myRelief: Mental Health Assistance through Mobile Application

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Abstract

Mobile applications have increased in popularity and also have increased in usage in a person's daily life. There are applications intended to better the user's health, whether it be physically or mentally. This paper is about the myRelief iOS mobile application project. The myRelief application is meant to act as aid to those who suffer from stress and anxiety, and is meant to help comfort the user by ways of breathing exercises, physical fitness tips, or even journaling.

There have been many other applications that cover the same topic of a mental health assistance through mobile application, but the myRelief mobile application is meant to follow specific rules and guidelines to not only aid the user regarding anxiety and stress, but also offer the a simple and friendly user experience. With guidelines from Apple Developer on User Interface design, there are specific ideas to follow regarding almost all components of this project. There are specific rules in the creation of the tab bar, the color scheme used for the application, the buttons and labels, and so much more. Apple User Interface design has a goal to make the best experience for the user, and their guidelines definitely follow that.

With the research done from other applications and articles on the topic of smartphones and mental health applications, there is always much to improve on in an application. Many of the applications currently published are not by trained health care professionals, but with the correct referencing and sourcing the reliability of the application increases, just by giving credit to the correct authors.

The myRelief application might be similar to some that have been created before, but with the appropriate adjustments and following the specific user interface guidelines, the application will be enjoyable for the user to interact with and use.

1. Introduction

The myRelief iOS mobile application is meant to help and provide a sense of comfort. This application is not meant to be a solution, but rather act as an aid along professional help for those who suffer from anxiety and stress. The goal of my project was to create an application that makes an easy user experience while focusing on some specific components of struggle for those with anxiety and stress. The idea was created from past experiences as well as new ideas to create an outlet. There are many other mobile applications that have the same idea as the myRelief mobile application. The difference between those applications and the myRelief application is the specific focus on anxiety and stress as well as the importance of User Interface design.

1.1 The Quiet Place

The idea of the myRelief iOS mobile application had branched from a website that was stumbled upon in high school. The website is called The Quiet Place Project and was created by Amitay Tweeto in 2011, who wanted to create different products that would ultimately make a difference in people's lives. The projects intentions are to remind users to take time aside from all social media and take time aside for themselves [1]. The project hooks users with "have you ever noticed how many things require your attention?" and lets the user interact using the space bar to switch between screen prompts. During the slideshow like experience, the user is reminded that it is a place with no notifications and the time using the website should not be meant wondering what all is happening on social media.

The projects website is meant to be simple and contain no distracting features, seeing as it contains a gray background, with dark gray and light gray text with occasionally different sized font. I had researched more into this project and the maker after I had created the idea for the myRelief iOS application. Tweeto is a User Interface designer, who says the concept of this idea would not have been created unless he first knew if there were people that were able to relate to it. Making sure the application is relatable and contains features for those who would potentially be using the application was very important in the idea creation process.

1.2 Background Information

The ideas for a senior research topic had all stemmed from the creation of an iOS mobile application. Being an Apple iPhone user, there has been multiple occurrences in which I have heard, "I wish there was an app for that".

Over the summer I was given the opportunity to work at a Fraternity's Headquarters, in which much of the work I encountered had to do with database and donations. I noticed that there was no type of mobile application created in which members or supporting donors could use to donate money via mobile device. I originally thought this was the application I wanted to create for my project. After much deliberation, the thought occurred to be that to create this application, it must pertain to both iOS and Android users, since it needed to suit the entirety of their general public. There was also the option of creating a better mobile website for the users, but the issue of communication between the company and myself would have been a large problem to make sure all necessary components were included into the application. After being told that the project the student decides on should be something they enjoy, I decided this would not be the project topic for me and quickly thought of other topics that I was interested in working with.

Since the idea of the Quiet Place Project had been in the back of my mind, I had noticed the amount of stress some of my friends underwent, just by being college students. There are many other applications, that will be mentioned and explained later, that pertain to the topic of mental health and mental health tracking, but none that focused specifically on anxiety and stress. I wanted to be able to create an application that helped to aid and relieve stress and anxiety. After asking many others on their opinion on this type of application and what they would like to see in this type of application, the decision was made on creating this application as a senior project.

