Lab 2 - Care Corner Product Specification

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1. Introduction

Sexual assault is far too common. It is reported that one in three women have been the victim of rape or attempted rape (What is Sexual Abuse?, 2018). Sexual assault on women has become so prevalent that a majority of them admit to taking regular steps to avoid being sexually assaulted (Journalist, 2019).

Another negative aspect of sexual assaults is how often they go unreported. There exist a lack of education in regards to how to report rape or sexual assault and a lack of education on what rape or assault even is. In addition, there are barriers including confusion, fear of judgment, and perceived lack of evidence (The US System Didn't Protect These Women, n.d.). As a result, both victims and potential victims live in fear of being assaulted and, if they are assaulted, the assailant is rarely held accountable.

Care Corner is a mobile application that is designed to aid anyone who feels they are at risk of being assaulted. Care Corner offers the user options to remove themselves from uncomfortable situations, as well as quickly notify friends and family in case of an emergency. Care Corner offers access to educational resources, local shelters, and assistance with reporting if any assault or incident takes place.

1.1 Purpose

The Care Corner mobile application for both Android and iOS. Care Corner is designed for anyone who feels the need to take additional precautions in regards to their safety. The application consists of two main areas which are prevention and reporting.

Care Corner offers several options to assist in the prevention of assault. This extends from making sure the user’s friends and family are aware of the user’s location to planning a night out accordingly to maximize the user’s safety.

Care Corner also looks to educate users and ensure if an assault does occur that the user has all the necessary tools needed to properly report any assailants. In addition, Care Corner also looks to assist users with recovery by connecting them with local and national aid.

Core Corner will not contact emergency services for the user. Care Corner will not provide any medical advice, including behavioural health.

1.2 Scope

The Care Corner Prototype will have the Panic Button implemented, which will instantly begin tracking the users location and notify contacts when activated. The Armed Safe Walk will be included so user's can proactively notify contacts when they're planning on walking alone. The Fake Phone Call feature be included as well so users can fake a phone call to excuse themselves when needed. The GPS tracking, audio recording, SMS notifications functionalities will all be implemented and part of the Incident creation process. They will function with the Panic Button and Armed Safe Walk as well.

The Functionality and UI for the Mombot and the Resource collection will be implemented, though only partially. The Mombot will not include a fleshed out logic and the Resource page will include only test data. The Reporting Assistance aspect of the application will be included, but simplified. The Journal will be fully functional.

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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, interfaces, and features of the Care Corner prototype. The remaining sections will provide a detailed description of each feature and their requirements for implementation.

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2 General Description

The Care Corner prototype will be designed to mitigate the risk of an assault taking place, educate users on preventative practices, and provide resources and information if an assault should occur. The Care Corner prototype will be designed to demonstrate the key features that achieve these goals. Despite the omitted features in the prototype, the Care Corner protype will still demonstrate proof of concept for the real world version of Care Corner.

2.1 Prototype Architecture Description

The Care Corner prototype will run on any Android device that is API version 21 Lollipop or higher. The prototype will be developed on Android Studio within the Windows 10 and Linux operating systems. The application will be written using Java8.

The user's device will serve primarily as the method in which users interact with the Care Corner application. Any features that require data from the database or files stored on the server will access these locations via the Care Corner API Handler. This architecture is outlined in Figure 1.

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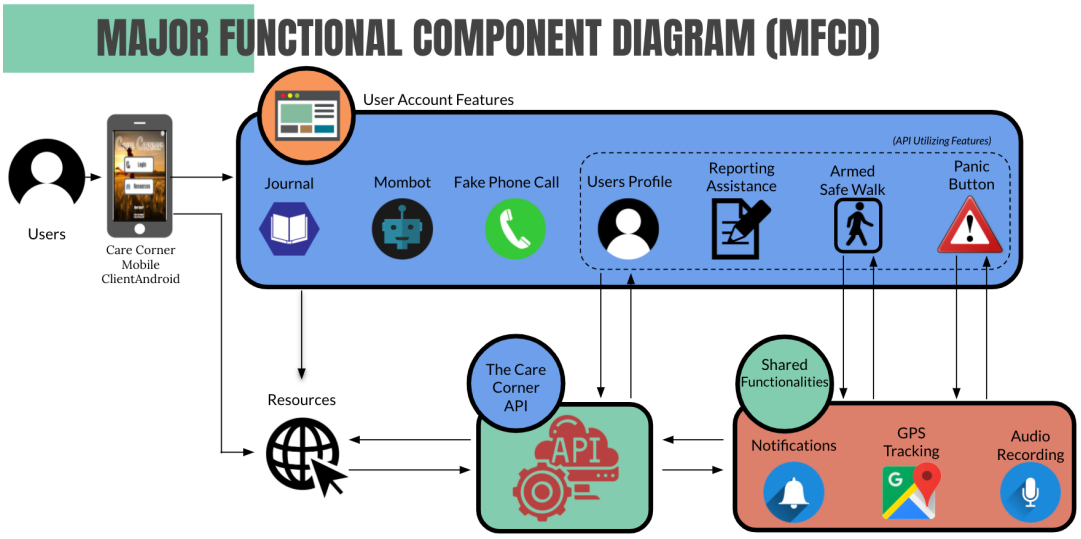
Figure 1

Care Corner Prototype's Major Functional Component Diagram (MFCD)



1.

