MOBILE-BASED RENTAL-SPACE FINDING SYSTEM FOR A BACHELOR

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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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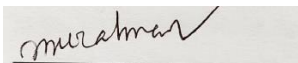Daffodil International University

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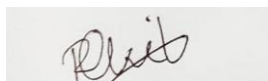## DHAKA, BANGLADESH

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of Md. Riazur Rahman, Senior 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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ABSTRACT

The goal of this android application is to help and save time and money, give security and correct information for the bachelor's to find room mate, sublet or apartment. The application lets you post your need and you can also search for your suitable ad .That you are looking for a seat or a sublet or an apartment for staying .By this ,the cost of printing ad's ,posting them outside on public walls or pillar's , we can easily find the right apartment ,with its information .thus, saving a huge time ,cost of ad printing for the bachelor's .bachelors can be students or an employee or worker ,they can all equally share this application's benefit .This contains how the android application "Mobile-Based Rental-Space Finding System for a Bachelor" work's, its feature, and the use's.

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CHAPTER 1
INTRODUCTION

This chapter illustrates an introduction of this project. Followed by motivation, objectives, expected outcome, report layout.

1.1 Introduction

Android has taken over the global market. The source code is free. it's open source. Android is very good with extension as intuitive android base portable application. Bachelors are like constant. In life there is a phase of bachelor. You have to live alone for the sake of studying or doing job or earning money by various works. You need to find a place to live while doing so. And in Bangladesh, in Dhaka you can't live with whole family, it's too costly. So, this app will let you find sublet or seat in a hostel or flat in you need to stay with its location and per month cost and additional information. Now a days almost everyone is using a smartphone. And it's not too costly to use internet either. So, this application can help every bachelor to find their much-needed place to stay as they are looking for. And for those who are in need of a roommate or a room member in their apartment, they can post it in this application, and if they find it reasonable, they can contact each and settle it. Thus, saving money, time, energy. Manually printing an advertisement for your place to be rented has many problems and time wasting with a loss of money and makes you physically exhausted. We can see in Dhaka that almost every wall, building, tea stall, grocery shop, bus, bridge, electrical pillars have ads printed on them saying "Roommate wanted". This is costly and not secure. A lot of harassment has been reported by this, fake poster or ad has scoured.

Java language, XML, Android studio, Adobe photoshop, real time database – firebase, a lot of studies different application had to searched in depth and object-oriented programming and real-time database authentication, had to be learned by completing this project

1.2 Motivation

This is a modern era. Now a days almost everyone has a smartphone and almost everyone know about internet. there is no data that isn't on the internet. almost all of our data are stored in the internet. And in Bangladesh it's not different either. To remove the hassle from finding a place for the bachelors to stay, this application which lets you find it easily. You don't have pay or spend time to put your ad's on public places. Just by a post of yours, you can do the same thing. More than 159.780 million mobile phone subscribers are in our country in 2019.And the mobile users are getting more and more and almost half of them are bachelors or young people .Either students, worker from village or employee .Not everyone can live in Dhaka with family it's too pricy .Bachelor people lives single after finding problem or can't find any place in due time. That is why "Mobile-Based Rental-Space Finding System for a Bachelor" can help a them easily find the place they are looking for and they can also post for a place that they want to rent

1.3 Objectives

The user will not have to go print out and type in computer a "TOO-LATE" ad and buy additional equipment for to publish that add .He will just simply fill up the needed information in the application and post it as ad in the application ,The user who is looking for a place to stay they can simply contact the other person. This application is going to solve a lot of hassling bachelor has to go through in order to get a roommate by end of the month, it will save their time, it will not waste energy of a person mentally and physically. "Mobile-Based Rental-Space Finding System for a Bachelor" app is very user friendly and easy to use, no complex feature than users have to go through every time, they just need to open an account to be verified and they can enjoy full length freedom from there and on.

The Objectives are:

- To Post ad for seat in an apartment/sublet.
- User to delete & edit his/her post at any time
- Search for suitable cost friendly room
- To save time, money and make life hassle free as possible
- Giving correct information with contact number
- Ensuring safety of the user

1.4 Expected Outcome

Now a days there are almost android application for anything on google play store or third-party application on the internet various sites also. The users find it hard to choose which application to use. Often the application is too complicated for the user to understand. And there are some apps which aren't that good either, that leaves the users unsatisfied. This application lets the user the freedom. It's not complex, its compact with useable features. There isn't any similar app that is rich in feature as "Mobile-Based Rental-Space Finding System for a Bachelor" application. The user will find it helpful in his/her everyday life. "Mobile-Based Rental-Space Finding System for a Bachelor" will help its user to find suitable place for his/her demand. they can post about their place to be rented or not. They can edit their information. they will certainly be happy and will be glad to have this application.

1.5 Report Layout

The report is consisting of six chapter's, given blow:

- The chapter 1 is describing the introduction, objective, motivation, expected result, methodology of this project.
- The chapter 2 is about the project background and the project overview, information about related work, scope of the problem, project challenges.
- The chapter 3 is contains the requirement and specification of the project.
- The chapter 4 described the design specification, front-end design, backend design, user-interface designs.
- The chapter 5 is contains about the Implementation and Testing of the project.
- The chapter 6 contains conclusion and future scope.

CHAPTER 2
BACKGROUND

2.1 Introduction

The use of mobile phone started in general back in 2000's. First the mobile was unable to what we are doing right now. As the time moved on the technology got bigger and better. And the internet is connected to almost every end-device's now a days. From your personal computer to smart hand watch. The most rapid change was in mobile phone. With 3.2 billion smartphone users worldwide and a global population of about 7.7 billion, the global smartphone penetration has reached 41.5 percent. And in Bangladesh it's no new news. Dhaka and the municipalities that make up the Greater Dhaka Area have a total population of over 18 million, and the city has shown a population growth of about 4.2% annually. Almost everyone has one smartphone with increase of smartphone the android application has also taken over the technology field. And a large number of populations that comes to cities are bachelors. Bachelor users as well as non-bachelor can both give rent and look for a place to stay or find sublet or apartment easily. Users can use it for free, no charge needed for posting ad.

