

Lab 1 - Care Corner Product Description

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1. Introduction

In today's society, women are taught to have a plan to avoid sexual assault whenever they go out anywhere. In fact, 61% of women polled in a Mental Health America study stated they regularly take steps to avoid being sexually assaulted (*Support Groups*, n.d.). As a result of these occurrences, women tend to feel unsafe and uncomfortable in situations in which they are alone and fear being attacked in some way or another. This is an unfortunate but true reality many women have to deal with daily, and there are more ways to improve the current state of affairs. Women simply need an easier way to receive help and information quickly to help deter such realities.

The other main issue women have to contend with besides the fear of being sexually assaulted is what to do in the event of a sexual assault. One in three women are a victim of rape or attempted rape, but only 1/5 of those cases are ever reported (*What Is Sexual Abuse?*, n.d.). Women are usually unsure about how to go about getting help after being sexually assaulted and how to start the process to their recovery both physically and mentally. There is a disconnect between an assault happening and the crime being reported, and the reasoning behind this can be attributed to a variety of reasons such as confusion on how to report, lack of evidence, being afraid of judgement, and not knowing how to share their experience (Davey, n.d.). Making evidence collection easier and educating society on what to do after sexual assault or rape occurs would be an improvement in the number of crimes reported.

Care Corner is a mobile application that provides tools and resources to help mitigate the occurrence of sexual assault, to provide a means of notifying friends and authorities in the event of an attack and actively record the incident, and gives direct access to resources that assist users on what steps to take in the event of a sexual assault situation.

2. Care Corner Product Description

Care Corner is a mobile application that provides ways for victims of sexual assault to find the resources they need quickly, supplies features that can mitigate the occurrence of sexual assault, and to report the crime. Care Corner accomplishes this by having features that include a panic button, fake phone call, Mombot, built-in support resources, journal, and education on reporting.

2.1 Key Product Features and Capabilities

Care Corner provides features and capabilities to assist in the safety of its users such as the armed journey mode, fake phone call, panic button, Mombot, built-in resources such as phone numbers to national hotlines pertaining to sexual assault, and education on reporting sexual assault. The first of these features is the armed journey mode in which the user's location and destination can be sent to select contacts in order to ensure their friends and family are aware of the user's location. Additionally, the user has complete control over which contacts receive what information in order to ensure their privacy is protected.

Care Corner's fake phone call feature can be activated on demand or setup to occur at a specified time. The objective of the fake phone call is to provide an opportunity for the user to exit from an uncomfortable situation or convey that they are in contact with someone if a threatening situation appears to be imminent.

Care Corner's panic button feature is only used if the user feels they are in imminent danger and, when activated will send an alert message to trusted contacts that the user can set up in advance as well as their GPS location data. The panic button will also begin automatically recording audio and video which can then be used as evidence in case an altercation does occur.

Once the panic button is activated, the user has the ability to initiate contact with emergency services such as 911, campus security, or the police.

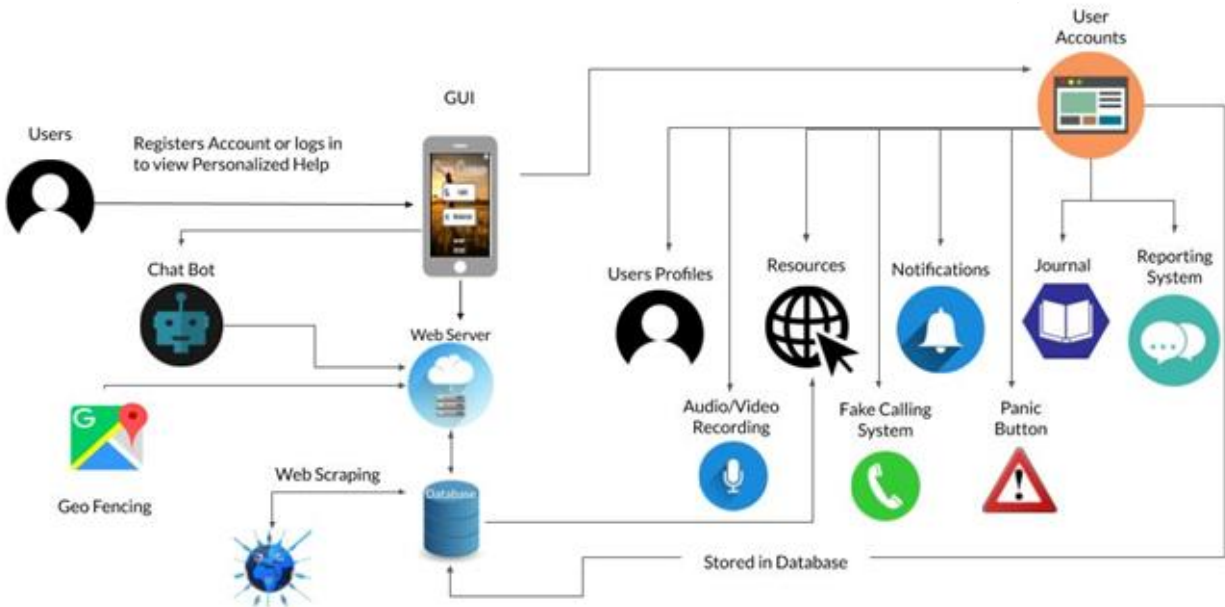
Care Corner's Mombot feature is a chat bot that analyzes the user's words both verbally and textually for certain keywords and provides feedback related to the queries. Mombot offers both national and local resources to help users find information on things such as finding the nearest women's shelter, how to report sexual assault, and educate the user on what steps to take after a sexual assault occurs. Mombot also helps the user by allowing them to state their plans for the evening and offering helpful advice depending upon what the user says. Mombot can also issue a "charge battery" warning if the phone is running low on energy so that the user is able to use Care Corner if they need to.

