

Lab 1 - Care Corner Description

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CS411W

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January 27, 2021

Version 2

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1 Introduction

Across the world, women live with a constant fear that they will be attacked at some point in their life. This fear is illustrated through walking in parking garages with keys in-between knuckles, always traveling in groups when possible, and making sure to never wear or say anything that might give someone else the wrong implications. This fear is rightly justified because one in three women are a victim of rape or attempted rape(*What is Sexual Abuse?*, n.d.). There are three immediate issues surrounding the topic of sexual assault.

The first problem is feeling unsafe in normally safe situations, or not having a way out of a potentially unsafe situation. Growing up, women are taught to have a plan of defense and escape in case they are in an uncomfortable situation or assaulted. Seven out of ten women say that their phone is always prepared when they are walking alone(*Mental Health America*, n.d.). Having a phone “prepared” could mean having a text already ready to be sent in case something happens, calling a friend during the walk so there is someone who would immediately know if something were to happen, or sharing location with their closest friends. This is the reality that, unfortunately, the vast majority of women have to live with daily.

The next problem involves the process of the assault victim finding appropriate help for their situation. Studies show that one in three women are a victim of rape or attempted rape, but only one-fifth of those cases are ever reported(*What is Sexual Abuse?*, n.d.). There is a huge disconnect between an assault happening and the victim actually reporting the crime. Many victims are left confused after an assault on how to and the right way to report the crime. Reasons for not reporting include fear of judgement, confusion about what happened, fear of not being believed, lack of evidence, and not knowing who or how to tell.

The last problem surrounds the overall knowledge about sexual assault. As a whole, the public is generally not aware of the actions they could be taking to aid in the fight against sexual assault. Men, for example, can learn what to watch out for when they are at a bar with their female friends. Women can learn about tricks that predators may try to use on them and ways to get out of those situations. Parents can learn how to talk to their children about the topic of sexual assault.

Care Corner is a solution to these problems. Care Corner is a mobile application that will provide safety features for responding to potentially unsafe situations, aid in the fight against sexual assault, and assist victims in determining how to find resources and report the crime.

2 Product Description

The goals of Care Corner can be summarized into the following three words: Safety, Resources, and Education. Care Corner aims to give another security option to women in the form of features readily available on their phone. These features can be used in uncomfortable situations to possibly prevent an assault from occurring.

The second goal of Care Corner is resources. With a low report rate of one-fifth of all assaults, Care Corner is trying to grow that number by putting resources directly into the application. Since the user will, ideally, already have the application downloaded on their phone for the safety features, the user will already be aware of the resources section in case they need to use it. This gives the user a confidential way to get the help they need.

The last goal of Care Corner is to aid in the fight against sexual assault. The objective of Care Corner is to complete this goal through education. The more that society learns about predators, how to spot when someone needs help, etc., will lead to more people knowing exactly how to look after each other.

2.1 Key Product Features and Capabilities

Care Corner aids in the fight against sexual assault through providing safety features for responding to potentially unsafe situations through the use of a panic button and fake phone call. The panic button is a clickable button on the application that, once triggered, will send an alert and share the location to the user's preset contacts, begin recording audio and video, and time-stamp when the button is pressed. This feature will give the user a sense of relief for their safety, as if something were to happen, all they have to do is click a button and a pre-set message will already alert the people that the user wants to alert. Additionally, recording audio and video will help the user build confidence in their evidence to lead to reporting the crime.

The fake phone call feature is a pre-recorded "phone call" that the user will appear to receive on their phone. This can be used to walk with to create another person that might scare off an attacker, or it could be a fake emergency to get out of an uncomfortable situation. For example, if a woman is stuck on a date with someone that is making her uncomfortable, she can press the fake phone call button, and the feature will work to appear as if she is receiving a normal phone call that she has to answer. Once she answers the call, it will be a recording on the other end making up some fake emergency that will cause her to have to leave the situation. Additionally, a key phrase can be pre-programmed by the user that, once said, activates the panic button.

Another goal of Care Corner is to educate its users on their responsibility in the fight against sexual assault. Mombot is the feature for this goal, it is an Alexa-type of bot that will communicate with the user. The user will be able to tell Mombot their plans for the night, and in return, get advice from the bot about things to look out for, and a checklist of what to do before leaving. For example, if someone tells Mombot that they are going to a bar with friends, Mombot

may tell them to never accept a drink from someone where they didn't watch it get poured. The general checklist that comes up on the screen may involve information such as sharing location with at least one person before leaving for the night, or creating a plan with friends of where they will meet up later in the night.

