**Lab 2 – Care Corner Product Specification**

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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. The next problem involves the process of

the assault victim finding appropriate help for their situation. The last problem surrounds the

overall knowledge about sexual assault. All three of these topics are serious problems that can be

greatly improved. Care Corner is a bridge to the solution of these problems. Care Corner is a

mobile application that provides safety features for responding to potentially unsafe situations,

aids in the fight against sexual assault, and assist victims in determining how to find resources

and report the crime.

### 1.1    Purpose

Care Corner is a mobile application that 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, preparation before going

out for the night, or finding resources after an assault has occurred. Care Corner also aims to aid

in the fight against sexual assault through education in the form of features available for

reporting assistance and tips for how to recognize a potentially unsafe situation. Care Corner is

being developed for women of any age. Although the application can be used by groups who are

not women, they are the intended user at the deployment stage of the application. Care Corner

will not alert the authorities but will allow the user to pre-program contacts that will be alerted

upon the user pressing the panic button. Care Corner will not guarantee to stop an attack from

happening but instead serve as a tool that women can use to potentially prevent an attack. Care

Corner is not a social networking platform. The user can insert the contacts that they choose to,

but the interaction with the contacts will only be for sending emergency messages to.

**1.2     Scope**

Care Corner's prototype application will allow a new user to create and set up an account

with their chosen contacts. These contacts will be the ones alerted upon activating the Panic

Button. The user will be able to press the Panic Button and enter Panic Mode, deactivate Panic

Mode and access their incident information in the Reporting Assistance. Additionally, users will

be able to access an unfiltered list of web resources. Users will also have access to a protected

Journal where they can create new entries, edit existing entries, and delete entries. Finally, users

will be able to set a Fake Phone Call to activate at the set time.

As a case study, Care Corner's prototype will focus on women of any age at ODU. The

group will use the application before they go out for the night. The case study will last three

months during the summer months. They will utilize the Mombot feature to explain where they

are going and follow the checklist to receive the tips and useful information. While they are out

for the night, they can pull up the application anytime they feel like they might be in an unsafe or

uncomfortable situation.

### 1.3 Definitions, Acronyms, and Abbreviations

**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 computer, servers, mainframes, etc

**Multimedia Messaging Service (MMS):** A standard way to send messages that include multimedia content to and from a mobile phone over a cellular network

**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 problem Twilio: A developer platform for communication

**UI / UX (User Interface/User Experience):** The graphical layout of an application which includes components such as buttons, navigation 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

**1.4    References**

*50 obstacles to leaving*. (n.d.). The Hotline. www.thehotline.org/resources/50-obstacles-to-

  leaving/

Carpenter, C. (2021, February 18). *Lab 1 - Care Corner description.* Old Dominion University.

  Retrieved from https://www.cs.odu.edu/~411copper/Lab1_FinalVersion_Carpenter.pdf

Davey, M. (n.d). *Domestic violence: five women tell their stories of leaving - the most dangerous

  time.*TheGuardian.www.theguardian.com/society/ng-interactive/2015/jun/02/domestic-vi

  olence-five-women-tell-their-stories-of-leaving-the-most-dangerous-time

Dewan, S. (2018, September 18). Why women can take years to come forward with sexual

  assault allegations. The New York Times. www.nytimes.com/2018/09/18/us/kavanaugh-

  christine-blasey-ford.html

Jain, A. (2019, April 9). *Database hacking & its prevention*. The Cybersecurity Place.

  https://thecybersecurityplace.com/database-hacking-its-prevention/

Journalist, J. (2019, March 28). 61% of women regularly take steps to avoid being sexually

  assaulted. https://today.yougov.com/topics/lifestyle/articles-reports/2019/03/28/women-

  safety-sexu al-assault-awareness

*List of hotlines*. (2020, January 15) Please Live. Retrieved November 9, 2020, from

  www.pleaselive.org/hotlines/.

Miles, S. (2016, April 1). 5 on-demand apps for emergency services. *Street Fight*.

  www.streetfightmag.com/2016/04/01/5-on-demand-apps-for-emergency-services/.

