Lab 2 – Product Specification

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1 Introduction

Far too often women feel unsafe and uncomfortable when they are in situations where they are alone, and some may live with a constant fear of being attacked (Ballard, 2019). To make matters worse, when women are attacked, they can be unsure how to go about getting help and how to begin their recovery (*After sexual assault*, n.d.). There is more that can be done to improve this reality that the majority of women have to live with daily.

In an attack or a potential attack, a woman can find herself limited in her options for help: she can fight, she can run, and she can scream for help. In a threatening or uncomfortable situation or faced with a potential attack, options for mitigating the situation or avoiding it altogether are limited to things like running away, calling for help, or attempting to make a phone call. Police or other emergency services are an option, but more women are becoming hesitant to reach out to them (Schreyer, 2018). There needs to be a discrete and readily accessible way to notify friends or family of a situation, record events as they unfold, and notify police or first-responders if necessary.

There is currently no application available to women to try and ease the burden of these issues addressed. Care Corner fills this void by offering a platform that has features for getting users out of uncomfortable situations; easily and quickly alerting trusted friends and family members; quickly recording audio and video; as well as offering educational resources on how to get help, where to get help, and what the reporting process is like.

1.1 Purpose

Care Corner is a mobile application that provides tools for reducing the likelihood of sexual assault and provides resources to help users understand what to do in the event that a sexual assault does occur. The application works to reduce likelihood of sexual assault, reduce severity of situations, and make recovery resources more accessible.

The application will be used by anyone looking for a tool to aid in the fight against sexual assault. The user could use it anytime but the core features(Mombot, Armed Journey, Panic Button, Fake Phone Call) could be used before going out, while on the way to their destination, at their destination, and on their way back home. Of course Resources and Journal could be used at any time.

The product will provide the user with tools to aid in the fight against sexual assault. The product will also provide the user with Resources and a Journal. The product will make it easier for the user to collect potential evidence and alert trusted contacts easily. The product will not protect the user from sexual assault.

1.2 Scope

The purpose of Care Corner is to reduce both the likelihood and severity of sexual assault as well as make resources more accessible. The objective of the Care Corner prototype is to demonstrate the key features of the product as a proof-of-concept implementation. This prototype will not include all functions and features of the real-world product. Omitted features will not be necessary to demonstrate the key capabilities of the Care Corner solution.

To achieve the goals of the product the prototype will implement Armed Journey, Fake Phone Call, Mombot, Journal, and Resources.

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

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1.5 Overview

This product specification provides the hardware and software configuration, external interfaces, capabilities and features of the Care Corner prototype. The information provided in the remaining sections of this document includes a detailed description of the hardware, software, and external interface architecture of the Care Corner prototype; the key features of the prototype; the parameters that will be used to control, manage, or establish that feature; and the performance characteristics of that feature in terms of outputs, displays, and user interaction.

2 General Description

The Care Corner prototype will be deployed as a mobile application using common mobile architecture. The algorithms used within Care Corner include geofencing and Mombot algorithms. The key features from the real-world product will be developed in the prototype to demonstrate Care Corner's usefulness.

2.1 Prototype Architecture Description

Care Corner is a mobile application which needs internet connection, camera permissions, microphone permissions, and access to contacts.

The Care Corner prototype has the following hardware requirements: a file server, a web server, a cloud based database server, as well as an Android with connection. There is a need to backup important and sensitive information that could potentially be used as evidence of a crime. Care Corner's server infrastructure is based on Amazon Web Services. The web server and file server are maintained on AWS-S3 web service, and the database is maintained on AWS-RDS with MySQL.

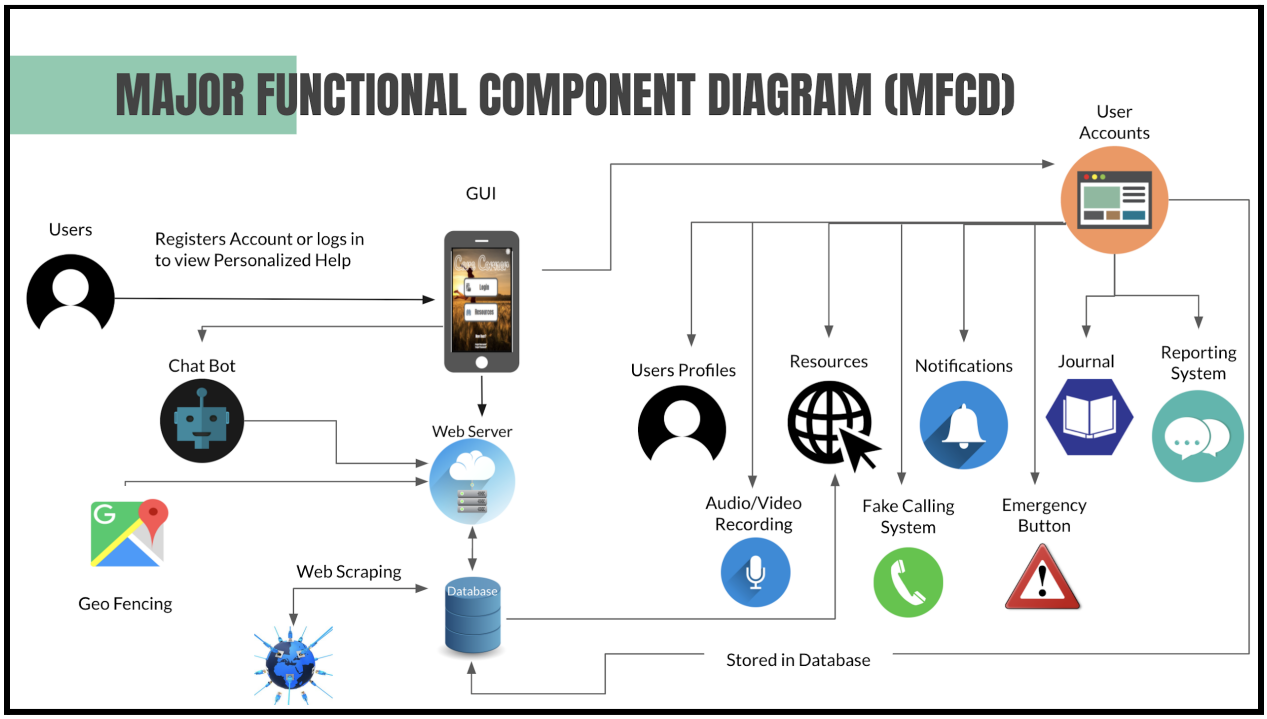
The Care Corner prototype has the following software requirements: web programming on HTML, CSS, JS, and PHP; operating systems on Windows, Linux, Android, and iOS; Github

