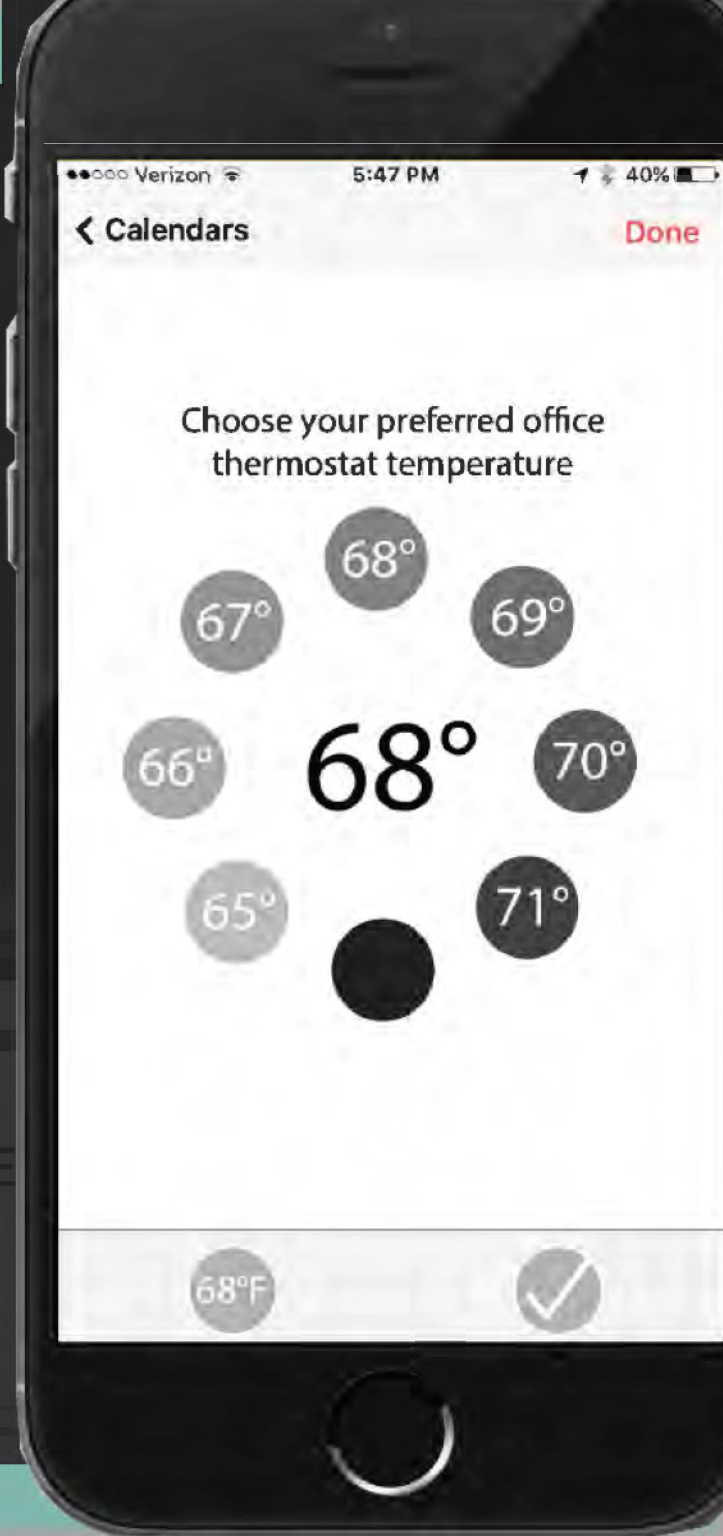
AN ENERGY EFFICIENT WORKSPACE



THE PROBLEM

The employee needs a way to manage the thermostat in the office workspace because the thermostat is not energy efficient and does not correlate to the employees' schedule or usage of the building.

EMPLOYEES BELIEVE THERE IS A MORE ENERGY EFFICIENT SOLUTION

How can we solve this problem?

CECILIA, AGE 33

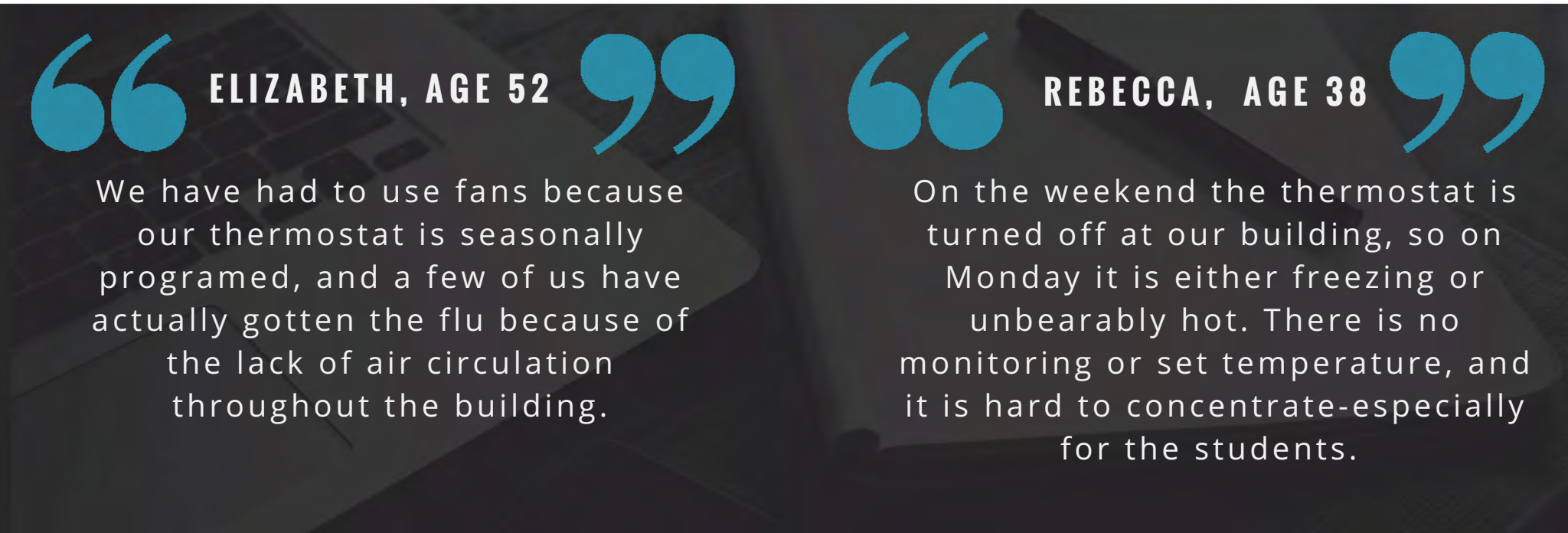
I have to stress to management the importance of thermostat and temperature and how that affects our business with clients in the office during meetings.

