

INFO 360A

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Design Specifications Document

Redesigning the enterprise level first-aid kit to include a digital interface providing critical medical emergency and disaster protocol information.

Problem Space

In a disaster, people are injured, if not killed, by forces beyond their control. In these circumstances, able-bodied bystanders, friends, and family conjure the courage to help one another. The immediate tool we have been trained to seek is a first aid kit. The home of bandages, medical supplies, pain relievers, and more.

But what happens when you finally find a first aid kit - in the midst of an earthquake - only to find ten, twenty, or more different supplies, with labels you do not understand? What happens when your friend is yelling for help and you don't know whether to use salicylates, capsaicin, or camphor-based pain relieving ointment? You possess all the tools to fix the problem, but lack the knowledge to know which tools to use or how to use them. You decide on your gut and what looks "right", and jump into action, hoping.

You shouldn't have to just hope. You should be able to know.

This situation presents a corner-stone example of how a properly designed experience, not just carrying case, can mean the difference between life and death.

A current problem with first-aid kits is people's lack of experience with its contents. In addition, the standard first-aid kit lacks proper organization of its materials, hindering its navigability for users. Thus, we believe that there is a need for an improved first-aid kit experience.

Here are the questions we need answered to confirm this belief:

1. During a disaster or another case of emergency, do people know where they can access a first-aid kit?
2. How are the contents of a first-aid kit currently organized, if at all?
3. Are first-aid kits difficult to use in disasters (under high levels of stress and panic, with various events occurring in the immediate environment)?
4. What type of first-aid kits are most commonly distributed? What is the standard for what items they contain?

All these questions can be answered through (1) online research and (2) talking to industry & academic leaders in the space of disaster recovery & preparation.

In order to control the scope of this experience, we will be narrowing our research to the following design questions:

1. How can we assure that non-medically trained individuals understand the use case of every supply piece in a first-aid kit?
2. How can we assure that non-medically trained individuals understand how to properly apply every supply piece in a first-aid kit, under a stressed condition?
3. How can we make our physical and digital designs simple and easy to use for a user who may be panicking or under high levels of stress?

Description of Users

We are targeting the enterprise-level first aid kit. Enterprise-level first aid kits must have enough supplies to support many individuals (10-20+) concurrently, versus a household kit serving one person in need. These kits are larger with a wider range of supplies. While corporate training programs often train staff in HR to use these kits, a disaster situation can yield havoc and uncertainty that the right people will be able to help.

The user of an enterprise-level first-aid kit is a professional in an office building. However, we plan to implement our design to be specific to the University of Washington campus. In conducting potential user interviews regarding our design, we learned that a majority of our peers do not know where to go to find medical supplies in the case of a first-aid emergency. Our target user group includes UW faculty, staff, and students, because everyone on campus should know what to do in a first aid emergency.

As affiliates of the UW, our users likely have (or are in the process of and have the capacity for) a higher-education background and are of ages ranging from 18-50 years old. We have established relationships with our users through our own networks, as a classmate or student of the target user.

Design Details

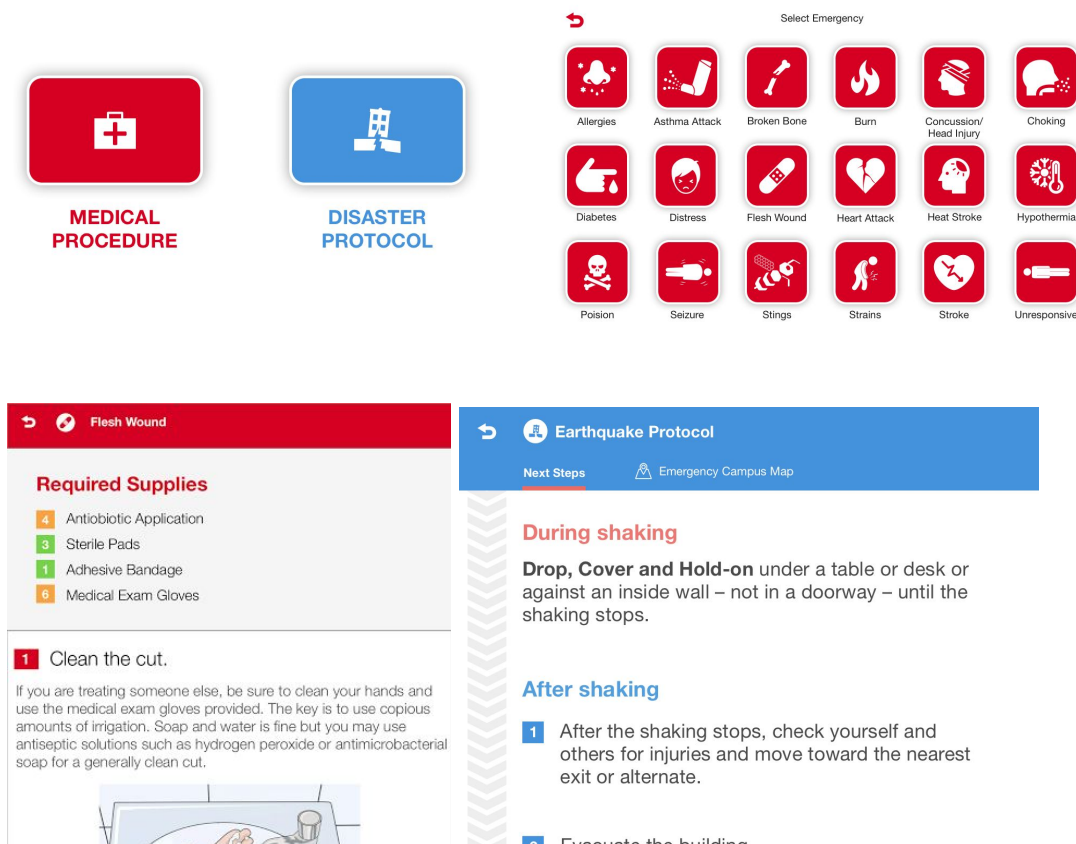
The design of our enterprise first-aid kit consists of two parts; the industrial design of the kit and the design of a display embedded in the kit. Our physical enterprise kit will contain all supplies of a class B first-aid kit required by OSHA. On the inside of its door will be an embedded, digital touch screen interface. It would have multiple compartments, systematically organizing the supplies to be consistent with the information provided by our digital interface. Each compartment would be numbered and grouped by color, allowing users to find items with ease in accordance to the location of each item specified on our interface. The interface itself will provide two major categories of information: quick step instructions that explain how to use the products in the context of various first-aid procedures, and disaster safety information and protocol specific to the UW campus.

