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# PROJECT PHASE 2

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## Team 11

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## User Analysis

User Characteristics	Homeowner	Guest	Service Employee	IT Employee	Vendor
Age	9+	13+	25 - 60	28 - 60	25 - 60
Sex	Male/Female	Male/Female	Male/Female	Male/Female	Male/Female
Physical Limitations	Weak eyesight – Blindness	Weak eyesight – Blindness	-	-	-
Educational Background	Elementary – High education	Elementary – High education	High education	High education	High education
Computer/IT skills	Novice – Expert	Novice – Expert	Expert	Expert	Novice - Expert
Pain points/ user requirements	1- Cannot see small fonts and icons, 2- Voice commands not being recognizable 3- Loud sounds makes him uncomfortable 4- poor Internet connection	-Does not have access and control permissions to all devices	-Finds it hard to find customer's location	-Finds it hard to work without user feedbacks	-Finding clients can be hard sometimes
Goals	1- To manage all smart devices at home with one single app 2-To allow guests to use the app on their smartphones 3-To control smart devices with voice	-To easily be able to ask for control permissions.	-To finish his work quickly and excellently	1-To make the app better and easier to use 2-Fix the app flaws	-To sell as many smart devices as possible
Frequency of use	Weekly usage – Daily usage	Weekly usage	-	-	-
Language	Arabic/English	Arabic/English	Arabic/English	English	Arabic/English

# Personas

## Saud (Abu Sara)



*"The new generation is obsessed with technology. It takes their valuable time away from them, and disturb their peace"*

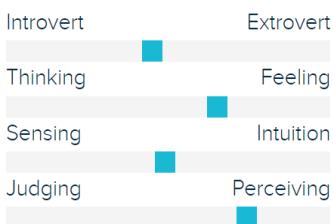
Age: 70

Work: retired

Family: widower, kids, grandchildren.

Location: Riyadh

### Personality



Respectful Wise Kind empathetic

### Goals

- To live peacefully without any disturbances
- Want things to be automated so he does not let his remaining time getting taken away by Technology
- To be able to fully take care of himself without needing anybody
- Be able to control the devices without needing to see.

### Frustrations

- He is blind, so he cannot use the app without Voice commands and text to speech.
- Sensitive to loud noises, for example, Washing Machine, TV.
- He does not like using Technology for too long.

### Bio

Saud is an old retired man. He lost his sight in an unfortunate event, his wife, who used to take care of him, died two years ago, and he has been struggling to take care of him since then. He lives with his daughter Sara and her crowded family, but she is so busy that she cannot take care of him. Sometimes he cannot sleep because someone forgot to turn the TV off or the Washing Machine. He wishes to be able to take care of himself without bothering his busy daughter.

### Motivation

Incentive

Fear

Growth

Power

Social

### Background

Educational Background: Diploma

Computer/IT skills: Novice

Frequency: Weekly

Language: Arabic

# Mohammed Abdo



"Get the most out of small things."

Age: 28

Work: software engineer

Family: Married, 1 kid.

Location: Riyadh.

## Personality



helping others clever Impatient

## Goals

- Use all the functionality of his smart devices.
- Make life easy for his family.
- Live in a modern house.

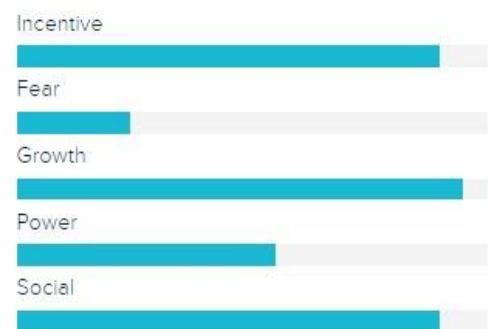
## Frustrations

- Forgetting to turn off electricity devices.
- Wasting money by not being able to control consumption of electric machines.
- Always explaining new eclectic devices to his wife.

## Bio

Mohammed is a KFUPM graduate who works as a software engineer. Mohammed and his family just got settled in, in new house and he and his wife just had a baby. Mohammed is a family guy and he wish to grant his family generous life, he is interested in investing money and saving for his son in the future.

## Motivation



## Background

Computer/IT skills: Expert.

Frequency: Daily usage.

Language: Arabic/English

Educational background: Bachelor in Software engineering.

# Mike Wazowski



*"I always enjoy hanging out at my friend's house to keep up with our school work and play video games."*

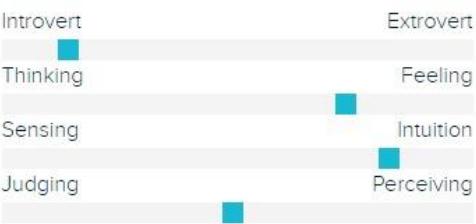
**Age:** 16

**Work:** Student

**Family:** 3 siblings, parents

**Location:** Austin, Texas

## Personality



Respectful    Shy    Friendly

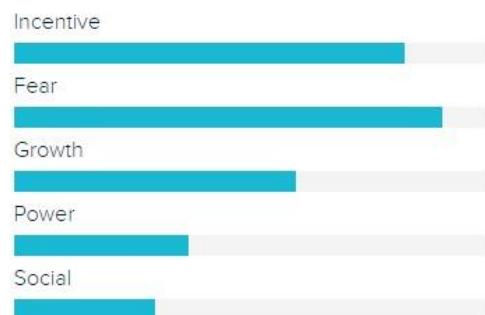
## Goals

- Be able to use more of the smart home devices at his friend's house while he is there.
- Convince his parents to buy smart home devices.

## Frustrations

- He is not able to access smart devices other than the ones in the guest room at his friend's house.
- His parents think controlling smart devices are harder than normal ones.
- Dislikes asking his friend every time he wants to change a specific device which he does not have permission to.

## Motivation



**Educational Background:** Highschool

**Computer/IT Skills:** Expert

**Frequency:** multiple times per week

**Language:** English

## Bio

Mike is a high school student who lives with his parents in a traditional house free of smart home devices, he saw multiple commercials about smart devices and his first interaction with them was at his friend's house and it was love at first sight.

# Ahmad Saad



"A person is a person no matter how small"

Age: 9

Family: 1 sibling, parents

Location: Dammam

## Personality



Smart Patient Visual learner

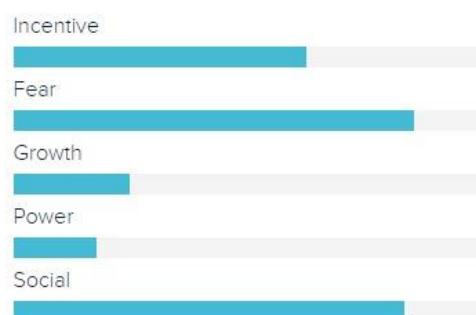
## Goals

- Live up to family expectations
- Helping the family
- Saving time for his hobbies

## Frustrations

- Complicated languages
- Not confident with technology
- Dislikes exploring the app by himself

## Motivation



## Bio

Ahmad is a 9-year-old who spends most of his time doing hobbies and playing around the house and he enjoys going to school to learn. He is a perceiving type of person and would like to see people do stuff before he does them by himself. Ahmad would like to help his family with their daily chores using technologies but most apps are hard to use and use complicated languages making them demotivating to use.

## Background

Educational background: Elementary school

Computer/IT skills: Novice

Language: Arabic

# Sarah Saud



*"I'm so busy with taking care of my kids, and I would like if there was a smart device to make my everyday tasks more convenient."*

Age: 39

Work: Mother

Family: Married, kids.

Location: Riyadh

## Personality



Friendly Hardworking Protective

## Goals

- To manage all home devices remotely.
- To turn on/off devices automatically.
- To spend more time with her kids.

## Frustrations

- Weak eyesight, finds it hard to see fonts and icons.
- Has to manage every home device manually, while taking care of her kids.

## Motivation

Incentive

Fear

Growth

Power

Social

## Bio

Sarah is a married woman, mother of 5 children. She has a very busy schedule, everyday she takes care of her kids, clean the house, and cooks food for everyone.

Sarah finds it hard to manage tasks while taking care of her kids, such as turning the TV on for the kids, or turning off the furnace in the kitchen. And she is interested in a method to manage these tasks remotely.

## Background

Educational Background: High School

Computer/IT skills: Intermediate

Frequency: Daily usage

Language: Arabic

## Task Analysis

<b>Task 1</b>	
Auto fill new registered devices' info	
Main Characteristics Questions	Answers
How frequently is the task carried out?	Monthly
What kinds of skills or knowledge are needed?	Basic knowledge about the application
Are there safety or security hazards?	No
How important is the task?	Important
How long does it take the user to perform the task?	5 seconds

<b>Task 2</b>	
Manually fill devices' info	
Main Characteristics Questions	Answers
How frequently is the task carried out?	Monthly
What kinds of skills or knowledge are needed?	Basic knowledge about the application
Are there safety or security hazards?	No
How important is the task?	Important
How long does it take the user to perform the task?	1 minute

<b>Task 3</b>	
Control device behavior	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Daily
What kinds of skills or knowledge are needed?	Basic knowledge about device behavior
Are there safety or security hazards?	Yes, some devices may cause physical damage if not dealt with carefully.
How important is the task?	Very Important
How long does it take the user to perform the task?	Varies based on the device

<b>Task 4</b>	
Change language	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Yearly
What kinds of skills or knowledge are needed?	Basic knowledge about the application
Are there safety or security hazards?	No
How important is the task?	Very Important
How long does it take the user to perform the task?	15 seconds

<b>Task 5</b>	
Add Smart Device	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Yearly
What kinds of skills or knowledge are needed?	Intermediate knowledge of the application and the device
Are there safety or security hazards?	No
How important is the task?	Very Important
How long does it take the user to perform the task?	5 minutes

<b>Task 6</b>	
Modify Device Information	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Yearly
What kinds of skills or knowledge are needed?	Basic knowledge about the application
Are there safety or security hazards?	No
How important is the task?	Important
How long does it take the user to perform the task?	2 minutes

<b>Task 7</b>	
Delete Device	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Yearly
What kinds of skills or knowledge are needed?	Basic knowledge of the application
Are there safety or security hazards?	No
How important is the task?	Important
How long does it take the user to perform the task?	2 minutes

<b>Task 8</b>	
Change Font Size	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Yearly
What kinds of skills or knowledge are needed?	Basic knowledge of the application
Are there safety or security hazards?	No
How important is the task?	Slightly Important
How long does it take the user to perform the task?	1 minute

<b>Task 9</b>	
Turn on/off device.	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Daily
What kinds of skills or knowledge are needed?	Basic knowledge about the application
Are there safety or security hazards?	Yes, some devices may cause physical damage if not dealt with carefully.
How important is the task?	Very important
How long does it take the user to perform the task?	10 seconds

<b>Task 10</b>	
Manage energy consumption	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Monthly
What kinds of skills or knowledge are needed?	Basic knowledge about application and the device
Are there safety or security hazards?	No
How important is the task?	Important
How long does it take the user to perform the task?	1 minute

<b>Task 11</b>	
File a scheduled report for devices' energy consumptions	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Weekly
What kinds of skills or knowledge are needed?	Basic knowledge about the application and technology
Are there safety or security hazards?	No
How important is the task?	Important
How long does it take the user to perform the task?	2 minutes

<b>Task 12</b>	
Sort reports	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Weekly
What kinds of skills or knowledge are needed?	Basic knowledge about the application
Are there safety or security hazards?	No
How important is the task?	Slightly important
How long does it take the user to perform the task?	10 seconds

<b>Task 13</b>	
Introductory tutorials to guide new users.	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Once/twice for every user
What kinds of skills or knowledge are needed?	none
Are there safety or security hazards?	No
How important is the task?	Important
How long does it take the user to perform the task?	2-10 minutes

<b>Task 14</b>	
Add device schedule/routine	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Monthly
What kinds of skills or knowledge are needed?	Advanced knowledge about the application and the devices behavior
Are there safety or security hazards?	Based
How important is the task?	Very Important
How long does it take the user to perform the task?	10-15 minutes

<b>Task 15</b>	
Voice commands	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Daily
What kinds of skills or knowledge are needed?	Intermediate knowledge about the application and its voice commands
Are there safety or security hazards?	Yes, User verification is needed for sensitive tasks.
How important is the task?	Very Important
How long does it take the user to perform the task?	10 seconds

<b>Task 16</b>	
Add new permission to guest	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Monthly
What kinds of skills or knowledge are needed?	Intermediate knowledge about the application
Are there safety or security hazards?	No
How important is the task?	Important
How long does the task take?	1 – 2 minutes

<b>Task 17</b>	
Text to speech	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Daily
What kinds of skills or knowledge are needed?	Basic knowledge of the application
Are there safety or security hazards?	No
How important is the task?	Very Important
How long does the task take?	20 seconds

<b>Task 18</b>	
Snooze the warranty notification for multiple of 24 hours	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Monthly
What kinds of skills or knowledge are needed?	Basic knowledge
Are there safety or security hazards?	No
How important is the task?	Slightly Important
How long does the task take?	5 seconds

<b>Task 19</b>	
Notify the user when less than a month remaining for warranty	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Monthly
What kinds of skills or knowledge are needed?	None
Are there safety or security hazards?	No
How important is the task?	Important
How long does the task take?	Instant

