

DHAKA GUIDE: “AN EASY AND SAFE TRAVELLING APP”

BY

MD.NAYEMUL HAQUE

ID: 142-15-3843

MD.MAHMUDUL HASAN

ID: 142-15-3980

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

Supervised By

MD.JUEAL MIA

LECTURER

Department of CSE

Daffodil International University

Co-Supervised By

AHMED AL MAROUF

LECTURER

Department of CSE

Daffodil International University



DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

APPROVAL

This Project titled “**Easy and safe travelling : An android app for bus guide for Dhaka city**”, submitted by Md. Nayemul Haque and Md. Mahmudul Hasan to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of B.Sc. in Computer Science and Engineering (BSc) and approved as to its style and contents. The presentation has been held on 10th December 2018.

BOARD OF EXAMINERS

Dr. Syed Akhter Hossain
Professor and Head
Department of CSE
Faculty of Science & Information Technology
Daffodil International University

Chairman

Narayan Ranjan Chakraborty
Associate Professor
Department of CSE
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner

Md. Tarek Habib
Assistant Professor
Department of CSE
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner

Dr. Mohammad Shorif Uddin
Professor and Chairman
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 Md. **Jueal mia, 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.

Supervised by:

Md. Jueal Mia.
Lecturer
Department of CSE
Daffodil International University

Co-Supervised by:

Ahmed Al Marouf
Lecturer
Department of CSE
Daffodil International University

Submitted by:

Md. Nayemul Haque
ID: 142-15-3843
Department of CSE
Daffodil International University

Md.Mahmudul Hasan
ID: 142-15-3980
Department of CSE
Daffodil International University

ACKNOWLEDGEMENT

First, we express our heartiest thanks and gratefulness to almighty God for His divine blessing makes us possible to complete the final year project/internship successfully.

We really grateful and wish our profound our indebtedness to **Md. Jueal Mia, Lecturer**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of “An android app for Easy and safe Travelling” to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to **Pro. Dr.Syed Akhter Hossain, Professor, and Head**, Department of CSE, for his kind help to finish our project and also to other faculty member and the staff of CSE department of Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

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

ABSTRACT

Our project titled “Easy and Safe travelling” is an android app for Bus guide of Dhaka city. Using this app, user can easily reach their destination. this application keeps all the Bus route, Bus stand, and Bus name of Dhaka city. And this app also shows the fare per km. When user select the starting and destination point/stoppage then this application will be showing how many buses moving in this route. And also showing which Bus is preferable for the passenger, compare with faster and low cost. Now-a-days smart phone becomes a part of our life. We can't think a single moment without our smart phone. We are more likely to use our phone for practical purpose in our daily life. Among these smart phone OS, android has majority percentage. Android OS is also an open source platform and it has large number of users. For this we thought that we should build something in android that has practical use to the user. And it will help them to travelling in Dhaka city. Our app will manage all the information beside the road also, as like besides hospital, police station and so on. This will helpful for the passenger to moving this city. It also reduces the travel time. We no need to go anybody for the bus route information this android application provide route information and it will reduce time. We use java and SDK for front-end design and firebase for back-end design. We also use firebase as our main database. This application is very user friendly. After finishing all the task and test process this application proved to be working effectively.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

A majority of unpleasant issues faced by travellers seem to grow due to lack of proper information. Unfortunately, making a safe travelling that doesn't take much effort and which all starts with one basic idea: **Information**. An android app can provide the solution by offering the ability to share issues between travellers and the transport system which lead to rapid issue resolution and fewer misunderstanding. And Passengers' require transport information to maintain secured and safe travelling. So it's a demand of the age to develop an android app to manage and send information of the transport system to the passengers through the **DHAKA GUIDE**.

1.2 Motivation

Now a days we see the argument between bus conductor and the passengers because of disagree with each other which cause is proper fare of bus. Bus Conductor don't want to say their terms and conditions. Sometimes they don't fill up the bus fare chart in every stoppage because of laziness and thinking the harassment. That's why passengers also face the main problem.

1.3 Objective

We want to make this apps. This app will have contain these features.

1. To keep all essential information about the Transport System .
2. To keep proper Bus route and fare.
3. To provide safe travelling.
4. To maintain security in an area.
5. To keep the nearest hospital for emergency health condition
6. To keep the nearest ATM booths of all bank

1.4 Expected Outcome

By using this app a Passengers can easily get all the information about the transport system such as, proper bus name, Preferable bus route, shortest bus route and the exact fare . On the other hand, Passengers can easily check the information which is comfortable from the asking somebody for the proper information and it saves their time. And if any emergency case for someone health issue or instant money problem, they can get the proper information for the nearest hospital and the ATM booth by using this app.

1.5 Report Layout

Chapter 1: Introduction

In this chapter we will discuss about introduction, objectives, motivation and the expected outcome of our project.

Chapter 2: Background study

Chapter 2 contains the works related with our app, comparative studies and the challenges we have to face to implement this app.

Chapter 3: Requirement specification

In chapter 3 we will discuss about requirement specification such as business process modeling, requirement analysis and modeling, logical data model and design requirement.

Chapter 4: Design specification

Front-end design, back-end design interaction design and UX and implementation requirements are described in this section.

Chapter 5: Implementation and testing

In chapter 5 we discuss about the implementation of data base, implementation of front-end design, implementation of interaction, testing implementation and test results and reports.

Chapter 6: Conclusion and future scope

The subject to describe in chapter 6 are conclusion and the future scope of our project.

CHAPTER 2

BACKGROUND

2.1 Introduction

An android app can provide the solution by offering the ability to share issues and information between passengers and bus conductor which lead to rapid issue resolution and fewer misunderstanding. The goal of the app is to create a better relationship between passengers and Bus conductor. The Dhaka Guide app is designed to support the travellers by enabling them to information repair issues, show automatically the total fare, and emergency information. Effectively resolving the bus route and bus fare issues is important to the traveller's long term future and this app will be an important tool for making easy and safe travelling stability by helping travellers speak with greater credibility through initiating and documenting communications and building smooth relationship with bus conductor.

2.2 Related Works

There are some android app almost similar with our app but these have many difference with our app. Some apps are:

Dhaka Bus Route: This is an interior design not provide the bus fare and nearby things [1].
Dingi Map: This app shows the bus route and the nearby system with GPS [2]. The passengers can enter the bus route and get a suggestion using this app.
Dhaka Wheels: The app allows to show only the bus name and bus stoppage [3].
Vara Koto: This app shows only the bus, train, CNG fare but not the preferable bus name or bus route[4].

2.3 Comparative Studies

Dhaka bus route app can only be used to show the bus route for the user. But in our app the user can be get the proper information about their preferable bus, bus route and the total exact fare. By using this app travellers can also see the nearest hospital and ATM booths for any emergency case. In our app there is one log in page, which is only for the user/travellers. The travellers can see his fare for the desired destination. Using our app the passengers get all information about the bus that information provided by the Dhaka Guide system. And the traveller can see nearest hospital and ATM booth in the system like Dingi Map app.

2.4 Scope of the problem

It's an android app, so if the travellers or the bus conductor does not have an android phone or if they do not know how to use an android phone it will be no effective for them. We can't add any payment system in this app. If the passenger face some kind of problem like, snatching, robbery, kidnaping and they want to communicate with the nearest police station for help, but our system has not this kind of service. The passengers can't get the exact road tracking direction because the API which we used in this app is free API. So, it will show only the probable direction to reach hospital or ATM booths. If we use paid API then this problem will be solved. We want to add emergency police service from nearest police station in our app. But most of the people do not know how to use this kind of services in their day to day life.

