

# BathroomSEC

DESIGN & PROTOTYPING

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# OVERVIEW

## What is BathroomSEC?

BathroomSEC is a Security & Care Interface designed to allow a simplistic bathroom management and communication experience between a User and their Caregiver.

The system, in the form of a mobile app, allows both the User and Caregiver to configure and manage options and devices within household bathrooms. The User can also alert their Caregiver for assistance when needed and the Caregiver will be notified on their own mobile device.

## What is the purpose of BathroomSEC?

For the development of this application to function to the best of its ability there are several factors that need to be considered for its creation. The main one would be making sure that the application's purpose and function are clearly defined and ensure that throughout development this purpose is kept in mind. If we end up with an app that doesn't correctly serve its intended purpose, then something has gone wrong along the way. The app aims to combine the theme of Security with general usage of the app being tied to Bathrooms.

## Understanding & Researching Scope.

When building upon the initial idea generation of BathroomSEC, we wanted to make sure we considered as many possible situations as possible. Through group discussions and collecting key points from each member we were able to determine a common goal for BathroomSEC. We considered the fact that as far as we could find, there is no other app like BathroomSEC currently on the market. Some apps do exist that contain similar functionality such as smart home management systems, but none to the same extent or for the specific purpose that BathroomSEC aims for.

# USAGE

## Considering the Sequence and User Functionality

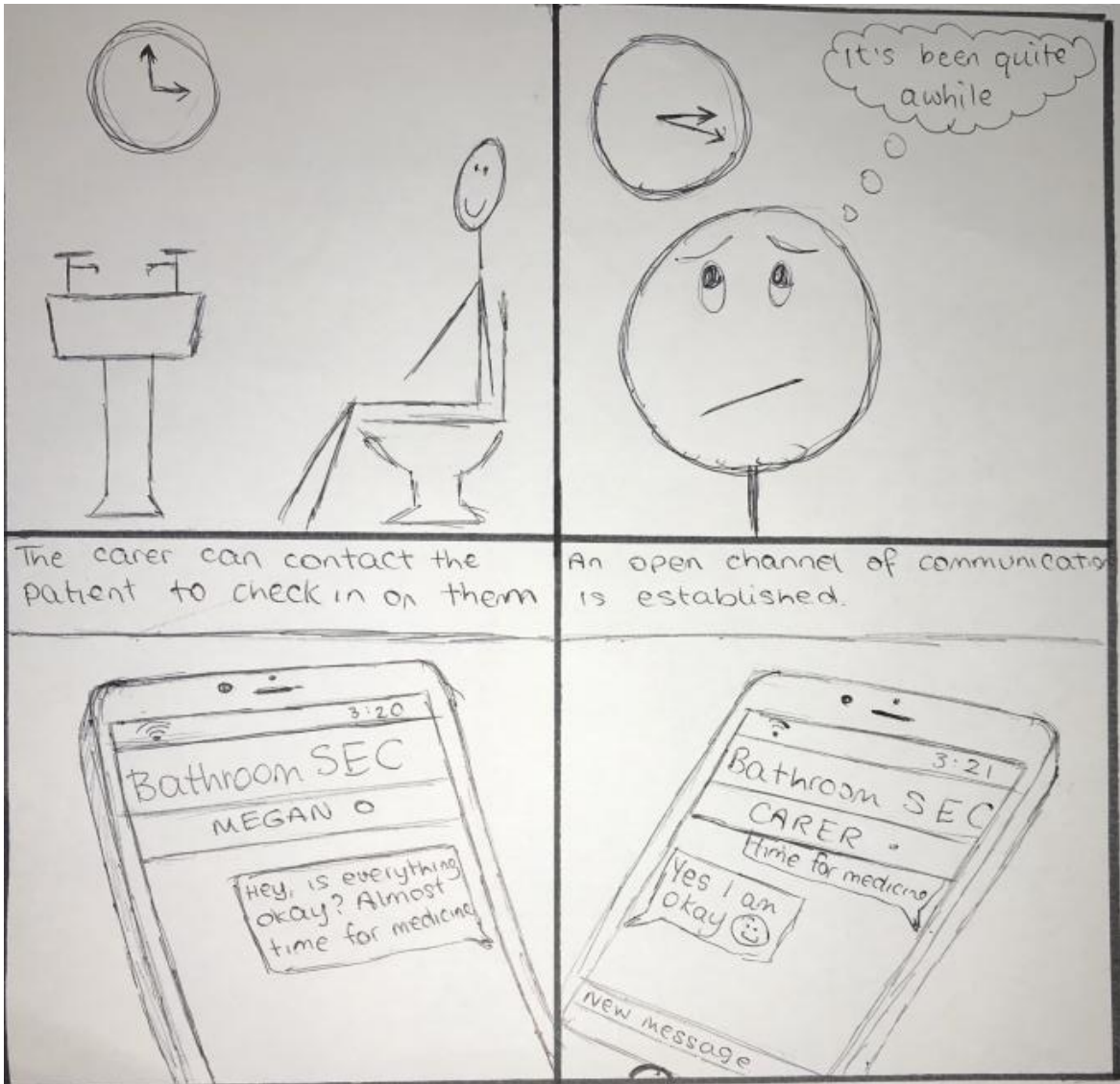
When building upon the initial idea generation of BathroomSEC, we wanted to make sure we considered as many possible situations as possible. Through group discussions and collecting key points from each member, we refined the original functionality of the system. Currently the planned low fidelity design of functionality is as follows:

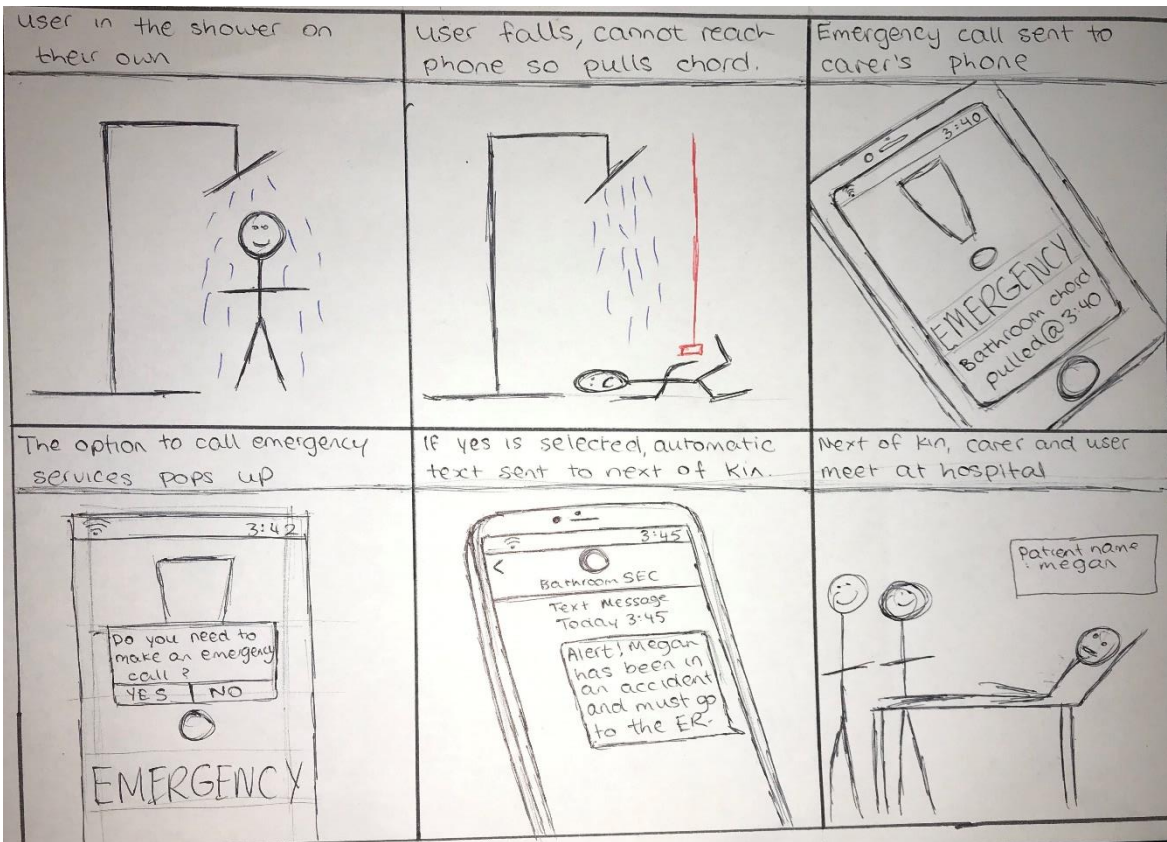
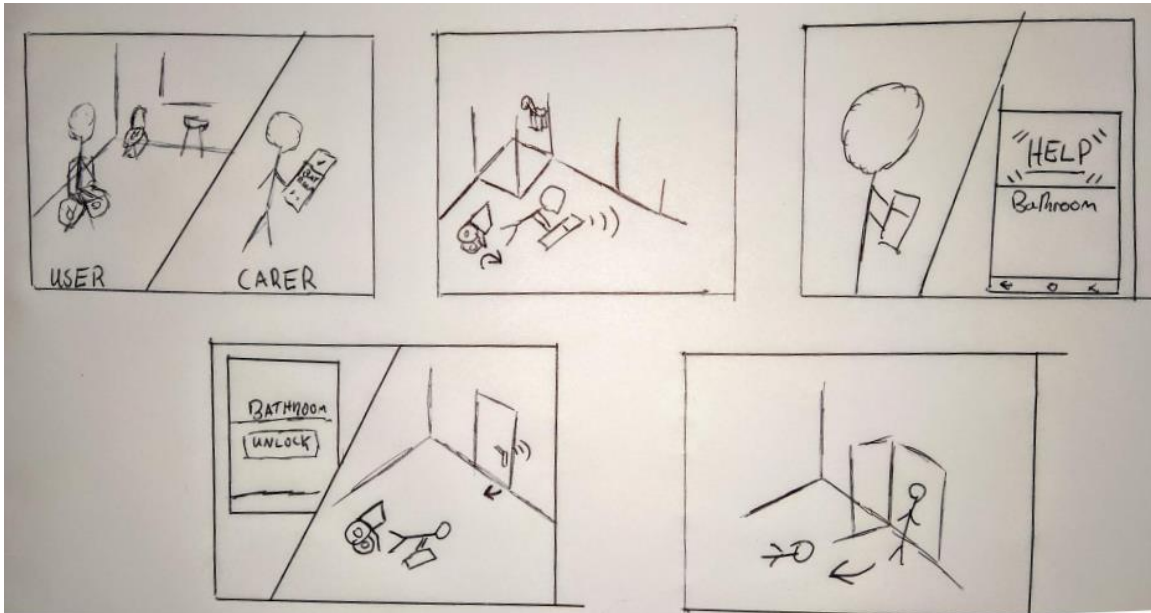
**Manage Devices in a Bathroom** - The app allows the maintenance of both the security of the room and the safety of the User with full control of all linked devices within the room. Features include the ability to activate and deactivate appliances and units from the app screen, along with the ability to automatically lock and unlock the door in situations where a User may be locked in and needs assistance.

**Monitor Activity of Users** - The app allows a caregiver to check a User's room activity by monitoring motion sensor security systems within a room. This gives caregiver the ability to respond quickly to emergencies by knowing exactly where a User is at any time. The caregiver can activate a timer feature to allow the tracking of how long a User has been in a specific bathroom and get an alert if the timer goes past a set time. If the caregiver suspects the User needs help, they can message, call, or sound an alert alarm to let the User know they are on their way to check on them.

**Maintain User Safety & Emergency Response** - In the event of a User being in the bathroom and needing immediate or emergency assistance, they can select the option to sound an emergency alert alarm from their app. The caregiver will get notified of the alert along with the location the alert was sounded from and can head to check on the User or choose to call or message the User to notify them that they are on their way.

# USER INTERACTION





## Example Scenarios

User Bio: Margaret, age 64. Margaret has severe back problems and can walk with assistance from another individual such as her Carer. Without assistance Margaret needs to use a wheelchair. Margaret and her carer both make use of BathroomSEC in case of emergencies.

Scenario: Margaret's Carer assists her to her bathroom, she escorts Margaret into the bathroom and once Margaret is comfortable, the carer leaves and uses BathroomSEC to lock the door from her app, so that Margaret does not need to move unnecessarily to lock the door before using the bathroom. Margaret is unable to get back up from the toilet and requires assistance from her carer. Using BathroomSEC Margaret can alert her carer of the situation, and the carer can unlock the door from her device to enter and assist Margaret.

User Bio: John is a carer at a retirement home that houses roughly 40 patients and elderly people. John's retirement home makes use of the BathroomSEC application, using streamline devices given to all the people in the home, John and his staff team of carers can maintain safety and monitor activity of all the people in the retirement home.

Scenario: John is in his office when he is alerted by one of his team members that they believe a patient has had a fall and is locked in one of the building bathrooms. In order to locate the patient, John makes use of BathroomSEC to check which bathrooms in the building are currently occupied. By checking this on the app John is able to locate the patient in the building, and using the unlock door feature, John is able to enter the room to assist the patient.

User Bio: Mary ages 72, lives alone in a two-story detached house in the Limerick countryside. She has dementia and struggles to perform/member tasks. Her bedroom and the main bathroom are located upstairs. It contains a toilet, a shower and her mirror cabinet containing her medication. Her other, less used bathroom is located at the rear of the house. It contains a toilet and a shower.

Scenario: It is six in the evening and Mary needs to take her medication. She received a notification on her phone and prompters which are located in the kitchen and her bedroom. The purpose of the multiple notifications is in case she does not have her phone on her person. The two prompters are located in the most used rooms up and downstairs. The prompters and app instruct Mary to proceed to the upstairs bathroom as it is time for her to take her medication. This can be tailored to the user e.g. an audio recording can play for someone who is visually impaired. Once in the bathroom, the program by means of sensors identifies that Mary has arrived. It then proceeds to instruct Mary to the location of her medication. This information can be pre-loaded by the user or carer. Depending on the user each task performed in the bathroom can be pre-loaded and step-by-step instructions can be given to the user.

User Bio: Luke aged 23, was born with cerebral palsy. He has minimal usage of his legs apart from with an assisted Walker. He has function of his upper body but suffers from delayed action response in his vision and the use of his arms. He lives in a bungalow with his mother in close proximity to his local hospital. Luke's bedroom is located at the front of the house and his bathroom is a large ensuite. It contains an altered bath shower and toilet. His mother is his full-time carer.