2.2 Some Other Projects Works

There aren't any applications exactly similar to this application. There is some application that are for different countries, not in ours. There is some application on google play store that are poor in feature's and lack user friendly User interface. I have taken good look into them and studied to develop the features that will be suitable for our country people to use. Most of them are one-star rating and bad reviews. While working and collecting resources for "Mobile-Based Rental-Space Finding System for a Bachelor", found that there isn't any application in our country that is dynamic and provides real time database facility and correct information. Most of the application did not have the feature that let user post ad.

2.3 Scope of the Problem

People who are new to smartphones can find it to use. this application is unique in its own way, it lets you post, search, updating your user profile. can change the information later by editing option in the application.51% people in Bangladesh using smartphone in 2019. This application has new and unique features compared to the other applications on the google play store. Its faster and provides safety and it won't store personal information for later if any user requests to delete their account.

2.4 Challenges

I faced a lot of challenges and block is the process of completing this project but thank you Allah for the strength and patience I was given to overcome these challenges. This application has overcome these challenges in order to come better in giving services:

1.Maintaining proper database and uploading data into database

2.Overcoming spamming

3.Must register first in order to use the application

4.To Maintain simplicity

5.Getting data from database and displaying them to users.

CHAPTER 3

REQUIREMENT AND SPECIFICATION

3.1 Introduction

"Mobile-Based Rental-Space Finding System for a Bachelor" is an android application that lets the user to find available bachelor apartments, sublets with ease. In this chapter we will see what will be needed to complete the proposed android application.

3.2 System Requirement

We need a minimum amount of system requirement to build this android application. we can't not make this without having proper system requirements' requirements are given below:

Software

▪ Windows Operating System (10/8.1/7)

Windows operating system 10 is the successor of windows operating system 8.1. Microsoft as a component of its Windows NT group of frameworks. And windows operating system is user friendly, you can get it free downloaded from the internet. Windows 10 gets regular updates and which the users can enjoy for free. Most used computer operating system is the windows operating system. Recently they shut down windows XP and windows 7.to give users better performance windows 10 is the latest in Microsoft.

▪ Android Studio

Android studio is the IDE for making the android application. It's a heavy software.it compilers codes then it has its own emulator to run that application code in real time. It is Google's Android working framework, based on JetBrains' IntelliJ IDEA programming and planned explicitly for Android development.

▪ Internet browsers (Internet Explorer/Firefox/Chrome)

Internet browsers are the way we can surf the internet. We can upload and send data through various internet browsers. Every file, web page in the internet has a unique URL (Uniform Resource Locator). Thus, making it possible to get data on the end devices or gadgets.

▪ Programming language (Java)

Java is the official language to write code for an android application and supported by android studio. Kotlin was recently use introduced as secondary official language for android development. I have used java language here. java applications are   aggregated to bytecode that can keep running on any Java virtual machine JVM (Java virtual machine). Java compiler converts the Java code into byte code (.class file) and these byte codes are then run by Java Virtual Machine. When this byte codes are executed, the JVM can take care of the security. So, java is more secure than other programming languages.

▪ Firebase

The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON and synchronized in real-time to every connected client. Building cross-platform apps with Android, clients share one Realtime Database instance and automatically receive updates with the newest data. Performance is, as with any large data app, only as good as your implementation. This application is a real-time application thus we are using Firebase as our data base.

