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Design Roadmapping, composite characters, and storyboarding

A reflective report on how we used each of the three design methods to communicate our project in creative and effective ways.

Design Roadmapping

Key Quotes, Core Needs, and Design Principles

After using design roadmapping in our class activity, we realized how useful this method is. We first of all decided on the top three quotes from our users that would characterize our project, each of the quotes comes from a different persona. The first quote is from a firefighter, who has extensive experience of extinguishing fire and responding in a crisis. He also happens to have an overview of fire safety in houses and buildings in the city of Berkeley, based on his experience of enforcing fire prevention codes. He told us that most homes do not fully enforce the fire prevention code, and most buildings in Berkeley are old and it is simply difficult to fully comply with the fire code. From this quote, we identified the core needs to be safety and security of both humans and properties. With this identified user needs, we realized that in our design we need to make our device easy to install so that it can be easily adopted in old buildings in Berkeley.

“I would evacuate just as everyone else would,” said a disabled person. People with disabilities are our second persona. They typically live by themselves in their own homes, equipped with a wheelchair and a ramp. In a normal situation they would be able to move freely just as everyone else would, and they also wanted to be treated the same as everyone else since they wanted to be respected. However, they still face challenges to successfully evacuate during a fire, especially when their assistant or family members are not there, not to say to successfully extinguish and control a fire by themselves. We identified the top needs of this user group to be effective communication with the emergency, special help to guide them to the right exit, and designs that protect and respect their individual identity. With these in mind, our design principle is to effectively help people with disabilities while protecting and respecting their identity using subtle and respectful designs.

“Don’t worry. We have a fire extinguisher,” said a homeowner. On the first level, it shows that this user group (homeowners) may not be as protected as they think, which attributes to their wrong perception of fire safety and ill-equipped fire protection knowledge. Since different types of fires need to be extinguished using different extinguishants, the typical homeowners thought that a fire extinguisher could be one-size-fits-all and solves all their fire-related problems. On a deeper level, this quote conveyed to us that the typical

homeowners enjoy convenience and simplicity. They don't put much thoughts into what types of fire extinguisher or fire protection device that they need, and the consequences of this lack of thinking are higher risks of getting injured in a fire. Thus, our design principles are to give users clear directions, and to ensure simplicity and ease of use by reducing human inputs and making our solution autonomous.

With our design roadmap, we could highlight our top three user/customer groups, their contexts and environments, their needs and points of view, and how we responded to their needs. It demonstrates our process of turning the observed data into the inferred and actionable design principles. It gives the audience a gist of how we identified our problem, core users' needs, and how we came up with our solution based on our design principles. Design roadmapping is a great method to showcase the design journey or thought process that our team went through, and it clearly conveys the deeper reasons for our design.

Phases of product development

We plan to start marketing mainly towards middle aged homeowners as well as landlords. Over time, we plan on expanding our product into the commercial market by creating a larger model for warehouses and other large buildings with little human interaction. This model would be more effective than similar solutions being used in such buildings currently.

For home users, we plan on enhancing the software so that it can warn of dangerous nearby fires such as neighborhood warnings and wildfires so the users can evacuate safely and on time. Currently our product only warns about internal fires but by using the internet, this is doable with a simple update.

Further in the future, we plan to make our device mobile for both commercial and home users. Currently, multiple devices are needed and are fixed to one location. We believe that we can create a model to patrol a certain area so that less devices are needed. Not only will this be more environmentally friendly, but by charging more for less product, we will be able to increase our profits.

Design Roadmapping Worksheet (1/2)

Key Quotes

Representative quotations you found out from design research: observation, interviews, Open-ended survey responses.

e.g., "I tend to not use technology when I workout because it doesn't feel natural. I have to input information and then it spits out numbers at the end of the day, not what I associate with working out like feeling good and that sort of stuff"

Core Needs

User's desires. Representative latent, unmet-user needs interpreted from key quotes in the previous step.

e.g., *User Needs to feel in control of their own actions and not feel like they are being told what to do, even if it is for their betterment.*

Design Principles

Considering your project scope, what are actionable design insights that can be used to guide the design of your product/service driven by core needs identified in the previous stage.

e.g., *Empowered-Recommendation*

The recommendation given by device should be things that allow user to do something with the data acquired. Not tell them what to do but rather give options that allow the user to make their own choice.



