Phase 2: Design
Project Name: *Control Freak*
Client: Bobby Beaton
Team: Christina Olk, Trevor Senior, Ben Robohn, Kyle Jeffries
CS 3724 Spring 2015

1 System Concept Statement

The *Control Freak* (CF) will allow residents to remotely monitor and control electronic features of their home with a powerful, dynamic web application that can be accessed from any location or device. The user will be able to control features of their home including, but not limited to, alarms, door locks, lights, television, thermostat, washer, dryer, dishwasher, oven, garage door, and coffee maker. A focus on the simple, intuitive interface will give users information about their home while they are away, leaving them with a sense of security and ease. The *Control Freak* will secure the users home and reduce the time it takes to perform everyday chores. A hands-free feature will give users information and access to their home, even while driving.

2 Activity Customization

To tailor these general phase 2 guidelines specifically to our project, we developed a persona of a CF user, Steve. Steve has a family, so that we can simulate specific situations that would arise when a group of several users all uses the CF for the same home. We were able to conceive situations involving multiple admin users, adding and removing permissions to the child accounts, and operating devices both at home and away.

As students who currently rent apartments with roommates, we have experiential knowledge on how the application would be useful to not only homeowners, but renters as well.

Since we are solely developing the web application for the CF, not the physical interfaces that devices will use, our “physical mockups” are sketches of initial designs for our application front-end.

3 Persona

Description

Steve Stevens is a 30 year old astronaut who works for NASA in Pensacola, Florida. He recently purchased an amazing new house for his family, although there is a longer commute to work. He has a wife and two kids, Tommy and Sarah, and he likes to use his iPad in his free time. On the weekends he likes to enjoy riding his bike on the nearby trails and go out on his boat to get away from his busy schedule. Steve drives to work every weekday at 7am and drops his kids off at school on the way, and his wife also leaves for work at 7am. Steve has to stay at work every weekday until 7pm, so his wife picks the kids up from school at 4pm. Steve is often away from his house and family for work-related conferences that usually last 2-3 days at a time. He often worries about his new home while his family and kids are away. Steve enjoys

taking his family on vacation very frequently to spend time with them and relax from his hectic work schedule.

Process

We established our persona by evaluating our contextual data and applying attributes that would create an ideal user for our interface. The ideal user for our interface is someone who will utilize all of the aspects that *Control Freak* offers. For example, since Steve has kids, he would want to set permissions on what they can and can't control in the house. He is also a very busy man who works a lot, so he is not at home for long periods of time consistently throughout the week. This is optimal for the automation and notification feature of CF.

Aside from making our persona ideal for using our application, we wanted to make him relatable to other users. We incorporated this aspect by making him a dad who enjoys spending time with his wife and kids, as well as having some hobbies on his own time. He is busy between his family and work, which many people are, and he worries about the safety of his home and family, a common characteristic of a father.

We also wanted Steve to be a very memorable character, so we came up with an interesting profession for him. He is an astronaut, which is somewhat of a rare job. So when people refer to *Control Freak*, they can think, "Steve the astronaut enjoys using *Control Freak!*"

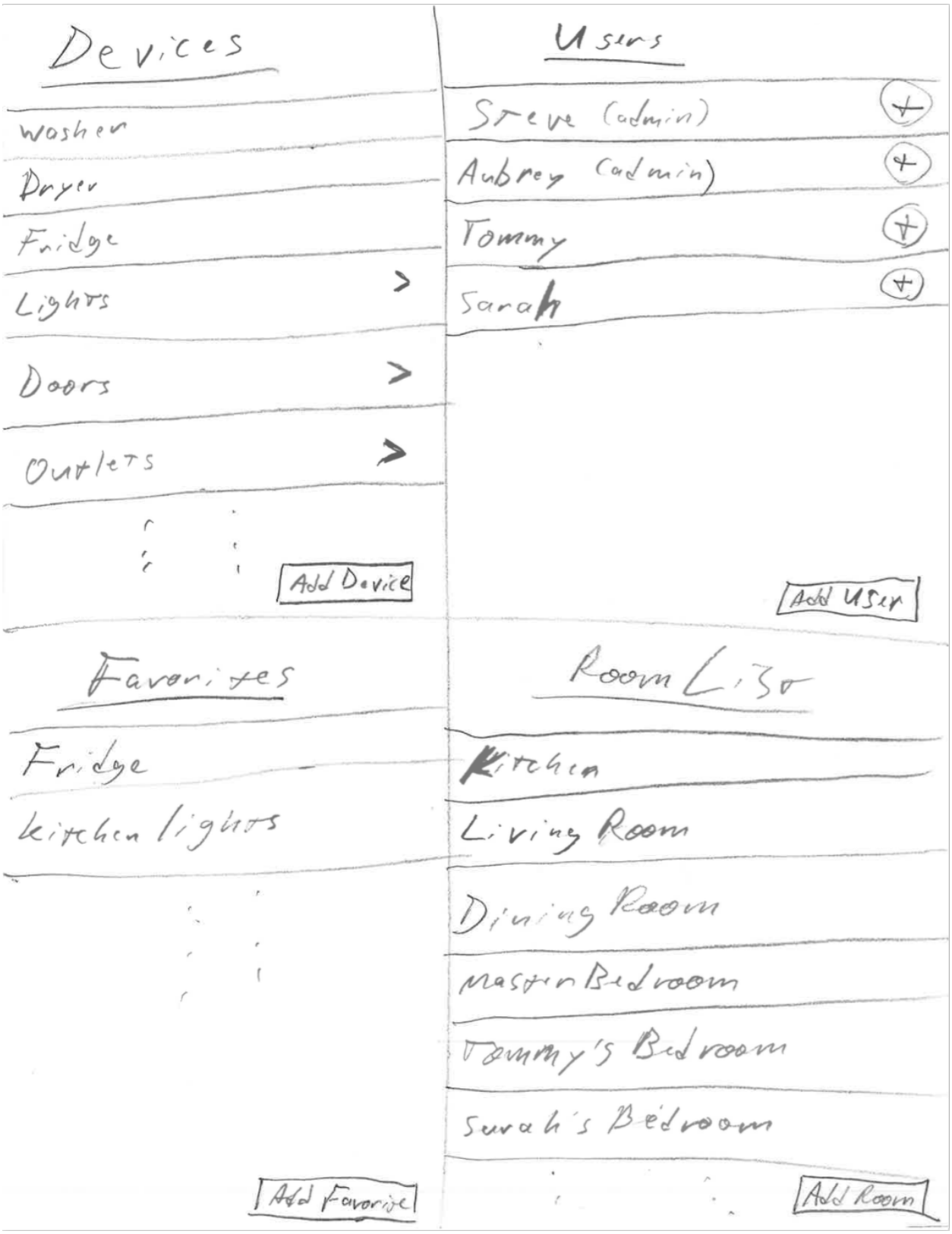
4 Ideation & Sketching

Process of Ideation

The process of ideation we went through involved all of us meeting as a team to review information gathered from Phase 1 and feedback received from the in-class activity demo. We created a Google Doc to make it easier for all team members to collaborate and contribute. On this document, we created a list of all of the features that could be added and concepts that are significant to our project based off of our contextual inquiry and analysis in Phase 1 and the feedback we received from our classmates. We then narrowed this list down to specific features we actually wanted to implement and concepts we wanted to keep in mind that will reflect the project. We chose features by thinking about our persona and what he could really use in our application.

Process of Sketching

The process of sketching involved us meeting as a team and working on the Google Doc again. We added a navigation list to the document. We proceeded to list all pages and menus we needed, and made sure these pages incorporated this list of features we created from our process of ideation. Then we each assigned each other a page to draw as a rough draft for our user interface. Below are some of the initial pages we created when figuring out how to do our sketches.


Devices
Washer
Dryer
Fridge
Lights >
Doors >
Outlets >
Add Device
Users
Steve (admin) +
Aubrey (admin) +
Tommy +
Sarah +
Add User
Favorites
Fridge
kitchen lights
Add Favorite
Room List
Kitchen
Living Room
Dining Room
master Bedroom
Tommy's Bedroom
Sarah's Bedroom
Add Room

This was an initial sketch we used when brainstorming designs for our application. Since creating these initial drawings, we have greatly streamlined the design by, most significantly, adding the map to the homepage in lieu of a list of rooms and devices. Using these rough sketches, we were able to create a wireframe for our project.

