

2018-05

Development of Android Based Application for Tenant

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**DEVELOPMENT OF ANDROID BASED APPLICATION FOR TENANT
SYSTEM**

BY

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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

MAY 2018

APPROVAL

The Project titled “**Development of Android based Application for Tenant System**” submitted by Md. Sabekur Reza to the Department of Computer Science and Engineering, Daffodil International University, Bangladesh, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering approved as to its style and contents. The presentation has been held on 6 May 2018.

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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Anup Majumder, Lecturer, Department of CSE**, and Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for an award of any degree or diploma.

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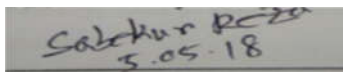
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ACKNOWLEDGEMENT

This project would not have been possible without the endurance, guidance and kind support of many individuals. I would like to extend the heartiest gratitude to all of them.

First, I express my heartiest thanks and gratefulness to Almighty Allah for His divine blessing makes us possible to complete this project successfully.

I am grateful to and wish my profound indebtedness to **Anup Majumder, Lecturer**, Department of CSE, Daffodil International University, and Dhaka. Deep Knowledge & keen interest of my supervisor in the field of Android application development influenced me to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stage have made it possible to complete this project.

I would like to express my great appreciation to the teachers, academic, technical and support staff of our department for their co-operation at a time to make this project possible I would like to thank my entire course mate in Daffodil International University, who took part in this discussion while completing the coursework.

Finally, I must acknowledge with due respect the constant support and patience of my parents.

ABSTRACT

This project is on An Android based Application for Tenant System. The purpose of this project is to allow the landlord to post their flat rental in a selective area and allow Tenant to find their desire area in Dhaka city. This app is initially some selected area in Dhaka city. In Dhaka, city landlord has to print different poster, different banner to find the tenant for their rental unit. Sometimes their rental unit remains open for rent about few months. This is a financial loss for them. On the other hand, the tenant has to go different area to find a house for them. This is very time consuming and hard task for tenants. Usually to find a rental unit tenant has to go house to house and talk to the landlord. They don't know anything about that particular rental unit before go to landlord's house. With will app, the tenant can find their rental unit easily. The tenant can see the picture of that renal unit and other information about that rental unit. In this app, the landlord can create their profile with their details select their area and post their flat information. Here in this app landlord can post multiple flat rental posts. They can update the information on their profile. They can also update and delete their flat rental post. Here the landlord can answer the question submitted by the tenant for a particular post. When the landlord gives the feedback of that message tenant can see the reply of that particular rental post on details activity. For this project, Android platform is chosen primarily because of mobile's portability, popularity and number of a user of the Android operating system.

TABLE OF CONTENTS

CONTENTS	PAGE
Approval	I
Declaration	Ii
Acknowledgements	Iii
Abstract	Iv
CHAPTER 01: INTRODUCTION	1-2
1.1 Introduction	1
1.2 Motivation	1
1.3 Project Objective	2
1.4 Users of this application	2
1.5 Summary	2
CHAPTER 2: BACKGROUND	3-6
2.1 Introduction	3
2.2 Related Works	3
2.3 Comparative Studies	3
2.4 Scope And Problem	4
2.5 Challenges	6
CHAPTER 03: REQUIRMENT SPECIFICATION	7-11
3.1 Business Process Modeling	7
3.2 Requirement Collection and Analysis	7
3.3 Use Case Modeling and Description	9
3.4 Logical Data Model	10

3.5 Design Requirements	11
CHAPTER 04: DESIGN SPECIFICATION	13-16
4.1 Front-end Design	13
4.2 Back-end Design	13
4.3 Interaction Design and UX	14
4.4 Implementation Requirements	16
CHAPTER 05: IMPLEMENTING AND TESTING	17-26
5.1 Implementation of Database	17
5.2 Implementation of Front-end Design	19
5.3 Implementation of Interactions	24
5.4 Testing Implementation	25
5.5 Test Results and Reports	26
CHAPTER 06: CONCLUSION AND FUTURE SCOPE	27-31
6.1 Discussion and Conclusion	27
6.2 Scope for Further Developments	27
REFERENCE	28
APPENDIX	
Appendix A: Project Reflection	29
Appendix B: Related Diagrams	29
PLAGIARISM REPORT	31

LIST OF FIGURES

FIGURES	PAGE NO
Figure 3.1 Business process model of Tenant system	7
Figure 3.2 Use case of Tenant system	9
Figure 3.3 Database Diagram of Tenant System	11
Figure 3.4 Flow chart of Tenant System	12
Figure 4.1 Tenant System back end architecture	14
Figure 4.2 UX Design of Interaction Design	15
Figure 5.1 All Registered User.	17
Figure 5.2 Main database root.	17
Figure 5.3 Profile info of registered user	18
Figure 5.4 Flat post info submitted by landlord.	18
Figure 5.5 Question asked by Tenant	19
Figure 5.6 Landlord answered the questions	19
Figure 5.7 Log in screen	20
Figure 5.8 Registration screen	20
Figure 5.9 Landlord Main	20
Figure 5.10 Landlord Profile	20
Figure 5.11 Profile submit	21
Figure 5.12 Rules	21
Figure 5.13 Select area	21
Figure 5.14 submit flat info	21
Figure 5.15 all post	22
Figure 5.16 Details post	22
Figure 5.17 Update post	22
Figure 5.18 Delete post	22
Figure 5.19 Question asked by tenant	23
Figure 5.20 Answer given by Landlord	23
Figure 5.21 Select user type	23
Figure 5.22 Area select for tenant	23
Figure 5.23 All rental post for tenant	24
Figure 5.24 Post details of selected area	24

LIST OF TABLES

TABLES	PAGE NO
Table 2.1: Related Work Table	4
Table 2.2: Time Scheduling	5
Table 4.1: Screen List	13
Table 5.1: System Testing Table	26
Table 5.2: User Acceptance Testing	26

CHAPTER 1

INTRODUCTION

1.1 Introduction

“Development of Android based Application for Tenant System” is an Android Application and it operates through online. This app is only for those people who understand Bangla language and live in Bangladesh. This app creates an easy way to find a rental unit for the tenant. With this app, the tenant can select their area and see all rental post of that particular area. The landlord can also create an account. The landlord can post flat rental post by selecting area. This application will be used by all who use android mobile anywhere and anytime through online. Alongside, it will reveal the requirements, feasibility study, design, and development process of this application.

1.2 Motivation

Behind building this system many things motivated me. Here in Dhaka, I stay with my family in a rental house. Sometimes I have to change the flat but it is very difficult to find a perfect flat in my desired area. Sometimes it takes a week or more just to find a proper flat. I am finding a way to get rid of the problem of finding a house. Sometimes some of my friends ask me to find a house or flat for them. This motivates me to build this app to solve this problem. In our country every day lots of new people come to city area for their job like Dhaka [1]. Most of them have to stay in a rental house. For staying in Dhaka tenant has to find their house but finding a desire is a very difficult task. For a newcomer it is a nightmare to find a perfect flat for them it becomes very hard when the tenant is a bachelor [2]. Sometimes they cannot go inside the house to see rental unit properly. In this app, the landlord will post their flat rental with picture and other details that will be very helpful for the tenant to find their rental flat. On the other hand, the landlord has to print poster or banner to find the tenant for their rental unit. Sometimes they sticky the poster on the public wall that destroys the beauty of the wall. This app will help the landlord to post their rental unit very easily.

1.3 Project Objective

The aim of this project is to reduce the hassle of tenant while finding a rental unit for them and also for the landlord to find the tenant for their rental unit and post rental unit's advertisement very easily. Among the best parts, it saves a big portion of time both landlord and tenant. The landlord can get registered and create their profile. This project can help the landlord to post their rental unit advertisement and manage them very easily. It will save the time and cost of the landlord.

1.4 Users of this application

There are two types of user of this system

- Landlord
- Tenant

1.4.1 Landlord

Landlords are the main user of this application. They can create their profile. They can post a rental unit advertisement. They can update and delete their post. They can answer the question asked by the tenant.

1.4.2 Tenant

Tenants are another user of this application. They can just view the rental unit advertisement post by the landlord. They can ask a question about the rental unit to the landlord of that particular post.

