

# **ANONYMOUS COMMUNICATION SYSTEM**

**BY**

**Md. Iqramul Hasan**

**ID: 141-15-3246**

**&**

**Bipasha Amin**

**ID: 141-15-3252**

This Report Presented in Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

**Seraj Al Mahmud Mostafa**

Senior Lecturer

Department of Computer Science and Engineering

Daffodil International University

Co-Supervised By

**Shah Md Tanvir Siddiquee**

Senior Lecturer

Department of Computer Science and Engineering

Daffodil International University



**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

**MAY 2**

## **APPROVAL**

This Project/internship titled “**Anonymous Communication System,**” submitted by Md. Iqramul Hasan, ID No: 141-15-3246 & Bipasha Amin, ID No: 141-15-3252 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 6<sup>th</sup> May, 2018.

### **BOARD OF EXAMINERS**

---

**Dr. Syed Akhter Hossain**

**Professor and Head**

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Daffodil International University

**Chairman**



---

**Dr. Sheak Rashed Haider Noori**

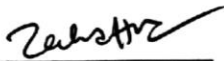
**Associate Professor and Associate Head**

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Daffodil International University

**Internal Examiner**



---

**Md. Zahid Hasan**

**Assistant Professor**

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Daffodil International University

**Internal Examiner**



---

**Dr. Mohammad Shorif Uddin**

**Professor**

Department of Computer Science and Engineering

Jahangirnagar University

**External Examiner**

## DECLARATION

We hereby declare that, this project has been done by us under the supervision of Mr. Seraj Al Mahmud Mostafa, Senior Lecturer, Department of Computer Science and Engineering (CSE), Daffodil International University.

We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

**Supervised by:**



---

**Seraj Al Mahmud Mostafa**  
Senior Lecturer  
Department of Computer Science and Engineering  
Daffodil International University

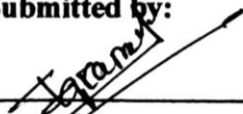
**Co-Supervised by:**



---

**Shah Md Tanvir Siddiquee**  
Senior Lecturer  
Department of Computer Science and Engineering  
Daffodil International University

**Submitted by:**



---

**Md Iqramul Hasan**  
ID: 141-15-3246  
Department of CSE  
Daffodil International University



---

**Bipasha Amin**  
ID: 141-15-3252  
Department of CSE  
Daffodil International University

## ACKNOWLEDGEMENT

Our first and foremost thankfulness to almighty Allah whose blessings gave us the capability to come to this far.

We would like to show gratitude to our supervisor **Mr. Seraj Al Mahmud Mostafa**, senior lecturer, Department of CSE, Daffodil International University. Without his dedicated involvement and assessment in this project, we would have never been able to complete it properly and successfully. His thoughtful approach and encouragement in our project work, his patience, and constructive criticism have guided us to accomplish the job perfectly. His deep knowledge and keen interest were great source of motivation for us.

We would also like to thank **Mr. Shah Md Tanvir Siddiquee**, senior lecturer, Department of CSE, Daffodil International University for being supportive and kind enough for getting through the dissertation.

Our time in the Daffodil International University has been highly productive and full of extraordinary experiences. So we would also like to thank the other faculty members, our classmates, instructors and staffs for being with us in the whole journey.

And finally, we are forever indebted to our respected parents who were besides us throughout the whole journey with their immense support and love.

## **ABSTRACT**

This project is focused on building a device to communicate anonymously when a person is in danger or in critical situation. Though the medium of communication is a combination of hardware and application, the proposed system will ensure the safety of the affected person by hiding the means of communication from the attackers. Safety issue has become a great concern nowadays. Though there is a lot of hardware or software based applications to support the victim of a crime or danger, all of them either solely cell phone based apps or hardware. Using cell phone requires a good amount of time to operate, whereas a victim mostly does not have this amount of time to deal with the system. Moreover, it can also happen that he/she would not be able to reach the cell phone. On the other hand, hardware is very expensive which is not affordable for all specially for the people of rural areas. So to solve the issues and provide victims the best utility of a safety app, the developers of this project have come up with an idea to create a device in the form of an accessory which will be connected to the app. Victims can wear the device very easily specially as a jewelry. Whenever victim sense a danger, he/she just needs to tap that device for once. Then the system inside the app will be activated automatically.

## TABLE OF CONTENTS

<b>CONTENTS</b>	<b>PAGE NO.</b>
Approval	i
Declaration	ii
Acknowledgment	iii
Abstract	iv
Table of Contents	v-vi
List of Figures	vii
<b>CHAPTER 1: INTRODUCTION</b>	
1.1 Introduction	1
1.2 Motivation	1
1.3 Objectives	1
1.4 Expected Outcome	2
1.5 Report Layout	2
<b>CHAPTER 2: BACKGROUND</b>	
2.1 Introduction to HID	3-4
2.2 Related Works	4-5
2.3 Comparative Studies	5
2.4 Scope of the Problem	5
2.5 Challenges	6
<b>CHAPTER 3: REQUIREMENTS FOR PROPOSED SYSTEM</b>	
3.1 Business Process Modeling	7-8
3.2 Requirement Collection and Analysis	8
3.3 Use Case Modeling and Description	9-11
3.4 Design Requirements	11-13
<b>CHAPTER 4: DESIGN SPECIFICATION</b>	

4.1 Front-end Design	14
4.2 Back-end Design	14-17
4.3 Interaction Design and UX	17-18
4.4 Implementation Requirements	18
<b>CHAPTER 5: IMPLEMENTATION AND TESTING</b>	
5.1 Implementation of Database	19
5.2 Implementation of Front-end Design	19-23
5.3 Implementation of Interaction	23
5.4 Testing Implementation	23-24
5.5 Test Results	24
<b>CHAPTER 6: CONCLUSION AND FUTURE SCOPE</b>	
6.1 Discussion and Conclusion	25
6.2 Scope for Further Developments	25
<b>REFERENCES</b>	26-27
<b>APPENDICES</b>	
Appendix A: Hardware Configuration	28
Appendix B: Software Configuration	29

