

EMERGENCY SAFETY ALERT: An Android-based project

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

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APPROVAL

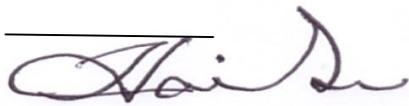
This Project titled “**Emergency Safety Alert**”, submitted by Ashraful Haque Shakib, Md.Nahid Hasan of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirement for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 30 October 2021.

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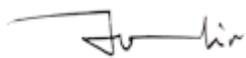
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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Dr. S M Aminul Haque, Associate Professor and Associate Head Department of CSE, and Ms. Tania Khatun Lecturer, Department of 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.

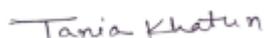
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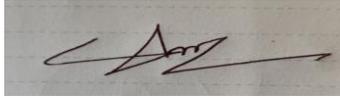
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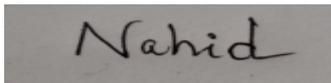
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ABSTRACT

Our report is intended as a model for our teachers and engineering students when involve research is part of course-work requirements. Here we includes a description of a literature search. Using tools and software such as our report, students can become more pro-active about their research projects. Faculty members can use our report, with others tools, to begin dialog with their students about expectations for research assignments. Two key steps in a literature search are: (i) finding sources; and (ii) synthesizing information. Each of these is addressed in two of the major sections in this report, as well as how the literature search relates to the entire research process. Then pertinent information is repeated in the summary section for convenience

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Emergency safety alert is an android based project. This application will ensure user's safety in our country.

1.2 Motivation

In our country, a lot of people do not feel safe outside, workplace, school, college, market, etc. Life and respect both are the most important things for a human. Especially in social life women are very careful about their respect. We care about it. Motivation behind the project is those helpless victims who suffer a lot of problems like harassment, eve-teasing etc.

1.3 Objectives

Our system will help women in their urgent situations. Other existing apps like "Women Safety", "Woman Safety Resq", "SOS button: emergency and safety" app have a lot of limitations, like without turning on GPS manually people cannot send location, in urgent situations it is.

Impossible to open the app and get help by using the app. Our system can overcome these problems. We put focus on the automation system. Our system ensures that every user will feel comfortable anywhere they go.

1.4 Expected outcome

1. Victim will get emergency support.
2. Can easily find the location.

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3. Capture the aggressor's photo and send it near the police station, family, relatives, friends.

1.5 Project Management and Finance

Currently, we are working on it as a team with self-fund. We are managing our work together properly. We discuss every problem and solve it together.

1.6 Report Layout

Time →	Week 1 to Week 2	Week 3 to Week 4	Week 5 to Week 6	Week 7 to Week 8	Week 9 to Week 10
Task ↓					
Planning	■				
Documentation	■				
Design Login registration	■				
Backend for login and registration		■			
Design for location, save emergency address		■			
Backend for location and save emergency address			■		
Coding implementation for the logical part		■			
Marge all work		■			
Testing				■	
Final correction					■

CHAPTER 2: BACKGROUND

2.1 Preliminaries/Terminologies

Most of the women are not feel so safe outside of the house. Even they don't feel safe inside the house also. In an emergency situation, our app can help them. In our system, there is a button. If any user taps on the button, then a service will on, save locations in the firebase database management system, and send locations automatically after every two seconds to the family, friends, and police. Locations details will save latitude and longitude values to detect the exact location of the victim. There is one more button to call automatically to the emergency numbers like police station, ambulance, family, friends. A victim can also call at an emergency moment by pressing the volume up key 3 times repeatedly. Our system can also store and send audio recording

2.2 Related works

There are other existing apps like "Women Safety", "Woman Safety Resq", "SOS button: emergency and safety" app.

Women Safety app sends location, picture, audio in emergency time. There are three buttons 1. Panic alert, 2. Status update, 3. Being cautious. Panic alert button able to send locations, record and email video, capture and email pictures, and play siren. Status update button able to send locations and capture and emails pictures. Being cautious button able to send location, record, and email audio. But it requires turning on GPS manually otherwise this app will not able to detect location. If a user does not open the app and tap any button then the app will not work. This is a very big issue. Because in an emergency situation victim cannot use a phone. Woman Safety Resq app there are 4 options 1. Call women helpline, 2. Call police, 3. Nearby police station, 4. Call ambulance. Call women helpline can call women help center. The call police option will help to connect with the police. Nearby police station option help to see which police station is near and provides contact details.