1.5 Summary

In this chapter, I discussed my proposed systems motivations, goals, and objective briefly introduced the target user of this system. It summarized the whole system.

CHAPTER 2

BACKGROUND

2.1 Introduction

Tenant System is an android based Application. It is also an online based app. This chapter is having details work present, comparative analysis with our app. Details about Scope of the application is explained. Our target and challenges that we face are described here.

2.2 Related Works

There are some web applications [5] for Rental Flat and some landlord and tenant management type application. The rental unit is part of those web applications. There are some mobile applications where the landlord can also post their rental advertisement like Bikroy.com. Some related apps are To-let[6], Bproperty [7], Flatemate [8] , But in this application, I just targeted the landlord and tenant. This will be a completely unique solution for landlord and tenant.

2.3 Comparative Studies

Tenant System is an android based Application. This application is based on flat Rental advertisement. There are some applications like this one but I found most of the system is web-based. Nowadays people feel comfortable in mobile apps. I also found some mobile apps for property management app but those apps are only for the landlord. But in this app landlord can create their account, submit their profile, post their rental advertisement, the landlord can update, delete their post. Here landlord can reply the question asked by the tenant for a particular post. Here we compare our application features with other application based on the Rental advertisement.

2.3.1 Caption

Table 2.1: Related Work Table

Flatemate	Bproperty	TO-LET	Android based Tenant System
User registration and login	User registration and login	User registration and login	Landlord registration and login
Select Area	Post add	Profile create	Create Profile
Post advertisement	View list of post	Add post	Select area
View all add	View details post	View Post	Post add
View details	Update delete post	Update delete post	View all post
Share add	View in Google map	Can not view post without registration	View details post
			Update delete post
			Rental Rules
			Give answer question asked by tenant
			View post without registration for tenant
			Select area view all post for Tenant
			Ask question for particular post
			Faster response for Real time database

2.4 Scope of the Problem

Time schedule of Android based Application for Tenant System is shown here. I divided the work into many parts. It helps me to easily complete the work. The time schedule table below

2.4.1 Time Scheduling

Table 2.2: Time Scheduling

Planning	1 month
Design and analysis	3 weeks
Coding	3 Months
Testing and Implementation	1 month
Total	5 Months and 3 weeks

This time i complete the whole project.

The Scope is Application Module. Android based Application for Tenant System has 2 Module. The main module of this app is Landlord. Here in this module landlord can create a profile, can post their flat rental advertisement. In Tenant, module tenant can only view the rental post and leave a message for the landlord.

2.4.2 Module

- Tenant Module
- Landlord Module

2.4.2.1

User module for Tenant. They can perform the below operation in this application

- Select Option for tenant
- Select the area for rent: Here tenant can select the area where they are looking for rental flat or house.
- See all the flat rental post of that particular area.
- The tenant can see the details about any flat rental post and go to the details page of that particular post.

2.4.2.2

User module for Landlord. They can perform the below operation in this application

- Registration: Here the landlord can register as a landlord
- Login: Landlord can log in with their email and password.
- Submit Profile: Here the landlord can submit their profile with their image and other information.
- Rules: In this section, there is, some rules provided by govt.
- Submit flat Info: In this option, the landlord can select their area and submit their flat information with an image.
- All Rental post submitted by landlord: Here in this part landlord can see all the rental post submitted by them. They can update the information about the flat rental post and delete their post.
- FAQ: There is a FAQ section for the landlord and they can see the question and answer.

2.4.3 Target of our Project

The target of our project is to reduce the hassle searching a rental flat in Dhaka city. This app will also help the landlord to post their flat rental unit easily. This app will help both landlord and tenant to reduce their time and money waste.

2.5 Challenges

Most challenging part of this project was database design as I am doing this project in Firebase Real-time database. It is NoSQL database. For Landlord area selection and insert data in particular area. Retrieving all data from a particular area form Tenant module was also a challenging part.

CHAPTER 3

REQUIREMENT AND SPECIFICATION

3.1 Business Process Model

Business process modeling is mapping out regular business processes and finding ways to improve them. The most part of a business model is how to revenue from the model. In our Flat rental app, there is revenue generating option. This revenue will come from landlord after free add posting limit ends.

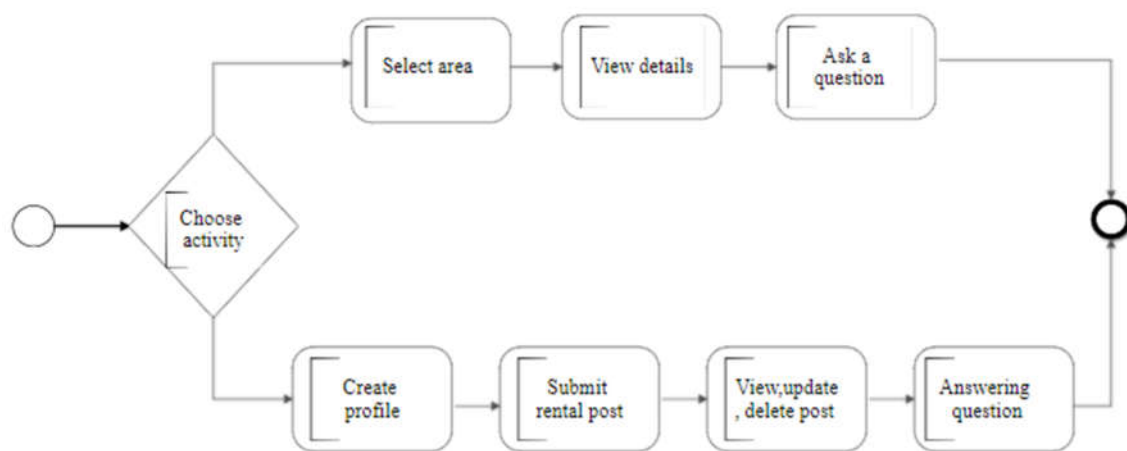


Figure 3.1 Business process model of Tenant system

3.2 Requirement Collection and Analysis

Software Requirements

To develop this application we used following Software and tools:

- Operating System: Windows 10.
- System Design: Photoshop
- Language: Java
- Database: Firebase Real-time database
- Tools: Android Studio[3]
- Technologies used: Java, XML.
- Debugger: Android Dalvik Debug Monitor service

For running the application those following are the Software Requirements:

- Operating System: Android 4.2.2 or higher versions
- Network: Wi-Fi Internet Network or Cell Phone data
- Minimum space to execute: 100 MB

Hardware Requirements

To develop this application we need the following Hardware Requirements:

- Processor: Intel Core I3 or Higher
- RAM: 8GB or Higher
- Free space on disk: minimum 10GB

Functional Requirements

- Graphical User interface which the application user
- Give ease of understanding to the application through Wi-Fi or cellular network Firebase Real time Database that stores the data or information to be displayed to the user

