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February 9th 2022

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Dear Department of Computer Engineering and Technology,

Attached to this letter is our technical report “Mobile Chat Application Part 1”. This report is submitted in partial fulfillment of the requirements for a diploma in Computer Sciences and Technology at Algonquin College.

This report consists of five chapters. The first chapter provides some background on the beginning of our project and the requirements we set forth for ourselves. Chapter 2 outlines the various designs that were considered and details what criteria were met by each of the designs. Chapter 3 contains our technical descriptions of the cycle of operation of our application. Chapter 4 Consists of our discussion of the results of the entire application. Chapter 5 consists of the conclusion and recommendations for future development.

We have thoroughly enjoyed working on this project and would like to thank the faculty of the Algonquin College School of Advanced Technology for their continued support and assistance. We would also like to thank our industry contact, Tony Geara, for his advice and assistance in developing this project.

Regards,

Ryan LeBlanc Vraj Patel Urbain Rwuhiriro Prince Felix

Attached: Technical Report

Mobile Chat Application Part 1

The FLUPC programmers

Algonquin College

School of Advanced Technology

Computer Engineering Technology Program

Ryan LeBlanc

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Submitted February 11th 2022

A technical report submitted to Algonquin College in partial fulfillment of the requirements for a diploma in Computer Engineering Technology

Summary

This is a mobile chat application designed based on being environmentally friendly, efficient, free to use, user friendly, reliable, simple, and safe to use. To fill the need of a new simple mobile chat application that anyone can use to send messages to friends or colleagues. The creators’ goal is to create a simple yet efficient way to receive and send messages with or without wireless access for both IOS and Android devices. This application will be free and will be completed by volunteers for a school project. Furthermore, they will not be providing multi-factor user authentication or Full 24/7 support as the volunteers are still learning the basics of mobile app development. ­­­­­­­­­­­­­­­­

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# 1.0 Introduction

This is a mobile chat application designed based on being environmentally friendly, efficient, free to use, user friendly, reliable, simple, and safe to use. To fill the need of a new simple mobile chat application that anyone can use to send messages to friends or colleagues. The creators’ goal is to create a simple yet efficient way to receive and send messages with or without wireless access for both IOS and Android devices. This application will be free and will be completed by volunteers for a school project. Furthermore, they will not be providing multi-factor user authentication or Full 24/7 support as the volunteers are still learning the basics of mobile app development. ­­­­­­­­­­­­­­­­

One of the most popular messaging applications: Messenger, which is owned by Facebook, does not offer end-to-end encryption by default, which means that its users’ information is not safe. This is very impactful because the users are not trying to have a public conversation when they use any messaging application, they want to discuss directly with the receiver. Additionally, all the data people send via Messenger has the possibility to be monitored, mined, or collected. This problem has been a concern of many people for a long time and as much as Facebook promises they still don’t deliver. Facebook messenger is amongst the most used chat applications so it should be a concern of every user that their private details could be in the hands of identity thieves or people with malicious intents. There are apps that offer solutions to this but few of them have the manpower behind it like Facebook, being one of, if not, the most popular social media companies. The potential solution is to offer end-to-end encryption or other type of security to keep the users’ data private and secure.

To be considered a success, the application must:

-Send messages with or without an internet connection

-Be built to run on IOS and Android devices

-Each message will contain a maximum of 160 char’s

-Be easy to navigate and use

-Able to create and manage accounts by either Phone number or email

-Have an acceptable level of security for the users

-Have the capability to retain data and have scheduled backups

Chapter 1 of this report consists of the introduction, design criteria and scope of this project as well as the beginning of the application design. Chapter 2 will encompass the larger part of the project where we will be working on the development of the application based on the template that was worked on previously. Chapter 3 will focus on the testing of the application to root out any flaws and bugs. Chapter 4 will be the pilot phase for a small audience to receive feedback. Chapter 5 will be the official launch to the public. Chapter 6 will be the final post-production enhancements and changes to fix any new bugs and improve the application.

Once implemented this application will allow any user to send a text message containing only text and no more than 160 characters to someone using an android or apple device without needing to be connected to the internet with a low level of Verification and security. The application will offer a simple solution to users looking for an easy and secure way to keep in contact with their friends from a distance without the need to be at home.