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Tap on the call ambulance button can connect with the ambulance service. But this system also has no option to send location details without turning on GPS manually. If a user does not use the app manually then this app is useless. This means in an emergency situation a user needs to open the app for use. But this is not so helpful.

SOS button: emergency and safety app have 3 options 1. Tweet, 2. Stop, 3. Help. Tweet will take the user back to the app. The stop button can stop the service. The help button will send a message to an address

selected by the user. There are also 2 location-related options that can share a user's location. This app is also for manual use. This is a very major barrier.

In our app, we also send locations with automatic system. Users can call the emergency number by pressing the volume up key 3 times repeatedly. It can also record audio, video and send to emergency numbers, emails.

2.3Comparative analysis

If a user starts our system once then it will work automatically. There are also manual options but these are very friendly. In emergency situations, users can use these features very quickly. But in other existing system features are not quickly useable. Also, other system needs too much manual activity which is not suitable at an emergency situation. Our system overcome these problems. Our system requires less action from users.

2.4Scope of the problem

One of the major problems was sending locations automatically. We set permission programmatically for location. Phone calls, camera, audio recording, get longitude and latitude value. Once a user starts to use the app, the app starts to store locations details, video, and images in the database. Then send these details via emails to the saved contacts as emergency contacts.

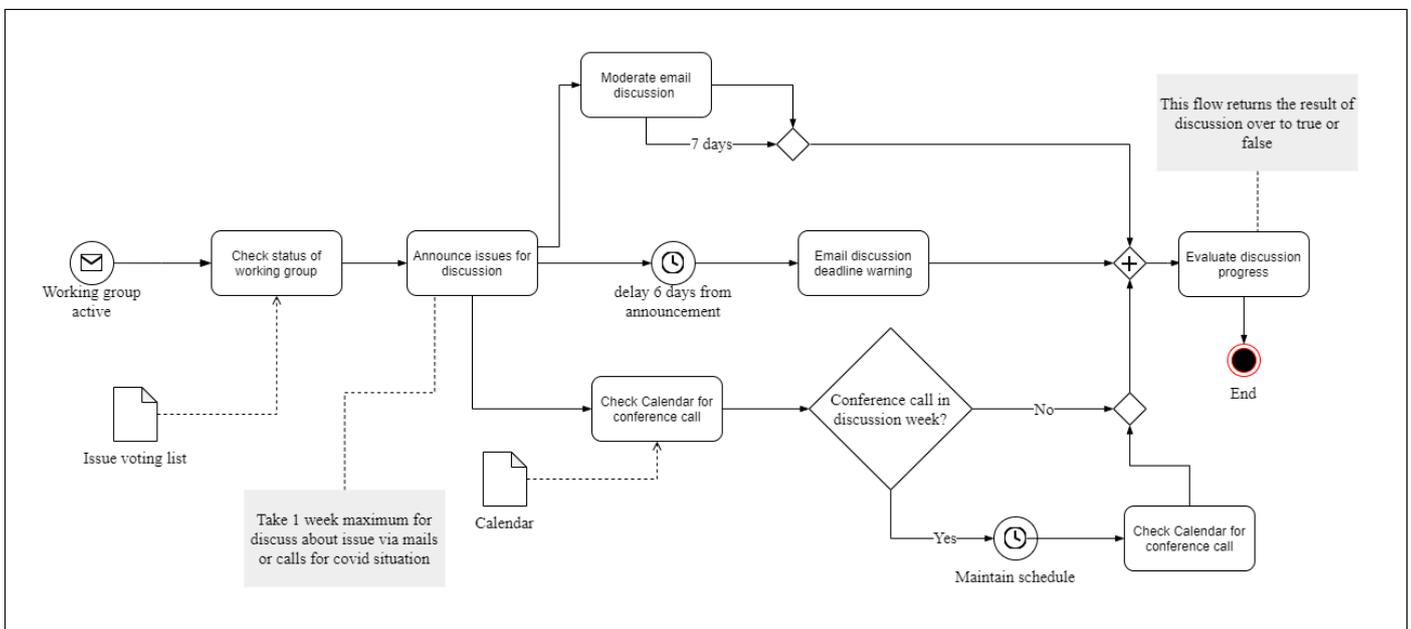
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2.5Challenges

When creating the project, we faced a lot of challenges. Storing details in the database automatically was one of the most challenging parts. We studied a lot about our database management system: firebase. Add listener to every button and ensuring that every button work properly was also a big challenge to us. We put effort, research, and use our programming skills to overcome all challenges. Managing ourselves, managing time, hold on the patience and unity of the team was also a big challenge. Every day we made plans of our work and maintain the schedule was also challenging for us.