3.3 Use Case Modeling and Description

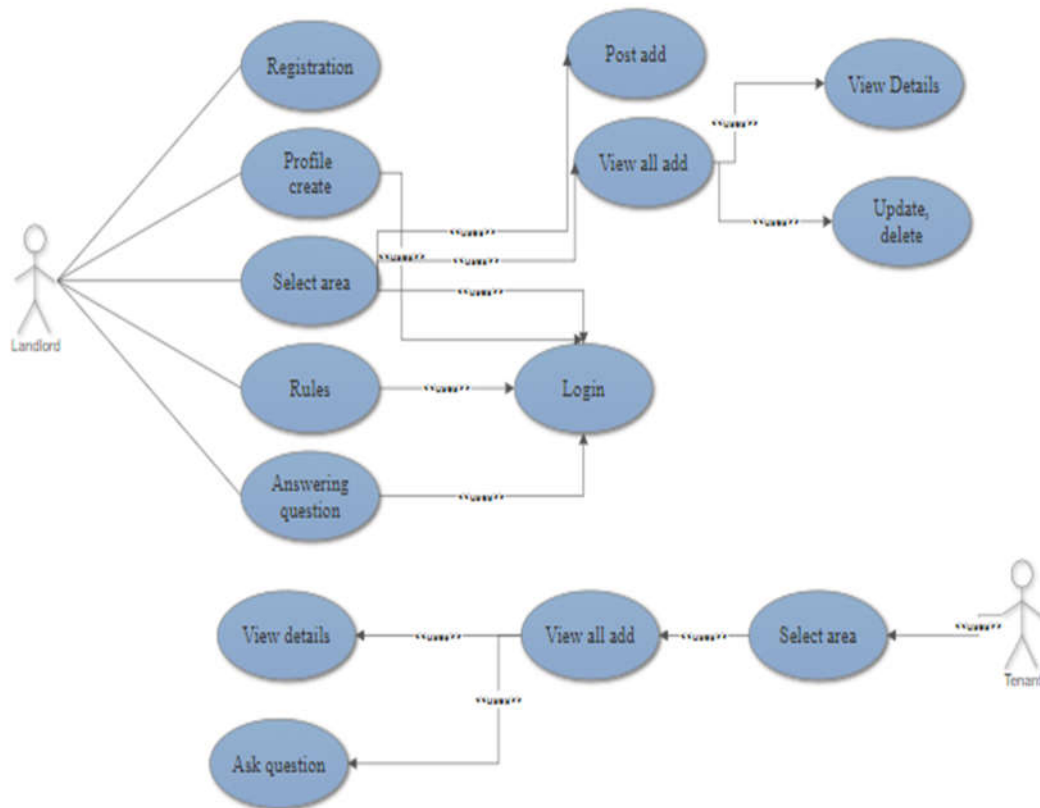


Figure 3.2 Use case of Tenant system

Actor Landlord

Flow of steps:

- This steps start when the user first open the app. There will be two options one for Landlord Registration and another of Tenant.
- Landlord has to select the landlord registration option.

Registration in the app:

In is app every landlord have to register first for posting add

Actor: Landlord

Flow of steps:

- This use case starts when landlord registered the system.

Add profile:

Here landlord has to add their profile to image and other valid information

Actor: Landlord

The flow of steps:

- Use case start after login in the app
- Here landlord will found an option for profile data submit with image and other valid data. Here landlord can crop their profile image and submit other necessary information.

Post Rental add :

Here the landlord can select their area and post add Landlord can add image of other information of the flat

Actor: Landlord

Flow of steps:

- This steps start after landlord login.
- Landlord can select area and post the flat rental add

View all post, Update and Delete:

Actor: Landlord

Flow of steps:

- After login landlord can view all their post that they posted
- Landlord can update their post
- Landlord can delete their post.

Actor: Tenant

Flow of steps:

- Here the tenant see the rental post
- Tenant don't have to login to see the post.
- Tenant can select the area
- After selecting area tenant can the post of that area
- By clicking in the post tenant can see the details of that particular post.

3.4 Logical Data Model

The logical data model represents the data processing modules. It used for data analysis and process easily. The Entity-Relationship Diagram/Model represents the logical data model.

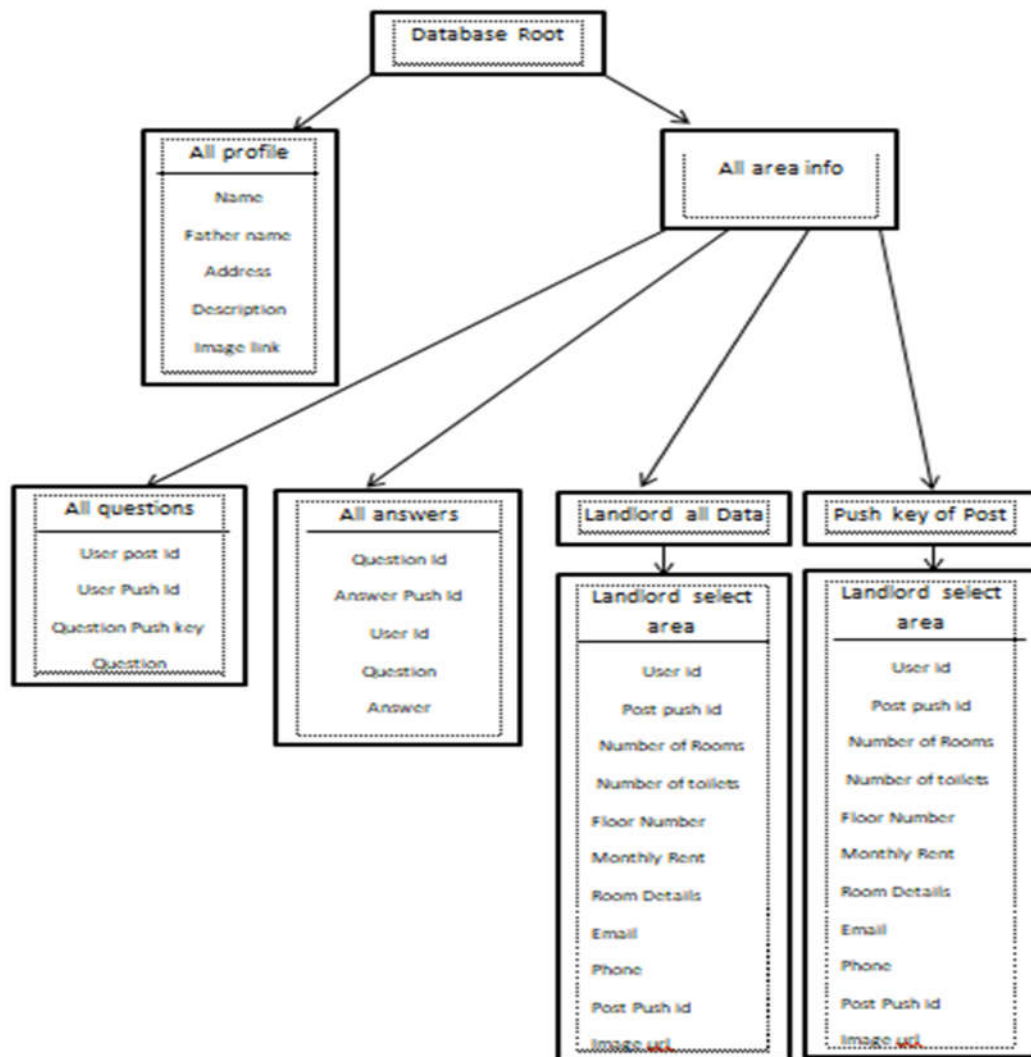


Figure 3.3 Database Diagram of Tenant System

3.5 Design Requirements

When designing systems or software, following issues must be considered that reproduce the overall design of the goals that the system expected to achieve. The following goals were kept in mind while designing the system:

Make system simple and flexible for users: The system users are able to have a great amount of control over their purpose in achieving objectives. Make the system compatible: It should be fit in the total system, future maintenance and enhancement must less.