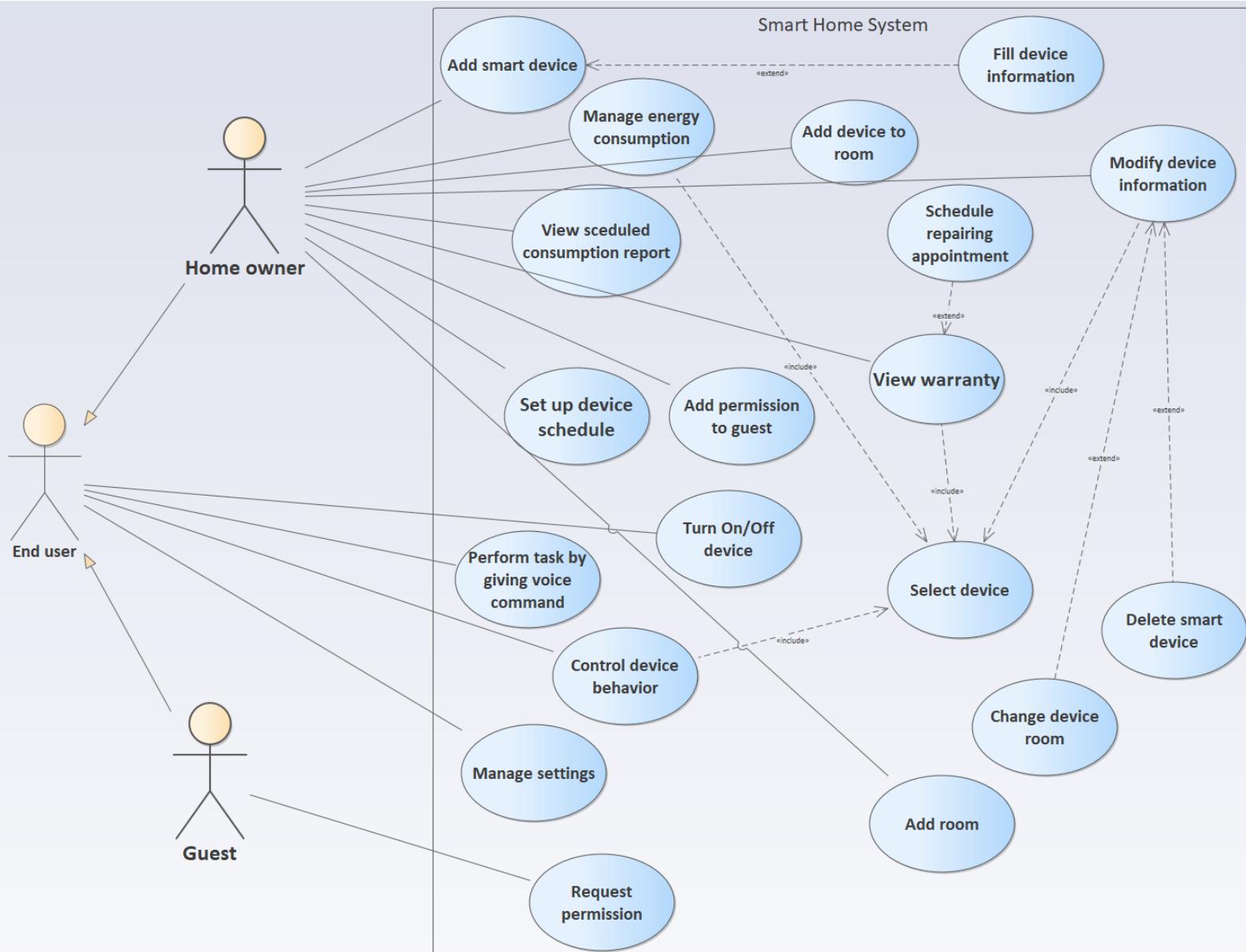
<b>Task 20</b>	
Book repairing Appointment	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Yearly
What kinds of skills or knowledge are needed?	Basic knowledge about the application
Are there safety or security hazards?	No
How important is the task?	Slightly important
How long does it take the user to perform the task?	1-2 minutes

<b>Task 21</b>	
Request Control Permission	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Monthly
What kinds of skills or knowledge are needed?	Basic knowledge about the application
Are there safety or security hazards?	No
How important is the task?	Important
How long does it take the user to perform the task?	1 minute

<b>Task 22</b>	
Add room	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Monthly
What kinds of skills or knowledge are needed?	Basic knowledge about the application
Are there safety or security hazards?	No
How important is the task?	Important
How long does it take the user to perform the task?	20 seconds

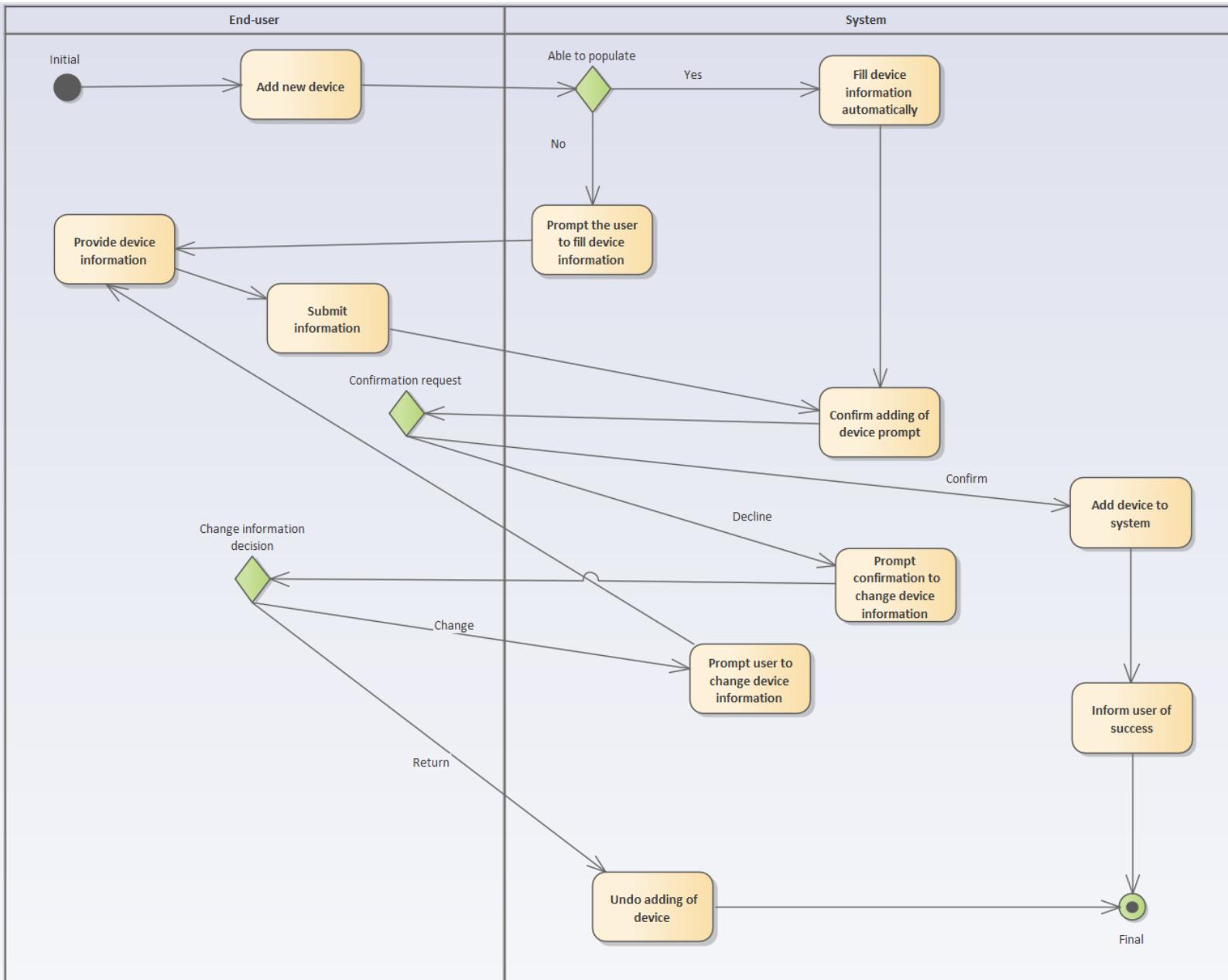
<b>Task 23</b>	
Add device to room	
<b>Main Characteristics Questions</b>	<b>Answers</b>
How frequently is the task carried out?	Monthly
What kinds of skills or knowledge are needed?	Basic knowledge about the application
Are there safety or security hazards?	No
How important is the task?	Important
How long does it take the user to perform the task?	20 seconds