3.3 Use Case Model
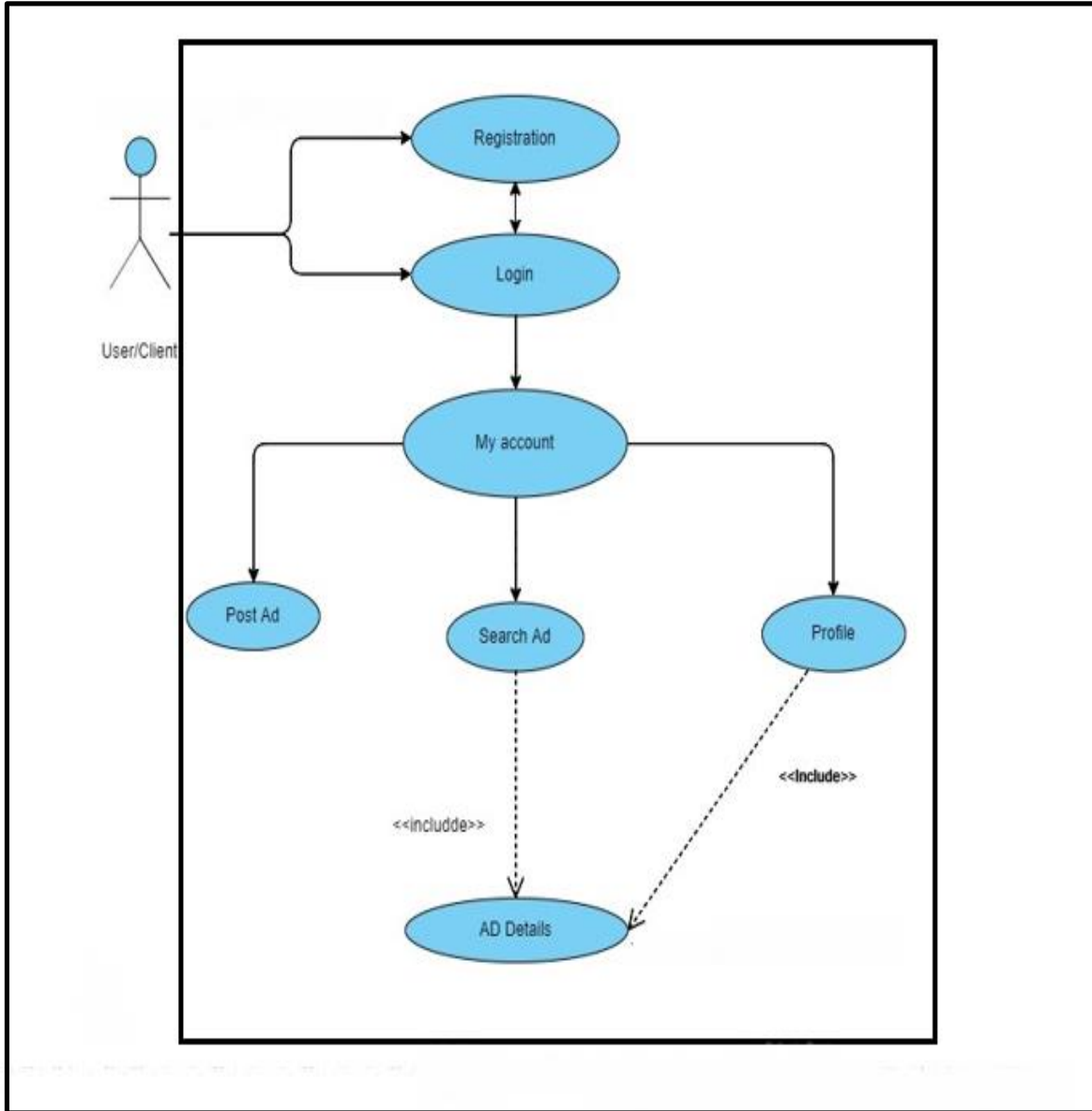
Figure 3.3.1 Use case model

3.4 Use Case Description

The Figure 3.3.1, description is given below and Pre-conditions and post conditions of an action performed are explained in use case description.

Table 3.1 Use case description of Login

Use case	Login
Primary Actor	User
Secondary Actor	Server
Pre-condition	Registration
Scenario	Enter E-mail Enter Password
Post-condition	Success or Failed

Table 3.2: Use case description of Registration

Use case	Registration
Primary Actor	User
Secondary Actor	Server
Pre-condition	NULL
Scenario	Enter Username Enter E-mail Enter Password Enter Re-Enter Password Enter Number
Post-condition	Success or Registration failed

Table 3.3: Use case description of Profile

Use case	Profile
Primary Actor	User
Secondary Actor	Server
Pre-condition	Login
Scenario	Upload Profile Image Edit Post Delete Post
Post-condition	Uploaded or Failed

Table 3.4: Use case description of Post Ad

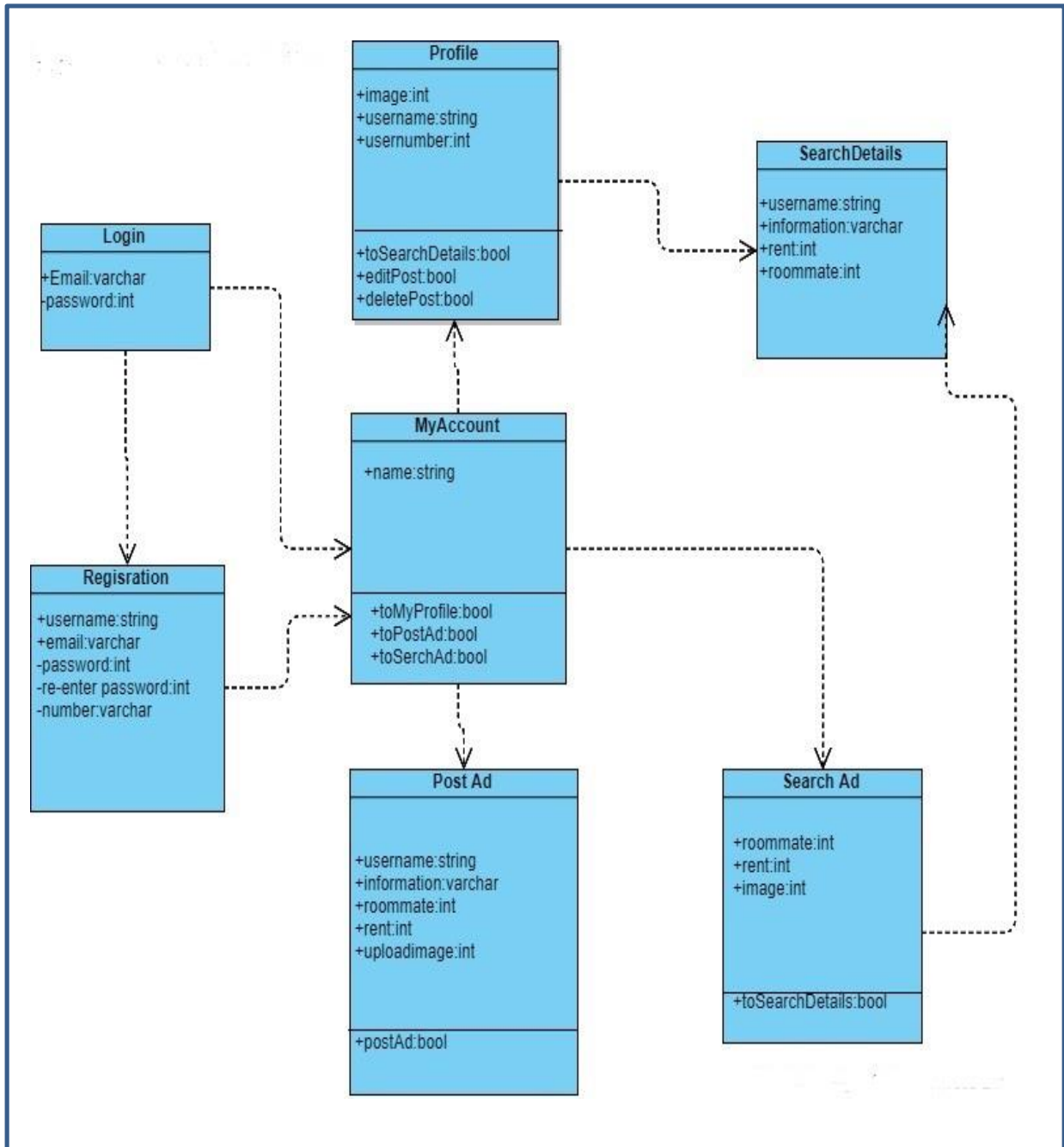| Use case	Post Ad
Primary Actor	User
Secondary Actor	NULL
Pre-condition	Login
Scenario	Enter Username Enter Information Enter Needed Room Mate Number Enter Rent/Cost Upload Image Post Ad
Post-condition	Success or Registration failed

3.5 Class Diagram

Figure 3.5.1: Class diagrams

3.6 Design Requirement

In order to make this app dynamic and user friendly and not complicated for the user ,because this application has a lot of features .User might get confused and bored ,so the design had to be simple yet attractive enough to the user to have fun and like the application .Because ,the more user enjoys the application they will use it more .The design had to focused on based these given below feature and to develop them in the future.