To come up with an idea for the storyboard, first we evaluated the persona we came up with. Then we made a list of all of the features of our application that we wanted to demonstrate in our story board. Using these features, we made a bulleted list of each frame of our story board. We looked over the list together to make sure there is no significant feature we missed in this list. Finally, we worked together to sketch out the storyboard. Since there involved a lot of repetition with the storyboard, we decided to create it in power point to make the process more efficient.

How the Two Processes Fit Together

Our process of ideation and our process of sketching fit together perfectly to create an ideal storyboard and wire frame. We used our process of ideation to develop a list of specific features and concepts for our project, and then we used this list to generate sketches for the wireframe and storyboard.

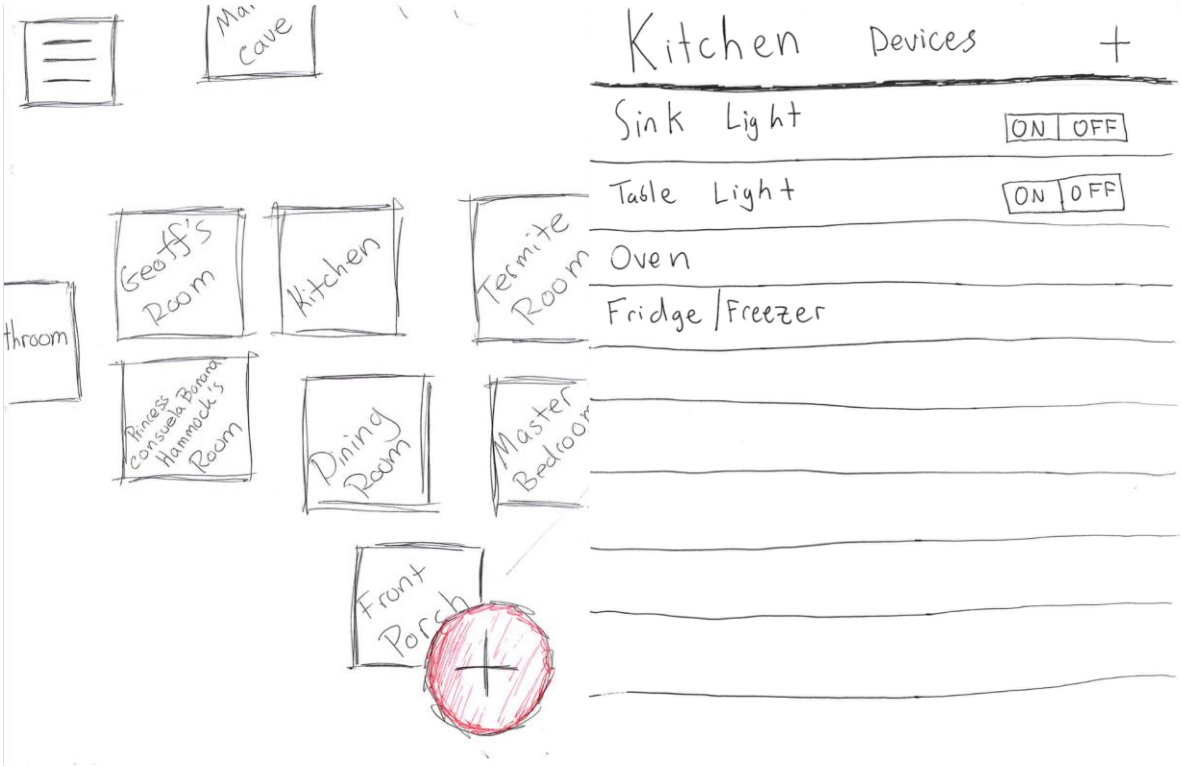
5 Workspace & Materials

The workspace for our Phase 2 was mainly the library. We chose this workspace so that there was enough room to spread out and work together. The library is also quiet enough to concentrate, but also allows for talking and collaboration. The materials we used were laptops, pen, paper, and occasionally a white board. When we felt a white board would be beneficial, we migrated to the CS lounge that contains plenty of white board and chalk board space.

6 Team Photo

Below is a photo of our team working together in the library. We are all collaborating on the Google Doc.

7 Selected Sketches

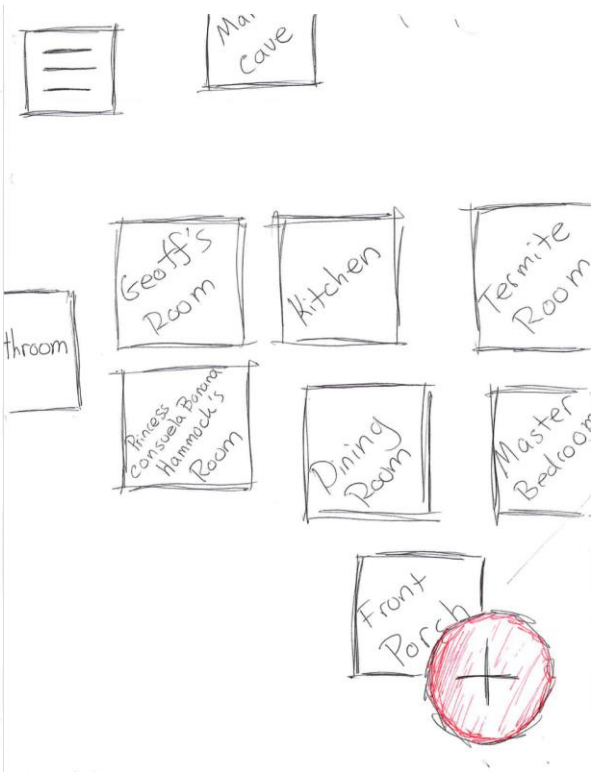


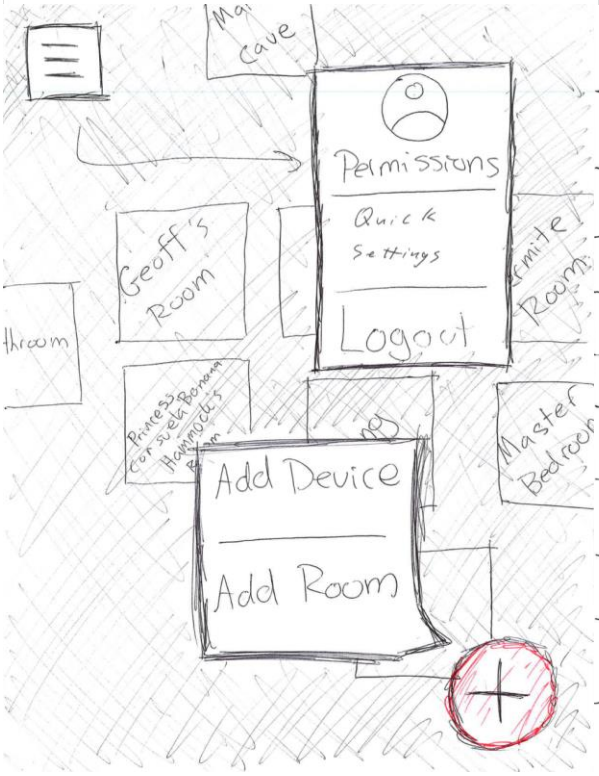
These two selected sketches show that the Control Freak is room oriented. By clicking on the kitchen, the user will be navigated to the kitchen devices. We have since further expanded on this quality of the Control Freak.