Movil, N. (2016, October 22). What women worry about when they're out at night.

  www.noticieromovil.com/what-women-worry-about-when-theyre-out-at-night/

SCRUM methodology. (2017, October 7). *Zaynab's Blog*.

www.zaynabzahrablog.wordpress.com/2017/10/07/scrum-methodology/

*Self-care for friends and family*. (n.d.). RAINN. https://www.rainn.org/articles/self-care-friends-

and-family.

*Common hotline phone numbers*. (2019, March 6). Psych Central. Retrieved November 9, 2020

from www.psychcentral.com/lib/common-hotline-phone-numbers/.

*Support groups*.(n.d.). Mental Health America. www.screening.mhanational.org/content/support-

groups

*The US system didn't protect these women - so now they're taking a stand for others*. (n.d.).

Amnesty International. www.amnesty.org/en/latest/news/2019/10/gun-violence-report/

*Tips for talking with survivors of sexual assault.* (n.d.). RAINN.

https://www.rainn.org/articles/tips-talking-survivors-sexual-assault.

*What is sexual abuse?* (n.d.). Hope Alliance. www.hopealliancetx.org/sexual-assault-statistics/

**1.5     Overview**

This product specification explains the functional requirements necessary to drive Care

Corner's prototype mobile application. The product specification explains what hardware,

software, and external interfaces will be used to implement the functionality of the prototype.

## 2     General Description

Care Corner's prototype will partially implement the key features of the real world

product enough to show a functional system and proof of concept. Some features have been

eliminated due to limitations in the prototype development and demonstration environment,

available development resources, or because they do not contribute to the key proof of concept.

**2.1     Prototype Architecture Description**

The Care Corner prototype architecture consists of the following major components: a

chat bot, web server, user profiles, audio/video recording, fake calling system, notifications,

panic button, and a journal. The chat box is used to communicate with the user through the

Mombot feature. The web server is used to access websites used in the reporting assistance

feature. The user profiles are created to remember the pre-set contacts that the user chooses. The

audio/video recording is used upon pressing the panic button or starting panic mode in any of the

features. Figure 1 illustrates these major components. The language will be Java, and the IDE

and UI/UX will be Android Studio. The database will be MySQL, and the build manager will be

Gradle. Version control will be through GitLab, project management will be through Jira, and

the testing framework will be JUnit. The web programming utilized in Care Corner will be

HTML, CSS, JS, and PHP. The prototype will run on an Android device. AWS Services will be

hosted on a Linux VM.