The Care Corner prototype's API handler will be how client devices interact with the Care Corner the servers and databases. Care Corner's AWS cloud infrastructure will be replaced by a localized version. A combination of LocalStack and Serverless framework will handle calls intended for the API that will be through AWS in the real world product. The database is implemented using MySWL. Any logic developed there will be able to be deployed to the AWS servers when ready. The different components that make the Care Corner prototype API handler are containerized using Docker for ease when working across a team with multiple OS. This architecture is outlined in Figure 2.

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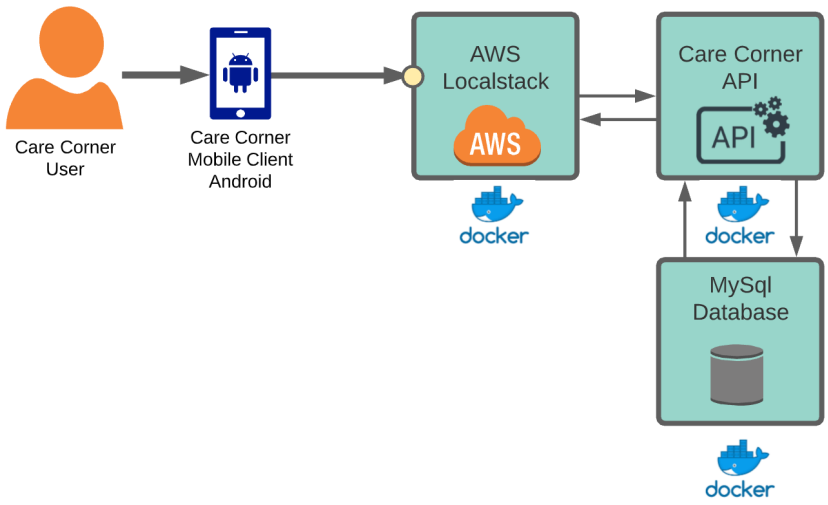
Figure 2

Care Corner Prototype's API Handler Architecture



2.2 Prototype Functional Description

A majority of CareCorner's feature set will be implemented in the prototype. The core features are Safe Walk, the Panic Button, and the Fake Phone Call. The three core features will be almost implemented in their entirety. Most of the remaining features will be implemented with limited functionality. The Care Corner prototype will serve as an adequate proof of concept. Please refer to Table 1 for details regarding the feature implementation of the Care Corner prototype.

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Table 1

Prototype Features Table

Feature	Description	Prototype Implementation
Safe Walk (armed) mode		
Notify contacts via MMS	The user's contacts will be notified 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 preset 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

Feature	Description	Prototype Implementation
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 receive advice in response	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 receive verbalized advice in response	Users 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 prototype will not feature an algorithm to appropriately provide feedback from Mombot based on user input. Instead, feedback will be generic
Journal		
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.	Partially Functional - The PIN is hardcoded for the prototype.
Educational Readings		
Govt/Official articles (just main sites like RAINN)	Users will be provided a collection of government/official sites that have been gathered via web scraping and RSS feeds.	Partially Functional - The prototype will only feature a few Government/Official Websites in order to show proof of concept. No web scraping or RSS feeds will be implemented.

Feature	Description	Prototype Implementation
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 implemented.
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 implemented.
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 nonprofits close to the user's location.	Partially Functional - The prototype will only have an unfiltered list of nonprofits
Counselors	Returns a geofenced list of counselors 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 websites 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 they are needed for a future reporting	Fully Functional

Feature	Description	Prototype Implementation
Assistance reporting via preset questions	All incidence created in the database through Car Corner API with specific user credential can be accessed to generate a report and used as necessary	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 authenticated 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 forgotten 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	Metadata 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

2.3 External Interfaces

Users will interact with the Care Corner prototype via their compatible touchscreen Android device. Access to the internet is required. The Care Corner prototype will not require any additional peripherals.

2.3.1 Hardware Interfaces

The Care Corner prototype will run on any Android device that runs Android Version 21 or higher. The device must have access to the internet, GPS functionality, and a functioning built in microphone as well.

2.3.2 Software Interfaces

The Care Corner prototype will use the Android Media Recorder to record audio. The Android GPS functionality will be used to track the user's location. This GPS information will be processed using Google Maps API to align it with mapping features. SMS functionality will be provided through the Twilio API.

2.3.3 User Interfaces

Users will interact with the Care Corner Prototype via their touch screen Android device. The device must also have a functioning internal microphone in order to record audio and interact with the Mombot via talk-to-text.