<b>LIST OF FIGURES</b>	<b>PAGE NO.</b>
Figure 3.1: Business Process Model	7
Figure 3.2: Use Case Model	9
Figure 3.3: Arduino Nano	12
Figure 3.4: HC-05 Bluetooth Module	12
Figure 3.5: RN-42 HID Module	13
Figure 3.6: FTDI 232 Serial Converter	13
Figure 3.7: BlueFlash Tool	14
Figure 4.1: User Information Activity	16
Figure 4.2: Design of User Information Activity	16
Figure 4.3: A sample program in JavaScript for Firebase	17
Figure 4.4: A sample program for Google Map Integration	17
Figure 4.5: A sample program of the Device	18
Figure 4.6: Interaction Design	18
Figure 5.1: Firebase Database Structure	20
Figure 5.2: Splash Screen	21
Figure 5.3: User Information	21
Figure 5.4: Receiver Information	22
Figure 5.5: Permission Page	22
Figure 5.6: Home Screen (Not Activated)	23
Figure 5.7: Home Screen (Activated)	23
Figure 5.8: Receiver's view	24



# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 Introduction**

This project “Anonymous Communication System” is mainly a device that will track the location of a victim using the Global Positioning System (GPS) of the cell phone and send it to his/her predefined contacts so that they can initiate the rescue operation as early as possible. These contacts can be of the law enforcement agencies or the trusted persons. The whole procedure will be done by the help of a mobile application but will only require one click of the victim on that device.

### **1.2 Motivation**

In context of Bangladesh, crime rate has increased drastically. According to NUMBEO [2], crime rate in Bangladesh has raised up to 74.8% in the past 3 years. Even possibilities of being attacked has increased up to 61.9% and percentage of violent crimes such as assault and armed robbery is 68% which is very “High” in the scale of vulnerability. Specially, violence against women has almost become a daily life phenomenon. Incident of being raped and getting killed afterwards is likely to be the daily news in the newspaper. So to improve the scenario, the project is designed in a way that it can provide the best utility of technology in time of this kind of situation to a victim. The system will ensure that the victim himself can take the defense using the device no matter how worse is the condition.

### **1.3 Objective**

The implementation of the dissertation is done by keeping in mind the importance of its contribution to the society. Therefore, it has the specific objective of –

- Enhancing the safety of an individual by creating a self-defense tool that will eventually result in a secure and sound environment of the society.

## **1.4 Expected Outcome**

Specific outcomes of the project are-

- A hardware device
- An android app
- & a website

## **1.5 Report Layout**

The whole project consists of six different chapters, references and two appendices.

The short summary of the report layout is-

- Chapter 1 contains introduction, motivation of the project, objective and expected outcomes.
- Chapter 2 is about the discussion of the technology used in the background section, literature review, comparative study, scopes and challenges of the project.
- Chapter 3 is occupied with requirements of the proposed system
- Chapter 4 presents the design specification
- Chapter 5 shows the implementation and testing results
- Chapter 6 finally concludes the project with future scope of development and limitations.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction to HID**

Human Interface Device(HID) is one of the most important and basic part of computer technology. These are the devices that provide human control over them. These devices are actually the means of human interaction with the electronic information system. HIDs are the integral parts of User Interface which allows human to directly control the operation of a computer system. [1]

Example of HID class devices includes-

- Keyboards and pointing devices (such as mouse devices, joysticks and trackballs)
- Front-panel controls (for example buttons, knobs, sliders, and switches)
- Simulation devices (such as steering wheels, pedals, other VR input devices)
- Remote controls and telephone keypads
- Other low data-rate devices that provide for example environmental data (such as thermometers, energy meters or even bar-code readers) [4]

Though in the very beginning, the definition of Human Interface Device started as a device class over Universal Serial Bus(USB) standard, HID is also used in other communication buses in this modern era of computer technology such as-

- Bluetooth HID
- Serial HID
- ZigBee input device
- HID over I<sup>2</sup>C
- HOGP (HID over GATT) [3]

HID protocol mainly consists of two components- “Host” and “Device”. The “Device” is what directly interacts with human for example keyboards, mice etc. The “Host” communicates with the “Device” to receive input data from it. Examples of “Host” are PC, cell phone etc. Output data flows from the Host to Device.

On the other hand, Android based applications are becoming daily life tools nowadays. They have become the solution for every possible problem of ours. So the project is an attempt to collaborate these two hardware and software technology to solve the issue of safety and security.

## 2.2 Related Works

Before starting the project, the developers have gone through a number of other development works that have been done before. To find out the limitations and scopes that can be worked on, a good literature review is the most crucial part of a dissertation. Findings of the job have been stated below.

- Self-Protect

**Author:** Md. Saddam Hossein

**Idea:** An emergency supportive mobile application on Android platform which works in two phases. Once installed it just needs a press to open the app on the phone; the app will find the nearby police station and send a SOS message. The app can also record video footage using mobile camera.

- Safer Smart Jewelry

**Author:** Leaf Wearables

**Idea:** A wearable jewelry that requires double press on the button backside of a pendant to send SOS text to the guardians along with the current location. It also Navigate to the nearest hospital or police station.

- Safe Trek

**Author:** Zach Winkler

**Idea:** A personal safety app that needs to press the safe button and hold it until the user feels safe. When he feels safe, he releases the button and enter a 4-digit PIN to cancel the notification of authorities. If he is in danger, he releases the button but not enters the PIN so that local police will get notification with victim's current location.

- iGoSafely

**Author:** Conspecture Inc.

**Idea:** A personal security alarm application that notifies emergency contacts in case of an emergency by unplugging user's headphone. It sends location and recording of the incident.

- Pocket Finder – personal tracker

**Author:** Location Based Technologies, Inc.

**Idea:** Allows the registered user to create a customized geo-fence zone so whenever the user arrive or leave the zone it notifies the other pre-defined users i.e. family persons; uses Wi-Fi and GPS technology.

### **2.3 Comparative Study**

The study sheds light on a number of development work on this area but all of them either fully dependent on software program or only a hardware tool itself. Each of them is either time consuming in term of operating or costly. Most of them need to have the smart phone in a stable condition. Operating a software application on the phone in time of crisis required a great effort and time and in term of hardware it requires to hold onto that tool to work on.