**Figure 1**

*Care Corner Major Functional Component Diagram (MFCD)*
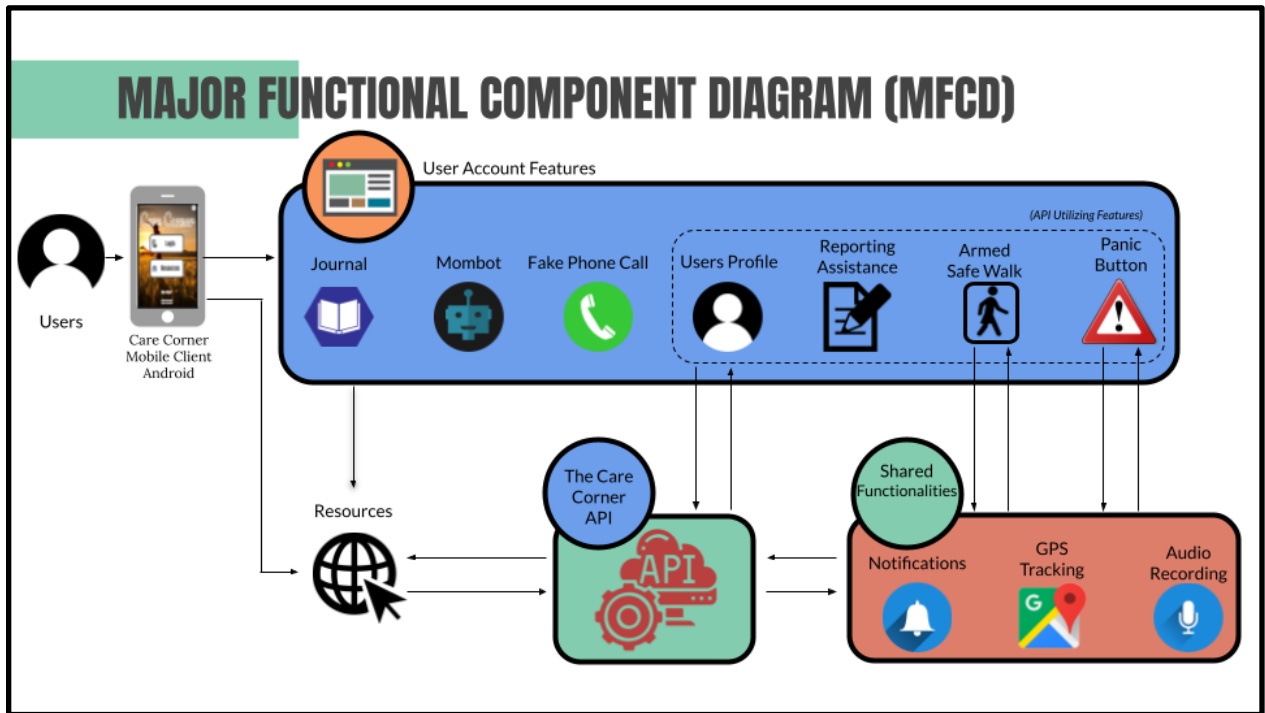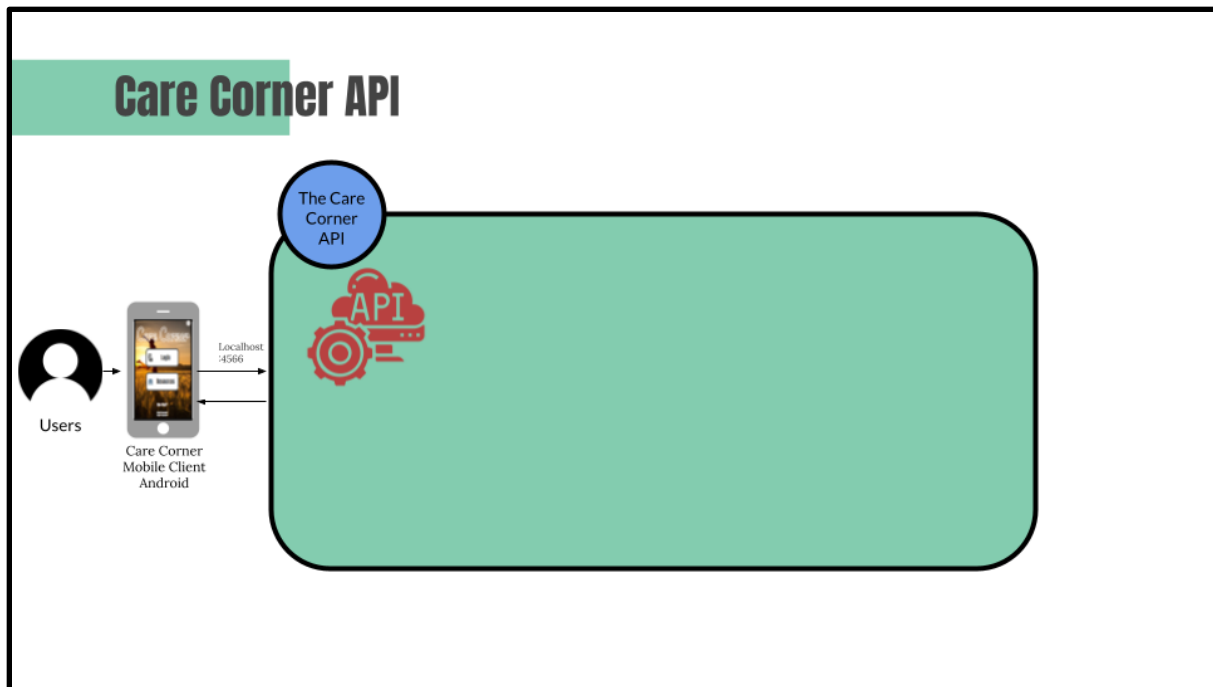


**Figure 2**

*Care Corner API*

Figure 1 illustrates what will be implemented in the prototype. Due to development environment limitations, the user accounts, resources, reporting system, geo fencing, and database will all be partially implemented. Figure 2 illustrates how the Care Corner API works.