for collaborative development and software version control; Build Manager of Grade; Workflow of Gitlab. All are standard for cross development and teamwork. HTML enables the upkeep of the website. Operating systems enable both development and maintenance of site and mobile application. Build Manager and Gitlab aid development and maintenance.

The Major Functional Component Diagram (See Figure 1) shows that the Chatbot, GUI, and geofencing work directly with the web server. The web server works to feed the Chatbot information as well as make the Chatbot perform properly. Also, the web server allows the geofencing API to work properly for the application's needs of finding nearby resources.

Figure 1

Care Corner Major Functional Component Diagram



The GUI works with the web server to display all the information on the mobile application. The web server works with the database to retrieve and send data ranging from

account information to videos that have been recorded. The database works with the web scraper, accounts, and resources to ensure the resources listed stay up to date. Finally the MFCD shows the User Accounts work with the GUI and the database to ensure proper mobile application functionality as well as personalization and profiles. The User Accounts can be broken down into many different nodes which have corresponding data being stored: profiles, recording, resources, notifications, Fake Call, Journal, Panic Button, and reporting system.

2.2 Prototype Functional Description

Some of the features of Care Corner will have limited usability in the prototype. Some features will be simulated while others features will be demonstrated using sizable materials. A comparison of each feature can be seen in Table 1.

Table 1

Table of Comparison Between RWP and Prototype

	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
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

(Figure continued on next page)

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
Assistance reporting via preset questions	Fully Functional	Partially Functional
General		
Cross-Platform Support	Fully Functional	Partially Functional
Authentication		
User account creation/ authentication	Fully Functional	Partially Functional
User Credential Authentication	Fully Functional	Fully Functional
Password Recovery	Fully Functional	Fully Functional
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	Fully Functional
Mombot Advice	Fully Functional	Fully Functional

The Armed Safe Walk provides a user the capability to directly communicate location information and scripted messages to selected contacts as well as quick access to the Panic Button. The Fake Phone Call provides a user the capability to activate or schedule a fake call to their phone so that they can excuse themselves from a situation when needed or seem to be on the phone with a friend. The Panic Button provides a user the capabilities to quickly message

preselected contacts, share GPS location with preselected contacts, and prepare a call to 911 or campus police. The Mombot provides the capabilities for a user to verbalize their plans then receive helpful mom-like feedback or advice as well as reminding the user of the option to schedule a Fake Call or start an Armed Journey. The Journal provides the user a secure journal or diary to use as the user would like and could aid in recovery if the user were to go through something traumatic. Resources provide the user with quick and easy access to reliable resources from a national level or at a local level through the use of geofencing.

From the welcome screen the user can go to Login, Forgot Password, Forgot Username, New User, or Resources. After logging in the user can access Armed Journey, Panic Button, Mombot, Fake Phone Call, Journal, or Resources from the homepage. Both Armed Journey and Fake Phone Call link to the Panic Button. No other direct links are made, back buttons are available for the user to easily return to the homepage and select a different feature.

2.3 External Interfaces

As a mobile application, Care Corner uses common hardware and software interfaces to allow users to access and utilize the mobile user interface. Care Corner also makes use of APIs for location sharing and geofencing.

2.3.1 Hardware Interfaces

The Care Corner prototype is hosted on Amazon Web Services (AWS) utilizing many serverless services to provide access to virtualized hardware and databases.

2.3.2 Software Interfaces

The Care Corner prototype works with several software interfaces to provide functionality. The Android SDK is used to enable standard application features. The Android GPS API is used to manage the user's geographical location. The Android Media Recorder is used to record audio and video. Twilio is used to provide SMS functionality. The Localstack and Serverless Framework with Docker are used to emulate an AWS development environment.

2.3.3 User Interfaces

The Care Corner prototype will be accessed using an Android Mobile device. The Care Corner application will consist of a welcome page, a login page, a settings page, forgot username or password pages, a homepage leading to major features, as well as pages for each major feature (i.e. Armed Journey, Panic Button, …).

2.3.4 Communications Protocols and Interfaces

The Care Corner prototype uses the REST application level protocol to communicate between the mobile application and the API. All traffic is managed over HTTP/1.1 and SSL/TLS 1.2. The data format is in JSON which requires the Content-Type HTTP header to be set. An API key is used to provide access in a HTTP header.

3 Product Requirements

Care Corner's requirements will be included in a separate document titled "Lab 2 Section 3 – Product Requirements." The document will include the key functional requirements of the product as well as illustrations to expand on the concepts. In addition to the functional requirements, the performance requirements of Care Corner will be included in the document. The performance requirements will be expressed in specific, measurable terms. Assumptions and constraints for Care Corner will be described, and the non-functional requirements will be outlined.