2.5 Challenges

1. The main challenges is to language barrier. Because most of the people in our country do not know English.
2. We use English to develop this app.
3. The app user connected by using internet. So, they must have internet connection.
4. The next challenge is to implement this app in rural area.
5. Use a suitable database that store all the information and give security.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Business Process Model

BPM or Business Process Modeling is a process of constructing a structural view of a system or process. It includes some process, starts and symbol, condition as like a flow chart. In our system we construct a BPM model which shows how to send the tenant information to the landlord and if landlord verify the information then the information will send to the nearest police station. And it also shows that what will happen if the landlord dose not verify the information. If the information is correct then it will be saved in the tenant and landlord information database by the police station.

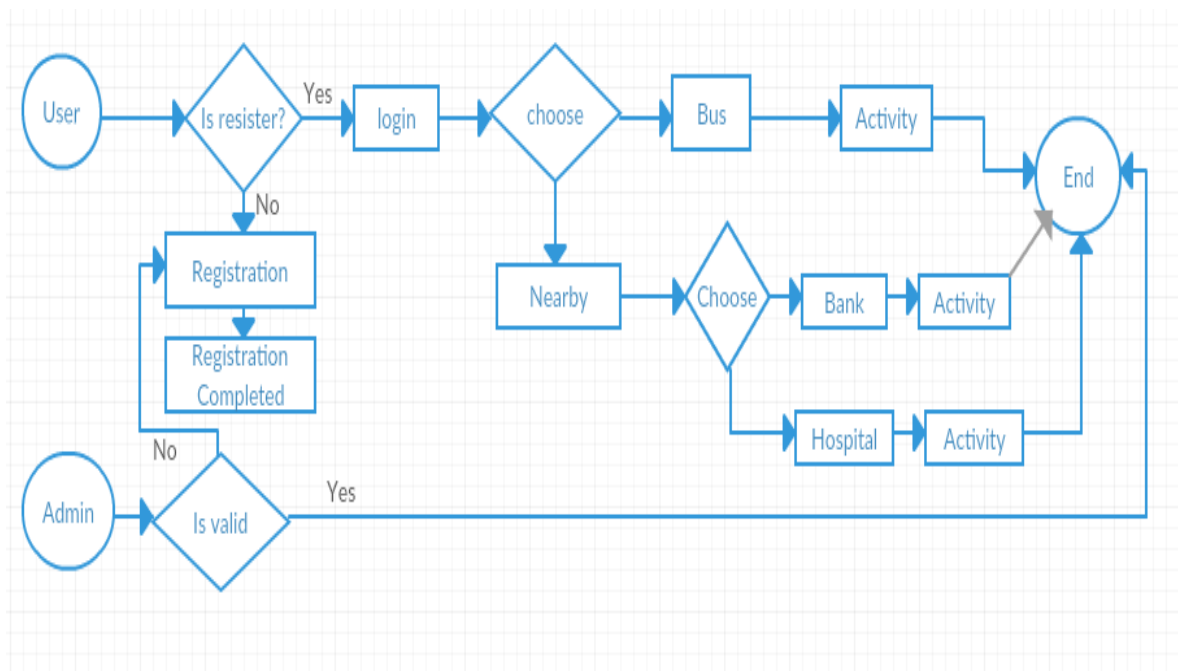


Figure 3.1 shows business process model

3.2 Requirement Collection and Analysis

Requirement collection and analysis are very important term to develop a system or any kind of android application. It meets the goal of the user and the admin. As our application is concerned with the requirement of the travellers and the admin so, we went to them and tried to know what their requirements for this app. They all are suggested to develop simple app which they can use conveniently. To maintain the information of the Bus and the bus fare and route this app will provide them a great service. Because they are facing some problem with the bus conductor, and they think that it will be a great process if they can choose their bus and the total fare for their destination.

3.3 Use Case Modelling

A use case model is a graphical description of the interactions among the elements of a system. A use case is a methodology used in system analysis to identify, clarify and organizing system requirements. Figure 3.2 shows the use case modelling of the app.

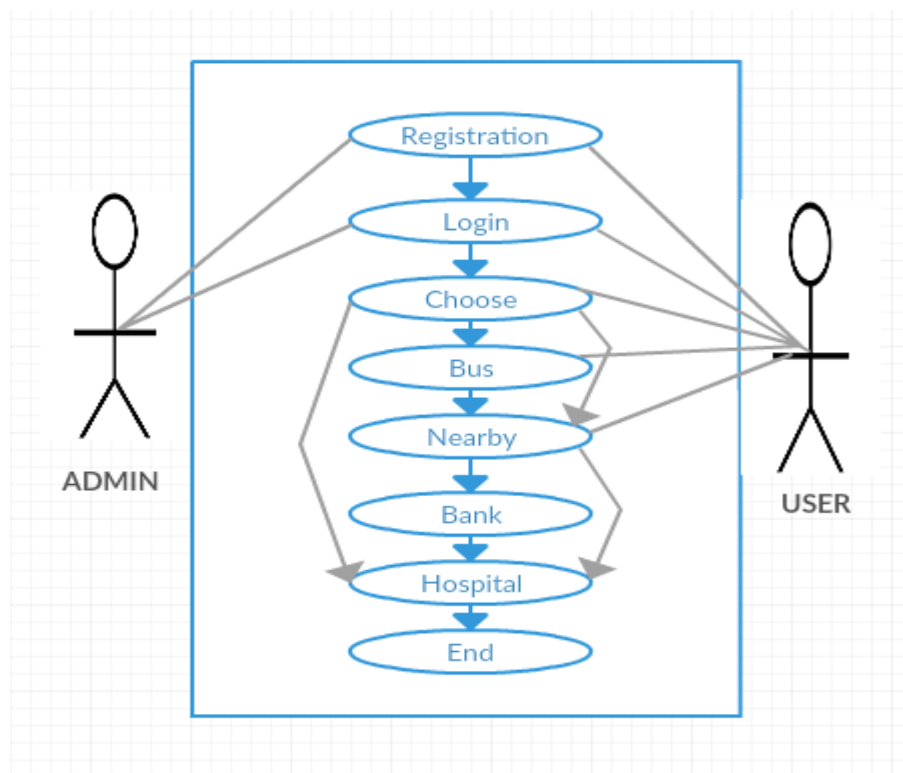


Figure 3.2: Use Case Model

Use Case : Admin Registration

Actor: Admin

Precondition: None

Primary Path:

1. Enter email address
2. Set a password

Use Case: Admin Sign In

Actor: Admin

Precondition: Registration

Primary Path:

1. Enter Email
2. Enter Password
3. Click on “Sign In” button

Alternate Path:

1. Email or Password is incorrect

Use Case: Receive information

Actor: Admin

Precondition: Provide key

Primary Path:

1. Verify Email

Alternate Path

1. Email is not Received

Use Case: Store Email

Actor: Admin

Precondition: Email received

Primary Path:

1. Check the accuracy
2. Manage database

Use Case: Traveller Registration

Actor: Traveller

Precondition: None

Primary Path:

