RentHub-An Android Based House Rent Project

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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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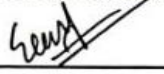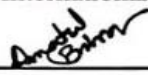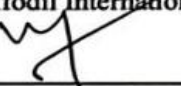**DAFFODIL INTERNATIONAL UNIVERSITY**

DHAKA, BANGLADESH

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APPROVAL

This Project titled **RentHub-An Android Based House Rent Project**, submitted by Omar Sakib Ibna Farouk 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 January 25, 2024.

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Dr. Md. Monzur Morshed, Professor, 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 creation of our application, "RentHub," is a response to the markets of the current era, where time is a precious commodity. Intending to be a valuable asset in today's society, RentHub caters to individuals who lack the time for in-person house hunting. The project introduces opportunities not only for prospective tenants but also for house owners, offering a streamlined avenue to quickly rent out their properties. Developed on the Java platform, RentHub is designed for Android users, ensuring widespread accessibility. The user-friendly interface of our application aims to provide a comfortable and reflexive experience, acknowledging the diverse needs of our user base. Our dedication to a better lifestyle is reflected in the development of RentHub, a tool crafted to significantly ease the challenges associated with finding and renting homes. Supervised by experts, the system utilizes XML, Java, Back4App database, and Android Studio to ensure a strong and efficient platform. Rigorous testing involving over 15 users has delivered positive results, with a majority expressing satisfaction with the system's utility. Looking ahead, we have ambitious plans to further improve and enhance the application, incorporating valuable feedback to continually refine the user experience. In summary, RentHub is not just an application; it is a solution tailored to meet the developing needs of individuals in a fast-paced society. By leveraging technology and user-centric design, RentHub aims to simplify the housing search process and contribute to a more convenient and efficient lifestyle for users.

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INTRODUCTION

1.1 Introduction:

Introducing "RentHub," a mobile application crafted to simplify the house-hunting experience for people seeking rental accommodations. Developed with a focus on user convenience and efficiency, RentHub is a game-changer in the way users discover and secure their ideal living spaces. This app caters especially to those who are in search of rental properties through an innovative and streamlined approach. By harnessing the capabilities of modern technology, RentHub offers users a seamless and user-friendly interface for browsing, booking, and managing rental houses. No more negotiating with the hassles of traditional house hunting – RentHub allows users to effortlessly navigate through listings, stopping the need for physical visits. This application marks the end of bulky processes, permitting users to securely and swiftly find, book, and manage their rental properties at their convenience. Forget about the worries of misplaced documents or forgotten details. RentHub ensures a hassle-free experience, providing a digital platform that simplifies the entire renting process. Tailored to meet the diverse needs of users, RentHub aims to redefine the landscape of property rental, offering unparalleled convenience and efficiency. Through its integration with a comprehensive database of rental listings, RentHub supplies real-time updates on available properties, pricing details, and essential information. The application prioritizes user privacy, implementing robust security measures to safeguard sensitive information.

1.2 Motivation:

RentHub, my brainchild, was born out of the challenges I faced while searching for accommodation in the university area. Frustration from unsuccessful searches led me to broaden my exploration over two days, involving a hefty 30-kilometer commute from home. This experience became the inspiration for RentHub—an app aimed at sparing others from similar struggles. The motivation behind RentHub is deeply emotional,

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driven by a commitment to ease the challenges I took. The vision is clear that create a platform that simplifies the accommodation search, offering efficiency and comfort. The memory of those two days, filled with relentless searching and long-distance commuting, continues to fuel RentHub.

In the face of adversity, the seed of innovation was planted. RentHub goes beyond being just an app. it's a response to the question, "How can we make this process easier for everyone?" Motivated by a genuine desire to reduce the stress of finding a place to call home, RentHub embodies empathy born from personal experience. RentHub aims to turn challenges into opportunities through technology. It's a project with a simple yet profound goal—to empower individuals via a tool that redefines the accommodation search. RentHub represents my commitment to making a positive effect, ensuring others don't face the hurdles I encountered on those crucial two days. For students, RentHub is a game-changer, offering room availability at their fingertips and eliminating the need for physical presence. Another key motivation is to provide real-time information and updates on room availability, status, and booking options. RentHub empowers individuals to stay informed and plan their accommodation seamlessly, creating the journey of securing a place to live less tumultuous. Additionally, my interest in learning Android development played a part in the decision to create an Android app, solidifying RentHub as the practical outcome of both a personal journey and a specialized learning experience.