In this project, the flow chart we used is given below

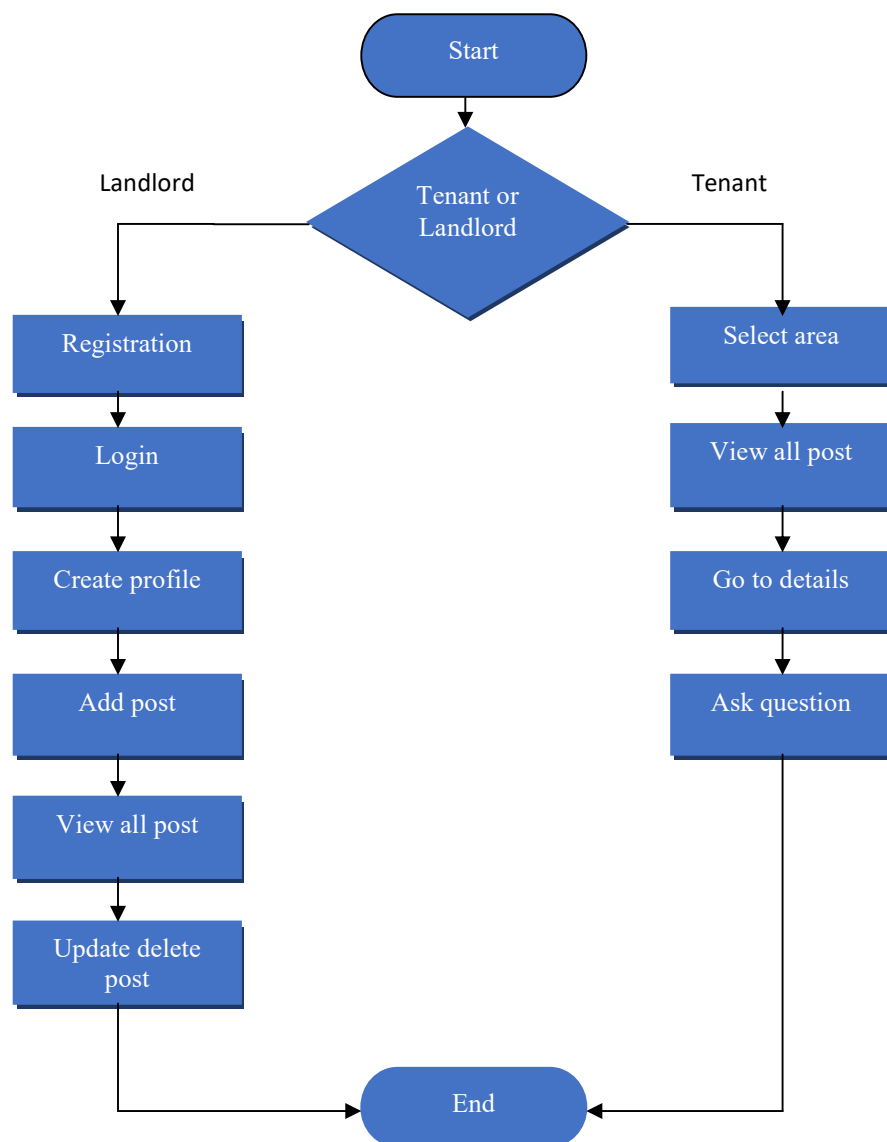


Figure 3.4 Flow chart of Tenant System

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front-end Design

Front-end Design is the main attraction of an application. It also should be user friendly. Our application we designed a beautiful front-end Design. We also try to design user friendly. In font-end Design our Application has some activity screen.

Table 4.1: Screen List

1. Choose Option as Landlord or Tenant
2. Landlord Registration
3.Landlord Login
4.Submit profile
5.House rental rules
6.Select Area
7.Flat info submit screen for rental post
8.View post submitted by landlord
9.Post update delete screen
10.Frequently asked question for landlord
11.About Us Screen
12.Select area option for tenant
13.View all rental post of that particular area
14.Flat rental post Details activity
15.Frequently asked question for tenant

4.2 Back-end Design

Our Application is Dynamic this function works by using the internet. Here I am using firebase real-time database. Firebase is a Backend-as-a-Service. Firebase frees developers to focus crafting fantastic user experiences.

What feature I am using in this project:

- Firebase authentication
- Firebase real-time database

- Firebase real-time analytics
- Firebase storage

Firebase real-time Database:

Store and sync data with our NoSQL cloud database. Data is synced across all clients in real time and remains available when your app goes offline. The Firebase Real-time Database is a cloud-hosted database. Data is stored as JSON and synchronized in real time to every connected client.

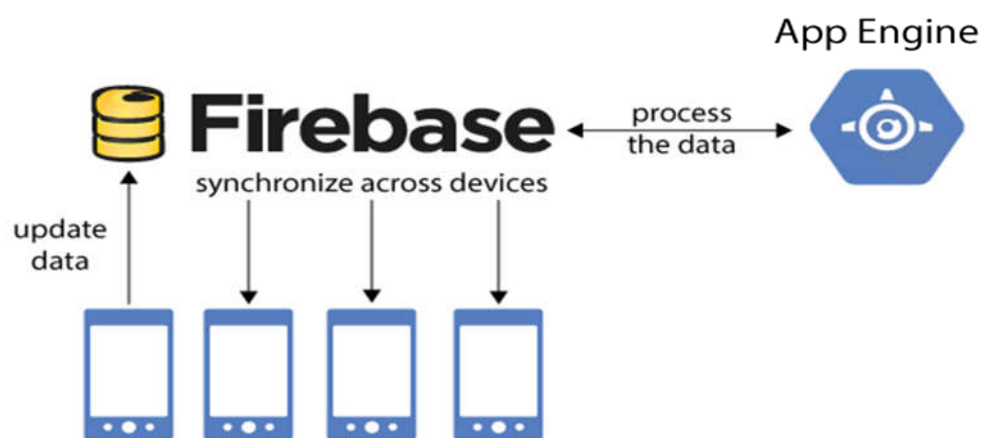


Figure 4.1 Tenant System back end architecture [11]

4.3 Interaction Design and UX

Interaction Design is most important part of User Experience (UX) design. An application fruition depends on User satisfaction. How an application is more attractive to a user is depends on interaction and Design part. In our application, we used a useful model of Interactive design. Android users expect your app to look and behave in a way that's consistent with the platform. Not only should you follow material design guidelines for visual and navigation patterns, but you should also follow quality guidelines for compatibility, performance, security, and more [10]. Android provides a variety of pre-built UI components such as structured layout objects and UI controls that allow you to build the graphical user interface for your app. Android also provides other UI modules for special interfaces such as dialogs, notifications, and menus.

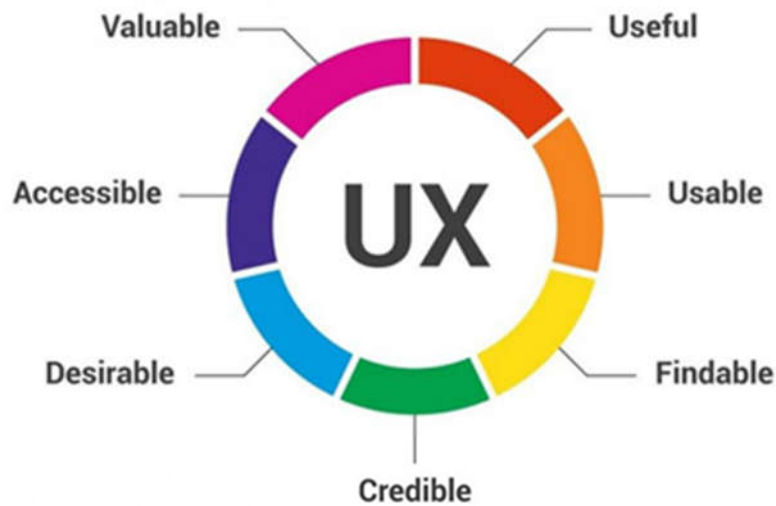


Figure 4.2 UX Design of Interaction Design

Home Screen Interaction Design and UX:

We have chosen an option for landlord and tenant. If the user chooses landlord option user has to register first if he is not registered yet. A user can directly login with email and password. If the user chooses tenant he /she need not register. The tenant can directly select the particular area and can see the rental post. Here tenant can see the post details clicking on each post.

Landlord Screen Interaction Design and UX:

After login as a landlord user will get a different option. Here landlord can submit their profile with image and other valid information. There is a rentals rules option for the landlord. Here landlord can select the area option and submit information about a post. There is an option to see all rental post. Here landlord can see details post, can update the post and delete the post.