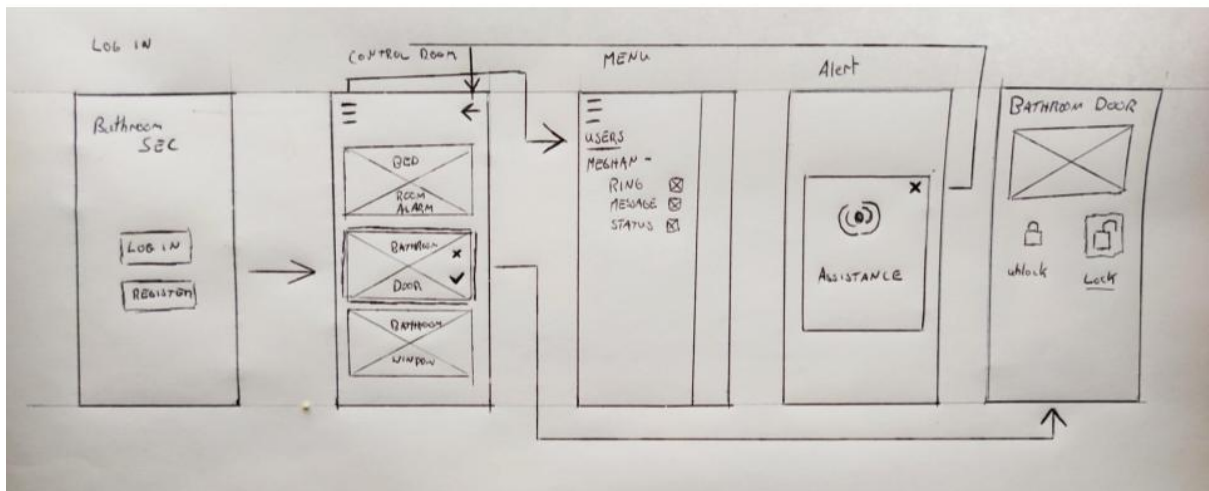
Scenario: Luke has just returned from college. His mother drops him home but leaves again as she needed to get food for dinner. The shop is a 10-minute drive from the house. Luke decides to have a shower before dinner. He enters the bathroom and locks the door to the mobile app. He then returns to the main menu and turns on the shower (The water temperature and strength can also be adjusted). As he prepares to enter the shower Luke slips and falls injuring his shoulder. He is unable to pull himself up off the floor. Sensors in the bathroom are triggered by the fast movement of him falling. They sent a notification to his phone telling him it detected fast movement in the bathroom and ask if he is okay by displaying **YES** and **NO** buttons on the screen. If there is no response is carer is then notified. The carer then can communicate within seconds from their phone into the bathroom. Luke was able to notify his mother about the accident. She then rushed home to his aid.

# DESIGN DEVELOPMENT

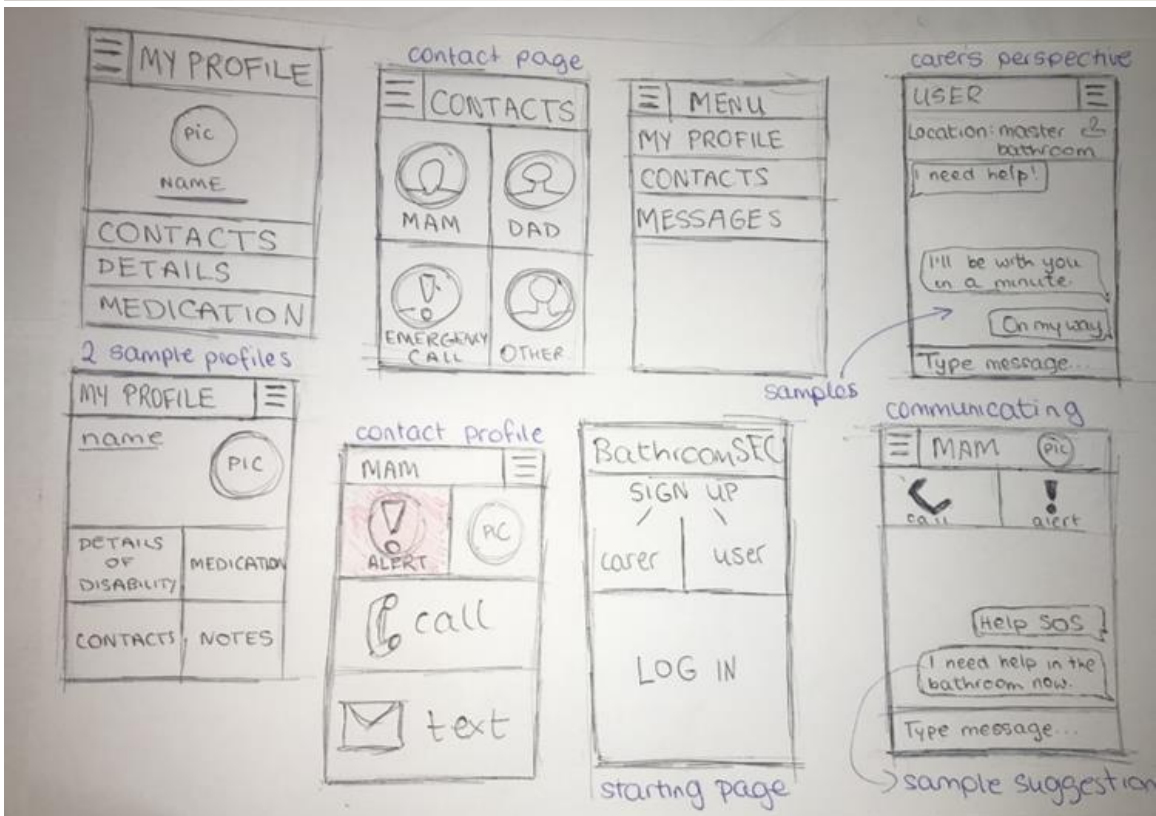
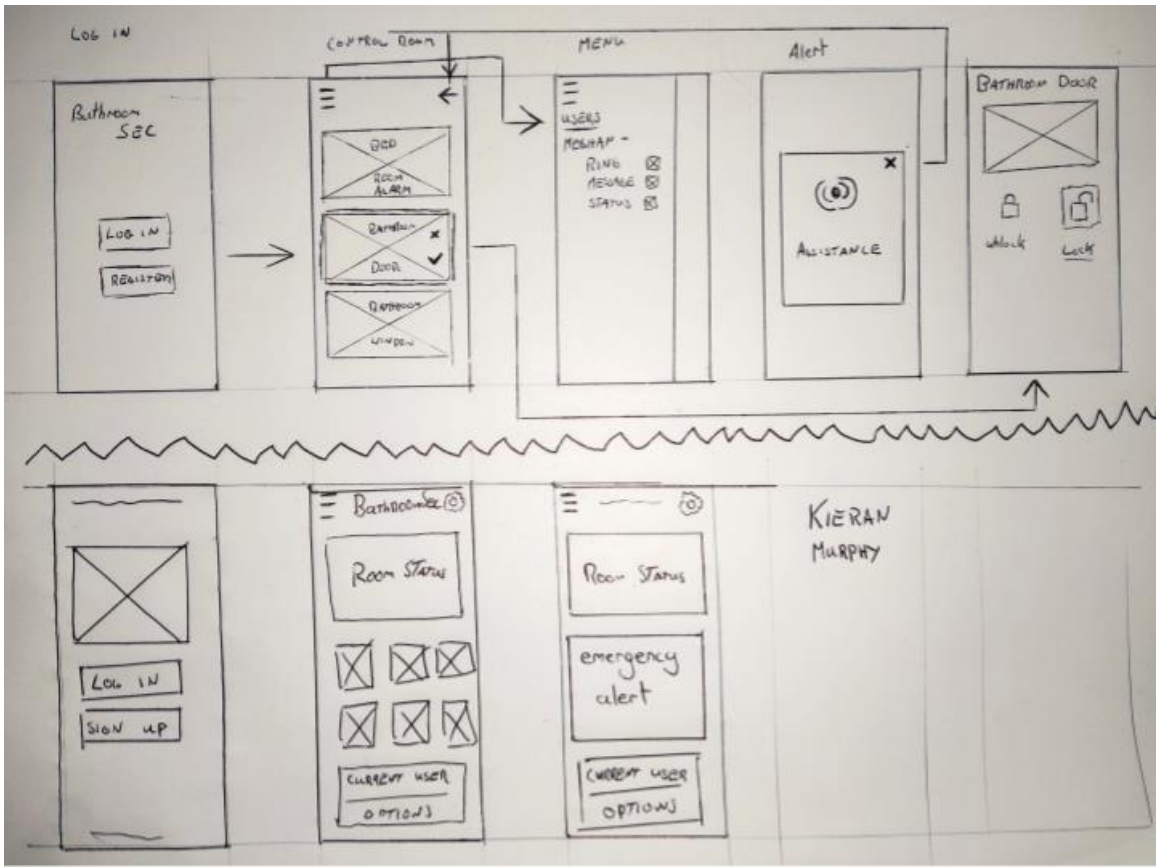
## Low Fidelity Development