1. Enter email address
2. Set a password

Alternate Path:

1. Enter valid email or password

Use Case: Traveller Sign In

Actor: Traveller

Precondition: Registration

Primary Path:

1. Enter Email
2. Enter Password
3. Click on “Sign In” button

Alternate Path:

1. Email or Password is incorrect

Use Case: Fill valid Email or password

Actor: Traveller

Precondition: Sign In

Primary Path:

1. Valid Email
2. Correct Password

Alternate Path:

1. Enter valid Email and password

Use Case: Choice

Actor: Traveller

Precondition: Registration and log in

Primary path:

1. Select Bus

Alternate Path:

1. Select Nearby

Use case: Nearby

Actor: Traveller

Precondition: Choose

Primary Path:

1. Click on “Hospital” button

Alternate Path:

1. Bank

Use case: Bus

Actor: Traveller

Precondition: Choice

Primary Path:

1. Select "From" and "To"
2. Click "Confirm" button

Alternate Path:

1. None

3.4 Logical Data Model

Our project's logical data model has relational table named Admin, User and bus, hospital and bank information. Here, we can describe how these entities are connected with each other. The total relational model has shown on the following figure

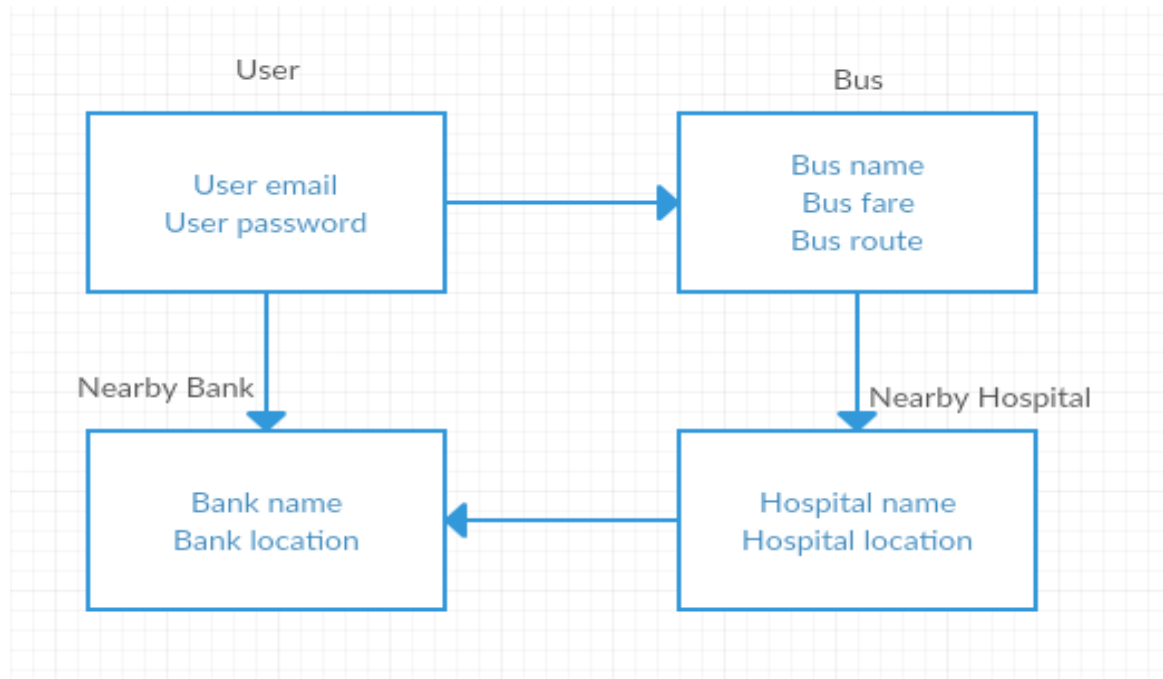


Figure 3.3: Logical Data Model

3.5 Design Requirement

A well design android app is pleasuring to use. Our app provides service to the local people and the bus conductor to maintain a good relationship about bus fare in Dhaka city. Though the users of our app are the local people so, we try to make the interface of the app convenient to the user. Well design of an android app is very essential, but we should concentrate to the output design of the app first. User typically use this app to move easily and safely one place to another. So, simplifying this app by making user interface simple is our primary responsibility.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-end Design

Front page of an android application must draw the attention of the user. To make our application attractive to the user we use some Graphical User Interface (GUI). We design our project with easily understandable GUI so that, the user can easily access the app. In the front page we simply use a registration option and a sign in option. To sign in this app the user must complete the registration first.

4.2 Back-end Design

Back end design is only seen by the programmer. How will the application interact with the user is implemented in the back end? User cannot interact with the back-end design, If there is any need to change or update any information or data, then this can only. As our project maintain the information that send by system so, we need to create a database to store this information. We also provide the unique id of the user. We use fire base to create the database. The following figures describes how we designed the back end of our project. Figure 4.1 shows the back-end design for the user. This authentication function shows all the users who registered in the database by using our app. When a user sign in this app, a database is automatically generated for the user.

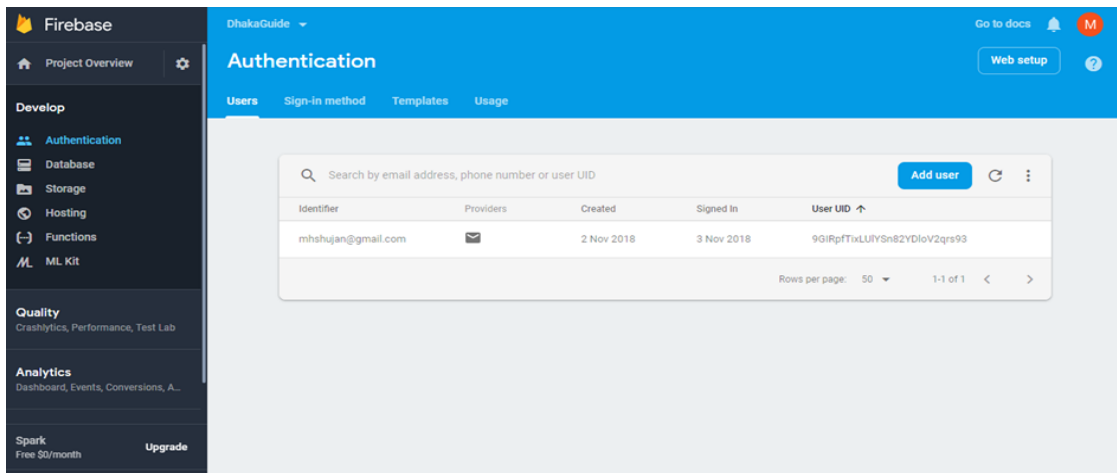


Figure 4.1: User List

Figure 4.2 shows all the sub database we create in our project. All the sub database contains different types of information of the user. It provides the personal unique key for the each user by which the information of individuals are managed.

