

Lab 2 - Care Corner Product Specification

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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.

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. 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.).

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 provides information for accessing 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. After creating an account and

logging in, the user will be granted access to the main menu that will allow to them to make a fake phone call, write and view journal entries, start the armed journey mode, activate the panic button, talk or text Mombot for advice, and learn about how to go about reporting sexual assault incidents and what steps to take in the aftermath of a sexual assault.

The fake phone call provides a way for users to escape an awkward or potentially dangerous situation by simulating a phone call by creating an excuse to walk away. The fake phone call also starts recording audio and video which can be used as evidence. The user can also hold the end call button for five seconds which will activate the panic button to notify trusted contacts of the user's location every few minutes along with a preset message which is all setup during account creation or in the settings menu. The armed journey mode feature is similar to the panic button except that the user can setup a destination they are going to and it keeps track of their location as they make their way to their destination and notifies trusted contacts along the way and when they reach their destination.

The reporting and resources features exist solely to educate sexual assault victims what steps to take in the event of a sexual assault and how to report the incident to the police. The journal feature is to provide an outlet to relieve mental anxiety and stress after a sexual assault incident because it is a known fact that writing one's thoughts in a journal improves physical and mental health. The mombot feature helps direct users to the appropriate sexual assault related information they are looking for by answering to either text or voice chat.

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

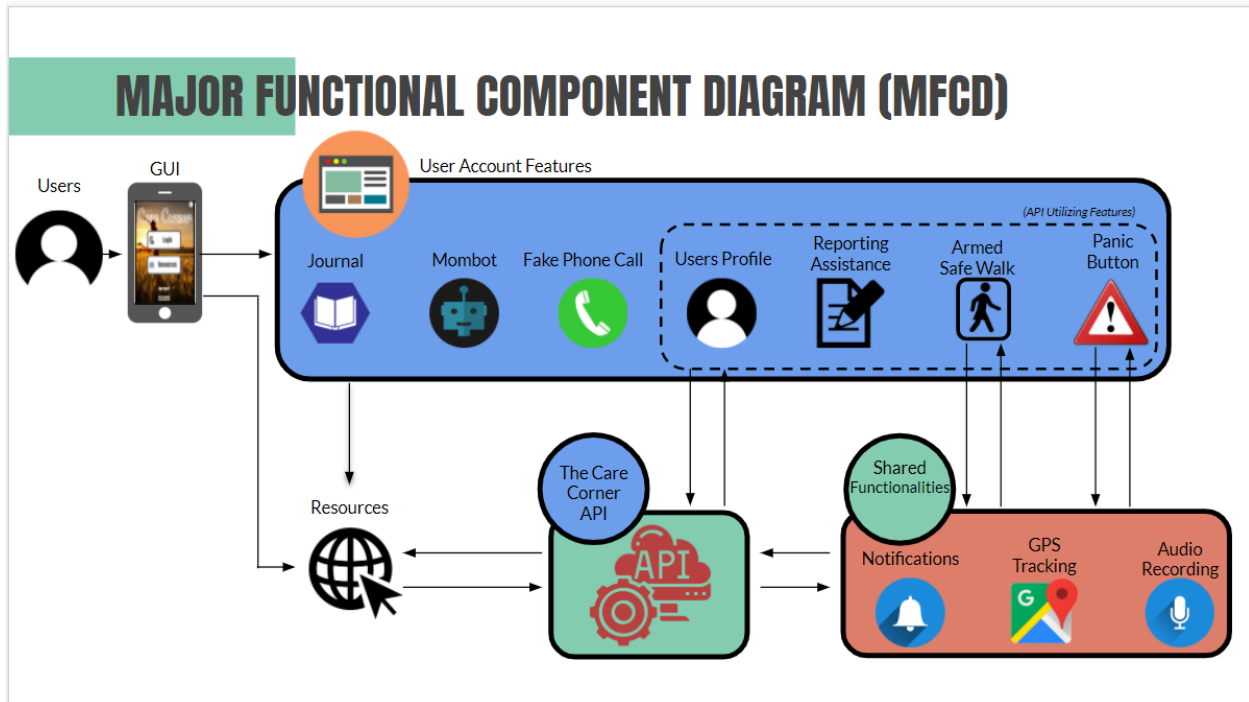
The Care Corner prototype will be deployed on smartphone devices. The algorithms used in the Care Corner prototype include data collection, data normalization, entity extraction, and information presentation. The key features from the real-world product will be developed in the prototype to demonstrate Care Corner's functionality, and simulated inputs and preloaded, mocked, data will be used where necessary to support the proof-of-concept objectives of the prototype.