The initial lo-fi prototype was designed on paper before being replicated in a design software, using the design software the design could be tested live on a phone screen. From this test the group made several decisions:

- The sidebar menu contains dashboard controls which is counter-intuitive and would be better placed on the dashboard
- The assistance alert should have proactive controls to react such as call or message
- Lock and unlock is a central feature of the app and should be accessible from the dashboard and not have to be on a separate window
- The back button is used to much for pages that existing buttons should or could be used





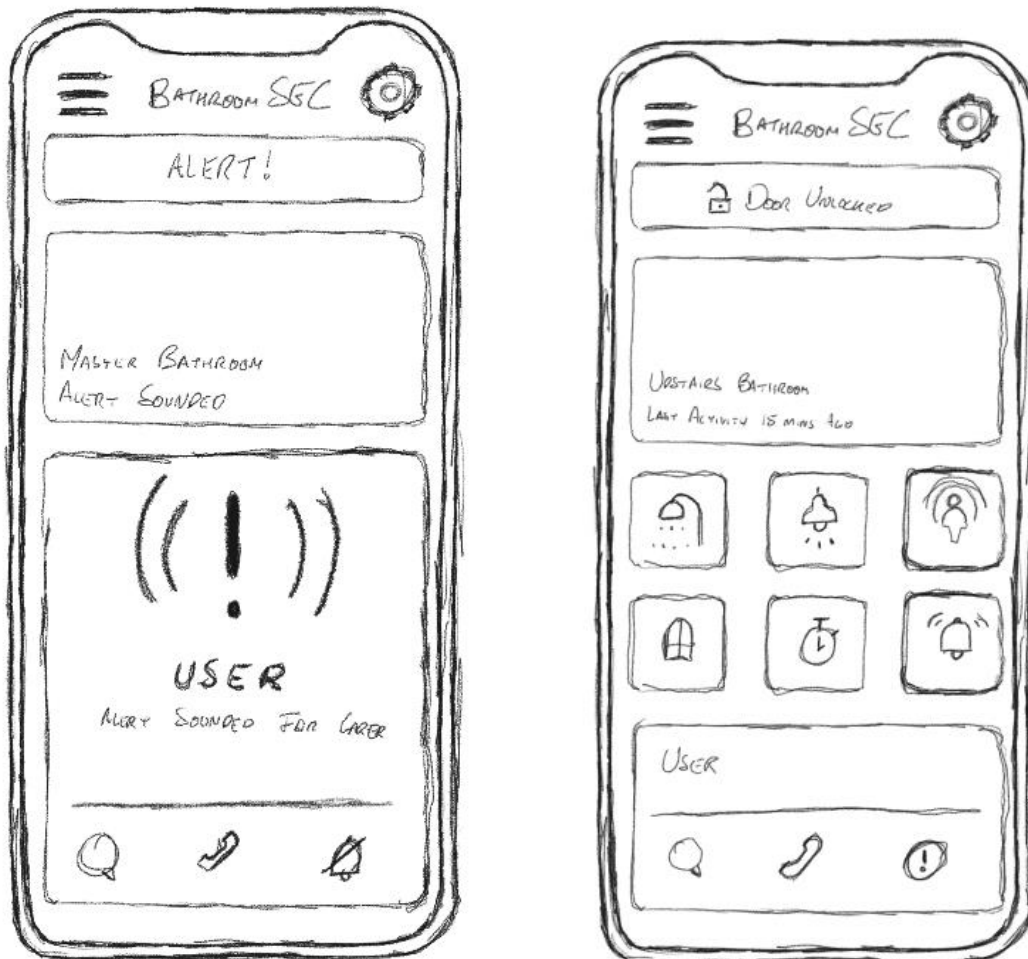


## How Purpose, Scope & Functionality Influenced Our Design

People using our app who may be physically or mentally handicapped may have some difficulty finding their way around the app. We contemplated making it a simple app with minimal buttons but realized that that was not what our app was for.

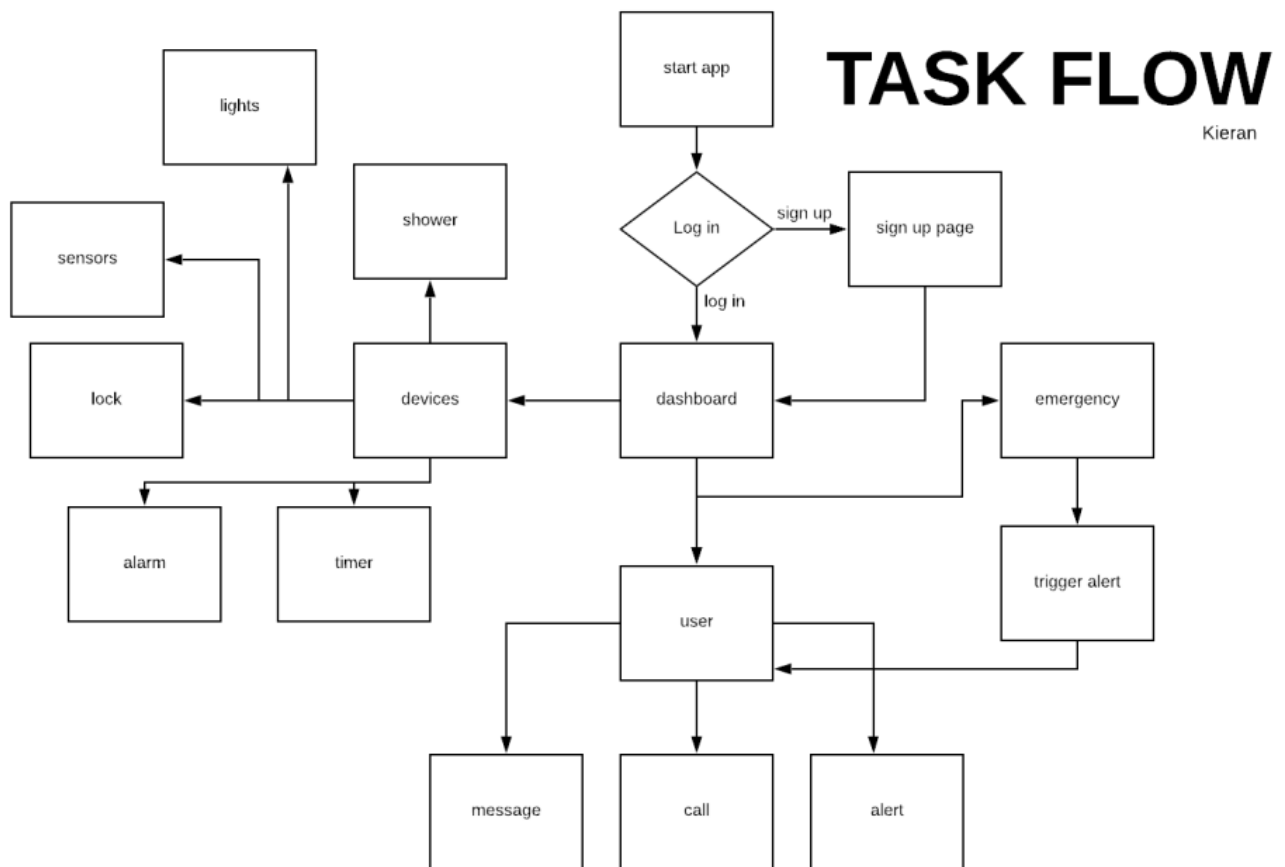
We wanted the aspect of providing people with more privacy while feeling safe, not concentrating on being able to use the app in a time or emergency.