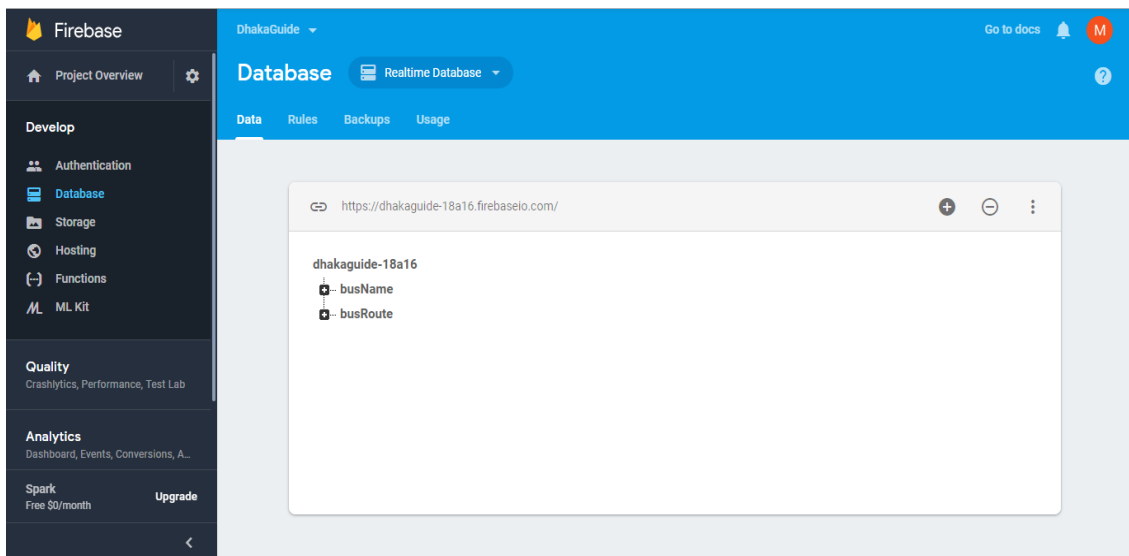


Figure 4.2: Database Creation

4.3 Interaction Design and UX

Interaction design describes the relationship between the application and the user. How much an android application will popular among the user that depends on the interaction of the app with the user. If the app is convenient to use and it provides a great outcomes to the user then it will gain the popularity. Experience is very essential for interaction design. Because mainly the user experiences focuses on the experience between the user and the application. From this experience we tried to make most of the features of our app that can interact with the user. Though ours is a information based android app so we tried to provide great information to them by using the registration option which required valid email id and password of the user.

UX design or user experience design is the most challenging part for a programmer. Always they need to focus on the experience of user for using android app and how they become satisfy with a product. We keep attention on this sector and tried to implement an application that has satisfactory interface which should be accepted by the user.

4.4 Implementation Requirement

To implement a project we need different types of tools, components, and software. We also used some tools and component to implement our project. Since it is an android based application project so we used android based design tools and components to implement our application. Here is a short description of the tools and components that required to implement the application.

4.4.1 Android Studio

Android studio is a popular platform to implement any kind of android application. It provides the great features to the programmer to implement an android app.it provides almost all the components and tools and frame works for developing an android app easily and quickly. We used android studio as our application IDE. Since it's an open source platform, so, programmer prefers android studio to develop various types android application.

4.4.2 Emulator

Emulator enables to run an application on a physical device in which the application is not implemented. It runs the same code in the device based on actual device. Emulator helps us to use this in different version of android phone.

4.4.3 Android SDK

SDK is very essential tool to develop an android application. It contains all the design and component libraries for development and the simulator to test the application. We use java development kit in the java platform with the SDK.

4.4.4 Firebase

Fire base is the most popular real time database. We need a database to store the information of the user. We use firebase as the main database of our application to store and maintain the information of the user. We also had to maintain the information about Hospitals, Banks, buses, bus routes and the fare. It synchronizes the data in real time to every connected user in the application. If we build an apps that has a cross platform with iOS, Android, JavaScript SDKs, all of the user uses the real time database instance and the user will automatically receive with the newest data by firebase.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

In this section we describe how we implemented our database. As we describe in the previous chapter that we use fire base as our main database. Fire base is a real time database so there is no need to use SQL query to perform the action. Fire base also has some other features like as hosting, crash reporting, cloud storage authentication, hosting and so on. How we use fire base to maintain our data is described below with proper diagram.

To store information in the database the user has to register and sign in. To sign in in our database fire base gives several choices to the user. In our app user can sign in by their email. Figure 5.1 shows the authentication option.

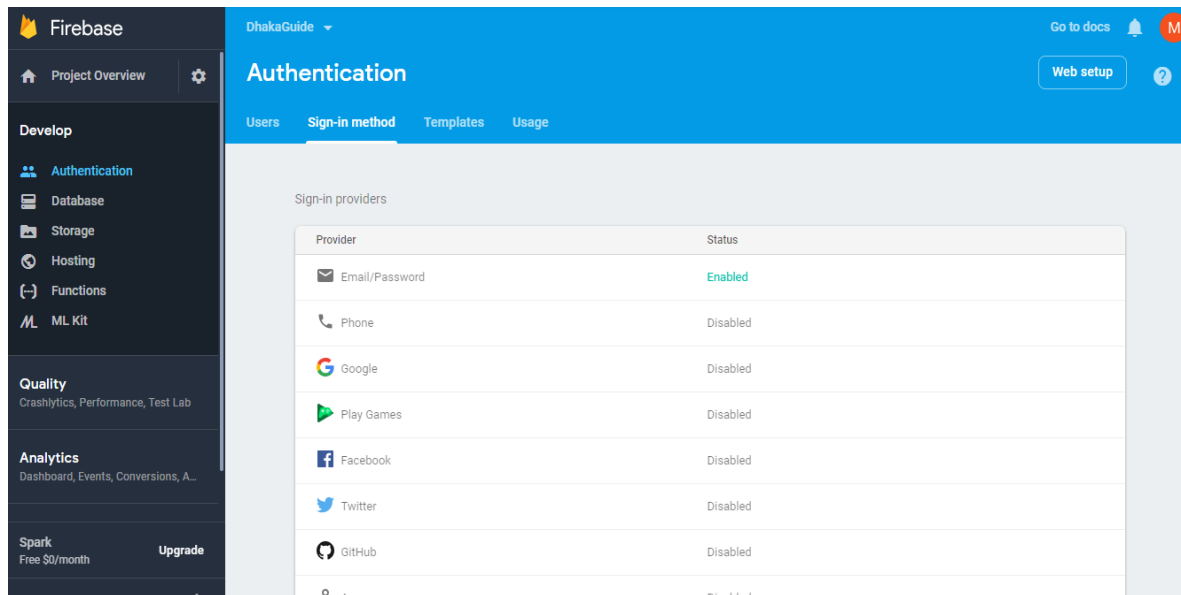


Figure 5.1: Authentication option

To sign in at the farther time if the user does not provide the valid user id or password then he cannot sign in. Firebase use an authentication rule if the email is valid or invalid. Figure 5.2 shows the authentication rule.