### **2.4 Scope of the problem**

In context of Bangladesh, there are lots of mobile applications which can control different types of electronics or hardware. But for controlling mobile application, there is no such hardware has been developed yet which is the main idea of this project. Building a cost effective hardware that can be affordable to every individual belongs to different economic stages was another great concern. And as the safety issue has become a great concern of our country in the recent times, so it is expected to hit a target a large group of people as users. Not only in time of security but also it can be used in time of any kind of emergency like accidents or in unwanted situations.

## 2.5 Challenges

The main challenges of this development work are-

- Turning an ordinary Bluetooth Module into a HID Bluetooth Module.
- Finding key codes for controlling Android Operating System.
- Real time tracking using Google Firebase since Firebase does not allow storing data dynamically.

# CHAPTER 3

## REQUIREMENTS OF THE PROPOSED SYSTEM

### 3.1 Business Process Modeling

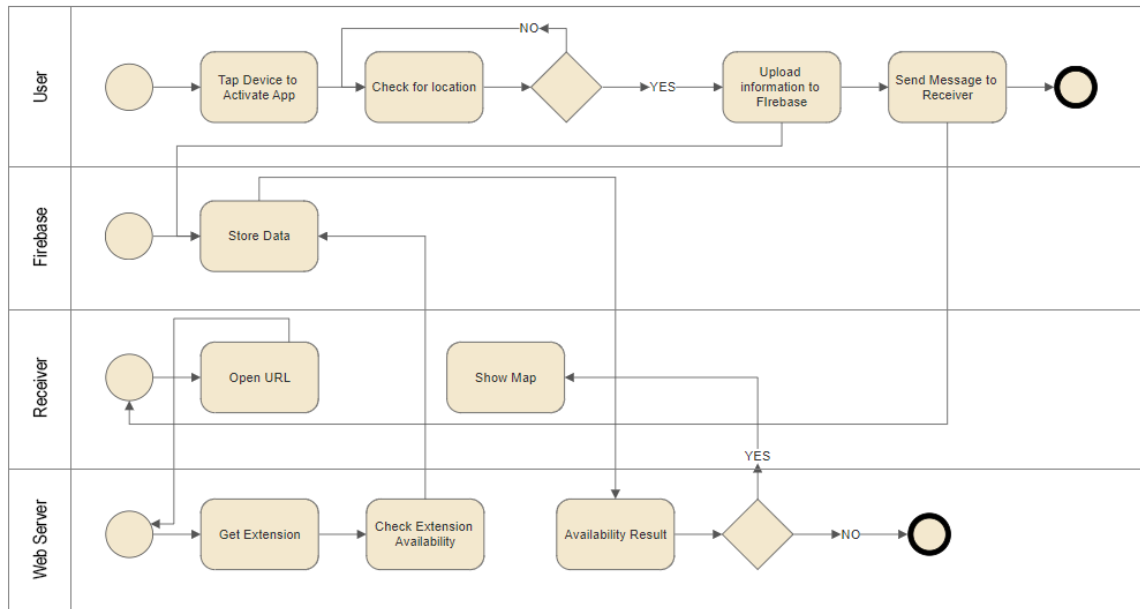


Figure 3.1: Business Process Model

The above figure illustrates the BPM of our system. There are four actors in the system.

- User
- Firebase
- Receiver
- Web Server

The process has two user categories- User and Receiver. While installing the app, the user stores his username, his phone number and three receiver numbers inside the application. Whenever he presses the button of the device, it sends one specific key code to the app and the app gets activated and starts searching for location. As soon as it detects the location, it sends the information to Firebase database containing user's phone number and location information. And it also sends one website URL to the receivers through SMS. When the receiver opens the URL, our web server first gets the extension of the URL and send it to Firebase to verify if Firebase has the database with

same name or not. If database is found, then it will show the map to the receiver and if not then it will show nothing.

### **3.2 Requirement Collection and Analysis**

Major role of our system is the device and mobile app.

#### **3.2.1 Mobile App requirements**

- Permission for accessing GPS
- Permission for sending SMS
- Internet Connection
- Background data restriction

#### **3.2.2 Device requirements**

- Microcontroller
- HID Bluetooth Module
- Push Button and other necessary components

After analyzing the above requirements, we found that there is no Bluetooth HID module available in our country, so we have to make one. For that HC-05 will be best solution because it can be converted into HID module by flashing its firmware. To control HID we'll use Arduino Nano. And all the mobile requirements will be done in the backend program of the app.