4.4 Implementation Requirements

Implementation Requirement is given below:

- Android Studio
- Android Programming[4]
- Java and Xml
- Firebase Real time database
- Firebase Authentication
- Firebase Storage

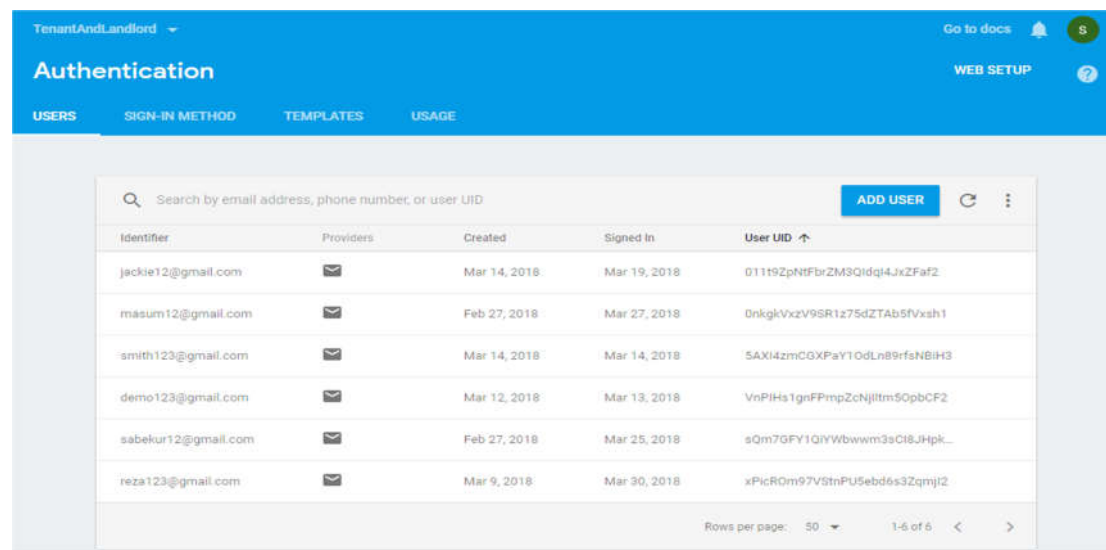
CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

Implementation of a database is a difficult part of a project. Here in this project i used firebase real-time database. Here data is saved as a NoSQL pattern. Here data is saved in the different root node.

All users shown below



The screenshot shows the 'Authentication' page in the Firebase console. It features a search bar at the top with the text 'Search by email address, phone number, or user UID'. Below the search bar is a table listing registered users. The table has five columns: 'Identifier', 'Providers', 'Created', 'Signed in', and 'User UID'. There are six rows of user data. At the bottom right of the table, it says 'Rows per page: 50' and '1-6 of 6'.

Identifier	Providers	Created	Signed in	User UID
jackie12@gmail.com	📧	Mar 14, 2018	Mar 19, 2018	011t9ZpNfBrZM3Qidq4JkZFaf2
masum12@gmail.com	📧	Feb 27, 2018	Mar 27, 2018	0nkgkVxzV9SR1z75dZTA65fVxsh1
smith123@gmail.com	📧	Mar 14, 2018	Mar 14, 2018	5AXi4zmCGXPaY1OdLn89rfsNBiH3
demo123@gmail.com	📧	Mar 12, 2018	Mar 13, 2018	VnPIHs1gnFPmpZcNjltm5OpbCF2
sabekur12@gmail.com	📧	Feb 27, 2018	Mar 25, 2018	sQm7GFY1QINWbwwm3sCi8JHpk...
reza123@gmail.com	📧	Mar 9, 2018	Mar 30, 2018	xPicROm97VStnPU5ebd6s3Zqmj2

Figure 5.1 All Registered User.

Here in the above figure all the registered users are shown

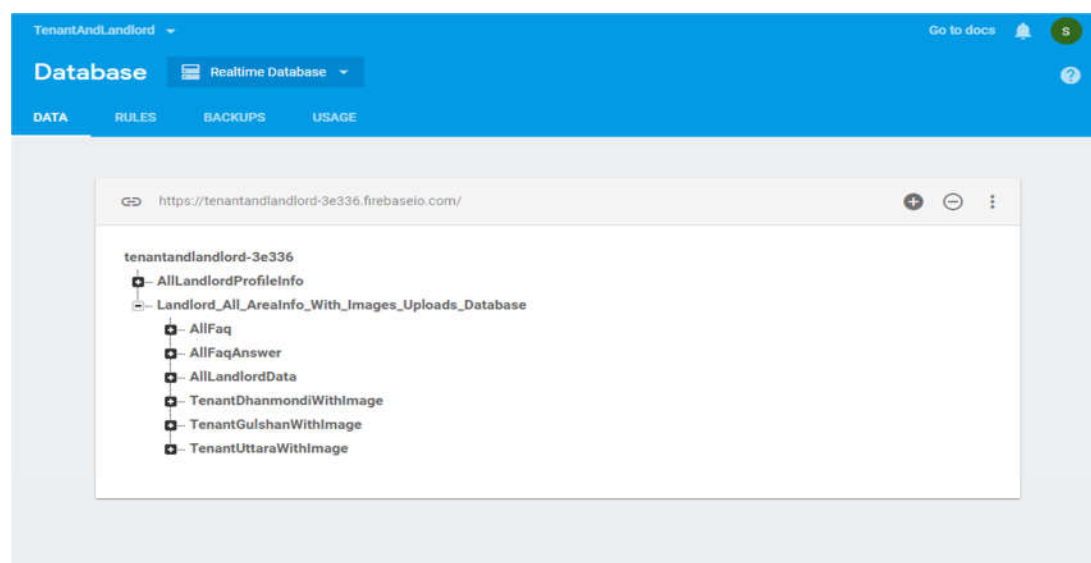


Figure 5.2 Main database root.

