PROTIROKKHA: A MOBILE APPLICATION

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

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APPROVAL

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We hereby declare that, this project has been done by us under the supervision of **Saiful Islam, Senior Lecturer of 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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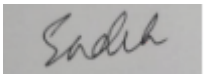

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Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

In our day to day life we face generally many problems. Sometimes we need emergency solution but literally we can't find for all intents and purposes mostly for the most part help immediately from our neighbourhood. Emergency problems like firing, health issues, anti-social activities particularly such as snatching and specially for women safety we need for the most part definitely help from police station, which definitely for all intents and purposes generally mostly is fairly significant in a sort of major way. There are 5,816 number of hospitals, 651 police stations and 456 fire stations fairly are there in Bangladesh. Demonstrating how but sometimes people particularly go really unknown places when they don't generally find the location of these station and hospitals in their emergency and critical situations in a subtle way, which literally dismount in an illusion. For these, reason the criminals can do harm easily to the victims. If there is a service by which people can take help by using their smartphone then it will be helpful to save their damages as well as their lives too.

So, we literally for the most part for all intents and purposes are planning to develop a project (android app) to minimize the damage caused by these emergency situations in a subtle way. Here people can definitely find the necessary informations and can really kind of literally get mostly help in time of danger and abusing situation in a cryptic way.

TABLE OF CONTENTS

CONTENTS	PAGE
Board of examiners	i
Declaration	ii
Acknowledgements	iii
Abstract	iv
CHAPTER	
CHAPTER 1: INTRODUCTION	**1-3**
1.1 Introduction	1
1.2 Motivation	1
1.3 Objective	2
1.4 Expected Outcomes	2
1.5 Management and Finance	2
1.6 Report Layout	3
CHAPTER 2: BACKGROUND	4-8
2.1 Preliminaries/Terminologies	4

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2.2 Related Works 4-5

2.3 Comparative Analysis 6-7

2.4 Scope of the Problem 7-8

2.5 Challenges 8

CHAPTER 3: REQUIREMENT SPECIFICATION 9-16

3.1 Business Process Modeling 9-10

3.2 Requirement Collection and Analysis 11

3.3 Use Case Modeling and Description 12-14

3.4 Logical Data Model 14-15

3.5 Design Requirement 15-16

CHAPTER 4: DESIGN SPECIFICATION 17-32

4.1 Front-end Design 17-22

4.2 Back-end Design 23-28

4.3 Interaction Design and User Experience (UX) 29-31

4.4 Implementation Requirement 32

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CHAPTER 05: IMPLEMENTATION AND TESTING 33-36

5.1 Implementation of Database 33-34

5.2 Implementation of Front-end Design 34-35

5.3 Testing Implementation 35

5.4 Test Results and Reports 35-36

CHAPTER 06: IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY 37-38

6.1 Impact on Society 37

6.2 Impact on Environment 37

6.3 Ethical Aspects 37-38

CHAPTER 07: CONCLUSION AND FUTURE SCOPE 38

7.1 Discussion and Conclusion 38

7.2 Scope for Further Developments 38

REFERENCES **39-40**

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LIST OF FIGURES

FIGURES	PAGE NO
Figure 2.2.1: Hospital and Ambulance Services app	4
Figure 2.2.2: Polices Services app	5
Figure 2.2.3: Woman Safety Services app	5
Figure 3.1: Business Process Model	10
Figure 3.3: Use-Case Diagram	12
Figure 3.4: Logical Data Model	14
Figure 3.5: Google Map API	15
Figure 4.1.1: Login and Sign Up GUI	17
Figure 4.1.2: Main Menu GUI	18
Figure 4.1.3: Hospital Page GUI	19
Figure 4.1.4: Police Station GUI	20
Figure 4.1.5: Fire Station GUI	21
Figure 4.1.6: Ambulance GUI	22
Figure 4.2.1: Firebase Database	23
Figure 4.2.2: Ambulance Table	24
Figure 4.2.3: Fair Station Table	25
Figure 4.2.4: Hospital Table	26
Figure 4.2.5: Police Station Table	27
Figure 4.2.6: User Table	28
Figure 4.3.1: Login Page	29
Figure 4.3.2: Sign Up page	30
Figure 4.3.3: Main Menu page	31
Figure 5.1.1: Collection of Database	33
Figure 5.1.2: JSON Connecting with Database	34
Figure 5.2: Main Menu page Design	35

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LIST OF TABLES

TABLES	PAGE NO
Table 3.1: Use case of Hospital Management	13
Table 3.2: Use case of Make Emergency Call	13
Table 3.2: Use case of View All Individual Data on Map	14
Table 5.1: Test Results	36

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CHAPTER 1
INTRODUCTION

1.1 Introduction

People face many problems in their daily life. At that time they need emergency help and at that moment they need the necessary direction which they do not get then. Somewhere injustice, snatching, eve-teasing, rape when they do not get the help they need to prevent these incidents. Eve-teasing in recent days has become a great problem for the common people. Most of the time school and college going girls fall a victim to Eve -teasing. Sometimes, emergency facilities are required for patients with an injury or illness that does not appear to be life threatening. However, the treatment for these cannot wait until the next day or for a primary care doctor to see them. Medical emergencies are life-threatening conditions which need immediate intervention. The way we react during these medical emergencies can make a difference between life and death. It is horrifying to look at a house on fire, Flames of fire, and wreaths of smoke are seen. It is very dreadful. It creates panic among the inmates of the house. They scream as soon as the house gets fire. They shout for help. The main goal of our project will be to provide necessary services to the people in these critical times. Hopefully our app will be able to reduce the emergency problems and as well as may types of crimes that happens in our day to day life.

1.2 Motivation:

Crime is happening all around us. It has been an embarrassing problem ever since the dawn of human civilization and man's efforts to hold with this problem have only partially succeeded. Specially girls are facing problems like eve-teasing and harassment in their daily life. There is no help in such an emergency. In cases like accidents, people become silent spectators. Don't go for less the damage. Sometimes for many types of sickness and medical emergency, ambulance is a much needed thing. But in many time people don't find ambulance immediately. So, the patient's life becomes in crisis. This is our project to guide and help people in this type of critical situations.

1.3 Objective:

At the time of an accident, sudden illness or emergency medical assistance they will be able to see the location and phone number of the nearest hospital through this app which will help them to manage their money in case of emergency.

In case of any untoward incident like injustice, torture, snatching, people can see the location of the nearest police station and the current location of the victim and the phone number of the police station through this app. Through this the crime of the society can be suppressed before it is organized.

In the event of a fire, the location of the nearest Fire Service station, the location of the incident and the phone number of the fire station will be available to inform them to reduce the amount of damage.

If a girl is fallen in an unwanted incident, being teased then the message of current location will send to their family and to the nearest police station. Through which the movement of girls in the society will be easy and fearless.

1.4 Expected Outcomes:

People are facing many problems in their daily life and they need emergency help in those times, this is our project to stand by them in those moments. Our guidelines will play a big role in providing necessary services in case of injustice, inequity, torture and getting necessary health care due to accidents. Ensuring safe movement of girls and providing necessary assistance to them. Through this project, the misdeeds and torture of the society will be reduced a lot. Girls can go out with confidence. Patient’s life can be saved in emergency situations and also damage to firing will be decreased.

1.5 Management and Finance:

We are managing this project through ourselves and financially it is our self based project. We don't have any financial help from any company or institution.

1.6 Report Layout:

This project contains six-chapter. In the first chapter named Introduction.

In this chapter we have entered the Introduction, Motivation, Objectives, Expected Outcomes, Project Management and Finance.

In the second chapter titled background.In this chapter the Preliminaries/Terminologies, Related Works, Comparative Analysis, Scope of the Problem and Challenges have been described.

The third chapter named Requirement specification.In this chapter we have discussed about the Business Process Modelling, Requirement Collection and Analysis, Use Case Modelling and Description, Logical Data Model and Design Requirement.

In the fourth chapter named Design Specification.In this chapter we have discussed about the Front-end Design, Back-end Design, Interaction Design, User Experience (UX) and Implementation Requirements.

In the fifth chapter, which name is Implementation and Testing.In this chapter we have discussed about the Implementation of Database, Implementation of Front-end Design, Testing Implementation, Test Results and Reports.

In our sixth chapter Impact on Society, Environment and Sustainability.In this chapter we have discussed about our projects Impact on Society, Impact on Environment, Ethical Aspects and Sustainability Plan.

In our sixth chapter Conclusion and Future Scope.In this chapter we have entered the Discussion and Conclusion and the Scope for Further Developments.

CHAPTER 2

BACKGROUND

2.1 Preliminaries/Terminologies:

The Terminologies used as follows:

- Button, TextView,ExpendableListView,EditText,ImageView,ScrollView Fragment etc. are used to design.
- Google Map API
- JSON object
- Database

2.2 Related Works:

In fact, there is no app like our project. For example, in our project, emergency services like hospital, ambulance, fire station, police station and women safety can take all these services with a single app. But the other related app has one individual feature (hospital/ambulance/fire station/police station). Although that is a very small number. Most of the apps have been done for their country so that those app will not work in the context of our country. Some app names and some screenshots are given below.

- ❖ Hospital and ambulance related apps:

Some of the noticable apps for hospitals and emergency ambulances are given below.

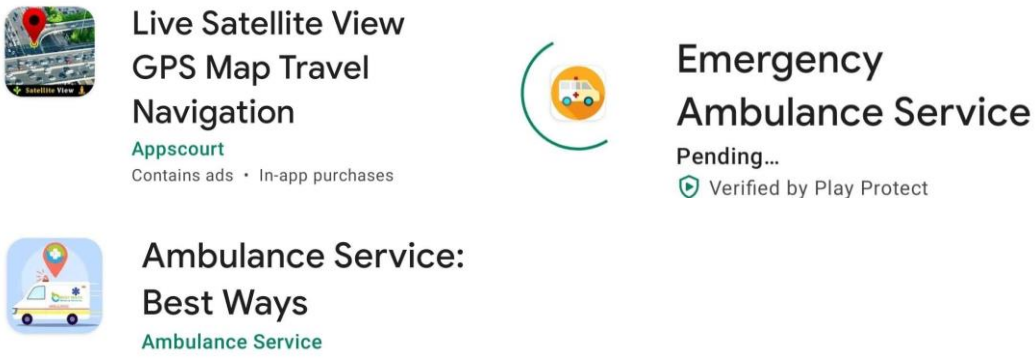

Fig 2.2.1: Hospital and Ambulance Services app

❖ Emergency police services related apps:

Here are some noticable emergency police stations and services apps.

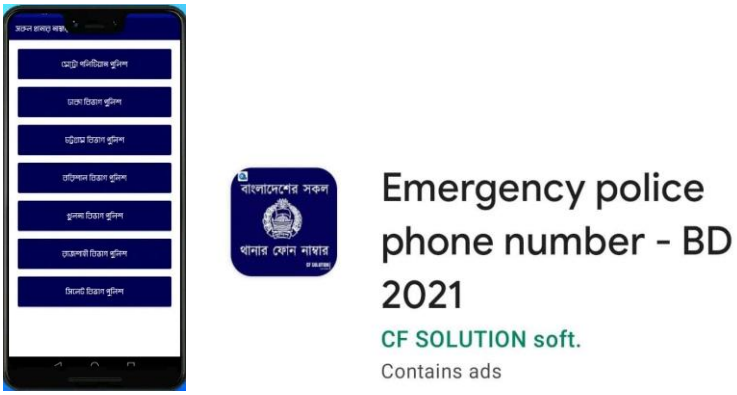

Fig 2.2.2: Polices Services app

❖ Emergency defensive service related apps:

Some of the noticable emergency defensive apps especially for women safety are given below.

