AN ANDROID BASED APPLICATION "HomeSeek – Buy, Sell and Rent"

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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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DHAKA, BANGLADESH

APPROVAL

This Project/internship titled **"HomeSeek – Buy, Sell and Rent"**, submitted by Istiaque Ahmed, ID No: 163-15-8452, and Shinthiya Nowsain Promi, ID No: 163-15-8457 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on October 8, 2020.

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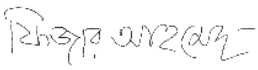

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Declaration

We hereby declare that, this project has been done by us under the supervision of **Md. Jueal Mia, Senior Lecturer, Department of CSE,** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted anywhere else for any award or for any kind of degree or diploma.

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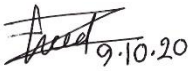

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Last but not the least, we deeply acknowledge the constant support and patience of our respected parents.

ABSTRACT

Our project named “HomeSeek – Buy, Sell and Rent”, is an Android and Web Application for buying, selling, and renting properties. Our application provides two separate accounts for both the buyer and the renter. There is also an admin panel that controls all the functionalities. The application contains some features like login, registration, rating, live chatting, listing/adding properties etc. This app compresses the entire property hunting process that people has to go into just a few steps. The buyers and renters can scout the properties details and get in touch with the seller far faster than normal. At the same time, sellers can predict the market conditions and therefore save management costs and be more informed about future real estate investments. Our application will make it easier and faster for renters to rent, buyers to rent as well as sellers to sell their properties.

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INTRODUCTION

1.1 Introduction

At present, there are a lot of issues about finding a place either to live or to as an office. As Bangladesh is densely populated, we can't really find a suitable place that easily. We have to visit each and every location and the properties to verify whether we want it or not. This is very time consuming as well as confusing.

In Bangladesh, buying and renting is a very hectic thing to do. People have to visit property to property in various areas in search of a suitable home or an office. Sometimes, after a long day of searching, they still cannot find a desirable place. Even if they do, that place might not be in their preferred area, or it is out of their budget. Either way, the renters and buyers have to go through and unnecessarily long and exhausting experience to find the right property, and sellers face an unpredictable market as a result.

In order to solve this problem, we need to think in a less complex and more resourceful way. Everything is available on the internet nowadays. We can save more time and be less confused about choosing property by our application. People can book a rental or buy/sell properties on this app just by sitting at their home.

1.2 Motivation

Many potential renters, buyers and sellers are in need of a more streamlined process that doesn't cost much time, effort or money. But in the current market situation, people need tom hire a middleman for a hefty price. This middleman can act as a mediator between buyers or renters and the seller. But a single middleman won't have the time to properly show the property to the buyers and sellers. Our motivation for creating this app was to compresses this process into a simple and short yet informative and free experience.

1.3 Objectives

The Objective of us creating this app is to make the process of renting, buying and selling property easier, less long and basically free. In the current market, the customers aren't able to check all the details of a property before visiting in person. This cost's both money and time. If the customer doesn't end up buying or renting the proper, then the money and time spent goes to waste. But our app will make it possible for customers to see the details and images of properties that match their criteria before vising in person.

The key objects of the project are as follows:

1. Bringing hectic property hunting situation into an online platform.
2. Saving time and money of customers.
3. Strengthen the relationship between owner and renter.

1.4 Expected Outcome

We expect our app to have a considerable impact on the market. The app would likely make the process of renting, buying and selling property more fast-paced and inexpensive. This will make the market more competitive and as a result, the prices of property will drop and the abundance of property within the market will increase. The lower prices and higher abundance will benefit the buyers and renters as they will have more options and better flexibility in their budget. But the sellers will also benefit from an influx of more customers.

1.5 Report Layout

In this Chapter 1: We discussed basic concept of 'HomeSeek- Buy, Sell and Rent'. We covered introduction, motivation, objective, expected outcome and project management and finance.

In Chapter 2: We will discuss background of our application. We will try to cover Preliminaries, Related work, Challenge, Problem etc.

In Chapter 3: We will discuss 'Requirement specification' of this application.

In Chapter 4: We will discuss 'Design Specification' of this application.

In Chapter 5: We will discuss ‘Implementation and Testing’ of this application.

In Chapter 6: We will discuss about Impact on society, Environment and Sustainability.

In final Chapter 7: We will discuss about conclusion and our future scope, limitation. Improvement and conclusion of our project.

CHAPTER-02

BACKGROUND

2.1 Preliminaries

Bangladesh is now a digital country. Bangladesh is rapidly digitizing as it has to become a modern nation in order to trade with other nations. Right now, most people in our country are using android devices and the internet. People are now heavily reliant on the internet and consequently, their phones for most tasks. As a result, android apps are the most common form of app used by Bangladeshi people. Due to the popularity as well as the ease of use, android is the best way to reach a wide userbase.

2.2 Related Works

There are many kinds of Android apps in Google Play Store (like: No Broker, Property Finder, RoofandFloor etc.) but our application will be used for buying, renting as well as selling purposes. Many property/real estate apps are used globally nowadays but our app is different. Basically, our application provides buying, selling, and renting, all three of these services at once, whereas other apps only provide one or two. This app will help the property/house owner and the customer/renter. Our application will also make the process of renting or selling property completely free and much.

Some related working sites are discussed below:

2.2.1 No Broker

It is a very popular android application in India. No Broker is a real estate app based in Bangalore that works as a bridge between the owner of real estate and the tenants and sellers. It is a free app with no charge for accessing its services. [7].

Advantages:

No Broker has a lot of features. They provide rent paying service, moving service, residential and commercial plan for users, rental agreement, and they also have a different service for the NRI's.

Disadvantages:

As this application has a lot of features and advantages, it also has some disadvantages. No Broker is only available for Indian locations. They do not provide services outside India. Another disadvantage would be this app opens URLs inside the app which might not be a very good user experience.

2.2.2 Property Finder

Property Finder is a Middle-East based property finder app. The app helps people from some middle-eastern countries find rentable and buyable property from a wide-variety of properties. [8].

Advantages:

This app has a wide range of properties. They have verified brokers and their lister properties. The whole application is very organized and color coordinated which leaves a very nice impression.

Disadvantages:

The biggest disadvantage of Property Finder is their limitation of locations. This app has only five or six countries as option. The images it contains take a lot of time to load. It also has very few options for users.

2.2.3 RoofandFloor

RoofandFloor is a home finding app that is focused solely on residential property. It helps people find a home. [9]

Advantages:

RoofandFloor application has a wide variety of property options available as the number of available properties of considerably large. The app is user friendly and the app also hosts trustworthy brokers.

Disadvantages:

The app takes a lot of time to load the properties. Another disadvantage is that the app only caters to Indian property buyers and has no customers in any other region. But perhaps the biggest flaw of this application is that the app's property options are solely meant for a upper middle-class and above.

A comparative study between those related works are given in a table below –

Features	Home Seek	NoBroker	Property FInder	RoofandFloor
Support Large System	√	√	X	X
Support Web	√	√	√	X
Cover Every thing	√	X	X	X
Free Version	√	√	√	√
Communication system	√	X	X	X

Table2.2: Comparison between related Works.

2.3 Comparative Studies

There are many types of apps in the world that deal with property transaction. Many of these apps are free and help people with renting, buying and selling property. But we still don't have any major app in Bangladesh that does something similar. That is why we have made this app to be the first in Bangladesh to perform the same tasks that other foreign real-estate or property exchange apps perform. This app will make the process of exchanging property more inclusive, efficient and cheap for our country's citizens.

2.4 Scope of the Problem

First, we tried to make a unique app. While our idea for this app isn't anything new, it is certainly a novel idea in the property market of Bangladesh. We did face some challenges in the development of this app. First of all, we visited various areas to scout property prices and abundance. We met with the property owners and their renters as well for this reason. We decided what features we should include based on our research. But creating a complex web of features for this app was a difficult challenge. This also led to a large number of errors on our part. Eventually, we overcame these issues and created a stable application.

2.5 Challenges

We faced many challenges in the development of this app. Such as, many property owners were hesitant to reveal their property details and images into a novel app. Many of the property owners and their customers were also hesitant to disclose their personal information where other users of the app could check their background. Gaining the trust of the users was the hardest part of the whole development process.

In our research we found that disclosing the renting or purchasing history of a user could lead to said user being disproportionately excluded from a list of potential customers, by property owners.

We tweaked our features to ensure that only the information a user wants to make public, can be seen by others. So, the privacy of our users is guaranteed surely.

CHAPTER-03

REQUEREMENT SPECIFICATION

3.1 Business Process Modeling

This project holds the model for "**HomeSeek – Buy, Sell, and Rent**". This model provides a good look at the project. This application will be available for both the owner and the renter/tenant. It is unique in comparison to other property apps in Bangladesh. The business process model provides the breakdown of the framework, design and the deployment of the application. The following figure 3.1 shows the BPM of our application.