### 3.3 Use case Modeling and Description

Based on the requirements a use case has been developed which is showing below,

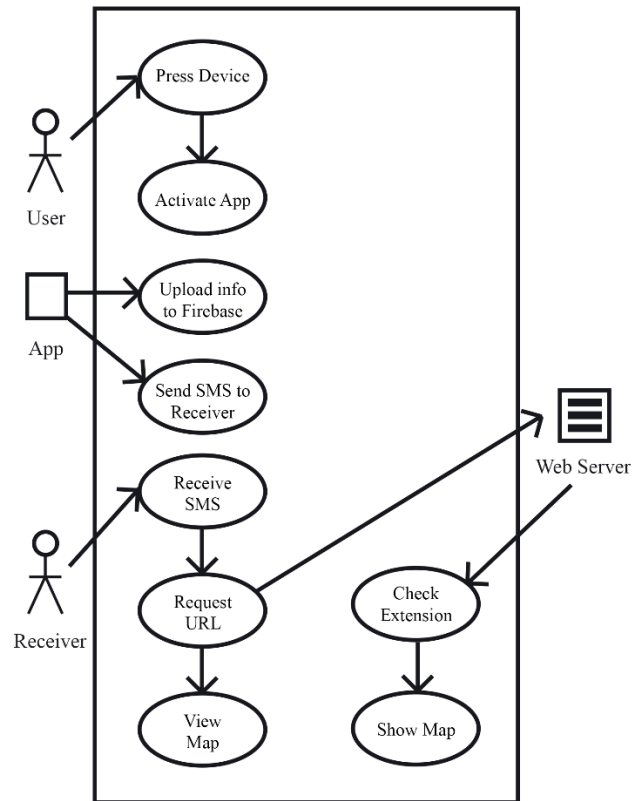


Figure 3.2: Use Case Model

#### Description-

##### Use case: Press Device

Actor: User

Actor's Goal: To activate the app

Pre-condition: Install App & device

Post-condition: Activate app

**Use case: Activate app**

Actor: User

Actor's Goal: To activate the app

Pre-condition: Press device

Post-condition: Upload information and send message

**Use case: Upload information**

Actor: App

Actor's Goal: To upload information in Firebase

Pre-condition: Activate App

Post-condition: nil

**Use case: Send SMS to Receiver**

Actor: App

Actor's Goal: To send message to the receivers

Pre-condition: Activate app

Post-condition: Receive SMS

**Use case: Receive SMS**

Actor: Receiver

Actor's Goal: To receive emergency message

Pre-condition: Send SMS

Post-condition: Request URL

**Use case: Request URL**

Actor: Receiver

Actor's Goal: To view the map

Pre-condition: Receive SMS

Post-condition: View Map

**Use case: View Map**

Actor: Receiver

Actor's Goal: To view the map

Pre-condition: Request URL

Post-condition: Help the victim

### **Use case: Check Extension**

Actor: Web Server

Actor's Goal: To verify the extension

Pre-condition: Request URL

Post-condition: Show Map

### **Use case: Show Map**

Actor: Web Server

Actor's Goal: To show the map to Receiver

Pre-condition: Check Extension

Post-condition: nil

## **3.4 Design Requirements**

The system has front-end and back-end, which work for online only. For storing the data we've used:

- Google Firebase

For fetching data from Firebase and for verifying the URL and for showing the Map, we've used:

- JavaScript
- Html, CSS

JavaScript is used to verify the URL and Fetching data from Firebase. Html and CSS is used for showing the map on the page.

### **3.4.1 Device Requirements**

For making the device we need some electronic components, which are described below-

#### **Arduino Nano**

One of the main component of the device is Arduino Nano. Which will control the key codes.

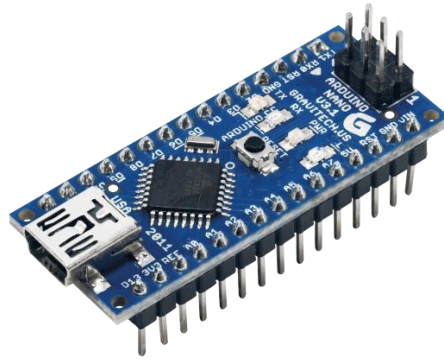


Figure 3.3: Arduino Nano

### Bluetooth Module HC-05

To connect and to send Key Code to Android OS we will need one Bluetooth HID module. But HC-05 is a normal serial adapter, we have to make it HID.

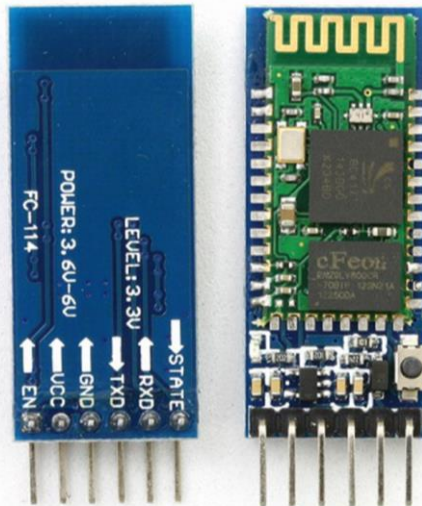


Figure 3.4: HC-05 Bluetooth Module

### Making Bluetooth HID Module



Figure 3.5: RN-42 HID Module

RN-42 is more advance Bluetooth module than HC-05 and it is HID too. The circuit design and hardware configuration of both modules are same but RN-42 is ten to fifteen times expensive than HC-05 and the device has gone retired also not available in the market. Luckily the firmware of RN-42 is still available in the internet. So if we can flash the firmware to HC-05 then it can be a HID module too.

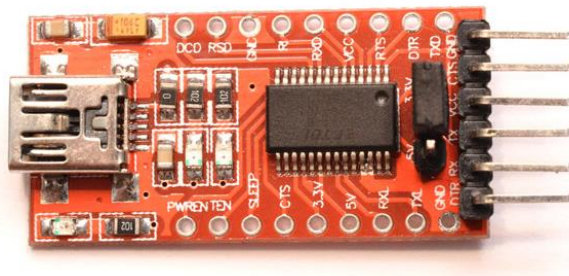


Figure 3.6: FTDI 232 Serial Converter

To flash the firmware to HC-05, we've to use FTDI serial converter. We have to connect four pins of this FTDI with four pins of HC-05:

FTDI → HC-05

DTR → CSB

RTS → CLK

RI → MOSI

DSR → MISO

Now we've to download the firmware and flash it by using BlueFlash flashing tool.

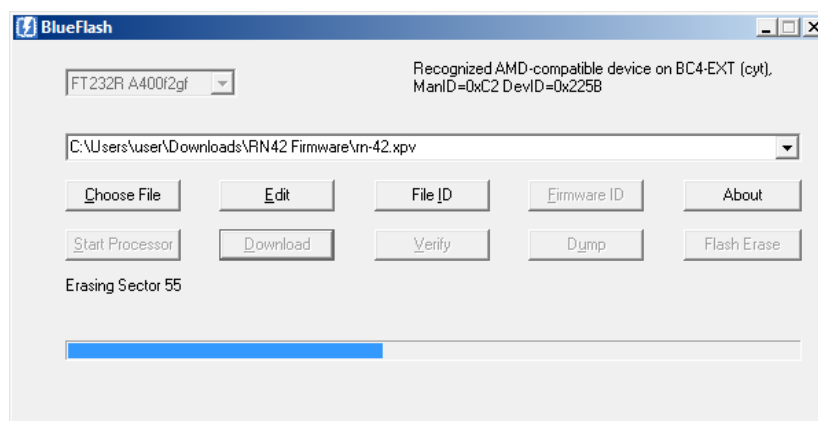


Figure 3.7: BlueFlash tool

Downloading the Firmware into HC-05 will turn it into HID Module.