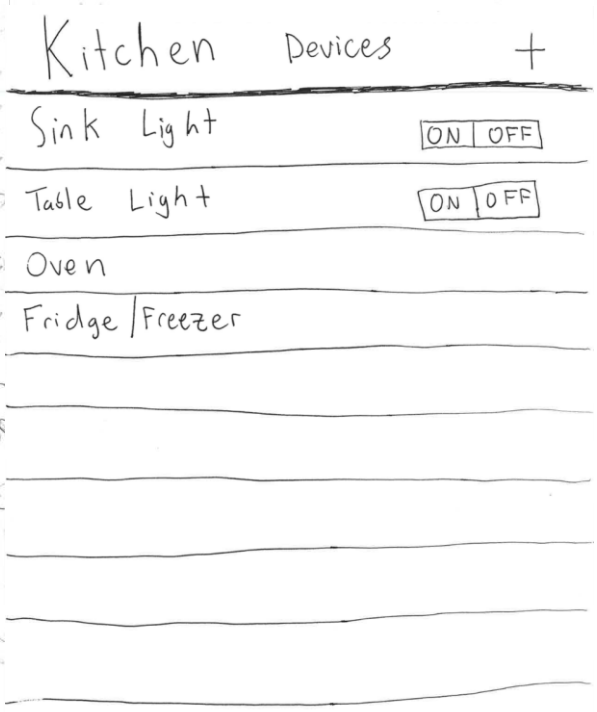
8 Physical Mockups

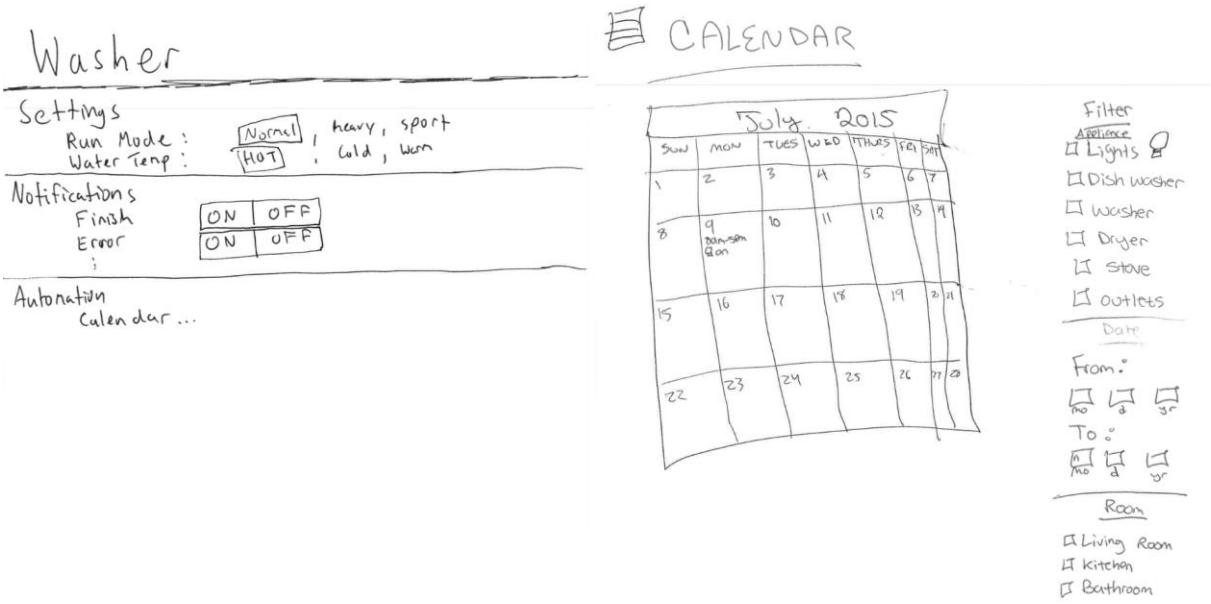
The physical mockups below represent the specific user interface for *Control Freak*. It consists of various navigation screens and features of the application.


Control
Freak
Username:
hokie
Password:
Sign In


Ma. cave
Geoff's Room
Kitchen
Termite Room
throom
Princess consuela Banana Hammocks's Room
Dining Room
Master Bedroom
Front Porch


Ma. cave
Permissions
Quick Settings
Logout
Geoff's Room
throom
Add Device
Add Room
Master Bedroom


Kitchen
Devices
+
Sink Light
ON OFF
Table Light
ON OFF
Oven
Fridge/Freezer



9 Describe the set of transformed and new activities you decided to support in your design.

Map

We've implemented a new map design on the home screen that will house an interactive screen with drag and drop shapes which will represent rooms throughout the house. These "rooms" will be added by each specific user and can be designed however they want. For example a user can imitate the layout of their home. You can click on each individual room to see the available lights and appliances to control.

Scripts

We have now introduced scripts into our interface that will allow users to create a preset mode that will execute a specified amount of things. For example, let's say the user is getting home from work and they have an "off work" setting. This setting will then run a script that will turn on the lights, TV, and open up the garage.

All on/off

This new feature will allow users to turn off all of their lights in the home with a single button instead of having to turn them all off individually.

Resident tracker
A feature that will let you know if any other residents are present in the home. On the home screen it will show if there is another person in the home by displaying their name.

Favorites
Make certain automation actions, settings, or scripts to a favorites menu that is conveniently located on the map when the application is started.

Intuitive, simple design
Made it so when you click on a room on the map it pops up with a menu of appliances you can do things with rather than having to go through multiple menus.

Back Button
You need a way to go back on screens, so we made a back button.

10 Mental Model, Conceptual Design, and Mapping from Designer to User.

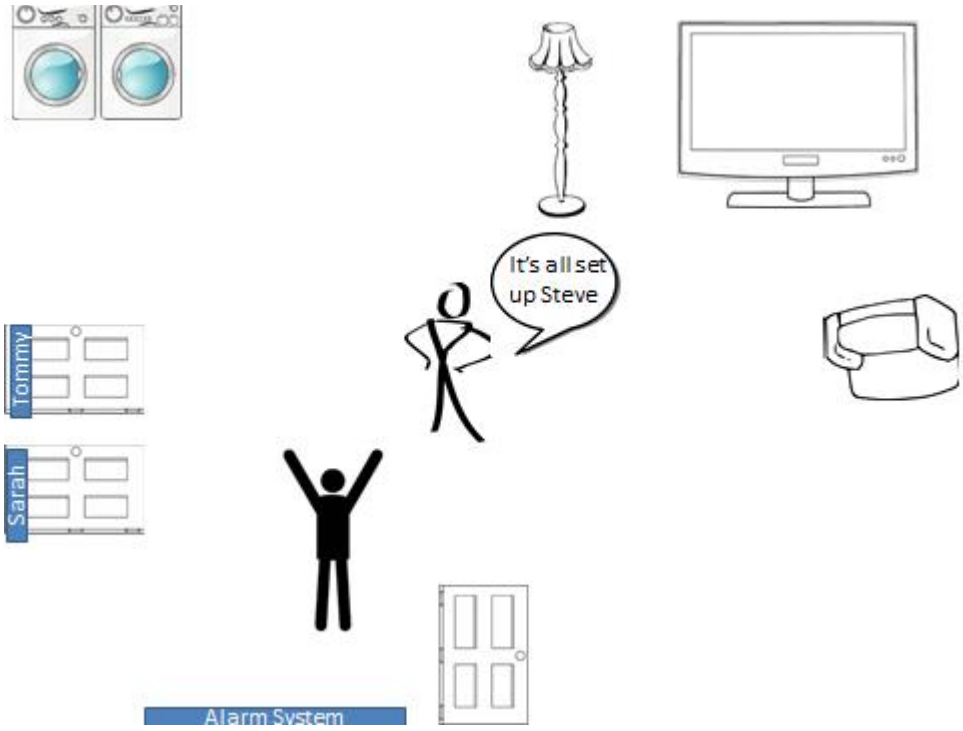
Designer's Mental Model
Control Freak will allow users to automate and monitor nearly all electronics in the home. Third-party manufacturers will make appliances compatible with CF, which will allow them to be controlled using the mobile application. There are three main components to this interface, which are the home screen, settings, and automation. The home screen houses the map of the home and the individual rooms with their electronic appliances. The settings offers users the ability to set restrictions on certain accounts, add devices to a room, or add a room to the map. Automation will allow the users to have preset functions for a given period of time.

Conceptual Design
Our conceptual design begins with a login page so that the user can have secure access to their home. Once the user is logged in, the home page will open and display the many rooms in the house available to access. Once a room is clicked on, a list of available features will appear, along with the option to add a device to the room and along with the settings menu. These settings will be specific for the room and will allow the user to automate devices. Global settings can be accessed via the menu button.