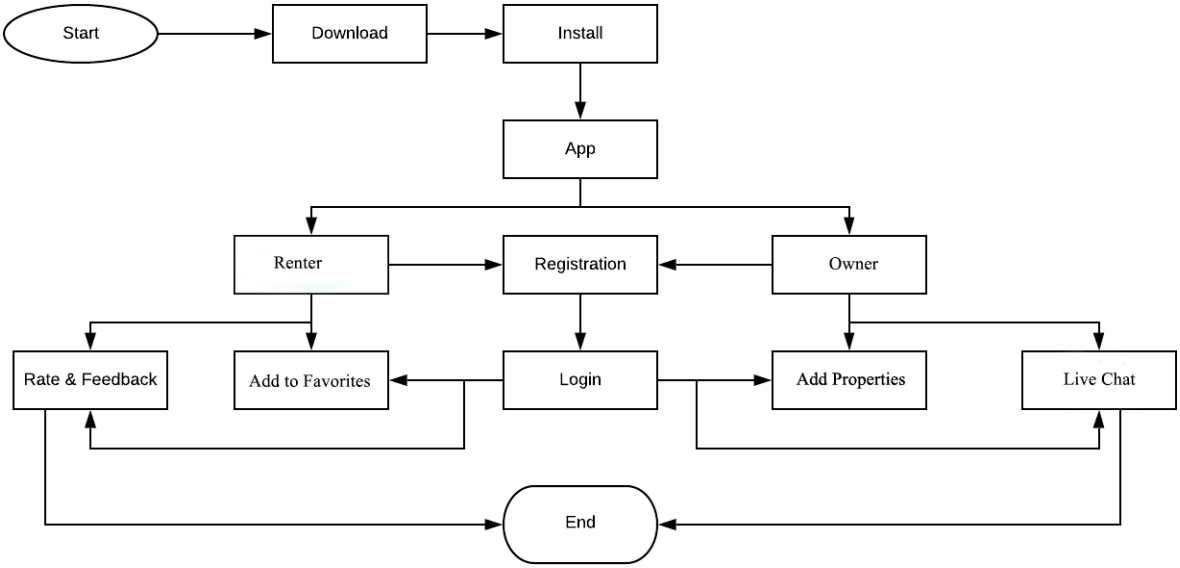

Fig 3.1: Business Process Model

3.2 Requirement Collection and Analysis

Gathering information and identifying the best requirement from them is very important. We collected information about the properties by visiting area after area. We asked the residents as well as owners of the properties about property prices and also asked how willing they would be to use an app like ours. We also took pictures to analyze the quality of most properties in those areas. This research has made us more informed about what features we should put in our app.

3.2.1 Resources Used to Develop and Improve the System

It is critical to distinguish the requirements that are required for this project and to structure the modules so that all the requests are met. Some planning advances are essential need. A few stages require a careful examination of the essential needs. It will be expected to bring out the fulfillment of the client. The requirements are all as per the user satisfactions.

3.2.2 Resources Used to Develop and Improve the System

The development or improvement process of a project has to be done step by step. After improving a portion, we have to improve or develop another portion of it. That is how the development and improvement process go on. After doing all this, collecting and implementing the resources are the most crucial part.

For creating this project, the resources we needed are given below –

1. Android Studio
2. Java
3. Firebase
4. A windows PC
5. An android mobile phone

3.3 Use Case Modeling and Description

Use case refers to all the potential uses that an app an have for a user. In software engineering, use case is all about a string of actions that a user can perform step by step. The use case is usually a mix of various separate systems to achieve a reach a certain goal. This app has two types of users; owners and their renters/tenants. So, the application has to be optimized for these two types of users.

Let's discuss about our users. If you are a renter then you have to do registration from the database and then you can log into the app. After login, you can see your profile and rate property owner's and also you can add properties to favorites. On the other hand, if you are an owner, you also have to register from the database and then login. After successfully logging in, you can add your property list and contact with the renters. You can also see your ratings given by renters. The use case model of this project is shown below:

3.3.1 Owner

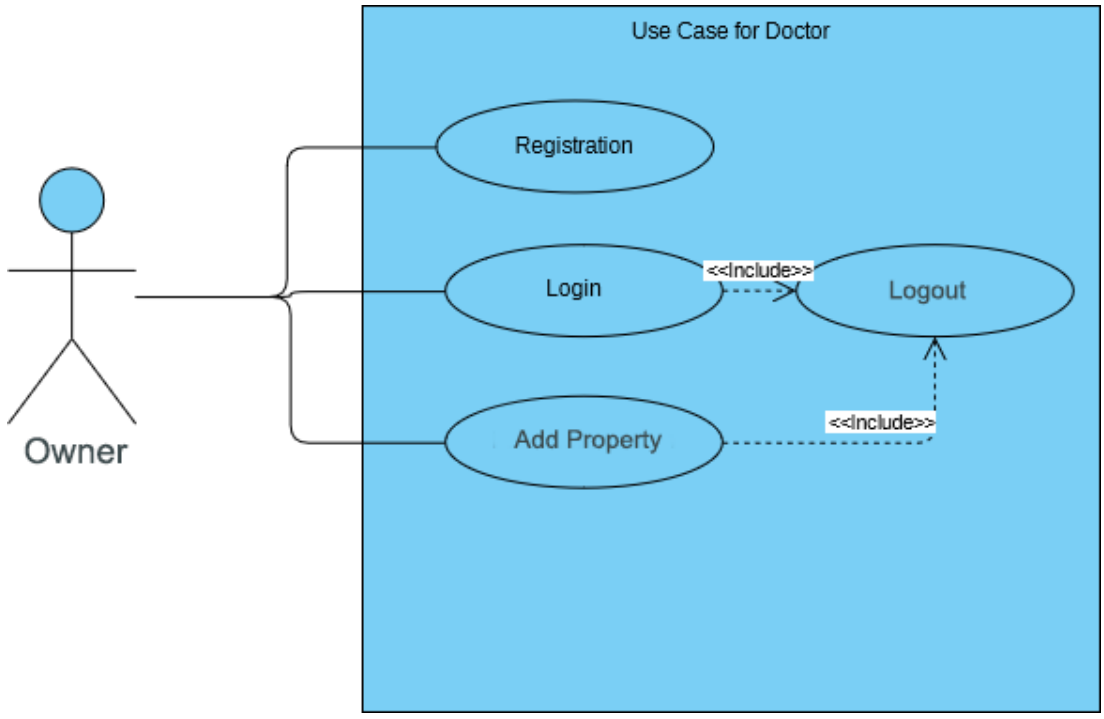

Fig 3.3.1: Use Case for Owner

3.3.2 Renter

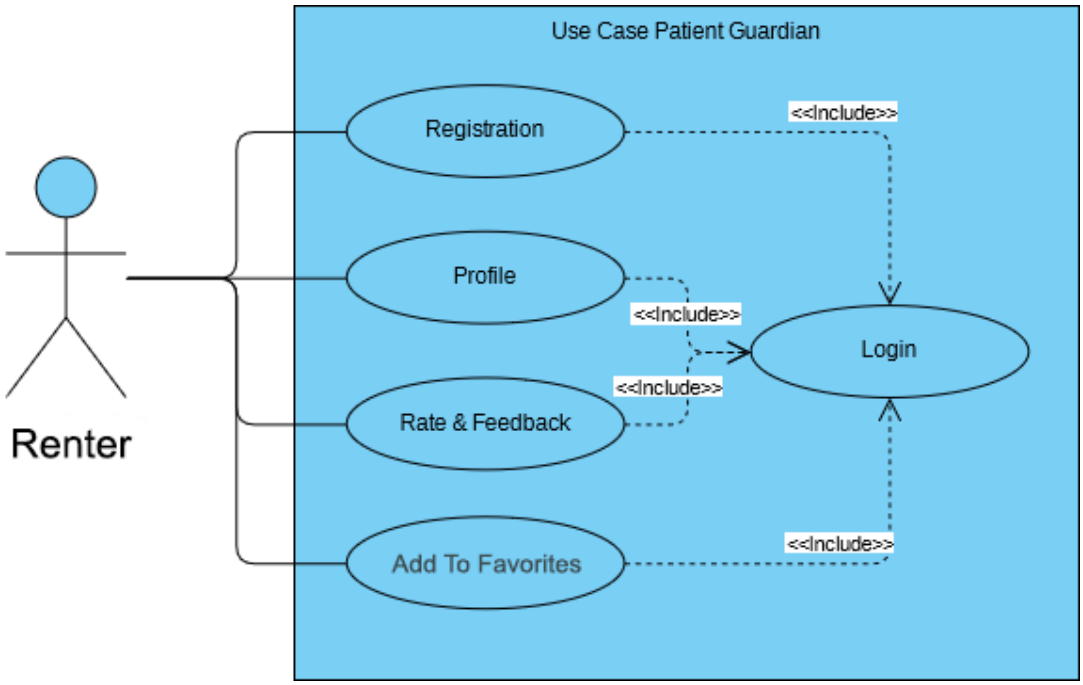

Fig 3.3.2: Use Case for Renter

3.4 Data Flow Diagram / Logical Data Model

In this diagram user uses this app which has some user-friendly features. In this app all information store in database.