1.3 The Problem

Like stated above, the goal of the myRelief mobile application is to make an easy user experience while focusing on specific components that will aid people that struggler with anxiety and stress. The main issue with this topic of choice, is that not only is this application an example, but many applications are created by those who are not trained in health care. According to an article by Erin Trauth, the Associate Director of Composition at the University of South Florida, in 2014 there were more than 100,000 available apps regarding health for iOS and Android [2]. In 2013, he references another article that indicates that developers often write application software without formal medical training and that is because apps are not required to be reviewed by physicians or medical associations. That being said, in 2013 only 3.4% of applications were actually published by traditional health care [3].

I am not trained in any type of health care and the idea of this project was created from my own thoughts and observations. This could possibly be an issue, but in the application, I intend on reminding the users that this application is not meant to be their only outlet if they suffer from

anxiety. Necessary phone numbers and websites will also be included in the application if the user wishes to seek more help. I intend on making this application simple and making sure to give credit to specific organizations and websites that will possibly give me information I need about the topic of anxiety and stress.

1.4 Similar Work

The use of mobile devices has increased throughout the years and it is common for people to use their devices as a way of keeping track of specific parts of their lives. There are still multiple applications being created that cover health related issues, aside from the already 100,000 for iOS and Android in 2014. There are similar applications in the Apple App Store that were free that I looked into during my research of this topic that I spent time on dissecting what made users enjoy their time using the application.

1.4.1 Happify

Categorized as a health and fitness application and the description states "HAPPINESS ISN'T JUST ONE THING. IT'S EVERYTHING" [4]. The Happify application intends for its users to note that although they have negativity in emotional and physical wellbeing, in relationships, and daily performance, that there is always a better outlook to life.

In my time of using the application, the first download and launch included a check in with multiple questions that need to be answered before continuing to the actual application. I also noted that this happened continuously as a tracker for the emotional state of the user. It was very tedious to begin with, and somewhat overwhelming for the user if their intentions were use an application without and road blocks. When completed with the questions from the check in, the application included multiple different options, which again was somewhat overwhelming.

It is nice for the application to include multiple different options, but simplicity in this specific application is lost.

1.4.2 T2 Mood Tracker

The T2 Mood Tracker's description states, "T2 Mood Tracker allows users to monitor their moods on six pre-loaded scales (anxiety, stress, depression, brain injury, post-traumatic stress, general well-being" [5]. The description also says that the application lets users rate their moods by moving a bar left to right and notes can be taken in the application to document important information regarding their daily life or anything health related.

After launching the application for the first time, the initial thought was the over simplicity of this application. It does give multiple options of different health related issues, which is different from my application because I chose to focus on anxiety and stress.

When clicking into a specific category on the application, categories are the specific health issue the user is focusing on, there are multiple options in which the user is meant to rate. Rating data in the application involves moving a slider to increase and decrease ratings. When saving the data, it doesn't seem that the data effects anything or is used anywhere other than the immediate page where everything was rated on.

1.4.3 Headspace

The Headspace application is described in the Apple App Store as, "Meditation made simple. Guided meditations suitable for all levels from Headspace. Meditation can help improve your focus, exercise mindful awareness, relieve anxiety and reduce stress" [6]. This application also focuses on anxiety and stress, but takes a different approach then what is planned for the myRelief application.

The application is aimed towards a specific exercise, sessions in which users take time out of their day to use the application. These sessions usually are around 10 minutes each, and from the first use of the application, there were 10 sessions, which relate to 10 days of definite use of the application. The application is definitely pleasing to the eye, but without going through all of the sessions, there was not a theme to be found. Although nice, the application is not very interactive for the user aside from the sessions the user must go through, where they must set aside at least 10 minutes of their day to be able to do that session for the day.

2. Project Description

2.1 Features

There are certain features and specifications for the myRelief application for implementation, this plan will include the following:

2.1.1 Icon

There must be a solid sketch of the icon for the myRelief iOS mobile application, at a specific checkpoint pointed out in the timeline in 4.1.