THE INTERVIEW

5 EMPLOYEES. BOTH PRIVATE AND PUBLIC SECTOR. AGES 33-52.

The corporate building thermostat runs all the time, so there is not a balance when the office building is at full capacity or when there is only a quarter of the staff working that day.

Employees prioritized the importance to energy efficiency in their environment, including both thermostat and lighting. The target audience job market consistently requires the daily use of technology.



ELIZABETH, AGE 52

We have had to use fans because our thermostat is seasonally programed, and a few of us have actually gotten the flu because of the lack of air circulation throughout the building.

REBECCA, AGE 38

On the weekend the thermostat is turned off at our building, so on Monday it is either freezing or unbearably hot. There is no monitoring or set temperature, and it is hard to concentrate-especially for the students.

THE INTERVIEW

5 EMPLOYEES. BOTH PRIVATE AND PUBLIC SECTOR. AGES 33-52.

Employees consistently use the internet for research and scheduling during their workday.

There is a consistent motivation for nutrition and healthy lifestyle habits by all users who own the fit bit/apple watch.

All employees have some kind of security presence in their office. The building is designed so windows cannot be opened for security purposes.

The thermostat and fluorescent lighting is distracting and employees notice their usage as energy inefficient.

BRIAN, AGE 46

"I am in my office 50% of the time. When I go to our campus I use multiple conference rooms for meetings ranging from 10-200 people. There have been instances when the thermostat is too hot or cold and that inconvenience consumes valuable time from everyone's day."

THE SOLUTION

We believe that by using employees' existing email platform to determine the location of people in the building and the hours they are planning on working per day, we will achieve an improved working environment with a comfortable, energy efficient thermostat.

GOALS & OBJECTIVES

Employees utilize and are extremely comfortable with their provided email/scheduling platform. By using their existing platform I will attempt to improve their current working environment. The thermostat is the most addressed issue, as the temperature in a building can directly affect work performance and energy efficiency of a building.

CONCERNS

The technology relationship. Employees have access to a scheduling/email corporate platform provided by their employer, but some employees do not use the platform to its full capabilities. The thermostat conditions can be so complex and frustrating in large federal office buildings or schools, teachers and employees give up instead of informing employers about all the negative impacts.

BUILDING A PERSONA

Based on User Research, the persona needs a way to customize the lighting and thermostat in the office building because it is currently not energy efficient and there are opportunities for advancement in energy efficiency utilizing existing technology.

PERSONA

"I schedule conference meetings in my office often, and energy efficiency in my building is something that I consider."

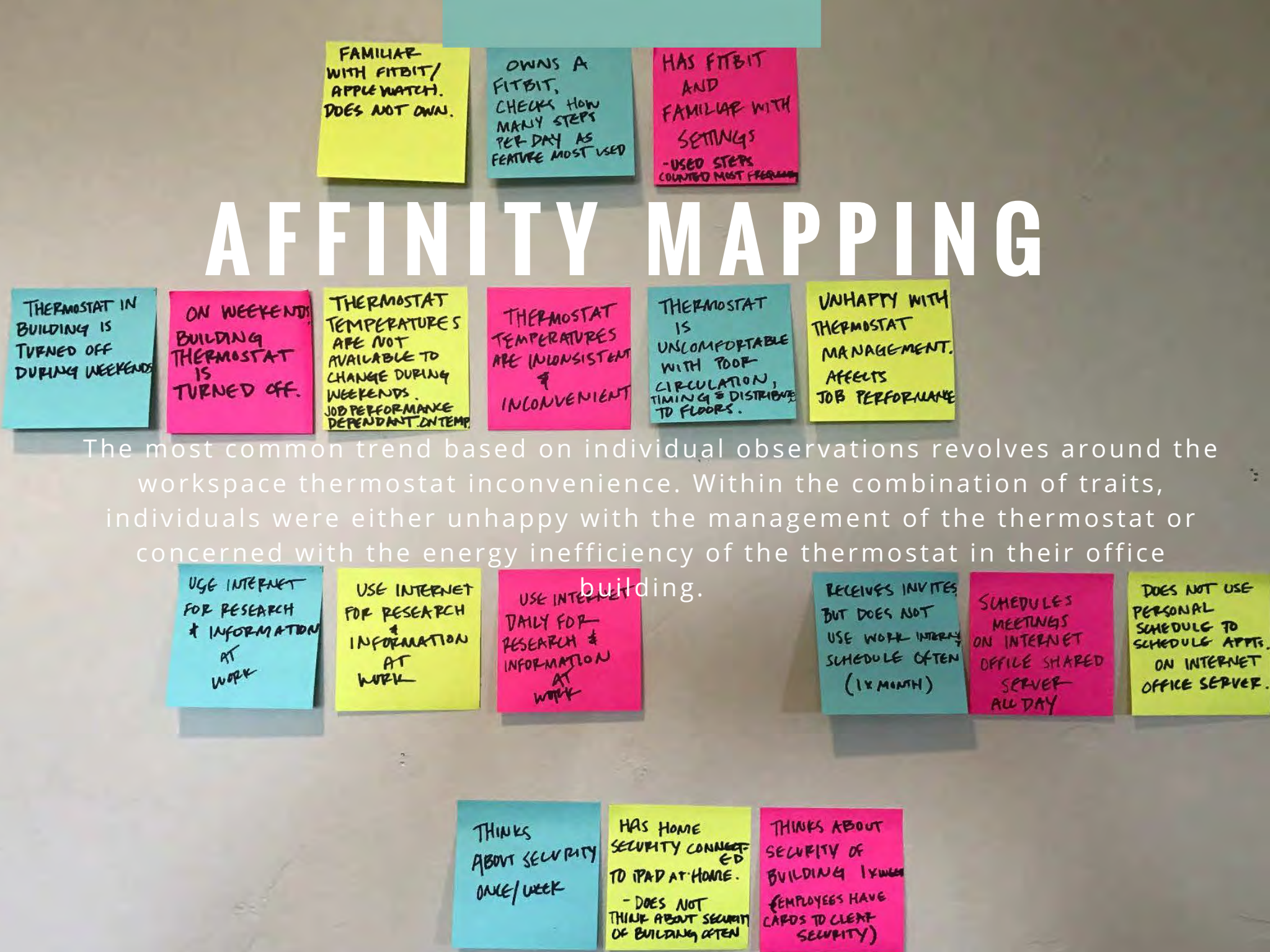
Janelle works at a tech company and has multiple responsibilities as a project manager. She is at her office 3-4 days out of the week, but often travels for meetings with partnering companies or works from home. While at her office building, she is not likely to be stationary. She schedules or hosts large conference meetings with stakeholders and colleagues, and she really enjoys the flexibility of her job.
Janelle enjoys working with people, and lately she has been more aware of her energy footprint. She joined several meet-up groups in her community and just learned that her neighborhood has a community garden.