2.2 Major Components (Hardware/Software)

Care Corner is supported for Android and iOS operating systems and runs on smartphone devices. The major components of the Care Corner hardware and software architecture are shown in Figure 1. The external APIs that are used in this product are Jsoup, Google Maps API, and Twilio. Jsoup is used in web scraping various resources from Google and other sites. The Google Maps API is used to find the nearest shelter, police station, or hospital and direct the user to that location according to their preset location data. Twilio is used to create a chat bot to direct users via text or voice to find the help they need.

Figure 1

Care Corner's Major Functional Component Diagram (MFCD)



The web and file servers utilize JavaScript and PHP in conjunction with the website and database, respectively. Furthermore, the web server hosts the Care Corner website whereas the file server stores data that has been data scraped for Care Corner to use.

The database is created using MySQL and is hosted on AWS. The database is used to store the video and audio recordings, resource information, contact information, optional school information, and user information, such as user profiles, settings, location data, etc.

3. Identification of Case Study

The main target for the product is women, but Care Corner can be used by anyone. The reasoning for this is because women are the group which are most likely to face the problems that Care Corner is trying to solve. For example, if somebody is trying to flirt with the user at a bar and they are not interested or feel threatened, they would use the fake phone call feature as

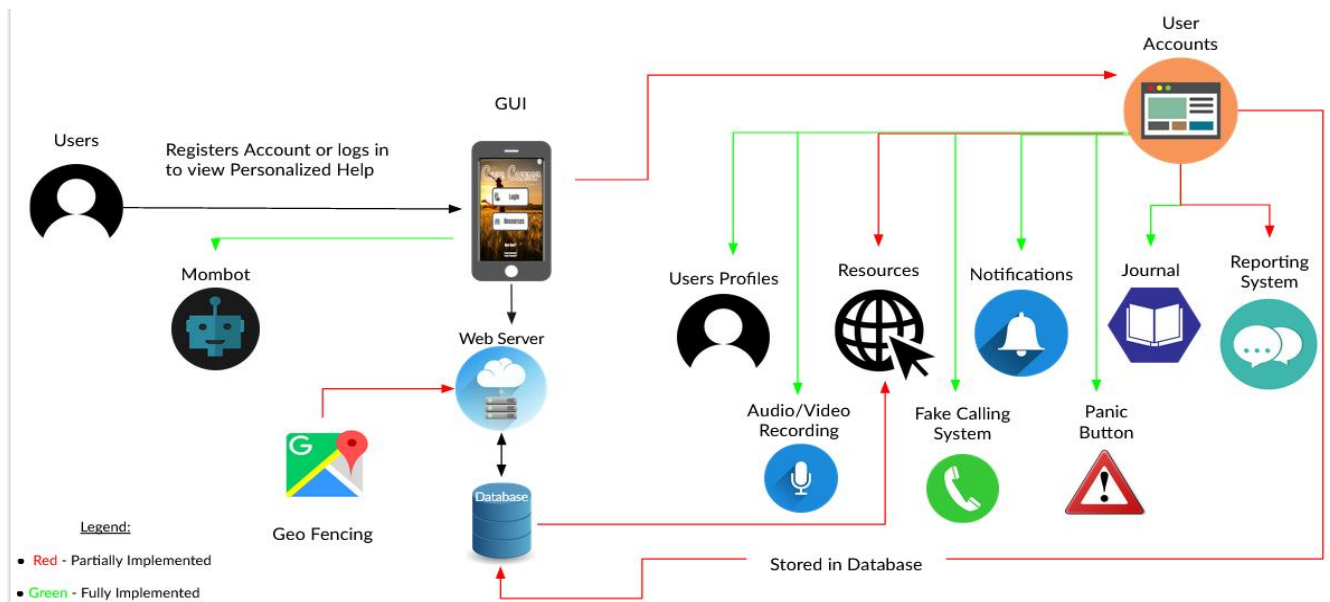
an excuse to get away safely, and similarly if a user is walking alone, it might make the user feel better and potentially prevent an attacker from assaulting them because they are on a phone using the armed journey mode or fake phone call features. Care Corner will be used to make a large positive impact on women by offering them a convenient and easy way to prevent sexual assault or to get information and resources quickly.

