

Lab 2 Care Corner Prototype Specification

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Introduction

Sexual assault is, unfortunately, prevalent in society today. One in three women have been a victim of rape or attempted rape (*What Is Sexual Abuse, n.d.*). The trauma of the experience often leaves many women confused. This makes many women live in constant fear as they go about their daily routine especially when they are alone. Having a mobile application that can help in the fight against sexual assault, especially one that can offer safety tips prior to any outing, will be an encouragement to many and increase their confidence when they are alone. It is against this backdrop that Care Corner was developed.

1.1 Purpose

Care Corner is a feature based mobile application developed to help users avoid becoming victims of sexual assault and make information about what to do in the event of an assault readily available. Care Corner is designed to make unsafe situations safe, offer reporting assistance in the event of an assault, connect users to local resources that help victims of an assault recover from the pain associated with the assault. Care Corner features include a time-stamped, GPS based video and audio recording which can be harnessed to provide evidence when it becomes necessary to report an assault. This can lead to a reduction in the number of unreported cases of sexual assault. Another feature available in the Care Corner application is the education resource which can offer reporting assistance to its users. Care Corner will neither report an assault directly to any agency, be it public or private, nor will it call law enforcement at any level on behalf of its user.

1.2 Scope

The main intention of Care Corner mobile application is to help women in the fight against sexual assault. For too long many women have suffer sexual assault without any tool at their disposal to resist the assailant or show evidence of an assault when it occurred. Care Corner is therefore going to be a tool in hands of women to push back against sexual assault. Properly harnessed, Care Corner can help in the prevention of sexual assault, offer reporting assistance if an assault occurs and thus, lead to a reduction in the number of unreported sexual assault cases and connect users to local resources that offer some form of relief from the pain of sexual assault

The prototype specification is limited to only some of the features in the real-world application that will demonstrate proof of concept and capability of the application. All features of the real-world application that are unnecessary for this purpose are not implemented in the prototype. Some features will be fully functional while others will be partially functional. Some other feature will be simulated due to some challenge encounter in the development of the prototype. Section 2.2 –the prototype functional description— captures this well and includes a table of the details of the prototype.

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 Web site. The feed tells the reader when new material has been published on the Web site

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.

1.4 Refences

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1.5 Overview

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

2. General Description

Care Corner features includes Armed Safe Mode, Fake Phone Call, Mombot, Journal, Resource, and Education. The design focuses on preventive measures –helping users avoid becoming victims of sexual assault. But if people get ensnared and becomes victims of sexual assault, they can take advantage of Care Corner in-built tools to provide evidence against an assailant. They can also get education on how to go about reporting an incidence. Victims can also be connected to local resource or assistance available to people going through sexual assault.

2.1 Prototype Architecture and Description

Care Corner is a client-server mobile application in which the client resides on an iOS or Android Smartphone. The client hosts the user interface that responds to various user interaction based on programming logic and communicate with Care Corner application programming interface (API). The Care Corner API in turn interacts with external interface like AWS, Google map API, Twilio to process user request. Its software components requirements are as follows:

its UI/UX and code is done on Android studio IDE with Java as the programming language. The database utilizes MySQL on AWS, the build manager is Gradle, and the version control is Gitlab. Other software includes HTML, CSS, and Java Script for the web programming, and Junit framework for testing. The development employs both Windows and Linux platforms. The hardware requirements include file server, web server, cloud-based database server, and an Android Phone. Figure 1 show the prototype Major Functional Component Diagram while figure 2 illustrates the interaction of the Care Corner application with both the user and some of the external interfaces.