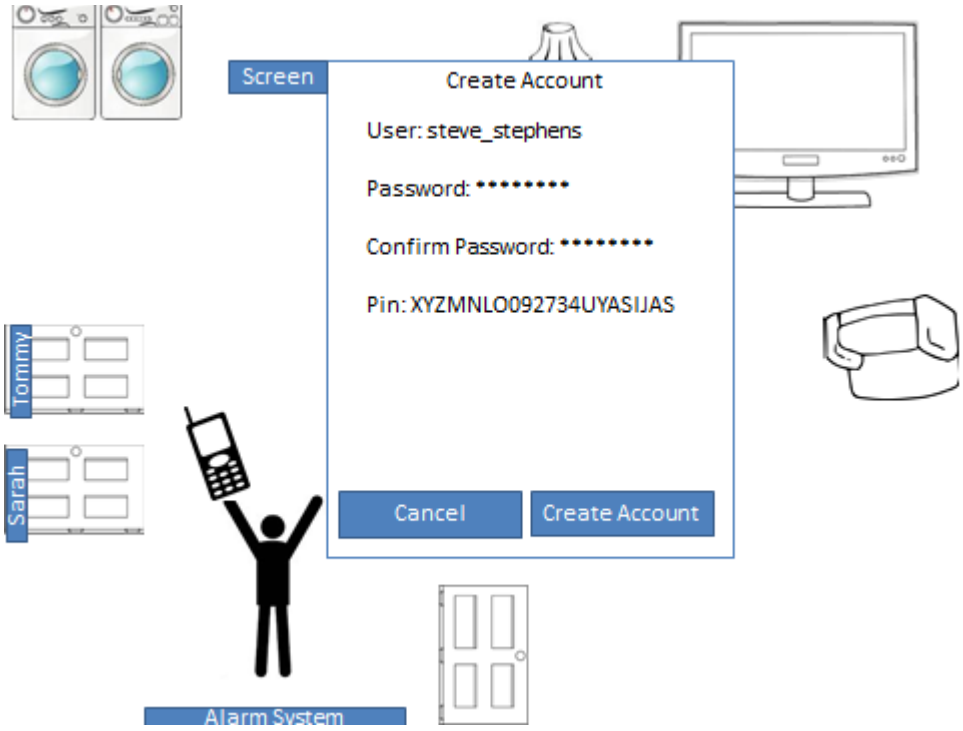
The conceptual design acts as a mapping from the designer to user by creating a less technical and more intuitive way to interact with the interface. It allows the designer's complex model of the application to be more efficient and useful via the conceptual design.

11 Storyboard

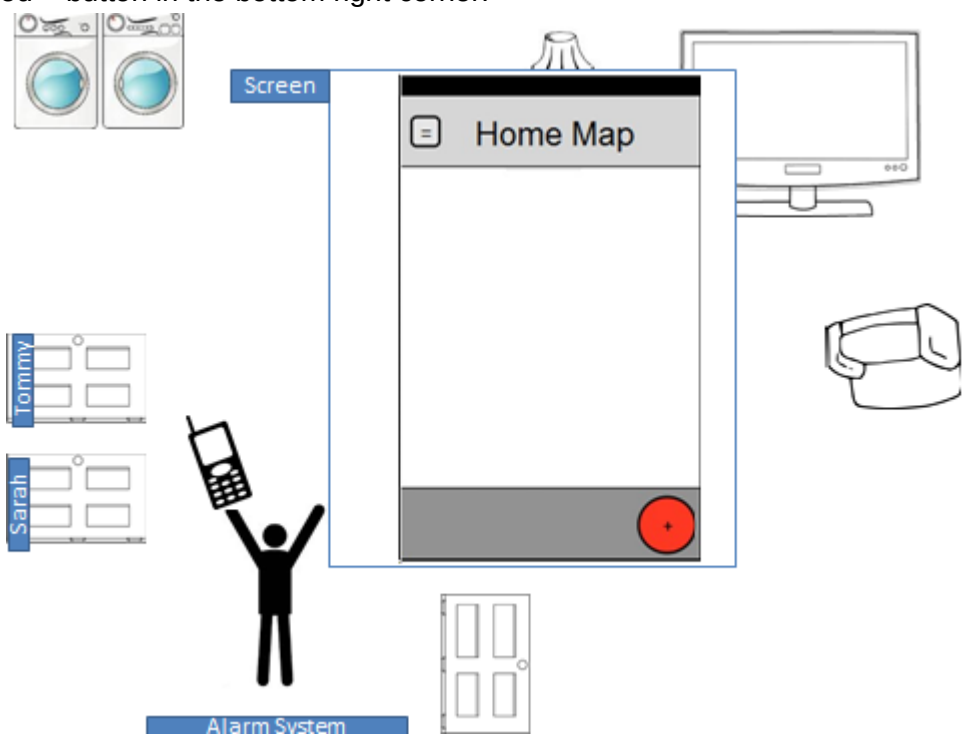
1. Steve just bought a new home and got all of the *Control Freak* compatible appliances set up.



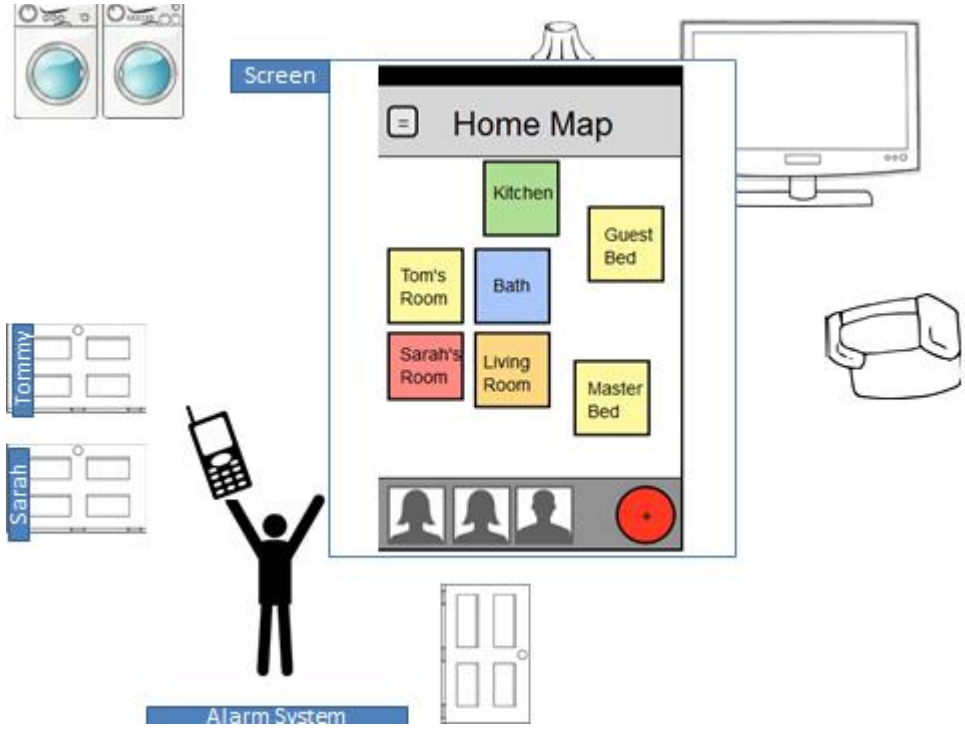
2. Steve makes an account with the pin number his home was assigned to.



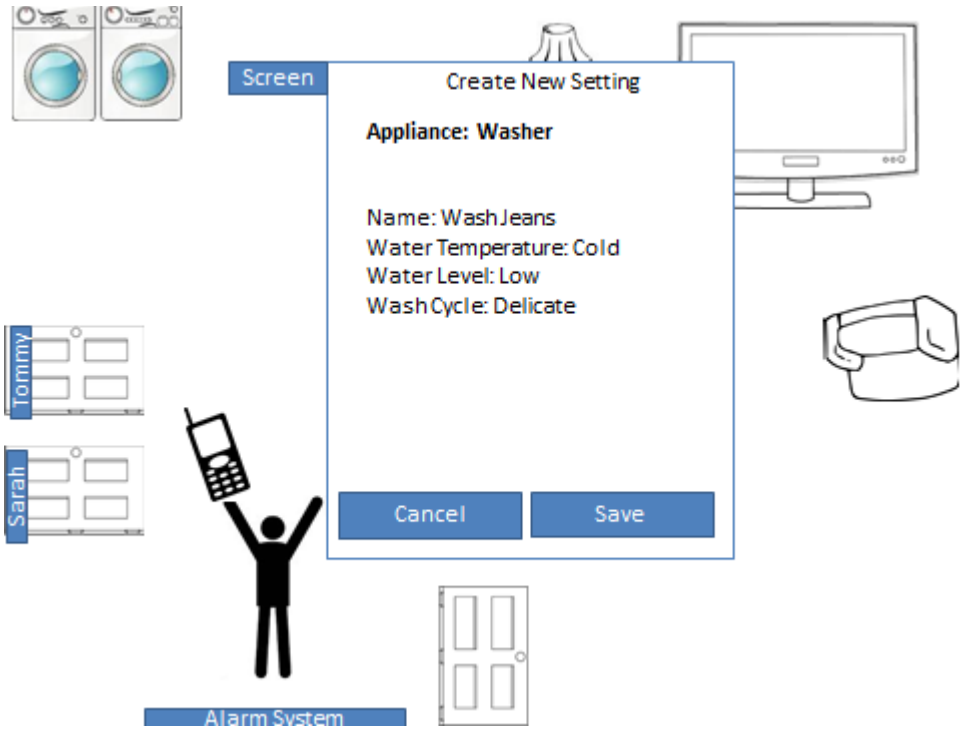
3. Steve is directed to a blank map, where he can now create his own layout of his house by using the red + button in the bottom right corner.