## **CHAPTER 4**

### **DESIGN SPECIFICATION**

#### **4.1 Front-end Design**

This project has two different categories of Front-end design- User end and Receiver end.

For user's front end we have used XML to design the application activities and JAVA for interacting between the activities. We have used Shared Preferences for storing the user information so that user need fill the information for once only.

The very first page is a splash screen which will load for five seconds and will check if necessary requirements are available in the device or not. In the second page the user has to put his name and phone number and this phone number will be used as a root of the database.

On the third page user needs to put three different phone numbers of three different receivers. Length of each number should be at least eleven. On the next page, app will ask user for some permission, without allowing those the app will not start.

The main page will wait for the signal from the device. As soon as the device is pressed, main page will be activated automatically and data will be uploading continuously to Firebase.

#### **4.2 Back-end Design**

We have used Java and XML for mobile application and JavaScript for fetching data from Firebase and for Google Map and C for the Device. Two sample screenshots are given below. Figure 4.8 is showing the user information activity and Figure 4.9 is showing the design of user information activity.

```

LoginActivity.java | onCreate()
13
14 public class LoginActivity extends AppCompatActivity {
15     private Button button;
16     private EditText name, phone;
17     @Override
18     protected void onCreate(Bundle savedInstanceState) {
19         super.onCreate(savedInstanceState);
20         requestWindowFeature(Window.FEATURE_NO_TITLE);
21         setContentView(R.layout.activity_login);
22         Boolean isLoginActivity = getSharedPreferences( name: "PREFERENCE", MODE_PRIVATE).getBoolean( @ "isLoginActivity", b: true);
23         onBackPressed();
24
25         if (isLoginActivity){
26             name = (EditText) findViewById(R.id.name);
27             phone = (EditText) findViewById(R.id.phone);
28
29             SharedPreferences sharedPref = PreferenceManager.getDefaultSharedPreferences( context: this);
30             final SharedPreferences.Editor editor = sharedPref.edit();
31
32             button = (Button) findViewById(R.id.next);
33             button.setOnClickListener((view) -> {
34                 String getName = name.getText().toString();
35                 String getPhone = phone.getText().toString();
36
37

```

Figure 4.1: User Information Activity

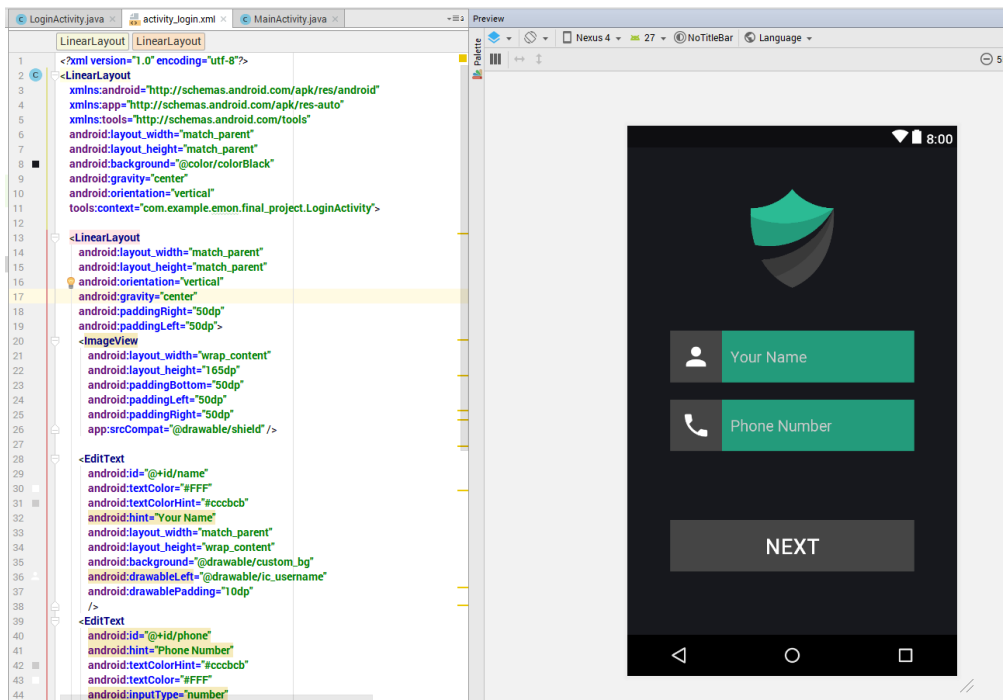


Figure 4.2: User Information Activity Design

Following Figure 4.10 is showing a sample code of fetching data from Firebase and Figure 4.11 is showing Google Map integration.

```
20 var gg = window.location.pathname;
21 var result = gg.substr(gg.indexOf("/") + 1);
22 var config = {
23   apiKey: "AIzaSyBv1RQNlB9bNc0EmCe93eq9qhf0Yy0AuT4",
24   authDomain: "androidtest-c4390.firebaseio.com",
25   databaseURL: "https://androidtest-c4390.firebaseio.com",
26   projectId: "androidtest-c4390",
27   storageBucket: "androidtest-c4390.appspot.com",
28   messagingSenderId: "286445967973"
29 };
30 firebase.initializeApp(config);
31 var database = firebase.database();
32
33 var x = gg;
34 var ref = database.ref(x);
35 ref.on('value',gotData);
36
37 var arrLat = [];
38 var arrLng = [];
39 var lat;
40 var lng;
41
42 function gotData(data) {
43
44   var location = data.val();
45   var keys = Object.keys(location);
46
47   for(i = 0; i < keys.length; i++){
48     var k = keys[i];
```

Figure 4.3: A sample backend program in JavaScript for fetching data from Firebase.

```
55
56
57 var posMarker = {lat: parseFloat(arrLat[count-1]), lng: parseFloat(arrLng[count-1])};
58 var map = new google.maps.Map(document.getElementById('map'), {
59   zoom: 17,
60   center: posMarker
61 });
62 var marker = new google.maps.Marker({
63   position: posMarker,
64   map: map
65 });
66 var infowindow = new google.maps.InfoWindow({
67   content: '<div><h1>Please Help!</h1></div>'
68 });
69 infowindow.open(map,marker);
70 arrLat = [];
71
72 }
73
74
```

Figure 4.4: A sample backend program in JavaScript for Map integration.