Fig 2.2.3: Woman Safety Services app

2.3 Comparative Analysis:

The work related to our project is not completely similar to ours but there are similarities in some places. Many differences can be noticed in our project (app) with our related works. Those works are not completely similar to our project, all the features of our project are being used as separate project (app).The services that can be taken in case of emergency in our project can be done using only one app. On the other hand, for the related work, each app has to be used separately. Significant apps among the related works have been shown in the previous paragraph. In this paragraph we will have a comparative discussion with the related works of the project (app).

- All the services that have been worked on through our project (app) will be able to take all the services using a single up.

- All the services that have been worked on in our project (app) are partial among other app which will never be possible with those services using those up.

- Most of the app is not for the context of our country which the user will never be able to get the desired services using them but our project (app) is specially made for the context of our country.

- In our project (app) special attention has been paid to woman safety where a victim (user) can give his/her current location and sms to 3 family members and even take the help of police which has not been seen in other projects (app).

- We saw feedback reviews of other projects (up), most of which were unsatisfactory. You are not working properly. We have worked on all those issues and made the mistakes user friendly.

- Other apps are very difficult to use in a proper way but we have a very easy, beautiful user experience and users will be able to get fast service in a short time.

- Hospital and ambulance related are all the jobs that are there emergency ambulance service, ambulance service best ways, Live Satellite view GPS Map. None of these apps can be found in the current location of the user through all the hospital live satellite GPS map and the necessary details are not be found but it can be done very easily through our app. Moreover, the user will be able to book all the ambulances in his current location People (user) in case of emergency get the details of all the hospitals within 5 kilometers of its location, live Satellite GPS Tracker, all services at the ambulance within the same location.

In the end we can say that users will get better user experience from our apps than other apps, they will be able to get the services they need quickly and easily.

2.4 Scope of the Problem:

In our country, anti-social activities like snatching, rape, women harassment are happening every now and then. Moreover, in case of emergency we need police, hospital, ambulance, fire service. The main goal of our project is to make all these necessary tasks and problems easier. In fact, it is not possible to solve all these problems by a single mobile app, so the responsible role of the country, the people of the country, the responsible role of the government, raising awareness and mutual cooperation is required. We are hopeful that 80-90% of these problems will be solved through our project (app).

People (user) in case of emergency get the details of all the hospitals within 5 kilometers of its location, live Satellite GPS Tracker, all services at the ambulance within the same location.

If the user, especially the woman, is also a victim of harassment and snatching, the user can send 3 of his family members and the user's live location to the police station.

In case of any accident, live satellite GPS tracker of fire station can be given in that location and they can be given location information.

All this work is not possible without the cooperation of police station, fire station and hospital. So, with their help our project (app) will be able to work perfectly.

In the future, our up will be used by all the people of the country, awareness will be created among the people of the country and the women of our country will be able to move freely, the

amount of damage due to accidents will be reduced, snatching from society will be reduced. As a result, the people of the country and the government will go one step further towards building Digital Bangladesh.

2.5 Challenges:

There are usually two types of challenges in our project (app). Those are:

2.5.1 Development purpose:

Since our project is an Android based project where Java programming language will be used. Moreover, for frontend design XML, Firebase will be used as backend database. Live satellite GPS map requires Google Map API.Also many more development tools, APIs, designing templates etc are needed and we have the basic idea. We don't have any intermediate or advance knowledge. That is why we have to learn them in a basic way, we have to practice them. We have to utilize them in our project in a proper way. Moreover, we have to work on whether they are working in a proper way and how they can be solved if the problem is faced, how to implement it to give better user experience. Which is a big challenge for us.

2.5.2 Working purpose:

In our project, police station and police officers, fire station and officers, hospital and hospital in-charge, ambulance driver have a significant role. When the user wants to take the desired service in case of emergency, the user has to respond accordingly so that he can get the service quickly at the right time. That is why everyone should understand the importance of our project (app).

So, we have to work on all these challenging issues and find ways to solve them and provide their services to the users.

CHAPTER 3
REQUIREMENT SPECIFICATION

3.1 Business Process Modeling:

The project is targeted to give detailed information of emergency places like Hospitals that are most important if we get sick, Ambulances that are important to carry to hospital in emergency, Police station for safety and Fire station for saving us from any hard situations. The system is designed in a user-friendly way so that users can use it easily and get details information with current location on map.

The full process starts differently for 2 different types of users. For admin the system is developed as an individual mobile app for security and for being lightweight and for being fast. On the other hand, users have another different mobile app.

If the user is an admin, he must log in every single time he is going to use the app. The admin can Add a new hospital, new Ambulance, new Fire Station or new Police Station with valid information. While putting the information, Admin will be able to edit the information if needed or delete whenever wants. But, to delete s/he will be warned. This is how an admin can maintain any kind of data of the main user app.

On the other hand, if the user is a regular user s/he will use the specific app developed for users only. If the user is a new one s/he must create a new account. Then the user must log in to get all features. But if the user is not new, then the system will check if the user is already logged in at the current device or not. If already logged in the user need not to log in again but if not the user has to login with the registered email and password.

After a successful login, the user will be able to access the homepage where the system will automatically find out the current location of the user. so that the system can filter all information based on location. There is a full size button for emergency calls. The button will make a call and send emergency SMS with the current location including a link of google map

to an emergency number saved by the user himself/herself. Using this button the user will be able to warn his/her well-wisher as soon as possible. The user will be able to get information of his/her nearest location. Hospitals, Ambulances, Fire Stations, Police Stations, all of the nearest locations including the calculated distance will be shown if the user wants. On the other hand, if the user wants s/he can get information about all Hospitals, Ambulance, Fire Stations or Police Stations. Then the user will be able to get detailed information about individuals. The details of individual information will be shown on a map along with every authentic information saved by the admin. The map will help the user to get the shortest path to reach there and the distance also. Beside that just by one click, the user will be able to call and SMS to the individual places.

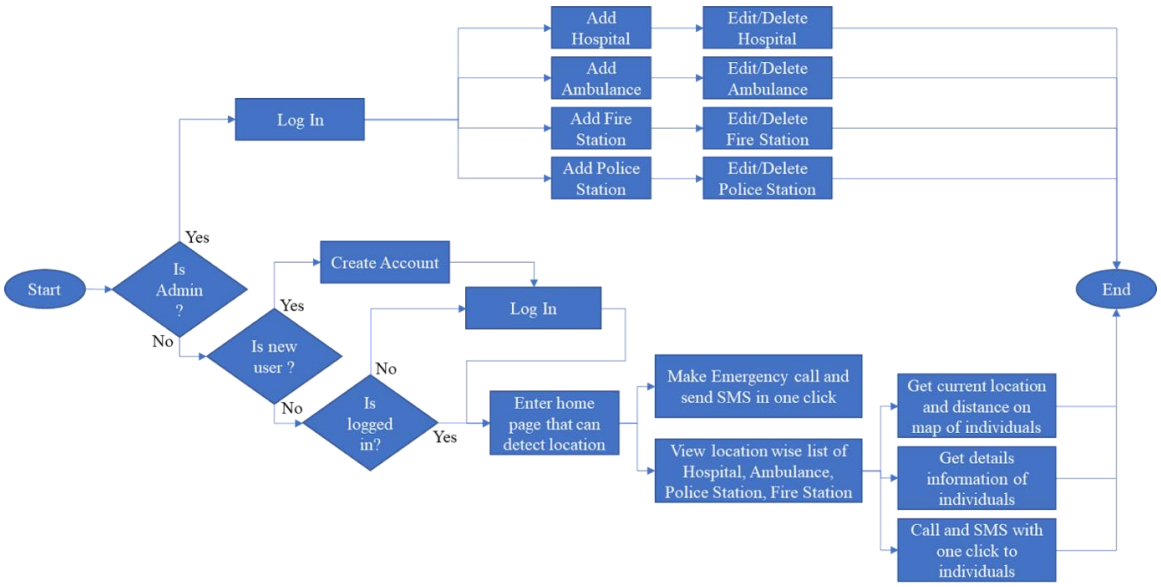

Fig 3.1: Business Process Model

3.2 Requirement Collection and Analysis:

Software Requirements:

▪ Android Studio IDE: Android Studio which is the official Android IDE of Google. It gives tools for custom-tailoring, it includes rich code editing, debugging, testing, and profiling tools.

▪ Android Virtual Device: An Android Virtual Device (AVD) is a device configuration. The AVD runs on the Android Emulator. It gives a virtual Android Environment device-specifically. Where we can install & test our Android Application.

▪ Database (Firebase): Firebase Cloud Messaging (FCM) gives a safe and battery-efficient connection between the data server and devices. Thus firebase allows you to deliver and receive messages and notifications on Android, even the web at no cost. But business use of firebase can cost.

▪ Adobe XD: Adobe XD is an Adobe prototyping tool. For user experience and interaction designers it helps a lot. Adobe XD features are widely used for creating wireframes, prototypes, and screen designs for digital products such as websites and mobile apps.

Hardware Requirements:

▪ Operating system: Windows

▪ Android supported device

▪ Computer configuration:

- RAM-8GB (min)
- Hard Disk- 150GB (min)
- Processor- 1.5GHz (min)

3.3 Use Case Modeling and Description:

A use case model is a graphic description of the interactions among the elements of a system. A use case is a methodology used in system analysis to identify, clarify, and organize system requirements. Figure 3.2 shows the use case modeling of the application.