There are specific rules and guidelines in which Apple's App Store need before submission. The App Store guidelines [7] include simplicity, single focus point, recognizable icon, simple background, avoid transparency, simple or small use of words if essential to logo, no use of pictures or screenshots, no replicas of apple hardware products, do not place application icon throughout the application interface, test icon with multiple different wallpapers, and when submitting to keep corners square because the system automatically applies a mask that rounds the corners of the applications icon.

Applications must have both small and large icons, because the icon size (in pixels) is dependent on where the icon is being placed, such as the icon for the App Store being much larger than the icon being shown on the phones home screen. Icon size will also

vary, depending on the version of the device as well as icons for the application for settings and the spotlight feature.

2.1.2 Tab Bar

2.1.2.1 Apple Developer Tab Bar Guidelines

The tab bar is the option in which users are able to switch between different sections of an application. It is location at the bottom of the application view.

A tab bar is not the same as a tool bar. For example, a tab bar is used in the Clock application on an iPhone and includes tabs such as Alarm, Stopwatch, and Timer. A tool bar is used to perform actions related to the current context. For example, the Safari browser application on an iPhone gives the user the options to go back or forward, an action button regarding the current content on the screen, a bookmarks button, and an option to see all tabs.

The specific user interface guidelines [8] behind tab bars include:

- Tab bars are used to organize information at the app level. It is a good way to provide information categories and modes at once.
- Do not remove or disable a tab when its function is unavailable. Although a tab may not contain any content, it is still important to keep the tab open to the users. Instead of removing it, instead state on that specific page why there isn't content. For example, the music application on iOS devices, there is a library tab. If the application does not contain any music, the screen will display "Looking for your music? Music you purchase from the iTunes store will appear here".
- Tab bars should only be used for navigation. Since it is not a tool bar, tab bars should not perform actions.
- Avoid having too many tabs. The general rule is to use between three to five tabs on an iPhone but a few more are acceptable for iPad applications. The more tabs, the more it reduces the clickable size of each tab. Only essential tabs should be used, meaning there also should not be too few tabs.
- Use badging to communicate unobtrusively. Badges are red ovals that contain either an exclamation point or number, letting the user know there is information associated with that tab they would possibly be interested in.
- Always switch contexts in attached view. This guideline specifically pertains more to iPad versions of applications, but when selecting a tab, it should affect the view that is directly attached to the tab bar, not another view elsewhere on the screen.

2.1.2.2 myRelief Tab Bar Specifications

The myRelief application will contain a total of four tabs, these tabs include:

- Exercises & Tips Tab
    - Breathing Exercise is meant to aid the user with breathing by breathing in and out with a graphic of a ball as it increases and decreases in size in four second time intervals.
    - Fitness Tips will include specific exercises and tips that have been found online from the "Anxiety and Depression Association of America". These fitness tips can be found in 2.1.6.
- Journal Tab
    - The journal tab will work in a way notes does, in which the user is able to type and continue typing until they desire to stop. The important feature with the journal is there set prompts in the system for the user to write about, most of prompts will be positive to leave the users in a positive mood and remind them of the positive points in their lives.
- Calendar Tab
    - The calendar tab will contain a calendar as a reminder for the user as well as counter as to how many days the user has used the application. This tab will also contain the user's name, for some personal feature in the application.
- Other Info/More Tab
    - The other/more tab will include the necessary phone numbers in case of an emergency.
    - Also include websites with information about anxiety disorders and stress.
    - If time permits, it of will include specific locations in the users' area for treatment centers and hospitals.

2.1.3 Table View

2.1.3.1 Apple Developer Table View Guidelines

In Apple developer, this is referred to as "Table" [9]. There are different options regarding tables, where they can be plain or grouped. If plain, the default, is chosen, the developer is able to keep it the way it is or is able to add subtitles to each of the rows.

There are important components to think about when creating a table such as:

- Table width. Tables should not be too thin or too wide, makes it difficult to read.
- Show table content quickly. Show textual data before any complex data, it is more useful to the user and will increase responsiveness of the application.
- Communicate content as content loads. Include progress bar or spinning activity indicator to reassure people that the application is loading.
- Keep content fresh. Take into consideration of updating content regularly.