We have used C to program our device. One sample screenshot is given below. Following Figure 4.11 shows a sample program of the device.



```
Button $
int buttonPin = 8;
int led = 13;
int buttonState = 0;

void setup() {
  //BTSerial.begin(9600);
  pinMode(buttonPin, INPUT);
  pinMode(led, OUTPUT);
  Serial.begin(115200);
}

void loop() {
  buttonState = digitalRead(buttonPin);

  if (buttonState == HIGH) {
    Serial.write(0x0D);
    digitalWrite(led, HIGH);
    delay(500);
  }
  else{
    digitalWrite(led, LOW);
  }
}
```

Figure 4.5: A sample program of the device

### 4.3 Interaction Design and UX

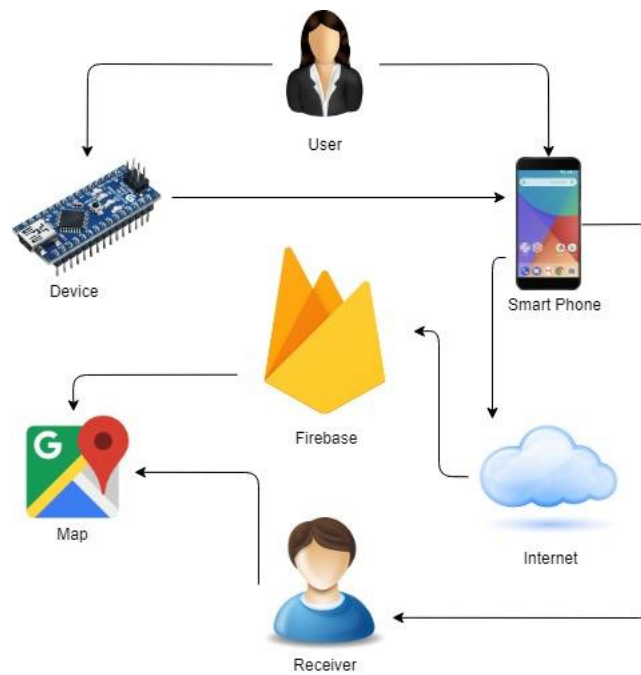


Figure 4.6: Interaction Design

User Experience of this project is very simple and user friendly. There are few things that we've to consider before starting this project.

First of all, the user doesn't need to keep his phone in his hand or he don't need to touch his phone while he is in emergency situation. He just has to tap our device for three times and all the process will be done anonymously. The device can be wearable as a jewelry or as a gadget. By using the device, user will be able to activate all the process within seconds.

We didn't use any authentication process. Because the aim of this project is to show map to the receivers not to verify whether the user is real or not.

We've used real time database as our backend system not the traditional database like SQL. Benefit of using real-time database is that data will be unloaded within seconds and can be retrieve within seconds too. And most important part is by using that map can be updated in real-time.

Lastly, this is an online based project. The reason we did not choose offline because for a certain amount of times app will be sending messages to the receiver, which will very cost effective and time consuming.

#### **4.4 Implementation Requirements**

To activate the app, user have to connect the device with the phone. Phone have to have a certain amount of balance to send three messages to the receivers to send data to firebase through internet.

# CHAPTER 5

## IMPLEMENTATION AND TESTING

### 5.1 Implementation of Database

Since our system is based on safety and security, we have tried to make the system's operation as fast as possible. We had to move from traditional database (like- SQL) to real-time database. We have used Google Firebase which is real-time database and backend service. Most important feature we've added in our system by using Firebase is real time tracking. As soon as the location information will be uploaded in the firebase, our map will load automatically. Following figure 5.1 is showing the database structure of firebase.

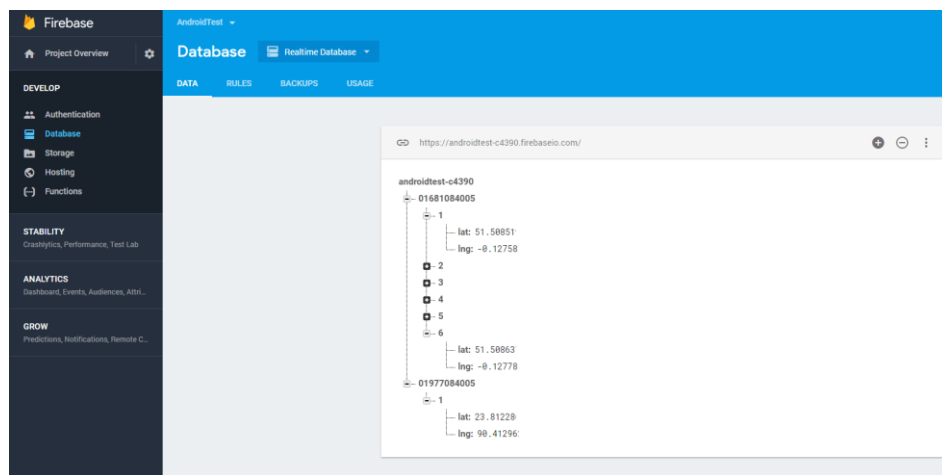


Figure 5.1: Firebase Database Structure

### 5.2 Implementation of Front-end Design

#### 5.2.1 User's Front-end

The very first page is Splash Screen which takes few seconds to identify whether the app has all the requirements or not.

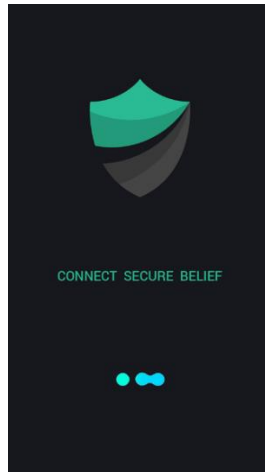


Figure 5.2: Splash Screen

Then the user has to continue by filling up his/her name and phone number. Since phone number is unique, so it will use in the Firebase as the root of the nested list of the user.