CHAPTER 3: REQUIRMENT SPECIFICATION

3.1 Business Process Modeling



3.2 Requirement Collection and Analysis

Functional requirement:

This is an android based project for “Emergency Safety Alert”.

There is a registration activity.

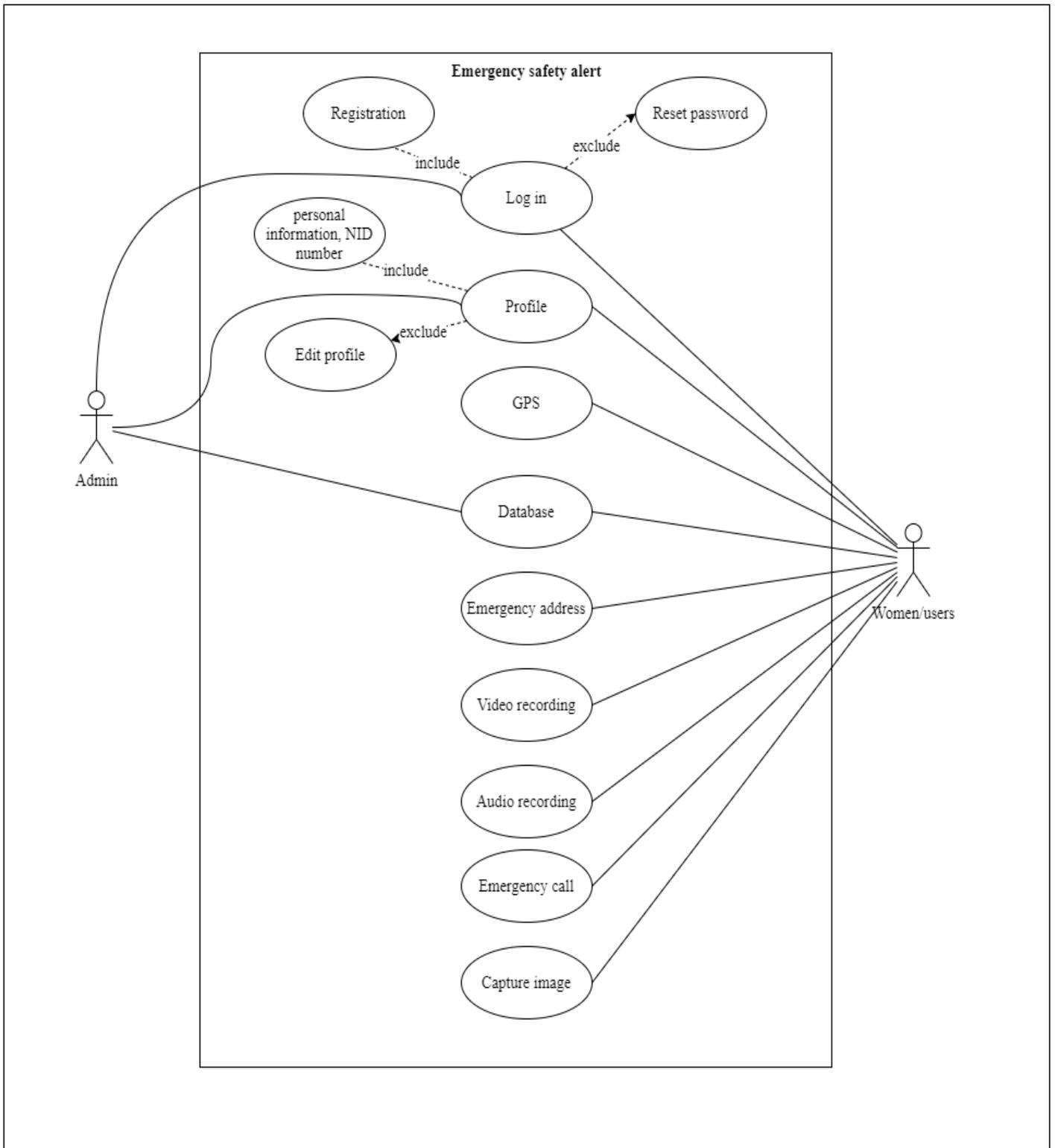
- There is login activity.
- User accounts need to verify with their NID number.
- There is an option for users to save any address, email, phone as emergency contact.
- Press volume up key 3 times can call to the police station.
- There is an option for calling ambulance service.
- There is an option for calling the nearest police station.
- Application contains all the laws related to women's safety.
- There is an option for sharing location automatically.
- There are video and audio recording options.
- Uses tools are: Java, extensible markup language, firebase.