▪ This application will give you most useful feature, you post, search, edit post, edit profile, delete Ads.

▪ The user must Register first and login

▪ User will set up his/her own profile picture and phone number

▪ User can Search for another ad

▪ User can Post Ad's

▪ User can   Edit and Delete the his/her Post

CHAPTER 4
DESIGN SPECIFICATION

4.1 Front-end Design

This is the graphical user interface, that connects the user and the application. The user can connect to database by login and posting ad, one user can both search and post ad from same account. The front-end design ensures that. To achieve this user interface design in front end of the application I have used XML, Adobe Photoshop, Adobe XD.

▪XML (Extensible Markup Language)

It's a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. This is really easy to use and there are a lot features we can implement in android project. This is really one of the best ways to build a project and giving it a look. For the buttons, textviews, Imageviews, background transparent effect circular image xml is used in this project.

▪ Adobe Photoshop

Adobe photoshop is graphic based software by Adobe INC. Both Windows OS and MAC can use this graphical software. This software is heavily used for image editing and making logos. Adobe photoshop has 3d image making option also and its used in rendering also. this is worldwide popular. For making the "Mobile-Based Rental-Space Finding System for a Bachelor" logo, I have used adobe photoshop to make the logo as well as possible.

▪ Adobe Xd(Experience Design)

Adobe INC's another product for the android developers can use. This adobe xd stands for adobe Experience Design. This is very easy and fast .it lets you design

If you can join coding systems for develop app in XD it is be a very useful software for app developers. Because beautiful design in android studio or XML file is not possible. We can convert the files design files into the android studio Xml file to use the designs from adobe Xd.

4.2 Back-end Design

 As we have used some heavy and compact software to build the user interface now, we must code do make them work. And in order to build up back-end design for this android project I have used the IDE Android Studio, java programing language. And for the database. Firebase has been used in this project. But unlike the front-end design the back-end design is not visible to user. It works behind the scene. We have used here, android studio, java language, firebase.

▪ Android studio
Android studio is the IDE for making the android application. It's a heavy software.it compilers codes then it has its own emulator to run that application code in real time. It is Google's Android working framework, based on JetBrains' IntelliJ IDEA programming and planned explicitly for Android development. Android studio lets us code in java language to build the feature and connects the activities, fragments, recycler views, images, connecting with data base etc. we do all the work in this IDE by the java language. Kotlin is another secondary official language of android studio can use. But I have used java as the programming language for this project. The emulator built in the IDE gives real time feedback on the application.

▪ Java

Java is the official language to write code for an android application and supported by android studio. Kotlin was recently use introduced as secondary official language for android development. I have used java language here. Java is object-oriented programming language. All the programming in his project is done by this language only. Connecting to database, making adapters, fetching and retrieving data from database are all in by this language in android studio for this project. Java is one first programming languages and it's still one for the top three programming language today.

▪ Firebase

The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON and synchronized in real-time to every connected client. Building cross-platform apps with Android, clients share one Realtime Database instance and automatically receive updates with the newest data.

▪ Android SDK Android Software Development Kit)

Android software development is the process by which new applications are created for devices running the Android operating system. Recently google stated that now Android applications can be written in java, Katlin and C++ by the help of android SDK. This SDK contains:

- Required libraries
- Debugger
- An emulator
- Relevant documentation for the Android application program interfaces
- Sample source code

▪ Emulator

Android virtual device (AVD) is known as the Emulator and developer using this for emulating any kinds of android application or project. It helps developers to test his application in his personal computer. This gives instant feedback on your work. If we want, we can also use our smartphones which runs android, connect it to the emulator and the emulator will not run instead on our won phone will work as an emulator. Comparing the android studio emulator, the device is faster and gives developer more fast response.

4.3 Interaction Design and UX

Interaction design is very important for User Experience, because it connects the humans to the machines. The user needs to feel comfortable while using the system through the user interface. User can easily get touch with the system by this application very interactive user interface.

4.4 Access Permission

- Required local storage access for uploading images
- Access to contacts
- Access to use internet

4.5 Registration Page Design

Firstly, you need to open and account to use the application, you need to fill up the required fields by providing current information's.