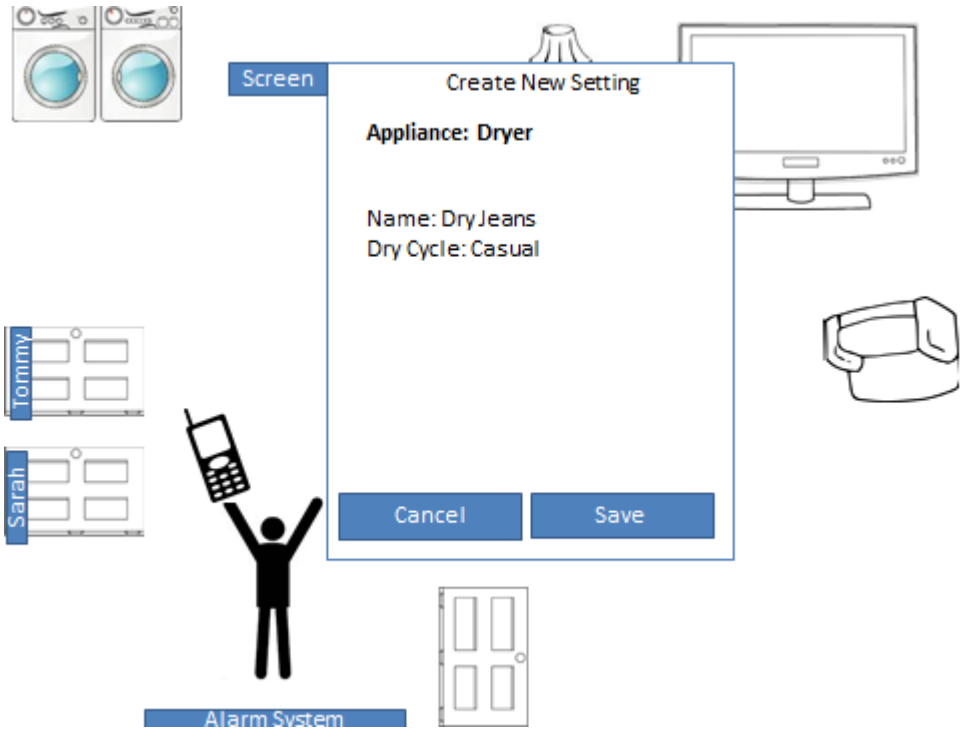


4. Steve created all of the rooms in his home and then adds all of the devices from the list of appliances that is generated from the installation.

