

Team UX & Rescue Experience Evaluation

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Part 1: Evaluation Plan

System Description:

Firefighters fill out a report for each run they go on, and we have found that this process is largely undeveloped and ignored. Large pain points exist within the reporting process, and we have synthesized their complaints and motivations in order to create a device that enables them to complete reports quicker and easier. Our product is AR based, and will allow for a combination of touch and voice inputs. Our system will allow them to record vitals, patient information, incident information, and the action that was taken in a way that is hands free so that it is more efficient. Our system is weather independent (tablet touch functions can struggle in rain) and can be used in the station or with all their gear on.

Task 1: Record two vitals and Glasgow measurements

Since the interactions for recording all 5 major vitals are the same, we are having our users recording the blood pressure and heart rate of a patient. In addition, we are also having them complete Glasgow measures for a patient because those involve a different screen and a different interaction set.

Completion Criteria:

The task is complete when the user has recorded the two vitals and the Glasgow measure and confirms that the information is correct.

Task 2: Logging incident information

In addition to logging in vitals, we are also having the user log in the incident information. We are having them log the information in two ways: voice and touch. The user will record the incident as emergent or non emergent, along with what type of incident it was. If something is missed, or a wrong keyword is said, the system will display options when the user goes back to correct it.

Completion Criteria:

The task is complete when the user logs in all of the incident information and confirms that the information is accurate and correct.

Task 3: Logging action taken for the incident

Finally, we are having the user record the details about what they decided to do with the patient. We ask the user to log the action that was taken, what kind of treatment they provided to the patient and to confirm the information they just logged. For this task, we are having the user log it by both voice and touch. For the action taken, the user can choose via voice or touch.

Completion Criteria:

The task is complete when the user fully records all the details of the action that was taken for the patient and confirms that the information is correct.

Participants:

Our users are firefighters. These are individuals trained to rescue and treat those in emergencies. These users have a good understanding of technology, especially the one who interact with the data logging software.

User 1: Br The first firefighter is a senior officer with more than 20 years in service. His use of technology was limited but was okay with simple devices like his iPhone.

User 2: Dk Dk is also a senior officer and the lead. He has more than 20 years of service. He has a high level of competence with technology, navigating through tablets and computers easily. His lead role means that he takes charge at most runs. He is also the one with the most contact with the reporting system.

User 3: My This user was the youngest, with less than five years in service. He also had a high degree of ability with technology. His role as a firefighter is participating in rescue.

User 4: Pl The last user was very technologically skilled, even connecting a computer to their TV for better viewing of the software they wanted to show. Pl is a firefighter at the station with over 10 years of service.

Methodology:

Pre-Test Background

We began with giving background on what technology we were planning on using to implement the software we are designing. We also informed them of the general usability testing guidelines, for example, stating that the user is not wrong but our design is.

Testing

We tested our three pathways with each of the users, each run through the other users talked about the functionality and what each thought it meant. We provided minimal guidance on directions to take. When the user was stuck we allowed them to struggle a bit and see what actions he or she took, vocalizing their thought process through the testing.

Post-Test Decompress

The users voiced their opinions on the prototype, where it succeeded and failed. This was also a chance to see the software the firefighters used and where it needed

improvement. We were able to pinpoint more specific pain points during the interview.

Part 2: Simple Evaluation

Motivation: Our motivation for conducting a usability test is to better understand the flow, feasibility and accuracy of our current design. Through this usability test we hope to identify areas of our design that are working and areas that need improvement to make appropriate changes for the next iterative step in our design process.

Methods of Observation:

1. Video Recording
2. Note taking
3. Photography

Usability Test Format: Our usability test consisted of three parts:

1. Project Brief:

We began by briefing our participants on our project and why we chose incorporating Augmented Reality into the Firefighting reporting process. We explained the key paths that we lead them through and why we chose those paths. Lastly, we explained the two ways that you can interact with the interface (voice and touch). We did not explain when to use either method, to get a better understanding of when they decided to use one over the other.

2. Task Completion:

During this phase, we asked each participant to walk through our app based on our commands. As the participant completes each task we provided them as little instructions as possible about where each button was to get a better gauge of their potential confusion with the interface.

3. Reflection:

This phase shed light on whether our application was successful at improving the reporting process for our users. We asked each participant a series of questions to gauge their overall understanding of the application as well as what was working and what was not.

1. What was your initial response to this new method of reporting?
2. What aspects of the interface would be particularly useful and why?
3. Is there anything you wished we incorporated in this interface and why?