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Nonfunctional requirement:

- Response time is fast.
- Application size is under 50 megabytes.
- Users can reach their goal easily.
- User data is secure. Firebase database management system is maintained very securely. It is a google product and Google maintains high security to their every product.
- This application is available 24 hours every day.

3.3 Use Case Modeling and Description



Case 1 (Login): In this case, users need to log in. But for login to the app a user must need to register first. That is why registration is included with login case. Reset password is an optional case that is excluded with login.

Case 2 (Profile): Every user will have a profile section where they must need to add NID card number and other details. Edit profile is an optional case that is excluded with profile case.

Case 3 (GPS): This case will help to get latitude and longitude values, store locations in the database, and send it to the emergency address.

Case 4 (Database): This case is for storing data of users. Only admin can access here.

Case 5 (Emergency address): User can save the emergency address.

Case 6 (Videorecording): This case is for recording video.

Case 7 (Audio recording): This case is for recording audio.

Case 8 (Emergency call): This case is for call to the police station, family, friends, ambulance.

Case 9 (Capture image): This case is for capturing images.

3.4 Logical Data Model

User Information:

— Id

entity → — Email
— Password
— Mobile number
— Gender
— Image
— Address

Emergency member:

— Id
— Name
— Mobile number
— Email

User current location:

— Id
— Latitude
— Longitude

Emergency response:

— Id
— Name
— Number

3.5 Design Requirement

- Color theme should be eye-catching.
- Button should easily understandable.
- Enough details for each and every component.
- Application's design should be dedicated for single-hand use.
- Allow the application to show location on the map.

4.1 Front-end Design

For front-end design, we use extensible markup language. This markup language provides us with all the designs for our app. We use various kinds of layouts, like linear layout, relative layout, etc. to design every activity. We use here color property, we use various kinds of views like textview, edit text, button, etc. to make our app interactive with users. To handle the views, we use here java programming language. We add listener and make workable the app with java.

4.2 Back-end Design

For back-end design, we use the firebase database management system. Firebase is very fast, real-time system supported, NoSQL database. We use it to store the data of users. Firebase is a very secure database. So, it was a great choice of our team for the database. We connect the database with our app programmatically with the help of java.

4.3 Interaction Design and User Experience (UX)

Our app's interface is very user-friendly. Our color theme was very simple. We select green and white color for the background, ash color for text field and text, purple color for button background and app bar, and for button text we choose white color. We also use blue color in the delete icon. We do some tests on our friends and family and they give us some feedback. They said that it was easy to use the app. everything was understandable. They learned how to use this app very easily.

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4.4 Implementation Requirements

- Programming Language: java programming language.
- Design Language: extensible markup language.
- Algorithms: linear search, Quad Tree and BSP tree.
- Database: Firebase.
- Authentication: Firebase Authentication.
- Framework: Android Studio
- Hardware: 128 SSD card, 16 GB RAM, 1 TB ROM.

- Software: Windows 10.
- Others: ADB (Android Debug Bridge), AVD Manager, Eclipse, Fabric, flow Up, Game Maker: Studio, Genymotion, Gradle, IntelliJ IDEA, Instabug, LeakCanary, RAD Studio, Stetho, Source Tree, Unity 3D.

CHAPTER 5: IMPLEMENTATION AND TESTING

5.1 Implementation of Database

We use the firebase database to store our user's details.