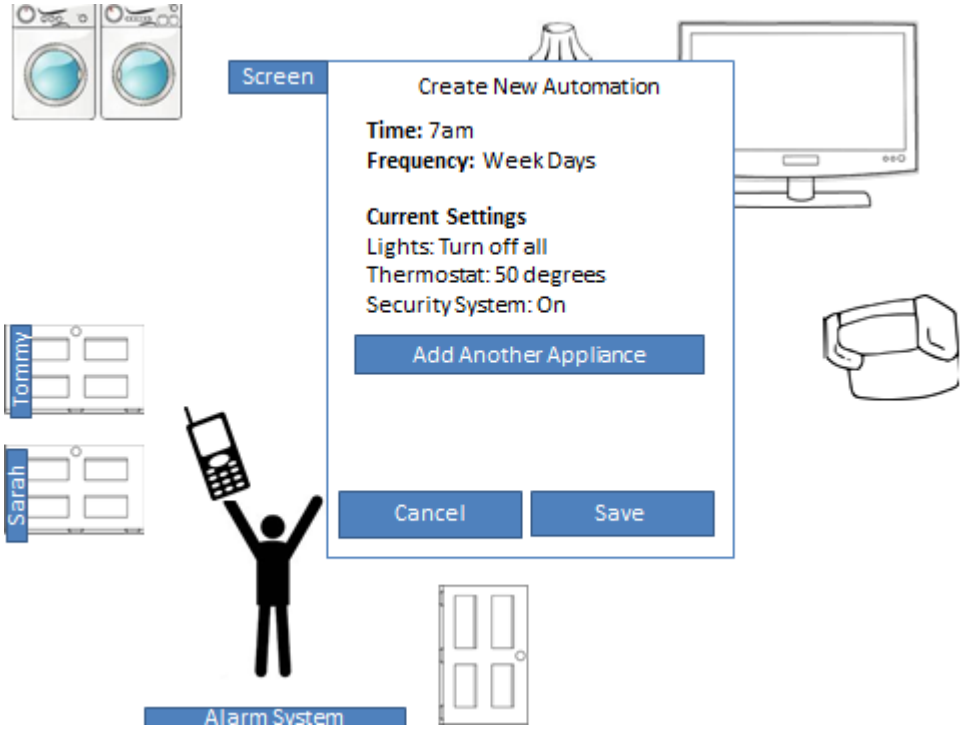


5. Steve wants to save some settings that he knows he will use often.

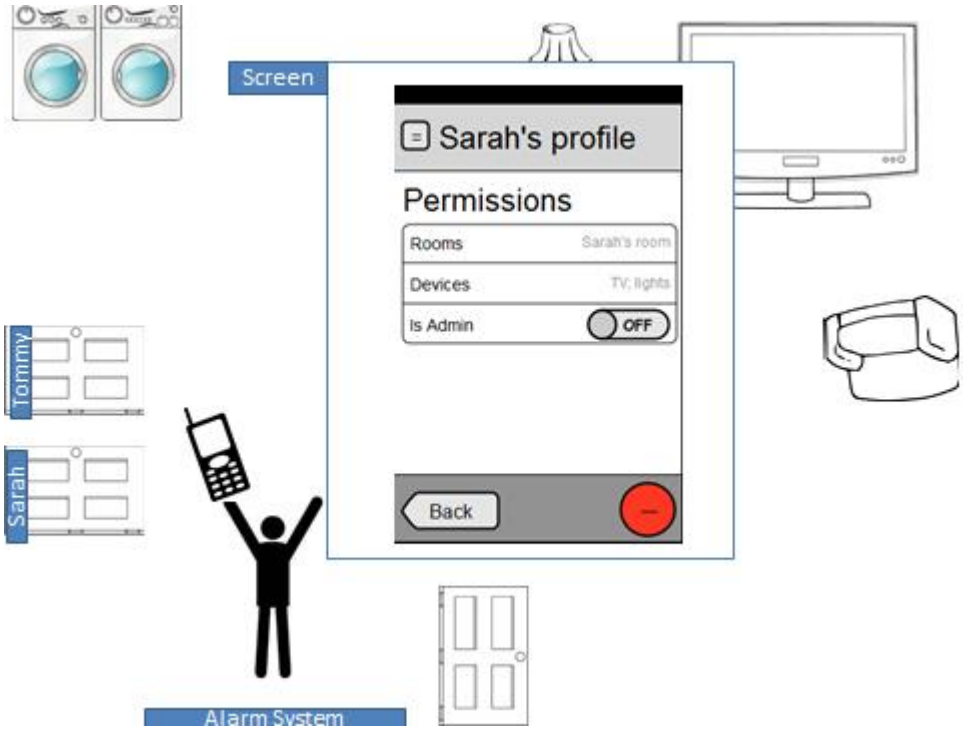




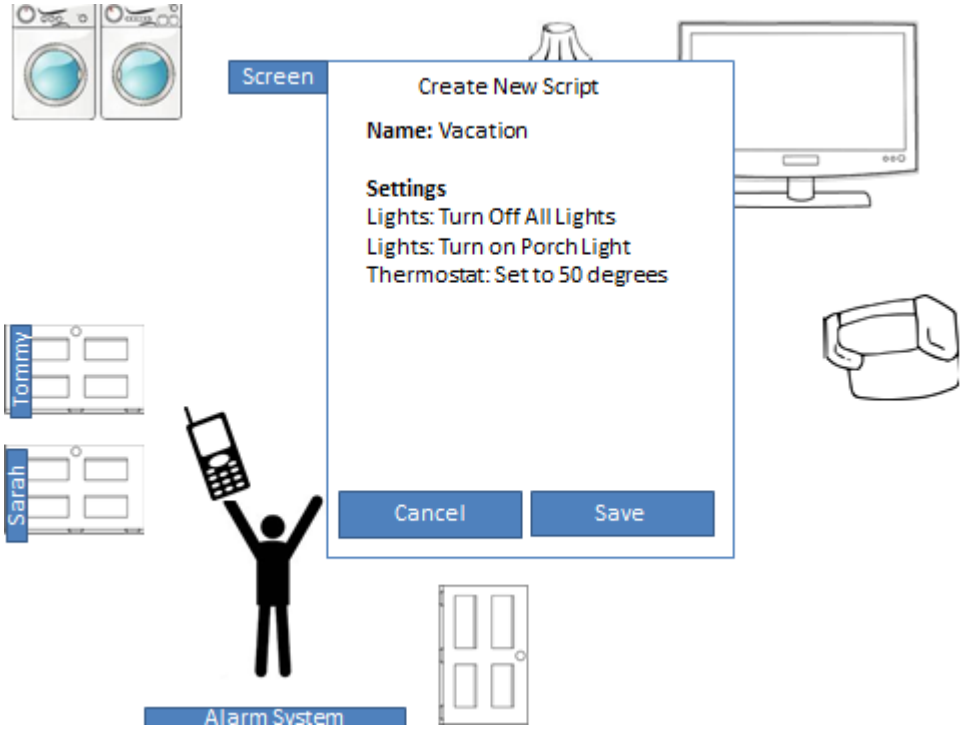
6. After saving some commonly used settings, Steve wants to set up some automation settings, because he and his wife go to work every morning at 7am.



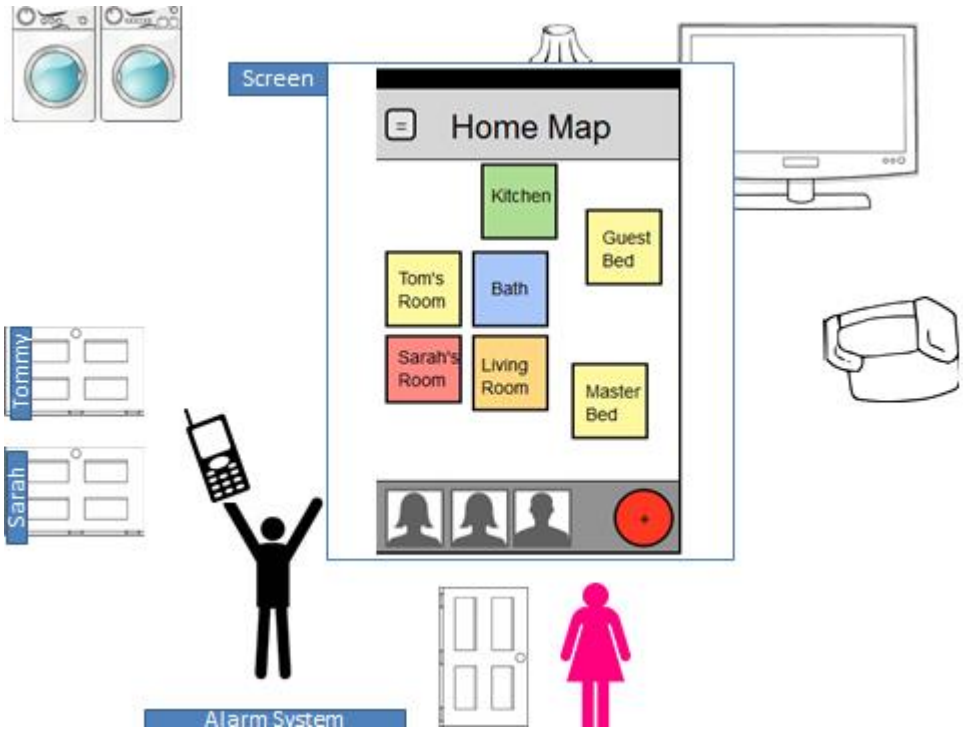
7. Steve notices that when he gets home from work, his kids are playing with the *Control Freak* by turning on and off the stove. He notices this is dangerous. He goes to the permissions settings and changes the permissions of his children. He makes it so they each can only control their own rooms and the TV, lights, and ceiling fan in the living room.



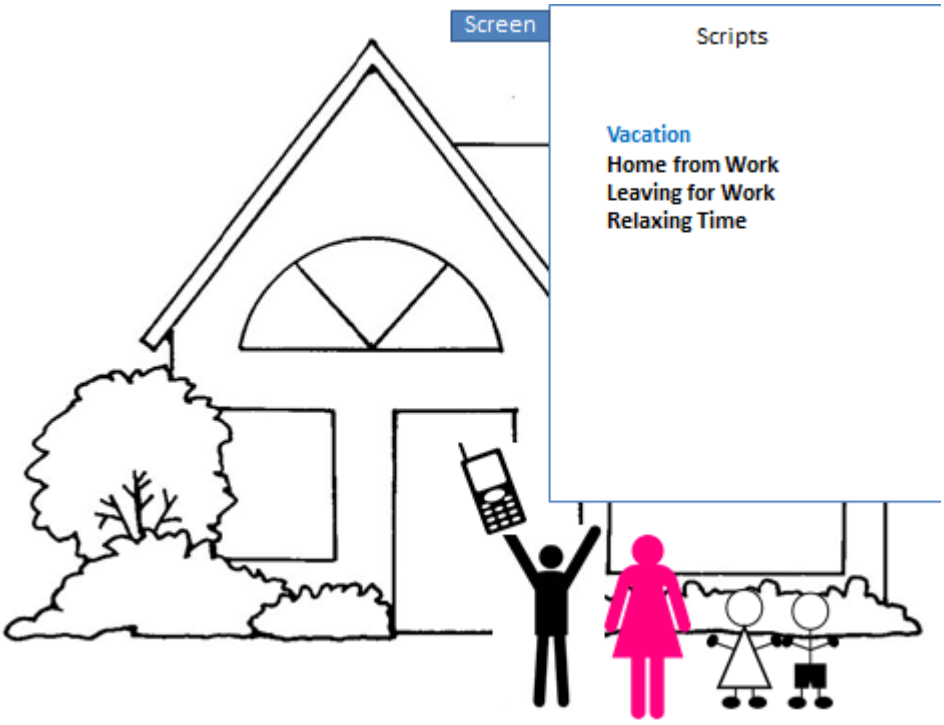
7. Steve is planning a surprise vacation for his family later in the month, so he decides to make a script for a vacation since he will definitely be taking more vacations in the future.



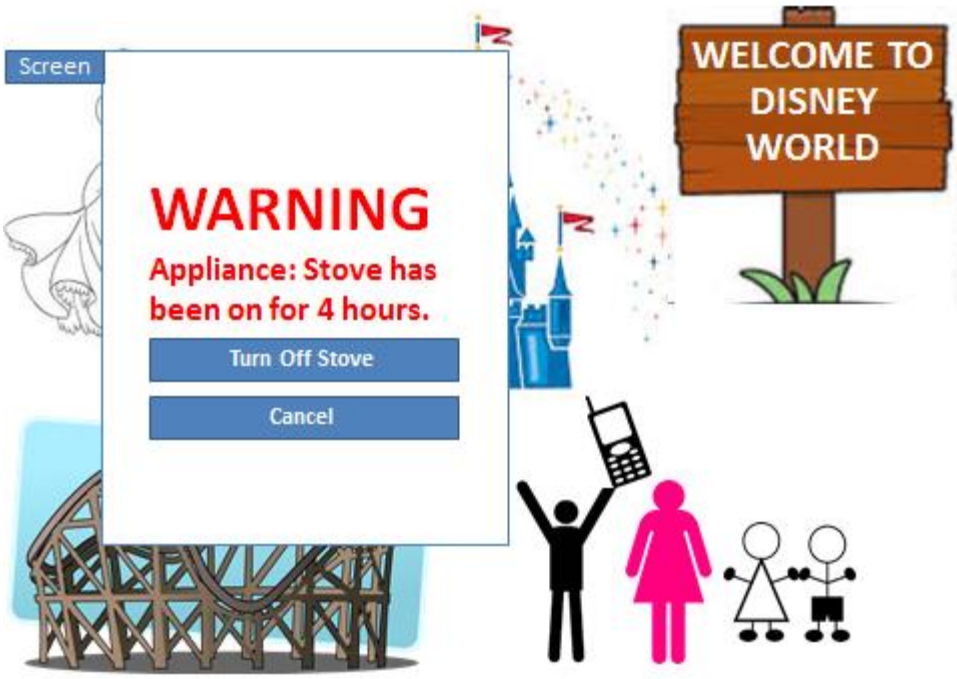
8. After making the vacation script, Steve goes back to the map view. He notices at the bottom of the screen his wife just got home. He decides to go to the living room to greet her.