Here in the above figure all the root node are shown here

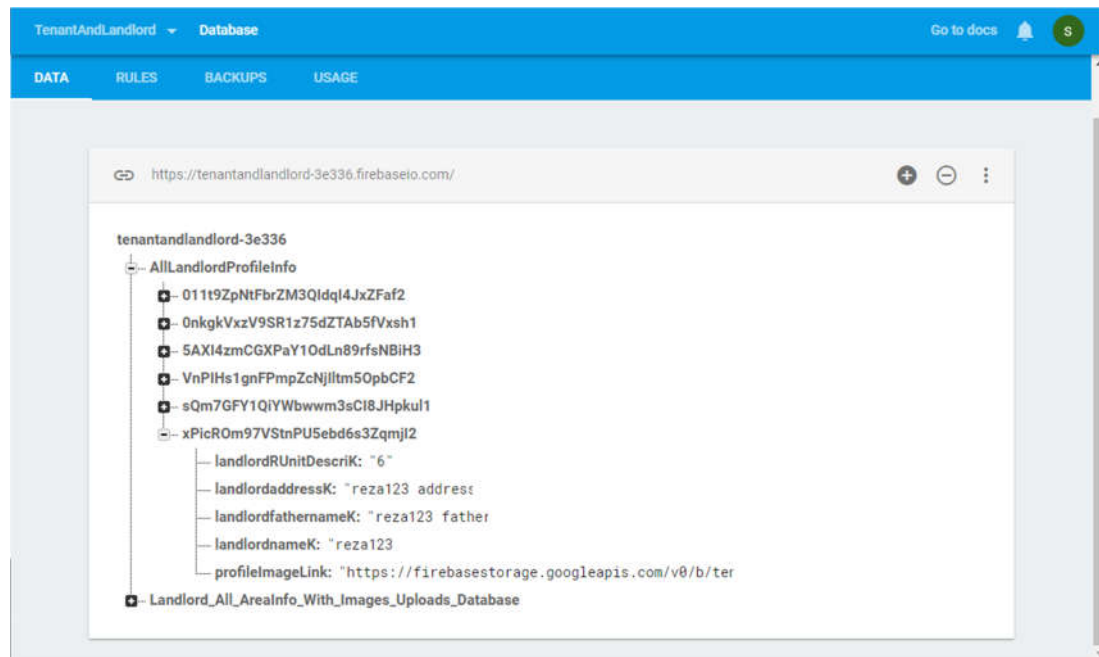


Figure 5.3 Profile info of registered user

Database figure of area with field

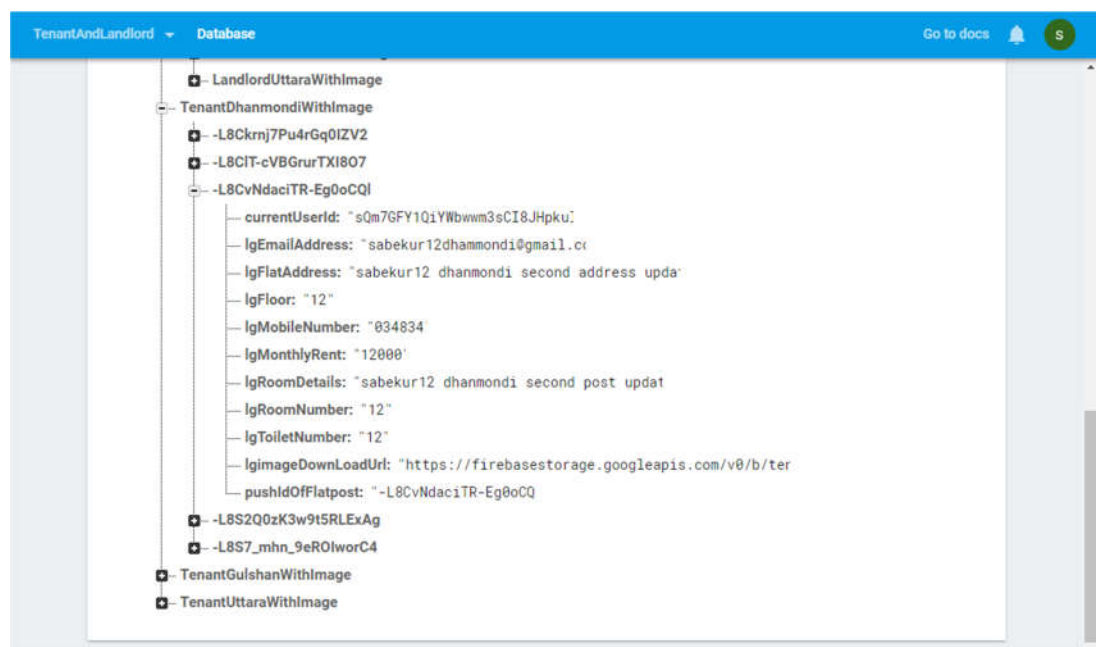


Figure 5.4 Flat post info submitted by landlord.

User information of landlord

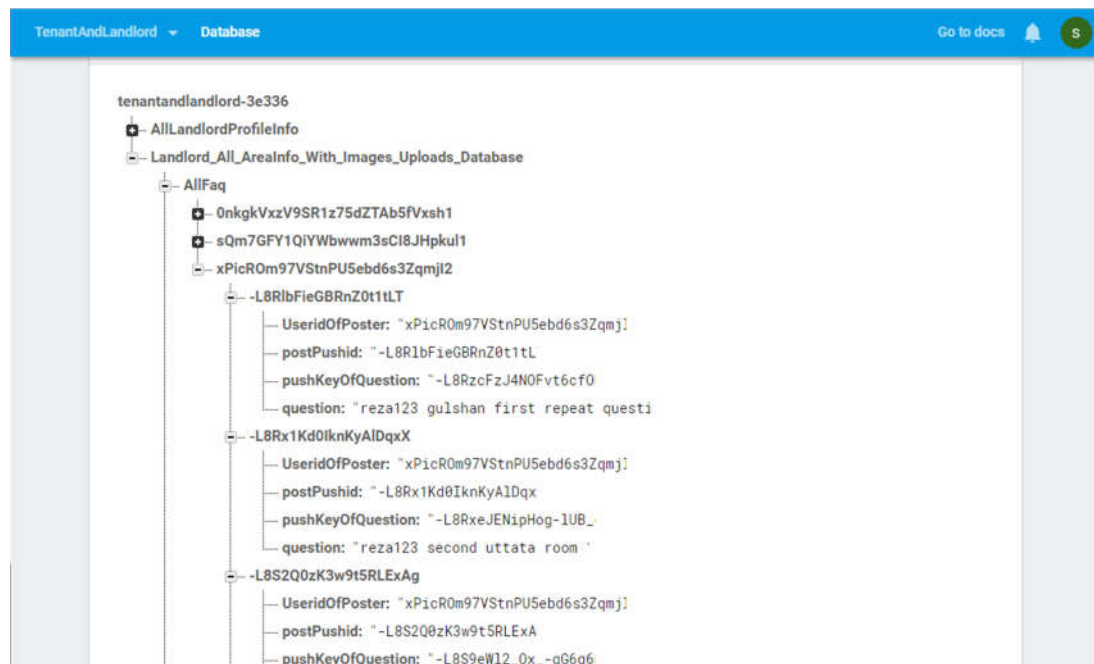


Figure 5.5 Question asked by Tenant

Flat information submit by landlord

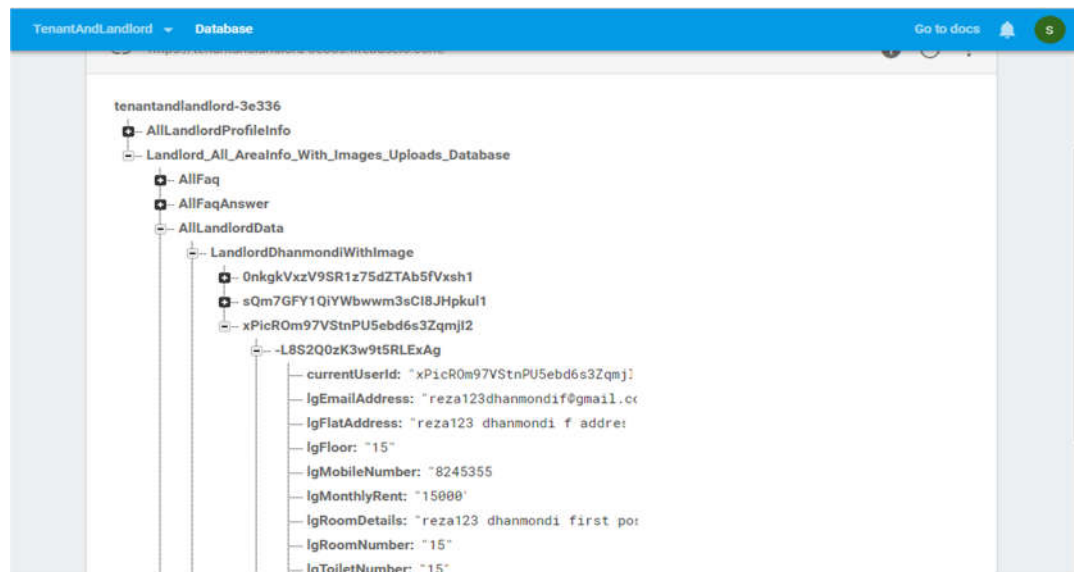


Figure 5.6 Landlord answered the questions

5.2 Implementation of Front-end Design

We implement our font-end design with some screen. The challenge was more when we design the screen of several users.

