CS441: MOBILE WEB PROGRAMMING

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CALM MIND MEDITATION APP DOCUMENTATION AND REPORT

Chapter 1: Introduction

The project seeks to explore the use of hybrid mobile application development using PhoneGap to solve problems associated mental stress and depression within Ghana. The aim of the project is to build an application that will provide meditation lessons to users to enable them stay present and cut out the stress in their lives. It also allows them to post their feelings, and learn more about meditations to better their plights.

Background and Problem Statement

Mental Health has been a topic of growing concern in the past few years. It is a broad concept, encompassing a wide range of needs and issues that apply to a heterogeneous population. Because resources designated for mental health are limited, different subgroups compete vigorously to achieve their priorities (Mechanic, 1994). Individuals report having immense stress and high anxiety levels which affects their ability to go about their day to day activities. Individuals turn to drugs, bad eating habits and in worst cases, suicide to escape the pain of the mental duress they are under. There are many techniques and practices that help prevent and ameliorate the effects of poor mental health but these are not widely known or practiced. Individuals find it difficult to seek help for the fear of being judged and ridiculed by others. It appears finding a trusted helper who will not judge an individual is a potential solution to many mental health problems.

Proposed Project

This project thus seeks to build an app that allows individuals to consume video and audio meditations as well as journal their thoughts. These practices are key in keeping the mind from wandering astray and falling into cycles of depression. By having different topics and pain points addressed through meditation, users can enjoy better mental health and a happier life.

Project Contributions

The contributions of the project are as follows:

1. A means for delivering video meditations to users for daily meditation
2. A means for users to journal their thoughts whenever they feel like to help them better understand their thinking processes
3. A platform to better understand the benefits of meditation and the impact it can have on the mind

Chapter 2: Requirements

Requirements Gathering

The primary users of the application are the individuals with an interest in improving their mental health and individuals who are in the field of counselling and hospitality. In determining the needs and requirements of the app, research was conducted online about mental health and the practices that are best for improving it, as well as informal interviews with professional guidance counselors This produced the specifications produced are listed below.

Functional Requirements

1. The user must be able to listen to audio meditations
2. The user must be able to watch video meditations
3. The user must be able to learn about the practice of meditation
4. The user must be able to know when they are no longer online
5. The user must be able to post their thoughts through journaling
6. The user must be able to take and upload pictures
7. The system must be to display meditation FAQs
8. The system must tell the user if they are working offline or not
9. The system must notify the user if they are losing battery power as a result of spending a lot of time on the app
10. The system must be able to store user information and authenticate users securely

Non-Functional Requirements

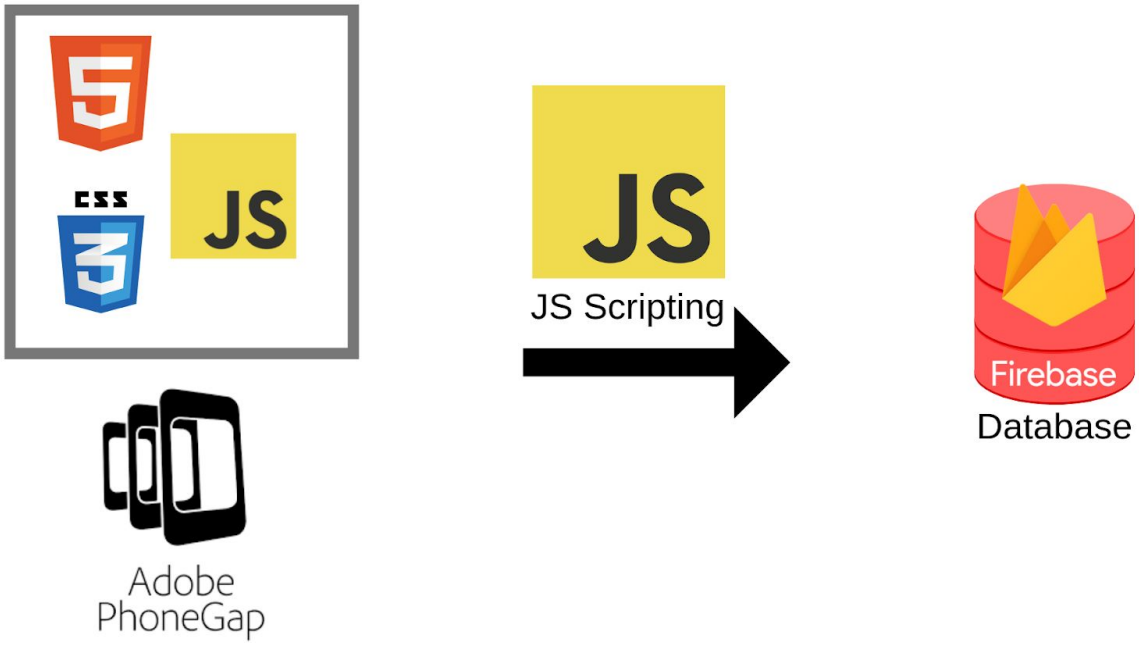
1. Availability - The system should be available and work always.
2. Integrity - The system must ensure that always, the information provided by users is accurate. The resources provided should also be credible and well researched.
3. Maintainability - The system shall be easy to maintain. The system shall facilitate changes and updates without affecting the normal running of the system.
4. Usability - The system and its basic operations shall be simple to understand at first glance
5. Security - The system must have security features in place to ensure there is no breach of integrity. Users should have the opportunity to remain anonymous