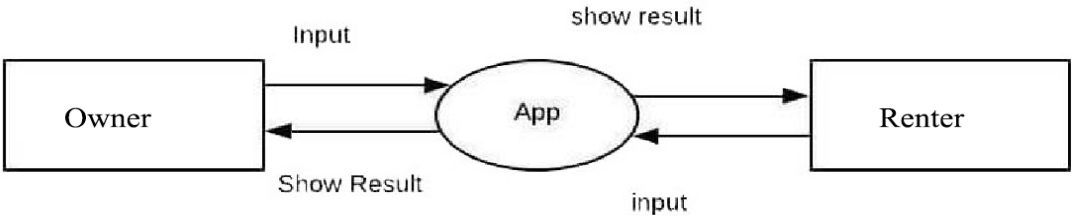

Fig 3.4A: Data Flow Diagram (level 0)

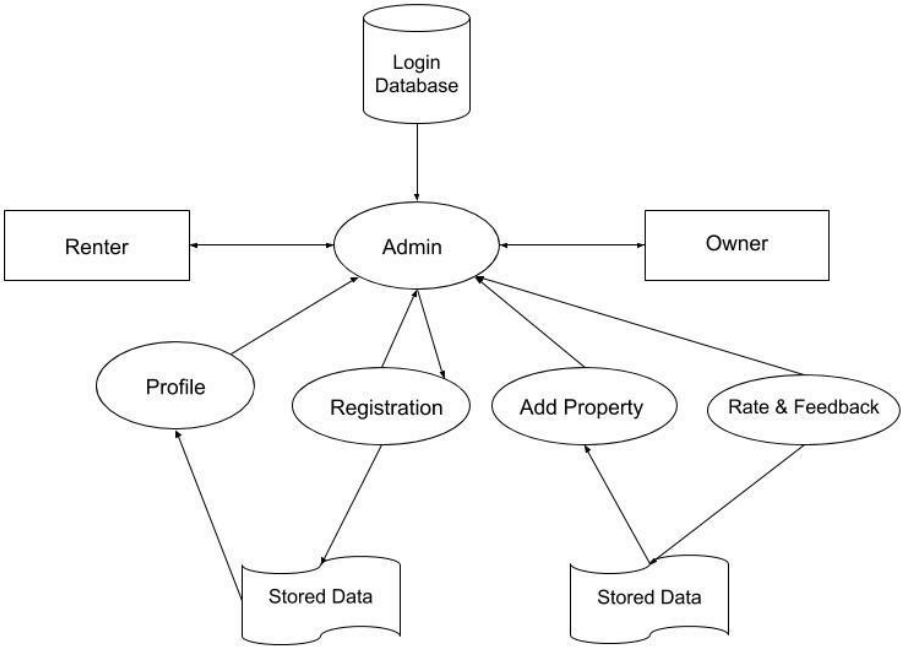

Fig 3.4B: Data Flow Diagram (level 1)

3.5 ER-Diagram

ER diagram is a model that reveals the interactions between the users and the software functionalities. It is a data model that shows us how an owner and a renter/seller will utilize the applications functionality. Connecting to an e-mail, setting up a password, creating a username etc. are all elements of this data model. between user and software. It is a data model. The following diagram fig 3.5 describes this model in the context of our app.

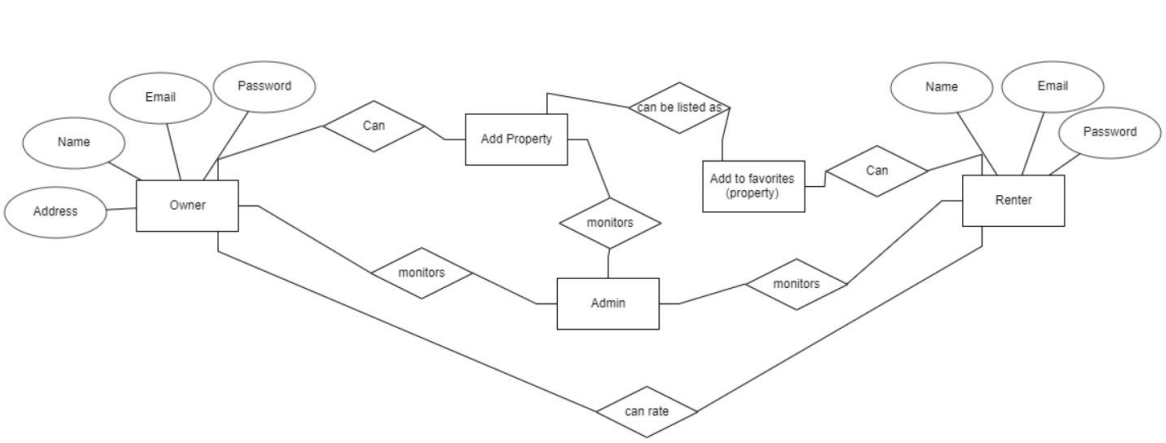

Fig 3.5: ER Diagram.

3.6 Design Requirements

Design requirement for user:

1. Admin Panel
2. User Register Panel
3. Add Property Panel
4. Add User Panel
5. Add to Favorites Page
6. Rate & Feedback Page
7. Web Management

CHAPTER-04

DESIGN SPECIFICATION

In this chapter, we will discuss about the front-end-design, back-end-design, the interaction design and implementation requirement of this app. To create the entire app, we used a single programming language. We used Android Studio for front-end-design and Java for backend design. We also added a firebase database for the authentication and as an admin panel.

4.1 Front-End Design

Front-end is a very important part in any application as it is the only part of the app which is visually accessible to the user. When the user interacts with the front-end, the processing is done in the back-end and afterwards front-end and back-end provide the information to the database.

4.1.1 Front-End Design for Admin

Admin will be able to control total management system from a website and create user (from database), set up locations and send notifications to users.