Figure 4.2.1: Registration page design

4.6 Login page Design

You have to get into the application by providing the Email and password. then the user can communicate with other users and the application itself.
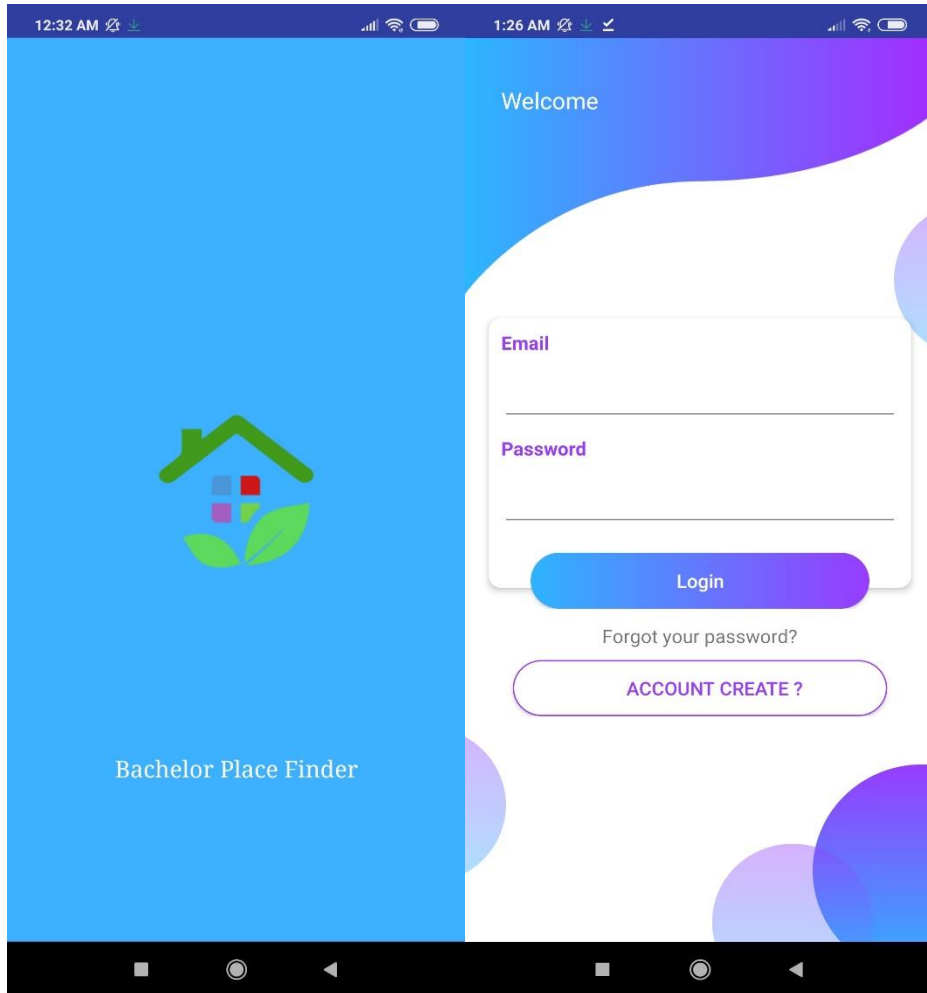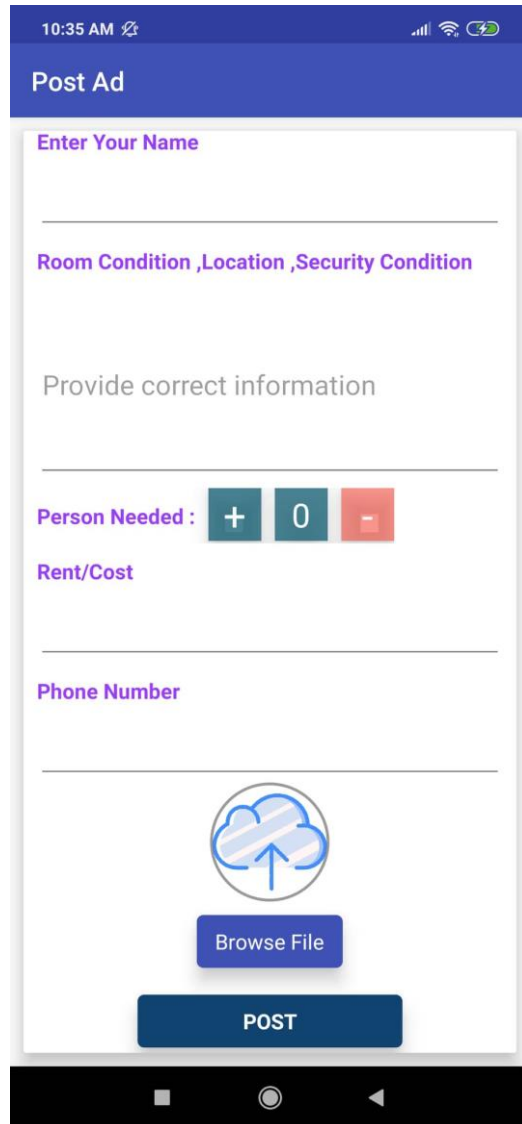

Figure 4.2.2: Login page design

4.7 Post Ad Design

User can post ad by filling up the information. User have to give out the location of the place, its condition, a picture of the room.

Figure 4.2.3: Post ad page design

4.8 Edit and Delete Ad Design

User can manage his/her posted ad from their profile. They can update their post information and also can delete them.