Janelle B.

Age: 36
Project Manager
Location: Seattle, WA

Frustrations:
Her office thermostat is not energy efficient
The timing of the thermostat does not configure to the business hours of the workplace
Needs:
Janelle needs a workspace with a comfortable temperature to accommodate clients and colleagues when working.
Goals:
Comfortable and consistent temperature throughout building for fellow colleagues
Energy efficient solution
Connection through schedule electronically, as everyone logs their schedule through Internet schedule in office
Problems:
She has noticed that her office does not regulate the thermostat. Janelle has come into the office on the weekends, and her office will be either too hot or too cold. This working environment is uncomfortable to work in, and she has had to leave on several occasions. She noticed that the thermostat stays on all night during the work week, sometimes on floors that are not used for meetings all week.


FAMILIAR WITH FITBIT/ APPLE WATCH. DOES NOT OWN.
OWNS A FITBIT, CHECKS HOW MANY STEPS PER DAY AS FEATURE MOST USED
HAS FITBIT AND FAMILIAR WITH SETTINGS
-USED STEPS COUNTED MOST FREQUENTLY
AFFINITY MAPPING
THERMOSTAT IN BUILDING IS TURNED OFF DURING WEEKENDS
ON WEEKENDS BUILDING THERMOSTAT IS TURNED OFF.
THERMOSTAT TEMPERATURES ARE NOT AVAILABLE TO CHANGE DURING WEEKENDS. JOB PERFORMANCE DEPENDANT ON TEMP
THERMOSTAT TEMPERATURES ARE INCONSISTENT & INCONVENIENT
THERMOSTAT IS UNCOMFORTABLE WITH POOR CIRCULATION, TIMING & DISTRIBUTION TO FLOORS.
UNHAPPY WITH THERMOSTAT MANAGEMENT. AFFECTS JOB PERFORMANCE
The most common trend based on individual observations revolves around the workspace thermostat inconvenience. Within the combination of traits, individuals were either unhappy with the management of the thermostat or concerned with the energy inefficiency of the thermostat in their office building.
USE INTERNET FOR RESEARCH & INFORMATION AT WORK
USE INTERNET FOR RESEARCH & INFORMATION AT WORK
USE INTERNET DAILY FOR RESEARCH & INFORMATION AT WORK
RECEIVES INVITES BUT DOES NOT USE WORK INTERNET SCHEDULE OFTEN (1x MONTH)
SCHEDULES MEETINGS ON INTERNET OFFICE SHARED SERVER ALL DAY
DOES NOT USE PERSONAL SCHEDULE TO SCHEDULE APPTS. ON INTERNET OFFICE SERVER.
THINKS ABOUT SECURITY ONCE/WEEK
HAS HOME SECURITY CONNECTED TO IPAD AT HOME.
- DOES NOT THINK ABOUT SECURITY OF BUILDING OFTEN
THINKS ABOUT SECURITY OF BUILDING 1x/WEEK
(EMPLOYEES HAVE CARDS TO CLEAR SECURITY)

COMPETITIVE ANALYSIS

CORTANA

+Intuitive & Internet Connection

+Social Media

-Lighting Adjustment

+Schedule

+Security Monitoring

-Thermostat Control

Limited to voice activation and search/questions features.

Is adaptable, designed to cross platform and responsive design.

Presence in workspace and home unobtrusively.

ALEXA/ECHO

+Intuitive & Internet Connection

+Social Media

+Lighting Adjustment

+Schedule

-Security Monitoring

+Thermostat Control

Limited to voice activation and set to one location. Not designed to be transportable.

Search engine, email, schedule capabilities combined with household utilities control.

NEST

+Intuitive & Internet Connection

-Social Media

+Lighting Adjustment

+Schedule

+Security Monitoring

+Thermostat Control

Does not cater to email or internet platforms providing external media.
Designed to provide access to household utilities on a universal scale. Promotes energy efficiency by managing footprint and tracking when leaving/entering the house.

FIT BIT

+Intuitive & Internet Connection
+Social Media
-Lighting Adjustment
+Schedule
-Security Monitoring
-Thermostat Control

Centered on user features for personal reflection, limited to small screen size and short period of time spent interacting with watch itself.

Fit Bit is Geo Locational and constantly feeds information to user in unobtrusive presentation. The Internet of Things is a method of presenting data to consumers at all times.