2.1.3.2 myRelief Table View Specifications

This specific feature pertains more to the Exercise and Tips tab, to give the option of what activity to perform. Like stated before, the Exercise and Tips tab will have specific activities to help the user physically.

2.1.4 Buttons

2.1.4.1 Apple Developer Buttons Guidelines

There are considerations that need to be taken in with the use of buttons [10] in an iOS application, these include:

- Use verbs in titles. Makes button interactive and explains what you want to happen.
- Use title-case for titles. Capitalization for words except articles, coordinating conjunctions and prepositions.
- Keep titles short. Long text will overcrowd the interface.
- Use borders or backgrounds only when necessary. By default, they do not have borders or backgrounds, only should be used if need to be eye-catching target.

2.1.4.2 myRelief Button Specifications

Buttons are used all over any application. Buttons there perform actions are included in the Journal tab, to compose a new journal entry. The Other Info/More tab will include buttons to call necessary phone numbers and buttons that will direct the use to specific websites.

2.1.5 Text Fields

2.1.5.1 Apple Developer Text Fields Guidelines

Text fields [11] in iOS applications are meant to request a specific small amount of information, such as an email address, name or phone number.

Some of the text field guidelines include:

- Show a hint in a text field to help communicate purpose. It should contain a placeholder text, such as "Name", if text has not yet been entered in that field.
- Use secure text fields when appropriate. This pertains more to sensitive data, such as passwords.
- Show the appropriate keyboard type. iOS provides many different keyboard types that focus on specific inputs. If asking for a phone number, it should display a number pad keyboard. If asking for an email, it should display an email address keyboard.

- Use images and buttons to provide clarity and functionality in text fields. These can be displayed on the left or right side of the text field; they will indicate the purpose of that specific text field.
- Display a Clear button in the right end of a text field when appropriate. This refers to the clear content button; in case the user needs to delete information.

2.1.5.2 myRelief Text Fields Specifications

To make the myRelief application feel a little more personal for the user, it will include the users name on the Calendar tab at the top of that screen. The text field will be an option when the user first opens the application and will continue to be there until they enter their name into the field.

2.1.6 Exercise and Tips

There are specific tips from the Anxiety and Depression Association of America regarding physical fitness [12]. These tips include:

- 5 x 30: Jog, walk, bike, or dance three to five times a week for 30 minutes.
- Aim for small daily goals and for daily consistency rather than perfect workouts. It is better wo walk every day for 15 to 20 minutes than to wait until the weekend to work out for 3 hours straight.
- Find forms of exercise that are fun and enjoyable. Extroverted people tend to enjoy classes and group activities. People that are more introverted enjoy solo pursuits.
- Distract yourself with an iPod or portable media player to download and listen to audiobooks, podcasts, or music.
- Recruit an "exercise buddy". It's easier to stick to the exercise routine when you have to stay committed to a friend, partner, or colleague.
- Be patient when starting a new exercise program. It takes about four to eight weeks to feel coordinated and sufficiently in shape to make the exercise easier and feel much more comfortable.

2.2 Use Cases

2.2.1 Breathing Exercises

If a user is feeling stressed and feels the need to calm themselves down and take some time to breathe, the myRelief application is able to help with that.

The user would launch the application; it would open up to the Calendar tab by default. The user would then click into the Exercise and Tips tab because of the fitness tips and breathing exercises includes. Clicking the "Breathing Exercises" option, the user could then use that activity to help calm their breathing.

2.2.2 Fitness Tips

Fitness tips will come in handy when user is feeling stressed and need an outlet of physical fitness. If they haven't done anything that involves exercising recently, it will be of much use, giving possible exercises and tips to be continuous with it.

To go to the fitness tab, the use would launch the application and again it would open to the default screen, the Calendar tab. The user would then click into the Exercise and Tips tab. In this tab, they would click the "Fitness Tips" option and it would open workout plans as well as tips to stay continuous with their workouts.