# Use Case Diagram

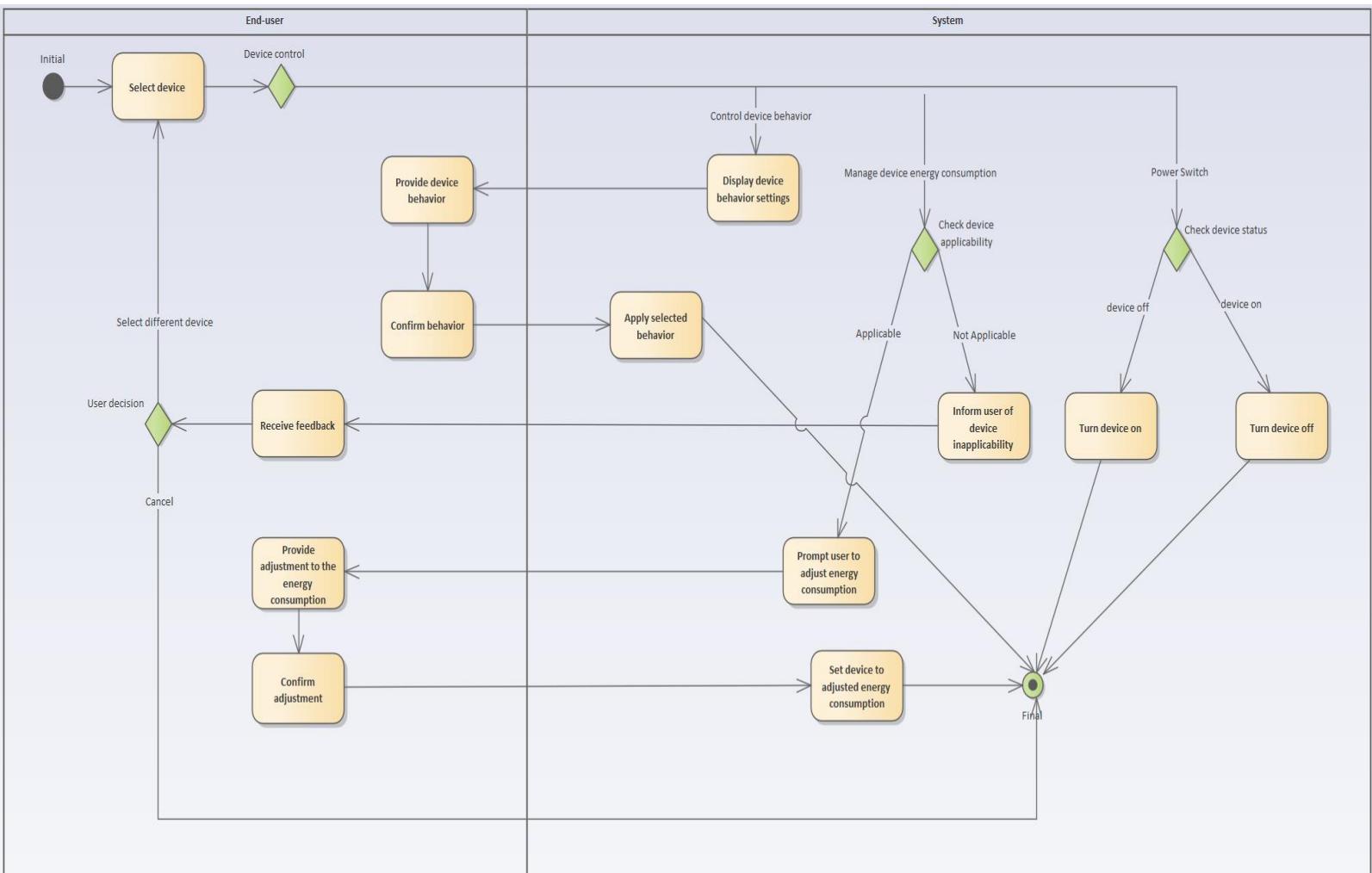


# Activity Diagrams

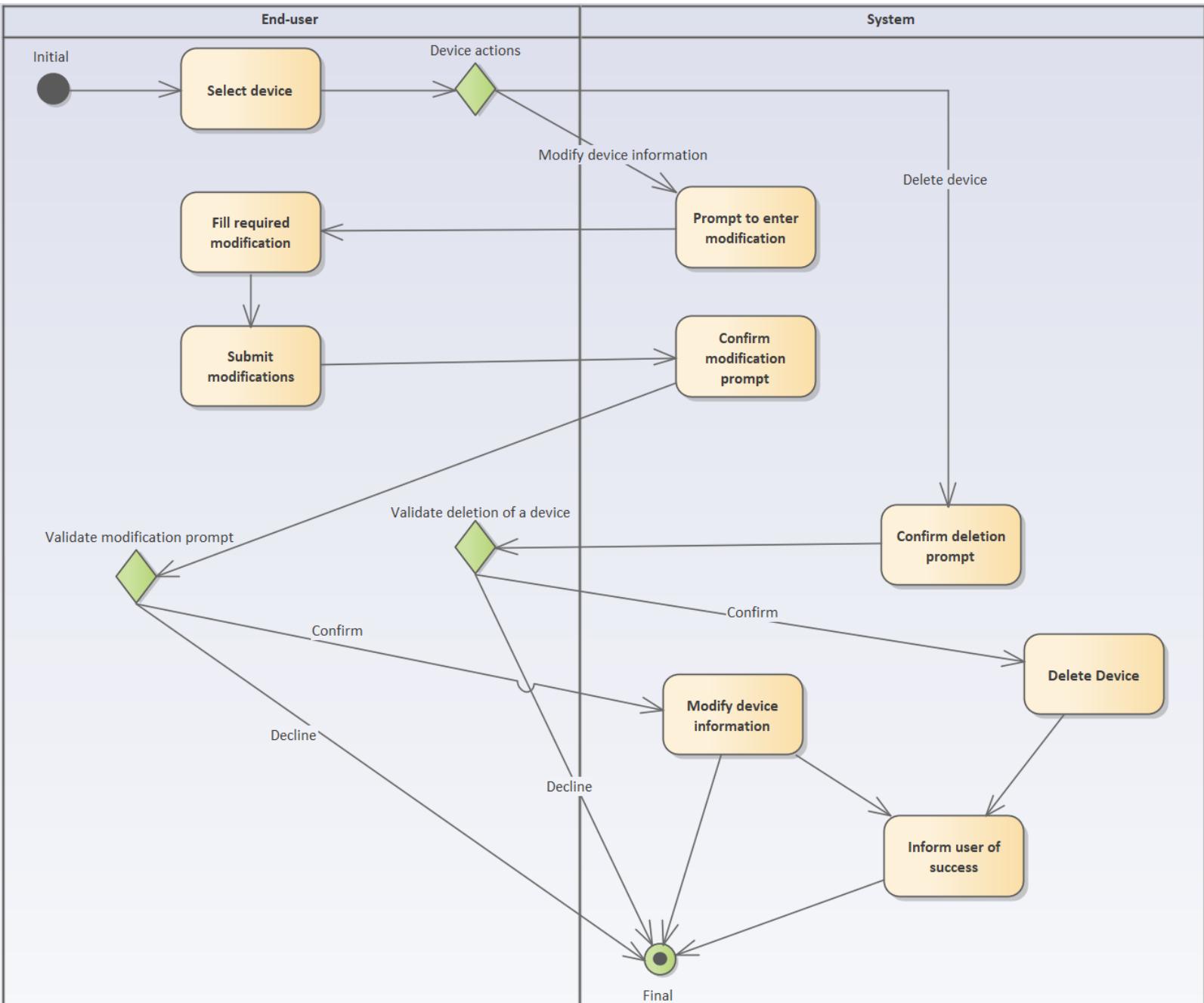
## Add New Device



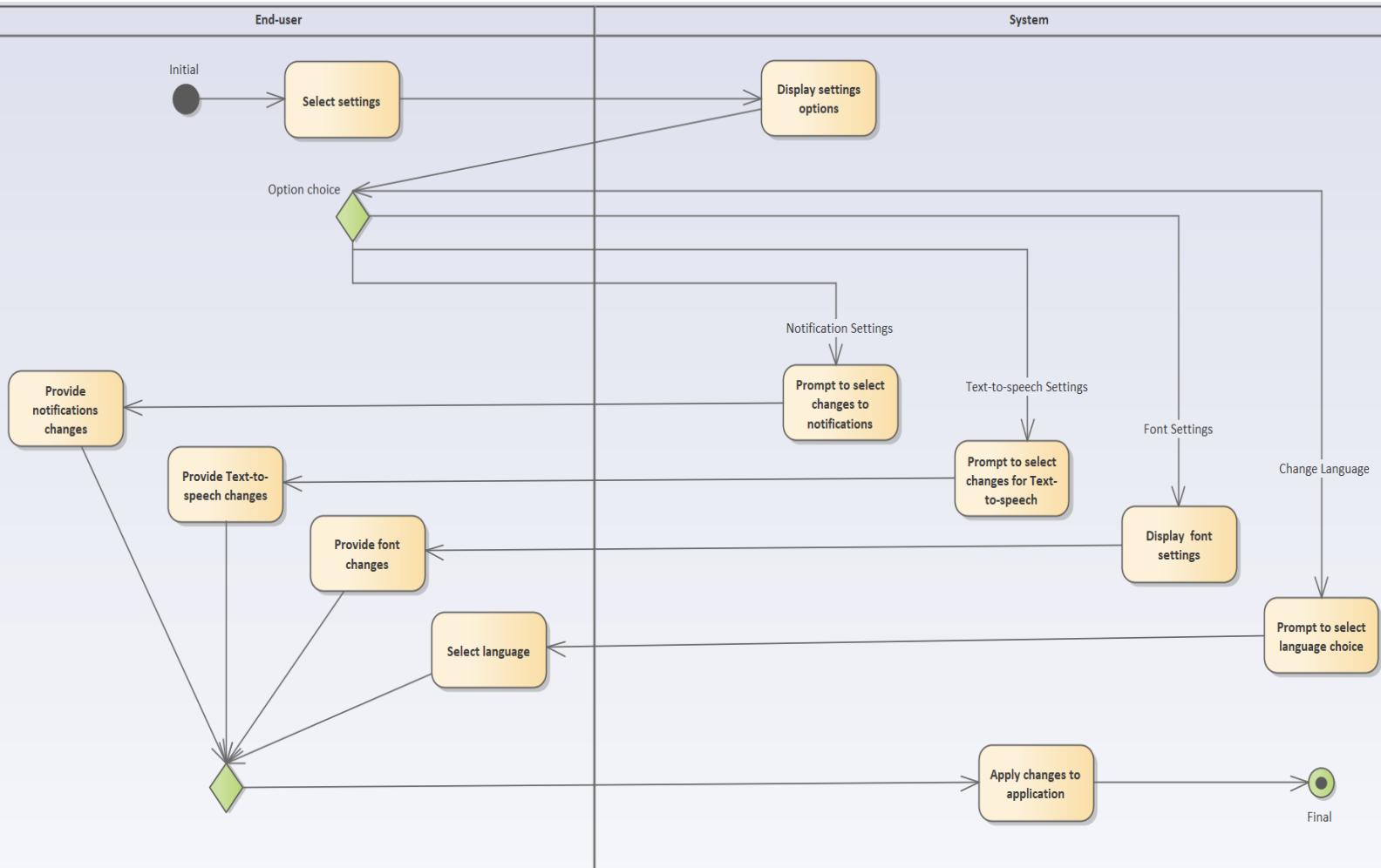
## Manage Device



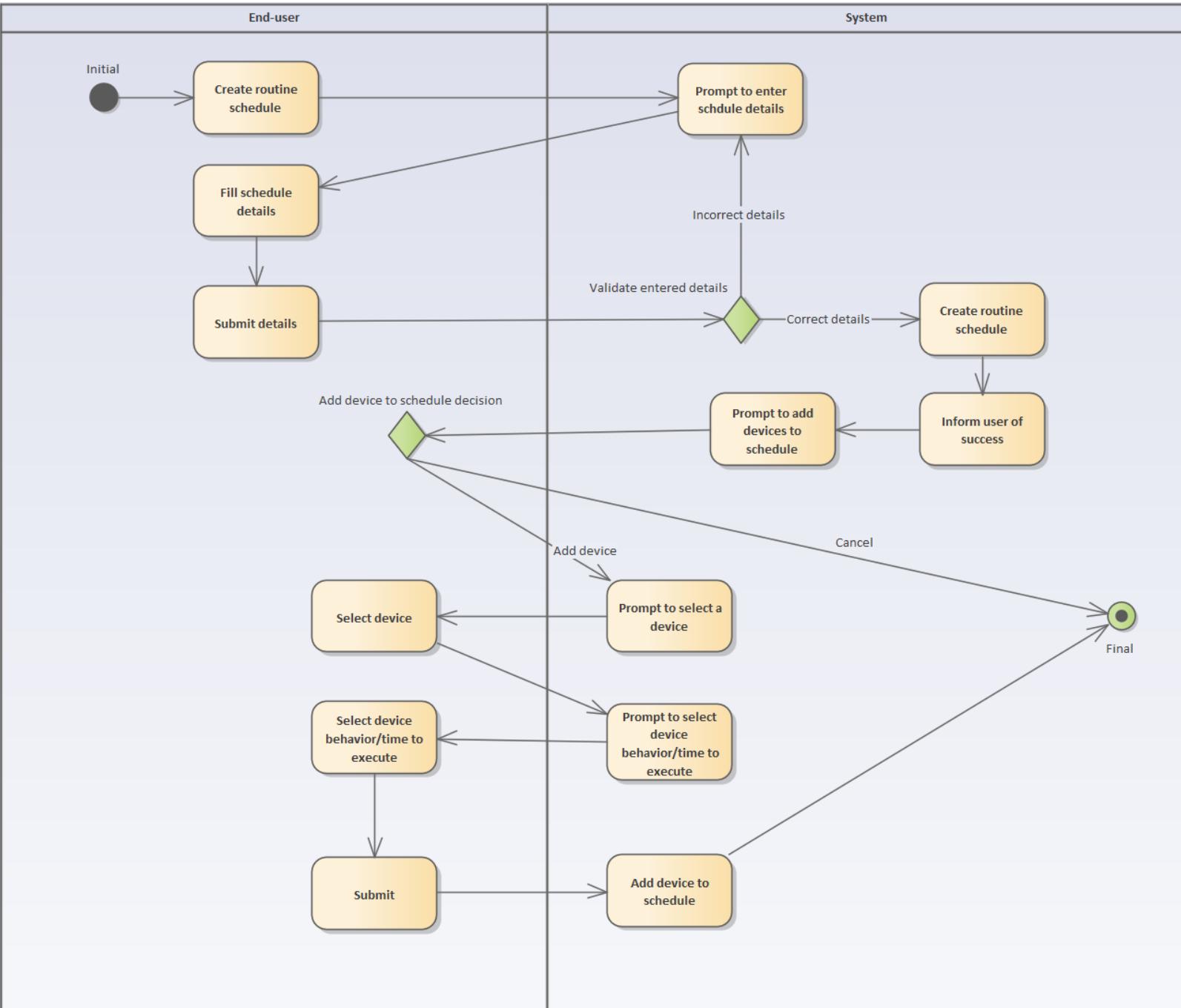
## Modify/Delete Device



## Manage Settings



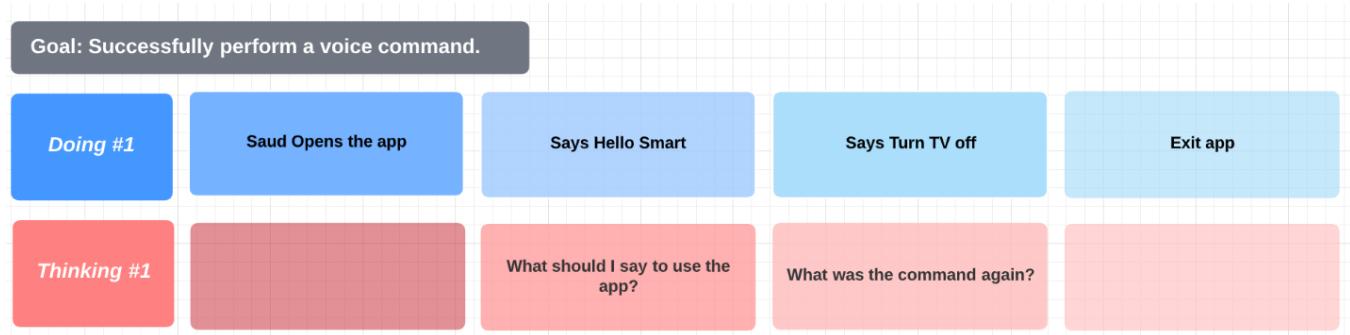
## Create Devices Routine Schedule



# Scenarios and Experience Maps

## Voice Command Scenario:

- The user says "Hello Smart" to make the device starts listening.
- Text to speech is then automatically turned on.
- The device asks the user about what he wants to do.
- The user says the command line.
  - The system lists the options to choose from (if there were any).
  - The user says the option name.
- The system tries to perform the task.
- The system notifies the user about whether the task was successfully performed or not.



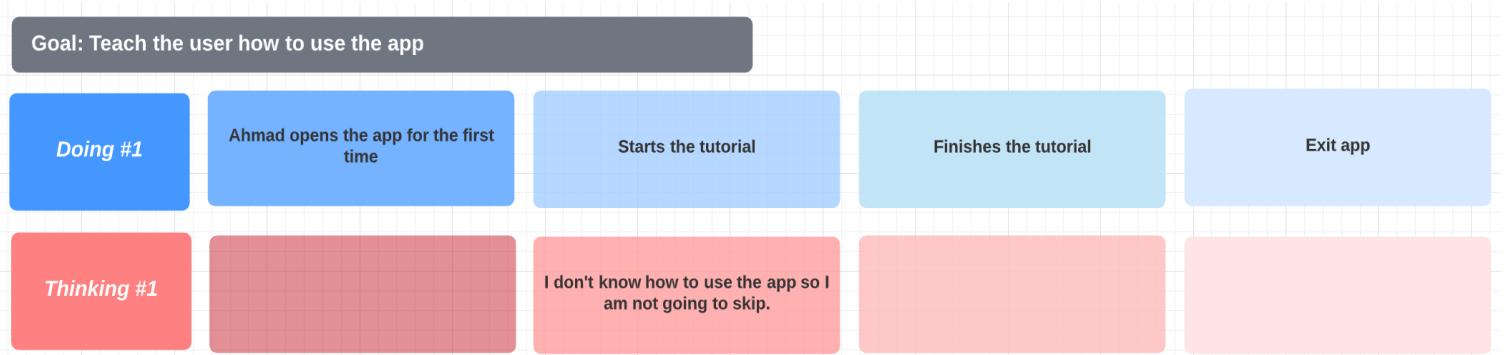
## Inform User about warranty Scenario:

- The user opens the app.
- A notification that says “warranty ends in less than 1 month” appears.
- The user chooses whether to hide the notification or snooze it.



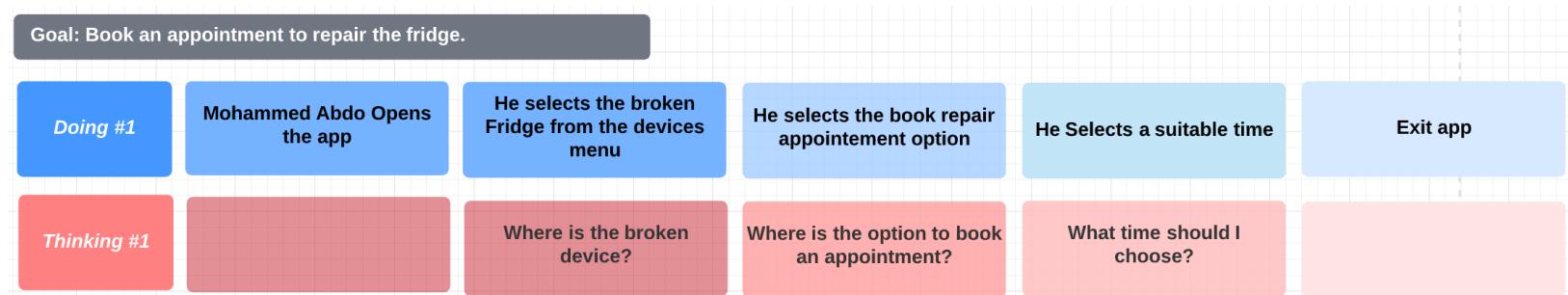
## Tutorial Scenario:

- The user downloads the app on his device.
- The user opens the app for the first time.
- Two options appear on his screen "Start the Tutorial" and "Skip"
  - The user clicks Skip.
  - The tutorial ends.
- The user clicks start the tutorial.
- The tutorial starts.
- The app gives the user a guide on how to use its functionalities.



## Book Repairing Appointment Scenario:

- The User opens the “Smart Home” application
- The User goes to the device’s menu.
- The User goes through the devices and choose the one that he wishes to repair.
- The User sees its information in the device’s information area along with other options.
- The User selects the “book repairing appointment” option.
- The User chooses the most suitable time for him.