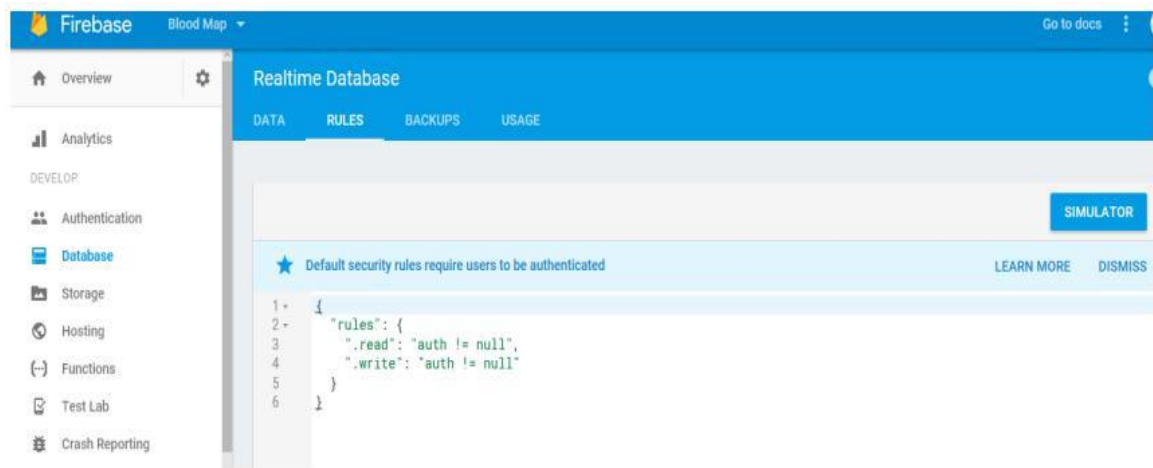


Figure 5.2: Authentication Rule

All the registered user has their own user table with unique user id. The information are stored in each unique table through the unique id. When a user sign in the database fire base gives a unique id.

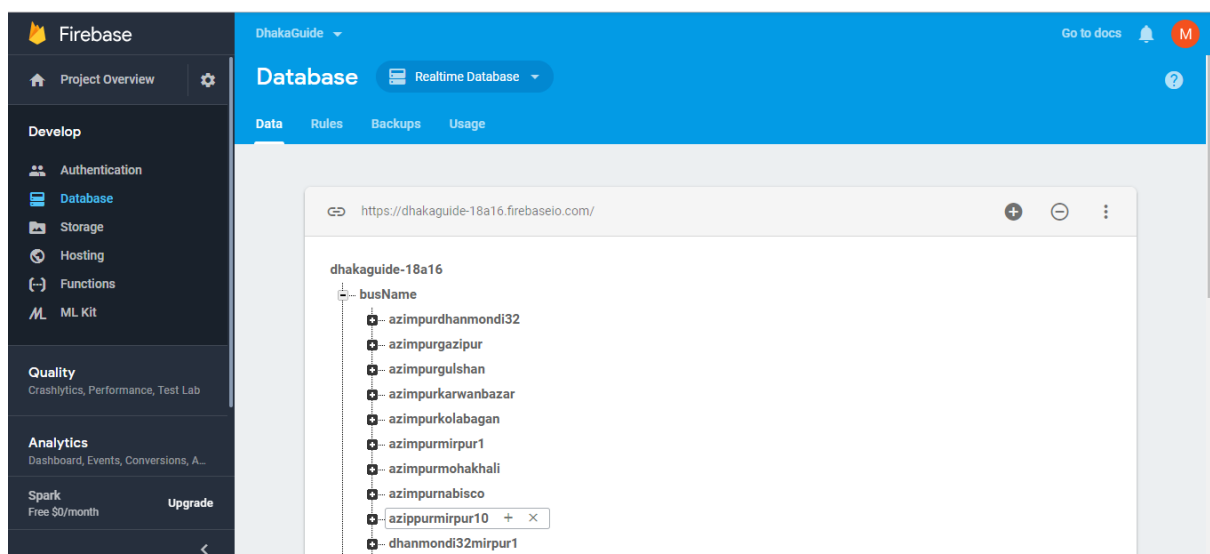


Figure 5.3: Bus Name and stands creation

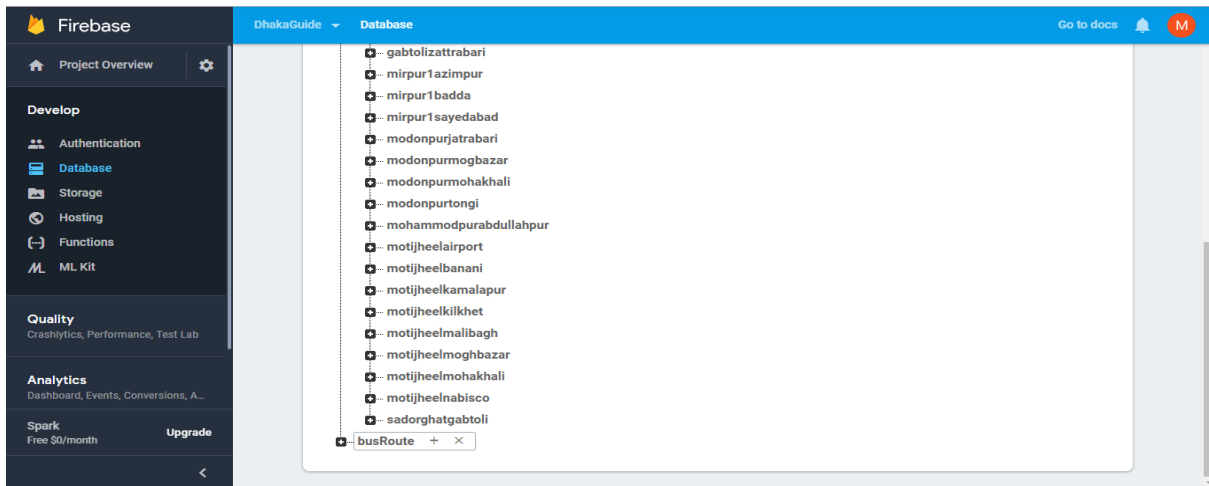


Figure 5.4: Bus Name and stands creation

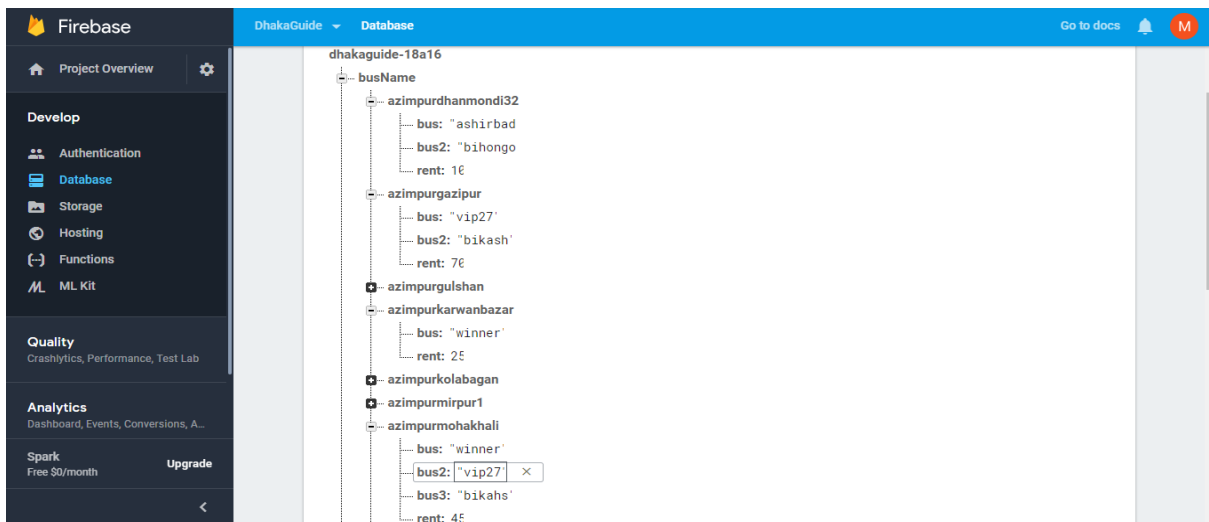


Figure 5.5: Bus Name and stands creation

Figure 5.3,5.4,5.5 shows the Bus name and bus stands creation according to the bus name and route.