2.2.3 Journal Entries

If a user finds that they need an outlet in the way of writing, they are able to use the journal activity option in the myRelief application The journal gives prompts, focused on positive outlooks of life and lets the user write as much as they want regarding that topic.

To go to the journal, the user would launch the application and it would again open to the default tab, the Calendar tab. The user would then click the Journal tab, which will be blank if the user has never made a journal entry before. At the top right of the screen, there will be an option to compose a new journal entry. From there, there will be an open screen with a prompt at the top for the user to write about.

2.3 Design and Architecture

Apple focuses a lot of their work on making any experience for the user a great one, that is the initial goal when making Apple applications, that is if the developer is using the Apple given user interface guidelines. The software used to make this application is Xcode, which is explained in 4.2.2, and it makes application creation and implementation extremely easy and friendly for the developer.

2.3.1 Overview of Application

The myRelief mobile application consists of a main tab bar which consists of the features in 2.1. This means that there are multiple views and interfaces included in the application to change from screen to screen and option to option. View controllers are main components of my application, because the tab bar specifically has multiple just to be able to have multiple tabs. Each of these views also will contain other views that are related to the immediate tab, such the "Breathing Exercise" and "Fitness Tips" in the Exercise and Tips tab.

Xcode makes it very easy to be able to see all the views of the application at once and too see what each view is also connected to regarding activities or other screens.

2.3.2 Tab Bar and Interface

Xcode makes it easy to create tab bars, either by creating a tab view controller or by starting a new project and choosing the tabbed application option. The tab view then is created for the developer and the rest of the work is up to the developer.

This view controller is the main portion of my application, because without the tab bar there would not be options for the users of my application to use. Any way the view controller is created, it begins with two tab options. Each other tab option is added by adding other views to the initial view controllers. After all views have been created, it is then easier to link multiple screens to the initial view.

2.3.3 Detailed Features

Making sure screens are linked to the appropriate screens is an important part of this application. Aside from the Calendar tab screen, all the other screens have other options in which they must be linked to. The Exercise and Tips tab has options of "Breathing Exercises" and "Fitness Tips" for the users to help them physically. The Journal tab gives the options for users to write, as if using the Note application on the iPhone, except the journal option gives the user prompts to type about. For this, I wanted to look into the Apple Note application regarding its code to help create the journal option in the myRelief application.

3. Foundations

3.1 Seminal Research

3.1.1 Anxiety and Depression Association of America [13]

Not being medically trained in health care or mental illnesses, there was much research that needed to be done regarding the topic of anxiety and stress. It was important to learn enough about this topic to comfortably make progress on this project.

Anxiety disorders are the most common mental illness in the United States. It affects 40 million adults that are 18 or older, which is about 18% of the population. These disorders are highly treatable, but only about one third of the population suffering will actually receive treatment.

The Anxiety and Depression Association of America, also known as the ADAA, has a lot of information regarding anxiety disorders and will be one of the websites the myRelief application will link to in the "Other Info/More" tab. It is very informative and also includes treatment options for anxiety disorders.

Although people with anxiety disorders might have already encountered this website, it's a useful website for those who want to use the myRelief application as an outlet, and use it with intentions of stress relief. The information is very relevant and could possibly convince the user that they might need to seek professional help when reading the facts given by the ADAA website.

The ADAA is also where many of the fitness tips that will be included in the application are from as well.

3.1.2 "Mobile Health Care Applications"

This article was written by Erin Trauth.

Like stated from earlier in 1.3, Erin Trauth has done research very relevant to my research. Again, he is the Associate Director of Composition at the University of South Florida.

This paper is titled "Mobile Health Care Applications: Authorship, Regulatory Challenges, and the Role of Medical Writers" [2]. The paper takes a different take on health, speaking of more physical wellbeing rather than mental health, but covers the ideas of the benefits of mobile health applications. Like stated earlier, there are only a small number of applications that have been published by health care professionals, out of over 100,000 in 2013. In this article, Trauth provides tips that will make mobile applications better, especially to those who are publishing these applications and are not health care professionals.

These tips include:

- Providing authorship information.
- List all references and sources.
- Disclose any application sponsorship.
- Balance out information.