The last goal of Care Corner is resources. The features that directly aim to meet this goal are the resources section, journal, and reporting. The resources section contains location-based help including hotlines, help-sites, police stations, hospitals, and more. Additionally, general knowledge from official trusted websites will be given. Users will be provided a private, secured journal to talk about their road to recovery. This will give the user a safe, protected space to talk about what they are going through. Finally, the reporting section of the feature will include education on the different ways that there are to report, the results of reporting at different places, and how to begin the reporting process.

There are two user groups in Care Corner. One has access to all of the features above, and the other one is a guest account, that only has access to the resources and education sections. If the user chooses to create their free account, then they will have access to all the features. By creating an account, the application will be able to save their old journal entries, have a record of the audio and video recordings, and will save the user's pre-set contacts.

2.2 Major Components (Hardware/Software)

For software, the language is Java, and the IDE and UI/UX is Android Studio. The database is MySQL, and the build manager is Gradle. Version control is through GitLab, project management is through Jira, and the testing framework is JUnit. The web programming utilized in Care Corner is HTML, CSS, JS, and PHP. The operating systems that are used are Windows, Linux, Android, and iOS.

The Major Functional Component Diagram shows that once a user logs into their account, they get access to their profiles, resources, notifications, journal, reporting system, audio and video recording, fake calling system, and the panic button. The mombot utilizes a chat bot and resources utilize geofencing and web scraping. These are all connected to the web server.

Care Corner Major Functional Component Diagram



This product is being developed for women of any age. They will be the main group using the product at its deployment and will provide feedback on the application. For future deployment, the design of Care Corner is applicable to anyone who feels like they need more

protection in a situation. For example, members of the LGBTQ+ community may also find our application to be useful to them to make them feel safer in similar situations through using some of the safety features. Future deployments of the application will add additional resources and education that tailors to these particular situations. Care Corner is also useful for the loved ones of the main users of the application so they can have a place that the user feels safe reaching out to them.

4 Care Corner Product Prototype Description

The prototype of Care Corner will partially implement the features described in the real world product enough to show a functional system and proof of concept. All the features will be implemented in the prototype, but some customizations in the features will not.

4.1 Prototype Architecture (Hardware/Software)

The prototype will be made using the same hardware and software as the real world product. For software, the language is Java, and the IDE and UI/UX is Android Studio. The database is MySQL, and the build manager is Gradle. Version control is through GitLab, project management is through Jira, and the testing framework is JUnit. The web programming utilized in Care Corner is HTML, CSS, JS, and PHP. The operating systems that are used are Windows, Linux, Android, and iOS.

The hardware requirements are a web server, database server, file server, and an android smartphone. All of the hardware requirements will utilize AWS. AWS S3 is the cloud server for the web, AWS RDS is our database server, and the file server is AWS FSx.

4.2 Prototype Features and Capabilities

Care Corner's prototype will implement all the features in the real world product, with some stepbacks in the details of the features. The prototype will only be available on Android

devices. The databases will work properly, but there will only be test data inside of them. A standard MMS message will be sent when pressing the panic button instead of a personalized one. The key phrase that the user can say to activate the panic button will be eliminated. In the mombot, the responses will be in text form, not speech. The resources will be an unfiltered list of online resources only. The website resources will be minimal for testing purposes.

Table 1*Care Corner RWP vs Prototype Features*

Functional Element	RWP	Prototype	
Safe Walk (armed) mode			
Notify contacts via MMS	Fully Functional	Fully Functional	
Customize MMS messaging	Fully Functional	Eliminated	MMS messages will be preset
Send location/destination to contacts	Fully Functional	Fully Functional	
Audio Recording & Storage on Server	Fully Functional	Fully Functional	
Video Recording & Storage on Server	Fully Functional	Fully Functional	
GPS data Recording & Storage on Server	Fully Functional	Fully Functional	
If Location/Destination is sent	Fully Functional	Eliminated	Location will automatically be sent to all of user's in-app contacts
Panic Button			
Send location	Fully Functional	Fully Functional	
Send pre-set message	Fully Functional	Fully Functional	
Start recording audio	Fully Functional	Fully Functional	
Start recording video	Fully Functional	Fully Functional	
Dial out to pre-set contacts	Fully Functional	Eliminated	
Timestamp location and time of panic	Fully Functional	Fully Functional	
Fake Phone call			
Start recording audio	Fully Functional	Fully Functional	
Start recording video	Fully Functional	Fully Functional	
Activate Panic	Fully Functional	Fully Functional	
User can say key phrase to activate panic button	Fully Functional	Eliminated	
General			
Cross-Platform Support	Fully Functional	Partially Functional	Prototype will only be developed on Android
Authentication			
User account creation	Fully Functional	Partially Functional	Account creation will omit surveys and school data
User Credential Authentication	Fully Functional	Partially Functional	Credentials will not be encrypted when stored in the Database
Password Recovery	Fully Functional	Eliminated	
File Server			
Audio/Video/GPS data stored	Fully Functional	Fully Functional	
Database			
User/Contacts	Fully Functional	Fully Functional	
Incident/Audio/Video/Journey	Fully Functional	Fully Functional	
School/Resources	Fully Functional	Partially Functional	These DBs will be functional, but only test data will be present
Mombot Advice	Fully Functional	Partially Functional	This DB will be functional, but only minimal test data will be present