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Design Roadmapping Worksheet (1/2)
The Jacobs Institute for Design Innovation
UC Berkeley, Aug. 2017

Design Roadmapping Worksheet (2/2)

Vision Statement

One-liner statement that does describe the clear mid to long-term goal of your business that specific enough including direction, objective of your product/service as well as how, what.

e.g. creating an environment that can improve a user's experience in a work environment by responding to a user's cognitive and emotional states.

3 Phases of Your Product/Service Development

Describe 3 phases of your design roadmap as a mix of forms among product, service, prototype, and experience.

Phase 1 (Final Tradeshow) →

Phase 2 (6 month after) →

Phase 3 (1 year after)

What is a current concept like by the end of this class? (1st generation)

- Single model
- autonomous detection and extinguishing
- full time monitoring and control
- easy to use and install
- interacts with fire emergency services

What is a to-be concept like by the end of this year? (2nd generation)

- Various models for different needs
- warns of external fires (wildfires, neighborhood fires)

Assuming your team decided to make a start-up with your current product/service concept, What is a to-be concept like in 1 year from the end of this semester? (3rd generation)

- Raise fire awareness through product usage
- can navigate houses instead of being mounted in one room



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Design Roadmapping Worksheet (1/2)
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Our design roadmaps

Composite character

Eric is our composite character. He is a middle aged software engineer, who works hard and is a heavy sleeper. He is deaf but he has learned to cope with his disability by using his other senses. He lives with his girlfriend Catherine who works the night shift at a local hospital.

We built this composite character based on 20 user interviews and observations. The traits we eventually decided to put into this character are:

- middle aged
- works hard
- heavy sleeper
- engineer
- IT/computer
- has sensory disabilities but have learned to effectively use other senses
- has someone they live with in their house (an assistant)

- the person who they live with is not in the house at night (the assistant only helps with the disabled person during the day)
- has a somewhat messy home. Some inflammable items (papers, etc.) are scattered around the house
- has not fully complied with the fire prevention code
- his extinguisher has expired, but he never bothered to keep it up to date. Perhaps he never even realized that it is expired
- cares about home security, but has a wrong perception of how protected he is

We found that creating a composite character can make our design to be more persuasive and authentic. It allows us to extract useful information we gathered from user interviews by figuring out the important traits and commonalities our user group has. With a clearly defined user group, we can know who should we focus on more in future iterations. Since we are designing for users, a composite character would clearly convey who our users should be and the types of user contexts and scenarios that we are going to address.

We also used Eric in our interactive game/storyboards, as he is the main character in the story.

You will be playing as Eric

Eric is a middle aged software engineer for Boeing. He works hard and is a heavy sleeper. He is also deaf but has learned to live with this. He lives with his girlfriend Catherine who works the night shift at the local hospital.

Eric has just gone to bed and Catherine is off at the hospital.