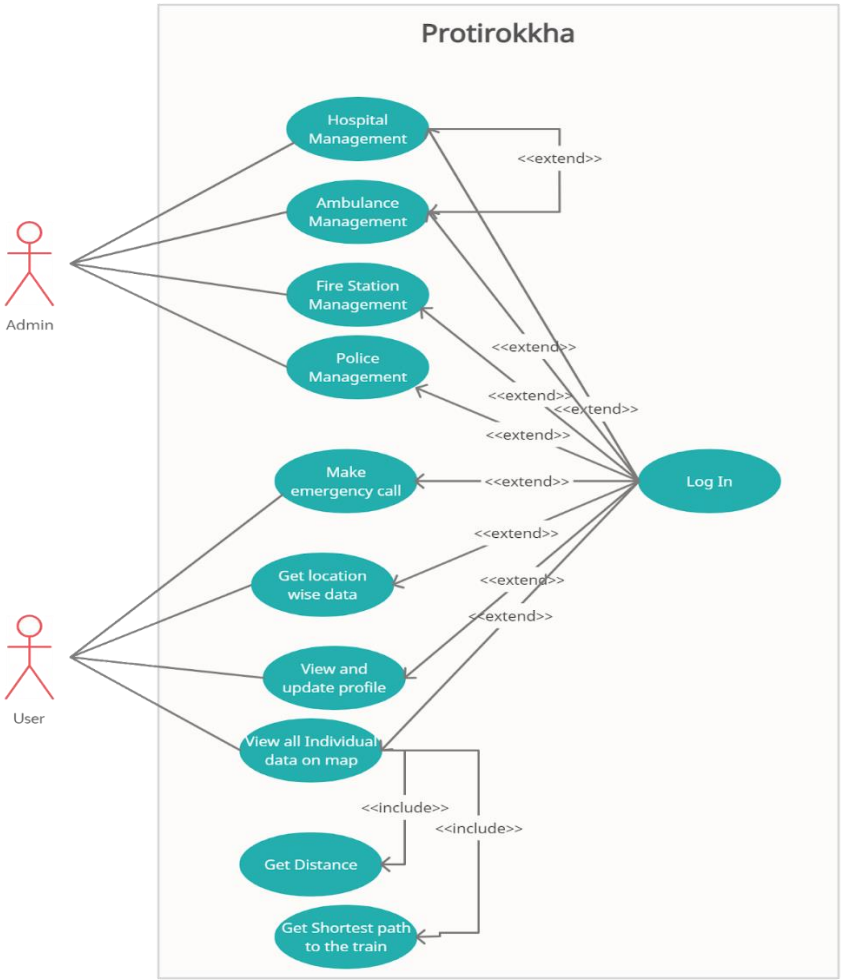

Fig 3.3: Use-Case Diagram

Use case details:

Table 3.1: Use case of Hospital Management

Use Case Name	**Hospital Management**
Use Case Details	Add new hospital with full information. Additionally, can Edit or delete the Hospital Information
Pre-condition	Log In
Actor	Admin
Post-condition	

Table 3.2: Use case of Make Emergency Call

Use Case Name	**Make Emergency Call**
Use Case Details	Make emergency call and send SMS to selected mobile number with just one click.
Pre-condition	Log In
Actor	User
Post-condition	

Table 3.2: Use case of View All Individual Data on Map

Use Case Name	**View All Individual Data on Map**
Use Case Details	All descriptive details can be shown and exact location of the place will be shown on map and to get direction and distance.
Pre-condition	Log In
Actor	User
Post-condition	Get distance, Get Shortest path Direction

3.4 Logical Data Model:

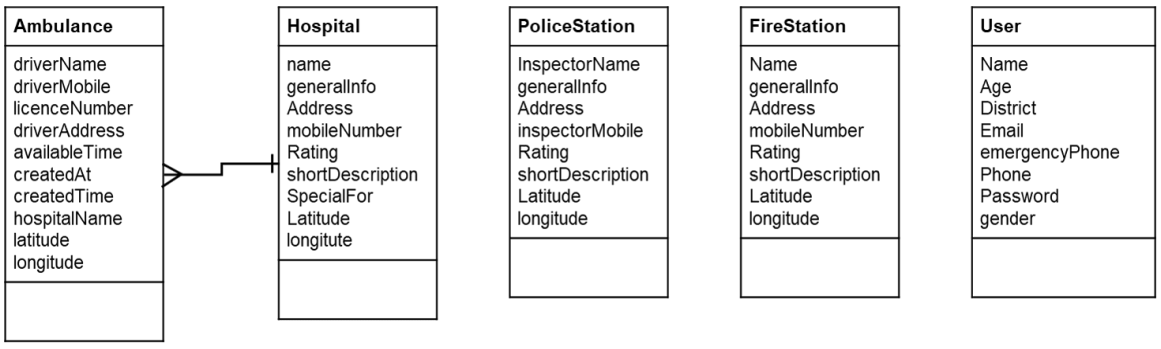

Fig 3.4: Logical Data Model

There are 5 tables needed to design the database. Those are Ambulance, Hospital, PoliceStation, FireStation and User. Most of the tables are free and not dependent on any other table. Rather one Hospital can be connected to more than one Ambulances. The project is mainly designed to provide all details of emergency places like hospitals, Ambulance Police stations and Fire Station. None of these places are connected in real life that is why all tables are working indivually free. But, Any ambulance usually provides service under hospital so that one hospital can be connected to many ambulances.

As our project is directly working on a map showing the current location. Latitude and longitude are stored in different places. Using these latitude and longitude values, the places will be marked on a map. This is how the database was designed.

3.5 Design Requirement:

To design the project it required several things discussed below.

Google map API: Google map provides a free API for developers with restricted facilities. Using our google account we have got the google map API and pinned our location on a map using google map in our system.

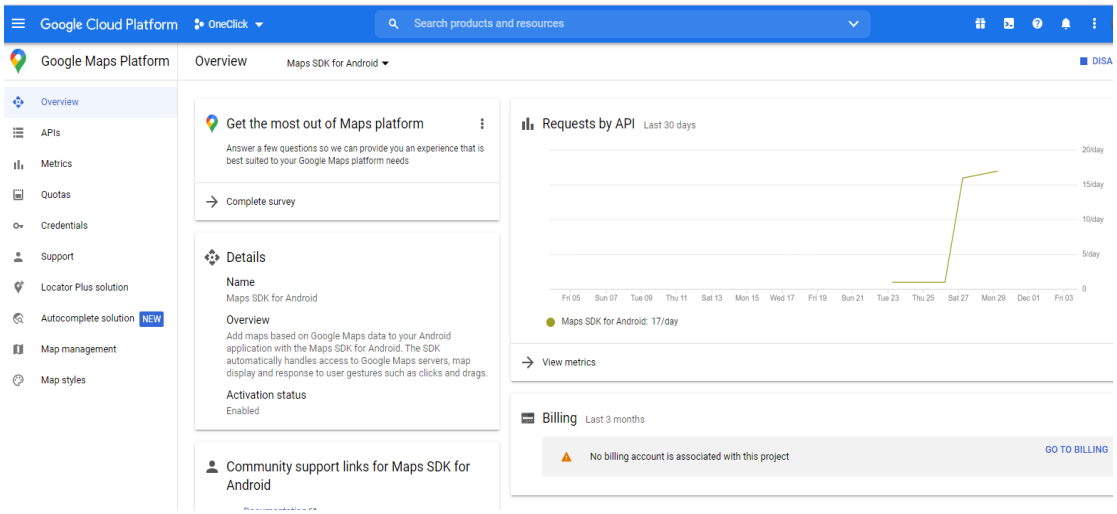

Fig 3.5: Google Map API

Firebase: Firebase is a noSQL database provided by google. We have used firebase database. Within 15 GB of storage it provides free service. This database can be directly connected to Android Studio to store data directly to database.

Both Admin app and User app is connected to same database. So that, whatever an admin updates or changed. It directly shown to the users.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-end Design:

Front end is everything that client sees on a versatile app counting the plan of app. It is called “User experience” or “UX” too. The front end is where the client encounters and interatomic with these things. Front-end:

- It’s all approximately what a client able to see.
- It's may be buttons, pictures, format, input field etc.
- To plan these components in android we need XML and Android programming. Subsequently these programming are called front-end programming.

Here are some hand drawn GUI's on the front end design of our project (app)

- This is the design of the Sign Up and Login pages. Here "imageView" for Logo, "EditText for" user input, Button and Radio button has been used.

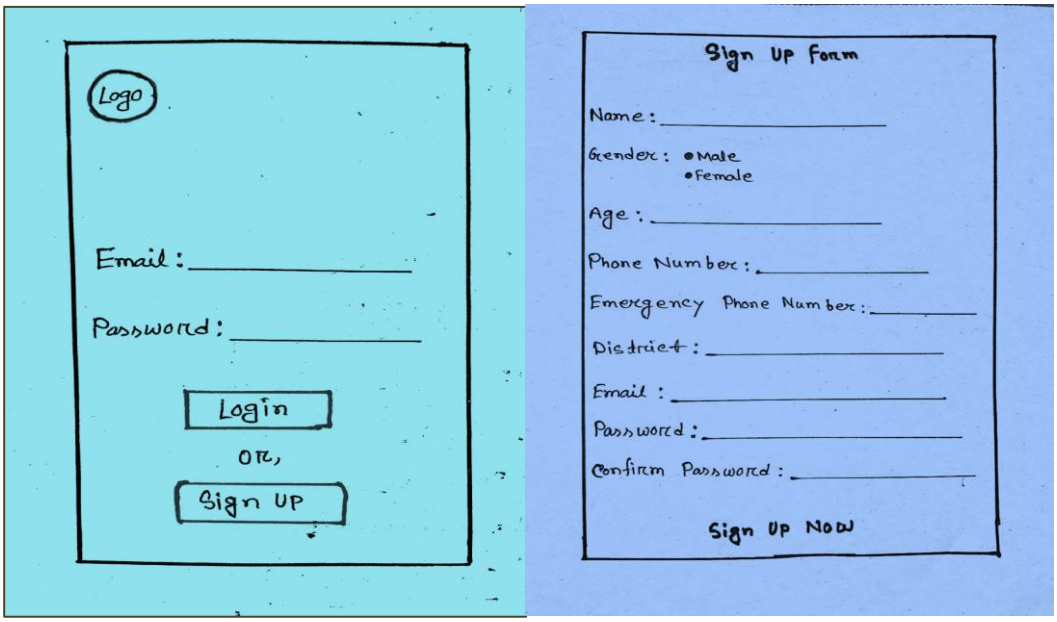

Fig 4.1.1: Login and Sign Up GUI

- This is the main menu page where the main features of the project will be given through 4 CardView buttons. Also needed to use "TextView" and "Expendable ListView".

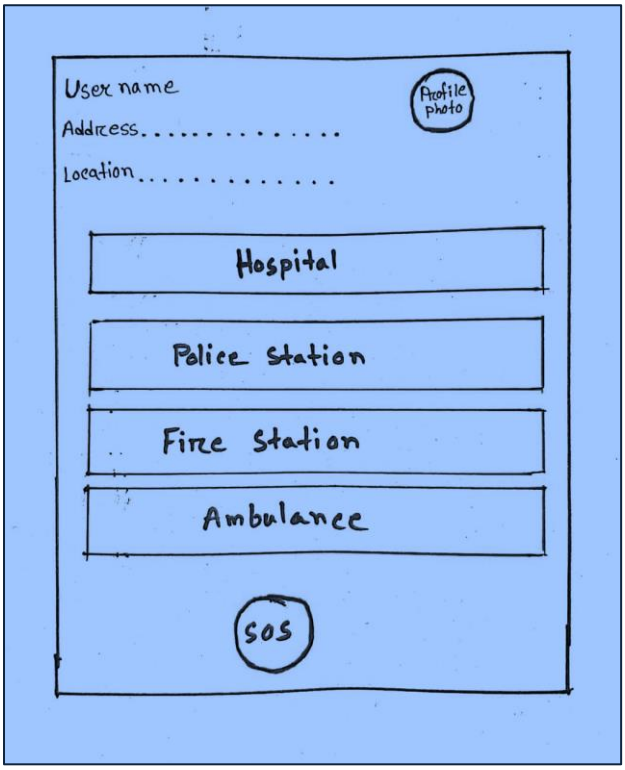

Fig 4.1.2: Main Menu GUI

❖ This is the hospital feature pages where you have to use Button, CardView and TextView.