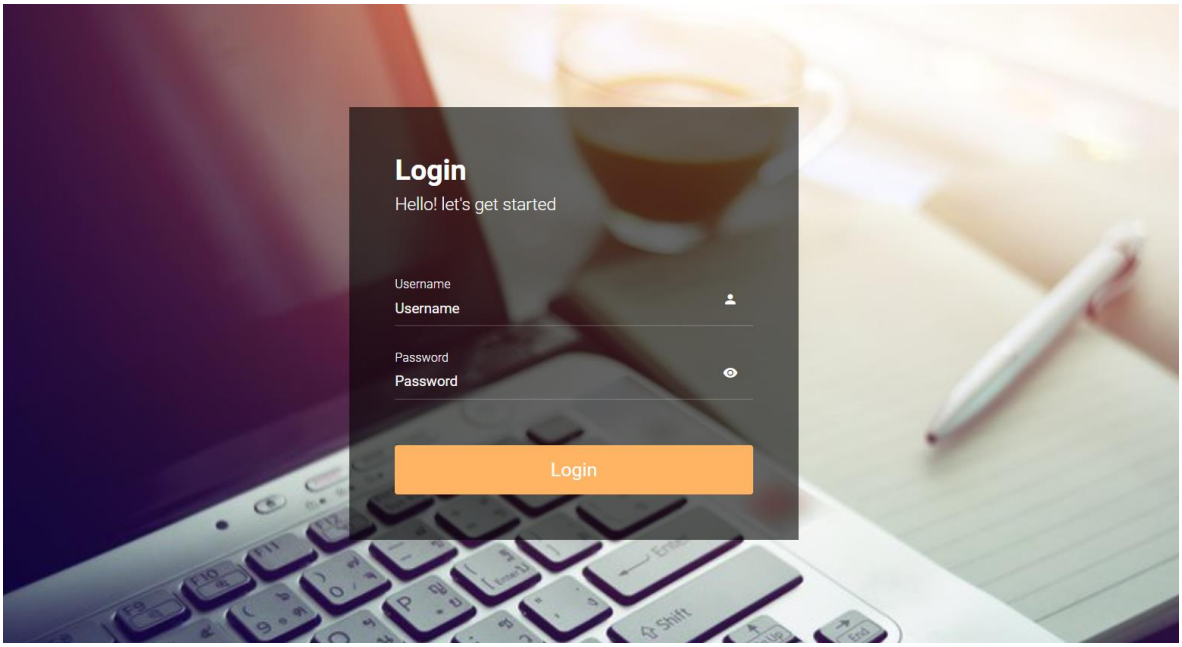

Fig 4.1.1A: Admin Login

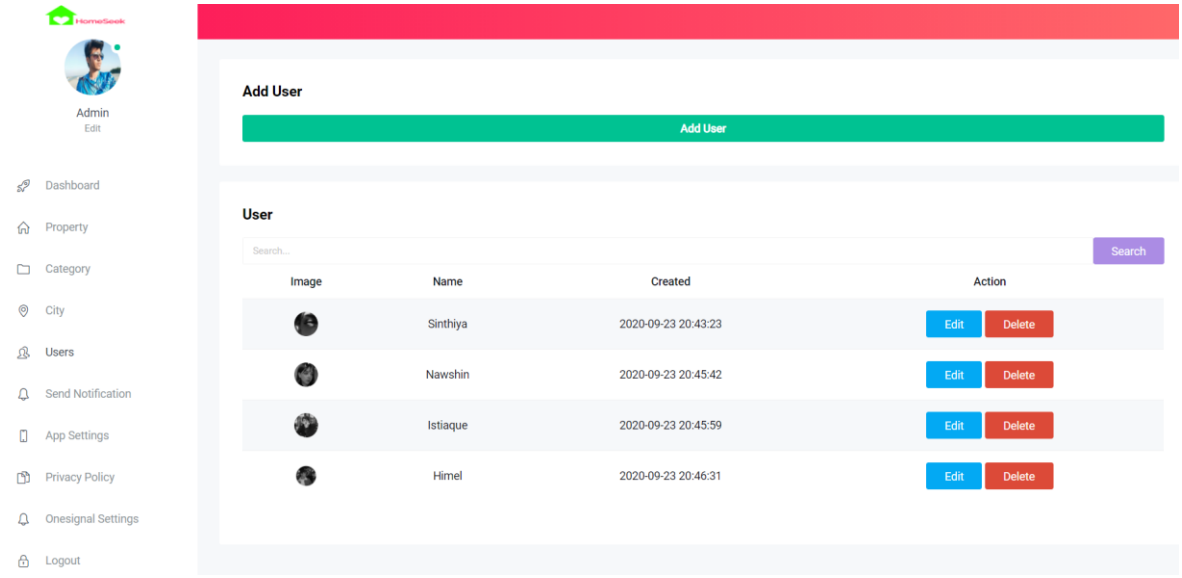

Fig 4.1.1B: Add User Page

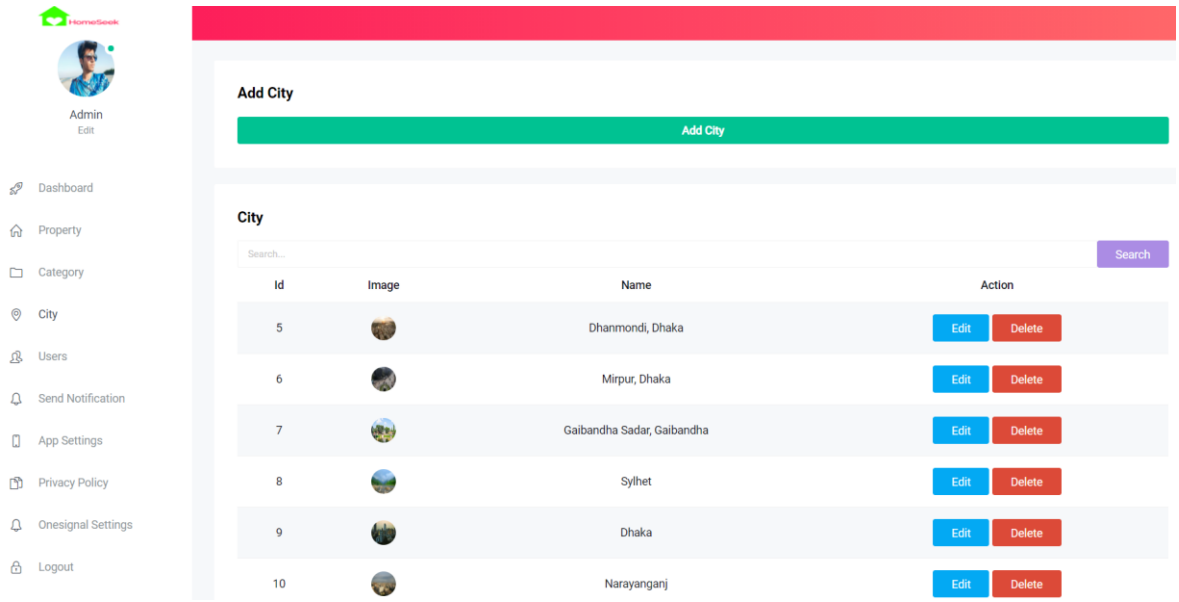

Fig 4.1.1C: Add Cities

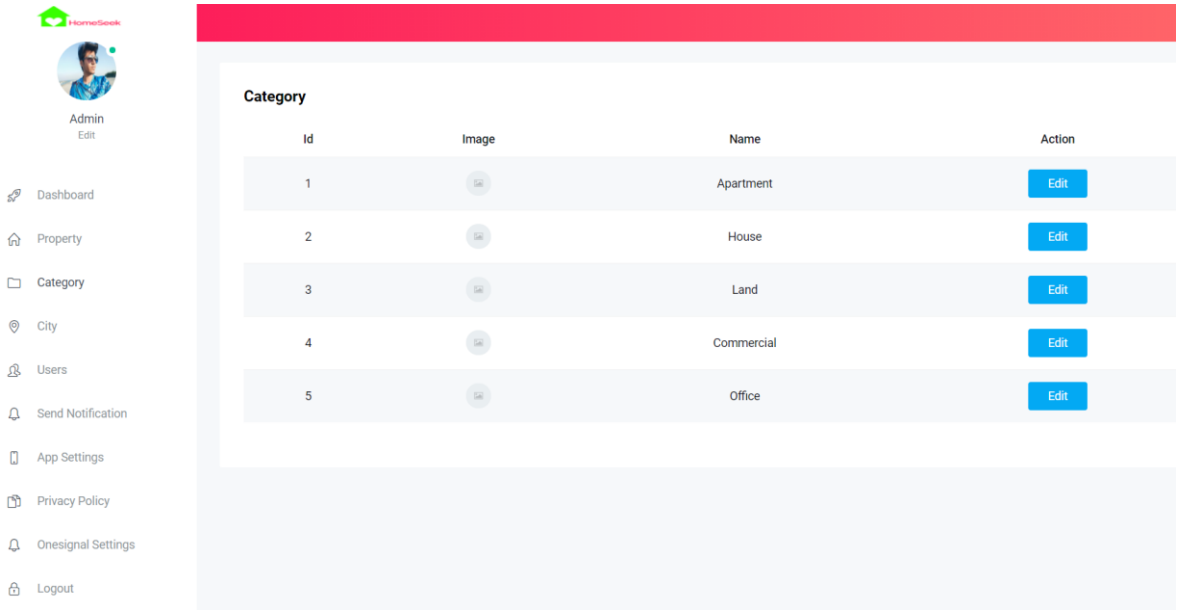

Fig 4.1.1D: Property Categories

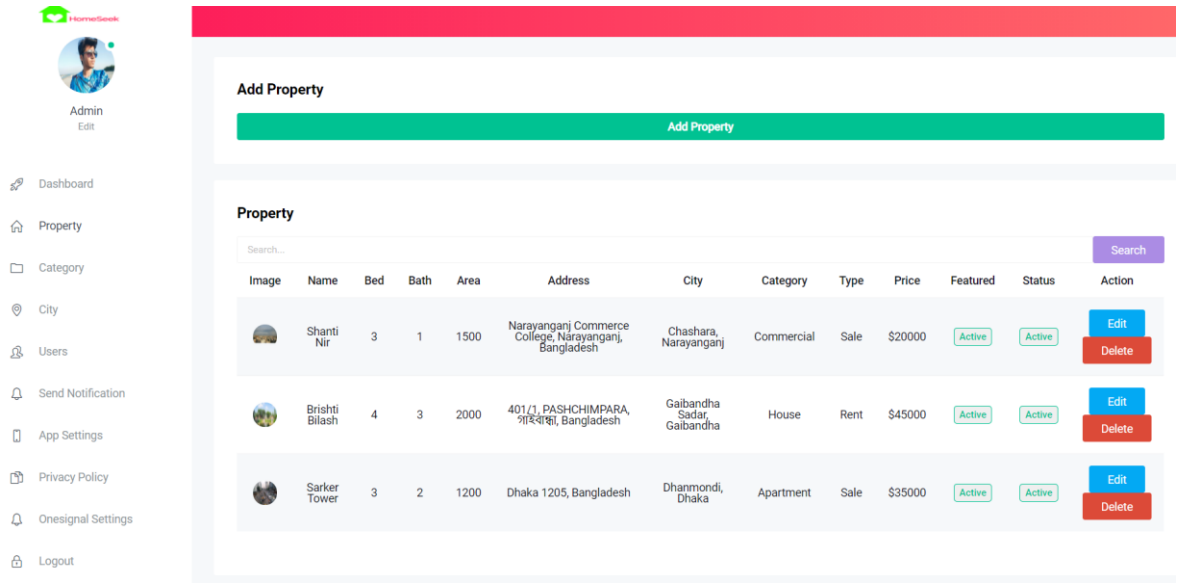

Fig 4.1.1E: Add Property

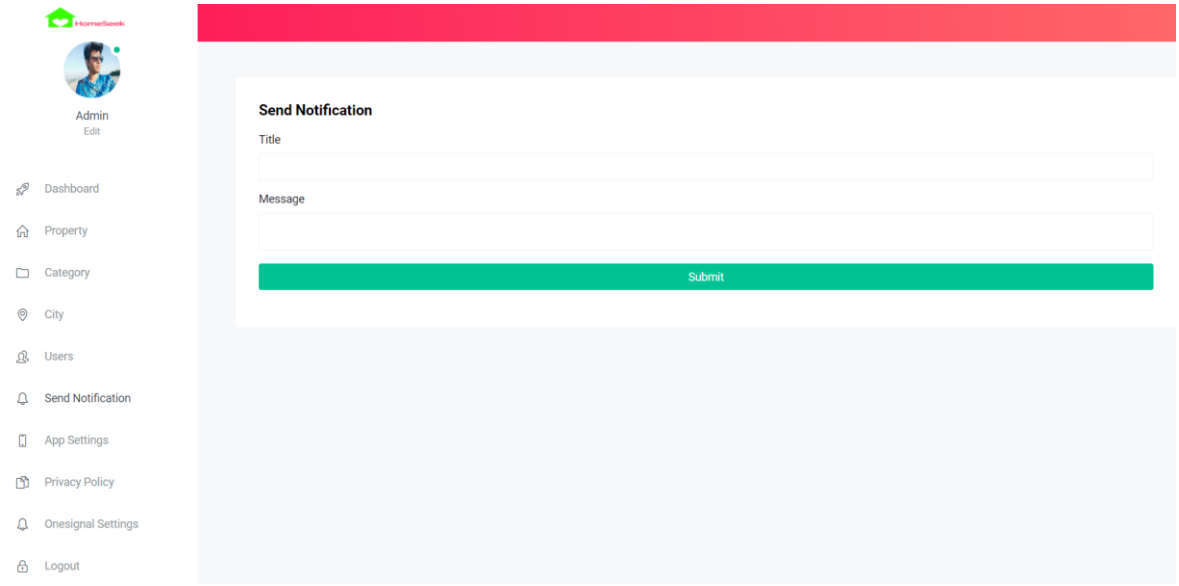

Fig 4.1.1F: Send Notification to Users

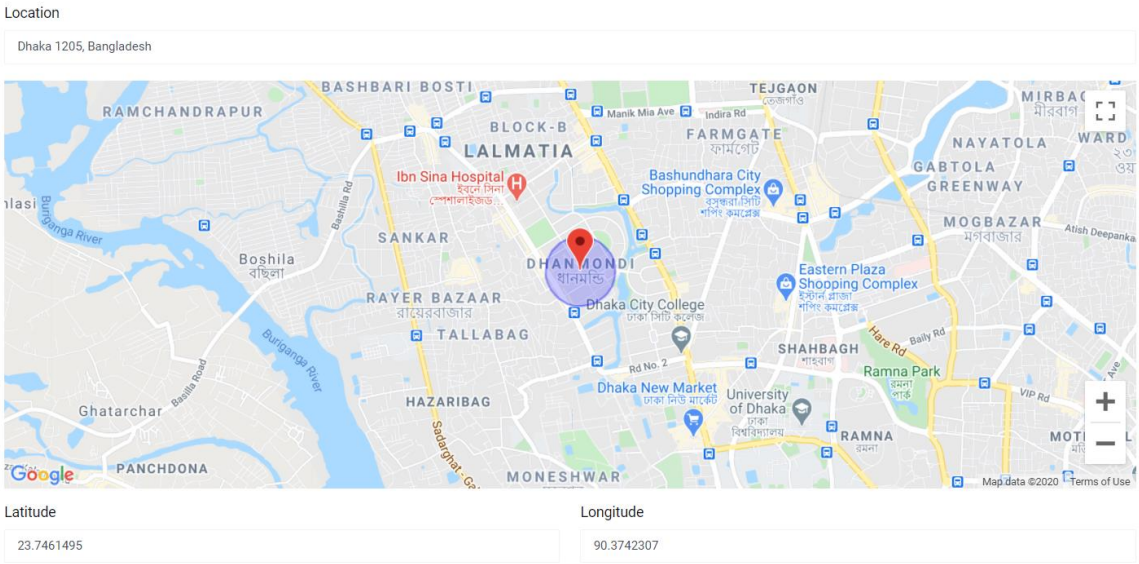

Fig 4.1.1G: Google Map for Location

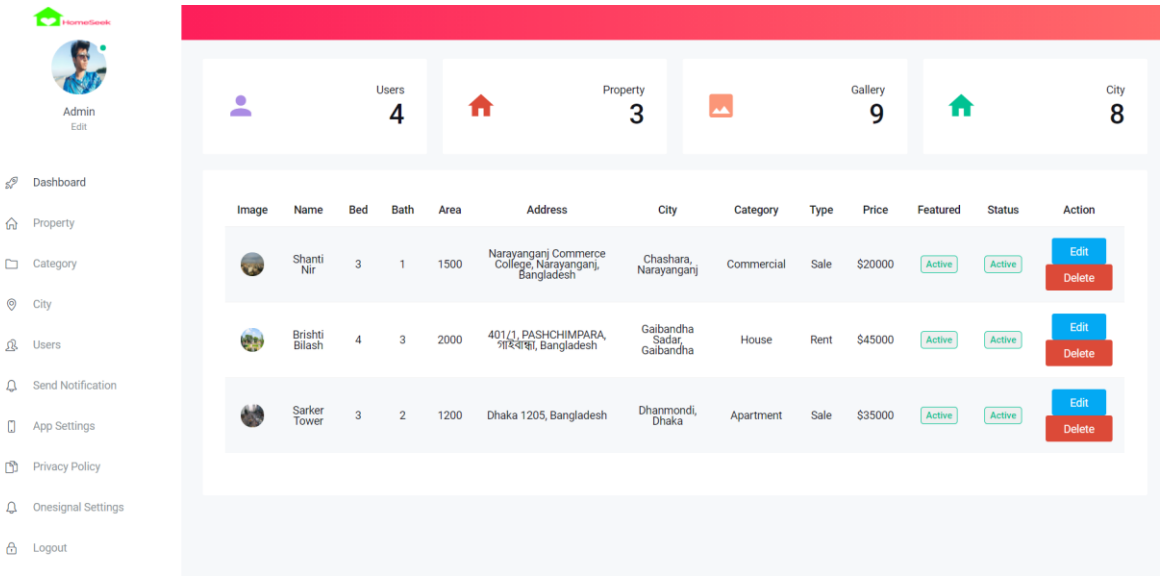

Fig 4.1.1K: Admin Dashboard

4.1.2 Front-End Design for User

The user will be able to create and manage the accounts of the teachers of the institution, the accounts of the students and the accounts of the parents through the register panel.

There is also dynamic subject creation, class creation, section creation, class time setting, determining which subjects will be in which class, deciding when and where the class will be, to determine it, which teacher will take which class and promoting students to new classes.