5.2.1 Login and Registration for Landlord

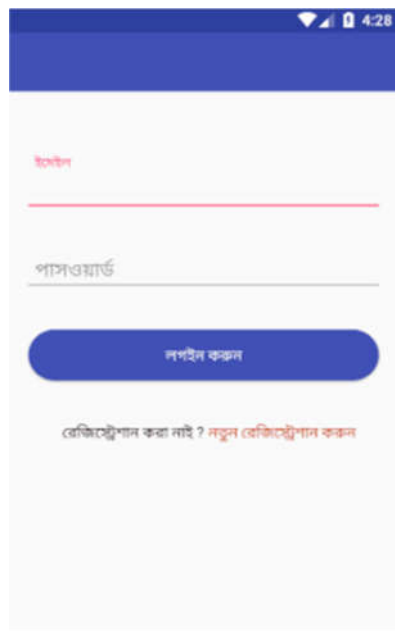


Figure 5.7 Log in screen

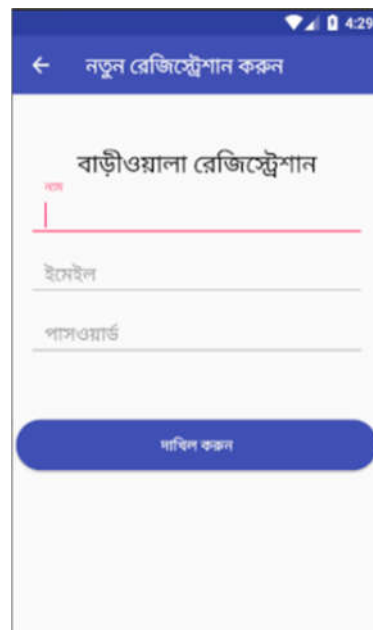


Figure 5.8 Registration screen

5.2.2 Landlord main Activity and Profile

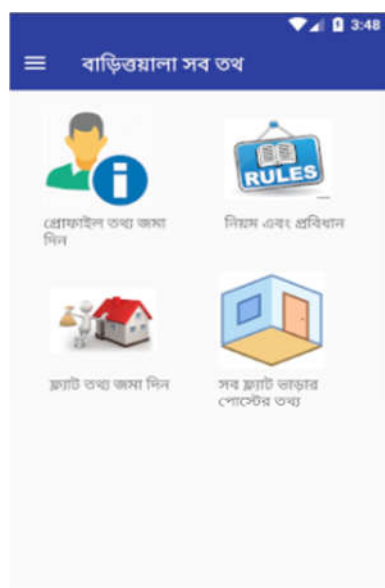


Figure 5.9 Landlord Main

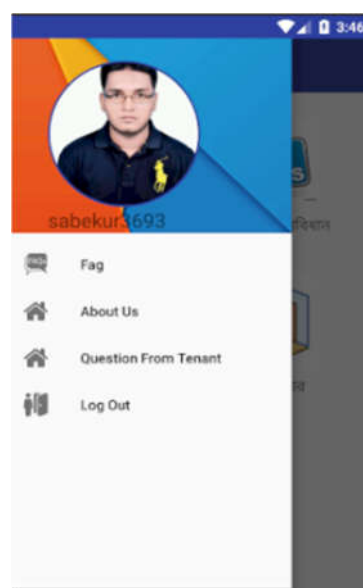


Figure 5.10 Landlord Profile

5.2.3 Profile submit and Rules Activity

Figure 5.11 Profile submit

Figure 5.12 Rules

5.2.4 Select Area and submit flat info

Figure 5.13 select area

Figure 5.14 submit flat info

5.2.5 All rental post and View Details of post for Landlord



Figure 5.15 all post [9]



Figure 5.16 Details post

5.2.6 Landlord post Update and Delete



Figure 5.17 Update post

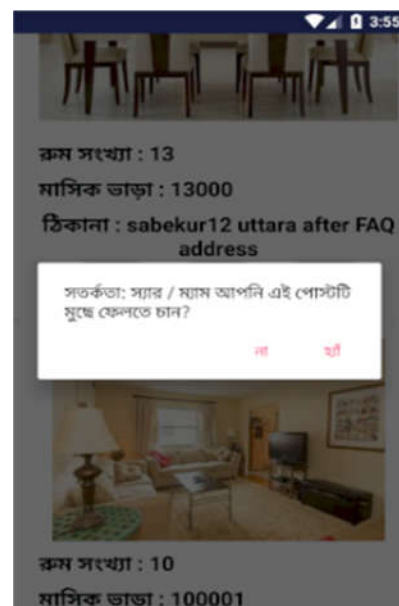
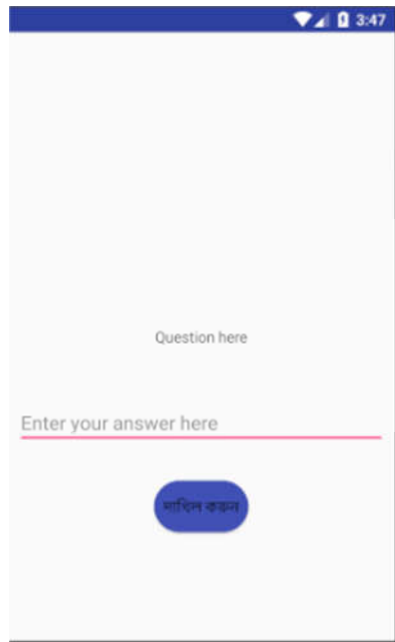
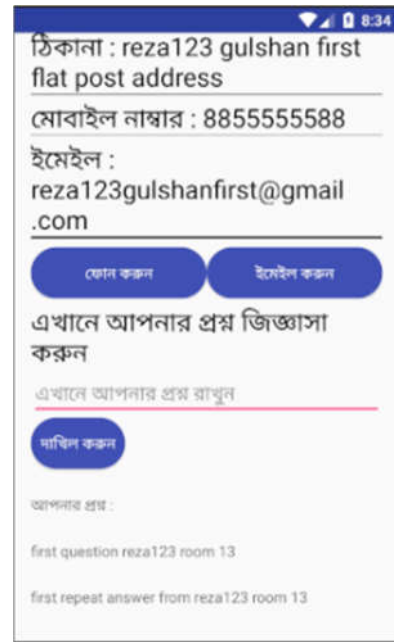


Figure 5.18 Delete post

5.2.7 Question asked by tenant for landlord and Answer given Landlord



A screenshot of a mobile application interface. At the top, there is a status bar with signal, Wi-Fi, and battery icons, and the time 3:47. The app's header is blue with the text "TenantAndLandlord". The main content area is white and contains the text "Question here" in a light gray font. Below this is a text input field with the placeholder "Enter your answer here" and a pink underline. At the bottom, there is a blue button with the text "দাখিল করুন" (Submit).



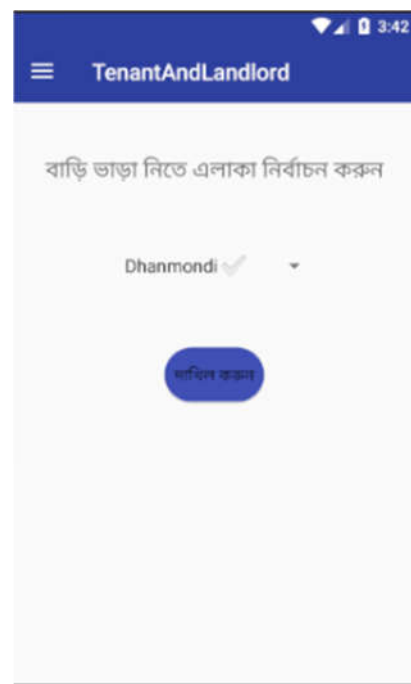
A screenshot of a mobile application interface. At the top, there is a status bar with signal, Wi-Fi, and battery icons, and the time 8:34. The app's header is blue with the text "TenantAndLandlord". The main content area is white and contains the following text: "ঠিকানা : reza123 gulshan first flat post address", "মোবাইল নাম্বার : 8855555588", and "ইমেইল : reza123gulshanfirst@gmail.com". Below this is a blue button with the text "ফোন করুন" (Call) and another blue button with the text "ইমেইল করুন" (Email). Below these buttons is the text "এখানে আপনার প্রশ্ন জিজ্ঞাসা করুন" (Ask your question here) and "এখানে আপনার প্রশ্ন রাখুন" (Put your question here). Below this is a blue button with the text "দাখিল করুন" (Submit). At the bottom, there is a section titled "আপনার প্রশ্ন :" (Your question :) containing the text "first question reza123 room 13" and "first repeat answer from reza123 room 13".

Figure 5.19 Question asked by tenant Figure 5.20 Answer given by Landlord

5.2.8 Select user type and select area for tenant



A screenshot of a mobile application interface. At the top, there is a status bar with signal, Wi-Fi, and battery icons, and the time 3:39. The app's header is blue with the text "TenantAndLandlord". The main content area is white and contains two blue buttons. The top button has the text "বাড়ীওয়ালার রেজিস্ট্রেশন" (Landlord Registration) and the bottom button has the text "ভাড়াটিয়া" (Tenant).



A screenshot of a mobile application interface. At the top, there is a status bar with signal, Wi-Fi, and battery icons, and the time 3:42. The app's header is blue with the text "TenantAndLandlord". The main content area is white and contains the text "বাড়ি ভাড়া নিতে এলাকা নির্বাচন করুন" (Select area to rent house). Below this is a dropdown menu with the text "Dhanmondi" and a checkmark icon. Below the dropdown menu is a blue button with the text "দাখিল করুন" (Submit).