Our design is limited by the following requirements:

1. The display must have a long battery life (10+ years).

- a. This is because first aid kits are commonly unused for long periods of time (hopefully), therefore any requirement of high touch, such as frequent charging, would be both cumbersome and error-prone.
2. The interface must not be reliant on internet connectivity.
 - a. All information should be pre-uploaded to the interface. In the case of a disaster, technological infrastructure is likely to be damaged or unavailable. Thus, the interface must be able to function offline.
3. The first-aid kit should be designed to withstand major impact and collisions.
 - a. In the case of disaster, it's very possible for the kit to fall or sustain impact with debris. Its contents are useless if they are damaged, so the case must be durable.
4. The information provided by our interface must be concise, yet meaningful.
 - a. A user operating the digital interface must be able to do so effectively even under duress. We do not want to overwhelm the user by bombarding them with information.

Through brainstorming, prototyping, and the usability testing of various prototypes, more requirements will be identified. By observing our initial designs in action we can test it with an eye towards improvement and fulfilling any other user needs that we observe.



Screenshots of various screens of the digital interface.

Evaluation and User Testing

Although stated as design requirements for a final product, aspects regarding the engineering and manufacturing of the physical components (material best suited for durability, sustainable technology for our embedded display, etc.) were not within our scope in designing our current prototype. Rather, our primary objective was to create a first-aid kit that would improve new user understanding of emergency practices and protocols. We also sought to provide new purpose to the enterprise first-aid kit by re-designing it with an eye towards disaster-related emergencies. In order to achieve these goals, we conducted multiple user tests in which user feedback and our own observations allowed us to make multiple iterations on our initial designs.

The design requirement we focused on the most in our user testing was the ease of navigability of both the information on the interface and the physical items presented within the first aid kit. Again, this important because a use case we are designing for is when the user may be under lots of stress or pain during a disaster or other medical emergency.

In our user testing, we presented our participants with the following scenarios and tasks:

- 1. You and your class have taken cover under the tables of your classroom in MGH. When the shaking has stopped, and your next priority is to get to safety and professional help for those who may needed. Find the map of UW's mass assembly areas on the first aid interface.*
- 2. You are on your way to class when a severe storm hits the area. Due to high wind speeds, you suffer a severely deep cut on your thigh and stumble your way into the building needing help. Use the first aid kit and interface available to perform first aid on yourself. For this test, all you need to do is take the appropriate supplies and put them on the table here. Please do not open the supplies.*

Our first round of user tests focused solely on the user interface and navigation of our digital interface's disaster protocol information. For this purpose, these users were only given scenario 1 to complete. A problem that arose was that our navigation links leading to the UW Mass Assembly Map did not look clickable. We also observed that the font size was too small for the users during the testing, causing readability problems for the users.

Solving these problems was critical to optimizing the layout and ease of navigation for our interface. Icons and vector images were essential for portraying buttons, and also served as quick indicators of the information being provided. We also learned from our font size issue that there is a difference between designing within an ecosystem on your computer screen versus what it physically looks like in action. These tests allowed us to finalize our design language to be used in designing the other pages of the interface.

In the second round of user tests, users were given both scenarios. Our primary goal was to test the user experience of the medical emergency procedures of the interface, and the user's interaction with the design of the first-aid kit. We conducted pre-test interviews to gauge each user's prior medical/first-aid experience. After the tests, we followed up with questions regarding the difficulty of each task, and why they thought so. During these tests, users found it difficult to locate the supplies listed for the given medical procedure in the first aid kit. After one test, we decided to create a numbering system specifying on the interface which compartment the item was located in. This also proved to be confusing, as the next user confused this number to be a quantity.

For our final design, we decided to use both numbering and color-coding to guide users towards the supplies they need. Each row in our 3-by-3 grid is assigned a color: the top row is green, the middle row is orange, and the bottom row is blue. In addition to color coding, each compartment is numbered, starting at 1, reading left-to-right. When a user selects a set of medical instructions on the digital interface, a supplies list is displayed at the top of the page. Next to each supply listed, a white number with a colored background is displayed - matching the physical interface in our first aid kit. Without the use of colors, a number next to the supply may look like a quantity, which is confusing. Without a number, the user has to look through as many as three compartments to find what they are looking for, which is inefficient. Using both of these identifiers in tandem helps to clearly communicate where the user should look to find the supplies they need.