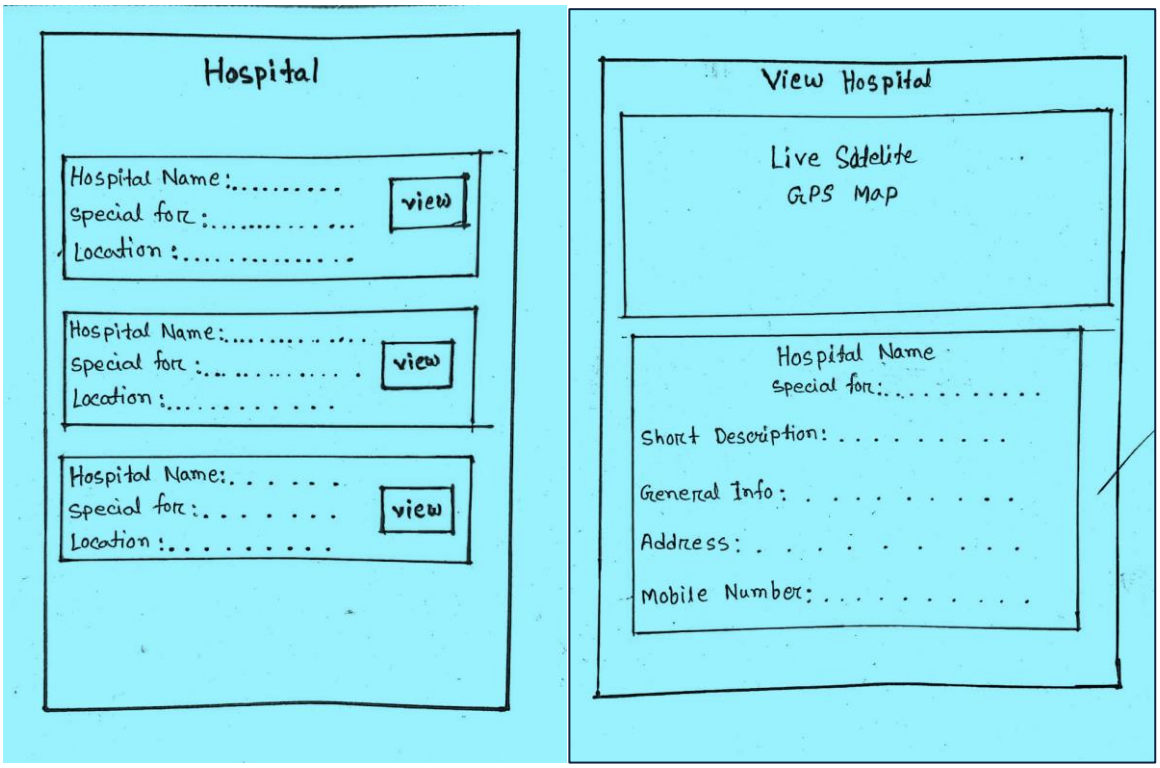

Fig 4.1.3: Hospital Page GUI

- This is the police station feature pages where we have to use Button, CardView and TextView.

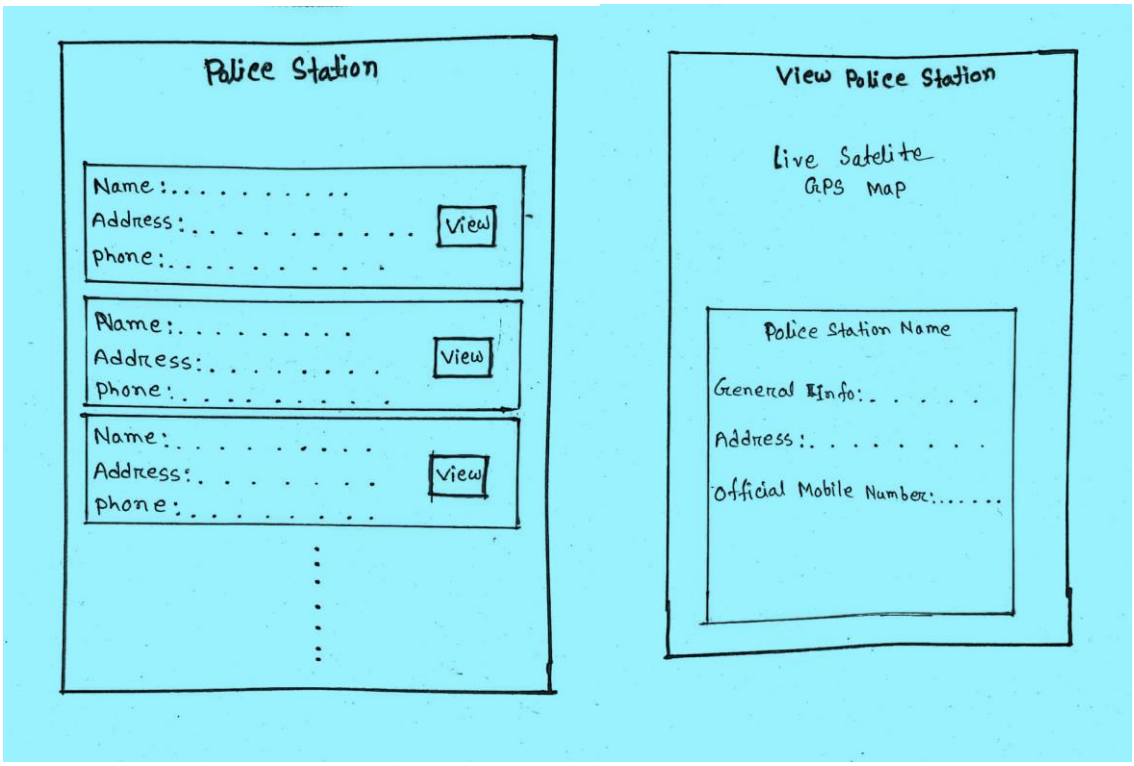

Fig 4.1.4: Police Station GUI

- This is the fire station feature pages where you have to use Button, CardView, TextView.

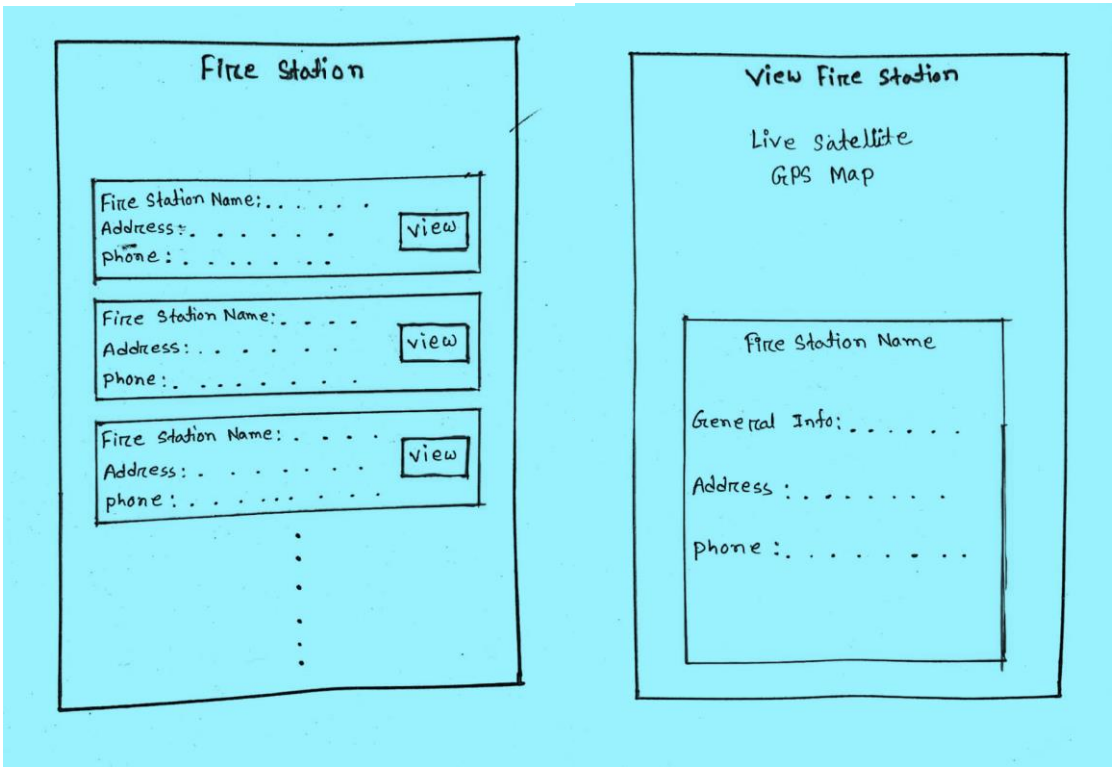

Fig 4.1.5: Fire Station GUI

❖ This is the page of ambulance feature where you have to use Button, CardView and TextView.

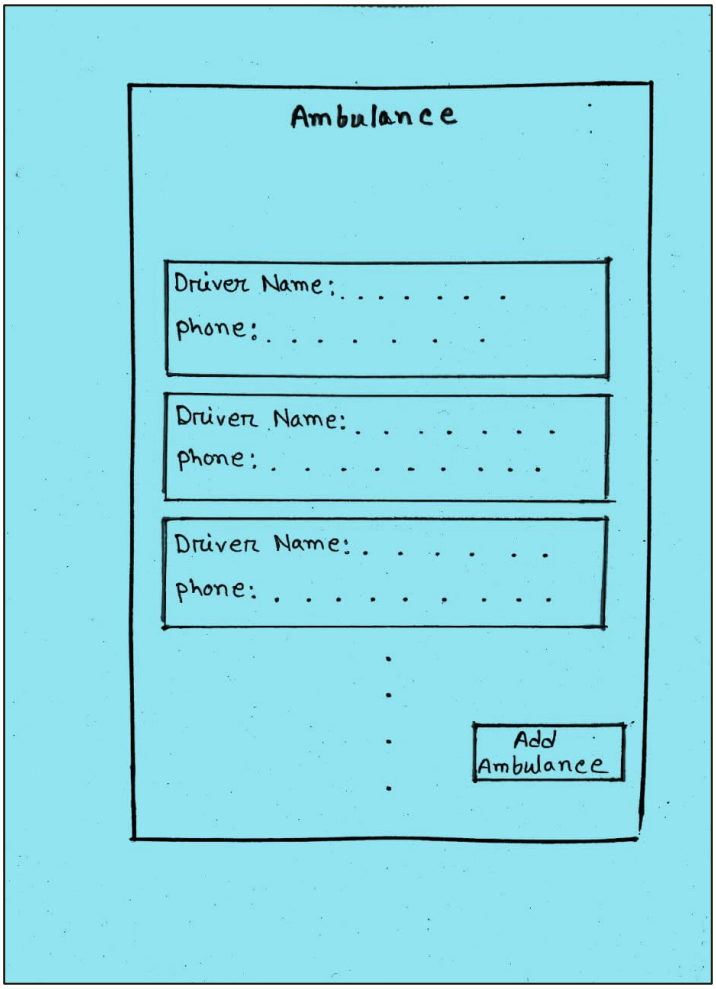

Fig 4.1.6: Ambulance GUI

4.2 Back-end Design:

Backend of anything is invisible to common client or administrator. It can be a peice of code or a program running on the server machine to serve the client needs.

Suppose, a client asked to log in with his accreditations from the personal mobile phone and the information went to server to check the qualifications. Presently, the backend will check the qualifications and choose whether a client to be allowed or not. Database is additionally a portion of backend.