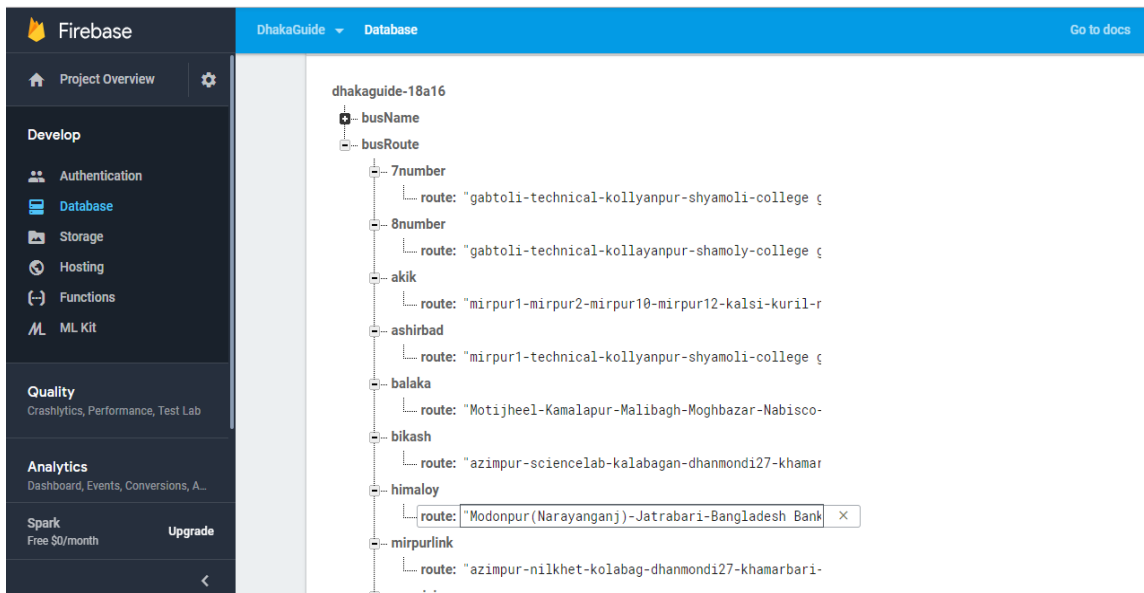


Figure 5.6: Bus Route creation

Figure 5.6 shows the bus route creation for the corresponding bus.

5.2 Implementation of Front-end Design

Only the front-end design is visible to the user. So it should affectionate to look at. It also should user friendly and easy to use. We already have said that the user of our app are the local people. At the first page of our app we arrange registration and sign in option. Figure 5.9 shows how we implement the front-end of our app.

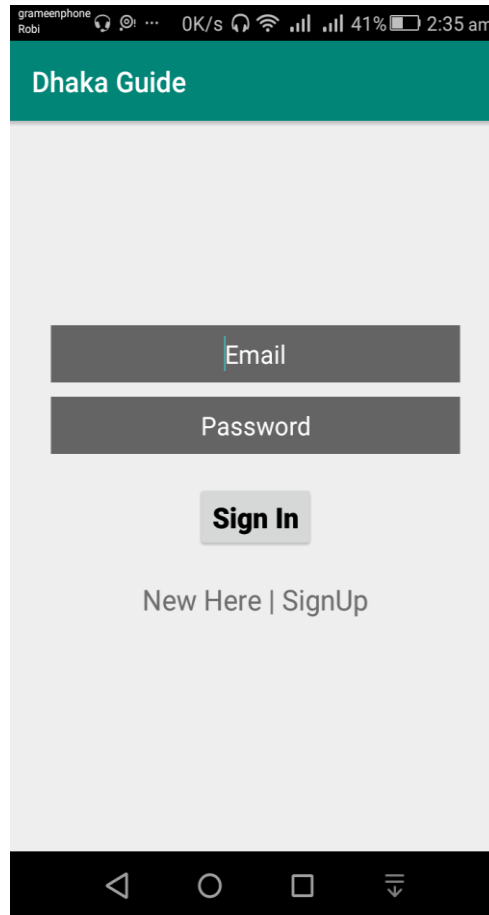


Figure 5.7: Home page

If any user wants to use our app at first he or she needs to register using register option. After clicking on the register option the following page will appear to the user. In figure we can see how a user complete the registration to use our app

User can registrar into the app by using email and password. After registration the user can sign in into the app as a traveller provide their email address and password here. Figure 5.7 shows user sign in option.

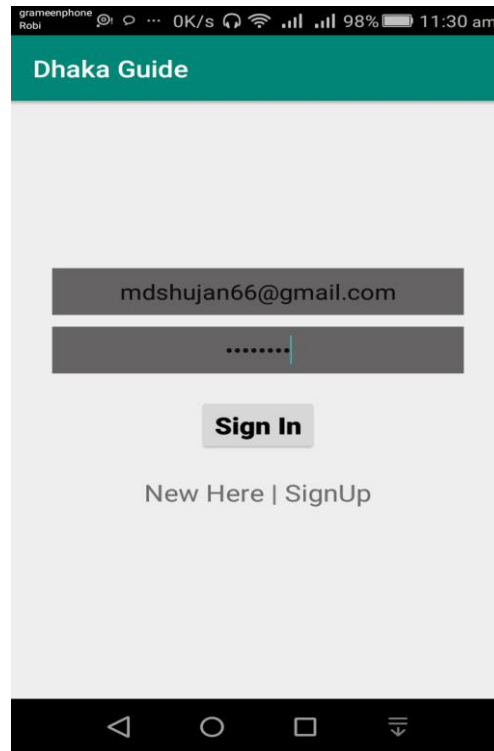


Figure 5.8 : Sign in

After login user can choose either Bus or nearby option.

Figure 5.9 shows the form that the bus and nearby option.