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 run 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 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).

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.

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Figure 2

Care Corner RWP vs Prototype Features

Feature	Description	Prototype Implementation
Safe Walk (armed) mode		
1 Notify contacts via MMS		Fully Functional
2 Send location/destination to contacts		Fully Functional
3 Audio Recording & Storage on Server	Audio is recorded and backed up to the server.	Fully Functional
4 Video Recording & Storage on Server	Video is recorded and backed up to the server.	Fully Functional
5 GPS data Recording & Storage on Server		Fully Functional
Panic Button		
6 Send location		Fully Functional
7 Send pre-set message		Fully Functional
8 Start recording audio	The phone captures the audio surrounding it	Fully Functional
9 Start recording video	Video is captured when activated.	Fully Functional
10 Timestamp location and time of panic		Fully Functional
Fake Phone call		
11 Start recording audio	The back camera turns on and begins recording audio until	Fully Functional
12 Start recording video	The back camera turns on and begins recording until deac	Fully Functional
13 Activate Panic	When the End Call Button is held for 5 seconds, the panic	Fully Functional
14 Include fake voice	Depending upon the user's choice of fake phone call voice	Fully Functional
15 Pre-program what name the call appears to come from	The user can enter into a text box what name they want to	Fully Functional
Mombot		
16 Write plans and receive advice in response		Partially Functional
17 Verbalize plans and receive verbalized advice in response		Partially Functional
Journal		
18 Can record in/ view Journal	The user can create new, edit, and delete journal entries.	Partially Functional
19 Password Protected	Journal is protected with a PIN.	Fully Functional
Educational Readings		
20 Govt/Official documents (just main sites like RAINN)		Partially Functional
21 Trusted blogs		Partially Functional
22 National hotlines		Partially Functional

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Geofenced Resources		
23 Shelters		Partially Functional
24 Non-Profits	Returns a list of non-profits close to the user's location	Partially Functional
25 Counselors		Partially Functional
26 Campus Police		Partially Functional
Websites		
27 Govt Official Sites	A list of clickable .gov websites that handle sexual assault	Partially Functional
28 Trusted non-profits/ other		Partially Functional
Reporting Assistance (Partial)		
29 Time/location stamp at any time		Fully Functional
30 Assistance reporting via preset questions		Partially Functional
Authentication		
31 User account creation/ authentication		Partially Functional
32 User Credential Authentication	Single, static, credential is authenticated.	Fully Functional
33 Password Recovery		Fully Functional
File Server		
34 Audio/Video/GPS data stored		Fully Functional
Database		
35 User/Contacts		Fully Functional
36 Incident/Audio/Video/Journey		Fully Functional
37 School/Resources		Fully Functional

The Care Corner Prototype allow users to use the armed journey mode, panic button, fake phone call, journal, and reporting assistance features almost as originally intended; the functionalities that were removed from the prototype are mostly supplemental or for security. The prototype allow user to use the Mombot and access educational and reporting resources but will only have enough information for the purpose of demonstration.

2.3 External Interfaces

2.3.1 Hardware Interfaces

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

2.3.2 Software Interfaces

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

2.3.3 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.

2.3.4 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.