## View Consumption Report (PC) Scenario:

- The User wants more detailed consumption report on his electric consumption last month, so he opens “Smart home” on his pc.
- The User selects the electric consumption option.
- The User sorts the consumption by month.
- The User can see the monthly consumption report and every smart device electric consumption in the selected month with detailed graphs.

Goal: See the consumption report on pc with more details.

Doing #1	Mohammed Abdo Opens the web app	He selects electric consumption option	He selects Sort by month	He checks the devices that consumes the most	Exit app
Thinking #1		Where can I find the option?	How can I see last month consumption?	How can I read this graph?	

## View Consumption Report (Mobile) Scenario:

- The User enters “Smart home” application on the phone.
- The User selects the Electric consumption option.
- The User sorts by date and chooses weekly.
- The User can see a brief consumption report.

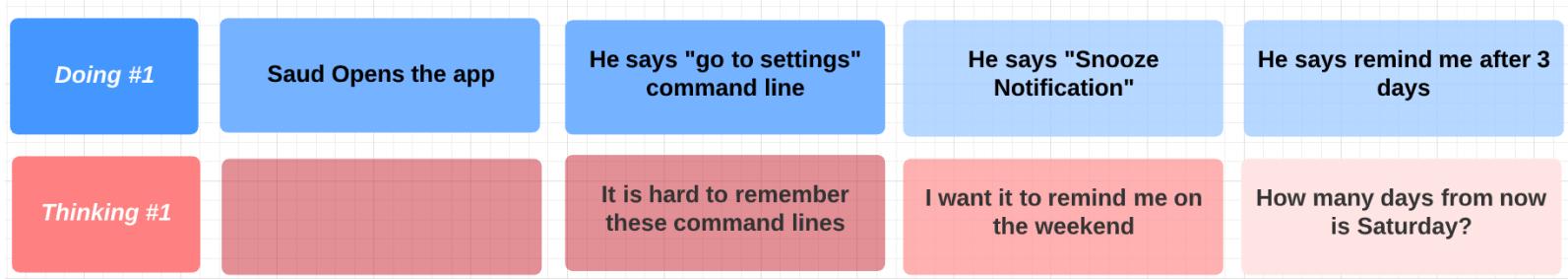
Goal: see the consumption report on phone with fewer details.

Doing #1	Mohammed Abdo Opens the app	He selects the devices menu	He selects the wanted device	He selects the electric consumption report option	Exit app
Thinking #1			Which device do I want to check?	How can I see the consumption?	

## Snooze Warranty Notification Scenario:

- The user opens the app.
- The user gets notified by text-to-voice that the warranty of his fridge is going to expire in one month.
- The User says “Hello Smart” to make the device starts listening.
- The User uses the voice commands to snooze the notification for 9 days.

Goal: To snooze the notification.



## Manage Energy Consumption Scenario:

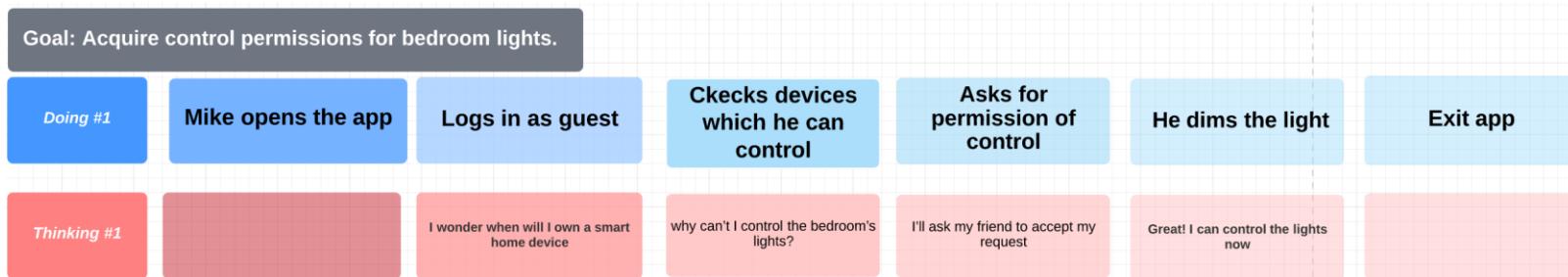
- The user opens the “Smart Home” application.
- The user goes to the devices’ menu.
- The user goes through the devices and choose the one that he wants to manage its energy consumption.
- The user sees information about the energy consumption of the device.
- The user decreases the energy consumption rate of the device.

Goal: Lower a device's energy consumption.



## Request Permission Scenario:

- The user opens the “Smart Home” application.
- The user logs in as a guest user.
- The user sees devices which he does not have access to.
- The user asks for permission to control a certain.
- The user controls the device after permission is granted from homeowner.



# Design Guidelines

## Jakob Nielsen's 10 Usability Heuristics of Interface Design

The principles	Questions to consider	Mark Complete
1. Visibility of system status	<ul style="list-style-type: none"><li>- How are you communicating the system status with the user?</li><li>- Are you presenting the user with feedback as quickly as possible?</li><li>- Is it clear and obvious enough for the intended audience?</li><li>- Does the user know which screen is he in currently?</li></ul>	<input checked="" type="checkbox"/>
2. Match between system and the real world	<ul style="list-style-type: none"><li>- How are you helping the user in relating the system to the real world?</li><li>- Can the user understand the meaning without looking up a word's definition?</li><li>- Are you avoiding internal jargons in your application?</li><li>- Do the interface elements resemble objects from the real world?</li></ul>	<input checked="" type="checkbox"/>
3. User control and freedom	<ul style="list-style-type: none"><li>- Will the user be able to undo and redo actions?</li><li>- Is there a clear way to exit current interaction with the system?</li><li>- Is the exit clearly labeled and discoverable by the user?</li><li>- Can the user easily navigate the application?</li></ul>	<input checked="" type="checkbox"/>
4. Consistency and standards	<ul style="list-style-type: none"><li>- Is the style of an element maintained across the application?</li><li>- Do all text have the same font (Roboto)?</li><li>- Are you using the same colors for all screens?</li><li>- Are the buttons positions the same in all application's screens?</li><li>- Is the mobile interface similar to the PC?</li></ul>	<input checked="" type="checkbox"/>
5. Error prevention	<ul style="list-style-type: none"><li>- Have you done everything to prevent this error from happening?</li><li>- Is the user presented with a confirmation option before committing to the action?</li><li>- If the user does make an error, how easy is it for them to fix it?</li><li>- Do buttons have enough space between them to avoid slips?</li></ul>	<input checked="" type="checkbox"/>

6. Recognition rather than recall	<ul style="list-style-type: none"> <li>- Does the user have to remember anything to understand what is going on?</li> <li>- How are you helping the user reduce recalling and promote recognition?</li> <li>- Are you offering the user in context help?</li> <li>- Are all elements, actions, and options visible to the user?</li> </ul>	<input checked="" type="checkbox"/>
7. Flexibility and efficiency of use	<ul style="list-style-type: none"> <li>- Who is this product designed for (Novice, Experienced)?</li> <li>- Are you offering shortcuts to tailor frequent actions?</li> <li>- Can the user customize the application to his liking?</li> </ul>	<input checked="" type="checkbox"/>
8. Aesthetic and minimalist design	<ul style="list-style-type: none"> <li>- Do the content and visual design help the user focus on the essentials?</li> <li>- Are you decorating interfaces elements moderately (simple)?</li> <li>- Are you using light colors to reduce the weight on user's eyes?</li> <li>- How are you prioritizing the content and features to support the primary goal?</li> </ul>	<input checked="" type="checkbox"/>
9. Help users recognize, diagnose, and recover from errors	<ul style="list-style-type: none"> <li>- How are you helping the user understand what went wrong?</li> <li>- Are offering the user a shortcut to solve the error immediately?</li> </ul>	<input checked="" type="checkbox"/>
10. Help and documentation	<ul style="list-style-type: none"> <li>- How are you helping the user understand how to complete their tasks?</li> <li>- Can the user easily find the help he requires?</li> <li>- Do tasks offer in-context help at the right moment?</li> </ul>	<input checked="" type="checkbox"/>

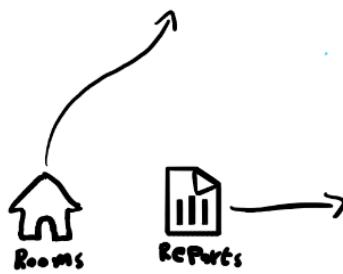
# Paper Prototype

Using a light bulb as a button icon for devices' menu because it's one of the most used electronic devices and one of the easiest to recognize.



Bottom Navigation

Using a house icon for the "Rooms" page might cause some confusion, however the word "Room" is written under it to clear that confusion. Using a Room icon would need an over detailed icon which goes against our minimalistic approach.



Using a simple report paper icon with graph on it for the consumption report page.

We chose the three buttons based on our expectations on the most frequent tasks to be performed.



# Devices



A simple + sign which complements the minimalist design to let the user add a new device



Light Bulb (Bedroom)

On



A title for each screen to show the user where he is currently at in the app

Power button changes color when pressed to indicate that the device is turned on or off

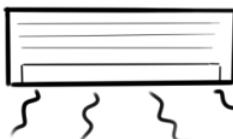


Tv (LivingRoom)

off



A written On/Off indicating the device's status in case the user finds difficulty in differentiating the colors of the power button



AC (Hall)

On



Devices



Rooms



Reports

Hamburger menu to hide the less frequently used tasks



Mohammed Abdo



⌚ Create a schedule



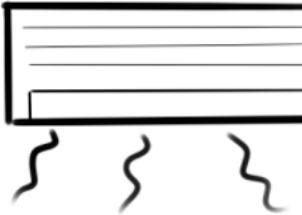
+ Add permission to guest

🔧 Settings



🔔 Notifications ①

📋 Terms & conditions



ⓘ About us

The tasks are sorted from most used to least used



Devices

<

## Settings

Change language



A toggle is used for tasks that have 2 states.

Text to Speech



Tasks with additional settings send the user to a different page

Font Settings

>

Snooze Notifications

>

## Guest Device screen



# Devices



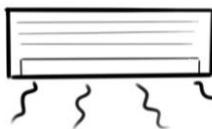
Light Bulb (Bedroom)

On



Tv (LivingRoom)

Off



AC (Hall)

On



Devices



Rooms



Reports

Display an error button to inform the user that he does not have permission and imply that he needs to click to get permission and fix the problem

After hitting the request button, a "Request Sent" label appears to improve visibility.

Remove the error message and replace it with the control button to indicate that the problem has been solved



# Devices

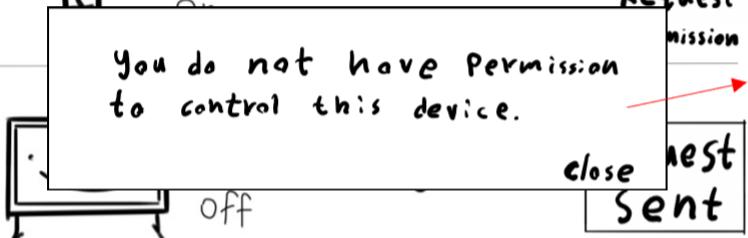


Light Bulb (Bedroom)

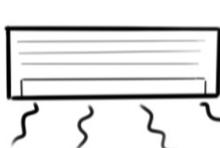


Request

mission



Display an error message when clicking a device without permission to help the user recognize the problem



AC (Hall)



Devices



Rooms



Reports

Page title written at the middle of the top section of the screen in every page to improve visibility and to keep the design consistent

Add device

**Add device**

Name  
Enter device name

Location  
Room

Model Number  
Enter model number

Warranty  
Enter warranty number

Manufacturer  
Enter manufacturer name

X Cancel      ✓ Confirm

Modify device info

**Modify device info**

Name  
Refrigerator

Location  
Kitchen

Model Number  
XXXXXX

Warranty  
XXX-XXX-XXX

Manufacturer  
XXX-XXX

Delete      ✓ Confirm

Unfocused text field have a greyer color while focused  
text fields have plain black color to improve visibility

Confirm and cancel buttons' positions are the same in every screen to keep it consistent

Change location

**Modify device info**

Name  
Refrigerator

Location  
Kitchen

Model Number  
XXXXXX

Warranty  
XXX-XXX-XXX

Manufacturer  
XXX-XXX

X Cancel      ✓ Confirm

Delete device/confirm deletion

**Modify device info**

Name  
Refrigerator

Are you sure that you want to delete this device?

Cancel      Delete

Manufacturer  
XXX-XXX

X Cancel      ✓ Confirm

A deletion confirm popup for error prevention

Different confirmation buttons than the ones at the bottom for improving visibility and making sure the user does not get confused between the

Delete button color becomes greyer after hitting it to highlight that it is the reason for showing the popup window

A back button for going back to the previous page exists on every page at the top left of the screen and a cancel button for canceling the process and going back to the main page to increase user freedom and control

Action name is written under the buttons to help user recognize the buttons and shorten memory load

# Report menu

Rooms are represented by tiles to improve visibility and to have a minimalist design.