We wanted our app to be clean and clear but not too simple or come across as childish. Therefore, we wanted a few features that may not seem necessary but improve efficiency.



## Usability of the Design

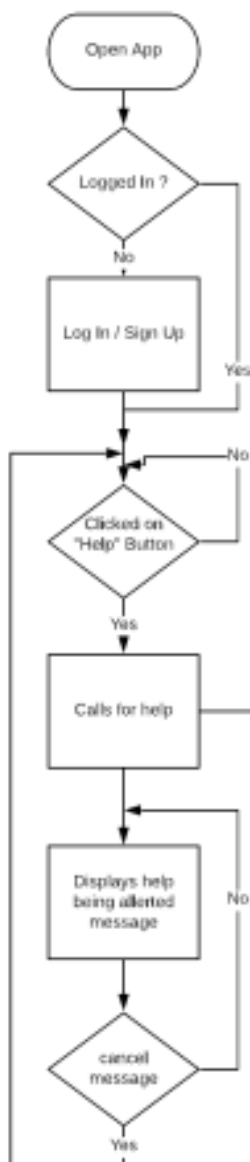
We thought about how to make our design as usable and efficient as possible. We strategically placed the buttons on the screen to allow it to be most accessible to the user. We looked at colour coding each button on each page and colour association for example red for an emergency alert.



