Safe Chatter

Name   : CHATHURANGA H.K.A.G.

Registration No.   : EN8615

Index No.   : 17/ENG/016

Course Code   : CO3302

Field of Specialization   : Computer Engineering

Abstract

Developing a mobile application called "Safe-Chatter".
Department of Computer Engineering, Faculty of Engineering, University of Sri Jayewardenepura.

In Social media and Chatting Application systems store user personal data. Sometimes data is removed by the users, but server store some backup files in there servers. Now a days there are so many hackers in the computer field and hack a server is easy task for them.

In our mobile app, we have introduced solutions to above mentioned issues. By using this safe-chatter app, User can request other friends and after request receiver can accept the request. Safe-chatter provide real time interface to chat each other safely. And also Safe chatter can be used for group chat.

We hope to implement this app using further implementations.

Acknowledgment

# **Table of Content**

List of Acronyms

IOT   – Internet of Things

Email   – Electronic mail

App   – Application

QR   – Quick Response

API   – Application program interface

SDK   – Software Development Kit

BASE64   – Image file Conversion to Strings

1.Introduction

Before 1876 people hadn't use good communication method. In the past, letters were often used to communicate with each other, but by the end of the era, many people were using the Telephone to communicate. This is due to the inefficiencies of this system, which pushes people to communicate on the Internet in order to achieve greater efficiency and greater security.

Letters   **Email**   **Social Media**

Telephone   **SMS**

Before 1876   **1876**   **1971**   **1992**   **Now**
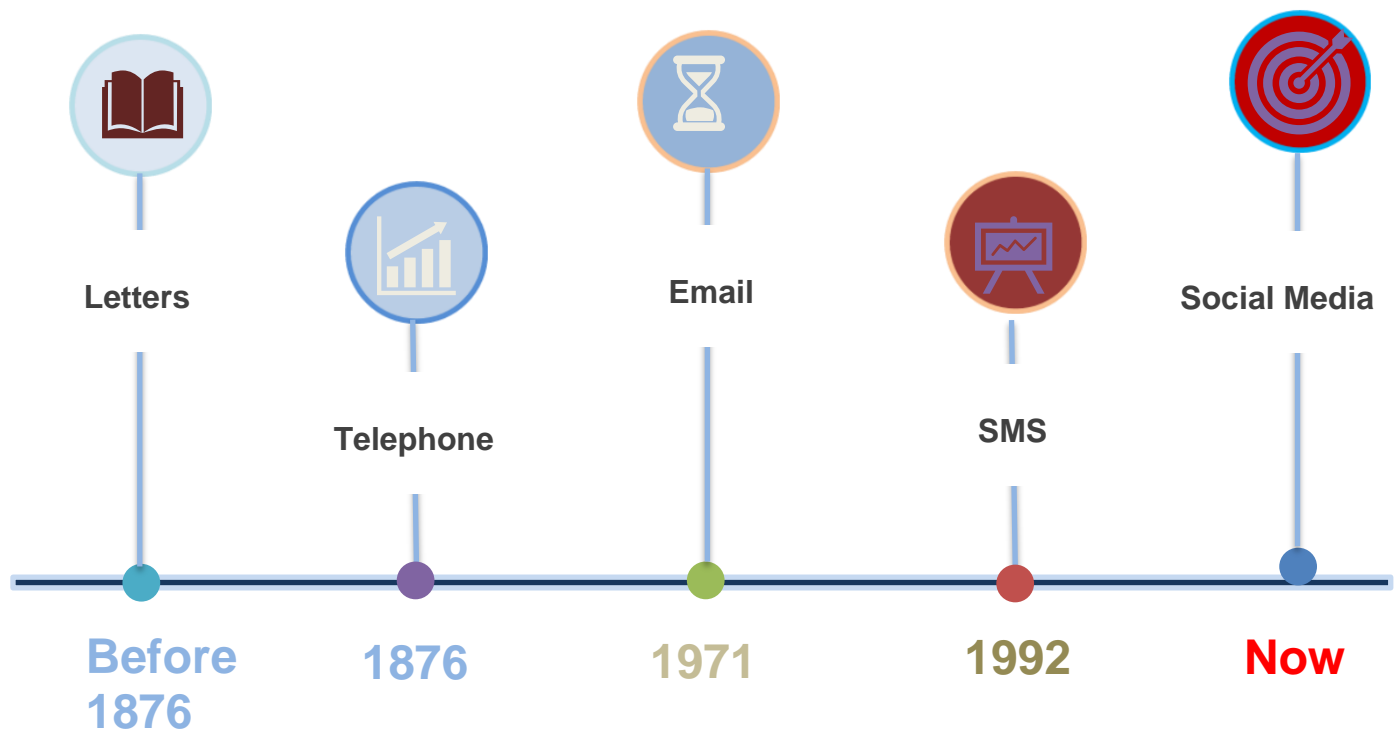
People have had to wait for weeks to communicate in the past. But nowadays the waiting time has reduced up to just 1or 2 seconds due to the development of the online services. Therefore, there is a need for a faster and more efficient system. [1]