4. Care Corner Product Prototype Description

The purpose of Care Corner is to provide tools and resources to help prevent sexual assault from occurring and provide direct access to information and resources to assist users in understanding what to do in the event of a sexual assault situation. The objective of the Care Corner prototype is to demonstrate these key functionalities. The features that will be omitted in the Care Corner prototype will not be substantial to demonstrate a mostly functional version of the product.

4.1 Prototype Architecture (Hardware/Software)

The Care Corner prototype will be developed using a two-tiered architecture consisting of an application layer and a data layer as shown in Figure 2. The application layer will be running on smartphone devices, and the data layer will use MySQL database via Amazon Web Services (AWS). Hypertext Preprocessor (PHP) will be used to develop the integrations between the application and data layers.

Figure 2*Care Corner Prototype Major Functional Component Diagram (MFCD)*

The application layer will be developed using the Java programming language in conjunction with Android Studio. Java is also used to develop all of Care Corner's algorithms which include the Graphical User Interface (GUI), Journal, Fake Phone Calling System, Audio/Video Recording, Geo Fencing, and Mombot. The GUI, Fake Phone Calling System, and Audio/Video Recording algorithms will make use of the Android OS API in order to access specific parts of the Android operating system such as the camera. The Mombot will make use of the Twilio API in order to parse user voice or text and direct them towards receiving the appropriate information. The Geo Fencing feature will make use of the Google Maps API in order to assess a user's geolocation and use that information to find the closest location to find help.

The data layer will be used for storing user account information, audio and video recordings, and resource information. All of this data will be stored in a MySQL database that is hosted on Amazon Web Services (AWS).

4.2 Prototype Features and Capabilities

Most of the main features of Care Corner are implemented or at least partially implemented within the Care Corner prototype. The key features of Care Corner are the Geo Fencing, Mombot, fake phone call, journal, armed journey mode, panic button, and resources and all of these features are sufficiently implemented to demonstrate their proof of concept in the Care Corner prototype. The armed journey mode, panic button, and fake phone call features will be fully functional in the prototype. The rest of the features in the Care Corner prototype will be partially functional due to time restrictions and demonstration purposes. The exact features to be implemented are defined in Figures 3 and 4 below.

Figure 3

Care Corner RWP vs Prototype Features Part 1

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/Destiantion 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	
Include fake voice	Fully Functional	Fully Functional	

Figure 4

Care Corner RWP vs Prototype Features Part 2

Functional Element	RWP	Prototype	
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
Depression/PTSD Counselor			
Reach a counselor via MMS	Fully Functional	Eliminated	
Reporting Assistance (Partial)			
Time/location stamp at any time	Fully Functional	Fully Functional	
Assistance reporting via preset questions	Fully Functional	Partially Functional	Will include a minimized question/field set

The Care Corner Prototype allows users to use the armed journey mode, panic button, fake phone call, journal, and reporting assistance features almost as originally intended; The functionalities from these features that only appear in the final product are mostly supplemental or for security. The prototype allows user to use the Mombot, access resources, such as educational information, and geofencing resources features as well, but they will only use minimal resources for the purpose of demonstrating basic functionality.

4.3 Prototype Development Challenges

The development of the Care Corner prototype has various challenges – foremost, the prototype needs to be developed over a three-month time period and uses multiple unfamiliar technologies. The usage of new language and frameworks to develop and deploy Care Corner will require allotting enough time to dedicate towards learning these new technologies. To compensate for these tight deadlines, familiar programming languages will be chosen over unknown and unfamiliar programming languages.

The features that will present most challenge during the development of the Care Corner prototype will be fake phone call, panic button, armed journey mode, and mombot features. The fake phone call, panic button, and armed journey mode in particular are only partially difficult due to learning how to configure and link Amazon Web Services (AWS) to the Android Studio project. The mombot feature will be using the Twilio API which has its own learning curve and will be the hardest part of programming that feature. Overall, one of the hardest developmental challenges will be learning the nuances of Android Studio development because it will be used in almost everywhere in the Care Corner prototype and works much differently than other software development tools.

5. Glossary

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

Amazon Web Services (AWS): 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 Website. The feed tells the reader when new material has been published on the Website

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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