Chapter 3: Architecture and Design

Overview

Upon opening the app the user is first asked to either log into the app or create an account if they do not have one. After filling in the necessary details for either, they are brought to the settings page where they can learn about the app, learn more about meditation, set their profile picture and sign Out of their account. There are three more tabs the system provides. The Journal tab allows the user to view past journal entries. It lists the journal title, content and date posted of the currently logged in user.The user can choose to add another journal post if they wish. The video meditations tab allows the user to watch guided meditation based on a topic of their choosing. There is a dropdown button of the top of the page which features various topics from which the user can pick to generate video meditations around the subject. The audio meditation tab is similar to the video meditation but works audio only and are great for users who only want to listen at any given time. Mediations are hosted on SoundCloud and Youtube. If the user loses internet connection, they are shown an alert with a vibration to let them know that they are offline and may not be able to access some features. When they get back online, they are notified as well. Users are also notified when their battery gets critical while on the application. This is most useful for individuals who might spend a lot of time on the application and hence serves as a way to improve user experience. One of the buttons in the settings tab allows the user to get their current location at a given time. This was added because some people who practice meditation like to take walks hence this button provides them with a fun piece of information when they venture into new places

High-Level Architecture



Use Case Scenarios

Akua Opens the Application during her break to listen to meditations about confidence

As part of his morning routine, Isaac opens the open to watch some video meditations about self acceptance before he heads off to work

David has listened to a number of meditations and jot down some of his thoughts and feelings in the journal tab.

Sampah has spent four hours meditating and the app notifies him that he should take a break and get a charge

Patrick has just got the app, is not sure about meditation and seeks to learn more about how it can benefit him

Database Schemas

The Firebase Database is a NoSQL Database and its collections are structured as below

Videos Table

Field Name	Field Type	Field Description
link	string	The link to a video meditation
title	string	The topic area of the video meditation
duration	integer	The duration of the video mediation

Audios Table

Field Name	Field Type	Field Description
link	string	The link to an audio meditation
title	string	The topic area of the audio meditation
duration	integer	The duration of the audio mediation