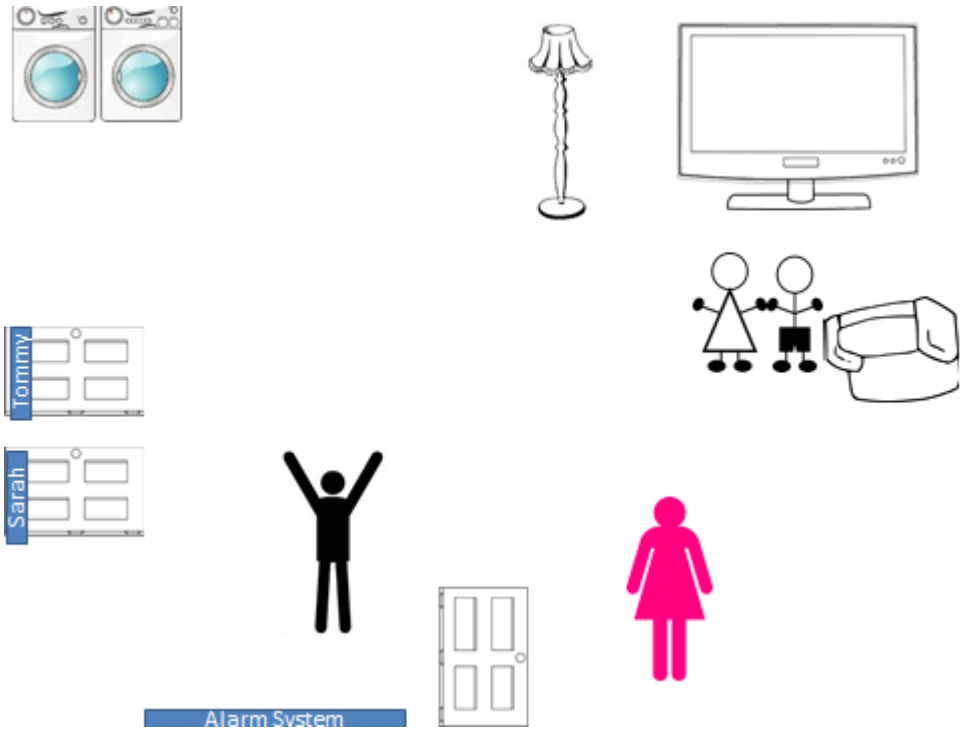
9. Steve finally sets off for his surprise family vacation to Disney World! He uses his script called “Vacation” as he leaves the house.



10. While Steve and his family are away on vacation, Steve receives a push notification on his phone! He is alerted that his stove has been on for more than four hours. He is prompted with the option to turn off the stove, and he decides to select “Yes”



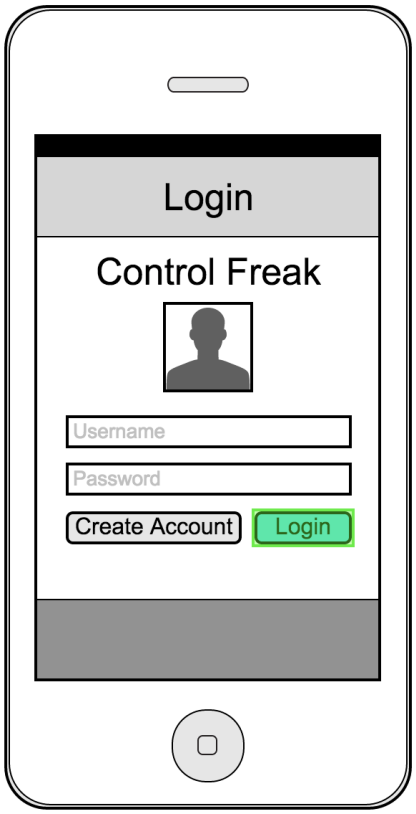
11. Steve returns home to a happy family and a safe house.



12 Wireframes

The scenario when using the wireframe is from Steve's point of view and how he interacts with his home with the *Control Freak*. Below are some images from the wireframe.

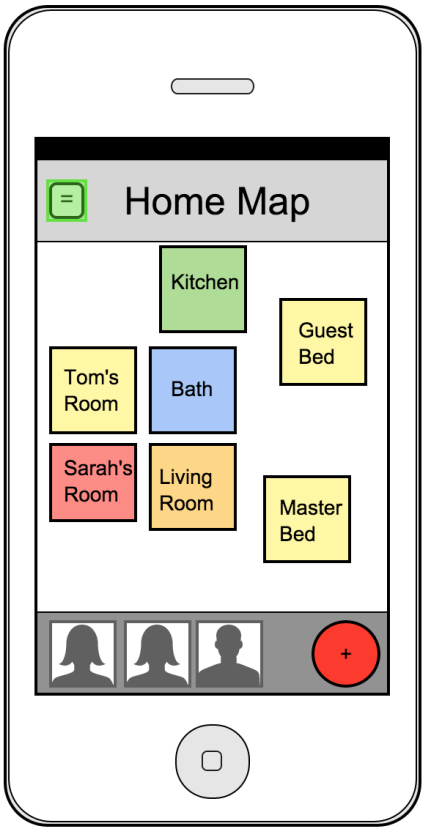
The user can login with a username / password. They can choose to create a new account, or login with an existing one.



The hamburger button brings up the global menu

Rooms can be added and moved around by the user. The color and name of the room allows for further

A list of current users in the home will appear in the bottom similar to how Google Docs shows who is viewing a document.



Clicking on an existing room brings up a setting to change the room settings, or add a device to a room.

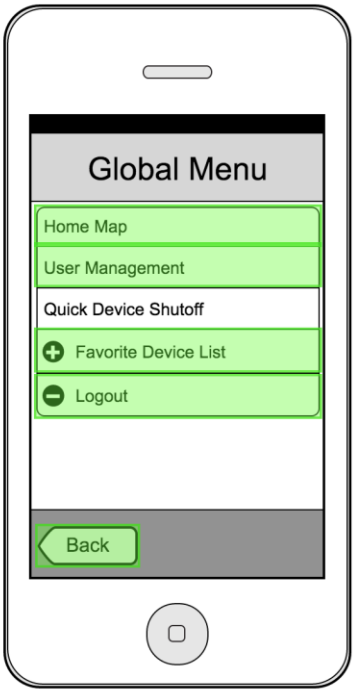
Room Settings

Add Device

Clicking on the plus button brings up an option to add a new room.

Add Room

Manage users that can access devices.