In scope: Create a mobile app that anyone can use that allows users to send messages using either Bluetooth or Text Messages via cellular or wireless network access for both IOS and Android devices, this application will be easy to use and provide the user a simple yet efficient way to receive and send message with their peers. We are planning to finish development, testing and pilot this application by Spring 2022. The cost of this application will be minimal due to the team volunteering their time and resources to the project for school.

Possibly out of scope: Frequent data backup and data retention in line with the budget.

Out of scope: post-release enhancements or upgrades to the application.

-Full 24/7 support.

-Data encryption

-Multi-factor user authentication

# 2.0 – Design Evolution

This chapter offers an overview of the various designs that were considered for this project. Each design is described and critiqued with respect to simplicity, effectiveness, and how well it meets the design criteria for success.

## 2.1 Design #1: Launch Page

This design was created after being given the initial requirements by the industry client and after the first meeting took place to work out the details of what exactly is expected. The word “launch” was used in official documentation, which implies this design will be present at the start or “launch” of the application.

### 2.1.1 Description of Design # 1 Launch page

This design consists of a simple background, the name of the program and its creators, a box to sign in and a button with the text “Create account”. A concept of this design can be seen in figure 2.1.

(see Figure 1)

Graphical user interface, application

Description automatically generated

Create account button

Sign in button

Title with creator information

Title

Figure : Launch Page

### 2.1.2 Evaluation of Design #1 Launch page

The launch page will allow the users to either sign in or create a new account, upon clicking sign in they will be brought to the sign in page seen in design 2. Clicking on the create account button brings the users to the account creation screen.

## 2.2 Design #2: Sign in page

This design was created after being given the initial requirements by the industry client and after the first meeting took place to work out the details of what exactly is expected. The word “sign-in” is used in official documentation, which implies this design will allow the user to sign in

### 2.2.1 Description of Design #2 Sign in page

Graphical user interface, application

Description automatically generatedThis page consists of a simple background, the title of the page, two input boxes for username and password, a check box to remain signed in and a submit button. (see Figure 2)

Check box to remain signed in

Submit button to sign-in

Input box for password

Input box for username

Title of page and application

Figure : Sign in Page

### 2.2.2 Evaluation of Design #2 Sign in page

This page will allow users to sign in to the application using a username and password and choose the option to remain signed in.

## 2.3 Design #3: Create account page

This design was created after being given the initial requirements by the industry client and after the first meeting took place to work out the details of what exactly is expected. The words “Create account” are used in official documentation, which specifically implies that this design will allow the users to create a new account.

### 2.3.1 Description of design #3 Create account Page

Graphical user interface, application

Description automatically generatedThis page consists of a simple background, the title of the page, three input boxes for username, email and password and a submit button. (View figure #3)

Text box for username of new account

Text box for email address of new account

Button to submit and create the account

Text box for password of account

Title of application

Figure : Create Account Page

### 2.3.2 Evaluation of design #3 Create account Page

This page will allow users to create a new account using a username, email address and password. The email and username must be unique as to not create problems with two users having the same username.

## 2.4 Design #4: Main Page

This design was created after being given the initial requirements by the industry client and after the first meeting took place to work out the details of what exactly is expected. The words “Main Page” are used in official documentation, which suggests that this design will be the main page of the application once the user is signed in.

### 2.4.1 Description of design #4 Main Page

Graphical user interface, text, application, chat or text message

Description automatically generatedThis page consists of a simple background, a cogwheel to access settings, the title of the page, a box to create a new contact, 6 boxes to open or delete previous messages to contacts as well as the contacts name or phone number. (See Figure #4)

Contact names or phone number

Cogwheel to access settings page

Deletes contact from recent message list

Box option to create new contact

Title

Figure : Main Page

### 2.4.2 Evaluation of design #4 Main Page

This page will allow users to open their messages with their previous contacts or delete them if necessary. It will also allow them to add a new contact to their list and access the settings menu from the cogwheel settings option. Clicking the trash bin will remove them from the list of recently messaged contacts. Clicking on a current contact will bring them to the new message page seen in design #6.