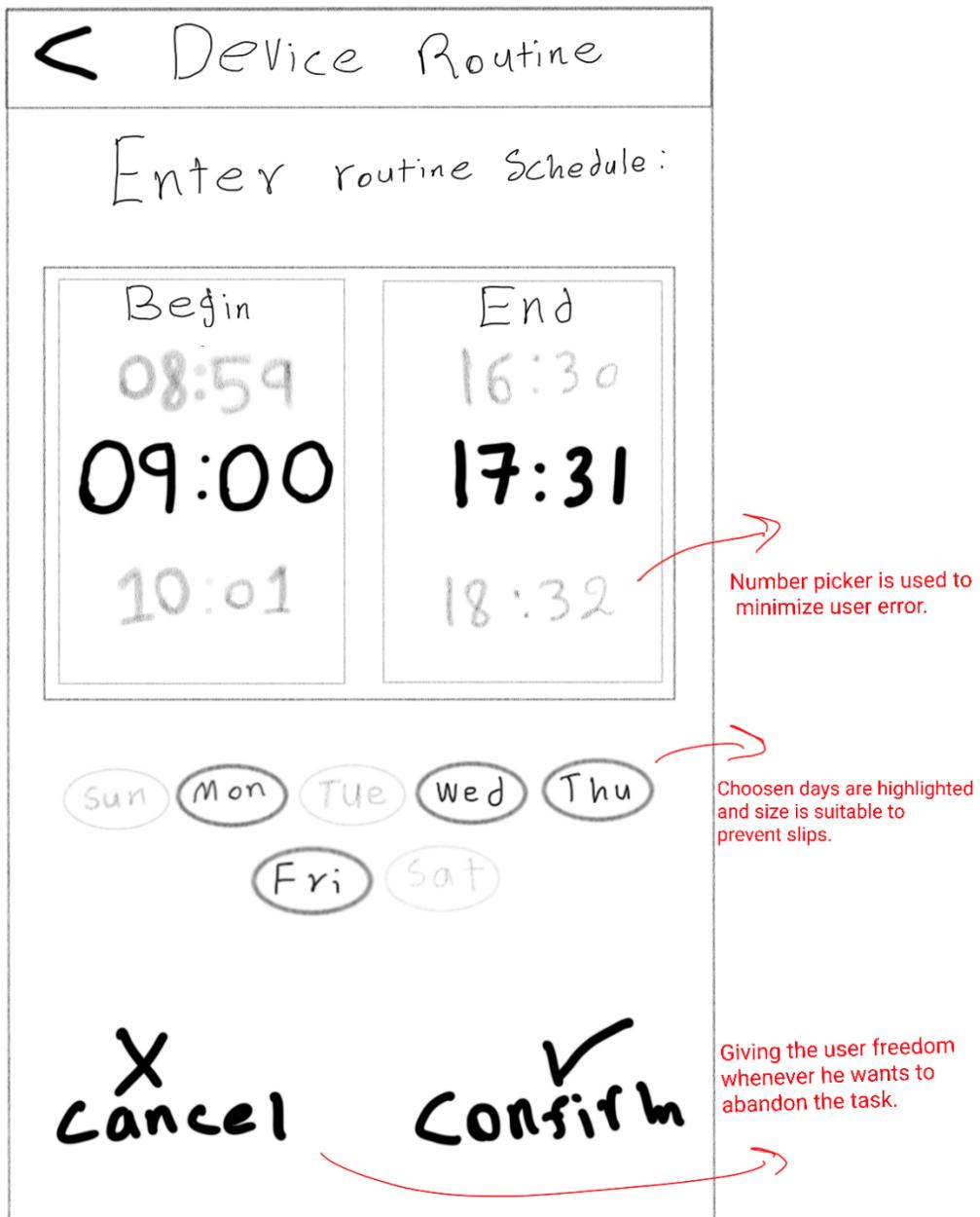
The image shows a hand-drawn wireframe of a mobile application interface for a 'Report menu'. At the top, there's a header with three horizontal lines on the left, followed by the word 'Reports' in a large font, 'Monthly' in a smaller font, and a dropdown menu icon with 'Max' and 'Min' options. Below this is a section titled 'Rooms' with a red arrow pointing to it from the top-left. This section contains six tiles representing different rooms: Kitchen, Main-Bedroom, Basement, Kids-Bedroom, Living Room, and Guest-Room. Each tile includes an icon, the room name, energy consumption in Kw, and cost in dollars. Below the rooms is a section titled 'Devices' with a red arrow pointing to it from the right. This section lists four devices: 1. Smart fridge in the Kitchen (55 Kw), 2. Smart Washer in the Basement (43 Kw), 3. Light Bulb in the Kitchen (20 Kw), and 4. Alexa in the Bedroom (10 Kw). At the bottom, there are three navigation icons: a lightbulb for 'Device', a house for 'Rooms', and a bar chart for 'Reports'.

Room	Icon	Kw	\$
Kitchen	Icon	122Kw	90\$
Main-Bedroom	Icon	110Kw	81\$
Basement	Icon	102Kw	75\$
Kids-Bedroom	Icon	87 Kw	60\$
Living Room	Icon	78 Kw	51 \$
Guest-Room	Icon	65 Kw	41 \$

Device	Room	Kw
1. Smart fridge	Kitchen	55 Kw
2. Smart Washer	Basement	43 Kw
3. Light Bulb	Kitchen	20 Kw
4. Alexa	Bedroom	10 Kw

Drop down menu used to hide info that is not essential to the user.

# Device routine time



# Device routine behavior

A hand-drawn wireframe of a mobile application interface. The top bar has a back arrow and the text "Device Routine". The main screen title is "Choose device". A dropdown menu is open, showing "Washing machine" with a checked checkbox. Below the dropdown is another title "Choose device behavior" and a list of four options: "Normal", "Whites", "Colors", and "Heavy duty". At the bottom are two buttons: "Cancel" with a large X and "Confirm" with a checkmark.

Device Routine

Choose device

Washing machine ✓

Choose device behavior

Normal

Whites

Colors

Heavy duty

Cancel

✓ Confirm

Drop-down menu to minimize errors and improve usability.

Name of the page so the user knows which page he is on

Here we have clear icons indicate the use of this buttons



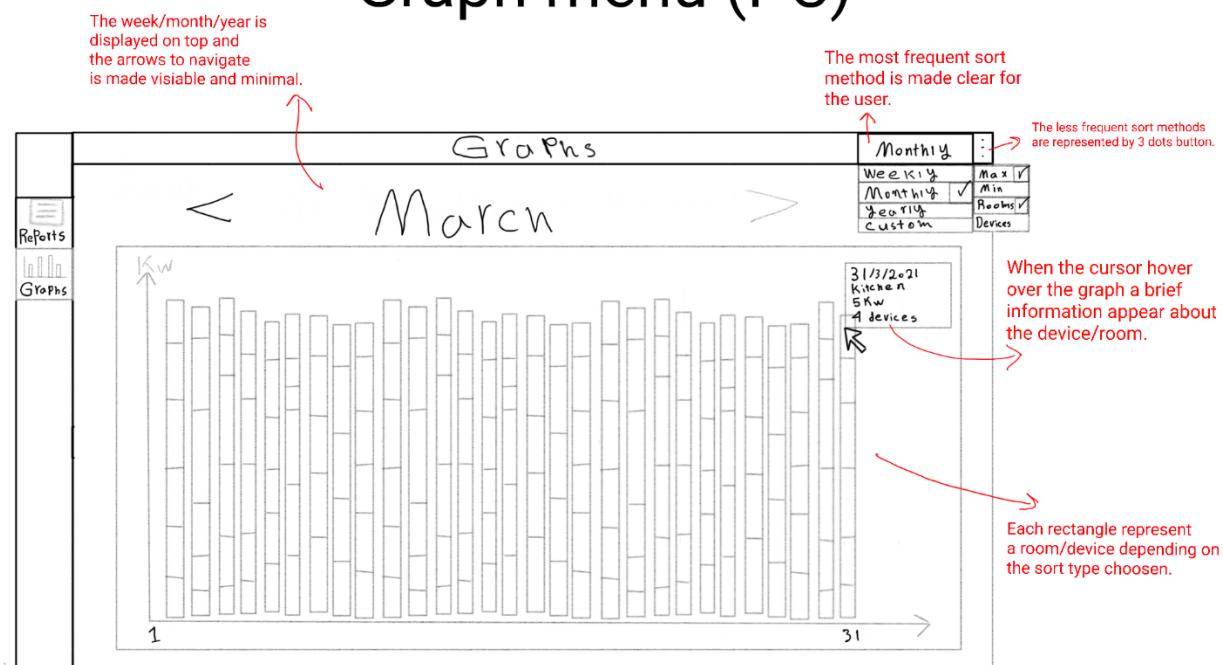


This button will appear when the user presses the delete button, then he can choose which room to delete.

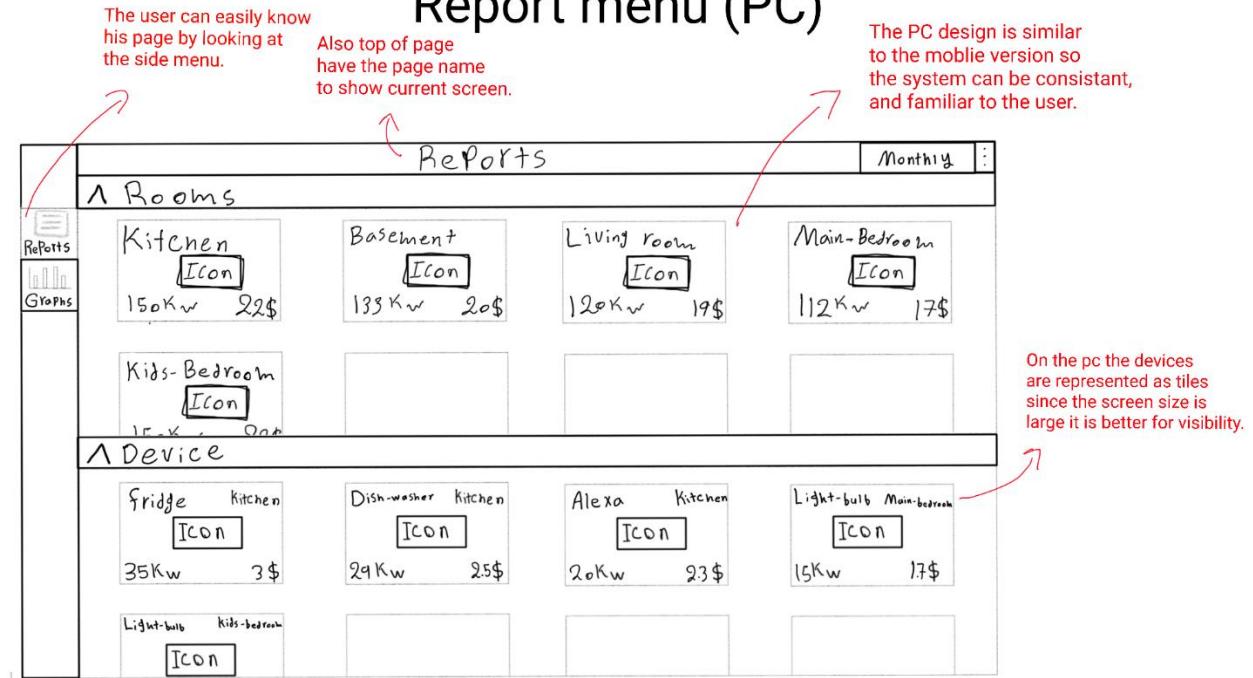


A text box will appear to The user so he can confirm the Decision that he made or cancel it. This is to prevent errors like deleting a room by mistake

# Graph menu (PC)



# Report menu (PC)



# Device consumption

Screen status is clear and the back button is available for the user.

Device Consumption

Room: Kitchen.  
Device: Philips-213  
Power consumption: 5w

This week:  
12.5 \$

Light bulb

Representation of the real world object.

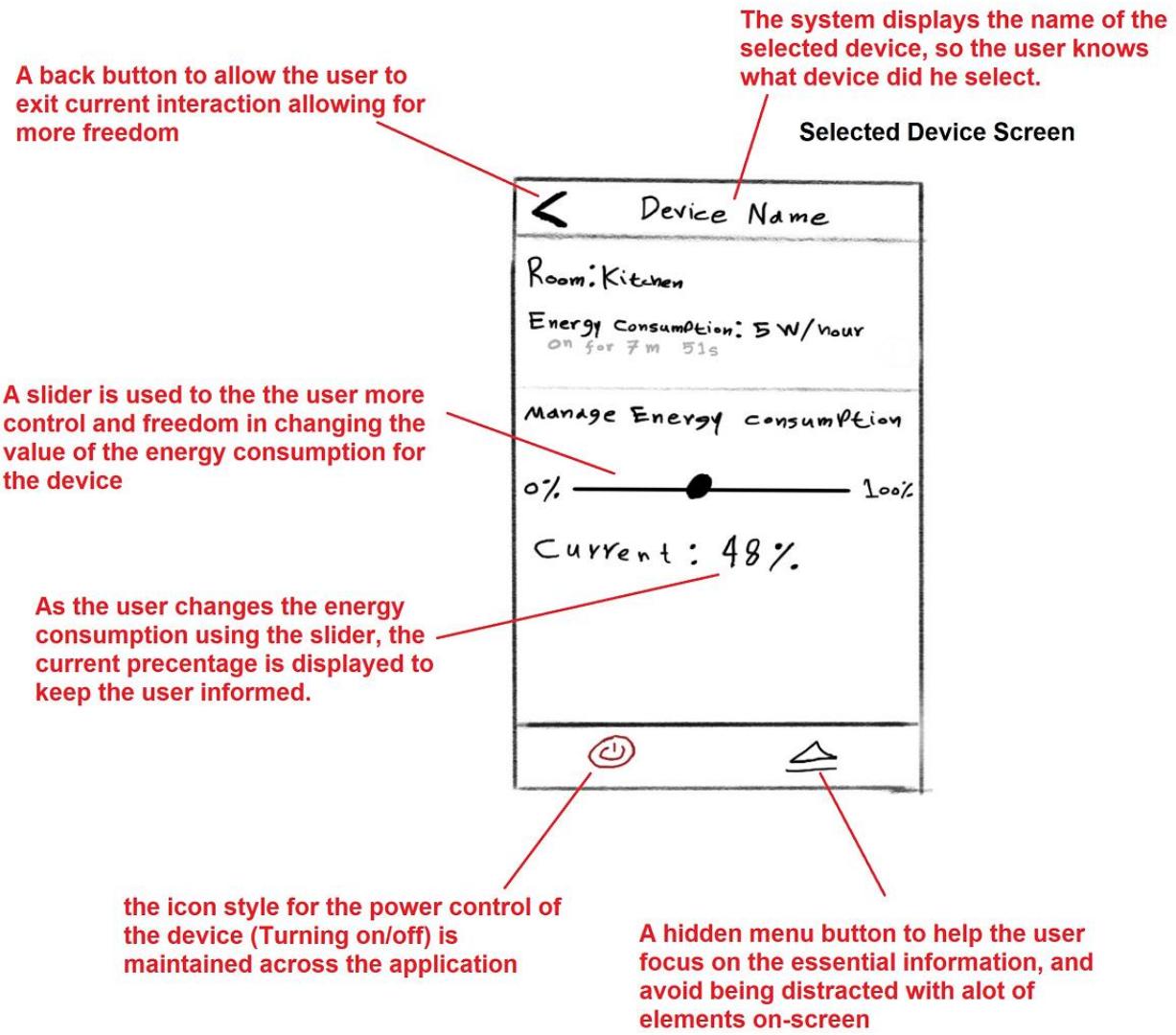
This week cost of the device consumption

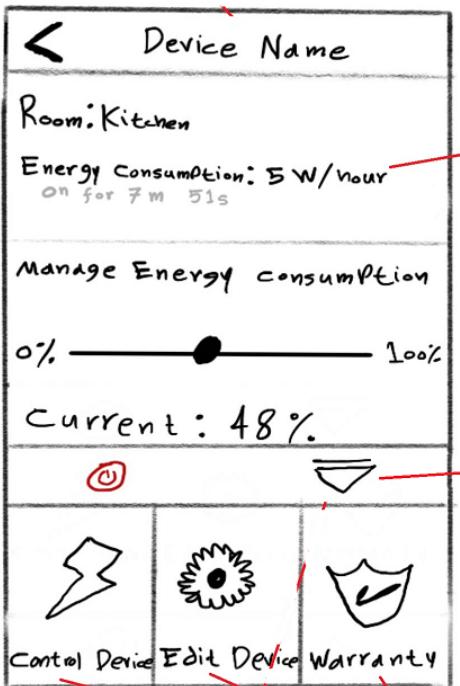
< 21-27 March >

Arrows are minimal and visible to the user so he can navigate between the weeks.