Journal Entries Table

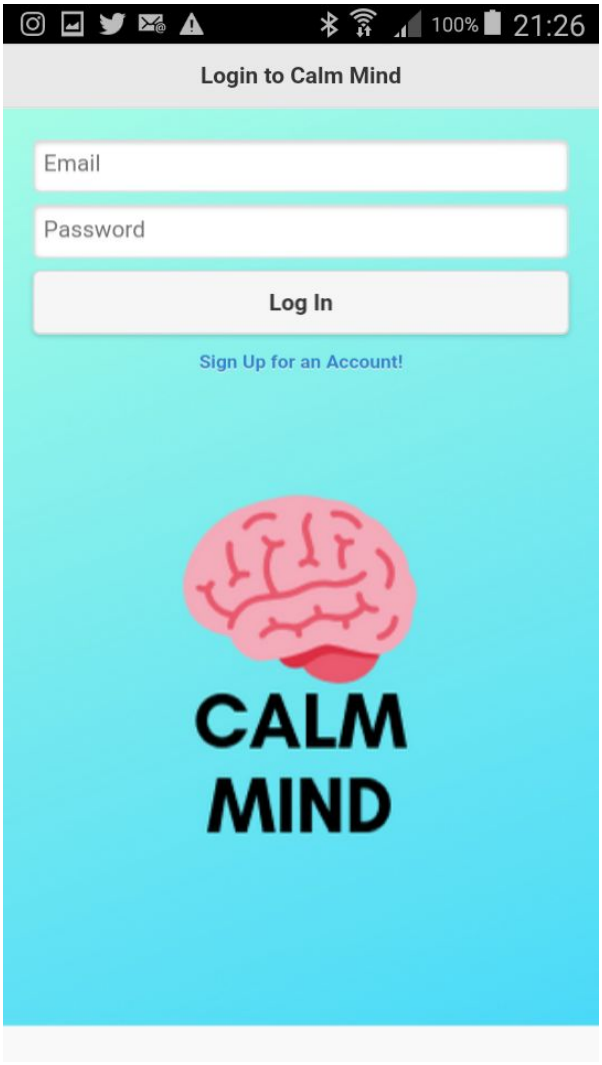
Field Name	Field Type	Field Description
title	string	The title of the post
timestamp	date	The date the post was made
content	string	The content of the post
userid	string	The userid of the user who made the post

Users Table

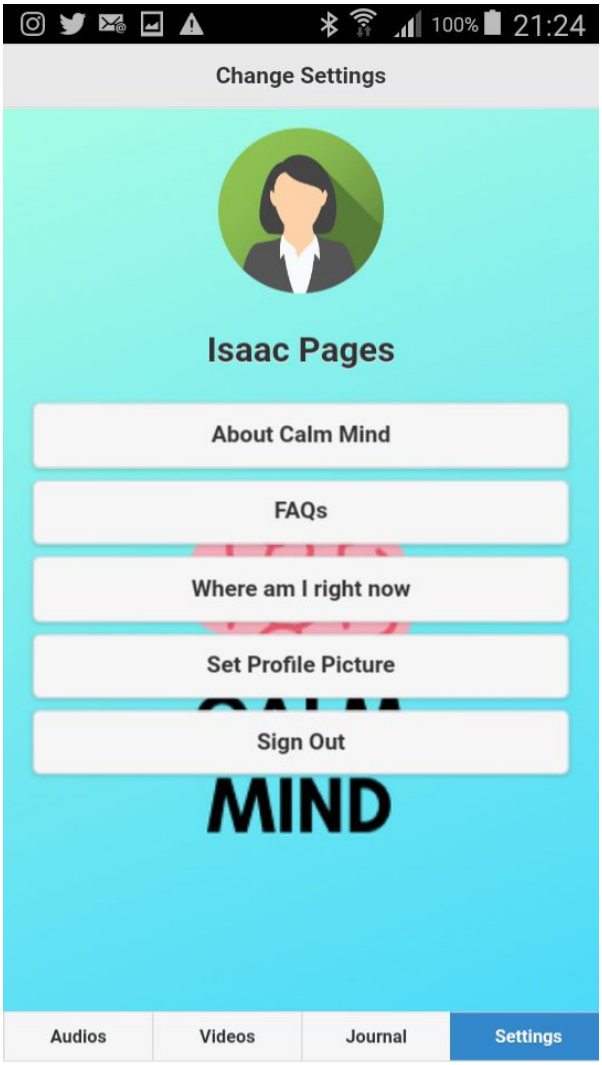
Field Name	Field Type	Field Description
useremail	string	an id that uniquely identifies each user
userpassword	string	The users email address
userdisplayname	string	The users password
userid	string	The userid of the user who made the post