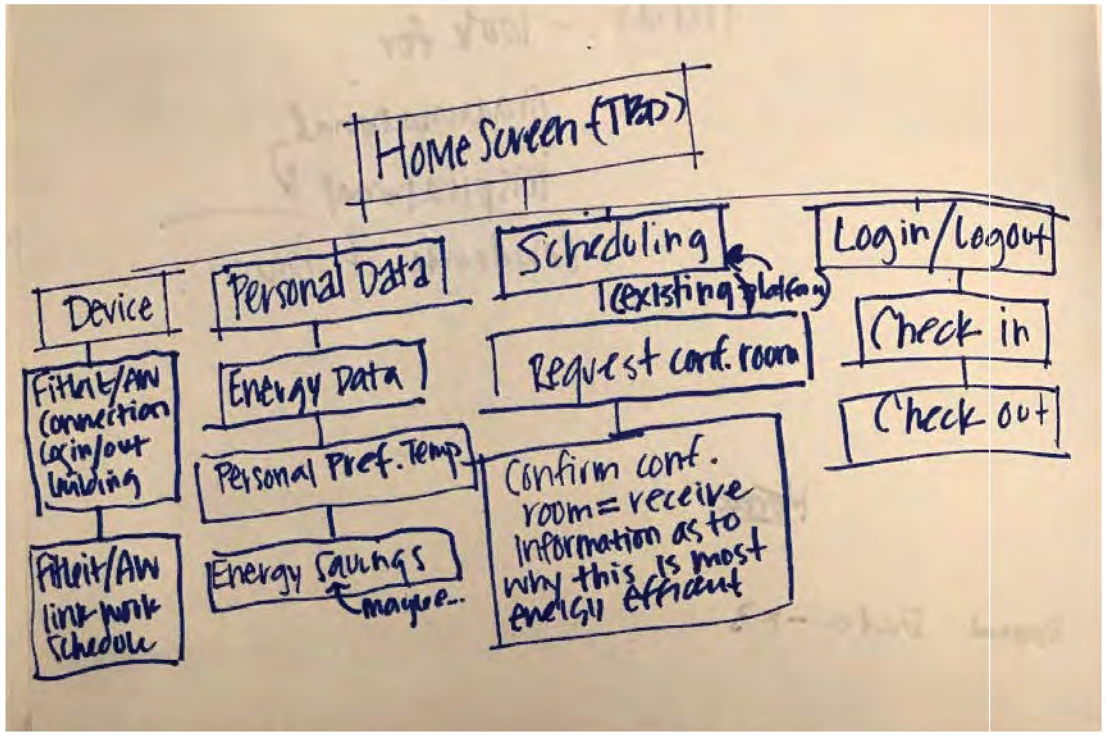
XFINITY HOME SECURITY

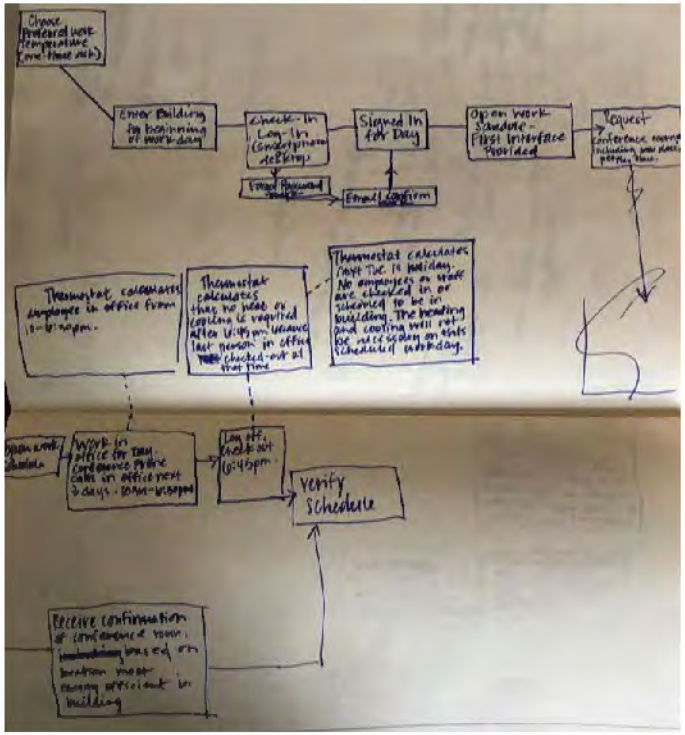
+Intuitive & Internet Connection
-Social Media
+Lighting Adjustment
-Schedule
+Security Monitoring
+Thermostat Control

Does not require Internet of Things capabilities nor does it require social media or email platform access. Strictly targets home security.

This platform targets security and thermostat readings. Although the span is limited to the house, the system is internet based, and broadcasts information to responsive platforms.

COMPETITIVE ANALYSIS





USER FLOW

PRIORITIES

Preferred Temperature
Log In/Log Out
Conference Room Request

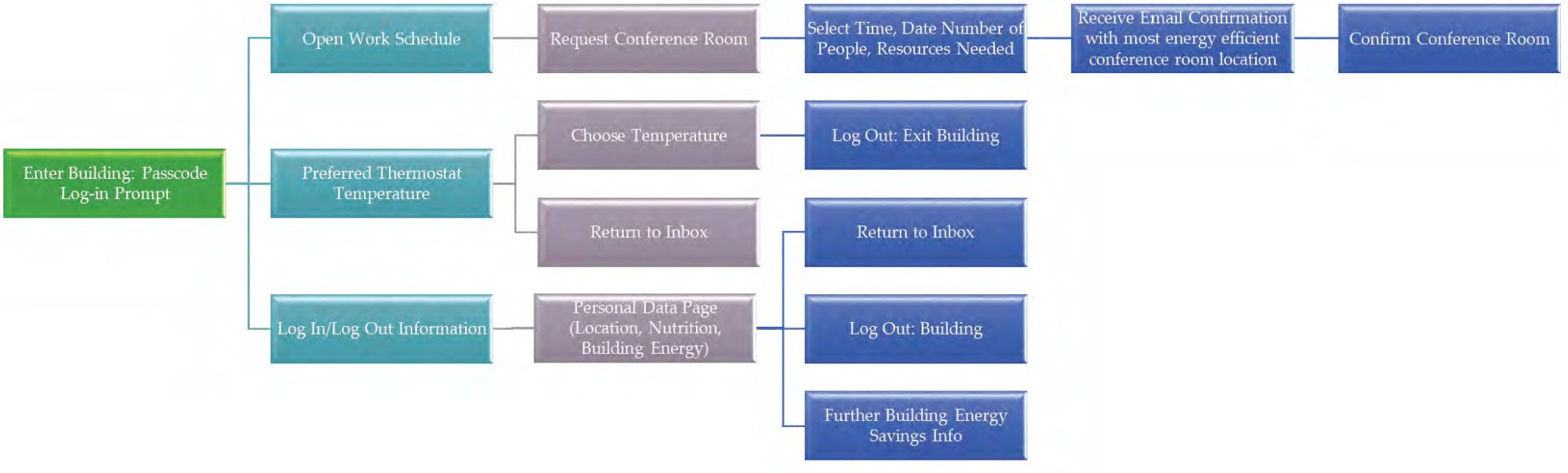
TASKS

Change your preferred temperature.
Schedule the most energy efficient room for 20 people at your designated time and date.

