Lab 2 - Care Corner Product Specification

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March 2, 2021

Version 1

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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.

1.1 Purpose

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.

1.2 Scope

The Care Corner prototype will allow users to register for an account in order to save and retrieve user settings, journal entries, and recordings. The prototype will be able to configure fake phone calls, activate the fake phone call, and save the recordings for use as potential evidence if needed. The prototype will also have a journal feature that is secured via a Personal Identification Number (PIN).

The Care Corner prototype will also feature Mombot which will analyze the user's words – both textually and verbally in order to give supportive advice or direct them towards a helpful resource. The panic button will be partially implemented, and the user will be able to set up trusted contacts that will be sent a message and location data, but the location data will be faked. The resources and reporting assistance features will also be partially implemented, due to the omission of web scraping for the prototype. All of the features that are partially implemented in the Care Corner prototype will include enough functionality to be demonstrated effectively.

1.3   **Definitions, Acronyms, and Abbreviations**

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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1.5   Overview

This product specification provides the hardware and software organization, interfaces, and features of the Care Corner prototype. The remaining sections will provide a detailed description of each feature and their requirements for implementation.

2. General Description
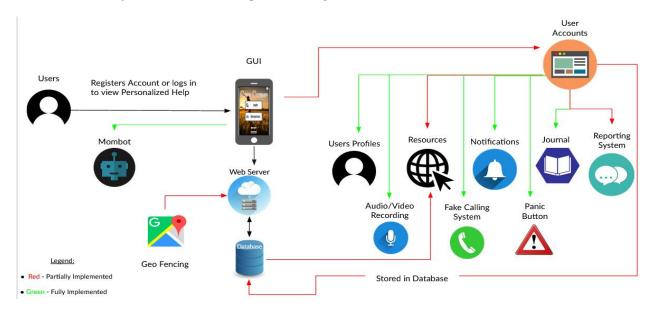
The Care Corner prototype will be deployed on smartphone devices. The algorithms used in the Care Corner prototype include data collection, data normalization, entity extraction, and information presentation. The key features from the real-world product will be developed in the prototype to demonstrate Care Corner's functionality and anything that will not be fully implemented will be mocked.

2.1   **Prototype Architecture Description**

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 1. 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 1:

Care Corner 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).

2.2   **Prototype Functional Description**

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 Figure 2 below.

Figure 2:

Care Corner RWP vs Prototype Features

	RWP	Prototype
Safe Walk (armed) mode		
Notify contacts via MMS	Fully Functional	Fully Functional
Customize MMS messaging	Fully Functional	Eliminated
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
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

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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
Pre-program what name the call appears to come from	Fully Functional	Fully Functional
Mombot		
Write plans and recieve advice in reponse	Fully Functional	Partially Functional
Verbalize plans and recieve verbalized advice in reponse	Fully Functional	Partially Functional
Journal		
Can record in/ view Journal	Fully Functional	Partially Functional
Journal will be encrypted	Fully Functional	Eliminated
Password Protected	Fully Functional	Fully Functional
Educational Readings		
Govt/Official documents (just main sites like RAINN)	Fully Functional	Partially Functional
Trusted blogs	Fully Functional	Partially Functional
National hotlines	Fully Functional	Partially Functional
Geofenced Resources		
Shelters	Fully Functional	Partially Functional
Non-Profits	Fully Functional	Partially Functional
Counselors	Fully Functional	Partially Functional
Campus Police	Fully Functional	Partially Functional
Websites		
Govt Official Sites	Fully Functional	Partially Functional
Trusted non-profits/ other	Fully Functional	Partially Functional
Depression/PTSD Councelor		
Reach a counselor via MMS	Fully Functional	Eliminated
Reporting Assistance (Partial)		
Time/location stamp at any time	Fully Functional	Fully Functional

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.

2.2.1   Hardware Interface

The Care Corner prototype will be available on any smartphone device.

2.2.2   Software Interfaces

Once the user creates and authenticates their account, Care Corner will retrieve their user settings and saved contacts from the database. Care Corner stores its data in a MySQL database which AWS accesses to read and write data.

2.2.3   User Interfaces

The Care Corner prototype will be accessed using smartphone devices. The Care Corner application will consist of the welcome screen, login screen, and a main menu that provides quick access to all of the application's features.

2.2.4   Communications Protocols and Interfaces

The Care Corner prototype will use the Transmission Control Protocol (TCP), Internet Protocol (IP), Hypertext Transfer Protocol (HTTP), Secure Sockets Layer (SSL), Transport Layer Security (TLS), and File Transfer Protocol (FTP) to connect to the AWS database in order to store and retrieve data. The API protocol that the Care Corner Prototype will be using is the representational state transfer (REST) API.