We utilized Firebase with JSON database. Firebase Verification makes it simple for engineers to construct secure verification frameworks and upgrades the sign-in and onboarding realization for clients.

Screen captures of the Database that we have created through Firebase and the tables that are under that Database such as User table, Hospital table, Police station table, Fire station table and Ambulance table.

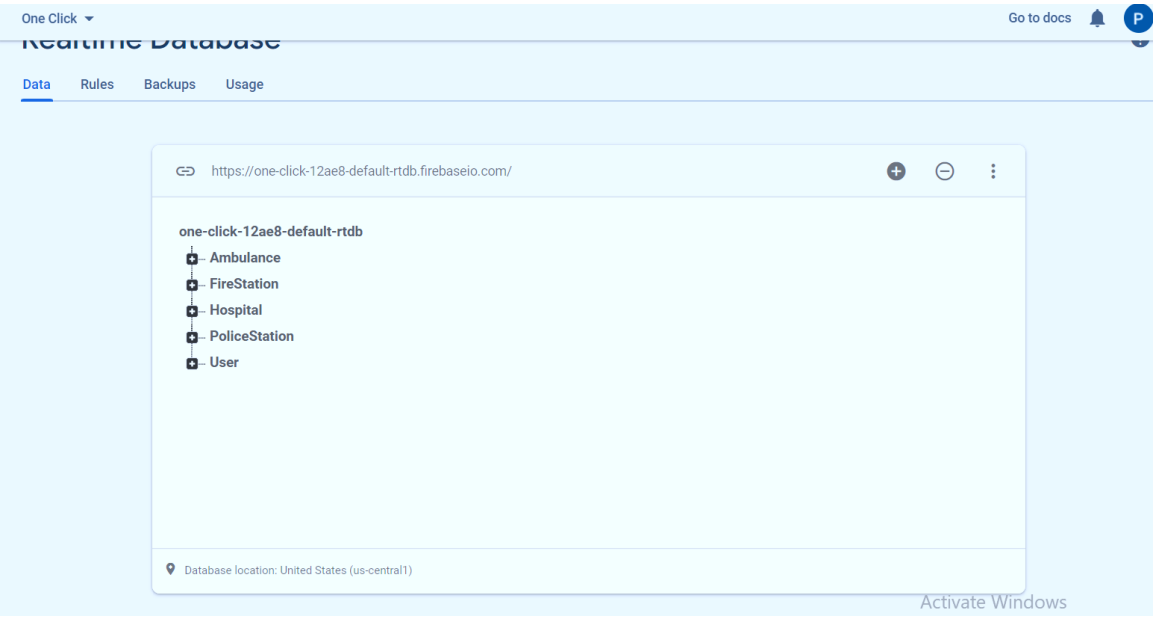

Fig 4.2.1: Firebase Database

Here all the data of the ambulance table is shown. The data contains here the ambulances will be available from the time that the service will be available at the specified time in "AvailableTime". Moreover, driver's name, mobile number, license number will be given. For the location of the driver, latitude, longitude and the name and key of the hospital that will provide the service will be given.

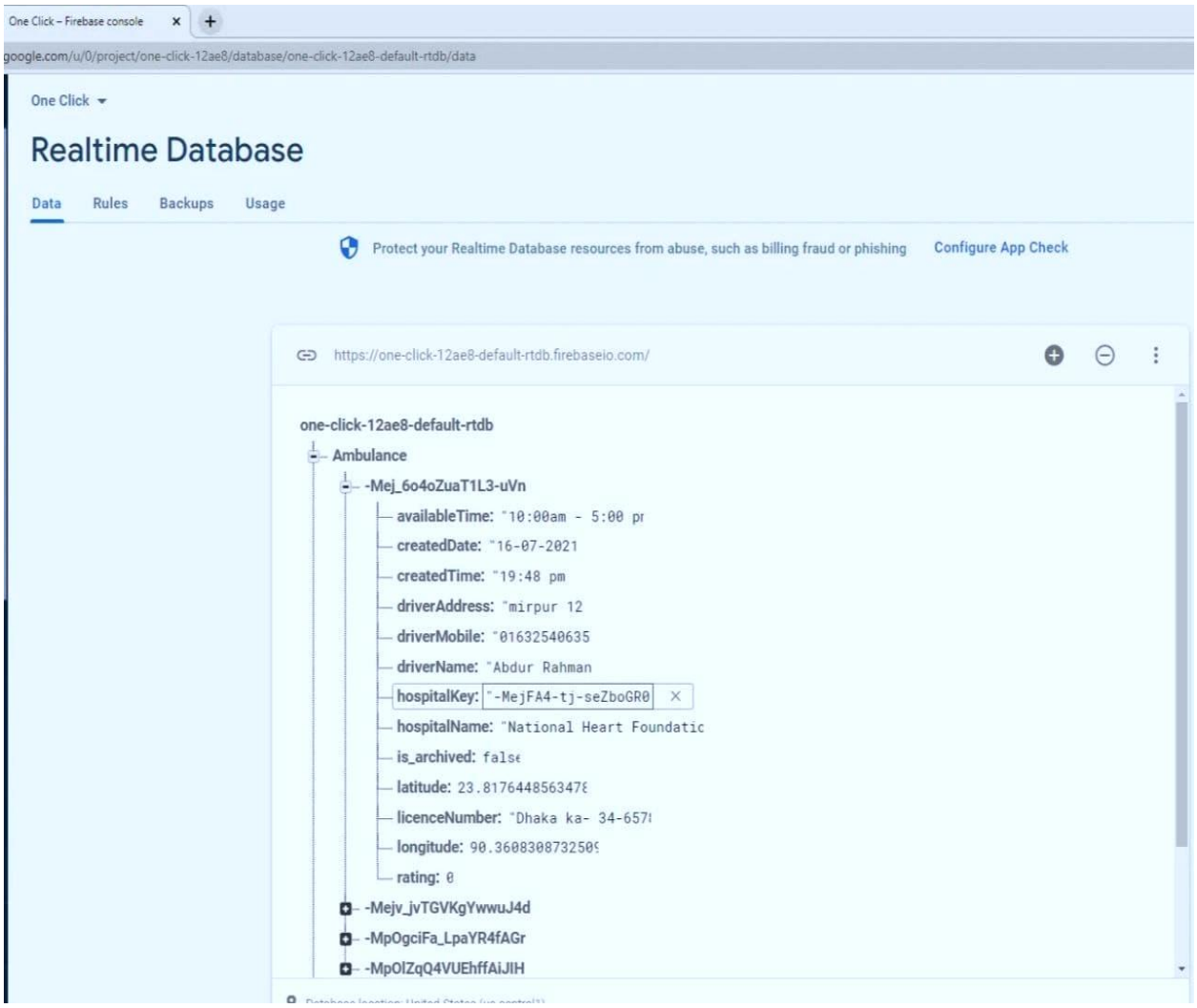

Fig 4.2.2: Ambulance Table

Here are all the data of the fire station table. The data that will be in the fair station table are the name of the fair station, address, Mobile number, latitude, longitude for location and short description of that fire station.

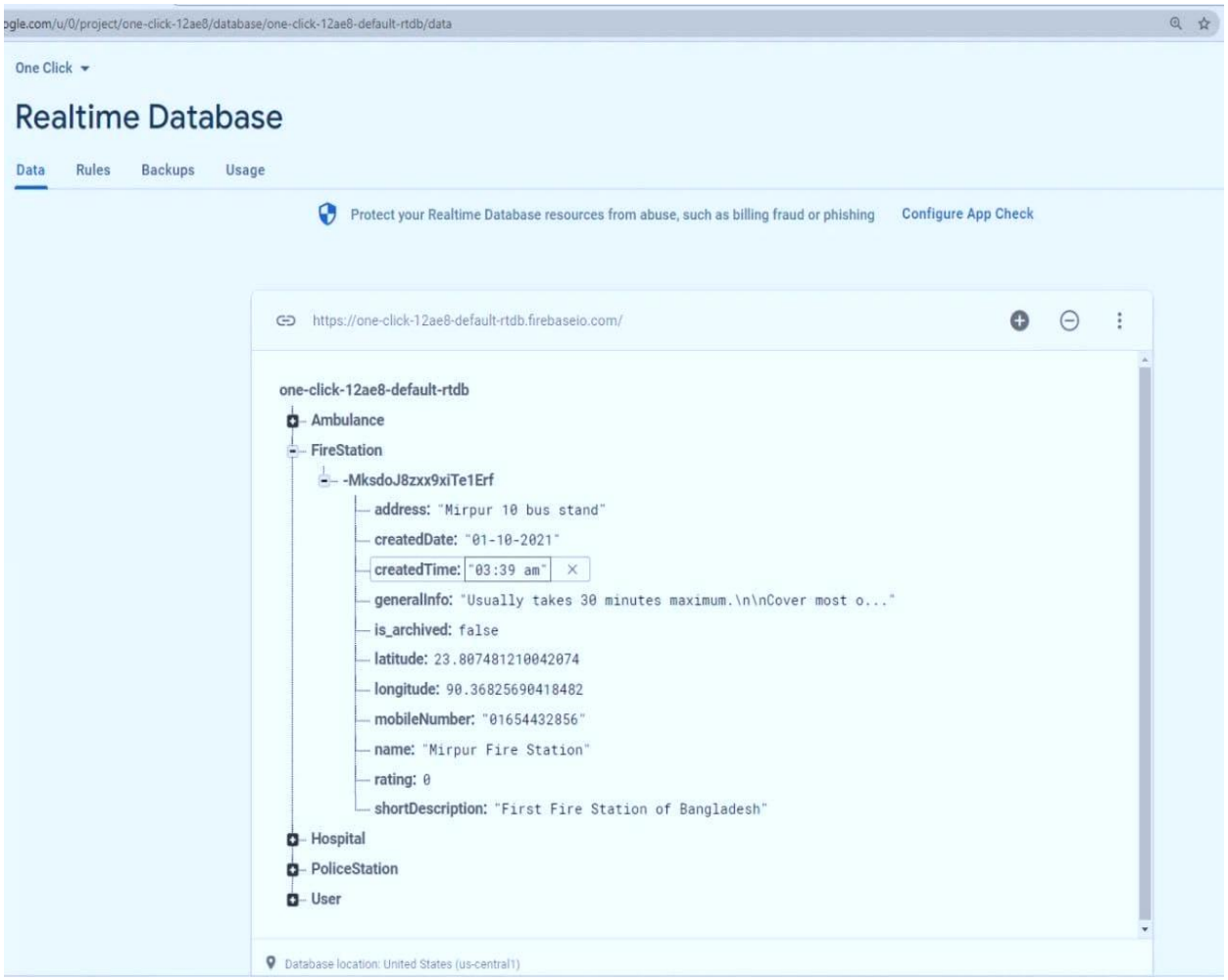

Fig 4.2.3: Fair Station Table

Here all the data of the hospital table is shown. The hospital table contains the hospital name, address, mobile number. Moreover, the hospital has a field for what is special and latitude longitude for location.