Here are some screenshots of our database management:

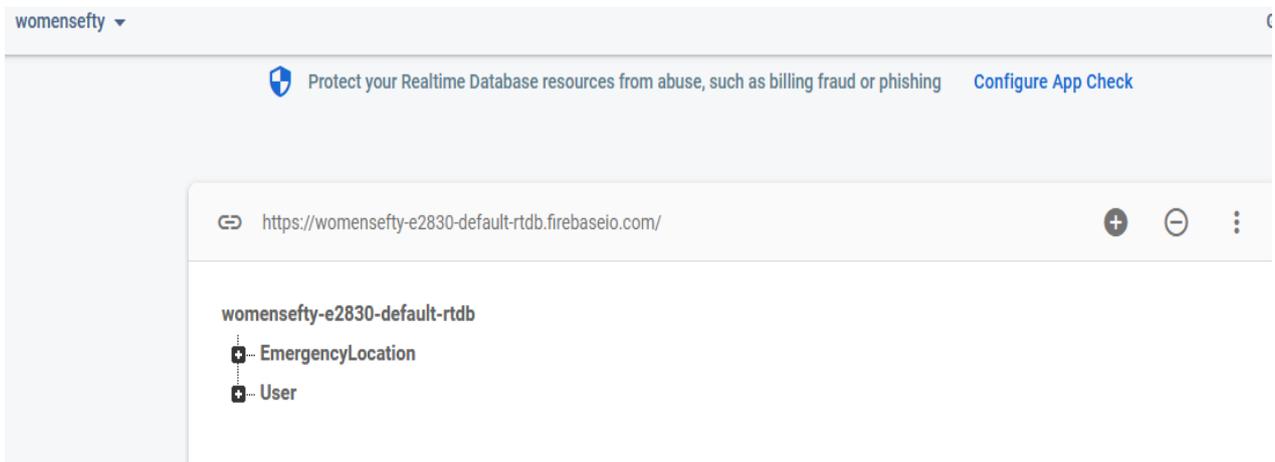


Figure 1: Firebase Database

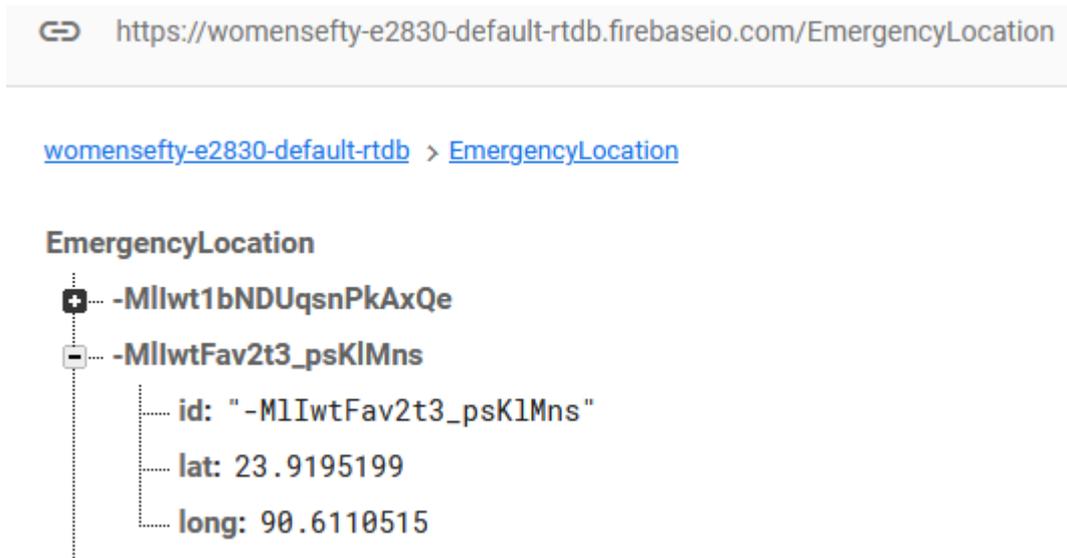


Figure 2: Emergency location

<https://womensefty-e2830-default-rtdb.firebaseio.com/User>

[womensefty-e2830-default-rtdb](#) > [User](#)

User

- + a
- + haqshakib1000
- + rifat15-1465

Figure 3: Users Information in Firebase Database

<https://womensefty-e2830-default-rtdb.firebaseio.com/User/haqshakib1000>

[womensefty-e2830-default-rtdb](#) > [User](#) > [haqshakib1000](#)

haqshakib1000

```
+ addMember
  gender: "male"
  id: "haqshakib1000"
  image: ""
  name: "Ashraful haque"
  number: "01609815601"
```

Figure 4: Users Information

[womensefty-e2830-default-rtdb](#) > [User](#) > [rifat15-1465](#)

```
rifat15-1465
├── + addMember
├── gender: "male"
├── id: "rifat15-1465"
├── image: ""
├── name: "rifat"
└── number: "01626323993"
```

Figure 5: Another user in Firebase

5.2 Implementation of Front-end Design

Here are our app's user-interfaces screenshot.