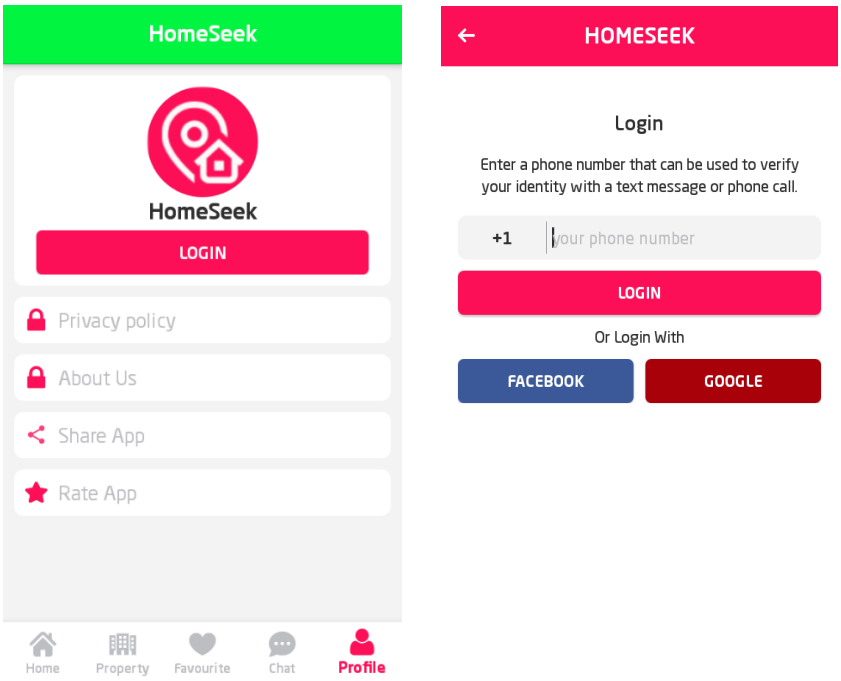

Fig 4.1.2A: User Login

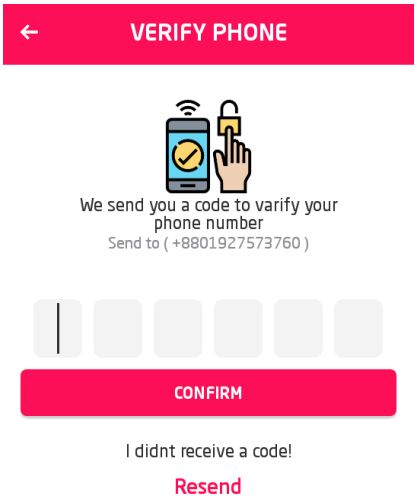

Fig 4.1.2B: Authentication

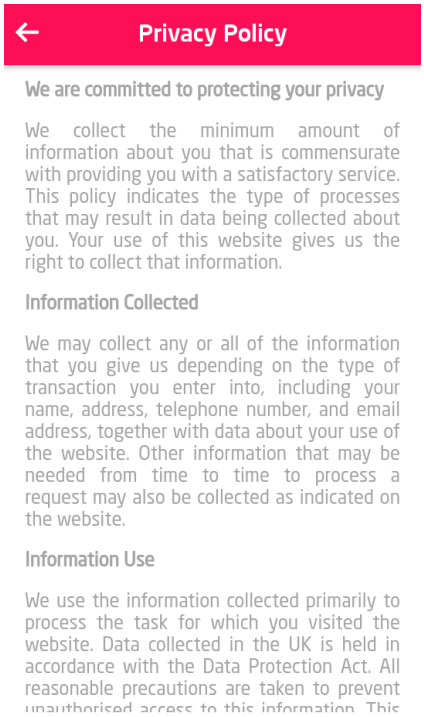

Fig 4.1.2C: Privacy Policy

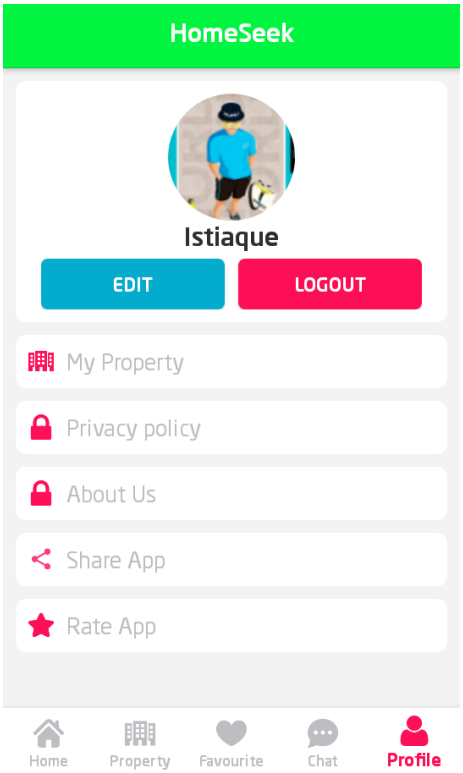

Fig 4.1.2D: User Profile

Fig 4.1.2E: Chat Box

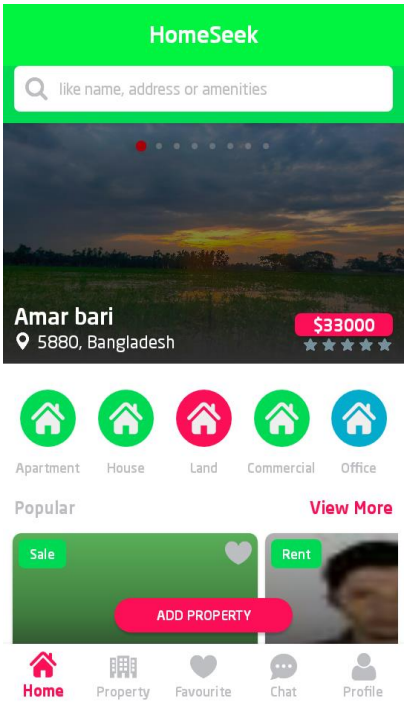

Fig 4.1.2F: Homepage

Fig 4.1.2G: Location

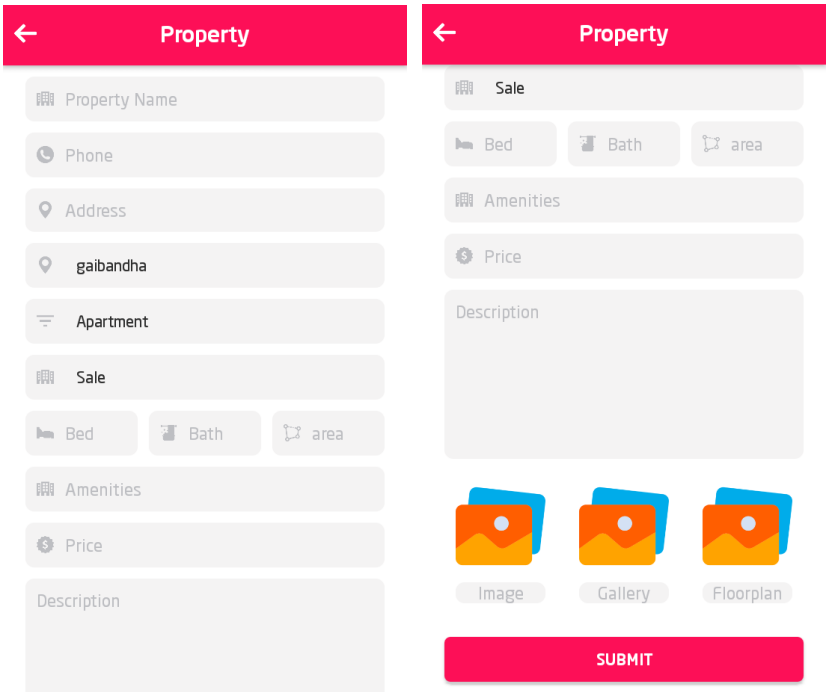

Fig 4.1.2H: Add Property Form

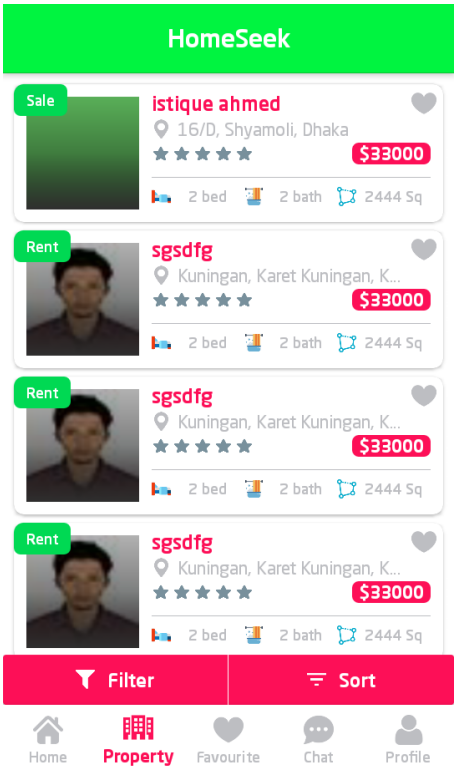

Fig 4.1.2I: Property List

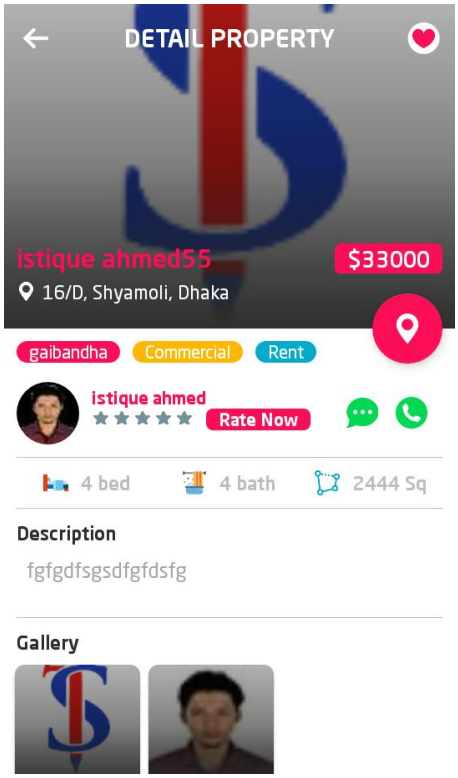

Fig 4.1.2J: Property Details

4.1 Back-End Design

The back-end is certainly not accessible to the users. It is where the users produce input which is then processed by the back-end part of the application. After that, the application will show the results of the processing in the form of output. This is why, the back-end is considered to be the mind of an app. In our application, the back-end is accessible only by admin and the developer. We implemented the back-end by using Android Studio and Java Programming.

4.2 Interaction Design and UX

Interaction design is a control that watches the interaction between a framework and its client. It refers to an expressive communication and collaborative relationship between user and the interface of the application. It is a systematic structure that simply connects with the people and provides them a wonderful experience of using that application.

User Experience (UX) refers to how much an app is user friendly. User experience defines how much development and improvement an application need. Based on UX, developers measure how users will be benefited by using this app and that's the main purpose of this development. For UX, we attempted to give the best experience to our users. We kept our framework very basic and simpler for better understanding for the users.