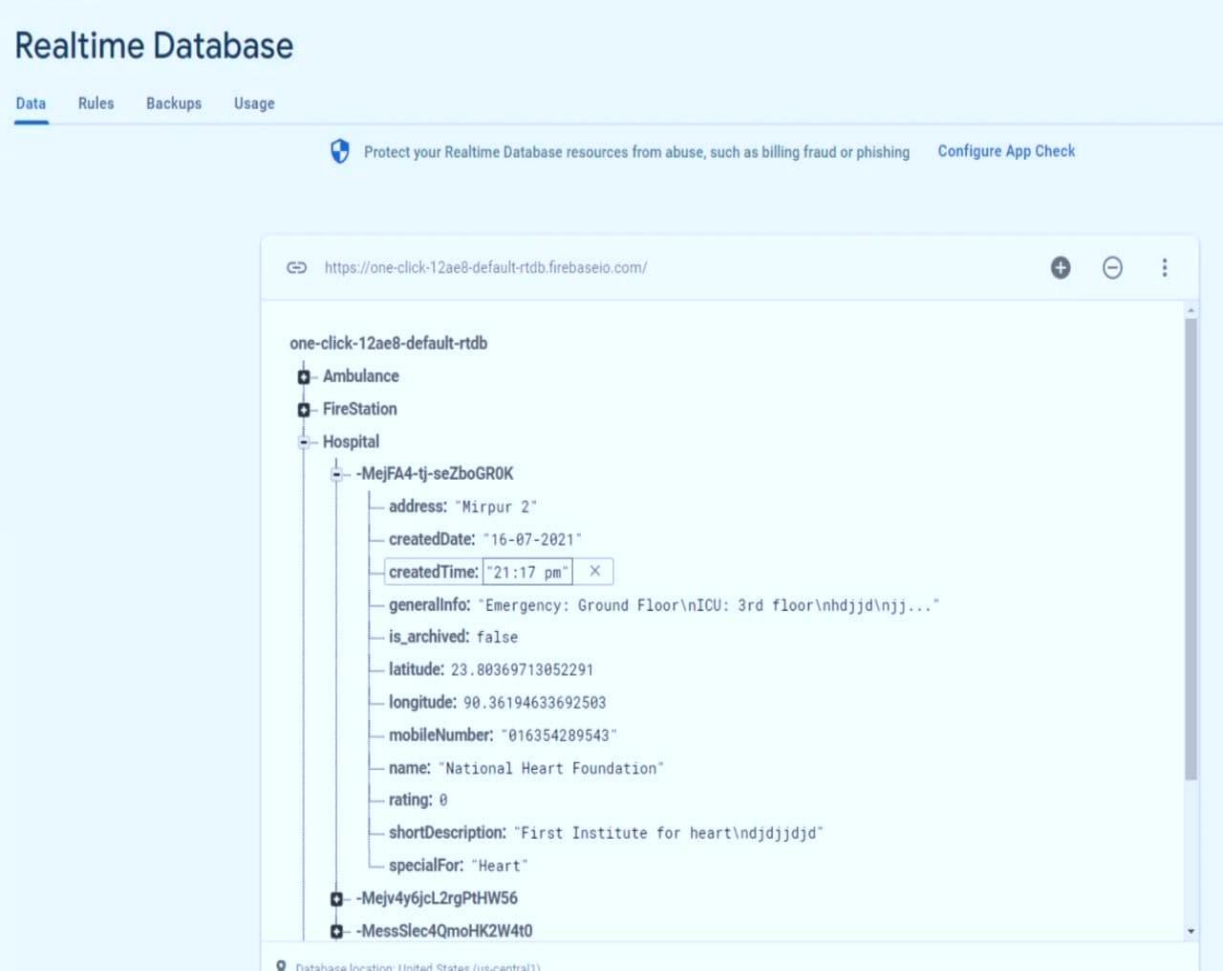

Fig 4.2.4: Hospital Table

Here all the data of police station table is shown. The name, mobile number and address of the police station will be given in the police station table. Moreover, there will be latitude longitude and short description for location.

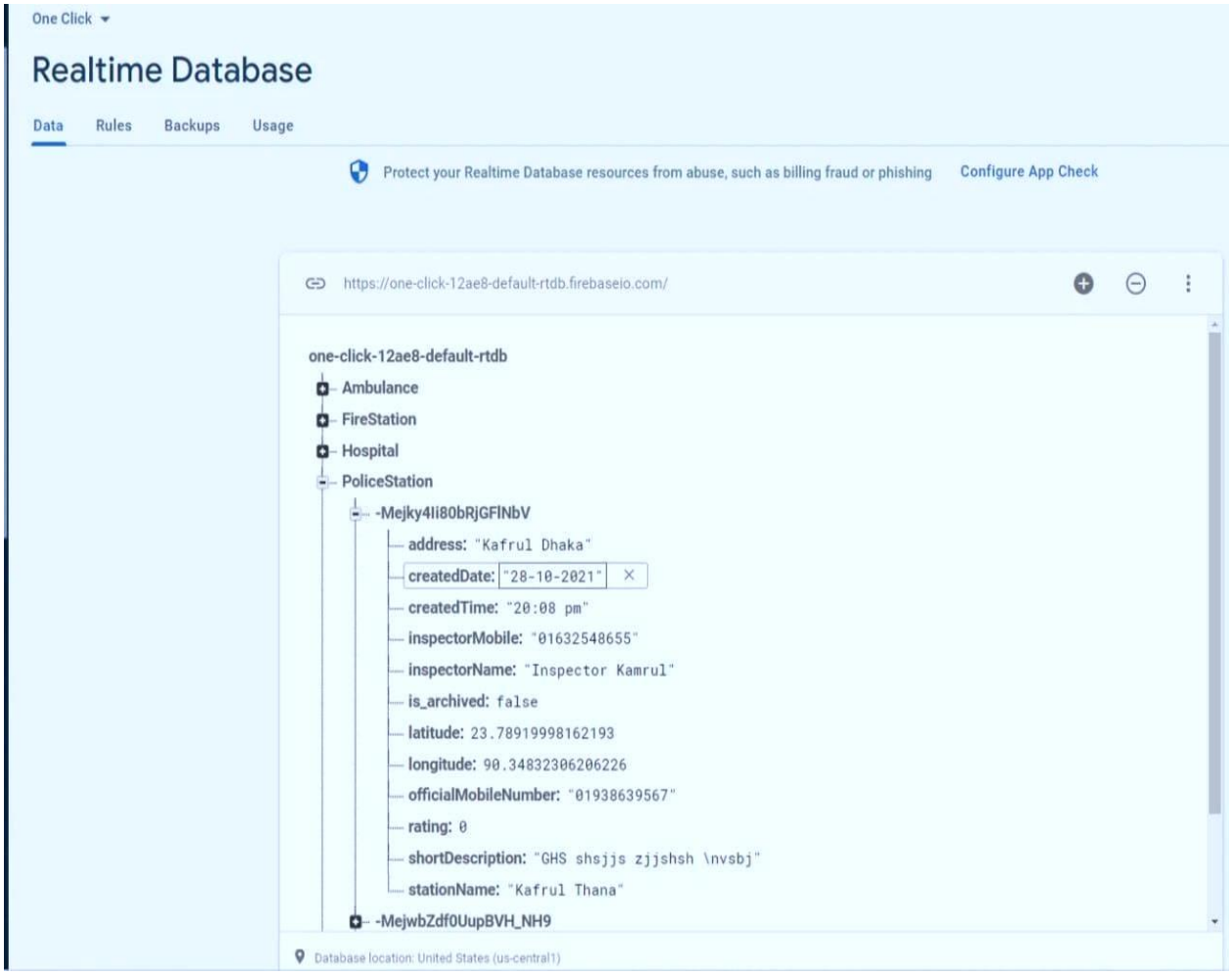

Fig 4.2.5: Police Station Table

Here all the data of user table is shown. The user table will have all the information of the user, they will have to give the user time to sign up.User's name, mobile number, age, gender, address must be given. Besides, emergency number for help, authentic email address and password must be given.

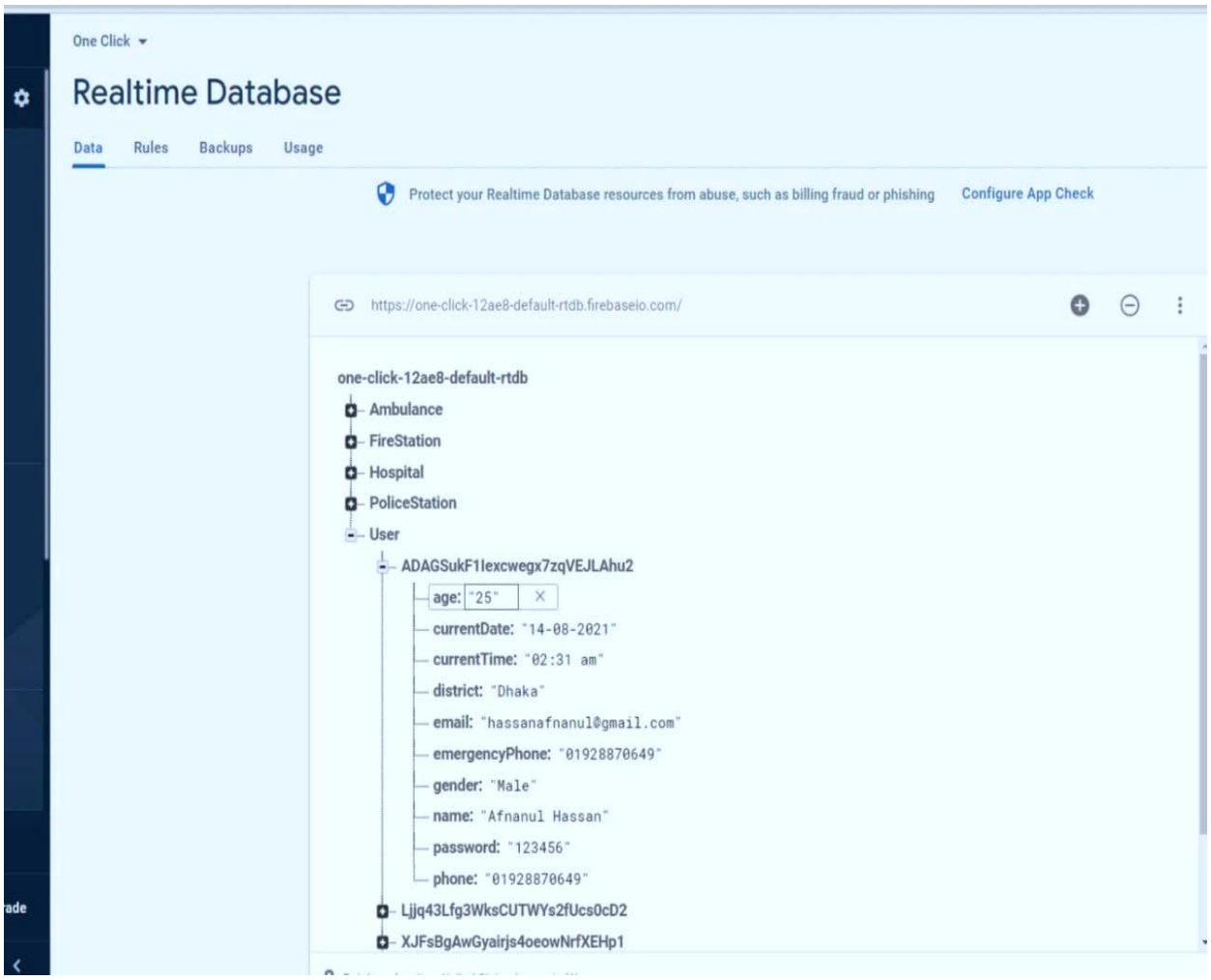

Fig 4.2.6: User Table

4.3 Interaction Design and User Experience (UX):

Implementation of interaction means how easily a user can interact with the app. We have implemented our app system with a quickly reactive UI. It will make sure of a better user experience. We used some familiar icons, text view, button, spinner, etc. As it is understandable and beautiful UI so the users will be able to communicate with the app easily.

