Lab 2 – 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 surrounding 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 add an extra layer of security 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 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.

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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leaving/

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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 features described in 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

Care Corner 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
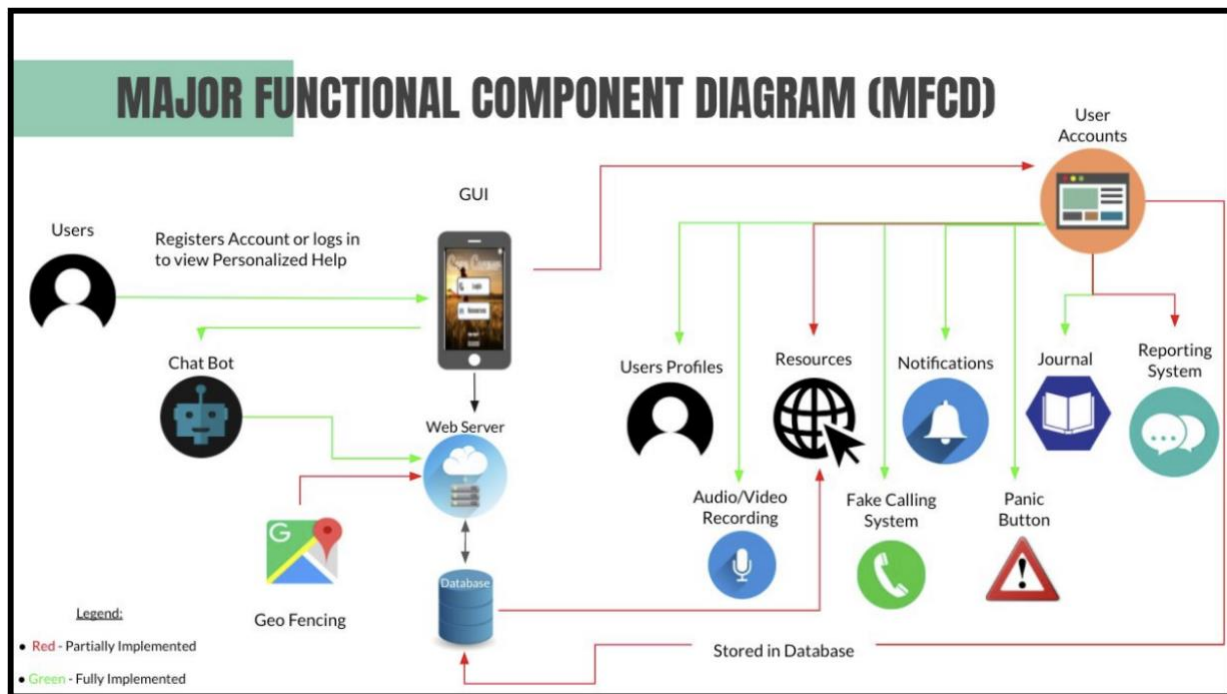
major components.

Figure 1

Care Corner Major Functional Component Diagram (MFCD)

Figure 1 illustrates what will change from the real-world MFCD to the prototype. Due to development environment limitations, the user accounts, resources, reporting system, geo fencing, and database will all be partially implemented.

2.2   Prototype Functional Description

Care Corner's prototype will have many working features that the product will perform. Some of these features will be fully implemented while others are partially functional. A comparison of how these features differ from the prototype to the real world product can be seen in Table 1.

Table 1

Table of Comparison Between RWP and Prototype

Functional Element	RWP	Prototype	
Safe Walk (armed) mode			
Notify contacts via MMS	Fully Functional	Fully Functional	
Customize MMS messaging	Fully Functional	Eliminated	MMS messages will be preset
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	Location will automatically be sent to all of user's in-app contacts
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	

Mombot			
Write plans and recieve advice in reponse	Fully Functional	Partially Functional	The responses will be a small sample size
Verbalize plans and recieve verbalized advice in repons	Fully Functional	Partially Functional	Talk-to-text will convert input. Response will be in text form, not verbalized.
Journal			
Can record in/ view Journal	Fully Functional	Partially Functional	
Journal will be encrypted	Fully Functional	Eliminated	
Educational Readings			*Webscraping will not be implemented
Govt/Official documents (just main sites like RAINN)	Fully Functional	Partially Functional	Minimal resources for testing will be available
Trusted blogs	Fully Functional	Partially Functional	Minimal resources for testing will be available
National hotlines	Fully Functional	Partially Functional	Minimal resources for testing will be available
Geofenced Resources			Unfiltered geofenced resources will be returned from external API
Shelters	Fully Functional	Partially Functional	Unfiltered online resources only
Non-Profits	Fully Functional	Partially Functional	Unfiltered online resources only
Counselors	Fully Functional	Partially Functional	Unfiltered online resources only
Campus Police	Fully Functional	Partially Functional	Unfiltered online resources only
Websites			
Govt Official Sites	Fully Functional	Partially Functional	Minimal resources for testing will be available
Trusted non-profits/ other	Fully Functional	Partially Functional	Minimal resources for testing will be available

General			
Cross-Platform Support	Fully Functional	Partially Functional	Prototype will only be developed on Android
Authentication			
User account creation	Fully Functional	Partially Functional	Account creation will omit surveys and school data
User Credential Authentication	Fully Functional	Partially Functional	Credentials will not be encrypted when stored in the Database
Password Recovery	Fully Functional	Eliminated	
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	Partially Functional	These DBs will be funtional, but only test data will be present
Mombot Advice	Fully Functional	Partially Functional	This DB will be functional, but only minimal test data will be present

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 software interfaces include the following 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.

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.