PROBLEMS

No prioritized order
Not engaging
How will we make this captivating and keep the user interested?

USER FLOW



REVISED USER FLOW

INITIATION TO GOAL COMPLETION

Prioritization of three main components has been created based on individual feedback and affinity mapping data collection results. Choosing the preferred thermostat temperature is the most interactive feature of the design, and links to both Work Schedule or Personal Data after Preferred Temperature is chosen.

LOCATION

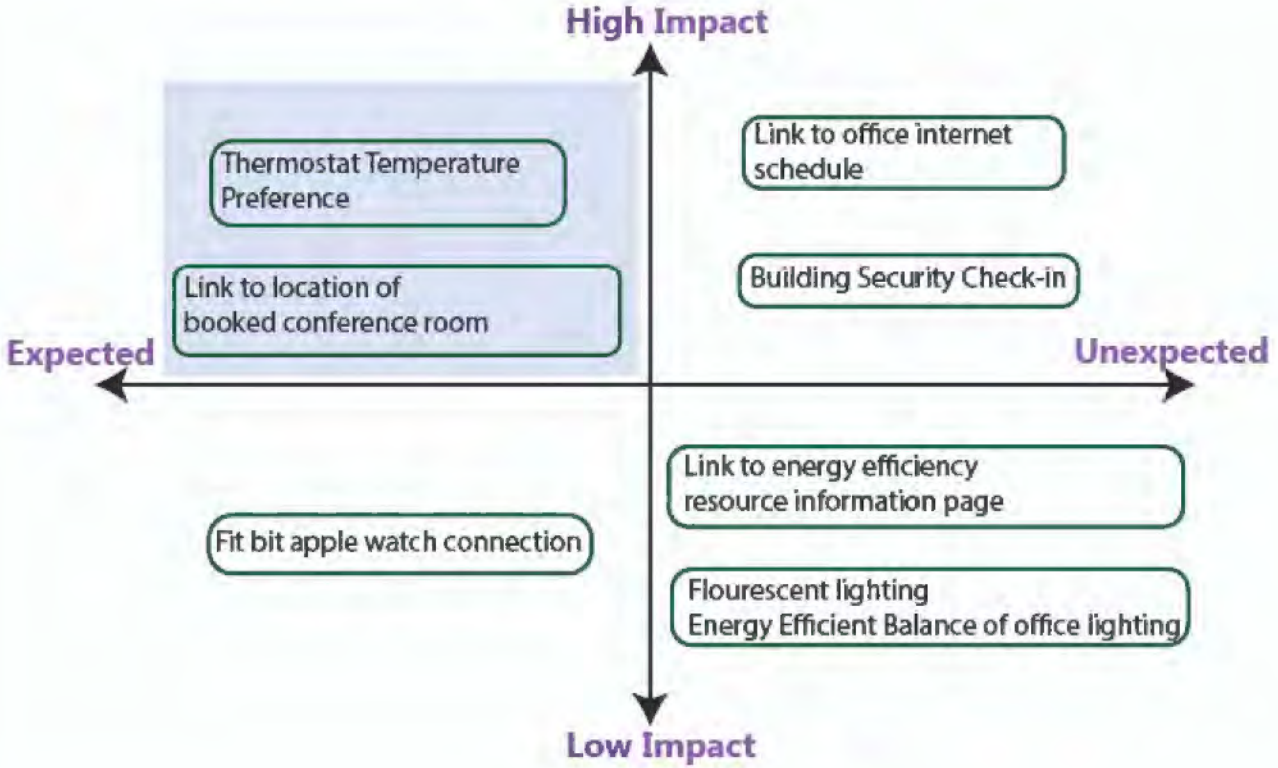
High impact and expected feature: Conference Room Request

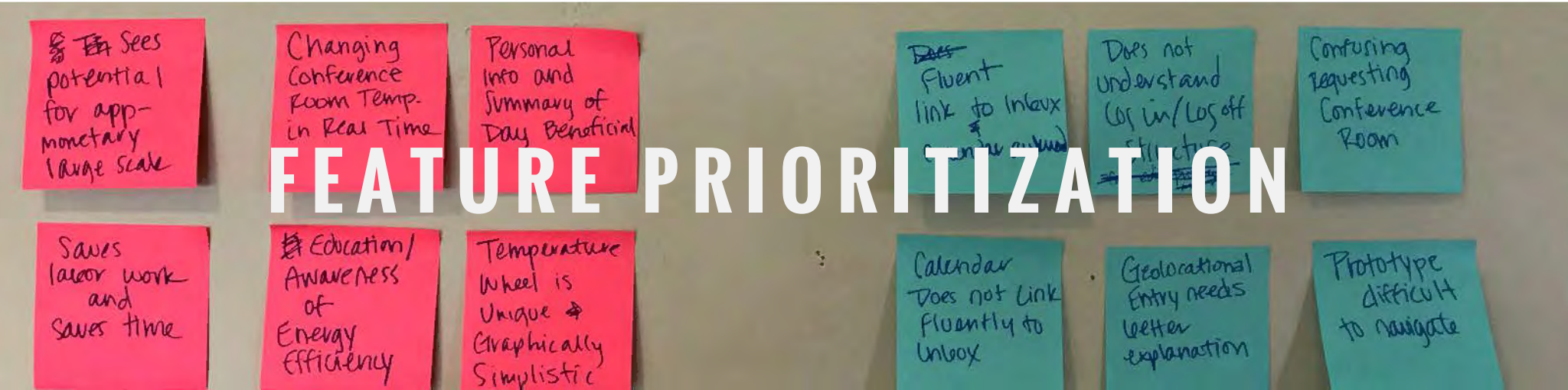
TEMPERATURE

High impact and expected feature: Thermostat temperature preference of users in the office building.

