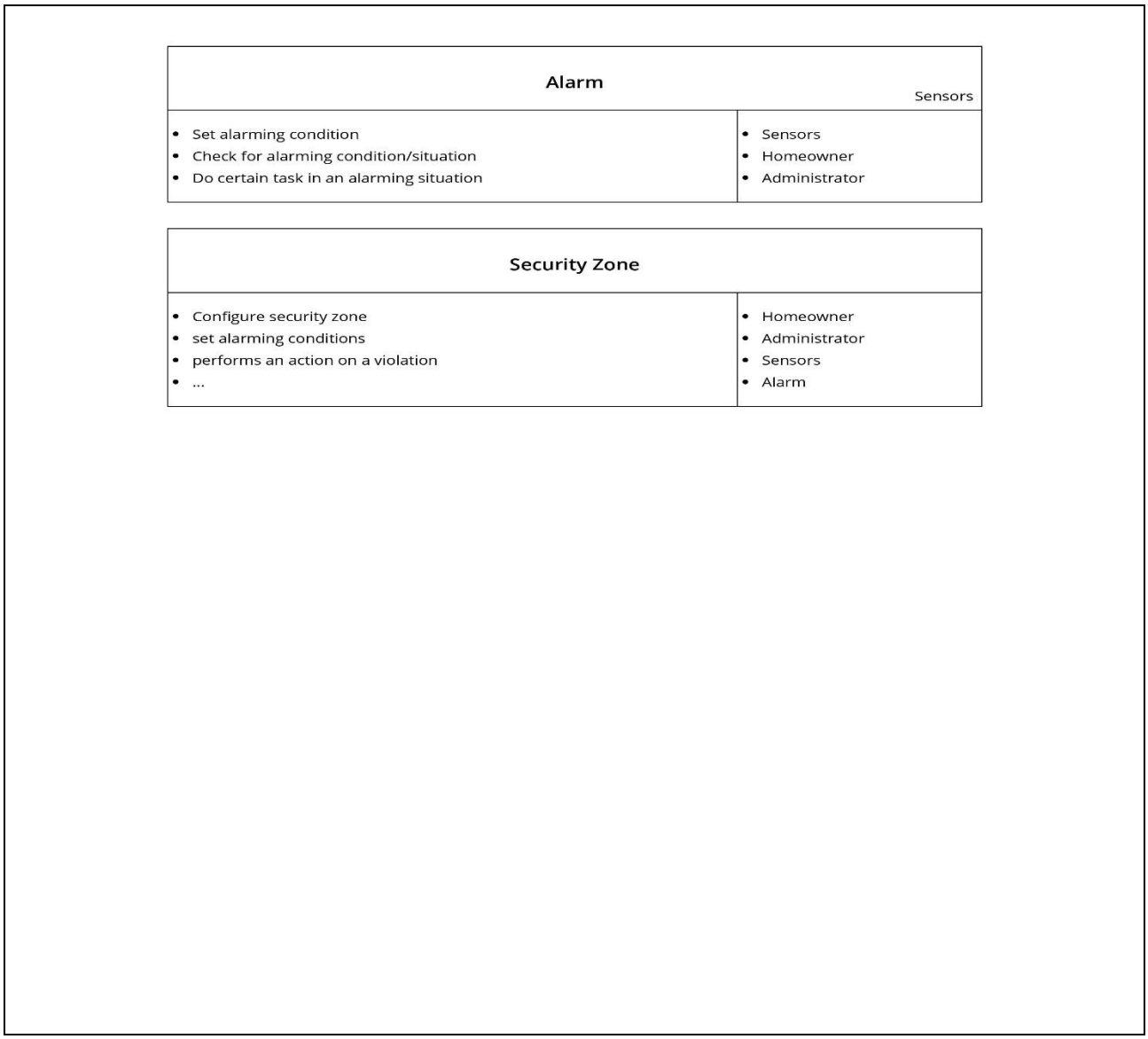
4.5. Class Diagrams


User
#user_id: int
-user_name: string
-paswword: string
#phone_num
#email: string
+role_in_system
+getUserName(): string
+getPass(): string
Login
+login_attempt_count: int
+take_credentials()
+velidate_login(user_name: string, password: string): Bool
+reset_pass(user_id: int): int
Administrator
+createProfile(user_name: string, user_id: int, pass: string, email: string, role_in_system: string): bool
+update_profile(password: string, email: string, role_in_system: string, phone_num: int): bool