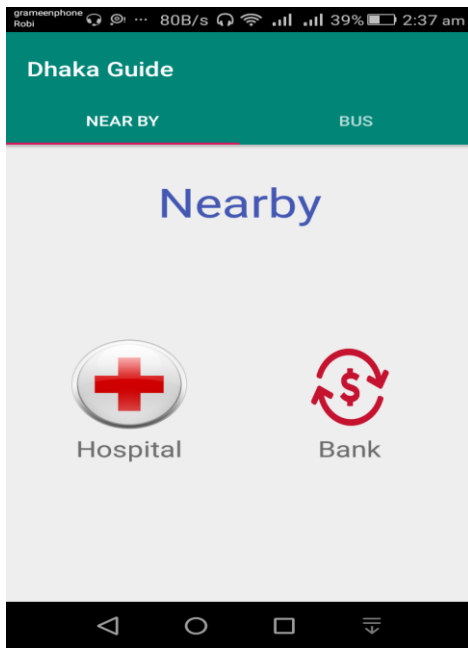


Figure 5.9: Choose Nearby

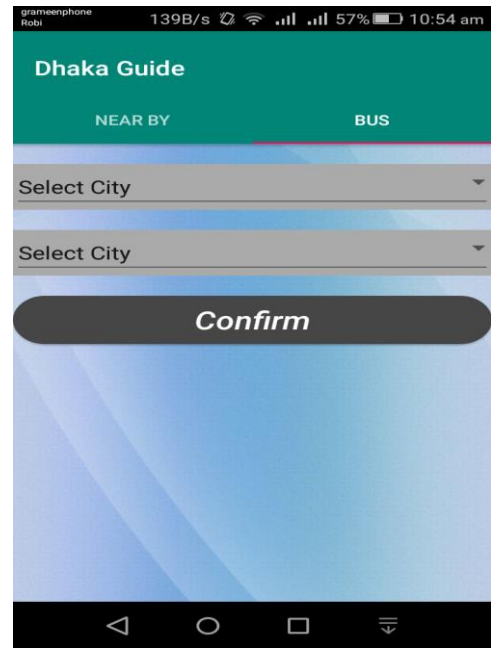


Figure 5.10: Choose bus

After selecting the starting and destination point and click on the confirm button ,then the system will shoe the suggested bus and the total fare and then after clicking on the bus name it will show the bus route as like following the figure 5.12 and 5.13.

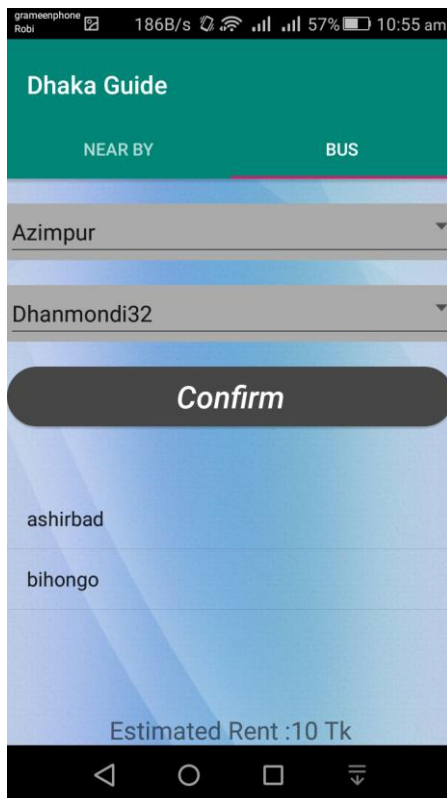


Figure 5.11: Find bus and fare

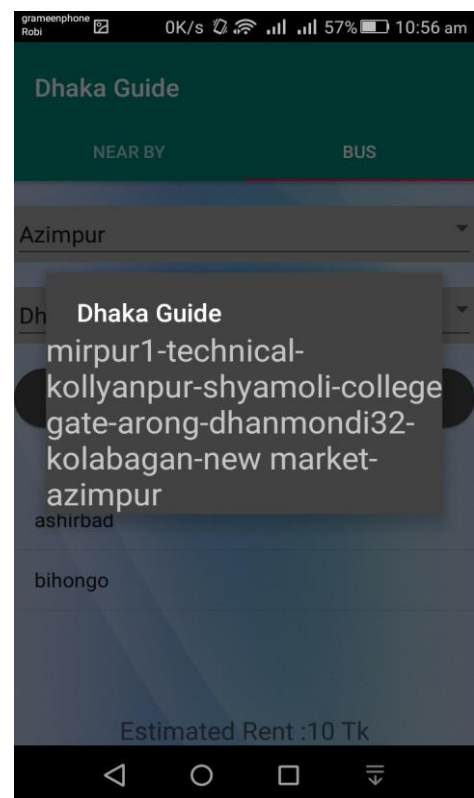


Figure 5.12: Find bus route

After choosing nearby user can select hospital or bank to find their nearest hospital and bank.

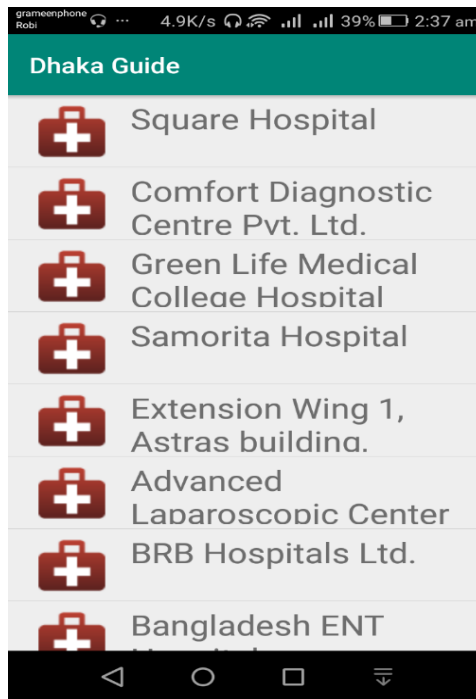


Figure 5.13: Hospital



Figure 5.14: Bank

When he selects any hospital or bank, he can see the route of the bank or hospital and also can see the distance from his current location.

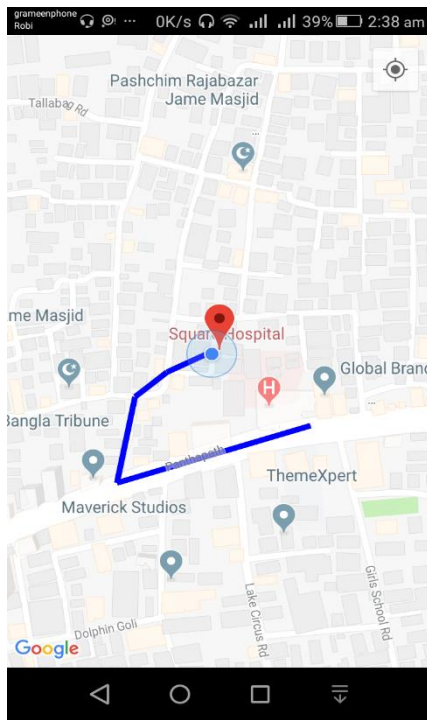


Figure 5.15: Direction of hospital

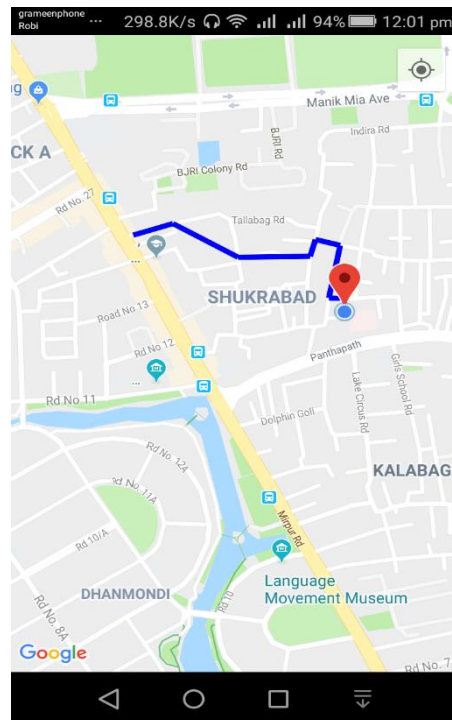


Figure 5.16: Direction of Bank

5.3 Implementation of Interaction

We implement our app for the user. Interaction makes a system attractive and popular to the user. So, it's very important to interact with the user so that it can meet up their need. To interact with the user, we try to make our app simple and easily usable. We implement our app with responsive UI for better user experience. To implement an easy interface, we use easily understandable icon, text and button option.