## 2.2      Prototype Functional Description

Care Corner's prototype will have many working features that the product will perform. Many of these features will be fully implemented while others will be partially functional. A comparison of how these features differ from the prototype to the real world product can be seen in Table 1. Care Corner's prototype application will partially implement the majority of the real world features. The prototype will only be available on Android devices. The databases will be pre-loaded with test data for demonstration purposes. Instead of a personalized message, the panic button will send a pre-set MMS message to the user's chosen contacts. In the Mombot, the responses will be in text form, but the user will still be able to talk to the Mombot through speech. The resources will be an unfiltered list of online resources only. The website resources will be minimal for testing purposes. The fully functional features of the prototype will show success of the prototype goals.

## Table 1

*Table of Comparison Between RWP and Prototype*

| Feature | Description | Prototype Implementation |
|---|---|---|
| **Safe Walk (armed) mode** | | |
| Notify contacts via MMS | The user's contacts will be notifed via multimedia messages (MMS). | Fully Functional |
| Send location/destination to contacts | The location and destination of the user will be sent to their emergency contacts. | Fully Functional |
| Audio Recording & Storage on Server | Audio is captured and stored on the server when the user chooses to back up their audio. | Fully Functional |
| Video Recording & Storage on Server | Video is captured and then stored on the server when the user chooses to back up their video. | Fully Functional |
| GPS data Recording & Storage on Server | The users GPS location during the armed mode will be stored on the server | Fully Functional |
| **Panic Button** | | |
| Send location | The user's location will be sent to emergency contacts when the panic button is activated. | Fully Functional |
| Send pre-set message | The user's preset message is sent out to their emergency contacts when the Panic Button is activated. | Fully Functional |
| Start recording audio | The phone captures the audio surrounding it | Fully Functional |
| Start recording video | Video is captured when activated. | Fully Functional |
| Timestamp location and time of panic | That phone will capture and save user's coordinates, time and date when Panic Button is activated | Fully Functional |
| **Fake Phone call** | | |
| Start recording audio | Audio capture starts until deactivation. | Fully Functional |
| Start recording video | The back camera turns on and begins recording until deactivation | Fully Functional |
| Activate Panic | When the End Call Button is held for 5 seconds, the panic feature is activated. | Fully Functional |
| Include fake voice | Depending upon the user's choice of fake phone call voice, that voice clip will play when the Fake Phone Call is started. | Fully Functional |
| Pre-program what name the call appears to come from | The user can enter into a text box what name they want to appear when the fake phone call is activated | Fully Functional |
| **Mombot** | | |
| Write plans and recieve advice in reponse | User can text Mombot what their plans are and receive general advice in return | Partially Functional - the prototype will only provide general advice and feedback |
| Verbalize plans and recieve verbalized advice in reponse | User can verbally express their intent to visit a location or attend an event. In response, the Mombot will provide appropriate safety tips and feedback | Partially Functional - the protype will not feature an algorithm to appropriately provide feedback from Mombot based on user input. Instead, feedback will be generic |
| Can record in/ view Journal | The user can create new, edit, and delete journal entries | Partially Functional - Speech parsing is not functional |
| Password Protected | A PIN is used to protect the Journal from prying eyes. | Parially Functional - The PIN is hardcoded for the protoptype. |
| **Educational Readings** | | |
| Govt/Official articles (just main sites like RAINN) | Users will be provided a collection of government/offical sites that have been gathered via web scraping and RSS feeds. | Partially Functional - The prototype will only feature a few Goverment/Official Websites in order to show proof of concept. No web scraping or RSS feeds will be implmented. |
| Trusted blogs | Users will be provided a collection of readings from trusted blogs that have been gathered via web scraping and RSS feeds | Partially Functional - The prototype will only feature a few blogs in order to show proof of concept. No web scraping or RSS feeds will be implmented. |
| National hotlines | Users will be given a list of national hotlines they can call | Partially Functional - The prototype will only feature a few National Hotlines in order to show proof of concept. No web scraping or RSS feeds will be implmented. |
| **Geofenced Resources** | | |
| Shelters | Returns a geofenced list of shelters close to user's location | Partially Functional - The prototype will only have an unfiltered list of shelters |
| Non-Profits | Returns a geofenced list of non-profits close to the user's location. | Partially Functional - The prototype will only have an unfiltered list of non-profits |
| Counselors | Returns a geofenced list of counelors close to the user's location | Partially Functional - The prototype will only have a small selection of counselors as test data to show proof of concept. |
| Campus Police | Returns the campus police information based on user's location | Partially Functional - The prototype will only have a small selection of campus police as test data to show proof of concept. |
| **Websites** | | |
| Govt Official Sites | A list of clickable .gov websties that handle sexual assault policies. | Partially Functional - The prototype will only have a small selection of unfiltered sites. |
| Trusted non-profits/ other | A list of links to trusted non-profit sites or articles providing support to sexual assault victims. | Partially Functional - The prototype will only have a small selection of unfiltered sites. |
| **Reporting Assistance (Partial)** | | |
| Time/location stamp at any time | Care Corner will store the time and location when using the Panic Button or Armed Safe Walk Mode in case this informatino is needed for a future reporting | Fully Functional |
| Assistance reporting via preset questions | All incidence created in the database through Car Corner API with specific user credencial can be accessed to generate a report and used as necesssry | Partially Functional - The reporting assistance for the prototype uses a limited set of prepopulated questions. |
| **Authentication** | | |
| User account creation/ authentication | A new user can create an account and the information is stored in the Care Corner Database. The user can then login to Care Corner through this account. | Partially Functional - The prototype will allow users to create new accounts and store the information but the user cannot login using this newly created account. |