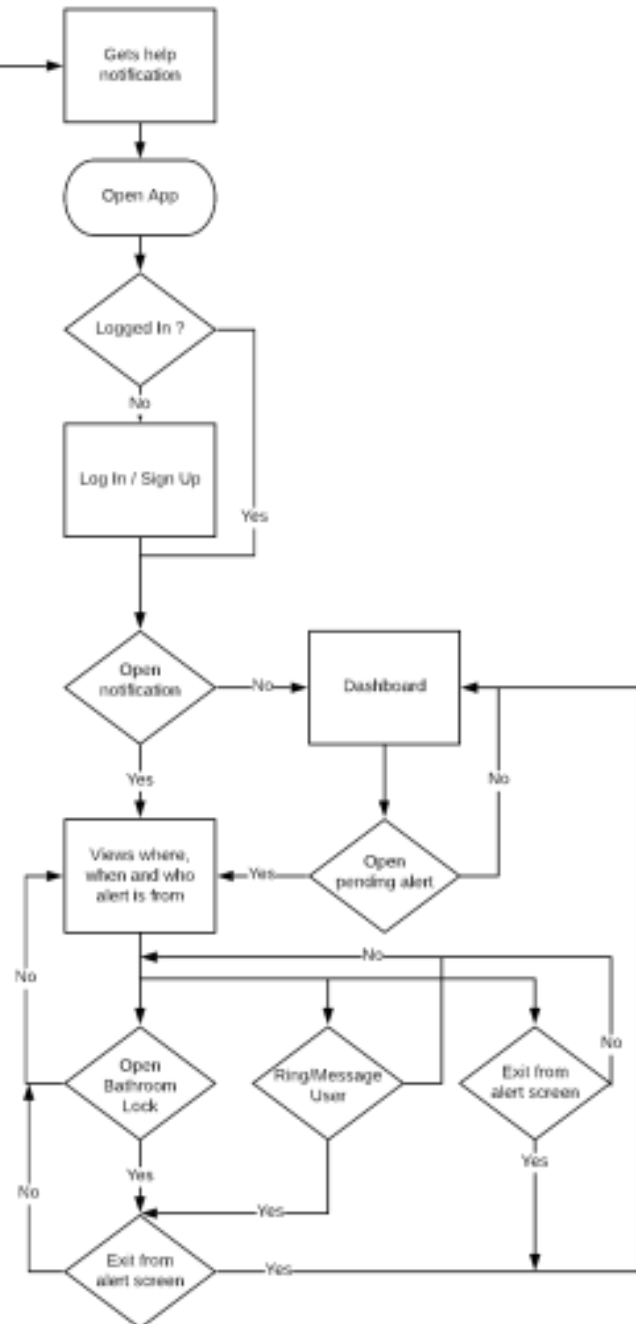
# Task Flow

## Emergency Alert

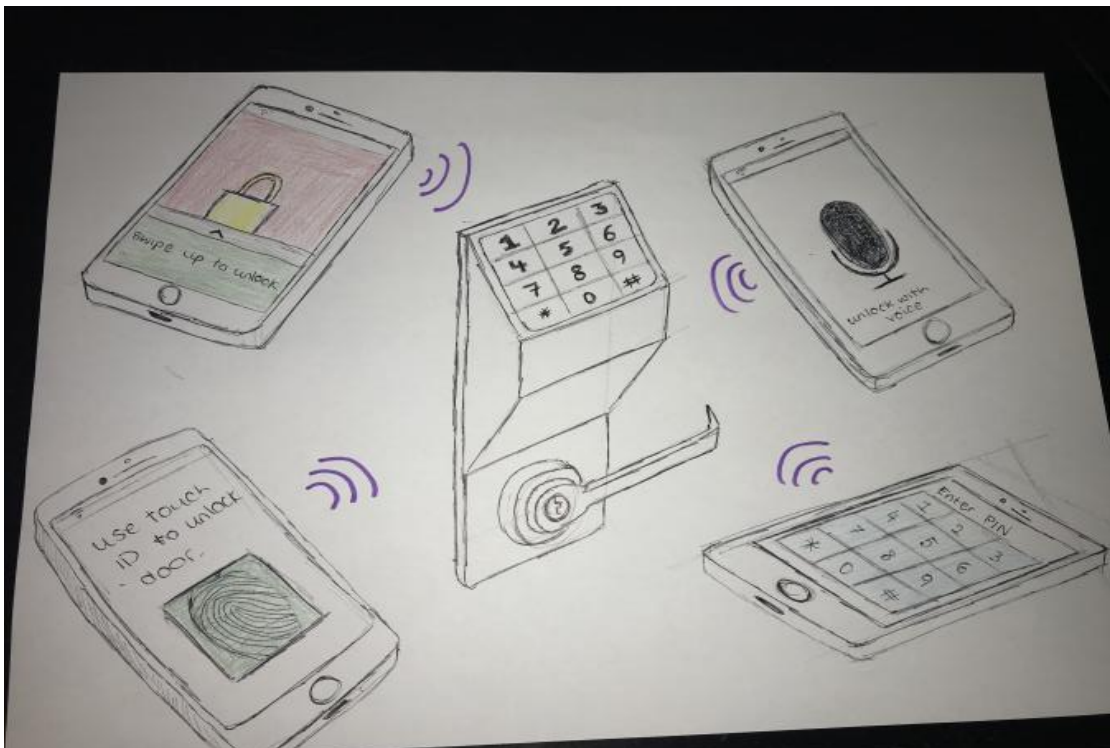
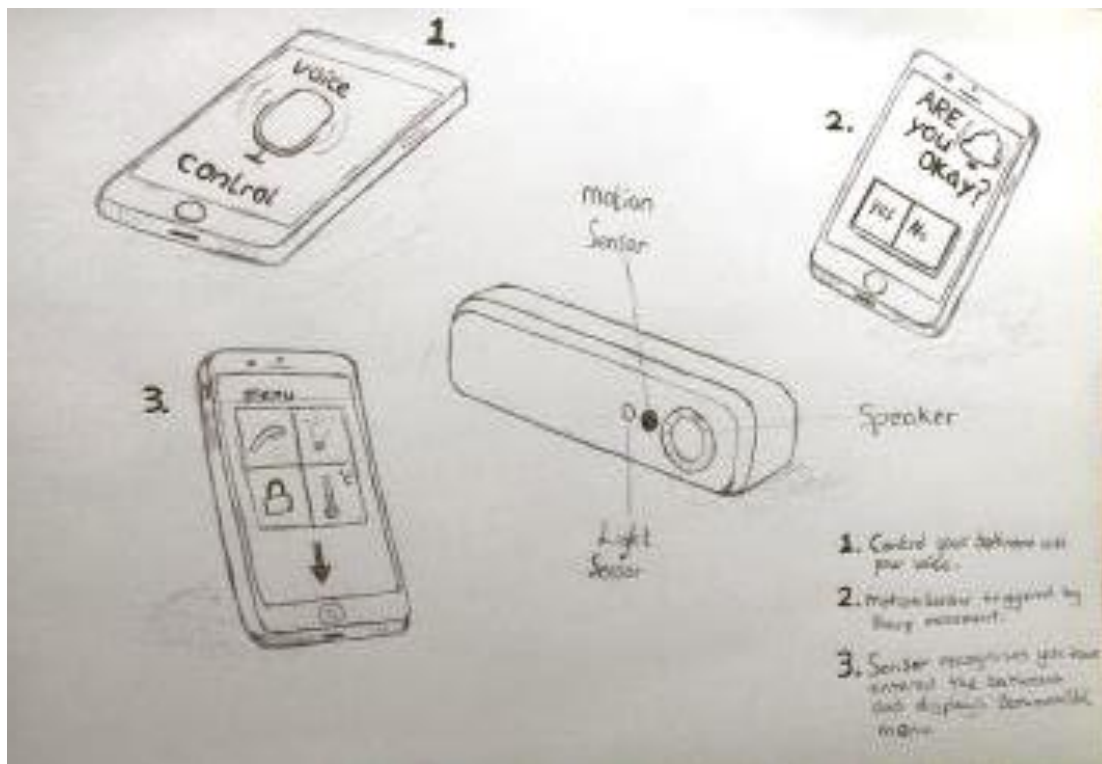
### User 1

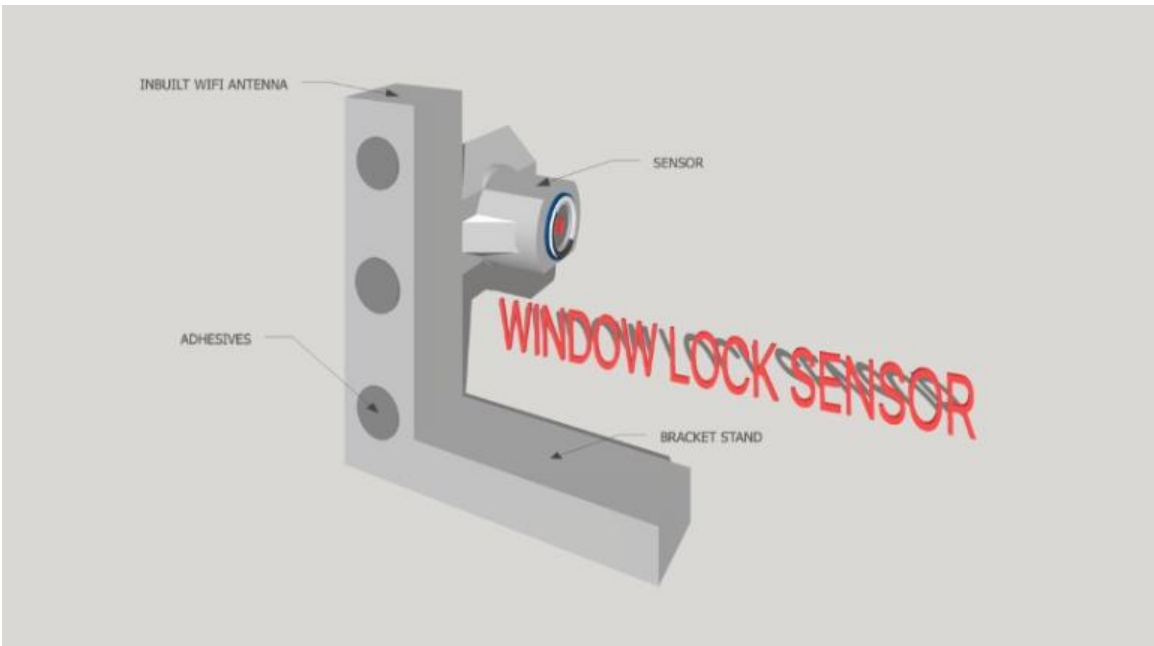
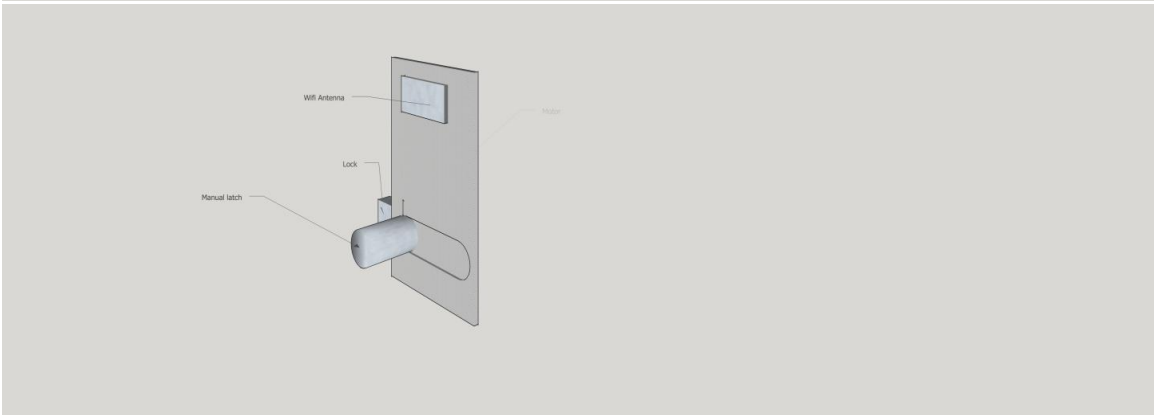
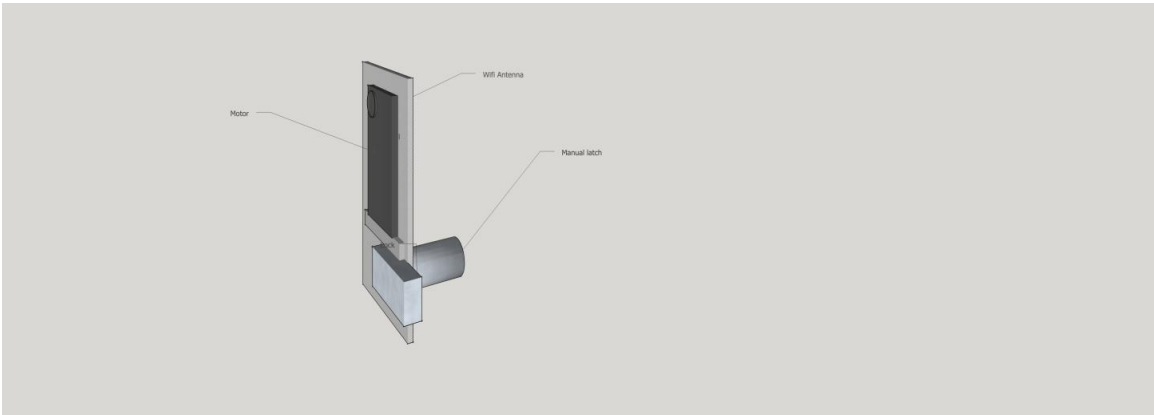