In the past, letters were often used to communicate with each other, but by the end of the era, many people were using the Internet to communicate. This is due to the inefficiency of

the system. People tend to exchange ideas online for the sake of high efficiency and high security.[2]

It is important to consider the safety use of the service when using the Internet for this process. That is, even outsiders have access to their personal information. There is a need for secure software

2.Problem Specification

2.1 Aims and Objectives

Aim of this project is to provide a user friendly and easy method to Chat with friends. Users allow to request his friends using friends usernames, and request receiver can accept or reject the friend request. Also, allow the users to create group chat rooms.

The objective our project is to provide a smart platform which facilitates the users to chat with high safety.

2.2 Problems

There are some kind of problems regarding the app. Some people haven't a smart phone and good internet connection. Most of people using normal phones. So they don't get a chance to use this app. Also, there are some users who don't know about the new technology and don't have smartphones to use this Safe-chatter app.

Another problem regarding the sending friend request is, Username is the key thing to send that request to request receiver. when someone send a friend request using this app, There can be two or many users with that same username. So there is no method to Identify the correct users.

Another problem regarding the app is there is no data base for store messages. Only done here is when someone send a message to any other, real time that message forward to

relevant receiver. There are no any saving method. So if some two users want to chat , both of user should be online in same time. If someone left the chat he haven't any method to previous chat.

Also someone create a chat room and he can add friends to the chat room. When users are chatting in chat room, if user want to see messages, user has to wait in chat room.

Another problem is when some user send a image file, it should be converted to base64 string and send it through the web socket. In receiver part that base64 string convert to real image. That conversion take some small time like 2,3 seconds. That is little interruption for real time chatting.

2.3 Milestones

- Step 1: Developing the basic interface with necessary authentication to create accounts for Users.
- Step 2: Creating the database for the application using Heroku.
- Step 3: Connecting heroku server using socket.io.
- Step 4: Testing and implementing the application.