SECURITY

High Impact and Unexpected: building security log in/log off access



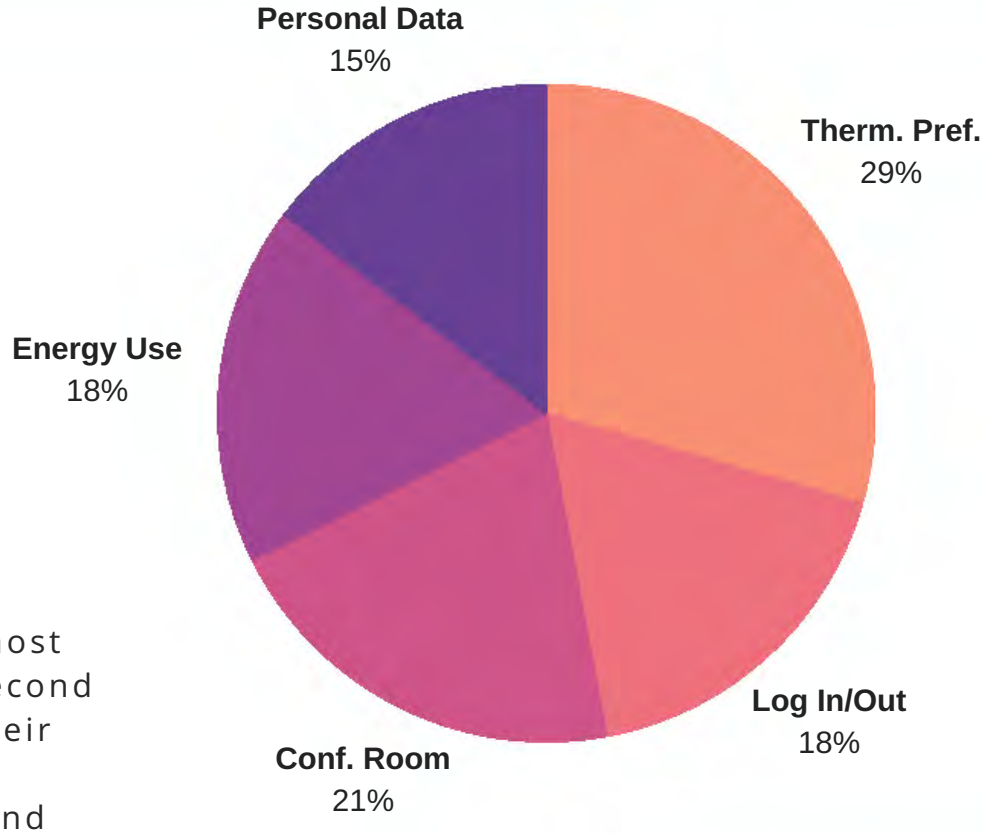


FEATURE PRIORITIZATION

FEATURE PRIORITIZATION

HIGH PRIORITY OF FEATURES

Thermostat Preference is important to employees in their office workspace. This feature should be the priority when designing.



FUNCTIONALITY OF DESIGN

Conference Room Request and Location of the most energy efficient location in the building is the second highest priority for employees, as they are on their email or computer continuously throughout the workday. Location of the most energy efficient and controlled thermostat conference room is a combined feature solution to the employees' problem.

SKETCHES



How can we make this more engaging?
How will this cater to the user?
How will this improve the business workspace and be unobtrusive to the existing platform used by employees?

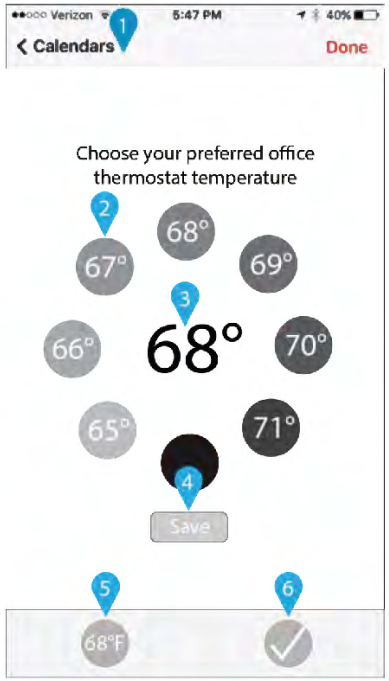
AFFORDANCES

The consistency of the design revolves around the icons on the bottom bar. These two elements represent temperature and log on/log off, and are the two most prioritized features. This title bar was designed to be unobtrusive and blend in to the existing platform provided to employees.

HEURISTICS

Learnability of the design is established at a relatively quick pace. Basic tasks are performed efficiently. Anticipated errors are the process of scheduling a conference room. This is dependent on the existing platform available to employees, and would be designed around that process. Visual Design and wayfinding is simplistic and appealing, the universal temperature thermostat wheel is appealing yet self-explanatory.

WIREFRAMES



THERMOSTAT PREFERENCE

1. **Back to Calendar Interface**- after entering phone security pass-code to log out of building, this message confirms employee has left the building.

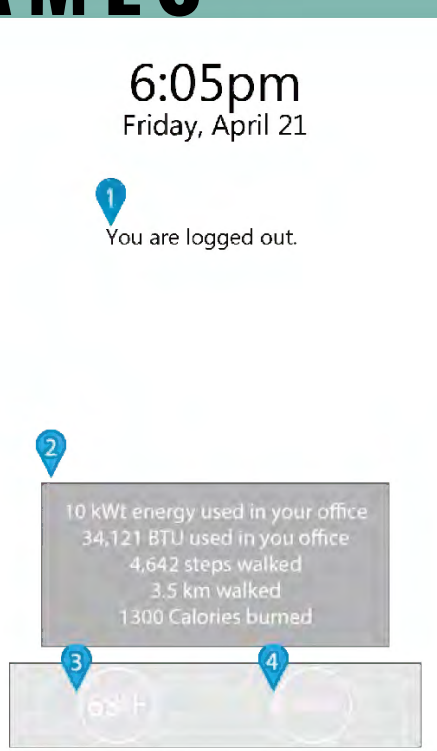
2. **Choosing Preferred Personal Office Temperature**- After the employee exits the building, a summary of their events is broadcast on their phone. This includes personal data and building data, merging both environmental footprint and nutrition data in one fluent summary.

3. **Preferred Personal Office Temperature Wheel**- Button is Pushed on Wheel to choose which temperature employee prefers to work in the office

4. **Save Button**- Verifying Personal Temperature and Saving

5. **Thermostat Preference Icon**-links to thermostat preference option, where employees can choose their preferred temperature in the workspace. This icon represents their current chosen temperature.

6. **Geo locational Status**- Represents if employee is in the building and has an office ecosystem footprint, or is logged out of the building.