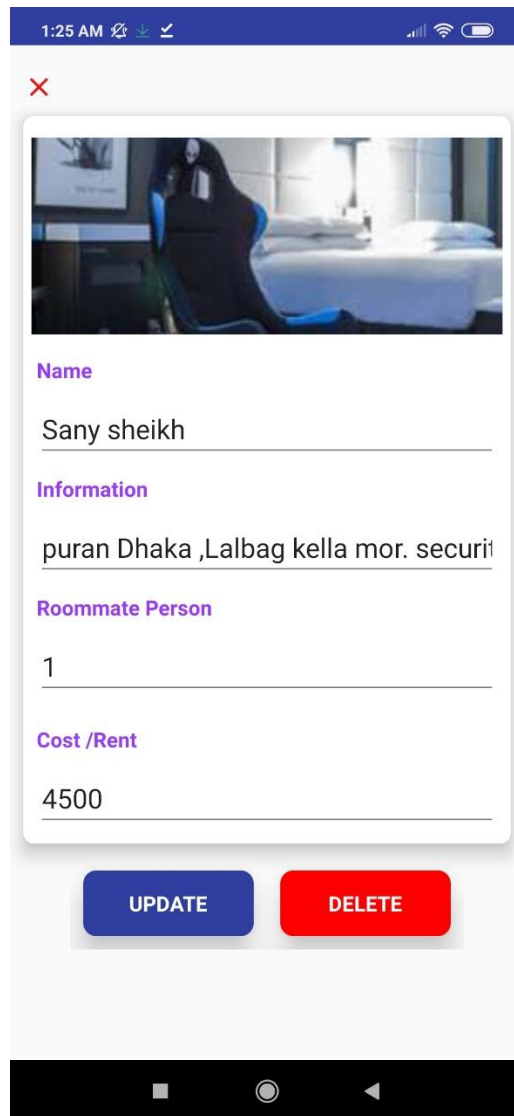Figure 4.2.4: Edit page design

Edith page and in delete page, user can update his/her given information to their needs and can save them for other users to see that ad.
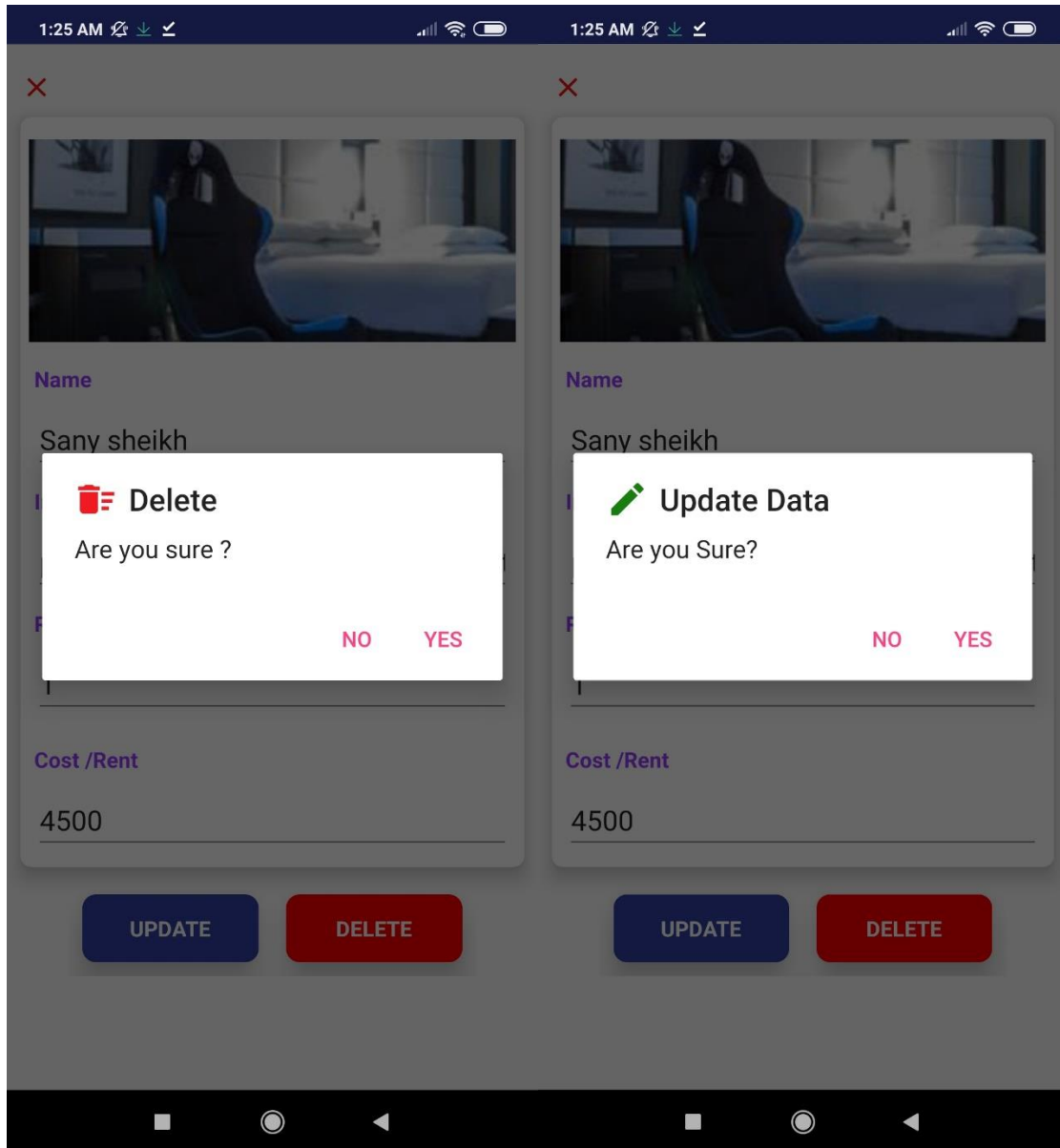
Figure 4.2.5: Edit page design

4.9 Search Ad Design

User can find suitable ad from the search list containing numerous ads posted by other users and can also connect them for renting the seat.
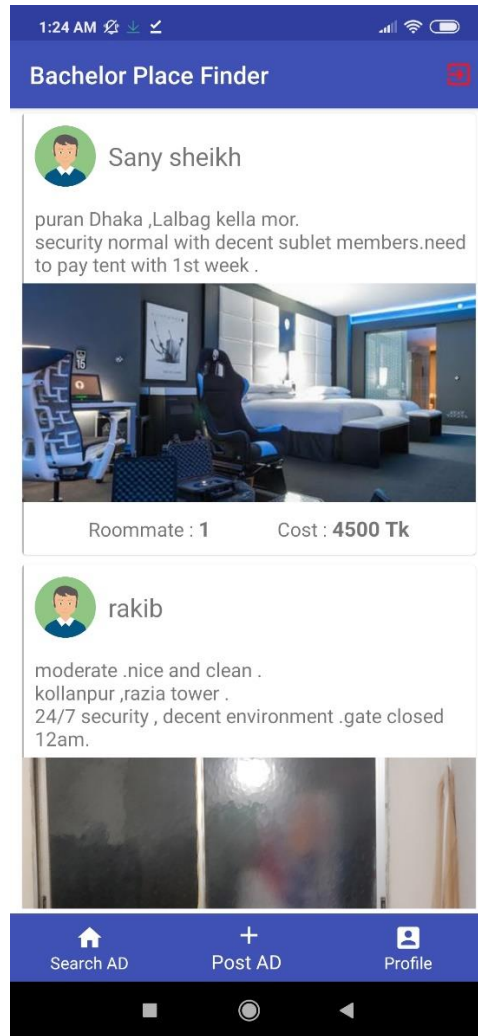
Figure 4.2.6: Ads search design