### User 2



## Development Sketches & Models





# PROTOTYPING & TESTING

## Testing & Feedback

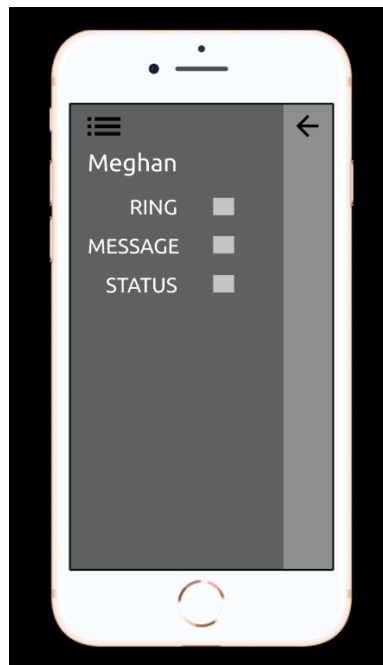
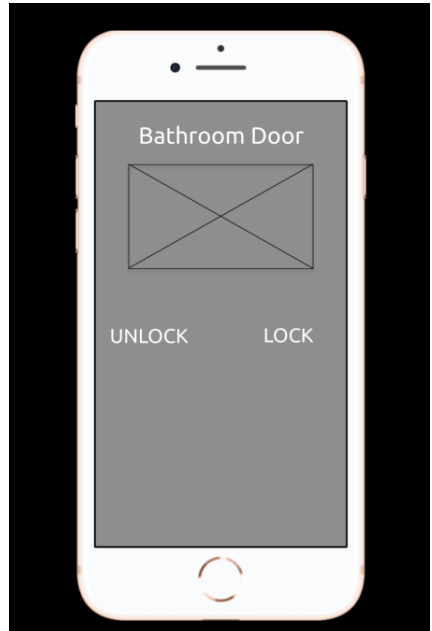
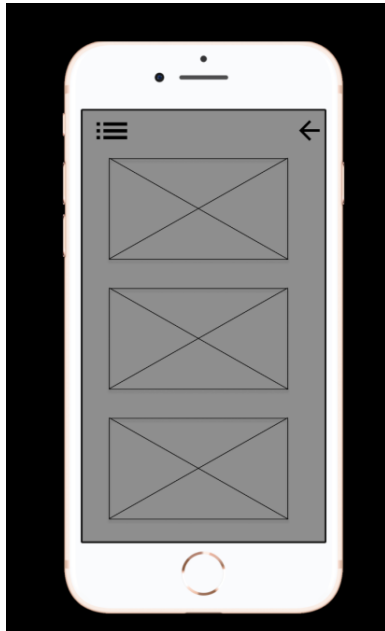
It was difficult to acquire extensive feedback and testing research while in isolation during the lockdown. To directly get user feedback, each team member displayed our work and design so far, along with wireframes and prototypes to members of our families who were present during isolation.

We decided not to interfere too much, and only give the information necessary for them to understand how the designs functioned that would be missing due to the prototypes being complete. Once our test users had all the necessary information to understand what the app was for and how to make use of the designs, we decided to not ask questions or give any more information until the user had been given enough time to explore our work and test the designs themselves. Initial reactions without any influence was important to us to truly determine how well our designs functioned without subconsciously suggesting any misdirected opinions to our users.

Overall, we were told that the concept was very marketable and would serve a very useful purpose to several types of users who currently need but do not have access to software such as this. From this we also determined that our app was easy to follow by users over a certain age, mainly teenagers upwards, however those of us with younger siblings discovered that a younger user tends to struggle to understand the functionality of some of the more complex features of our designs and prototypes.

Using the information gathered, we made some tweaks to designs and functionality and came up with our most recent iterations of our prototypes. Most of which revolved around making the interfaces much more simplistic and minimal as well as aesthetically cleaner, as these are the issues with our designs that we gathered from our testing phase.

## Prototypes & Wireframes







## Manage Your Devices

Maintain both the security of the room and the safety of the User with full control of all linked devices within the room.

Features include the ability to activate and deactivate appliances from the app, along with the ability to automatically lock and unlock the door in situations where a User may be locked in and needs assistance.

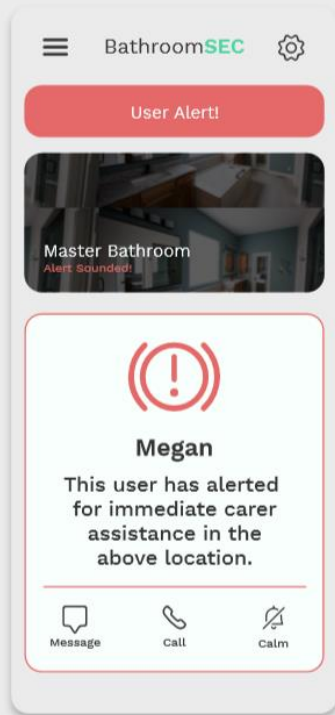
## Monitor User Activity

Check a User's room activity by monitoring motion sensor security systems within a room.

Activate a timer to allow the Carer to track how long a User has been in the room, and get an alert if the timer goes past a set time.

If the Carer suspects the User is in need of help, they can message, call or sound an alert alarm to let the User know they are on their way to check on them.

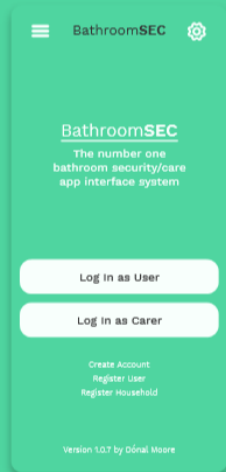




## Maintain User Safety

In the event of a User being in the room and needing immediate assistance, the User can also select the option sound an emergency alert alarm from their app.

The Carer will get notified of the alert along with the location the alert was sounded from and can head to check on the User, or choose to call or message the User to notify them that they are on their way.