Mombot			
Write plans and receive advice in response	Fully Functional	Partially Functional	The responses will be a small sample size
Verbalize plans and receive verbalized advice in response	Fully Functional	Partially Functional	Talk-to-text will convert input. Response will be in text form, not verbalized.
Journal			
Can record in/ view Journal	Fully Functional	Partially Functional	
Journal will be encrypted	Fully Functional	Eliminated	
Educational Readings			*Web scraping will not be implemented
Govt/Official documents (just main sites like RAINN)	Fully Functional	Partially Functional	Minimal resources for testing will be available
Trusted blogs	Fully Functional	Partially Functional	Minimal resources for testing will be available
National hotlines	Fully Functional	Partially Functional	Minimal resources for testing will be available
Geofenced Resources			Unfiltered geofenced resources will be returned from external API
Shelters	Fully Functional	Partially Functional	Unfiltered online resources only
Non-Profits	Fully Functional	Partially Functional	Unfiltered online resources only
Counselors	Fully Functional	Partially Functional	Unfiltered online resources only
Campus Police	Fully Functional	Partially Functional	Unfiltered online resources only
Websites			
Govt Official Sites	Fully Functional	Partially Functional	Minimal resources for testing will be available
Trusted non-profits/ other	Fully Functional	Partially Functional	Minimal resources for testing will be available

4.3 Prototype Development Challenges

The main development challenge will be collaborating as a team. Although the team is using Scrum and Jira to organize our product, this will be the first time utilizing these tools for the majority of the team. Learning how to properly and efficiently collaborate on these tools will be a challenge.

Another challenge for the prototype development is the inexperience of the development team. For the majority of the team, this prototype is the first mobile application they have created, so there will be a lot to learn for every team member when it comes to utilizing APIs, AWS, and Twilio.

Another challenge for the creation of the prototype development is that the development team only consists of one woman, so there will only be one person who truly understands the need for the creation of the application and the lived experience that the problem details.

The final challenge for the prototype development will be learning how to synchronize the way the team codes into a working product. Being able to understand everyone's code will be a skill that every member of the team will actively have to participate in.

5 Glossary

Agile: Set of frameworks and practices where solutions evolve through collaboration between self-organizing cross-functional teams

AWS (Amazon Web Services): Cloud computing platform provided by Amazon

Android: Mobile operating system primarily developed by Google

API (Application Programming Interface): A set of functions that allow one program to access data and interact with an external program

Client-server: Computer system where a central server provides data to a number of networked workstations

Cloud Based Database Server: Virtual infrastructure that performs application and information-processing storage

Data Retention: Storage of an organization's data for compliance or business reasons

Database: Structured data held in a computer

File Server: Controls access to separately stored files

Geofencing: Using GPS to create a virtual geographic boundary

GitHub: Web-based collaboration platform for software developers

GPS (Global Positioning System): Provides users with positioning and navigation information.

Gradle: Build automation tool for multi-language software development

GUI (Graphical User Interface): The set of interactive visual components in software to improve the user experience.

HTML (Hypertext Markup Language): Standard markup language for documents designed to be displayed in a web browser

iOS: Mobile operating system developed by Apple

JavaScript: Object-oriented computer programming language commonly used to create interactive effects within web browsers

Jsoup: Open source Java library used mainly for extracting data from HTML

Kotlin: Object-oriented programming language initially designed for Android and Java Virtual Machine (JVM)

Linux: Unix-like, open source operating system for computers, servers, mainframes, etc.

MySQL: A freely available open source relational database management system that uses structured query language (SQL)

PHP (Hypertext Preprocessor): General-purpose scripting language suited to web development

RSS Feed (Really Simple Syndication Feed): Set of instructions on the computer server of a Web site. The feed tells the reader when new material has been published on the Web site

Scrum: A process framework used to manage product development and other knowledge work

Stakeholder (direct): Those involved in the company's day-to-day activities

Stakeholder (indirect): Those more interested in the result of the production

Twilio: A developer platform for communications

UI / UX (User Interface/ User Experience): The graphical layout of an application which includes components such as buttons, navigations bars, etc.

Web Scraping: Extracts and scrapes data from websites

Web Server: A computer that runs websites

Windows: Series of operating systems developed by Microsoft

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