## 2.5 Design #5: Settings page

This design was created after being given the initial requirements by the industry client and after the first meeting took place to work out the details of what exactly is expected. The words “settings page” is used in the documentation, which suggests that this page will access the users’ settings and allow them to be changed.

### 2.5.1 Description of design #5 Settings Page

Graphical user interface, application

Description automatically generatedThis page consists of a simple background, a title, a button to return to main page and three buttons, one for user info, color theme menu and to sign-out. (See figure #5)

Drop down menu for color theme

Arrow to return to main page

Box to sign out

Drop down box for user info

Title

Figure : Settings Page

### 2.5.2 Evaluation of design #5 Settings Page

This page will allow users to view their user info (Phone number, username, email, forgot password option etc.). Access the color theme menu to change between light mode or dark mode and the sign out button will allow the users to sign out of their account.

## 2.6 Design #6: New message Page

This design was created after being given the initial requirements by the industry client and after the first meeting took place to work out the details of what exactly is expected. The word “new message” is used in official documentation, which means that this page will allow users to send new messages to their contacts.

### 2.6.1 Description of design #6 New message Page

A screenshot of a phone

Description automatically generated with medium confidenceThis page consists of a simple background, a title, a button to return to the main page, a cogwheel to access settings, a box showing the current contact they are messaging, previous messages they received and sent as well as an input box and button to send new messages. (see figure #6)

Arrow to send message to contact

Message to be sent to contact

Received messages

Cogwheel to access settings

Arrow to return to main page

Current contact

Title

Figure : New message Page

### 2.6.2 Evaluation of design #6 New message page

This page will allow users to view previous messages they received and sent to a specific contact as well as allow them to send new ones by entering text in the input box and clicking the send arrow. The page will also display the name of the current contact they are messaging. The settings cogwheel will open the settings page from design #5. The backwards facing arrow will return the user to the main page from design #4.

## 2.7 – Design comparison

This section of the report contains an evaluation of each design according to the criteria for success outlined in chapter 1. The evaluation of each design can be seen in table I

Table : Evaluation of design vs criteria

|  |  |  |  |
| --- | --- | --- | --- |
| **Design** | **Simple user interface** | **Meets design criteria** | **Effective** |
| Launch page Design | Yes | Yes | Yes |
| Sign in page Design | Yes | Yes | Yes |
| Create account page Design | Yes | Yes | Yes |
| Main page design | Yes | Yes | Yes |
| Settings page design | Yes | Yes | Yes |
| New message page design | Yes | Yes | Yes |

This data is significant to the design because it meets all the criteria established by the industry client for creating a mobile chat application able to send and receive messages regardless on internet connection. Every design pattern meets the criteria for Simple user interface, established design criteria and effectiveness. Therefore, this current stage of the design process has met the expectation set forward by the customer.

# 3.0 Technical Description

## This chapter examines the different components of the Chat Application design.

Considering the finished design, it consists of various parts of the application such as Login/Signup, Settings, and Main Screen, as seen in Figure 1, this breakdown will focus mainly on the User’s Main Screen.

## 3.1 General Description of the User’s Main Screen

The main screen is the most important part of the Chat application design. It represents as the body of the full application. The main screen let the user see the list of active devices for Bluetooth mode and list of past messages for Online mode, enabling the user to communicate to other users as programmed. The main screen also redirects users to Setting, if he/she wish to, allowing them to customised things and most importantly to logout of the application.

Graphical user interface, application

Description automatically generated

Figure : Chat application design

## 3.2 Part By part Description of the Chat Application [Level 2]

The Main Screen is designed to hold past messages for online mode and active devices for offline mode. The Main Screen consists of two main different view for the User as they open the application. The Online/Wi-Fi mode, which enable the user to connect to other users using internet connection, while the offline/Bluetooth mode enable the user to connect to other users that are nearby without internet connection for it uses Bluetooth to be perform communication. Figure 2 shows the two main screen of the application.