4.10 My Account Design

This is where User can go their profile, post ad and search ad activity and can update profile, post ad or look for ads.
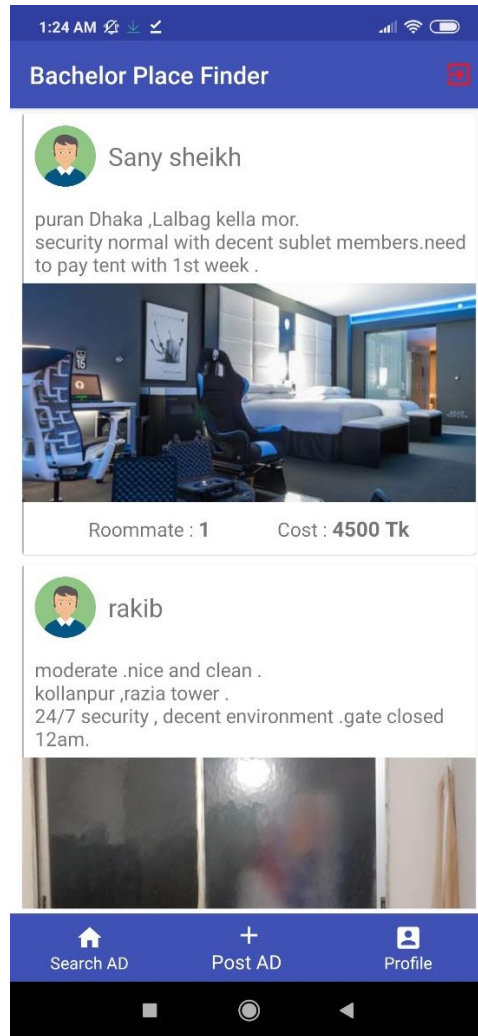
Figure 4.2.7: My Account design

4.11 Ad Details Design

Ad details shows the information of a posted ad on the application from their database. Letting user to see the full details of their search.
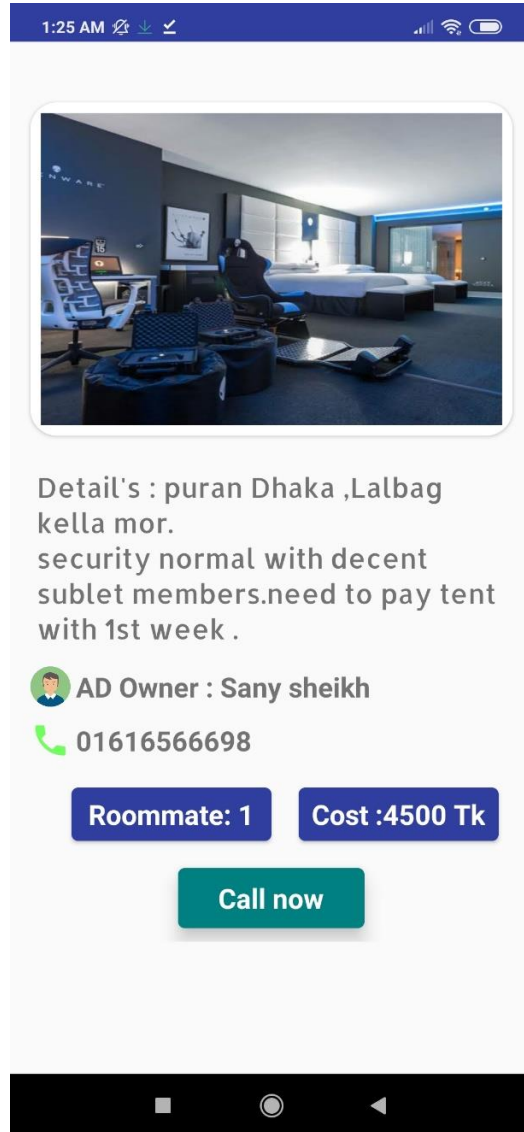
Figure 4.2.8: Ad Details design

4.12 Logout and Forget password

User can logout of their account and they can also request for a new password, if they forget their password. The password reset link will be sent to their e-mail account.

Figure 4.2.9: Logout and Password Reset

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Database Implementation

Every database is not same. each has its own unique feature to be recognize with. The database I have implemented in this project is Firebase. Why? Because its relatively fast and its real time database. Implementation of data base are not same. Fire base is mobile platform of google and android is a product of google. By using firebase, we can monitor Crash report, we can store an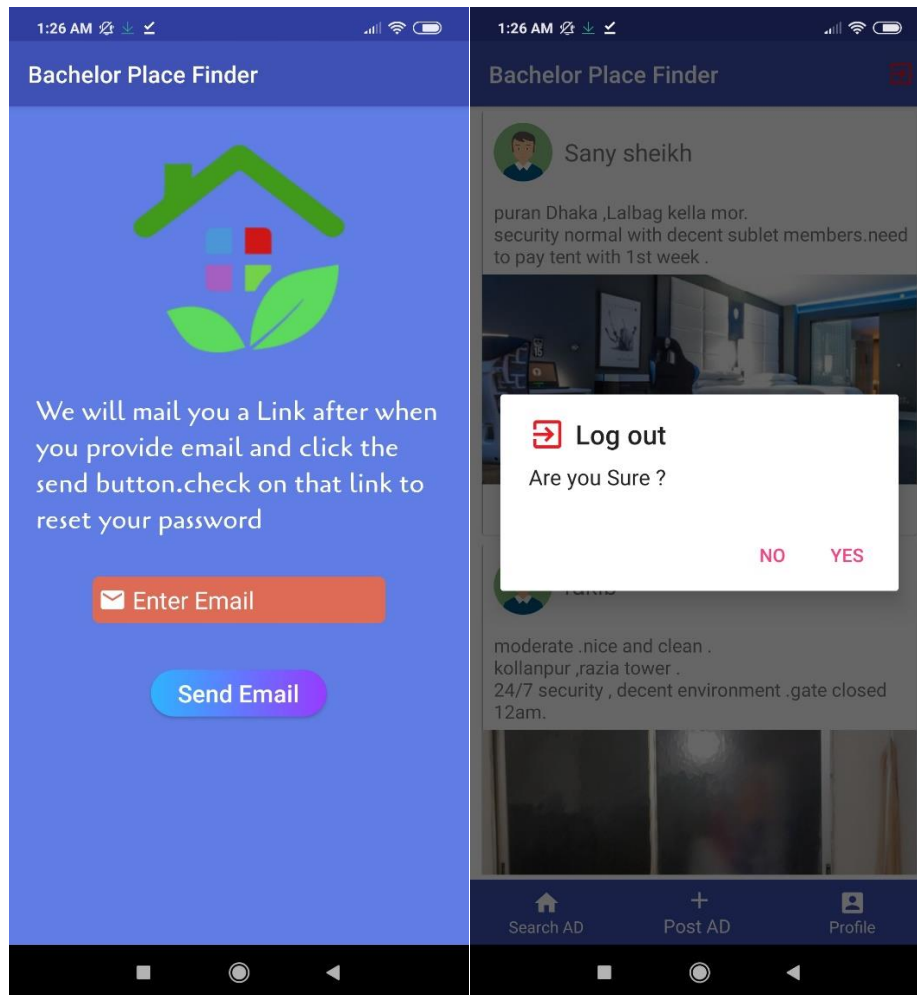d sync app data in real-time. File storing is easy in firebase. Why not using other data base because we need, interface for client-based users to access data and database structure that manages and stores the data on the server.