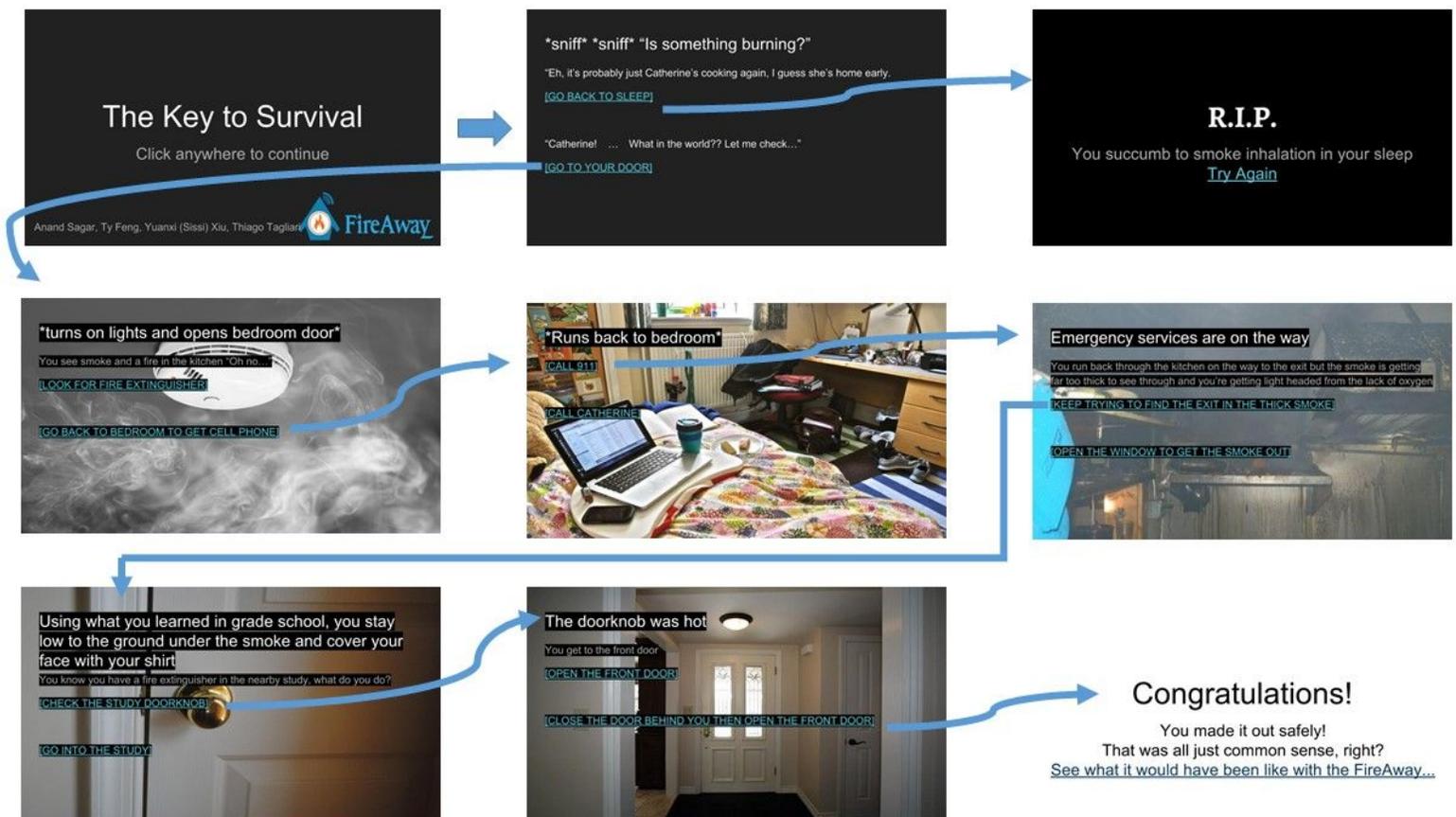
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Storyboarding

As we are developing our product to a specific group of people, the **composite character** was useful in identifying the user of our product. This method allows a composite character amalgamates multiple characters, allowing the target audience to be

multi-faceted as homeowners concerned about fire and disabled people. Thus, this method helped us to take into account many characteristics of the target audience. We believed that this would be a great method to illustrate different scenarios that our product would be involved in and how it would work. We also thought we could put a twist on it by creating an interactive storyboard so the audience could experience the situation in a more first person context in order to induce more empathy. This would allow us to be more convincing since it forces users to be put onto the spot and experience the scenario themselves. This method would clearly communicate the problems that we are trying to solve and how important it is.

Thus, we developed two types of scenarios. In the first one we simulate a situation with our character without the FireAway system. It is important to keep in mind that in a fire situation people don't use to react consciously and rationally, they just act by the survivor instinct, so you can have not the right and better decisions, as we can see in the story below. Without the FireAway, our character needed to take a lot of right decisions to escape in safety his house, and in this story, a bad decision could take his life.



In the second scenario, with the FireAway system, the character didn't need to take decisions, because the automatic system did it for him and he could stay safe, understand what went wrong in your house and try to avoid this kind of situations in the future.



Documentation

Interview Transcripts:

Subject 1

When was the last time that you encountered a fire disaster

About 4 years ago

Was it a big fire or a small fire?

It burned down several houses so I'd say it was pretty big.

What caused it?

A hobo got cold and lit some paper in a trash can on fire. The burning paper flew up and lit the trees around him on fire.

Where did the fire occur?

Near La Crescenta (SoCal)

What did you do? Why?

I didn't do anything since it was far away but the sky still turned orange.

What were your initial reactions to the fire?

I don't remember

How did you feel?

I don't remember

What were damaged? Any big losses? Any emotional loss?

A lot of trees and houses burned but I didn't lose anything.

How did you cope with the losses?

I mean, I didn't lose anything

What did you wish you have done to prevent the fire? What would you do to prevent the fire? Why?