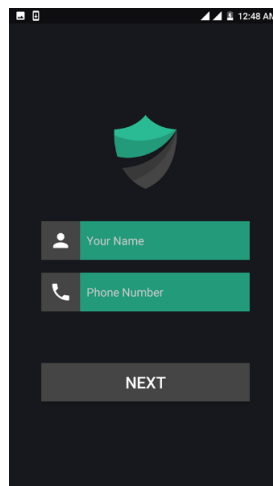


Figure 5.3: User Information

After that the user will be taken into the Receivers information page and the user must have to fill all with three different numbers. When the app will be activated, one message will be send to these numbers individually.

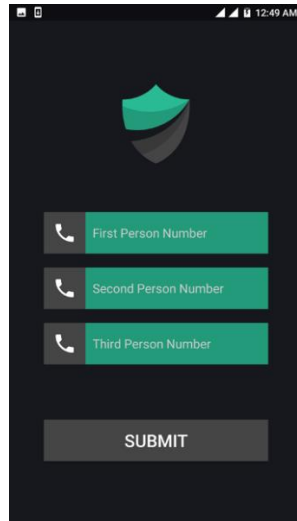


Figure 5.4: Receiver Information

If everything is done correctly, then the user will see some popup of Android Permission. Which have to be accepted by user if he wants to continue further.

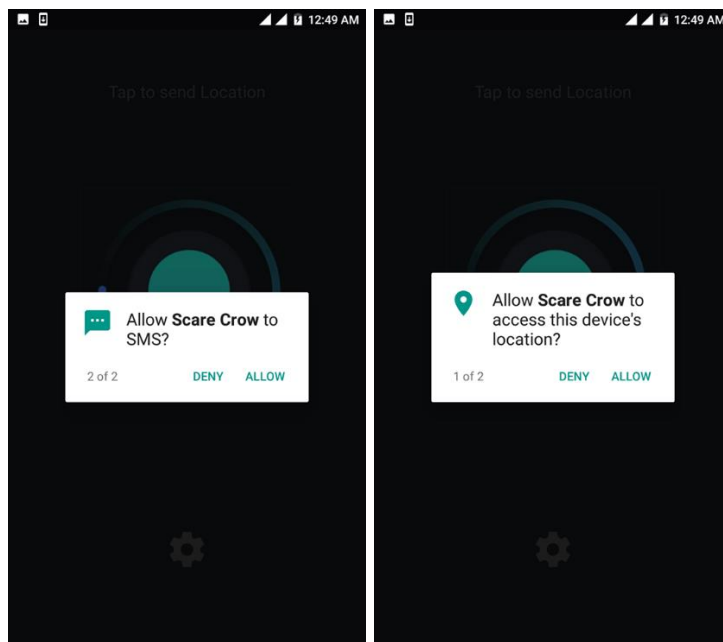


Figure 5.5: Permission Page

If the user allows all the permission, then he will be taken to the home screen. There will be two options for the user. Either he can activate the app by touching the image or by tapping the device.

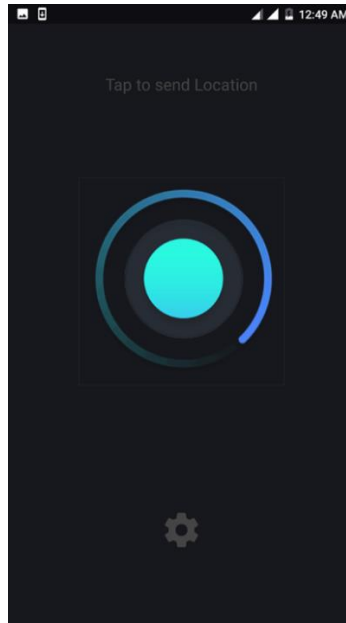


Figure 5.6: Home Screen (Not Activated)

If the app is activated and data submitted to the server then the color of the image will be changed into red.

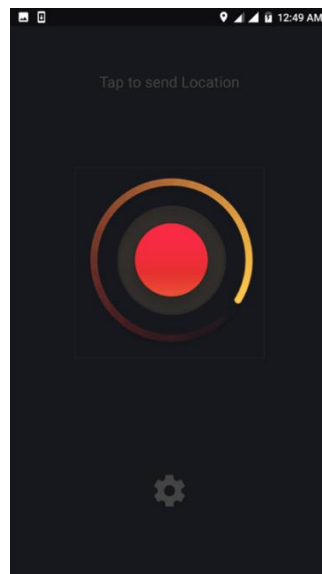


Figure 5.7: Home Screen (Activated)

### 5.2.2 Receivers Front End

When the user's app is activated the receiver will get one message from the user. That message will continue one URL link. When the receiver clicks on the link, it will show google map-

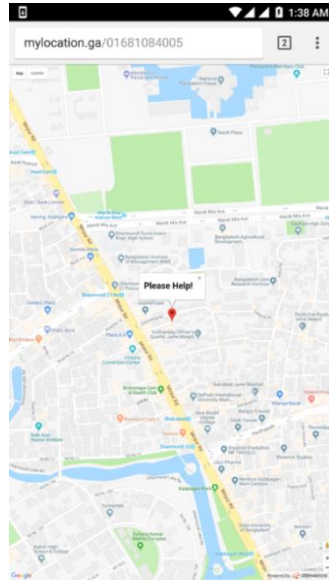


Figure 5.8: Receiver's view

### 5.3 Implementation of Interaction

To interact with the app from the user need to press the push button of the device for three times. And we have used intent which is a java class specially made for android to interact between one activity to another activity. User cannot interact with the next activity until he fills all the requirements of the current activity.