LOG OUT

1. **You are logged out**- after entering phone security pass-code to log out of building, this message confirms employee has left the building.

2. **Summary of Employee Actions**- After the employee exits the building, a summary of their events is broadcast on their phone. This includes personal data and building data, merging both environmental footprint and nutrition data in one fluent summary.

3. **Thermostat Preference Icon**-links to thermostat preference option, where employees can choose their preferred temperature in the workspace. This icon represents their current chosen temperature.

4. **Geo locational Status**- Represents if employee is in the building and has an office ecosystem footprint, or is logged out of the building.

"I have a security card and we have a security guard, so I think about security on a daily basis at work."
-Amanda, Age 40

WIREFRAMES



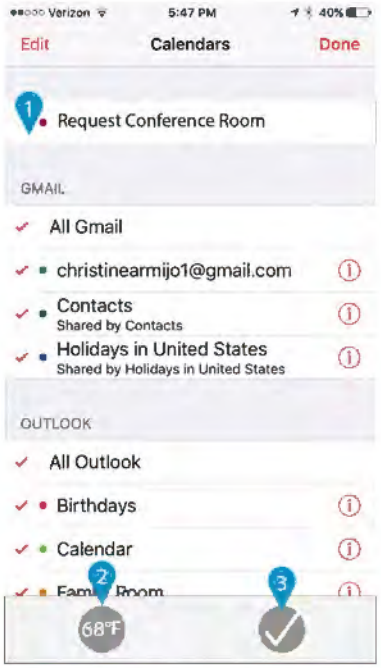
LOG IN/OUT

1. Greeting and prompting employees to log-in to building- this message appears when employees enter their employed building. There is a Geo locational access on their phone which will either ring or vibrate, in which employees must use their phones to enter their secure IDs, fingerprints, or retinas scanners on their phones to verify they have entered the building.

2. **Pass-code Prompt-** After the employee enters the building, this pass-code prompt will appear (similar to login in to your smart phone). Other log-in options are available on smart phones today that are less time consuming, including retina scanning and fingerprint ID. These are also available to ID the employee, and begin their ecosystem building footprint for the day.

3. **Thermostat Preference Icon**-links to thermostat preference option, where employees can choose their preferred temperature in the workspace. This icon represents their current chosen temperature.

4. **Geo locational Status**- Represents if employee is in the building and has an office ecosystem footprint, or is logged out of the building.

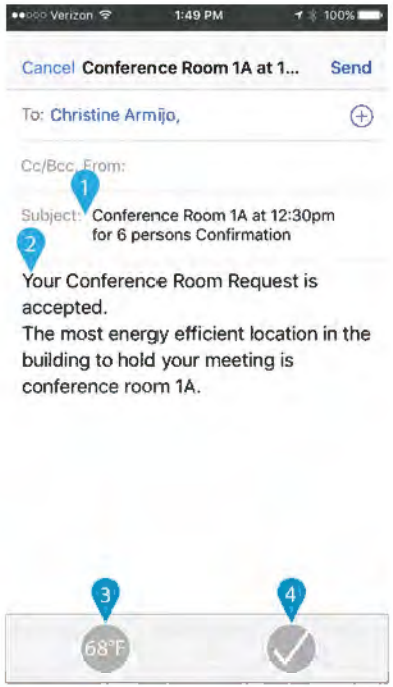


CONFERENCE ROOM REQUEST

1. **Request**-Request Conference Room that is most Energy Efficient

2. **Thermostat Preference Icon**-links to thermostat preference option, where employees can choose their preferred temperature in the workspace. This icon represents their current chosen temperature.

3. **Geo locational Status**- Represents if employee is in the building and has an office ecosystem footprint, or is logged out of the building.



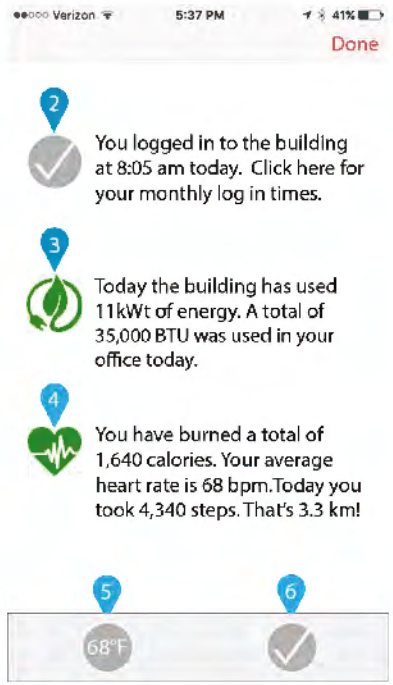
CONFERENCE ROOM CONFIRMATION EMAIL

1. **Email Conference Room Confirmation Request Subject**

2. **Conference Room Request Details**- this email confirmation of conference room location confirms the location of the conference room, the time, the number of people attending, and gives further information as to why the location chosen is the most energy efficient. This informs and adds an unobtrusive reminder to employees that energy efficiency can be implemented in the workspace.

3. **Thermostat Preference Icon**-links to thermostat preference option, where employees can choose their preferred temperature in the workspace. This icon represents their current chosen temperature.

4. **Geo locational Status**- Represents if employee is in the building and has an office ecosystem footprint, or is logged out of the building.



SUMMARY

1. **Done**- returns to previous screen

2. **Summary of Employee Schedule & Location**- This summry can track the employee's time spent in the building based on their log in and log out status.

3. **Energy Efficient Data**- this summary is based on the building's data collected and energy used. It creates an awareness of the employee's energy footprint in the office.

4. **Summary of Employee Health**- linked to fitbit, apple watch, or smartphone nutrition data. This includes personal data, creating an incentive merge both environmental awareness and healthy living awareness in one's everyday lifestyle.

5. **Thermostat Preference Icon**-links to thermostat preference option, where employees can choose their preferred temperature in the workspace. This icon represents their current chosen temperature.

6. **Geo locational Status**- Represents if employee is in the building and has an office ecosystem footprint, or is logged out of the building.

Usability Test Screener: https://goo.gl/forms/hafmfJsz2NVgErYK2

USABILITY TESTING

Log In/Log Out



Log In/Log Out Passcode displays preferred temperature as well as Geo Locational Status. When employee is walking into office building, passcode or fingerprint ID screen will display and direct user to existing email/schedule platform. The icon will then show a check mark, representing employee is logged in for the day.