Figure 5.21 Select user type

Figure 5.22 Area select for tenant

5.2.9 All rental post of selective area and post details

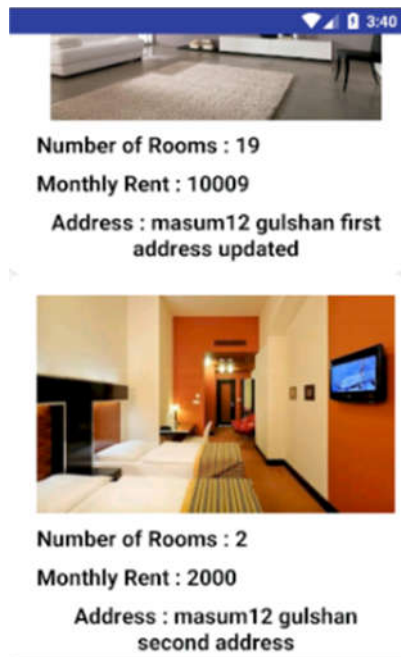


Figure 5.23 All rental post for tenant



Figure 5.24 Post details of selected area

5.3 Implementation of Interactions

Implementation of interaction is most important part of a system. Interaction means when we are in a specific function and go to another function that we want those time. I separate the function for a variant of a user. I design every user part very politely that user what he wants is indeed here. I design very carefully that the design attractive to users. An application Successions where a user is satisfied using the application. The Satisfaction level of our system is high.

5.4 Testing Implementation

When a system is implemented and tested some specific function is called test implementation. I have tested our system several times. Landlord Registration, Login, Create Profile, Select area, Submit a flat rental post, View flat rental post for the selected area, update a post and delete a post, answering the question etc. test by me in various time.

I have tested the following factors:

- Landlord Registration
- Landlord Login
- Profile create
- Select area
- Submit a post with an image
- Update post
- Delete post
- View post from Tenant part
- Ask question form Tenant part

I test the whole system by maintains SDLC method.

5.5 Test Results and Reports

System Testing Table show below a bridge the result of system testing:

Table 5.1: System Testing Table

Test Case Id	Date Tested	Tester	Pass/Fail	Severity Of Defect	Summary Of Defect	Closed prior to Release?	Comment
1	10.3.2018	Sabekur	Pass	Bug in 1 places	Bug	<Yes>	Working well

5.6 User Acceptance Testing

The table below a bridge the test cases for user acceptance testing and the test result obtained each other.

Table 5.2: User Acceptance Testing

Test Case Id	Date Tested	Tester	Pass/Fail	Severity of Defect	Summary Of Defect	Closed prior to Release?	Comment
1	20.3.2018	Sabekur	Pass	No Defect	No Defect	<Yes>	
2	21.3.2018	Bari	Pass	No Defect	No Defect	<Yes>	All ok
3	21.3.2018	Jewel	Pass	No Defect	No Defect	<Yes>	

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

For the grace of ALLAH, we have successfully completed our project and documentation. After the long-term of thinking, Discussion, implementation we are in the last session and happy of completion. Dhaka rental for tenant and landlord is for both tenant and landlord. Herewith is app Landlord can create their profile, post their rental advertisement, can update and delete their post. Here landlord can also answer the question asked by the tenant for a particular post. Here with this app, I tried to solve the inconvenience of the tenant for searching a perfect flat for their family and themselves. On the other hand, this app will landlord to post their rental unit advertisement and maintain them. I hope this app for saving time and money both for tenant and landlord.

6.2 Scope for Further Developments

I have a future plan for the application. Some of the planes are:

- Add Real time chat with Tenant and landlord.
- Add payment method for giving advanced payment for flat rental
- Feedback system for the landlord

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APPENDIX

Appendix A: Project Reflection

The purpose of this Appendix is to provide an introduction to Project reflection. It is a challenging and enjoyable experience for me. The purpose of this project is to allow the landlord to post their flat rental in a selective area and allow Tenant to find their desire area in Dhaka city. This app is initially some selected area in Dhaka city. In Dhaka, city landlord has to print different poster, different banner to find the tenant for their rental unit. Sometimes their rental unit remains open for rent about few months. The aim of this project is to reduce the hassle of tenant while finding a rental unit for them and also for the landlord to find the tenant for their rental unit and post rental unit's advertisement very easily.

Appendix B: Related Diagrams

The bellow image illustrates the use case diagram of Tenant System.

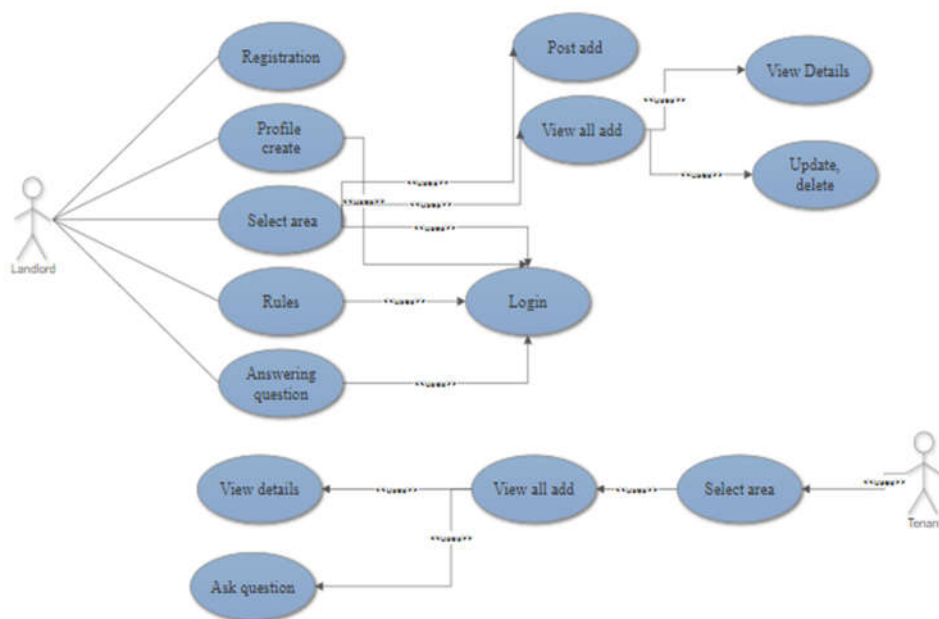


Figure 3.2 Use case of Tenant system

The bellow image illustrates database of the Tenant System.

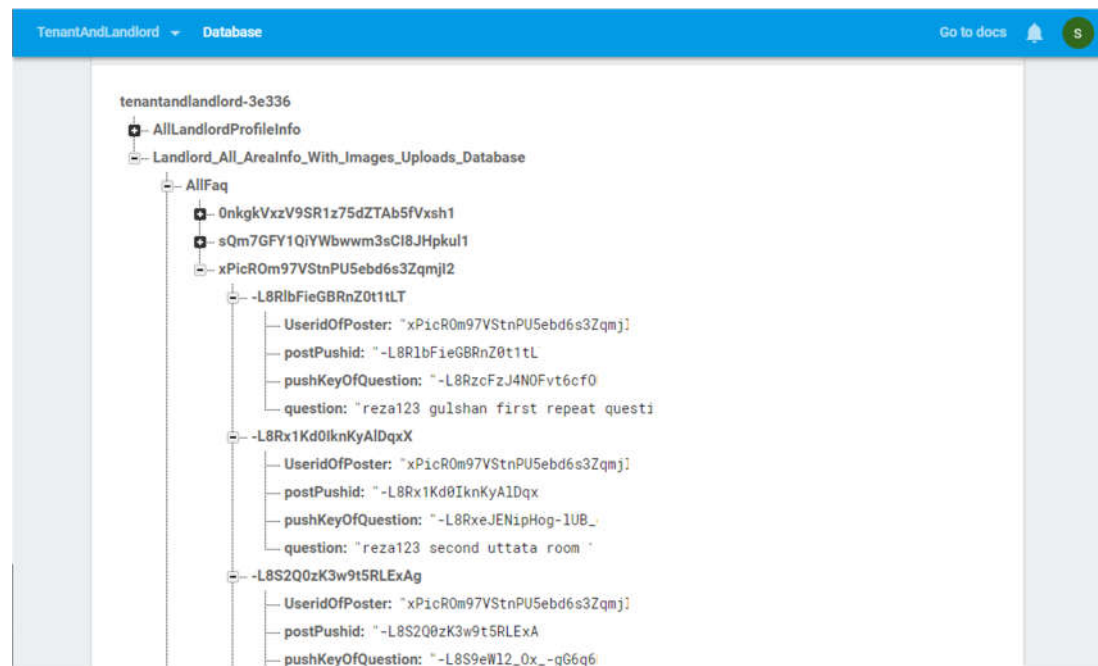


Figure 5.5 Question asked by Tenant

PLAGIARISM REPORT