Sensor
+type: string
+range: number
+location: string
+sensor no: number
+status: string
+sensor_id: int
+company: string
+gather_data()
+gives_output()
+is_working(): boolean
+detect_alarmingSituation()
+checking_status(): string
+activate()
+deactivate()
+equip()
+unequip()
Camera
+views: string
+movement_angle: number
+zoom in range: number
+zoom out range: number
+camera_id: int
+view_output()
+zoomIn()
+zoomout()
+pan()
+record()
+change_view()
+change_setting()
Alarm
+camera_id: number
+Alarm no: number
+status: string
+location: string
+warn_user()
+enable()
+disable()
Smoke Detector
+monitor_smokeLevel()
+detect_intensity()
+enable_alarm()
+notify_system()
Motion Detector
+specification: string
+monitor_movements()
+detect_IntruderEntry()
+WarnOnIllegalEntry()
+notify_SecurityAgency()
Door-Window Sensor
+Window_status()
+Door_status()
+setting_alarmingsituation()
+WarnOnAlarming()
Monitor_Camera
+camera_id: int
-home_section: string
+MonitorCamer()
+CheckForErrors()
Security Agency
+location: string
+distance: number
+responsibilities: string
+contact: number
+rescue()
Security Zone
-security_zone_id: int
+security_zone_name: string
-cam_id: int
-alarm_id: int
-sensor_id: int
+Create_Security_Zone(): int
+Update_Security_Zone(securit_zone_id: int)
+Activate_Deactivate(security_zone_id: int)
+View_Security_Zone(security_zone_id: int)

4.6. Class Responsibility Collaboration Diagram aka CRC:





5. Other Nonfunctional Requirements

5.1 Performance Requirements

The system should stick with following mentioned performance criteria.

- Sensor events should be recognized within one second.
- Event priority scheme should be implemented (which event is more crucial and how much it is critical.
- System must interface directly to standard phone line.
- Software interface must be user-friendly which makes software easy to use.

5.2 Safety Requirements

Following safety requirements should be fulfilled.

- System must recognize and report when sensors are not operating.
- System must be working 24 hours daily.
- Website would be secure.
- Website would perform comprehensive verification to guarantee that we are safe.

5.3 Security Requirements

During working, system should take these security measures.

- There must be a function when logging on web. If ID and password do not match, an intruder cannot access web features and functions.
- After logging when user selects a certain function, system might request further verification by asking for address and phone number.
- If user forgets password this may be an exception handle it accordingly.
- To access control panel features there must be a validating PIN. If PIN will not correct, control panel will never allow using functions.
- Software shall not reveal any personal data during working.

5.4 Software Quality Attributes

- Reliability:
  Software should be reliable; it must work at all times. It should give us a valid response within one second. Its failure rate should be minimum. On average, It should not fail more than once per year.

- Availability:
  Software should be available all time whenever users want to use it.

- Maintainability:
  Software should be easy to maintain means easy to debug. Software code should be readable and testable. There should be low coupling between security functions. There should be modularity in code so that specific portion can be easily changed.

- Explorable system:
  Software system must be explorable. System must be flexible to changes. System can restore all settings.

5.5 Business Rules

- The homeowner interacts with home security function in different ways using either a control panel, a tablet, or a cell phone.
- At one time, users can access security functions via only one channel (using control panel, tablet or cell phone).
- Only one safe home system can be installed per home.