Chapter 4: Implementation

Front End Design Walk Through

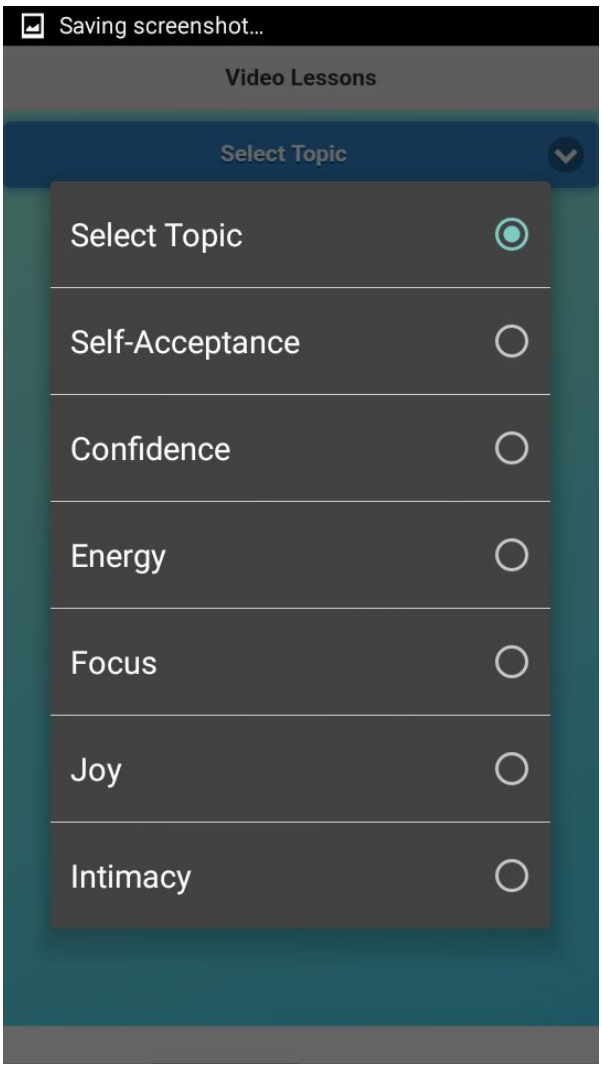


Log In Page

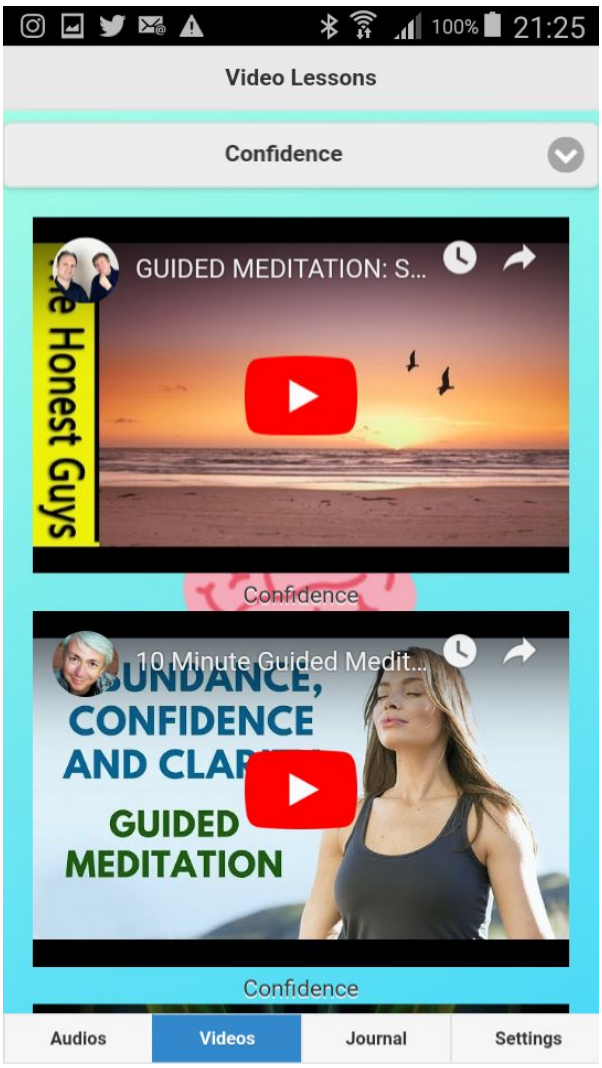


Settings Page

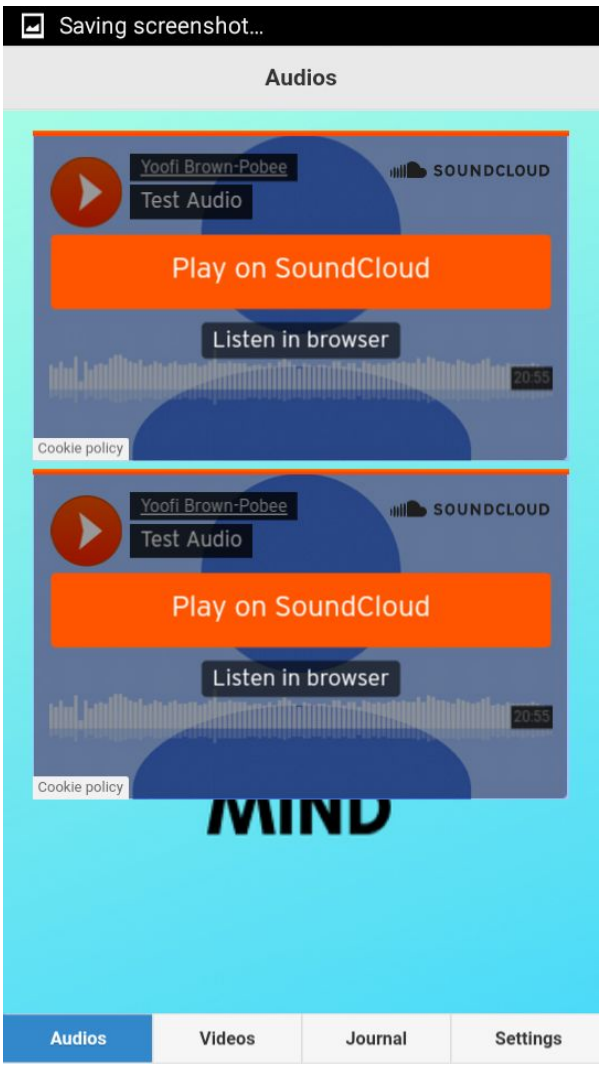
Video Meditations Page



Video Meditations Page DropDown

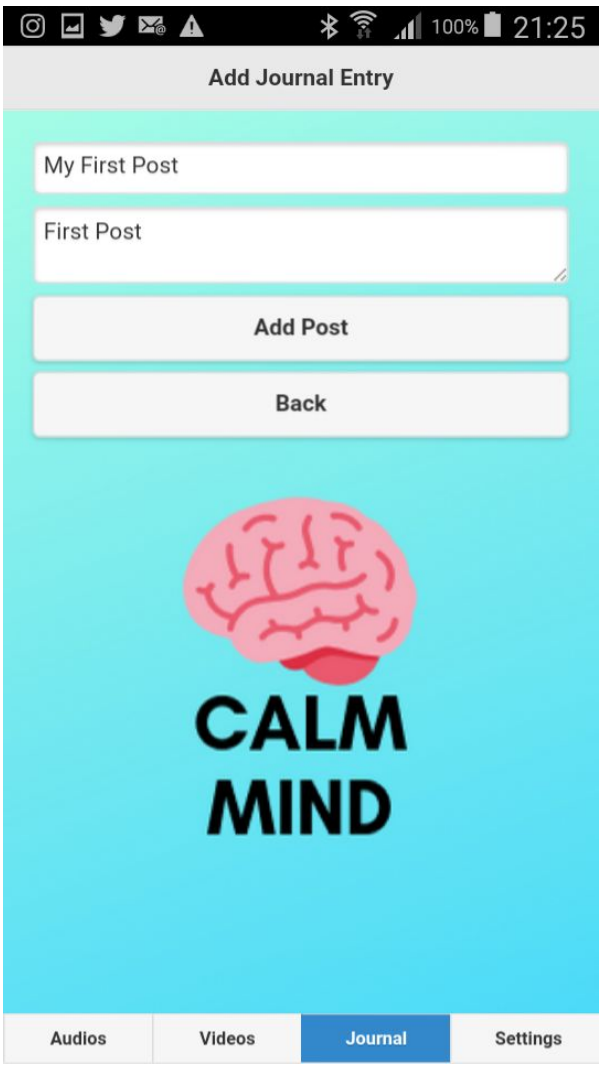


Video Meditations Listing

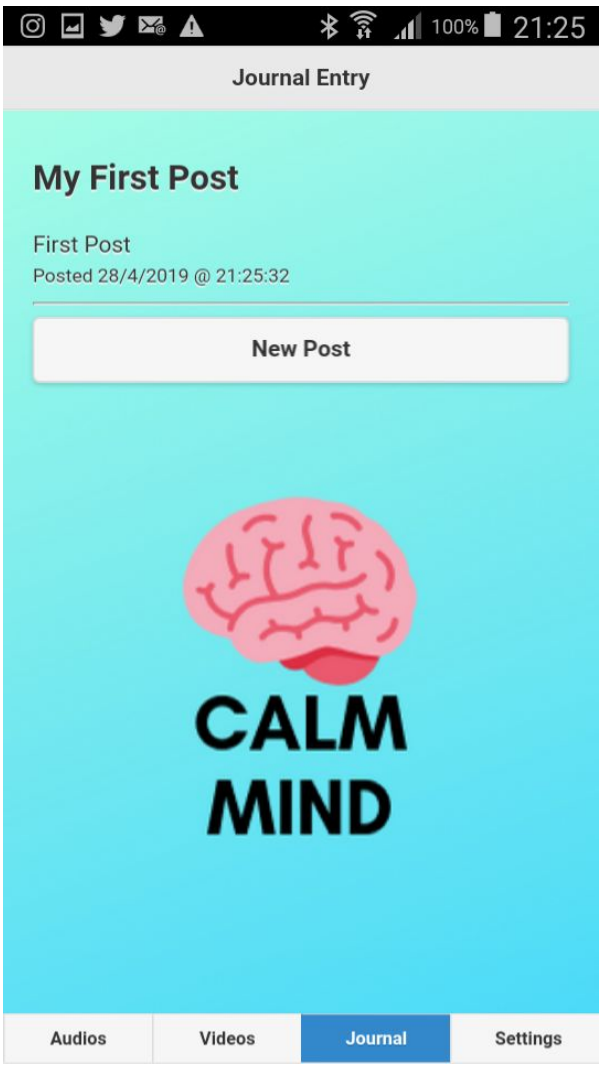


Audio Meditations Listing

Journal Page Before Post



Journal Page Adding Post



Journal Page After Post

In App Browser From Settings

Resources Used

InApp Browser: When the user wants to learn more about meditation. They can head to the settings tab, click on the FAQs button to open up the in app browser which navigates them to the web page of a professional meditation teacher who answers some questions about meditation