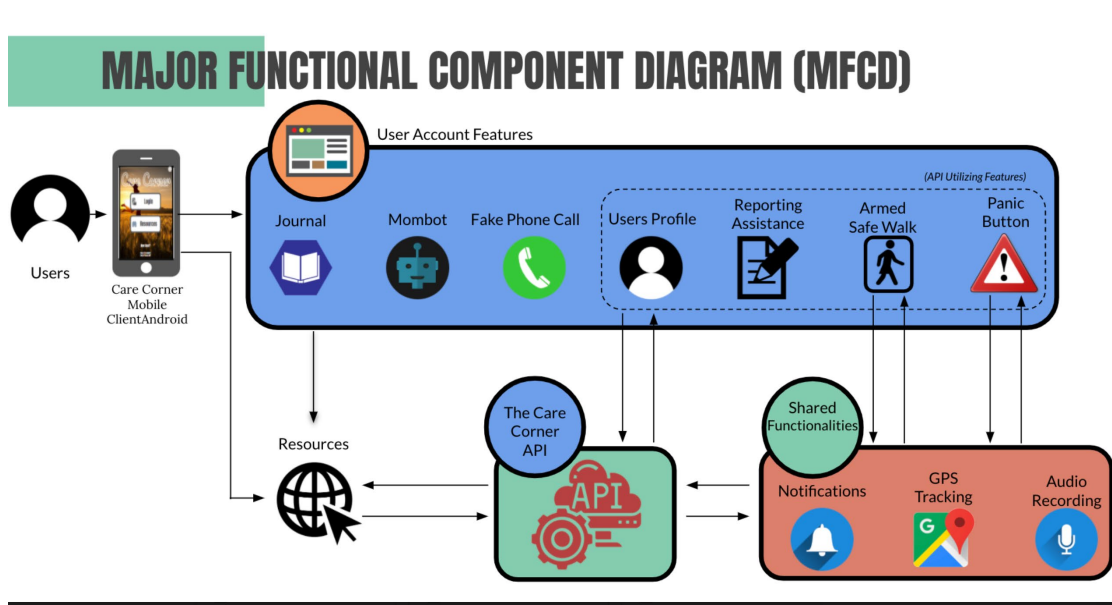


Figure 1

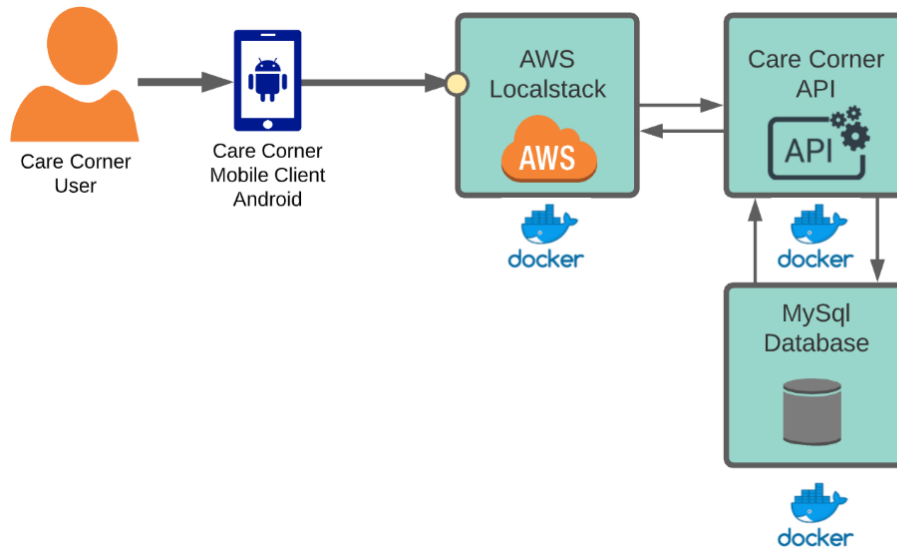


Figure 2

2.2 Prototype Functional Description

Here are some of the capability of the Care Corner mobile application that is functional in the prototype. A user can access the resources feature of the application without needing to create an account or login. The resource feature help users to connect to local resources like shelter or educational resource that guide victims on how to overcome the challenges of the trauma of sexual assault. For a user to get the most out of the application, he/she must create an account and login. A user who is logged-in can use fake phone call feature to get out of unsafe situation, activate the Armed Safe Walk which when active sends user's current location and destination to preferred contact from user saved phone contact. User can also activate Panic Button from the main page or the Armed Safe Walk page. Table 1 captures all the other functional feature of the prototype

Table 1

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
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	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 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.
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

Feature	Description	Prototype Implementation
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 this information 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 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
School	Data for US Colleges/Universities and their campus police can be stored for faster user access.	Fully Functional

2.3 External interface

The Care Corner mobile application prototype use local stack to simulate AWS server due to the challenge of access to AWS server and docker container for ease of access, irrespective of operating system. This also enhance ease of development for developer on various operating system.

2.3.1 Hardware Interface

Care Corner utilizes a Smartphone to host the client which the user interacts with to process requests. The back end utilizes AWS server and various amazon product.

2.3.2 Software Interface

The software interface includes android studio for developing the application features, Google Map for geofencing, Twilio for sending messages.

2.3.3 User Interface

The user interface relies on the touch screen of the Smartphone to interacts with Care Corner application.

2.3.4 Communication Protocols

Communication between the client and server utilizes HTTP and SSL/TLS as users interacts with the front end.