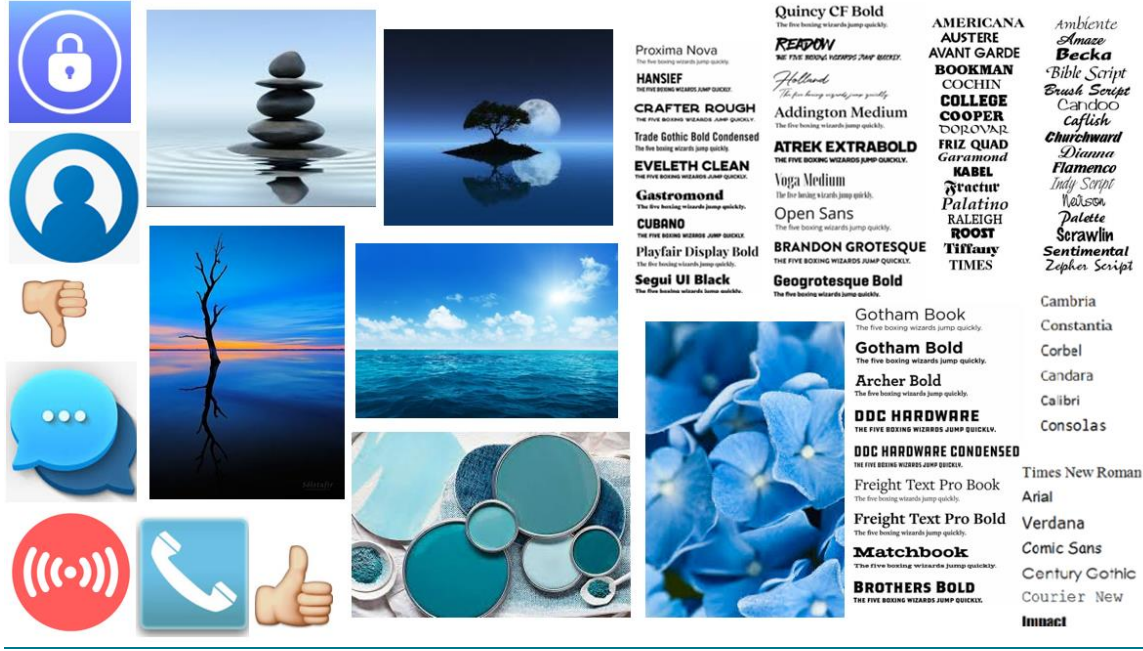


## BathroomSEC

BathroomSEC is a Security & Care Interface designed to allow a simplistic bathroom management and communication experience between a User and their household's registered Carer.

The system, in the form of a mobile app, allows both the User and Carer to configure and manage options and devices within household bathrooms. The User can also alert their Carer for assistance when needed and the Carer will be notified on their own mobile device.

# MOODBOARDS



Mood Board

Kieran Murphy

### Color Palette

Buttons, interactive text, borders

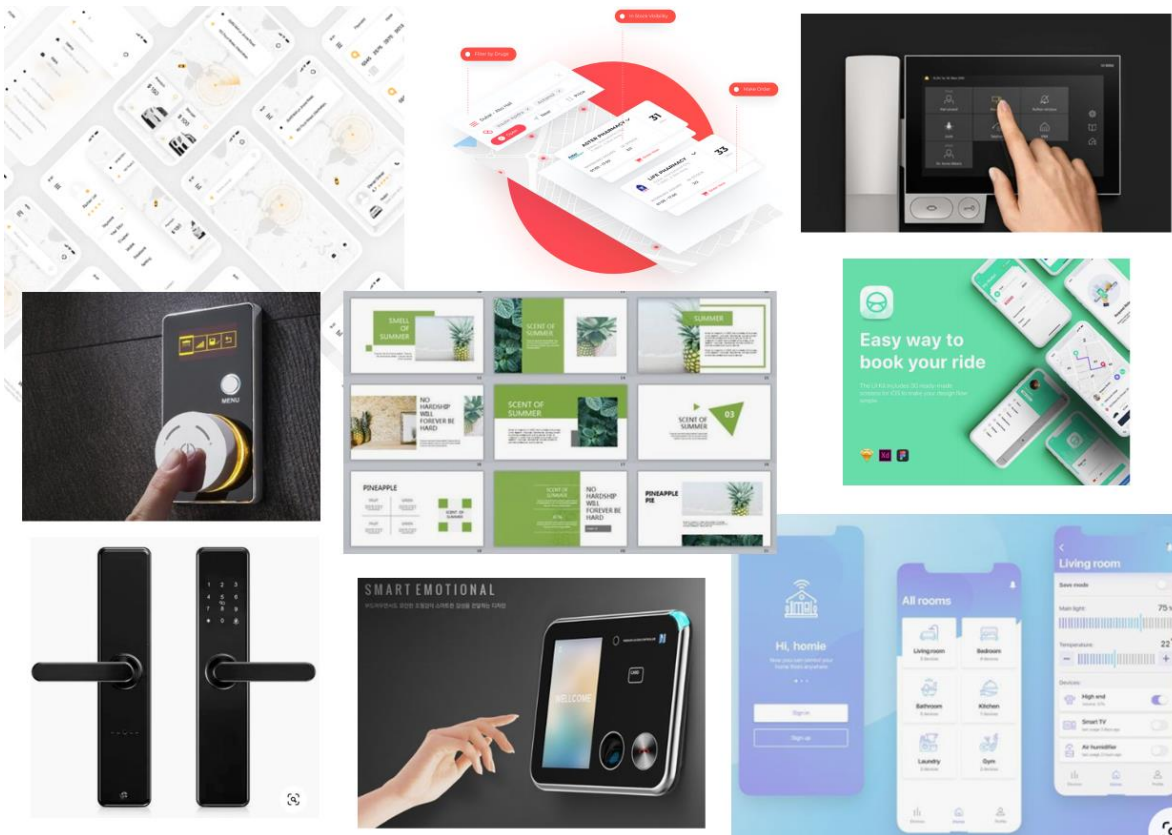
Alerts, emergency buttons

Backgrounds, text

### Typography

Roboto **Roboto** *Roboto* **Roboto** Roboto 1234  
Avenir Avenir Avenir Avenir 1234  
Pavanam Pavanam Pavanam Pavanam 1234

### Icons



## Design Integrations & Moodboard Inspiration

The form of the software will most likely be a mobile application available on most app stores. The form of each hardware device included in BathroomSEC can be altered to fit the specific need of each customer. There will be basic models available. These include both wall and free-standing sensors, notifiers and locks. These will be the most affordable package and be available to purchase in outlets and online. We want the hardware to be able to blend in or stand. This will depend on the customer.

The devices will come in a variety of colours. The basic package will come in either eggshell or charcoal. These are the most common bathroom colours and will allow the devices to fit in well. Again, the colour can be altered by ordering online. The interface of the app software will most likely be a pale light green combined with eggshell white. The use of green conveys a sense of calm and security as this is what most users would associate the colour to. This is exactly the kind of feeling we want users to connect with while using our software.

without giving exact dimensions, the hardware available with the app will be compact. We want the devices to blend into the surrounding environment while also being aesthetically pleasing. For example, the sensor would ideally be positioned out of main view from the user whereas the notifier would be centrally positioned in the room. From our research the main materials that will be used will be polycarbonate as it is tough and inexpensive. Other materials such as aluminium and wood can also be used for aesthetic purposes.

# MOCKUPS