Online/Offline Detection: The Device detects when a user loses and gains connectivity and notifies them of this fact

Battery Resource Detection: The Device detects when the users battery is critical and low and notifies them of this fact

Camera Resource: The app can activate the devices camera for taking pictures. In the settings tab the user can call on the camera resource to take and set a profile picture.

Local Storage: A copy of the profile picture taken by the User is stored in offline local storage

GeoLocation: In the settings tab the user can find the geographic details of their location

Phone Motion(Vibration): When alerts for battery level and connectivity are fired, the device vibrates

Implementation Technologies

Front End Implementation

The front end was created with HTML, CSS, JAVASCRIPT and jQUERY Mobile. These were used to create the structure and styling necessary to provide a means for users to interact with the application. The application was built as a single page to allow for easy navigation.

Server-Side and Database Interactions

JavaScript also served as the server side scripting language and Firebase was used as the external live database base mostly due to its reliability. Javascript is used to interact with the database to return information such as the updated video and audio links and user journal posts. With video and audio posts, JavaScript is able to call for data to be served dynamically depending on the choice of topic the user prefers. It was also used to

authenticate existing and new users as well as keep track of their sessions as they went from tab to tab.

References

Mechanic, D. (1994). Establishing Mental Health Priorities. *The Milbank Quarterly, 72*(3), 501-514. doi:10.2307/3350268