4.3 Implementation Requirements

First, we developed the front-end, back-end and database relationship of this app. We need an IDE and a programming language as well as a markup language for styling and lastly, we need a database. This app is an android application. So, it can be accessed by an android mobile.

We used a domain named "amibachelor.com" for the admin panel. All the administrative jobs will be done from there. For front-end design we needed XML (from android studio). Used Firebase database for storing data and Java programming to process data which is being connected to the database.

CHAPTER-05

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

Here we show database implementation. We used firebase for database management. Fig 5.1 shows the database dashboard that has an overview of our app. A user has to register on the database to have an account, then login to the app.

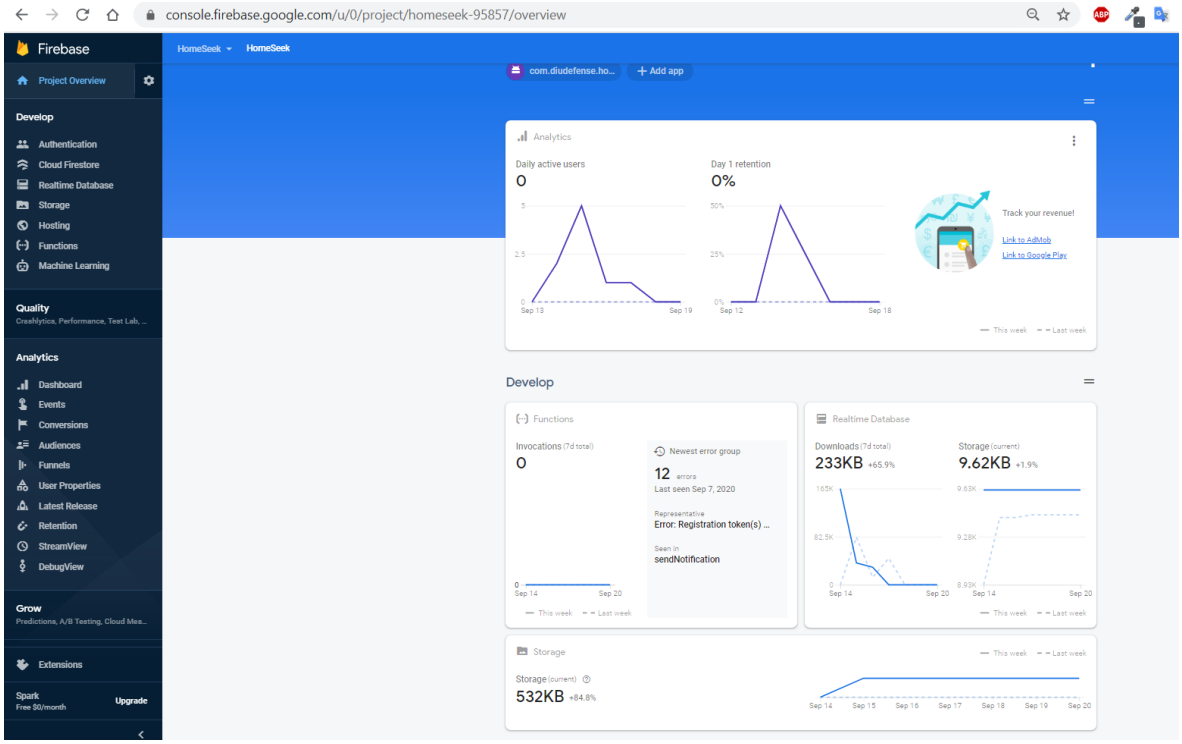

Fig 5.1: Database Dashboard

5.2 Implementation and Interaction

In this section, we have showed the implementation of the first page to joining the app. This is the logging page where user can login by putting their phone numbers and verify their login with a code sent to the number. User can log into the account by their google and Facebook account also. This is an example of the front-end design done on Android Studio.

5.3 Testing Implementation

In this Section, we will test our app as a user and an admin to get the best results. The following figures as in Fig 5.3.1 shows testing inputs from user on the app and Fig 5.3.2 shows testing inputs from admin panel.

5.3.1 Testing Data as User

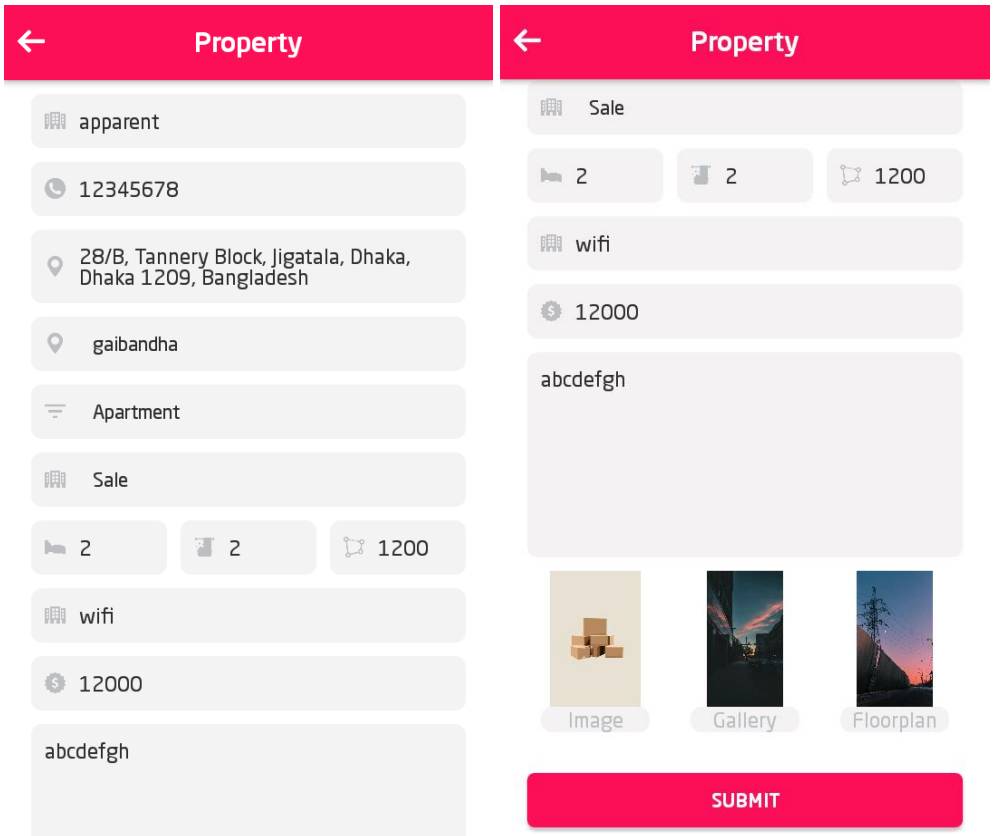

Fig 5.3A: Testing Data as user

5.3.1 Testing Data as User

We are giving our inputs in the add property form and we will get the test result in the next section.