- ❖ After installing the app, this page will appear where the user is asked to login. If the user already has an account, then he/she has to enter that email address in the Email EditText field and then he/she to login by clicking on the "Login" button with the password in the EditText field.

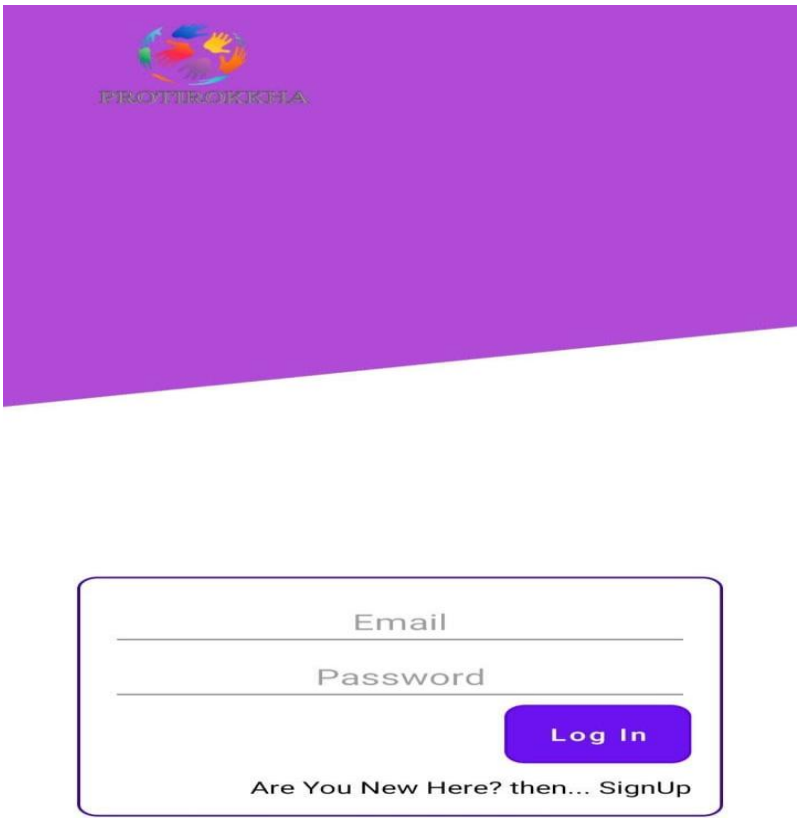

Fig 4.3.1: Login Page

❖ This page is the "Sign Up" page. The user has to create an account by filling up the form of this page. EditText, Button and RadioButton are used in the form page.

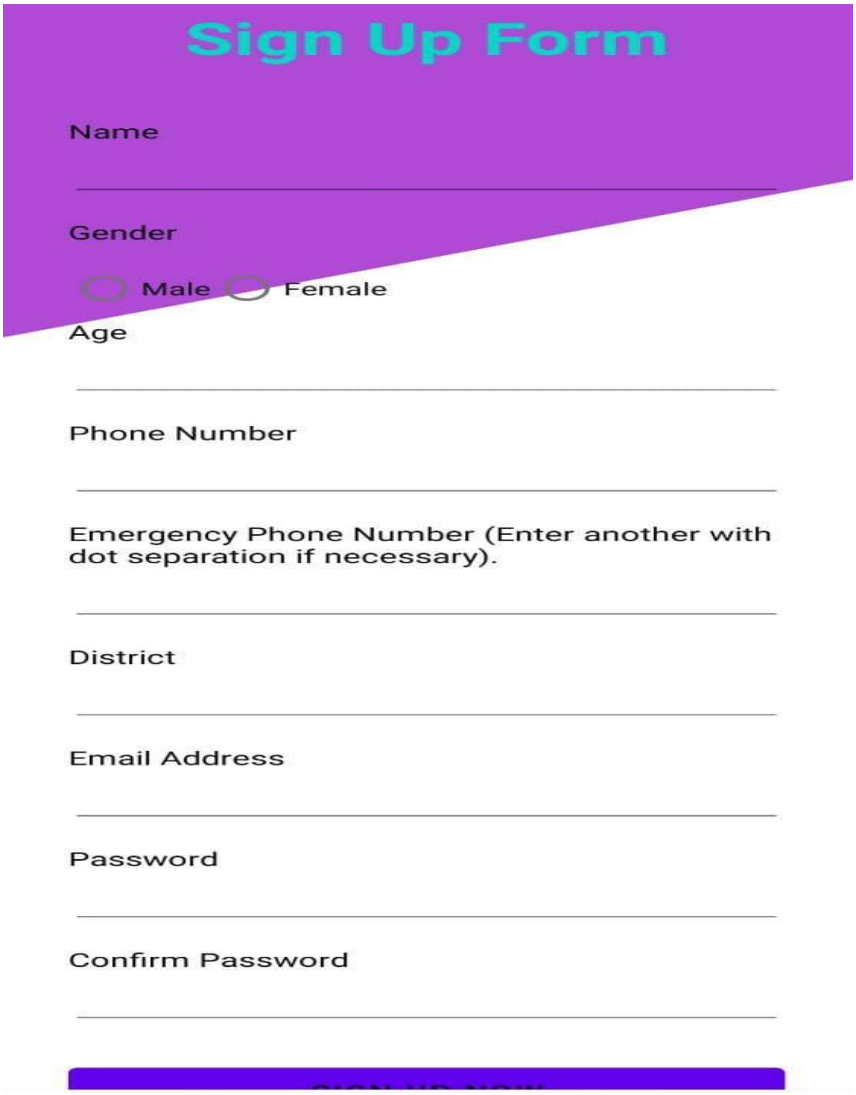

Fig 4.3.2: Sign Up page

❖ This page is the main menu page. From this page users will be able to access the services they need and that is why clickable CardView has been used. Moreover, the current location and name of the user for which TextView has been used. Clicking on the user icon will take you to the user details page

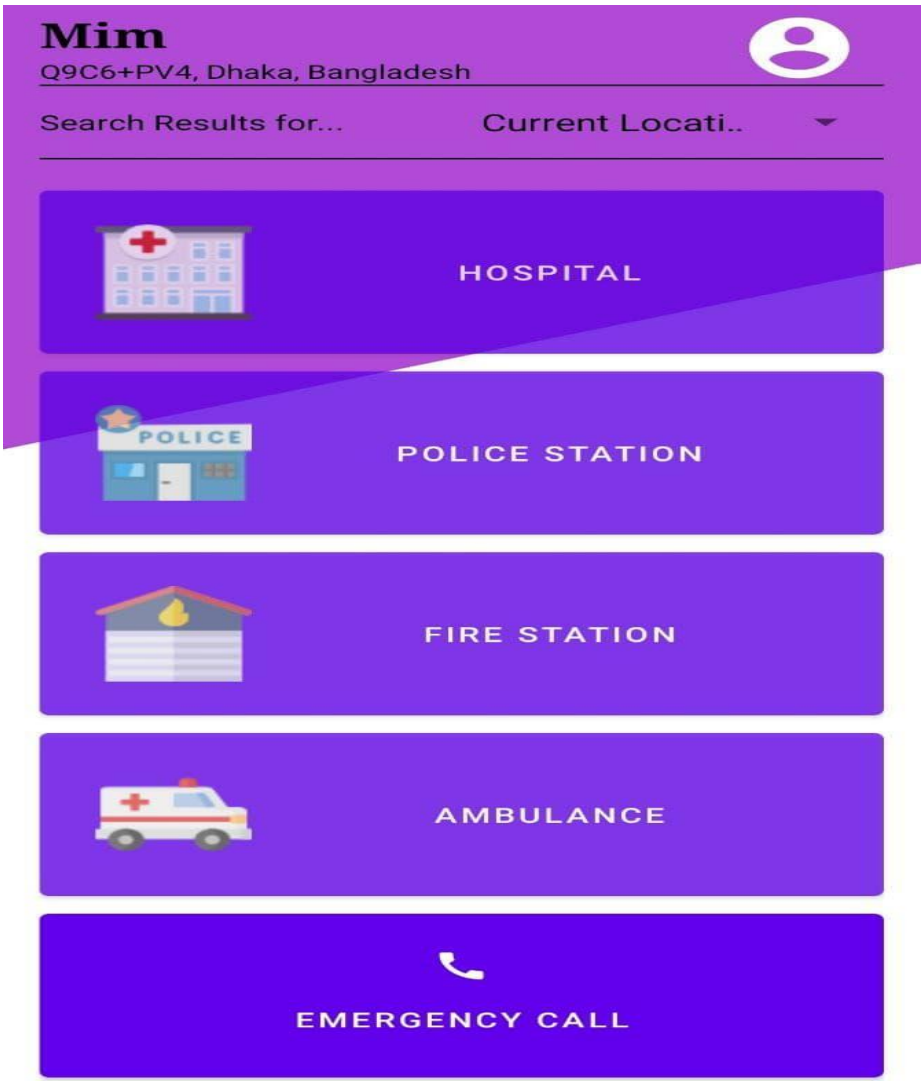

Fig 4.3.3: Main Menu page

4.4 Implementation Requirements:

The technology used as follows:

- Programming Languages: JAVA, XML.
- Database:Firebase

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database:

In this project, we utilize a firebase database to store, recover, and so on within the database. Here information is stored in JSON groups (as JSON objects), and any changes in data reflect promptly by performing adjust over all the gadgets & stages. We applied three frameworks within the database, and they are storage, firebase authentication and real time database