A bar chart showing energy consumption over time. The Y-axis represents hours (4H, 8H, 12H, 16H, 20H, 24H) and the X-axis represents dates from 21 to 27 March. The bars show a fluctuating pattern of consumption.

Date	Consumption (Hours)
21	12H
22	8H
23	22H
24	18H
25	12H
26	14H
27	9H





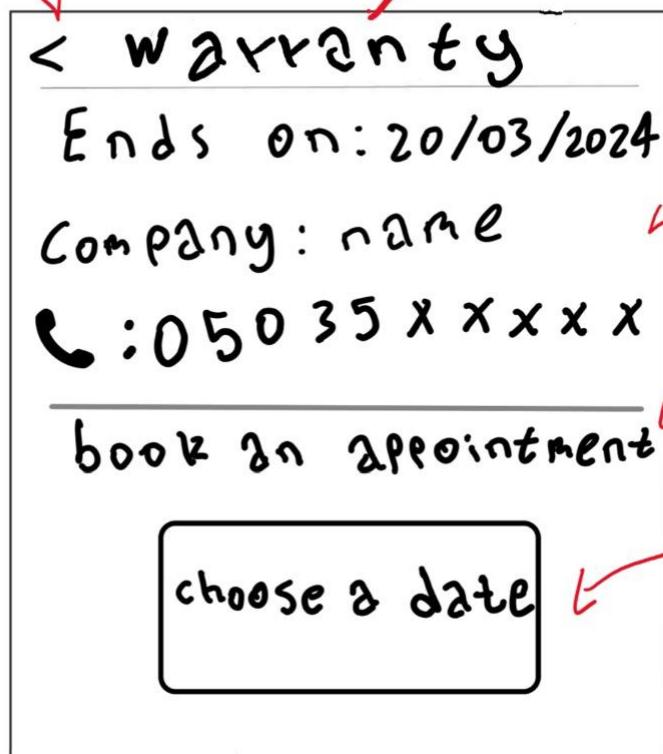
Convert selected percentage value of the energy consumption to real world unit terms (Watt per hour) (Based on the selected device power). Helping the user understand the system more.

Unhidden options

Simple wording is used to help the user in understanding the meaning without having to look up a definition

A button to go back to the previous page  
So the user can navigate back.

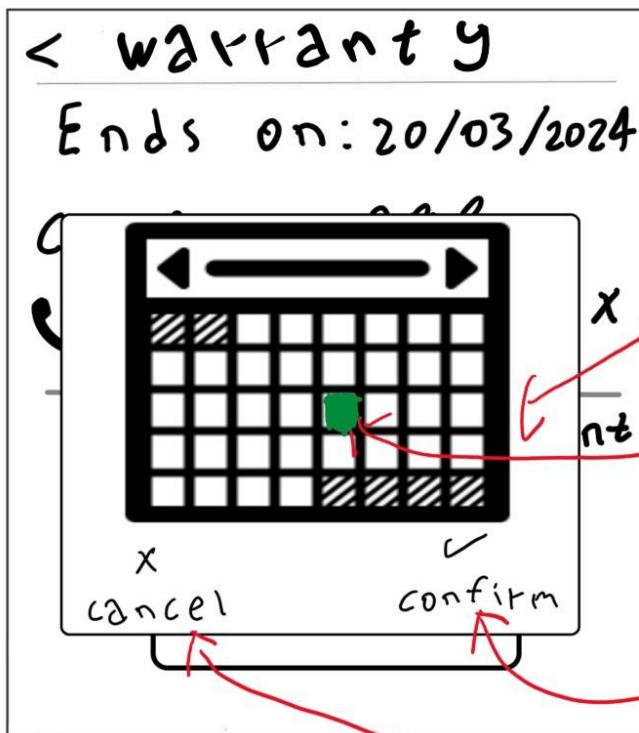
Name of the page in the top center of the screen, so the user knows the page he is on.



Info of the warranty are clear and in the Center of the page.

This line is to divide the page to two parts.  
Each part got its own use.

A big button with a text inside to inform the user about the function of the button.



When the user press the "pick an appointment Button", a calendar will appear with the available days to book, when the user picks a date a green block will be placed on the day he picked, this is to prevent errors and the user can make sure which day he picked.

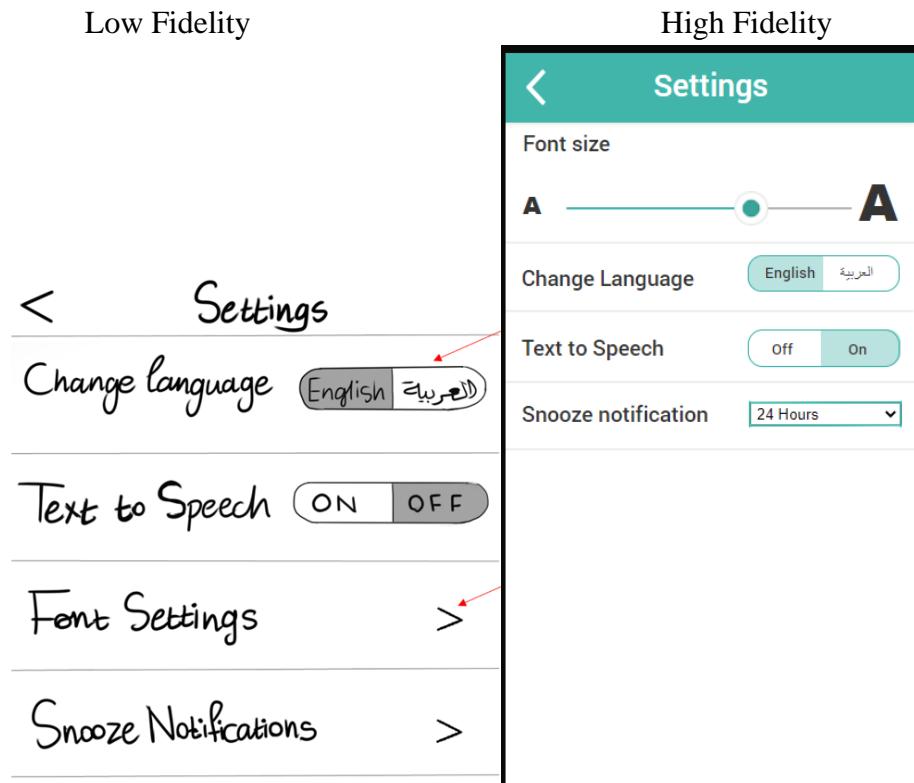
After the user picks a date he can confirm the date or cancel it and go back the warranty page

## Updated Guidelines (Phase 3)

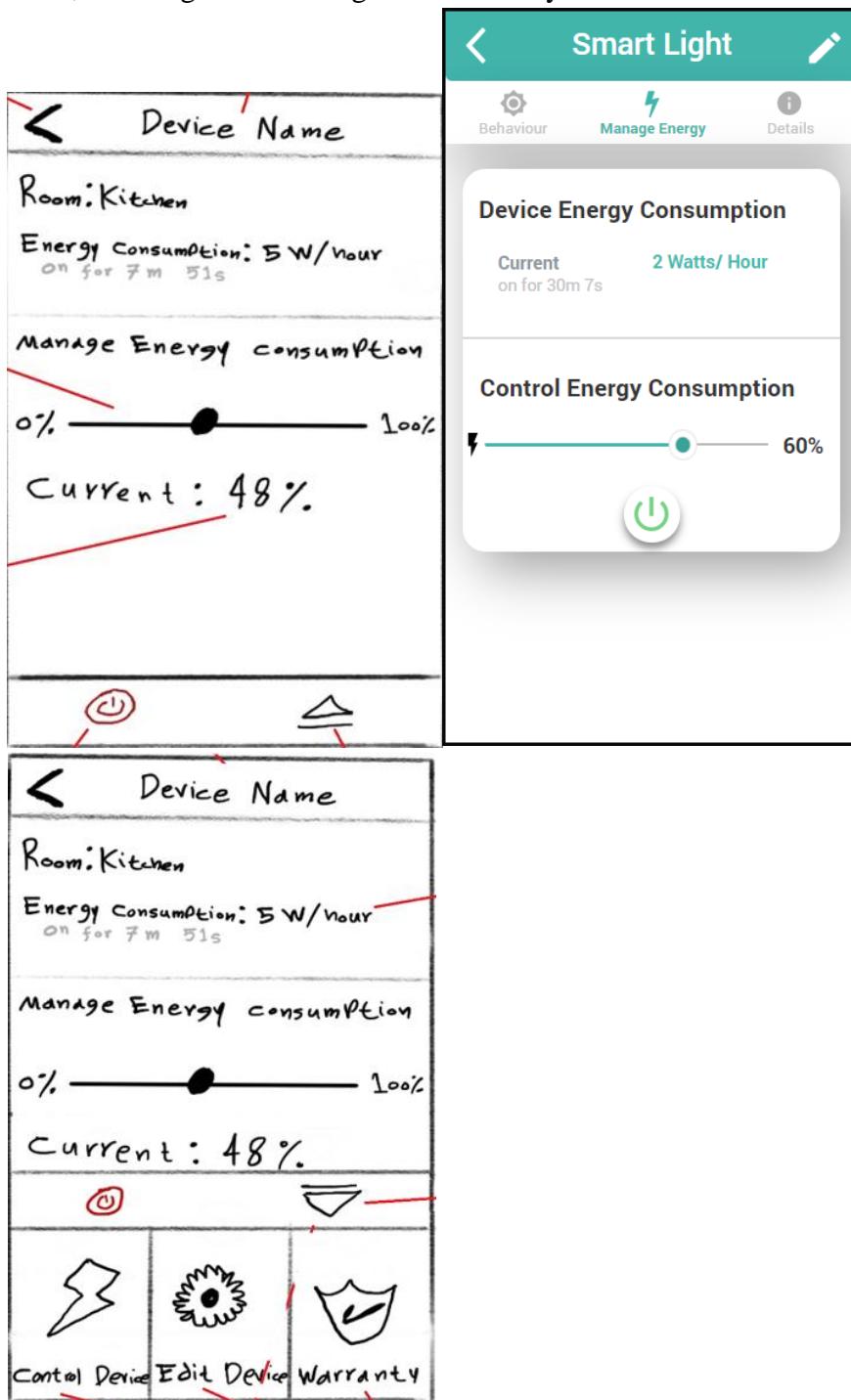
In this phase, for designing our high-fidelity prototypes, our original guidelines that were discussed in phase 2, did not change. However, we can go into more details for our high-fidelity prototypes, and discuss the font, colors, buttons, images, and interaction styles that were used to design it.

We have changed some elements in the high-fidelity prototypes that were present in the initial low-fidelity prototypes

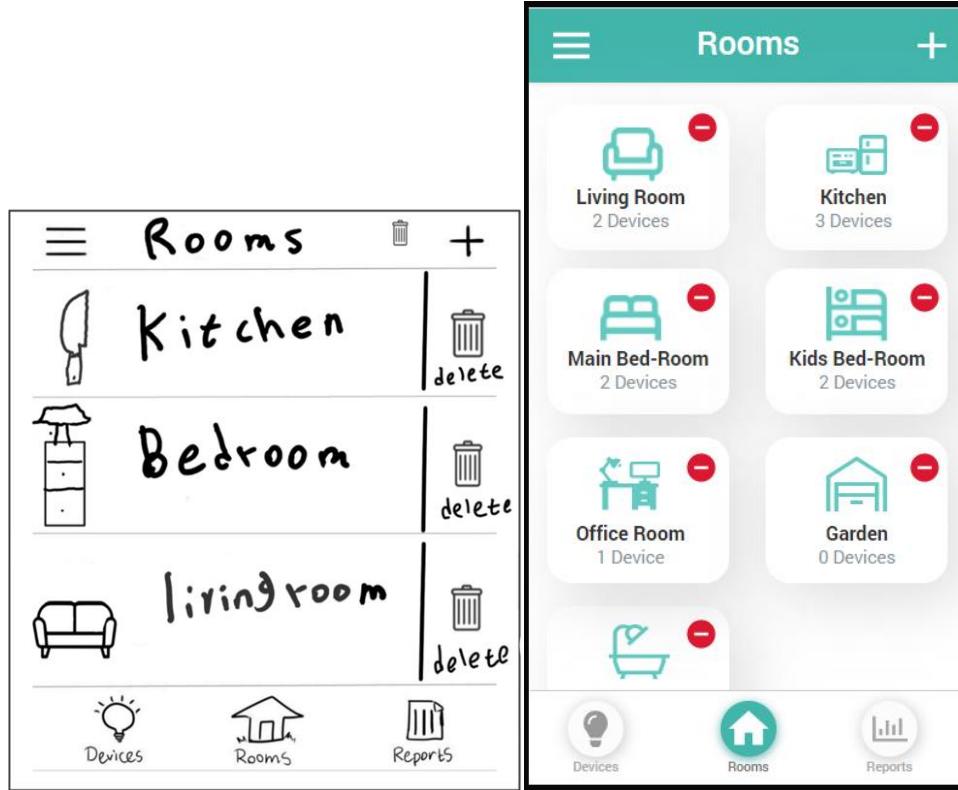
- We decided to present the user with all the options in the same screen, and he can freely adjust them, and the option will take effect immediately.