3.Methodology

3.1 Architectural Diagram
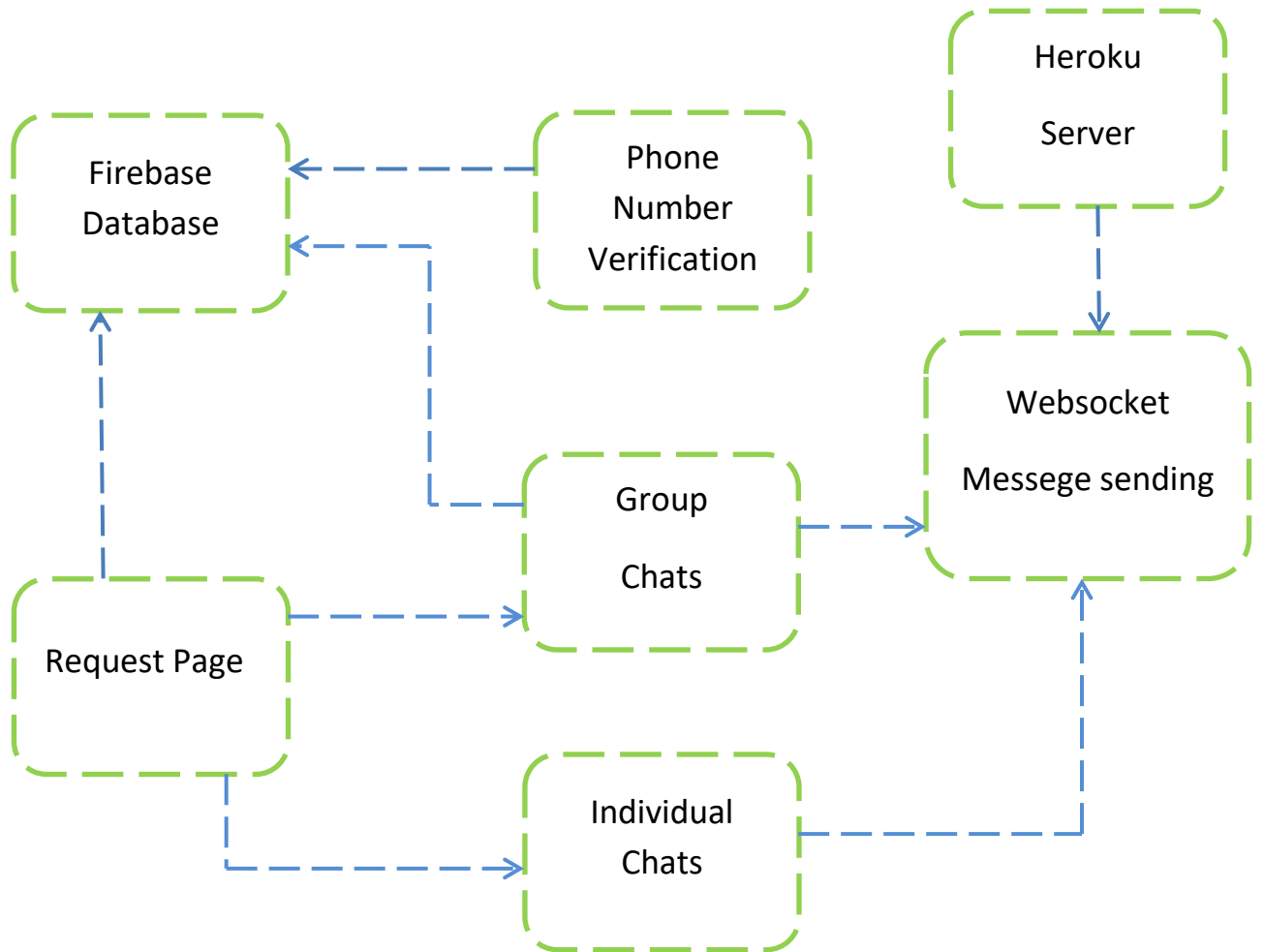
3.2 Methodology

Mainly methodology can be divided main 5 categories.

1. Analysis
2. Design
3. Implementation
4. Testing
5. Deployment

3.2.1 Analysis

In Analysis part mainly can be divided to 2 parts. Such as requirement gathering and analyzing requirement. In here I analyzed what are requirement that I need to complete that projects. What are the tools and knowledge that I need to complete this project. After Analyzing part I choosed what are best tools and best tools for create this project.

3.2.2 Design

In design part I planed my all project. First of all I created a prototype using adobe XD, because that very use full for create application interfaces. Major design part was creating a realtime database for store request details. I used firebase realtime database to create application database. Also I created a firebase firestore to store users profile pictures.

3.2.3 Implementation

This is the major part of this application, I can divided that implementation mainly 2 parts.

- Front-End development

  In front-end development, I used java using android studio. Android studio support to work with firebase easily, because there is a firebase tool in android studio. And also I used 'AndroidX' pluginsfor develop my android app. Other feature is android studio provide some multiple emulators to test our project.

- Back-End development

  Mainly for Back-end developing I used Nodejs language, Because it's very functional language and it also very easily to deploy in heroku. For Nodejs Coding I used VScode software.

3.2.4 Testing

Alpha testing and beta testing were done in testing.   Testing is discussed more In evaluation part (testing).

3.2.5 Deployment

Mainly I deployed my server files in free heroku server. Heroku is a nice service for deploy projects and it also provide platform to deploy nodejs files.

4. Implementation

4.1 Software services / Special Tools / Platforms

We used following platforms to do the project.

Mobile – Android/IOS

Software that we use during the project are,

Flutter

Firebase realtime database

Firebase firestore

Node JS

Other than those we used visual studio code and android studio to run the flutter codes and Nodejs to run the android code. The languages that we used are,

Dart

Nodejs

5. Evaluation

5.1 Testing

5.1.1 Objectives

The main objectives of the test plan for the Safe-Chatter software are as follows,

- To identify the parts of the system that need to be tested.
- To identify and define all the activities necessary to prepare for and conduct the testing process of the application.
- To define the pass/fail criteria for each item that is tested
- To determine the deliverables of the testing phase of the application.
- To define any suspension criteria and resumption techniques.
- To assure the quality of the final output of the application.

5.1.2 Definitions

The following are some of the terms and definitions that are related to the test results of the Safe-Chatter mobile application

- **Pass/Fail criteria:** Decision rules that are used to determine whether a software item passes or fails a test.
- **Test:** A collection of one or more test cases
- **Test Item:** A segment of the application that is subjected for testing.
- **Test Plan:** A document describing the scope, approach, resources and schedule of the intended testing activities.
- **Testing:** The process of analyzing a application segments to detect the differences between the existing and required conditions.

5.1.3 Test Items

The followings are the major testing components of the system.