### 5.4 Testing Implementation

**Project name:** Anonymous Communication System

**Test Designed by:** Developer

**Test Executed by:** Developer

Table 5.1: Test Cases

TC No.	Test Case Name	Pre-condition	Input	Expected output	Actual Output	Status	Test Executed Date
1	Button Test	Device have to be connected with the phone	Button Click	Activate App	App Activated	Pass	02-04-18
2	Phone Unlock	Device have to be connected with the phone	Button Click	Unlock Phone	Phone unlocked successfully	Pass	02-04-18
3	Data upload to Firebase	Button Click	App Activation	Data should be upload continuously	Data uploading continuously	Pass	02-04-18
4	Send SMS to receiver	Button Click	App Activation	Send SMS	SMS received by receivers	Pass	03-04-18
5	Show Map	Extension Verification	URL	Show map to the receiver	Map is showing continuously	Pass	03-04-18

### 5.5 Test Results and Reports

As we can see in the Table 5.1, the system passed and works properly without any issues. Therefore, we can say, it meets the requirements described in the requirement chapter.



## **CHAPTER 6**

### **CONCLUSION AND FUTURE SCOPE**

#### **6.1 Discussion and Conclusion**

This report is precise description of a challenging project of collaborating a human interface device with Android operating system to find out the feasible solution of the greatest issue- safety. Proper guideline for future development will help the implementation to be introduced in greater level of target users.

#### **6.2 Scope for the future developments**

Further developments that shall be done to the project are-

- A circuit design inserted into a ring or pendant like accessory that would be more user friendly and reliable
- Turning the whole system into a device so that the person will even not need to have a smart phone

##### **6.2.1 Limitations**

Present limitations of the project are-

- A user needs to have a smart phone with enough balance.
- When the phone gets turned off, the whole process will be stopped until it is turned on again.

## References

- [1] Introduction to HID concepts, Available online:  
<<<https://docs.microsoft.com/en-us/windows-hardware/drivers/hid/introduction-to-hid-concepts>>>, [July 16, 2017].
- [2] Crime in Bangladesh, Available online:  
<<[https://www.numbeo.com/crime/country\\_result.jsp?country=Bangladesh](https://www.numbeo.com/crime/country_result.jsp?country=Bangladesh)>>, [February 27, 2018].
- [3] Human Interface Device, Available online:  
<<[https://en.wikipedia.org/wiki/Human\\_interface\\_device](https://en.wikipedia.org/wiki/Human_interface_device)>>, [July 16, 2017]
- [4] USB components, Human Interface Device Class, Available online:  
<<[https://www.keil.com/pack/doc/mw/USB/html/\\_h\\_i\\_d.html](https://www.keil.com/pack/doc/mw/USB/html/_h_i_d.html)>>, [July 16, 2017]
- [5] Roving Networks. *Bluetooth Data Module Command Reference & Advanced Information User's Guide*. Available online:  
<<[www.microchip.com/mymicrochip/filehandler.aspx?ddocname=en557964](http://www.microchip.com/mymicrochip/filehandler.aspx?ddocname=en557964)>>, [July 25, 2017]
- [6] Getting started with RN-42 Bluetooth Module, Available online:  
<<<https://eewiki.net/display/Wireless/Getting+Started+with+RN42+Bluetooth+Module>>>, [July 25, 2017]
- [7] Getting started with the Arduino Nano, Available online:  
<<<https://www.arduino.cc/en/Guide/ArduinoNano>>>, [August 5, 2017]
- [8] Bluetooth HID Gamepad, Available online:  
<<[https://mitxela.com/projects/bluetooth\\_hid\\_gamepad](https://mitxela.com/projects/bluetooth_hid_gamepad)>>, [August 20, 2017]
- [9] Android Key Event, Available online:  
<<<https://developer.android.com/reference/android/view/KeyEvent.html>>>, [October 10, 2017]
- [10] Android Bluetooth Library, Available online:  
<<<https://github.com/OmarAflak/Bluetooth-Library>>>, [October 12, 2017]
- [11] Connecting to Arduino from Android, Available online:  
<<<https://stackoverflow.com/questions/37156409/connecting-to-arduino-bluetooth>>>, [October 20, 2017]

[12] Android Location Based Services, Available online:

<<[https://www.tutorialspoint.com/android/android\\_location\\_based\\_services.htm](https://www.tutorialspoint.com/android/android_location_based_services.htm)>>,

[October 30, 2017]

## **Appendix A: Hardware Configuration**

### **Arduino Nano**

Type: Microcontroller

Operating Voltage: 5V

Input Voltage: 7V-12V

### **HC-05**

Type: Bluetooth Module

Operating Voltage: 3.3V

Input Voltage: 5V

### **FTDI-232**

Type: Serial Converter

Operating Voltage: 1.8V – 4.0V

Input Voltage: 6V

## **Appendix B: Software Configuration**

### Mobile Application

- Java
- XML

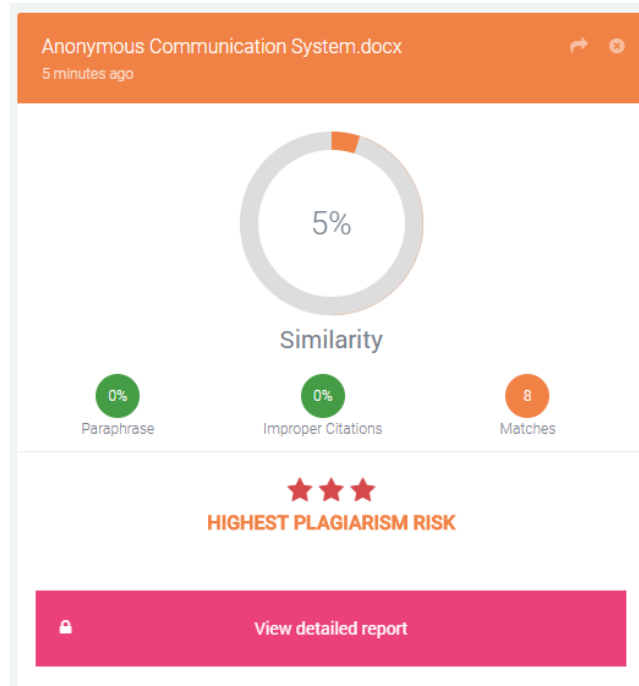
### Web Application

- JavaScript
- HTML
- CSS

### Device

- C

# Plagiarism Report



This report was tested in <https://plagamme.com/>  
Score: 5%