6. MINUTES OF MEETING

MINUTES OF MEETING

1st meeting

Meeting Agenda:	**Discussion about what are use cases and how to categorized them**
Meeting Date:	**28 December 2020**
Time:	**7:00 pm to 8:10 pm**
Meeting Handled by:	**Ali Raza khan**
Participants:	**Ali raza khan, Zia ur Rehman, Rehan Ali, Sidra Ayesha, Zeemal urooj**
Meetup Tool:	**Zoom**
Meeting points:	First of all we all group members have read the SRS report sample about safe home project. Than we have a meeting about what are use cases and how we can categorize it. With the contribution of all members, we have made some use cases about safe home security.
Goal:	use cases have been divided and explained by all. Every member have equally contributed in this and this was our start towards project by the help of these use cases. So this was our meeting goal about use cases. Our main focus was to work on security of safe home.

2nd meeting

Meeting Agenda:	**Group discussion about Use cases and make them clear and updated after discussion**
Meeting Date:	**31 December 2021**
Meeting planned By:	**Rehan Ali**
Timing:	**1:00 pm to 2:30 pm**
Participants:	**Sidra Ayesha, Zia ur Rehman, Zeemal urooj, Ali Raza khan, Rehan Ali**
Meeting points:	As we have distributed to explain use cases in a specified template so every member of group shared their use cases and we all got through them and there had to be some changings in use cases so we have done this step. This is a group project so we all contributed equally and through zoom meeting and through WhatsApp group we helped each other. Next we have discussed about all diagrams and discussed about working tools for diagrams. We have divided diagrams among group members equally. So we decided Zeemal urooj and sidra Ayesha will work on state diagrams and CRC diagrams, Ali raza khan and Zia will work on wireframes, Rehan will work on swim lane. And use case diagram will be made by group meeting through zoom.

3rd Meeting

Meeting Agenda:	**Started working on diagrams**
Meeting Date:	**6 January 2021**
Meeting duration:	6:00 pm to 7:25 pm
Meeting arranged by:	Zia Ur Rehman

Participants: **All members were present**
Meeting points: First we have revised our concept regarding diagrams and use cases. Then worked on use case diagram through LUCID CHART TOOL.
We worked on and completed use case diagrams.
Next step was to work on divided diagrams and show them to all group members after completion.

4th Meeting
Meeting Agenda: **Discussion on completed diagrams**
Meeting date: **10 January 2021**
Meeting time: **7:00 pm to 8:35 pm**
Meeting arranged by: Sidra Ayesha
Meeting points: Have shown our state diagram which we have completed on 2, 3 use cases just for general review of all.
Also shown swimlane diagram and we have made clear them. There were many mistakes so we worked on them.
This meeting was to highlight the problems about diagrams on which we were working differently.

5th Meeting
Meeting Agenda: **work on CRC modeling and wire frames**
Meeting Date: **13 January 2021**
Meeting duration: 5:45 pm to 6:30 pm
Meeting arranged By: **Zeemal Urooj**
Meeting Point: We were still working on diagrams so after completion of every step we have planned a meeting to share it with all.
Some use cases were not matched with diagrams especially swimlane so we focused on it and were little bit confused about CRC modeling so every member tried to work and understand it equally.
Went through on state diagrams and swimlane and forwarded towards wire frames.

6th meeting
Meeting Agenda: **discussion about issues regarding Modeling**
Meeting Date: **18 January 2021**
Meeting time: **6:00 pm to 7:45 pm**
Meeting arranged by: Rehan Ali
Meeting Points: Our state diagrams have updated once a little bit. We gave our reviews about completed work and also discussed about CRC completion.

7th meeting
Meeting Agenda: **regarding class diagram**
Meeting date: **21 January 2021**
Meeting time: 6:55 pm to 7:50 pm

Arranged by: Ali Raza Khan
Meeting Points: Class diagram is final step so we all discussed about it and there were some issued regarding completed diagrams so we cleared them which we could.
Still, we are working on it…….

8th Meeting
Meeting Agenda: **Go through and finalize the project**
Meeting Date: **23 January 2021**
Meeting Time: **3:00 pm to 4:10 pm**
Participants: **All members of Group**
Discussion about:

We all group members have shown their class diagrams and there had to be some changes and exceptions corrections so if all done by the help of every member. After completion of class diagram, we have discussed about finalize the project and if any point is missing so we have add it up.
If any single person had a confusion so we all have tackled it and we arranged our all documents regarding SRS and have finally arranged to submit.
This is all about group discussions regarding SAFEHOME project.