- Phone Number Verification
- User Login

- Database and firestore data input and retrieve
- Web Socket

5.1.4 Testing Approach

The approach followed for testing the system ensures that major features and components of the project are adequately tested. The testing is carried out on the system while logging in to the system as a normal chatting user.

5.1.4.1 **Unit Testing**

Here each single module of the software is tested to check for errors. This is mainly conducted to discover errors in the code of the Safe chatter application. The main objective of the unit testing is to isolate each part of the application and to check the correctness of the code. Here in this application all the Android classes are tested. This facilitated the changes in codes and the testing is carried out in bottom up fashion.

5.1.4.1 **Integration Testing**

The software was subjected for unit test mainly dividing it in to four major segments;

- Phone number verification
- Login
- Input and retrieve data from firebase database
- Web Socket

The integration testing was carried out after the combination of all the main four segments in to a whole unit. This helped to test the functional and performance requirements on the major items of the project.

5.1.4.1 **System Testing**

Since the system of Safe-Chatter is a combination of both the Front-end and server parts, the system was tested after integrating whole the system in to a one. The system testing combines and follows the unit and integration testing.

6. Discussion

6.1 Challenges

The framework that is used to develop the application is flutter. Flutter is a recent platform introduced by the Google. Since it's a framework it was difficult to find solutions to our problems online. It was a challenge to us. Also, there are very limited amount of plugins are available for the flutter. While I am doing the project, there were continuous SDK updates. I had to avoid from those updates. Because, in sometimes the app worked for the previous version. But it didn't work for the new update. So, I had to face many kinds of difficulties

Also, there were lack of developer community for the flutter development. Unlike Java, or swift based android development, the flutter being a new SDK for android development is still at its infantry stage. Still the developer community is developing and there are no any considerable amount of discussion forums or documentations for the plugins that is required for the development of the segments in the Chatting software. So, it was a major challenge in developing the software. But with the available resources and tutorials, the team were able to develop the software.

Another challenge is, the constraints in the database. I used database for many places. While we are handling those, I have to face challenges.

I did the project as parts by parts. Finally, when I gathered them together, I had to face many challenges. Sometimes the dependencies weren't matched and I had to find solutions to solve it. I used firebase in many areas. So, when gathering all the parts, it didn't work in the very first time. I had to many changes.

The recent "AndroidX" upgrade has made most of the flutter plugins to loose compatibility with the devices. This was a really challenging task to convert the plugging to be compatible with the AndroidX.

When talking about the language used for the development, there were some issues since Dart is a language with has been introduced recently. Some of the errors and bugs during the program development stage caused the build failures and since it's a new language the

issues related to it couldn't be found easily through the dart documentation and with the limited number of forums.

6.2 Further Implementations

- As the project developer, initially the system is designed for parallel deployment with the chatting system for the community.
- During the project, I implement these facilities only for a chatting, I hope to develop a voice call and video call facilities to individual chats and group chat.
- Also I hope to improve application chat activities with message encryption methods. In this application there is no any database to save messages. Problem of this application is 3rd party hacker can access our connection and he can see our all the messages. If there is a any encryption method, third party hacker cannot understand application messages.
- After Some testing process , I hope to deploy this application to google playstore. It helpful to download this application very easily.

7 Conclusion

By using the app, we can avoid the problems regarding the Real time chatting system. Users can make their chat smart. Users can get all facilities regarding with the app and use them after mobile verification. They can Create chat very easily and quickly without difficulties. There are no constraints. Anyone can create an account and create a chat by using this app. And also, they can create group chat room using this app.

Users can enter their username and they can attach their photo when registration period of the application. This Username and profile photo is uploaded to the database. And also if some user request to the user, database create a node for both 2 users. After that when user can see chatlist according to the accepted request.

By using chat list user can choose an individual chat or group chat. Using real time websocket for forward messages one user to other user. If user want to send an image, there is an image button for choose images from gallery. After selecting an image , the application convert that image to Base64 string and send that string through the websocket. After receive that base64 string, that string decode in to image file.

When I was doing this project as individual, I got huge experience. I learned about new software tools, hardware tool, languages. Also, improved my soft skills. Also, I set timelines to achieve the milestones. I could achieve my target. I thought that this app will very helpful to develop the safe chatting system. Also, I hope to develop this app by avoiding the problems regarding the app and add the further implementations.

References

[1] "Email Over Postal Mail - Advantages and Disadvantages | Frndzzz.com." http://frndzzz.com/email-over-postal-mail-advantages-and-disadvantages (accessed May 03, 2020).

[2] "Internet Security - Chatting - Tutorialspoint." https://www.tutorialspoint.com/internet_security/internet_security_chatting.htm (accessed May 03, 2020).