What worked Overall:

1. Voice as a method of inputting information
2. Using Keywords to activate voice
3. First three tabs for on scene reporting felt appropriate (Patient Information, Vitals, Action Taken)
4. Unobstructive and intuitive interface (looking down to pull up interface)

Areas of improvement Overall:

1. Incorporating a home page
2. Removing Glasgow as an reporting area
3. Incorporating a better method for patient look up and input
4. Improved explanation and representation of what interface would look like and how it could function

Findings:

1. *Device as extension to glasses is a good idea*
 - a. Details- Firefighters use safety glasses for every run, regardless of if it's non emergent, so a system on glasses would be used everywhere.
 - b. Plan- Implement system on glasses!
2. *Back arrow was confusing, where is the main menu?*
 - a. Details- Originally we had a back arrow on the upper left, with a profile icon and plus icon to the right of that. We intended for the profile icon to mean patient info, and the back arrow to get back to the main menu. However, we found the icon leading to patient info was confusing, as the firefighters pressed it and expected to go back to the main menu.
 - b. Plan- We are changing the interface so that the patient icon means home, and brings you back to the main menu of all the data options.
3. *System distinguishing between talking to system, and talking to team*
 - a. Details- There was concern among the firefighters that data would be written over or changed if the system picked up their voice when they were talking to a patient or a team member.
 - b. Plan- We are entertaining the idea of start and stop keywords, where the user says something to begin recording, and says something at the end so the system stops listening
4. *Glasgow is more for medic*
 - a. Details- We found Glasgow measures on a paper report that they gave us and had them walk through it as part of the first task. However, they mentioned that they don't use Glasgow anymore.
 - b. Plan- Instead, they use something called Alert & Oriented x4. The patient has to list a person, place, time, and event. If they can list all four, they are A&O x4, and are considered oriented. If they can't list any, they are A&O x0, and are considered disoriented.
5. *Patient name should be inputted by typing*
 - a. Details- We asked them their opinions on how to enter a patient name, because we as designers were struggling to find a clear obvious answer. They talked about how they read names off of medicine bottles, letters, ID's, medical bands, etc when patients are unresponsive.
 - b. Plan- They said to use typing on a keyboard because that was easiest, but we were wondering if some sort of ID scanner function would be a

good add on for those cases. Scanning a name is quicker than typing it in.

6. *Ability to jump back and forth is crucial*

- a. Details- In our prototype we had progressive disclosure. Clicking non emergent would lead to 3 more options, which would then lead to more depending on which one was clicked. They did not like this option, as they said the ability to jump back and forth is crucial, and they liked having all the options displayed for them at one time.
- b. Plan- In response to this, we plan to keep all the options on one screen, just organize by hierarchies so the subfields of one don't get mixed into the subfields of another.

7. *Syncing report with whitepages and searching by Date of Birth*

- a. Details- Although we didn't have them run through our patient path, we asked them about how they would like to look up patients. Currently, they have to type the exact correct name to find an existing report. Meaning Kay Waller and Kay D Waller do not pull up the same person. As a consequence, there are large numbers of repeat reports, and firefighters are having to create a new report and input information again even if it already exists, because they can't find the old report.
- b. Plan- We thought about syncing it to the whitepages database, then searching by DOB. If the user inputs DOB and first name, that will significantly decrease the amount of people. If I input "Barbara" and "10/2/1974", the chances that there are many Barbara's born on that exact day is very slim. It would then show all the Barbara's born on this date, so the user doesn't have to know exactly how the name was inputted before, they can just choose the right one.

8. *Field called primary impressions*

- a. Details- We learned about a field called primary impressions. This is where the patient describes what they think happened (ex: I think I broke my leg!). However, there are outrageous numbers of options for them to choose from, and the firefighters said they have to search and may find the field they need by luck.
- b. Plan- Although we don't have the authority to change the number of primary impressions, we can change the way they are presented. We are toying with the idea of having the most common impressions (abdominal pain, respiratory stress, chest pain, and fall) be available at the top, for easy clicking.

9. *Confused about Incident Info tab*

- a. Details- In our paper prototype, we had four main categories, one of them being incident info. We intended for this to have the run type, address, etc. However, in talking to them, the firefighters don't actually fill that much out in this category, and as they were running through it, our path and fields were inaccurate to what they actually have to input.

- b. Plan- Because we are trying to accomplish a lot already, we are taking out the incident information tab, preferring to focus our attention on quality over quantity.