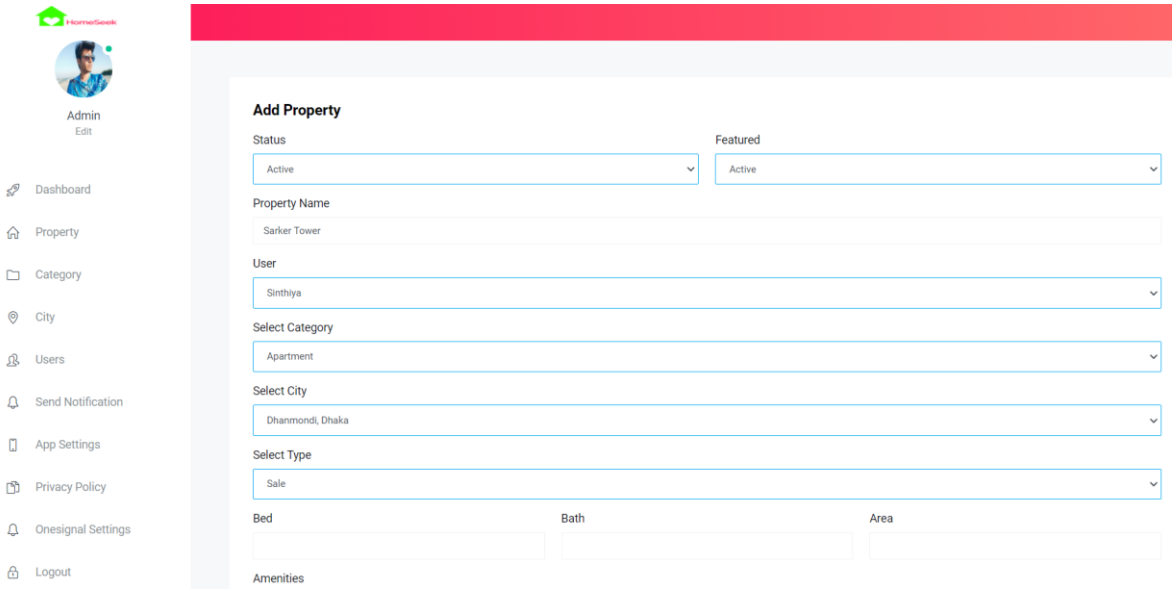

Fig 5.3.2: Testing data as Admin

5.4 Test Result and Reports

In this section, we will show the test results from our previous section's test. We put two tests, one on the user's side form the application and the other from the admin panel. Both tests serve one purpose, adding property.

So, Fig 5.4A shows the test results from users input and Fig 5.4B shows added property from admins input.

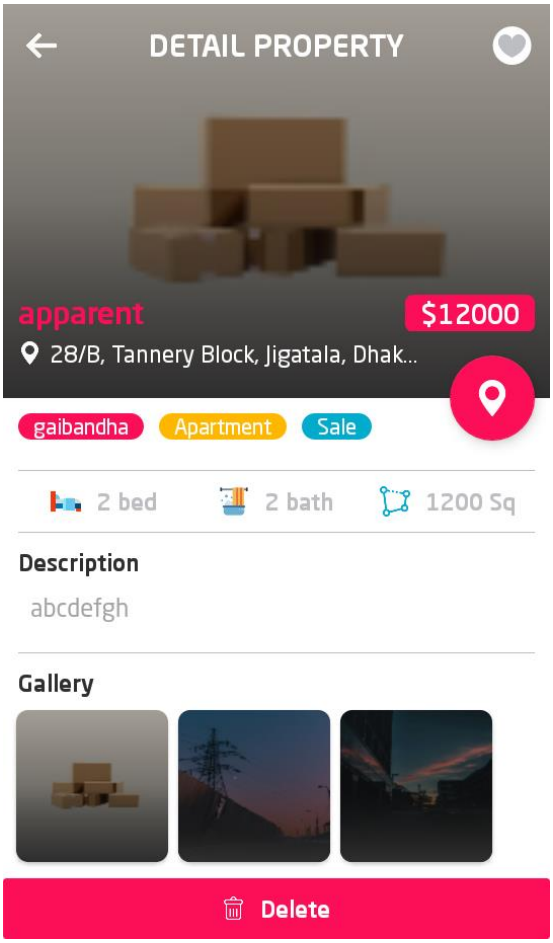

Fig 5.4A: Test Result from Users

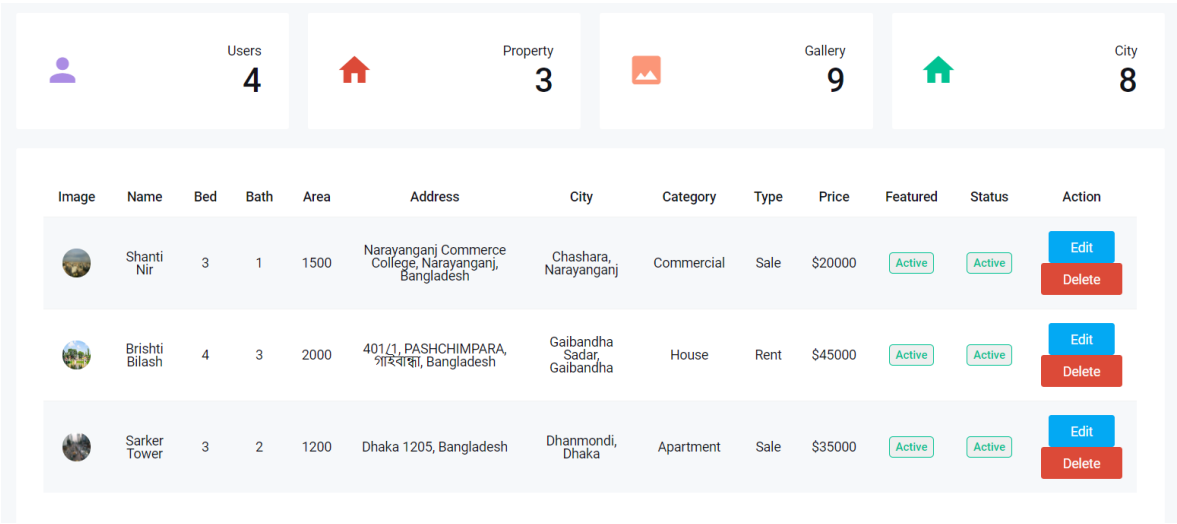

Fig 5.4B: Added property on Admin Panel

CHAPTER-06

Impact on Society, Ethical Aspects, Sustainability

6.1 Impact on Society

The purpose of our app is to streamline the process of buying, renting and selling property. It also makes the entire process cost-free. As a result, more people will be able to buy, sell or rent property and the market will become far more stable and predictable. This will likely cause a drop in the price of property in the market and increase accessibility, abundance and profit for sellers.

6.2 Ethical Aspects

The ethical implications of this app are that the property market will become more accessible, inclusive and be abundant with affordable property. This will hopefully help people in poverty-stricken areas as they are often disproportionately ignored by property sellers and mediators. But with our app, they will be able to buy, rent and sell property more easily.

6.3 Sustainability Plan

This app is also one that is easy to maintain. The app that we have developed only requires slight tweaks in the algorithm occasionally and maintaining the functionality of server. As such, the operational costs are low, the number of employees required is low and the sustainability is very good.

CHAPTER-07

Conclusion and Future Scope

7.1 Discussion and Conclusion

We have put a considerable amount of effort to complete this android app. starting from the registration page to the logout page and every feature in between, everything has been added to this app. There are two types of users in this app; the owner/seller and the renter/buyer. The seller uploads details of their property on their profile and all the potential buyers or renters can see if it fits their needs from their profiles. The app also comes with a dedicated chatting system for both parties and a rating system that ranks the seller with the goal of changing the property market.

7.2 Scope for Further Developments

An android app has nearly limitless potential for growth and change. As our app is an android app, we plan to make add changes in the future that will make it even better. We also plan on making the app iOS compatible in the future as well. We will also make some changes to the UI to make it more optimized and fix bugs to make the app run more efficiently on devices. The updates of this app will keep coming.

APPENDIX

8.1 Appendix: Project Reflection

From Fall-2019 semester we had stated our journey to make a system which is an android app for HomeSeek – buy, sell and rent with the all hard work and spending a lot of time finally we were able to reach our goal. This system is time saving and error free compared to the traditional system. This also very useful for property owners and buyers/renters. This will attract users with its attractive and user-friendly UI.

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