- Instead of having the option hidden, they are now visible to the user all the time, allowing him to change screens freely.



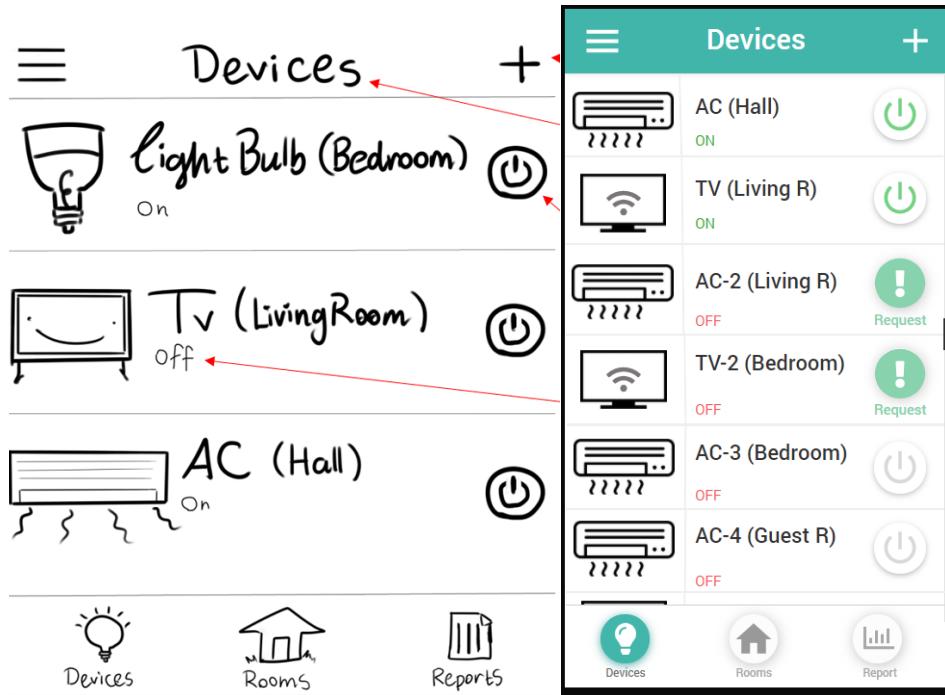
- For the Rooms screen, all the rooms that the user have added are displayed in squares instead of rectangles. This saves a lot of space and makes it easier to locate the rooms that have been added. Moreover, we changed the icon for deleting a room, and made it simpler and more familiar to the users.



- The buttons in the high-fidelity prototypes are now changed, and are easy to differentiate, thanks to the added colors. Therefore, we have removed the icons that were in the low fidelity. In addition, we have made it so the “Confirm” button received the focus, by coloring it with the primary color. And the “Cancel” button has the less focus.

Low-Fidelity Sketch (Left)	High-Fidelity Prototype (Right)
<b>Name</b> Enter device name	<b>Name</b> Enter device name
<b>Location</b> Room	<b>Location</b> Room
<b>Model Number</b> Enter model number	<b>Model Number</b> Enter model number
<b>Warranty</b> Enter warranty number	<b>Warranty</b> Enter Warranty number
<b>Manufacturer</b> Enter manufacturer name	<b>Manufacturer</b> Enter manufacturer number
<b>cancel</b>	<b>Confirm</b>

- We have added colors that indicates the status of the device. Now if the device is in “On” status, the button will be in a green color. On the other hand, if the device is in “Off” status, the button will be in a gray color. This will make it easy for the user to know which status the device is currently in.



## Style Guidelines

01. Colors

02. Typography

03. Iconography

04. Textfields

05. Selectors

06. Buttons

### 01. Colors



Primary  
#2BB5AB



Black  
#333333



Gray 1  
#AAA8A8



Gray 2  
#C4C4C4



Request/Success  
#6BD280



Confirm/Error  
#B52B2B



White  
#FFFFFF

### 02. Typography

**Roboto**

JustInMind Fonts

Regular

Medium

**Bold**

### 03. Iconography



## 04. Textfields

Textfield with prompt

Filled Textfield

## 05. Selectors

Brightness Slider

Energy Slider

Font Slider

HUE Color Slider

Toggle Buttons

Time Selector

Day Selector

## 06. Buttons

Form Fill-in Buttons

Alerts/Confirm Buttons

Quick action buttons

## Fully interactive mobile UI

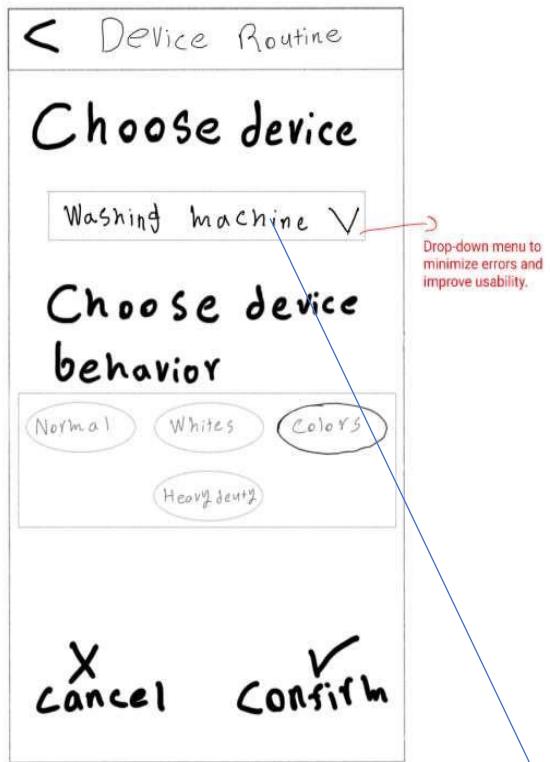
<https://www.justinmind.com/usernote/tests/51686047/51904689/51904691/index.html>

## Web sample interactive UI

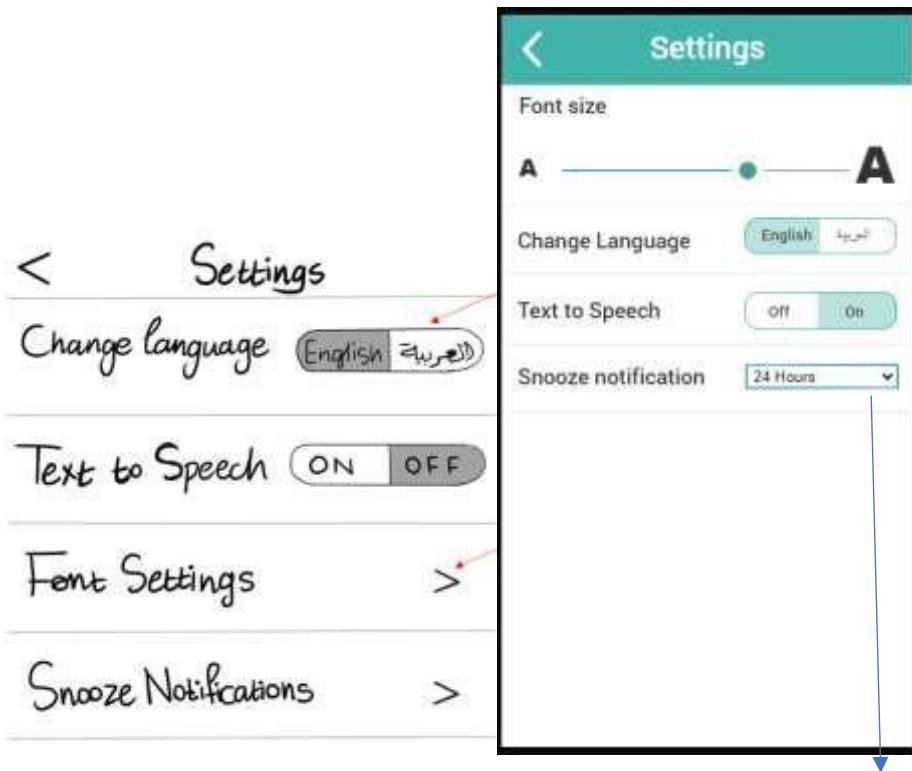
<https://www.justinmind.com/usernote/tests/51686047/51904719/51904721/index.html>

## Team 10 Evaluation to OUR TEAM (PHASE 4)

Device routine behavior

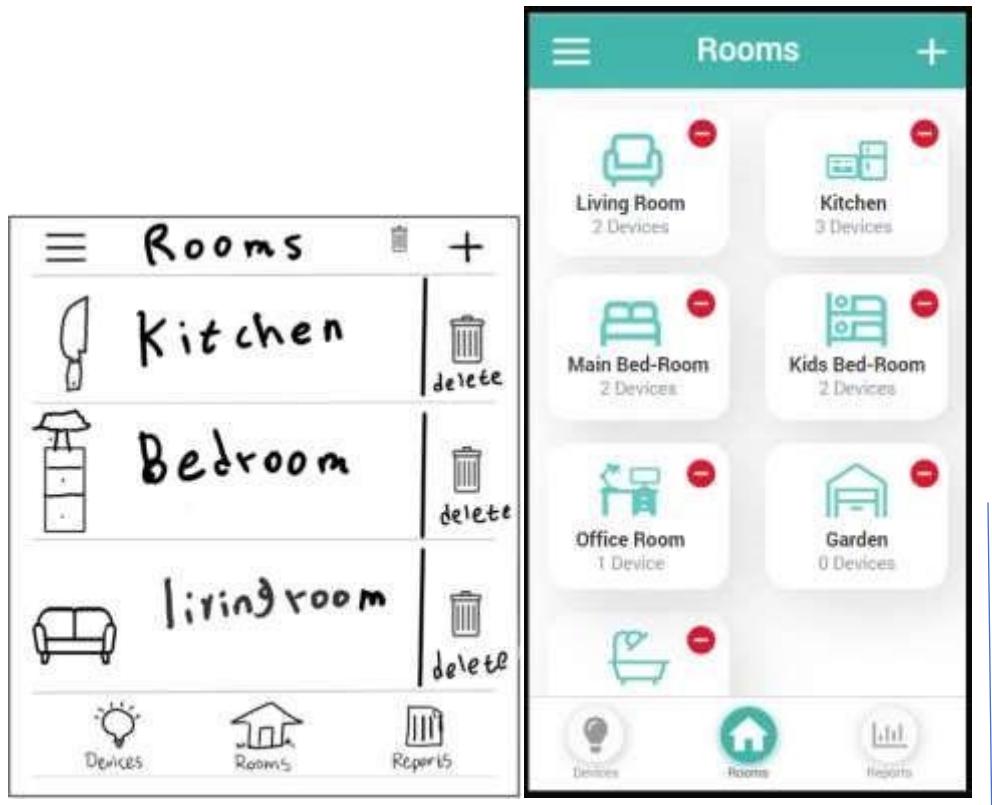


**Unclear device belongs to which room**



**"The user will have the option to snooze this notification to any period of time in multiples of 24 hours."**

**It is better to use a DatePicker for this function.**



**The delete icons should not be visible all the time to prevent mis clicking.**

## Evaluation of Team 12 (Phase 4)

### 1- Evaluation Strategy

The strategy that will be conducted on evaluating team 12 prototypes is Guidelines Review. Team 12 interface will be checked for conformance with the documented guidelines that they have provided in their phase 3. Our team will be checking if they have upheld all the guidelines that they have provided. In addition, our team will also provide comments on the design decisions made by Team 12.

### 2- Evaluation of Guidelines provided by Team 12

- + The principle of minimizing scrolling down is upheld. As all important items are displayed and does not require the user to scroll down (ps. There is no known guideline with the name minimizing scrolling down as far as we know).
- + Elements and icons used are familiar for the user, as they are widely used in different applications.
- + The user is in control in navigating the application through the “Menu Bar” at the bottom of the page. As he can freely move between main functionalities of the application

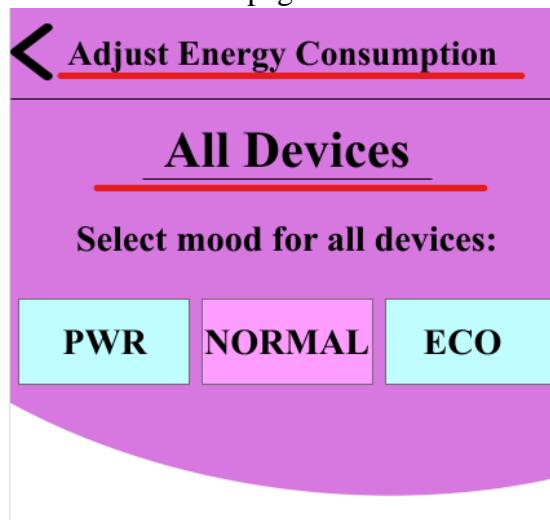


- + From the Visibility of the system status principle, the title of the screen is used to communicate which screen the user is currently. Thus, helping the user in not getting lost.

- Even though the user is provided with a clear way to return from current interactions through “Back Arrow”. There are no ways of error preventions for the user. In the screen below, no confirmation prompt is shown to the user when he taps the save button, confirmation prompts are necessary when editing info because unintentional slips may happen, and the user needs to be able to undo his actions.



- Font sizes are not consistent, some subtitles are larger than the title of the page. Also, some labels in the same page have different font sizes.



- Wrong usage of UI elements. To illustrate, the “Kebab Menu” button navigates the user to a different page in the app instead of displaying a menu in the same page which violates consistency and standards guideline of that element.
- Color combinations used for some text and backgrounds in the app are extremely incompatible, which makes the text hard to read, especially for people with slight color blindness.



### 3- Result of the Evaluation

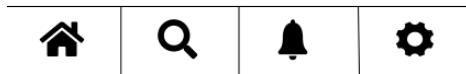
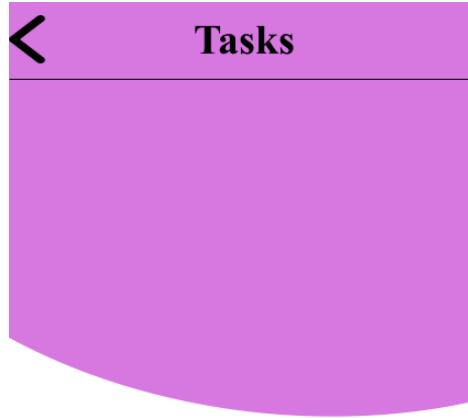
Concluding the evaluation of Team 12 design guidelines. They have not followed their guidelines completely, as they have violated several of the provided guidelines mentioned above.