| | | | |
|---|---|---|---|
| | User Credential Authentication | A user credential is authentiated to allow access to the application. | Partially Functional - The username/password is hardcoded for the prototype, only one user account is supported. |
| | Password Recovery | A user can recover a forgoten password using some info store on the database at time of account creation | Fully Functional |
| **File Server** | | | |
| | Audio/Video/GPS data stored | Audio, video, and GPS data collected by the user will be saved in the Care Corner Database. | Fully Functional |
| **Database** | | | |
| | User/Contacts | User data such as name, email, username, password, and emergency/trusted contacts are stored in the Database. The name and phone number of the contacts are stored as well. | Fully Functional |
| | Incident/Audio/Journey | Metedata from an Incident, including the server location of the associated audio file and GPS journey file. | Fully Functional |
| | Resources | Data for vetted resources can be stored in the DB for faster user access. | Fully Functional |
| | School | Data for US Colleges/Universities and their campus police can be stored for faster user access. | Fully Functional |

**2.3    External Interfaces**

Care Corner utilizes hardware, software, user, and communication interfaces in order for

the prototype to be run smoothly.

### 2.3.1    Hardware Interfaces

Care Corner requires 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 the database server, and the file server is AWS FSx.

### 2.3.2    Software Interfaces

Care Corner's prototype works with many software interfaces for functionality. The

Localstack Framework is used to create an AWS development environment. In Android Studio,

the SDK emulator is used to run the application. The Android Media Recorder will be used to

record audio. The Android GPS is used to find the user's location. Twilio is used to provide SMS

functionality.

### 2.3.3    User Interfaces

The user will need to be able to access a mobile Android device to use the prototype.

Additionally, they will need to be able to download the application onto their device from the

Android application store.

### 2.3.4    Communication Protocols and Interfaces

Care Corner's prototype needs to have an internet connection in the form of TCP/IP

connection.