Diagram

Description automatically generated

Figure : Application's main screen

### 3.2.1 Major Assembly #1: Online/Wi-fi Screen

The main screen for online/wi-fi mode consist of two functionality which are triggered on pressed. These functions are the message and the user profile. As seen in Figure 7, the message function allows the user to communicate to other users in real time and the user profile allows the user to navigate to main setting.

#### 3.2.1.1 Sub-Assembly #1: Messaging and profile

Graphical user interface, application

Description automatically generated

Figure : Messaging and profile design

### 3.2.2 Major Assembly #2: Offline/Bluetooth Screen

The main screen for Offline/Bluetooth mode consists of three functionality which are also triggered on pressed. These functions are the search users, connect, and the setting. As seen in Figure 4, the search users function is programmed to locate any active users nearby, this is performed using Bluetooth, connect function allows the user to communicate to other users in real time using Bluetooth and the setting allows the user to navigate to main setting.

#### 

Graphical user interface, application

Description automatically generated

Figure : Creating new chats

## 3.3 Cycle of Operation

### The essential capabilities to interact between two users are included in the chat program, making it simple to use. As we explore the app, we can see how beneficial it may be to communicate with one another over Bluetooth or the internet. This technology is now so common that it can be found in almost every gadget.

### 3.3.1 Operating of chat application

1) If you are using this chat application for the first time, you will be asked to register, and if you are already a user, you will be asked to sign in. We developed an application that accepts both email and phone number logins. The first approach uses email and username, while the second option uses a phone number those changes depending on the country code. The signup and login pages took care of this.

2) Our main page and message page both follow this pattern, with the main page displaying our existing contact information and the message page displaying the dialogue between all the current members.

3) The settings page follows the main page, allowing the user to sign out and make changes to his or her account. We've also included a dark theme option to our app in case any users wish to try it out.

### 3.3.2 Maintaining the chat application

This are the main points which our team has decides to maintain our chat application.

Updates to New Features Ensure that new hardware and software are compatible with the app. Maintain a current user interface. Bugs should be fixed as soon as possible. Keep an eye on the database so that user interface is smooth. Provide system maintenance on a regular basis.

## 3.4 Value to User

This programme will be simple to use for all of our users, and we have targeted people of all ages. It contains all of the features that entice our users to utilise it on a daily basis without difficulty. We've also included a dark option because many people nowadays want to avoid harsh light. This function shields the user's eyes from hazardous rays. We'll make it available across all platforms so that no one is left behind when they use it.

# 4.0 Discussions of results

This chapter summarizes the results of the test cases that were performed on our application. Several tests were conducted in order to verify the proper functioning of sending messages from two devices, seeing if people are online, changing profile pictures, logout button, connecting nearby users, navigating between screens of testing nearby connection modes, sending and receiving messages, switching from online to nearby and nearby to online.

Table : Discussion of results

|  |  |  |
| --- | --- | --- |
| What is tested | How we tested it | Does it meet the needs? |
| Sending messages between two devices | Sending and receiving messages on two devices successfully | Yes |
| Changing profile pictures | Changing profile picture to an image stored in our device | Yes |
| Logout button | Log out of an account successfully | Yes |
| Accessing the settings page from any part of the app | Tested every part of the app where settings is reachable to see if any errors occurred | yes |
| Navigating between nearby connection modes | Smooth transition between nearby connection modes | Yes |
| Navigating between sending and receiving message screen | Smooth transition within the receiving and sending screen into any other screen | Yes |
| Switching from online to nearby | Swapping from online to finding nearby users | Yes |
| Switching from nearby to online | Switching from finding nearby users to online messaging without failing | Yes |
| Creating account | Creating a new account from scratch | yes |
| Logging in with invalid info | Tried using invalid login info to see if it would let you log in with wrong password (it didn’t) | yes |
| Logging in successfully | Logging in with correct information and existing account | Yes |

# 

# 5.0 Conclusions and recommendation

This chapter consists of the conclusion of the report

## 5.1 Conclusions

Thanks to the knowledge and determination of our team as well as combinations of tutorials and previous experiences, we were able to complete the application in a manner that the client was satisfied with the final deliverable. Our application suits our primary objective of being a free to use, easy to use chatting application that can be used to communicate via Bluetooth or Wifi.