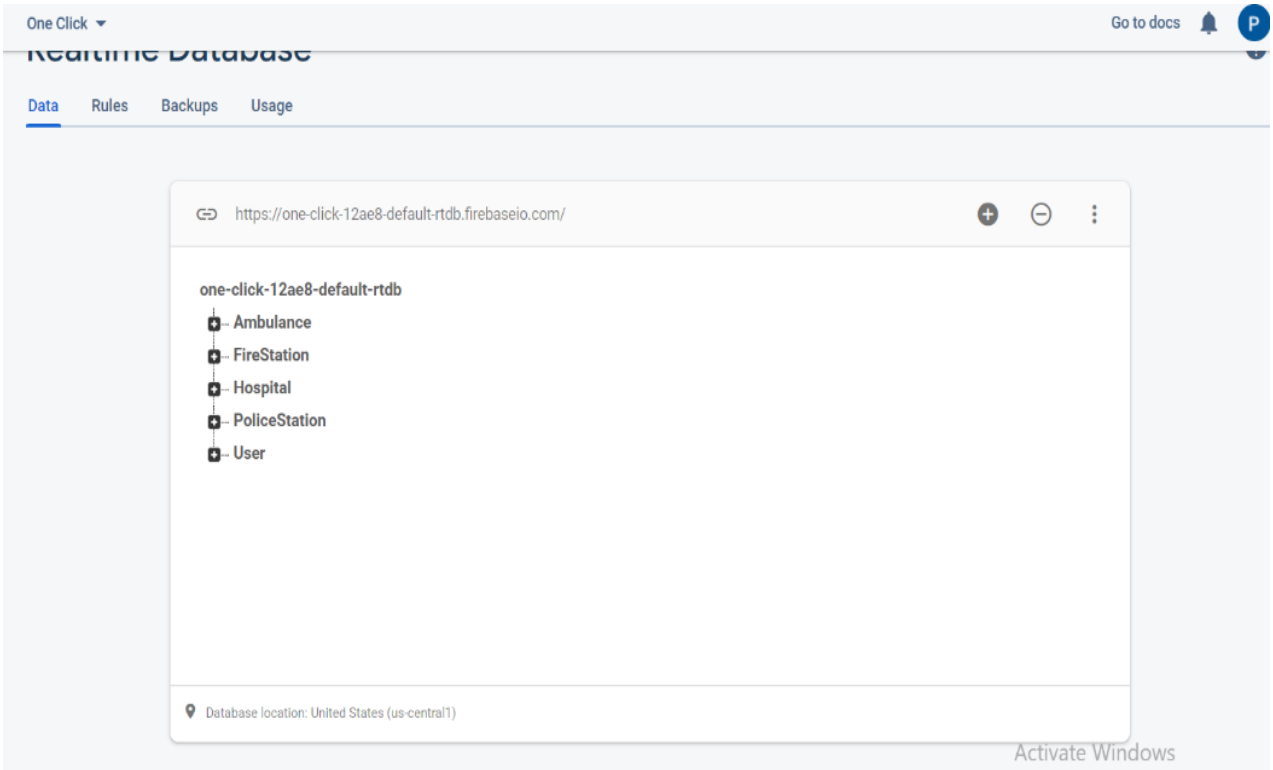

Fig 5.1.1: Collection of Database

Moreover, a snapshot of how JSON is connected to the database is show

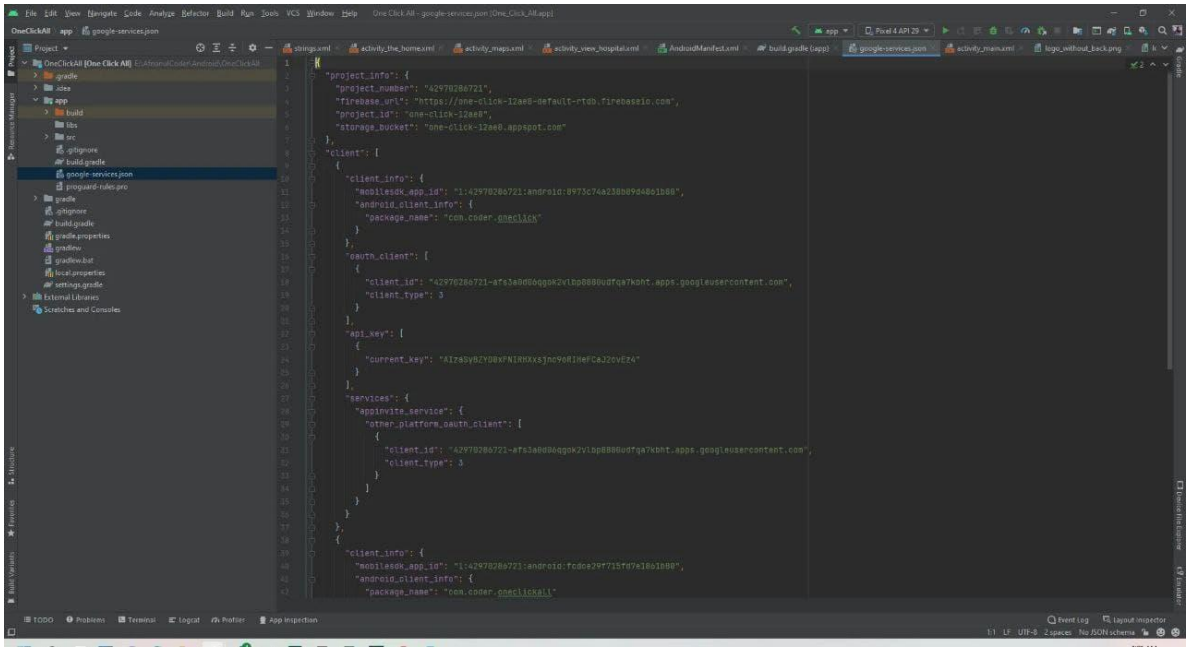

Fig 5.1.2: JSON Connecting with Database

5.2 Implementation of Front-end Design:

For Android, Extensible Markup Language (XML) code is used for front end design. Button, TextView, Expendable ListView, EditText ImageView etc are used to design. Here are some of the ones we found to be important:

- We didn’t plan from code, not indeed the little stuff.
- We have coordinated the plan but didn’t attempt to improve it.
- We attempt to get it the Connections and pecking order to execute them properly.
- Whitespace and alignment are vital. So, we made them exact to the pixel and make them equitably all through anything we add.
- We make our additions as minimally styled as we can

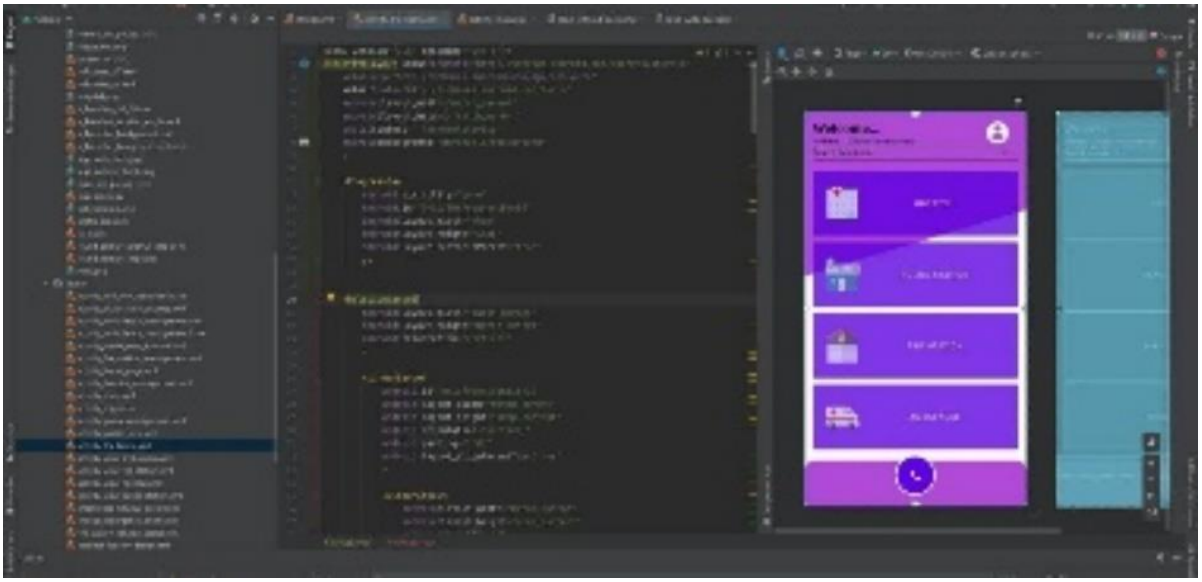

Fig 5.2: Main Menu page Design

5.3 Testing Implementation:

Instrumentation tests run on a gadget or an emulator. Within the background, the app will be introduced and after that a testing app will moreover be introduced which can control the app, lunching it and running UI tests as needed.

Instrumentation tests can be utilized to test none UI rationale as well. They are particularly valuable once a person ought to test code that features a reliance on a setting.

UI Testing, also known as GUI Testing is fundamentally a instrument implied to test the viewpoints of any program that a client will come into contact with. This as a rule implies testing the visual components to confirm that they are working concurring to necessities – in terms of usefulness and execution. UI testing guarantees that UI capacities are bug-free.

5.4 Test Results and Reports:

This is a procedure in which an application tester or the program's creator will be able to examine a variety of scenarios to ensure that the application and specifications are met. However, the application may have limits in the beginning or later stages.

Table 5.1: Test Results

Test case	Test input	Expected outcome	Obtained outcome	Passed/ Failed	Testing Period
Login	Email & Password	Login Successfully	Login Successfully	Passed	27-11-2021
Geolocation Permission Granted	Automatically gather user location	Successfully Gather user Location	Successfully Gathered user Location	Passed	27-11-2021
Geolocation Permission Denied	Automatically gather user location	Fail to Gather user Location	Failed to Gather user Location	Passed	27-11-2021
Create a Request	Create a request	Successfully Created	Created	Passed	02-12-2021
Response to a request	Response to others request	Respond Successfully	Responded Successfully	Passed	02-12-2021
Create Request for Call	Create a request	Successfully Created	Created	Passed	02-12-2021
Create Request for SMS	Create a request	Successfully Created	Created	Passed	02-12-2021

CHAPTER 6
IMPACT ON SOCIETY, ENVIRONMENT

6.1 Impact on Society:

In our society, anti-social activities like snatching, rape, women harassment are happening every now and then. Moreover, in case of emergency we need police, hospital, ambulance, fire service. In these situation's the user will be able to take the services they need and the amount of loss will be reduced. There will be fear among those who engage in anti-social activities and all these anti-social activities will continue to decrease in our society.

The women of our country will be able to move around without fear, the amount of damage due to accidents will be reduced, and snatching from society will be reduced. As a result, the people of the country and the government will go one step further towards building Digital Bangladesh.

6.2 Impact on Environment:

Our project (app) focuses on the two issues of emergency service and woman safety. Hospital, fire station, police station help can be taken to prevent the damage of the accident and for the safety of women family members can go to the location and call of the victim through which the women of our country can move safely. At the right time fire service will be able to maintain the balance of the environment through their work.

6.3 Ethical Aspects:

Our project (app) has been done for the welfare of the people and will work against all the evils of the society. No immoral acts can be committed using this app. The app can only be used in an emergency situation and is not likely to cause any harm to any person or society. We are

also hopeful that there will be no moral decay by this up. Since all the services and information of the app will be controlled by the admins, there is no chance to display any wrong information here.

CHAPTER 7
CONCLUSION AND FUTURE SCOPE

7.1 Discussion and Conclusion:

The project is finished with the help of XML, Java, JSON, Google map API and Firebase Database. People can Use it anywhere by using a smartphone with the help of an internet connection. This project (app) providing emergency necessary services in Case of injustice, inequity, torture and getting emergency necessary health care and ambulance service due to accident. Ensuring safe movement of girls and providing necessary assistance to them. This whole system has been working on all the services that people need in case of emergency. People can use this app for free.

7.2 Scope for Further Developments:

Since our project (app) does not have any financial support, the Google map APIs used in our project are free APIs which allow the user to use the default Google map of the smartphone via hospital police station, fire station and ambulance service. GPS map is a waste of time. If someone use the free API, the features of the map will work in our app and time will be saved.

There are plans to make it a better user experience and smoothly usable through the next update. There are plans to expand the ambulance service more widely and then the user will be able to use them more easily**.**

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