3.1.3 "Therapeutic applications of the mobile phone"

This article was written by Preziosa, A., Grassi, A., Gaggoli, A., and Riva, G. [14].

This article includes a review of 40 well-designed outcome students of online self-help treatment. Online self-help appears to be more effective than no treatment at all and just as effective in most cases as treatment administered by the therapist. It also notes that in 2009 the use of cell phones increased, expressing the capabilities of a mobile phone.

This articles states that mobile phones are one of the most widespread technologies, facilitate interactive feedback, guarantee availability anytime and anywhere, and are common use in life.

There were two studies done, the second one pertaining more to the topic of this project. Study two involved stress management using mobile phones. The idea behind the study was to test relaxation before and after an exam. There were three groups and their stress levels were found by questionnaires they completed before and after the exam.

The findings of the study concluded that the mobile narrative group, the group that used cell phones as a way of destressing by listening to a story on their cellular device, experienced a significant reduction in the anxiety level, and an increase on the relaxation scale. The level of engagement and spatial presence was significantly higher in the mobile narrative group.

3.1.4 "Smartphone Applications for Mental Health"

This article was written by Radovic, A., Vona, P., Santostefano, A., Ciaravino, S., Miller, E., and Stein, B. [15].

This article includes research into mobile applications that are tagged under mental health, depression, anxiety, post-traumatic stress disorder, and some others. There are a total of 361 applications that were retrieved, 161 iOS and 200 Android, 163 that were specific to the topic search, 42 relevant to general health, and 3 relevant to stress.

From these specific applications, the common description used and most common purpose for the applications was symptom relief. Some of these applications did state that they were not to replace professional therapy. They claimed improvement by approaches of relaxation, stress management, calming audios, and symptom tracking.

This research was the most relevant and similar to the ideas of the myRelief application. Since this is not an application of professional therapy, the approaches which this research found is very similar to the line of work of the myRelief application. With more research, finding some applications of this research would add to the work and possibly credibility of the overall myRelief application.

3.2 Project Relations

Like stated in 1.4, there are multiple applications that are very similar to the myRelief application project. The project behind the myRelief application also needs to focus on the user interface Although there are specific guidelines regarding specific components of an iOS application, there are guidelines of User Interface design.

Some rules to follow about user interface design include:

- Formatting of application to fit on a screen.
- Easy interaction for the user.
- Good organization of the application.
- Follow alignment throughout application.

Like stated in Features, there are specific design guidelines to follow for application components, such as the icon, status bar, tab bar, table view, and even color palette depending on the type of application.

Some user interface design recommendations proposed included:

- A setting for privacy or password protection.
- Discrete designs.
- Assurance of credibility on any medical content mentioned.
- Visual aesthetics.
- Possible representation of progress.
- Allow interruptions from cellular device and not lose progress made.
- Allow customization of the user's own preferences.

Color scheme of applications is also an important component of iOS applications [16]. The guidelines that developers need to take into account during the application creation process include:

- Use complementary colors throughout the application. The colors should work together, not conflict and distract.
- Choose a limited color palette that coordinates with the application logo. The subtle use of color is the best way to communicate the brand.
- Consider choosing a key color to indicate interactivity throughout the application. Choose a specific color as a way to denote interactivity within the application.
- Avoid using the same color for interactive and noninteractive elements.
- Consider how artwork and translucency affect nearby colors. To maintain visual continuity, interface elements should not be overpowering or underwhelming. Apply color or translucency when needed.
- Apply color profiles to your images.
- Use wide color to enhance the visual experience on compatible devices.
- Test your application's color scheme under a variety of lighting conditions. Lighting and colors won't always look the time, so previewing the application under multiple lighting conditions, like outdoors when sunny or rainy, is important just to see how the color looks. Colors should be best possible viewing experience in majority of lighting cases.
- Consider how the True Tone display affects color. This automatically adjusts the white point of the display to adapt to lighting conditions.
- Be aware of colorblindness and how different cultures perceive color. Since people see color differently, it's important to take all cases into consideration.
- Use sufficient color contrast ratios. Insufficient contrast makes application content hard to read, icon and text might blend into the background. The minimum contrast ratio of 4.5:1, although 7:1 is the best option because it meets accessibility standards.