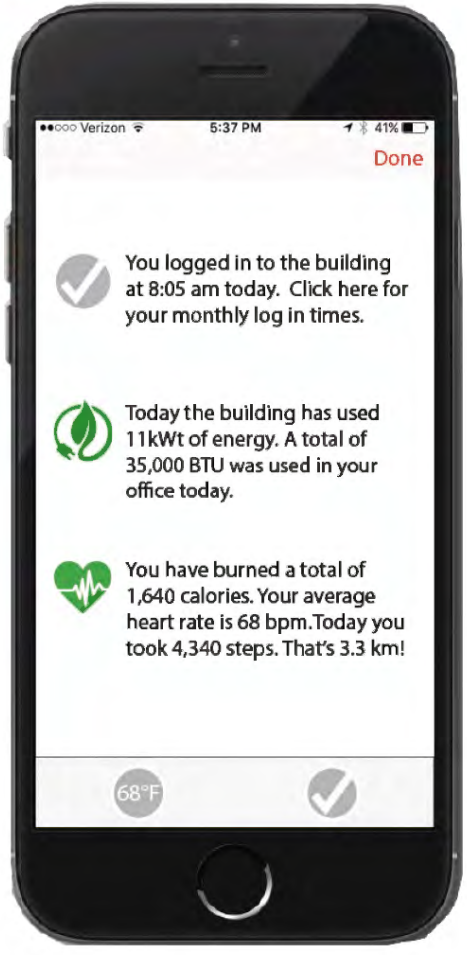
Preferred Temperature Control



Preferred Thermostat Temperature allows the user to choose their preferred temperature in building.

https://invis.io/6UBGYYVC7

Personal Data Information



Log In/Log Out link informs user of the building's energy efficiency. This includes nutritional and wellness facts, as well as log in and log out times.

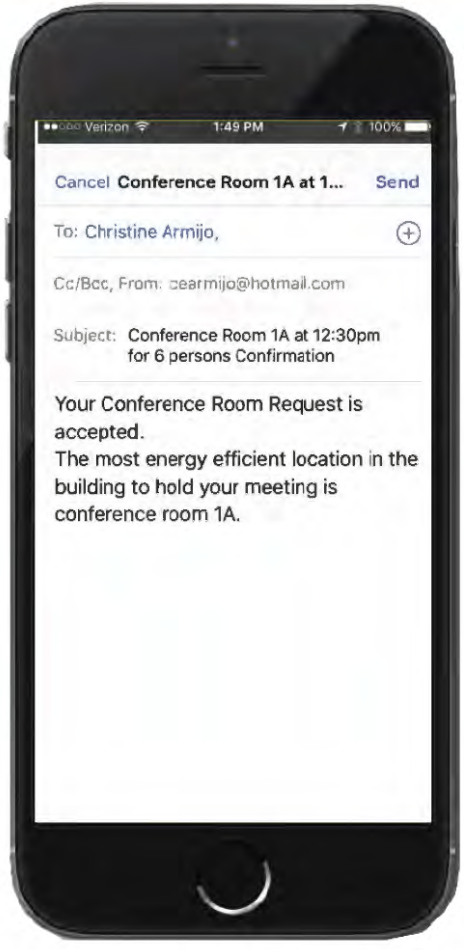
USABILITY TESTING

Request Conference Room



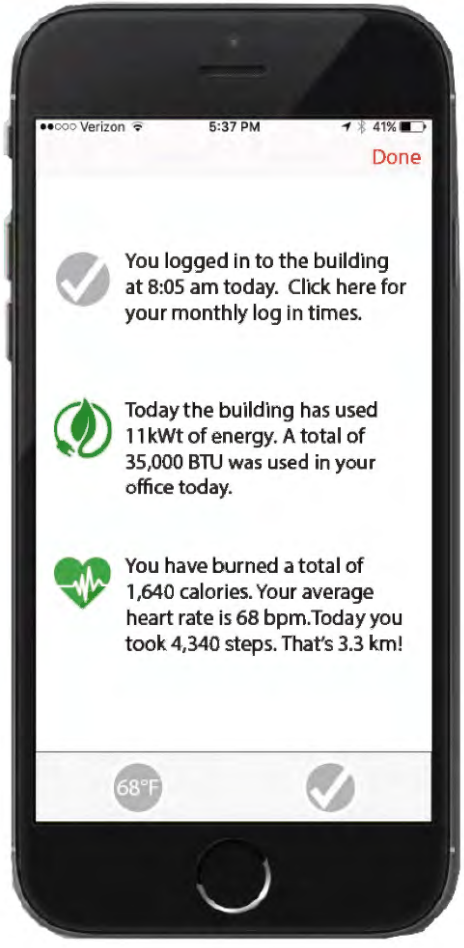
Request Conference Room integrated into interface but notably placed in a conventional position

Conference Room Confirmed



Confirmation of Requested Conference Room is informative and intuitive. Suggests information regarding most energy efficient conference room.

Energy Savings Data



Log In/Log Out link informs user of the building's energy efficiency. This includes nutritional and wellness facts, as well as log in and log out times.

https://invis.io/6UBGYYVC7



USABILITY TESTING TAKEAWAYS

USER CONCLUSIONS

Employees appreciate personal data updates provided by their fit bit (including steps taken and health wellness information). However the attitudinal versus behavioral data shifted after the usability testing. The realization that employees' existing technology platform has the ability to schedule conference rooms with preferred resources, book times and places in the most energy efficient space, and customize the thermostat changed users' mind on their original prioritized features. The icons used are not universally recognized as energy efficient, and could be more self-explanatory.

Users agreed that by designating conference rooms for the proportionate amount of employees, energy efficiency and thermostat regulation is a realistic goal in the office workspace.

USER CONCLUSIONS

Users were interested with the Security feature, and how that would be implemented into an office setting. The Log On/Log Off feature is Geo Locational, therefore tracks employees' movements whenever they enter or exit the building. Who has access to these records? These are designed to be for security in an office setting or school, but there is concern by users that some employers would have access to the data.

When I present in large conference rooms, sometimes clients or employees complain about the thermostat temperature. Multiple times I have tried to pry open the thermostat box during the time it takes for the adjustor service to get to our office building. -Brian, Age 46



https://invis.io/6UBGYYVC7