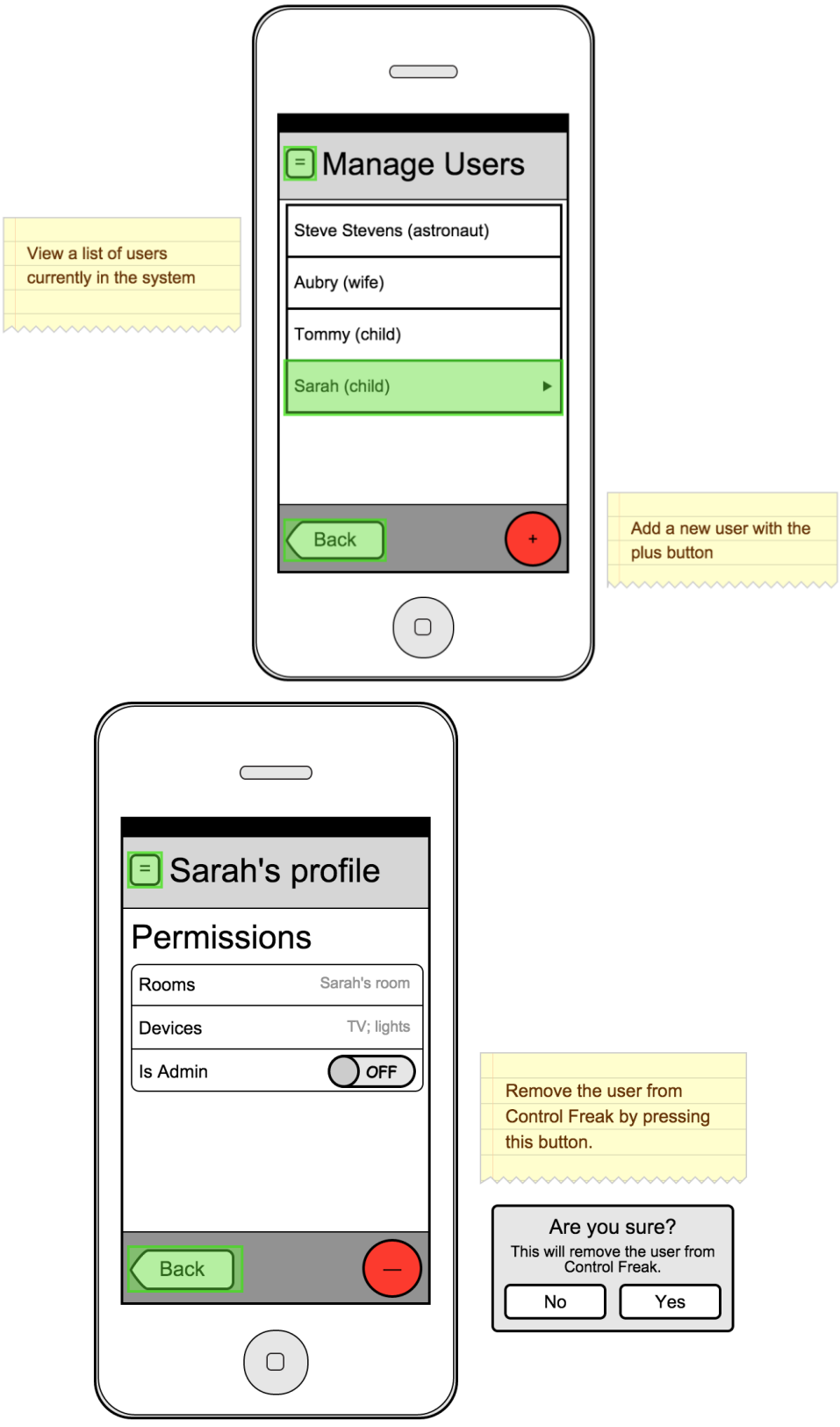


Quick setting to turn off all devices in the home. A popup context menu will allow one to deselect items to remain on.

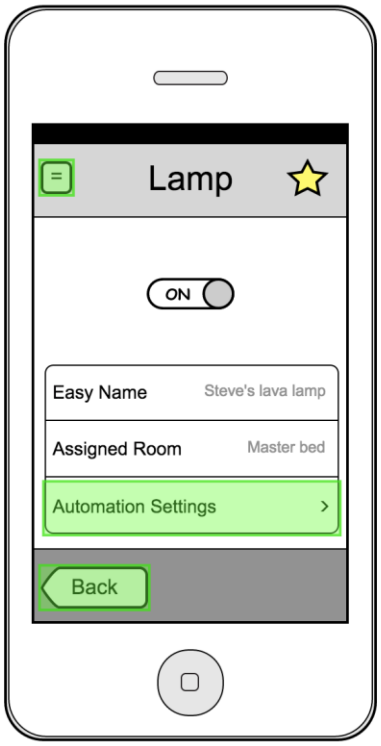
Turning off these items:

- Lights
- Washer
- Oven
- A/C
- Lights
- Master bed
- Sarah's room
- Tommy's room
- Bathroom
- Living room

Nevermind | Turn them off!


Manage Users
Steve Stevens (astronaut)
Aubry (wife)
Tommy (child)
Sarah (child)
Back
+
View a list of users currently in the system
Add a new user with the plus button
Sarah's profile
Permissions
Rooms
Sarah's room
Devices
TV; lights
Is Admin
OFF
Back
—
Remove the user from Control Freak by pressing this button.
Are you sure?
This will remove the user from Control Freak.
No
Yes

The favorite device list takes a user to the device settings page of a device that they have favorited.



Device controls (such as turning off and on a lamp) will appear at the top.

Favorite this device and it will appear in the favorite device list for quick access.

Easy Name allows the user to assign a custom name to a device.

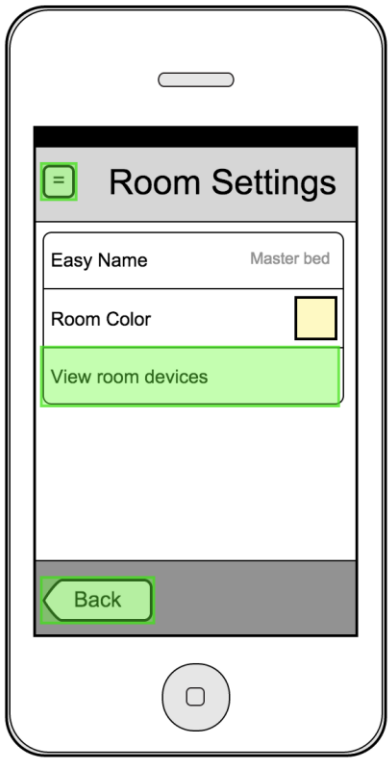
Assign the device to a room.

Setup automated schedules for this device.

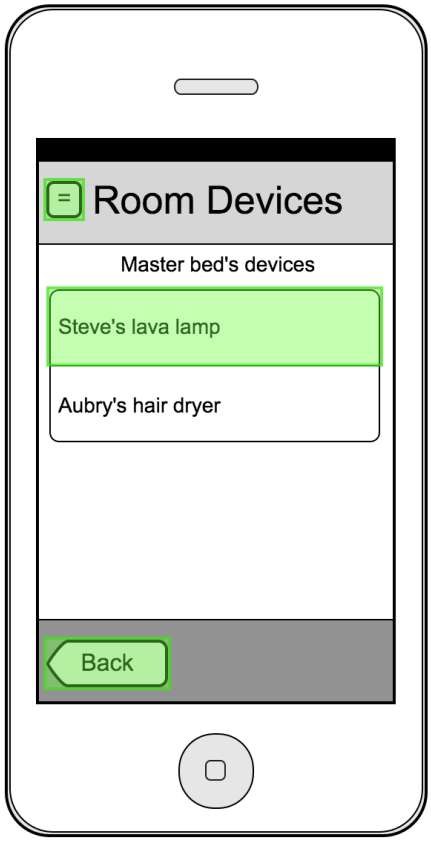
Automation is defined by actions, time they occur, and how frequent the actions occur. They can be toggled on/off as well.

Pressing the plus button will add a new automation task for this device.

Customize how the room will appear on the home map and easily view the devices in the room.



A list of all devices in a room.



13 Target Table

Work Role: User Class	UX Goal	UX Measure	Measuring Instrument	UX Metric	Baseline Level	Target Level
Homeowner: new user setting up the app for the first time	Ease of setting up the home page	Initial user performance	CF: Home Page	Time spent on task	5 minutes	3 minutes
Homeowner: Commuter	Quickly check to make sure all light and outlets are turned off	Time taken to check status	CF: Lights Page	Time spent on task	20 seconds	15 seconds
Homeowner: Parent	Restrict permissions given to a child user	Success rate of restricting access	CF: Permissions	Success rate	95%	100%
Renter: shares apartment with two roommates	Select the user's personal washer settings from presets	Time taken to select a particular washer setting	CF: Appliance Page	Time taken to complete task	35 seconds	20 seconds
Renter: shares apartment with two roommates	Check if roommates are home	Time taken to check	CF: Home Page	Time spent on task	20 seconds	15 seconds
Child: uses iPad to control TV	Use iPad to turn on TV and go to favorite channel	Time taken to go to channel	CF: TV Control	Time spent on task	20 seconds	15 seconds