*Note: (+) mark means the guideline is achieved, while (-) mark means the guideline is violated*

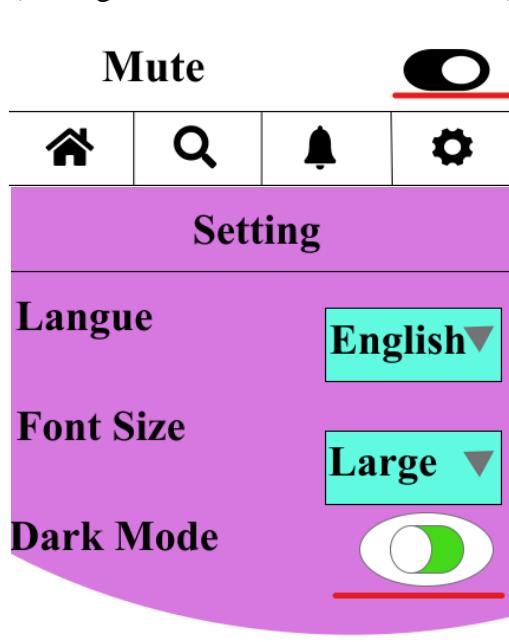
## 4- Comments on Guidelines and Design Decisions

As team 12 have only provided a few guidelines to be evaluated, we have decided to use our own guidelines to evaluate their provided prototypes.

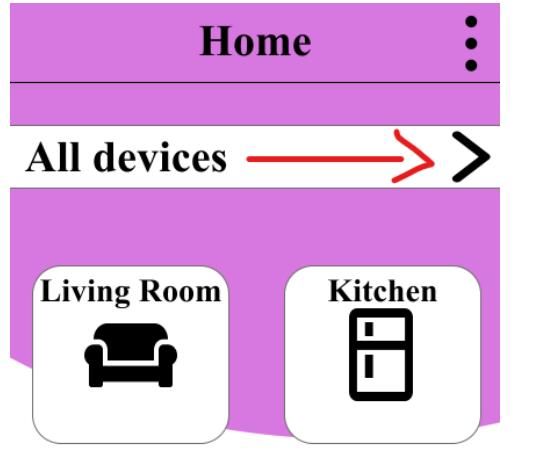
- The principle of User Control and Freedom is violated, as the “Edit Device” Button does not allow the user to select the device to be modified. Instead, it takes him to the edit screen straightaway.



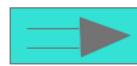
- The consistency in style of elements for the radio buttons used is violated. As there are two different radio button styles used, and with different colors.  
(Settings Menu and Notification Menu)



- Another violation of style of element consistency, is the style of arrows used for both “Settings Menu” and “Home Menu”. Both elements are supposed to provided the same functionality, which is transferring to the next page. But their style is completely different.



**See Energy Consumption**



**Adjust Energy Consumption**



**View Report List**



- It is not clear which icons are buttons and which are not. For example, the pie chart contains clickable content. However, it is not clear for the user whether he can click on it or not. Thus, violating visibility of system status principle.



- Some screens are cluttered with unnecessary objects which violates Aesthetic and Minimalist principle. Even though, it could be displayed in separate screens. (Report List should only display the energy consumption of the devices and nothing else)

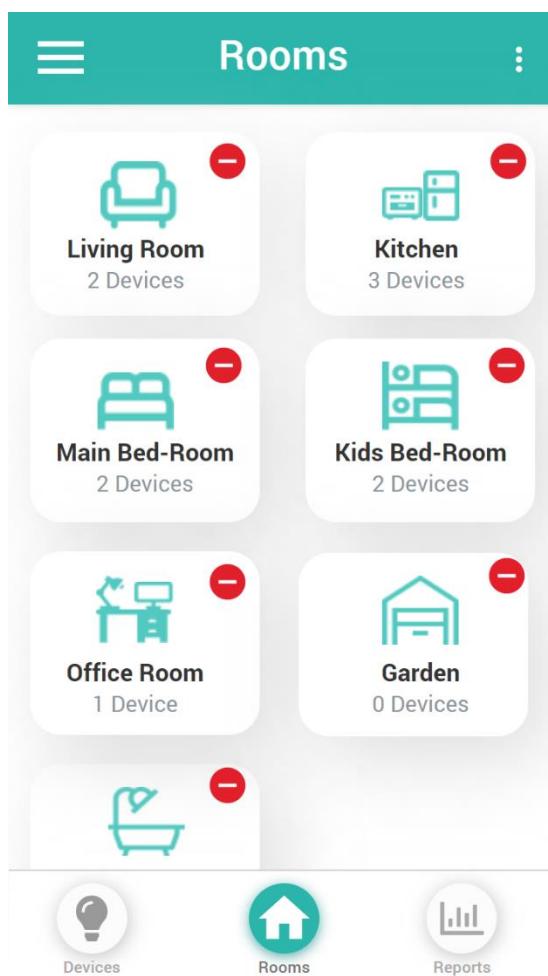


## Improvement of software prototype (Phase 5)

We have made some changes to our prototypes from the feedback that we received in phase 4 from Team 10.

- For the Rooms Menu, in phase 3 the delete icon for the room was always on screen for the user, this can cause some mis-clicks when the user is trying to click on the room. We changed it so it only appears when the user selects the option to “Delete Room” from the kabab menu on the top right.

**Phase 3**



## Phase 5 Changes

The image displays two side-by-side screenshots of a mobile application interface, likely for managing a smart home or office environment. Both screens feature a teal header bar with the word "Rooms". Below the header, there is a grid of six room cards:

- Living Room**: 2 Devices. Contains an icon of a sofa.
- Kitchen**: 3 Devices. Contains an icon of a kitchen cabinet.
- Main Bed-Room**: 2 Devices. Contains an icon of a double bed.
- Kids Bed-Room**: 2 Devices. Contains an icon of a single bed.
- Office Room**: 1 Device. Contains an icon of a desk with a computer.
- Garden**: 0 Devices. Contains an icon of a house.

At the bottom of each screen are three circular navigation icons: "Devices" (lightbulb), "Rooms" (house), and "Reports" (bar chart).

In the first screenshot (left), a context menu is open over the "Kitchen" room card, showing "Add Room" and "Delete Room" options. The "Delete Room" option is highlighted.

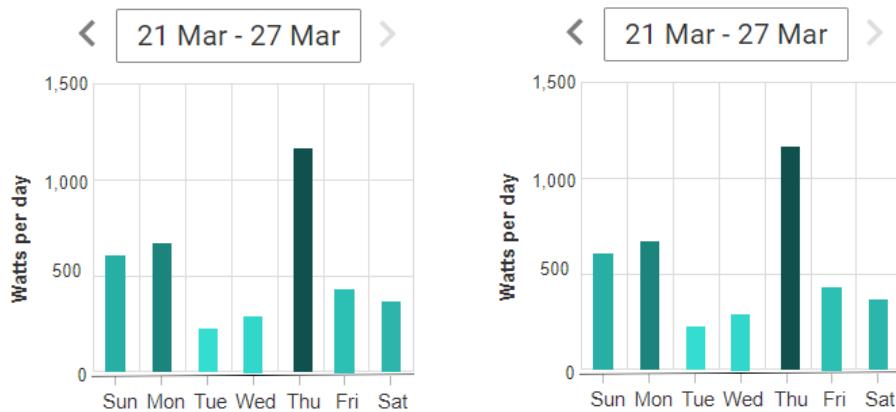
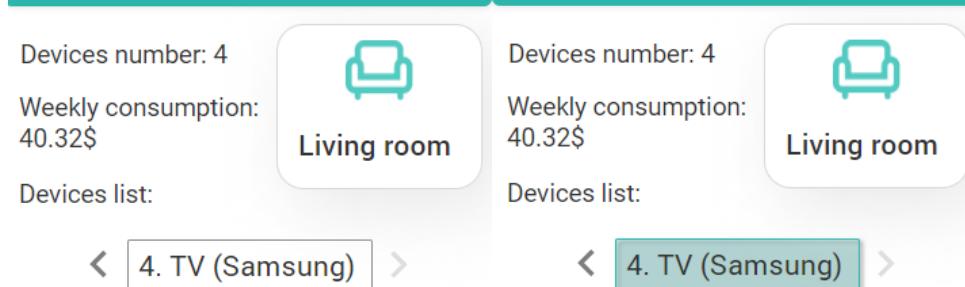
In the second screenshot (right), the "Kitchen" room card has a red minus sign in its top right corner, and the "Garden" room card also has a red minus sign, indicating that both rooms have been deleted.

- Another change was for the detailed report of the Room consumption report. It was not clear that the device list contains clickable button. We have changed the color so it is clear for the user that it can be clicked on.

**Phase 3**

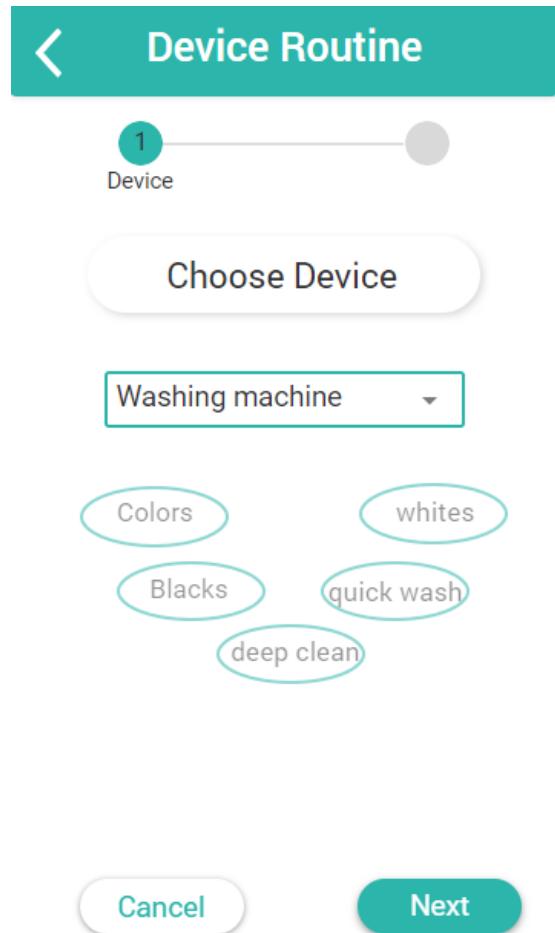


**Phase 5**



- For the functionality of creating a schedule we have made it so the user has to select the room he wishes to select a device from, then a drop-down list with all the devices in the selected room will appear.

### Phase 3



## Phase 5

### Create a schedule

1 Device

Choose Device

Select a room ▾

Storage

Washing Machine ▾

Colors

Whites

Blacks

Quick wash

Deep clean

Cancel

Next

### Create a schedule

1 Device

Choose Device

Storage

Washing Machine ▾

Colors

Whites

Blacks

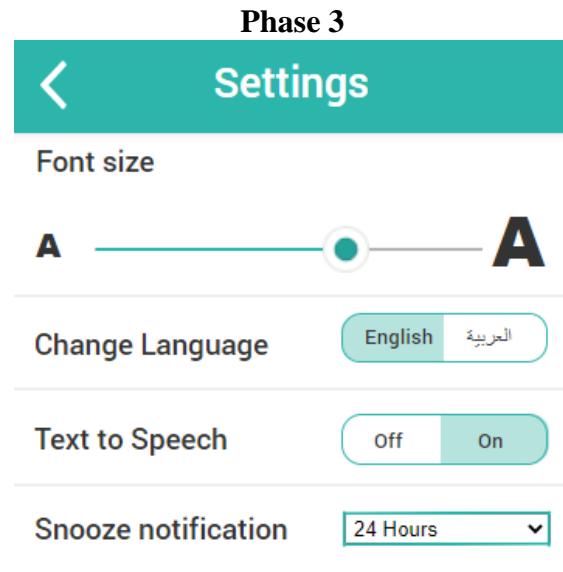
Quick wash

Deep clean

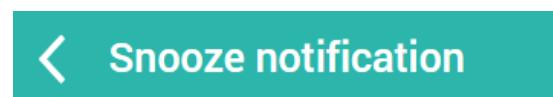
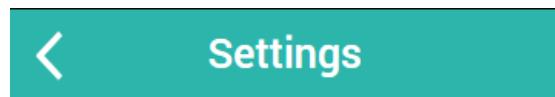
Cancel

Next

- Another change is in the settings menu of our application. We have changed the snooze notification settings, so the user has to select the date in multiple of 24. Instead of a drop-down list with a fixed duration in multiple of 24 hours.



## Phase 5



2021

Tue, Apr 18

< April 18 >

S M T W T F S

1  
2 3 4 5 6 7 8

9 10 11 12 13 14 15

16 17 18 19 20 21 22

23 24 25 26 27 28 29

30

Cancel

Confirm

## Demo video of our presentation (Phase 5)

We talked about the principles and elements that we have used in our design. And we discussed the changes that we have made from phase 3 to phase 5 after receiving the feedback in phase 4 from Team 10.

### **Link to video**

[https://mega.nz/file/uRUXVQhB#QLwxBfjQ98q9O80\\_a3tdxO50dy\\_97JPX0hGOfJgevnQ](https://mega.nz/file/uRUXVQhB#QLwxBfjQ98q9O80_a3tdxO50dy_97JPX0hGOfJgevnQ)

### **Link to fully interactive mobile UI**

<https://www.justinmind.com/usernote/tests/51686047/51904689/51904691/index.html#/screens/7128b34d-0750-4054-9d1c-38b50b3a12c1>

### **Link to fully interactive web sample UI**

<https://www.justinmind.com/usernote/tests/51686047/51904719/51904721/index.html#/screens/8fe859cb-bab4-4e6d-b5e3-85c0068bf7e9>

## Contribution Table

Name	Ayman Fadlallah	Abdul ilah Alomri	Omran Albedeiwy	Abdulrahman Gharsa(Phase 5 Leader)	Abdullah Hakeem
Contribution	20%	20%	20%	20%	20%