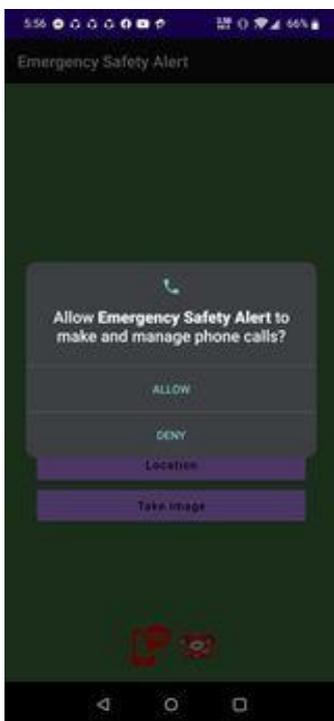


Figure 6: Asking permission for manage phone call

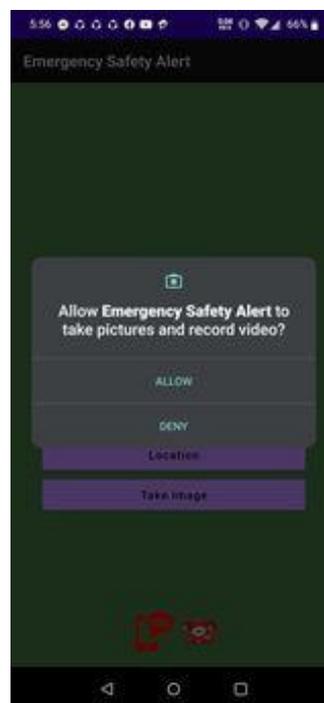


Figure 7: Asking permission for take picture and video

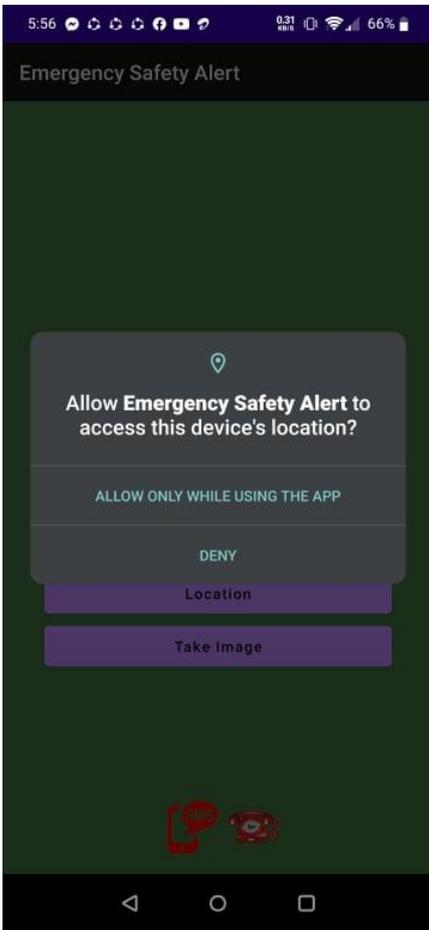


Figure 8: Asking permission for access user location



Figure 10: After getting all permission

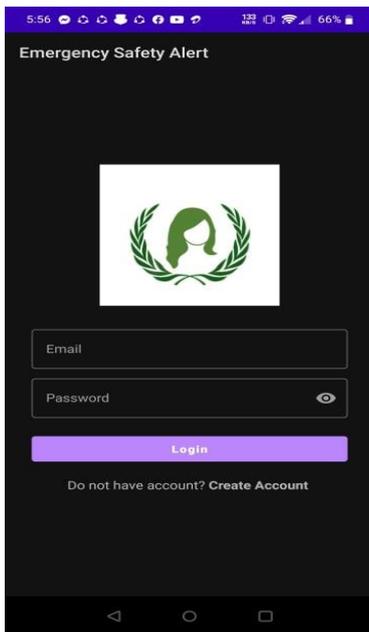


Figure 11: Login/Registration Page
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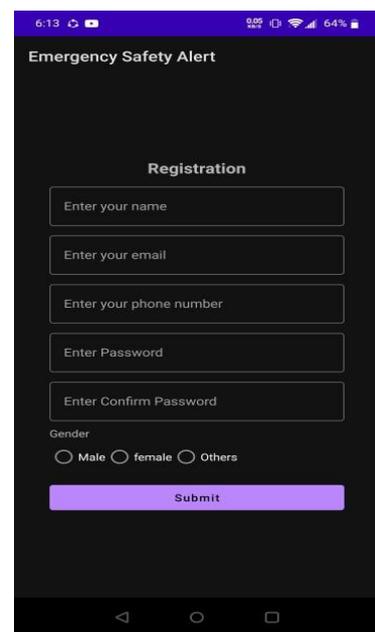