I couldn't have prevented it.

Subject 2

When was the last time that you encountered a fire disaster

About 13 years ago.

Was it a big fire or a small fire?

It was a medium sized fire.

What caused it?

A couple of my friends and I were playing with matches and we lit a tarp on fire.

Where did the fire occur?

On the fence between two of my neighbors' houses in India.

What did you do? Why?

My friends and I tried to blow it out because we were really young but that only made it worse so we went inside and pretended we didn't know about it.

What were your initial reactions to the fire?

I was worried I was going to get in trouble.

How did you feel?

I was pretty scared.

What were damaged? Any big losses? Any emotional loss?

No emotional losses but my neighbor's car tarp was destroyed.

How did you cope with the losses?

I pretended I had nothing to do with it.

What did you wish you have done to prevent the fire? What would you do to prevent the fire? Why?

I wish I hadn't played with matches and I probably should have told someone about the fire so that they could have put it out.

Subject 3

When was the last time that you encountered a fire disaster

3 years ago.

Was it a big fire or a small fire?

Small fire, it was in the kitchen

What caused it?

Some oil got too hot and caught fire in the pan

Where did the fire occur?

At my parent's house in Irvine (SoCal)

What did you do? Why?

I put the pan's lid on top of the pan because that's how I was taught to put it out.

What were your initial reactions to the fire?

A little surprised but I knew how to put it out so it wasn't that bad

How did you feel?

I don't know

What were damaged? Any big losses? Any emotional loss?

Nothing was damaged

How did you cope with the losses?x

There were no losses.

What did you wish you have done to prevent the fire? What would you do to prevent the fire? Why?

I should've realized that the pan was too hot but I've been more careful since then

Subject 4

When was the last time that you encountered a fire disaster

When I was in like 8th or 9th grade so like 5 or 6 years ago.

Was it a big fire or a small fire?

It was a really small fire, just on some scrap paper.

What caused it?

I was playing with a magnifying glass trying to burn paper and it almost got out of hand.

Where did the fire occur?

On a school bus

What did you do? Why?

I threw it on the ground and stomped it out because blowing on it wasn't working and I didn't want to get in trouble.

What were your initial reactions to the fire?

I was surprised and a little overwhelmed

How did you feel?

A little scared, nervous, I was more afraid of getting caught than the fire.

What were damaged? Any big losses? Any emotional loss?

Nothing was damaged, just the paper I burned

How did you cope with the losses?

There were no losses.

What did you wish you have done to prevent the fire? What would you do to prevent the fire? Why?

In hindsight, I should not have been playing with fire on a school bus full of kids so my prevention would be to just not do something like that in the future.

User Observation



Overloaded outlets near a bed



Burned dryer in Foothill



Uncleaned stovetop



Flammable paper and cardboard near stove and oven



Medium fidelity prototype of our hardware

Reflection

When we first started this project, we knew that fire safety was a problem in our society but never fully understood how deep the problem was. By analyzing our interviews and user observations seen below, we were able to better get an idea of what needed to be done to fix this problem. From here we created several ideas, many of which may be implemented in future iterations such as wheels or flight, and selected the best ones in order to make a basic model which we could market to our primary market base of homeowners and disabled people. We tested these ideas through renderings and a 3D printed model to determine feasibility which seemed to work pretty well. During all this time, we knew that a significant problem was the mental aspect -- it was how people view fire safety. We knew that this would be a difficult problem to tackle and so thought that this could be effectively communicated through an interactive game which we hope will raise awareness of this serious problem and could even be part of our advertising campaign.

Conclusion and Next Steps

Design Roadmapping:

By showing us where we started from and where we plan to go on a timeline, we are better able to gauge how feasible our plans are and what we will need to do in order to achieve them. We will need to go back to the interview stage and interview our new customer base as well as researching current systems in such places. We will have to create the most effective way to allow our sensor to become mobile and test such methods both with users and in use. Once we know what works and what does not, we can figure out how to expand from there, possibly with another design roadmap.

Composite Character:

With the composite character we could develop real life character and insert them in a fire situation. The use of this method provide us the opportunity to create a character that fit very good in the role in different scenarios.

Storyboards:

We could develop two types of stories that showed how an emergency could look like in real life and the stress behind every decision you need to take in a fire situation, and how this situation would be different with the use of FireAway system to detect and prevent fire. The interaction with the audience could provide good feedback to improve the user experience.