3.3 Problems Related to Other Works

There are many other applications that cover similar or exact ideas that are main components of the myRelief mobile application. A big issue regarding this application and other applications is that there are multiple applications that have been created with the same ideas and similar goals and it's somewhat difficult to create an original application, since it would be very similar to already made ones.

Like the applications stated in 1.4 and from the research done regarding the topic of mobile applications and health care, these applications are extremely similar and some follow the same ideas that are intend with the creation of the myRelief mobile application. Again, just from the applications I took the time to research into and look at, they either did not follow the same content plan in which is good that they differ. The ones where the content is similar, the user interface design can be one of the largest components that will improve the myRelief application and make it stand out.

This application is another health related application that will not be getting published by health care professionals. To combat this issue, there will be necessary references and sources with any information that has been taken from actual health care providers. There should not be any point in the myRelief application that is opinion based from the developers' decision other than interface design. All information will be factual from organizations and websites that are reliable and fully understand the disorder of anxiety and the effects of stress.

4. Implementation Plan and Timeline

4.1 Timeline

- Checkpoint One
    - Basic sketch of potential application icon
    - Basic skeleton of application interface and have tab bar completed
    - Begin work with the breathing exercise activity (potentially have some components done)
- Checkpoint Two
    - Have some content on each of the interfaces (even if just text and buttons)
    - Have Calendar tab working and implemented
    - Have Exercise and Tip tab with appropriate table view
    - Add appropriate color – Regarding research of User Interface and health.
- Checkpoint Three
    - First poster draft completed
    - Have breathing exercises done and implemented
    - Other Info/More tab implemented with appropriate information
    - Have icon decided and completed
    - Continue work with color
- Checkpoint Four
    - Poster draft

    - Have journal tab interface implemented with set prompts for each journal entry
    - Have opening and welcome screen completed
- Checkpoint Five
    - Poster draft
    - Have application running and completed
    - Any necessary updates
    - Upload application to the app store
    - Potentially add in location functions for treatment centers
- Checkpoint Six
    - Poster draft
    - Upload application to app store (final)

4.2 Tools and Languages

4.2.1 Programming Language

The myRelief application is an iOS and has a goal to be published in the Apple App Store to conclude this project. The code and language used for this project is the Swift programming language [17] [18].

Swift is a programming language specifically for iOS, macOS, watchOS, and tvOS applications that builds off of the best parts of C and Objective-C languages. Although this language has taken a long time for Apple to create, they are actually on Swift 3, which they released in the later months of 2016.

For newer programmers, Swift is a friendly language. With the newest version of Swift, as in Swift 3, it claims that the newest improvements in the language make writing code feel much more natural. The Swift Playgrounds include real iOS frameworks like UIKit, SceneKit, and SpriteKit, and access to hardware touch gestures, gyroscope, and camera. Swift supports all Apple platforms as well as Linux, and community members are working to port to more platforms.

Along with this updated version of the language is also the update software in which the code is written in which is explained in 4.2.2.

4.2.2 Software

The software I will be using for this project is Xcode [19]. Xcode is currently on version 8, the most compatible with the currently version of the Swift language.

Xcode makes it very easy to learn and interact in app creation, and helps the user when coding. It is able to create applications for iPhone, iPad, Mac, Apple Watch, and Apple TV. Xcode contains an Interface Builder design canvas that has been reengineered in Xcode 8 to make the work faster and provide greater control. The idea of the design

canvas is to make application creation easier for the developer. It is also useful to see what the interface looks like, especially with all views linked to one another. With the Xcode 8 update, runtime issues alert the developer on hidden bugs by showing memory leaks.

4.3 Testing, Editing, and Revision Plans

4.3.1 Testing

Creating an iOS mobile application with Xcode makes it easy to simulate the application on the computer itself. The simulation seems as if you are using an actual iPhone. The simulation gives the opportunity to really play with the application without having to publish it to the App Store, and to catch any bugs with the application before it is released for anyone else to see.