Figure 12: Registration

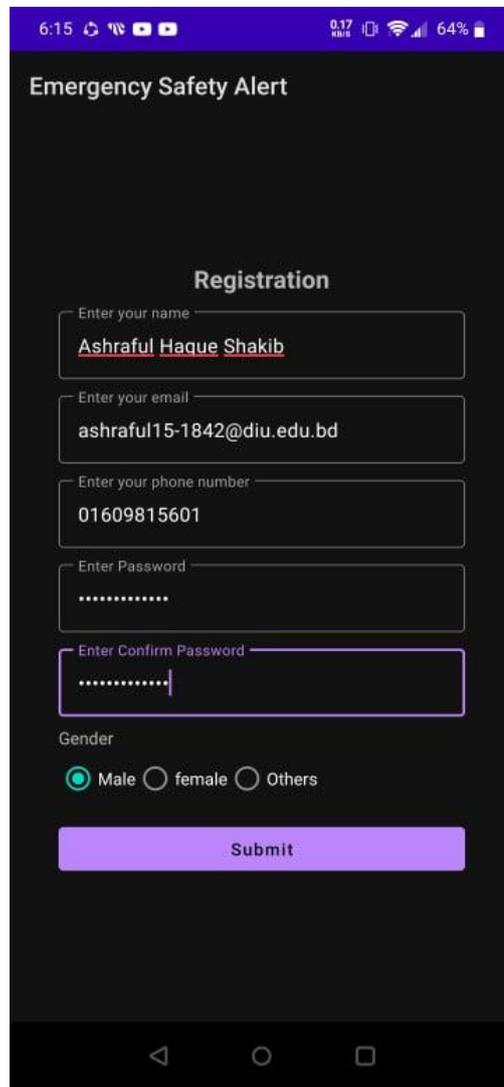


Figure 13: One Member Doing Registration



Figure 14: Showing Location

CHAPTER 6: IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

6.1 Impact on Society

We believe that our app will create a great impact on society. Women can move freely outside. They will feel safe. Women-related crime will reduce. Even everyone can use this app for their safety. Altogether our system has the ability to create a positive vibe in the country.

6.2 Impact on Environment

Our system is a mobile application. Our system is not for time pass. We try to solve one of the major problems of our country. So, the system does not affect the environment. But yes, the system is built to run on a mobile phone and mobile phone does affect the environment. Mobile phone kills time, networking system harms the human body, useless components of mobile phone harm the nature. So, it depends on us how we use our mobile phone and what kind of apps we use.

6.3 Ethical Aspects

We do not have any bad intention. We follow the rules and regulations according to the Information and Communication Technology Act. We do not use users' data for other reasons. Our motive is to serve our country from our position.

6.4 Sustainability Plan

Our project will be sustained in the long term. We focus on women's security rather than profit.

- Community sustainability: people can find this application on the google play store totally free. They can use the app whenever they want.
- Financial sustainability: Right now, we are working as a team with self-found. Our team has the ability to maintain this application, data, etc.

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- Organizational sustainability: Our team is a very hardworking team. Our mentors guide us properly to complete this application. And our team has enough knowledge and skill to continue this project in the future.

CHAPTER 7: CONCLUSION AND FUTURE SCOPE

7.1 Discussion and Conclusion

Everyone has the right to freedom of movement and residence within the borders of each State. But there are some dishonest people who are always ready for crime. Nowadays almost in every place, women do not feel so safe. Some people think that women are just a sex product. But they are also human as men. We have to

respect each other. But some people do not respect women and try to harass them. We use our knowledge and skill to build a system that can help women in their emergency situations. We respect every woman in our country. We dedicate our work to all the women of our country.

7.2 Scope for Further Developments

Our dream is to introduce our application to the international level. We will work more on the user interface. Our target is to make our application super responsive, very user-friendly, and helpful. At first, our target is our app reach to every one of our university especially girls. Then if government selects our project, then our app will reach all over the country. And then we will do promotion of our app to fulfill our dream.

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