Our app is successfully implemented with necessary equipment that can easily interact with the user. It has an impressive interaction with the user.

5.4 Testing implementation

Our goal is to design a series of test cases that has a high likelihood of finding errors. To uncover the errors software techniques are used. This technique provides systematic guidance for designing test that.

1. Exercise the internal logic of software components and
2. Exercise the input and output domains of the program to uncover errors in program function, behavior and performance.

Table 5.1: Test case shows the following test case has been done for several time to detect errors.

S.no	Test Case Id	Test Case Name	Test Case Description	Step	Expected Result	Actual Result	Test Case Status Pass/Fail
1.	Login User	Validate Login	To verify that login id on login page	Enter the Login Email and password and click Sign in Button	Login successful or an error Message “Sign in failed” must be shown	Login Success -ful	Pass
2	Password	Validate Password	To verify that password on log in page	Enter password and log in name and click sign in button	An error message “password invalid” must be displayed	Password is invalid	Fail

5.5 Test Result and Reports:

Test Reports represent the result of the test in a formal way. Report contains the data which we evaluated in a professional and organized manner. Report describe the operating condition and shows the result with test objective. By analysing the testing report we can say whether the app is ready to use or not. In table 5.1 we describe the test case no, test case id, test case description, step of the test case, expected result and what is the actual result is and the test case status which can be pass or fail. Using these criteria we took several number of tests and got the accurate result. The accuracy is 100%. So, we can say that our app is error free and user acceptable.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

Now-a-days find a proper bus guide and nearest hospital and bank in a city is a big problem. To maintain this problem every people should have the information about bus, hospital and bank of an area. Our app is implemented to maintain that information. So, it will render a great effort to the people of an area. In the age of computer science analogy system for maintain information is an old process. People can easily find the information and travel by using their android phone. It will also save their time.

If the user fills free to use our app and accept our work in a cordial heart, then the implementation of the application will be successful.

6.2 Future Scope

We cannot implement some important feature in our app. But our exertion won't be stop. We want to add some more features that will bring benefit to the people and the government. The main field user of our app are the local people. We want to add a emergency help service from the nearest police station and the hospital for any emergency in our application. Using this helpline method people can easily get the services from the police and the hospital. We are concern to implement a feature where police can track the affected people and can easily find them.

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APPENDIX

Appendix A: Project Reflection

We started our journey from Fall 2017 to implement this android application. We tried to make a user-friendly interface of our project. The main feature of our project is to make an easy and safe travelling in Dhaka city. It's very essential to keep the information of the bus and the bus route and fare to the government. Now-a-days people are more likely to use the smartphone in their practical life. This app provides them a service in practical life. To implement this application first we build a model of our application then we implement our app step by step. After a long journey and hard work finally, we able to reach our goal. Our app provides service to the travellers. It also reduces time and give them a better solution to find a bus for their destination and also the total cost for their travelling.

We believe that our application will be a positive and effective for users.

Appendix B: Related Diagrams

To implement our proposed application at first we build a model of our app. We use some diagrams and use case model to analyse how we can implement our app. The first diagram we create the use case diagram. From the use case diagram we can know about user of our app and what is their activity in the app. In our Dhaka Guide app there is one user and that is the traveller. We also use business process model which acts a flow chart. In this section we describe the activity of the user and how they interact with the system. We implement our application using android studio and firebase. In this section we add some diagrams from the user interface and back-end. Figure A.1 shows the use case diagram.

Use Case Model:

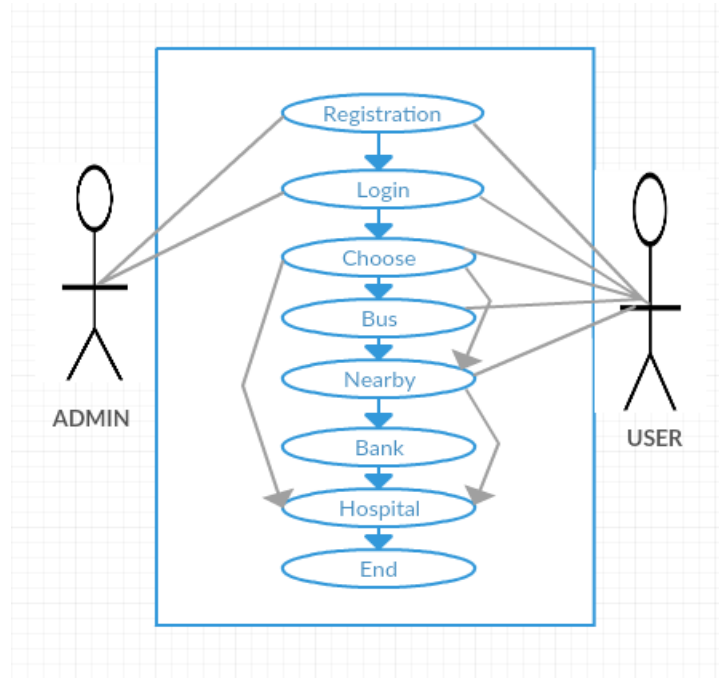


Figure A1: Use Case Model

Database:

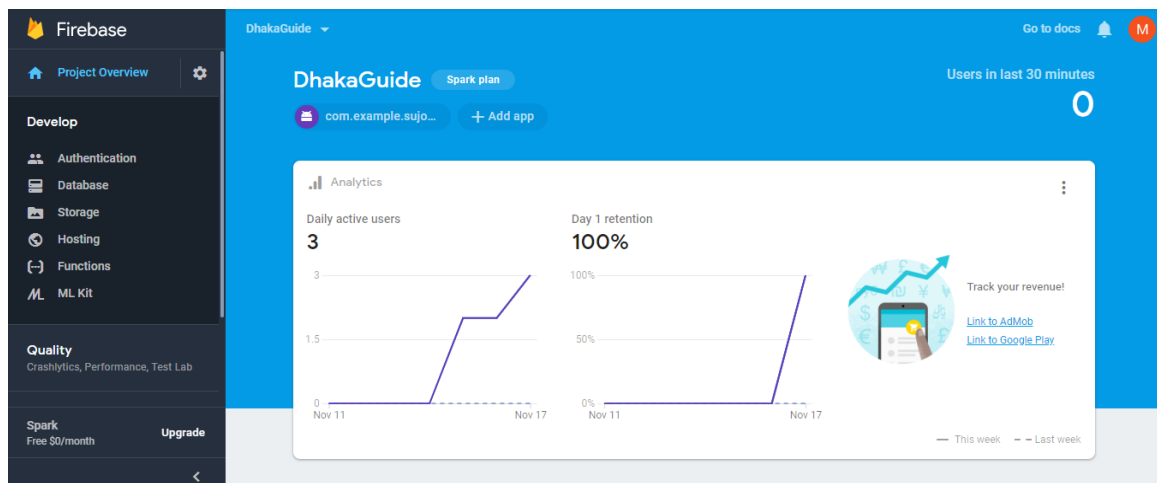


Figure A1: Database