To store our data firebase is used. Firebase provides real time data to user. MySQL server do not provide real time data and it's not suitable for this project because we need real time data fetched from server. The initial data cloud captured new data directly on existing data imported from DBMS.

5.2 Database Design

In this application I have used firebase database as database manger .in database, accounts and posts Childs are created for posting ad and opening new account from there the application will take data and will functions as programmed. There is database for smaller data and storage for storing large data. Application needs to be refreshed because it using real time database. MySQL is not used here because it does not provide real time data base. MySQL is an open-source social database the executive's framework (RDBMS). Its name is a blend of "My", the name of prime supporter Michael Widenius' daughter and "SQL", the shortened form for Structured Query Language. But MySQL does not provide real time data base.

We, the developers and designer determine what data must be stored and how the data elements interrelate. With the information, we developers and designers can select which

of the data will be sent and to be received from database model. For making a database design we must classify the data and identify interrelationships.

5.3 Implementation of Requirements

▪ Maximum number of post's should be monitored

▪ Invalid data input error

▪ Database should be Real time database (Firebase)

▪ when input fields are empty, need to fill up should be shown

▪ Invalid data input will not be granted

▪ UI design is made from Adobe XD and XML combined then integrate into android studio.

5.4 Implementation of Interactions

The "Mobile-Based Rental-Space Finding System for a Bachelor" app is user friendly. I have used only email verification with password. The user can take full control of the app and its feature as long as they have this account and logged in, they can easily surf through the ad notifications and post ad. Also, able modify their profile picture and delete and edit their posts. This feature makes this application most user friendly and wants you make browse more ads as well as to see full application feature. When people download an app from google play store or other third-party android apk file, if it is not interactive enough, they do not feel to engage in that app. Even high rating applications have few users. Rich in future and contents but the user inter face is complicated and not user-friendly enough to the user. We have to think about what normal people would want the most. Then work on the design that is able draw their attention to interact with the app.

5.5 Testing Implementation

Table 5.4: Testing Implementation

Test Cases	Test Inputs	Expected Outcome	Obtained Outcome	Pass/Fail	Tested on
1.Registration	Register via android device	Successful	Successful	Pass	**21-10-19**
1.Login	Login via android devices	Successfully Logged in	Successfully Logged in	Pass	**21-10-19**
3.Post Ad	Post via android device	Successfully Posted ad	Successfully Posted ad	Pass	**21-10-19**
4.Edit Ad	Edit Ad via android device	Successfully Edited ad	Successfully Edited ad	Pass	**21-10-19**
5.Delete Ad	Delete ad via android device	Successfully Deleted ad	Successfully Deleted ad	Pass	**21-10-19**

Figure 5.4.1: Testing table

5.6 Test Result and Report

This test for the app was successful.it had to go through many tests. Every project must have some sort of result as an output. We have got all positive results. The user gets the desired result through all the testing. From logging in the account to deleting the post, editing post, updating image and finding post. All the has been successfully done. upon this test result it is clear that the application has. While testing this application, the most difficult part was retrieving different data from database for different user .and it was done correctly and the test result are all pass.it is functional application ready to be used and serve.

▪ Time and hassle-free application feature and more user-friendly UI.

▪ Real time data base is used so it's more efficient than MySQL.

▪ Posting and editing posts are easier

▪ The system easier to use. Better UI for interaction.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

Bangladesh is developing a country and with passing time more people from country sides are heading towards big cities for livelihood, education, jobs etc. as result the big city population is increasing. They can find and contact the ad publisher to find staying place. People need to move from one area to another area can also be helpful by this application.

6.2 Further Development Scope

For now, the application will work in Dhaka city as it is the capital of Bangladesh and everyday more and more people are coming to Dhaka for various reasons. Currently "Mobile-Based Rental-Space Finding System for a Bachelor" only has one field for only, that is finding place for staying, in future we can add more fields into this. Map route to the destination.

now, the application is limited to its feature but can be upgraded in future, such as:
• No spamming possibilities
• Security more powerful
• Bachelor life other field implementation's, like: Finding Tuition, finding part time jobs.
• Google Maps implementation on each Ad posted with route and directions.
• Banning spammer and fake post user, dummy user, inactive user.

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APPENDECIES

Acronyms

JSP = Java Server Pages

JVM=Java Virtual Machine

URL=Universal Resource Locator

JPA = Java Persistence API

SQL=Structured Query Language

DBMS = Database Management System

DDF= Data Flow Diagram

UI= User Interface

IDE=integrated development environment

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