The other way to test the application is to actually try the application on Apple devices. Developers can install applications onto devices using Xcode. Many of the testing rounds will involve the application being installed onto my own Apple device, as well as my friends that are willing to participate in testing the myRelief mobile application, as long as they have an Apple device such as an iPhone or an iPad. There are specific steps that need to be taken when exporting the application onto a device for testing [20]. These steps include:

- Register all test devices.
- Archive your app.
- Export the archive using either an ad hoc provisioning profile or team provisioning profile to code sign your app.
- Install the app on test devices.
- Solicit crash reports from testers.

4.3.2 Editing

Editing and debugging are planned to happen as the application is being created. From the created checkpoints, it only points out any updates that need to be made would occur in checkpoint five, but editing of any component of the application should be done as the application is being created.

Since there are specific components that are planned to be completed each week, it is important to continue with the set plan and if time permits, then any potential plans to keep improving the application will be made.

4.3.3 Revisions

If any revisions are made to the application, it should be somewhat easy to work around without having to completely change the entire application. From the plan that has been made for the application, the only revisions that could possibly happen are within the tabbed components themselves.

The timeline was created with the idea of having enough time to implement the necessary portions of the application and potentially starting the next checkpoint early if time permits. Instead of overshooting and adding too much to this project, I tried to think reasonably about the work load I will be putting on myself.

Again, if time permits then added components to the application could be included.

4.4 Priorities and Scale Back Plan

4.4.1 Priorities

All parts of the timeline were intended to be of the highest priority.

The most important component, after the tab bar which should not be difficult at all to implement would be the breathing exercise and the journal with the set prompts for the user. The breathing exercise has higher priority than the journal prompts. If need be, the prompts would be a scale back, as explained in 4.4.2.

Again, the timeline was created with the most efficient time utilization in mind. It is with high hopes that each of the checkpoints will be completed in the allotted amount of time.

4.4.2 Scale Back

Like stated earlier, the timeline was created with time carefully thought about, and getting all necessary components of the application implemented in a timely manner. The initial plan is to not need to scale back any portion of the project.
If time becomes a large constraint and it becomes impossible to complete the project to the initial plan, I would not implement the journal entry prompts right away. That would potentially be a later addition if time does not allow for the initial project.

Between each checkpoint there is enough time to think wisely about the work that needs to be put in. If the prompts do not get implemented at the initial checkpoint planned, there are always later dates in which it could be worked on aside from bettering the application altogether.

5. Conclusion

Recently, the usage of smartphones has increased. The usage of health related mobile applications has increased as well. Whether it be an application to track physical fitness, eating habits, or mental health. The myRelief iOS mobile application project falls in line with other self-help mobile applications. There are many applications regarding mental health disorders, and they each focus on relief from stressful events and situations. The difference with this application is the focus on the User Interface to make this an enjoyable application for the user, while still wanting relief for the user that is struggling with anxiety and stress.

It is important for the user to understand that this application is meant to provide a sense of relief in stressful or anxiety filled situations, but is simple and user friendly enough for the user to understand and use. There has been research done on the topic of smartphone applications that involve mental health, with advice regarding ways to improve future applications as well as give the application more credibility. There are important tips that research has helped to find regarding improving the reliability of the app when the necessary organizations are included, even if the creator of the application is not a trained healthcare professional.

Since most of these health related applications are published by nonmedical trained developers, in which any information used in the application should be referenced and sources should be included. This is a key point recognized in the creation of the myRelief application, especially with the necessary information needed to understand anxiety disorders and possible ways to relieve and comfort users.

The work that needs to be done with the myRelief application will be tedious, especially regarding specific exercises, but the end result will be worth it. Over this course of time, there has been plenty of research done, not only with applications that have similar ideas to the myRelief application, but also research regarding user interface design, whether that be icon design, tab bar information, color information, and so much more. There is still so much more to learn regarding it all, but there will be so much learning done during the process of creating this application.

There is a lot of potential in this application and in this project. Although this type of application has been done before, it will be an experience learning the process on my own and getting to see if I am capable of creating the application I am envisioning in my mind.

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