1.3 Objective:

In the development journey of RentHub, we have outlined a strategic set of objectives that navigate our path toward achieving our overarching goal. Initially, our focus lies on optimizing the application for mass production, conducting detailed analyses, and implementing modifications to enhance scalability and operational efficiency. Beyond geographical confines, RentHub aspires to evolve into a nationwide accommodation solution, starting from Dhaka and extending its reach to various cities. Additionally, we are committed to tailoring RentHub as an efficient application specifically designed to

address the special accommodation needs of university-area students, recognizing the unique challenges they face.

Our vision extends beyond simply creating a functional app, we aim to make RentHub a transformative experience for every user. This entails a commitment to ensuring that anyone utilizing the app notices a significant and praising difference in their accommodation search process. To achieve this, we will establish a strong feedback loop with RentHub users, integrating continuous insights to iteratively enhance and optimize the application. This feedback-driven approach aligns with our dedication to staying responsive to user expectations and preferences.

By fostering a dynamic and user-centric approach, RentHub aims to be more than just an accommodation search platform—it aims to be a comprehensive and transformative resolution for seekers at all levels. These objectives collectively embody our dedication to developing RentHub into a widely accessible, efficient, and impactful tool for individuals navigating the intricacies of finding suitable accommodation.

1.4 Expected Outcome:

The RentHub system encompasses various scopes to enhance user experience. It serves as a useful platform for room seekers to easily find and locate accommodations. Moreover, it caters to common users, offering an easy-to-use interface that not only simplifies the accommodation tracking but also saves valuable time and money. One of the primary expected outcomes of this project is the reduction of the hassle associated with searching for house rentals. By introducing a digital platform, individuals can conveniently reserve homes using their smartphones, eliminating the need for physical presence. This streamlined process is anticipated to save valuable time, allowing users to efficiently complete their renting transactions over a call. Another expected outcome is the enhanced convenience and accessibility of the renting process through RentHub's user-friendly interface. Designed to be intuitive and easy to navigate, the system caters to students of all technological backgrounds. RentHub ensures flexibility and convenience in the purchasing process, providing users with a seamless and hassle-free experience.

Individuals can expect to search for accommodations anytime, anywhere, without the need for in-person visits or concerns about the availability of homes.

1.5 Project Management and Finance:

Implementing a room rent application system necessitates effective project management and meticulous financial planning, ensuring the system's successful development and deployment within budget constraints. The following key considerations for project management and finance should be taken into account during the implementation of a room rent application system:

- Define project scope: Clearly articulate the project's goals, objectives, and deliverables, outlining the essential functionalities and features the system should incorporate. This comprehensive definition aids in accurate estimations of project timelines and resource requirements.

- Allocate resources: Identify the necessary resources for the project, encompassing personnel, hardware, software, and other infrastructure requirements. It's crucial to confirm that the project team possesses the requisite skills and expertise for a successful project completion.

- Develop a budget: Estimate the costs associated with the development and execution of RentHub, covering software development, hardware, licensing, training, and ongoing maintenance expenses. A thorough budget should encompass all aspects of the project.

- Financial forecasting: Assess potential financial benefits such as increased efficiency, reduced labor costs, improved inventory management, and enhanced customer service. Conduct a comprehensive cost-benefit analysis to determine the return on investment (ROI) and validate the financial viability of the project.

- Monitor project progress: Regularly track the project's advancement against the planned schedule and budget. Implement project management tools and methodologies to promptly identify and address any deviations or issues. Maintain stakeholder engagement through regular progress reports and meetings.

- Risk management: Recognize potential risks and formulate mitigation plans. Common risks associated with RentHub may include technical challenges, budgetary overruns, schedule delays, and user adoption issues. Implementing robust risk mitigation measures is essential to minimize the impact of these risks on the project.

1.6 Report Layout:

A effortless summary and representation for navigation through the content of the entire project:

In Chapter 1: we explored the fundamental concept of 'HomeSeek- Buy, Sell, and Rent, covering aspects such as introduction, motivation, objectives, expected outcomes, and project management and finance.

In Chapter 2: Our focus will shift to the application's background, encompassing Preliminaries, Related Work, Challenges, Problems, and more.

In Chapter 3: We will delve into the 'Requirement Specification' of the application,

In Chapter 4: We will address its 'Design Specification.' The subsequent chapter,

In Chapter 5: We will be dedicated to the 'Implementation and Testing' phase.

In Chapter 6: We will provide insights into the application's societal impact, environmental implications, and sustainability aspects.

In Chapter 7: We will wrap up our discussion with a focus on conclusions, future scope, limitations, improvements, and the overall project summary.

CHAPTER 2
BACKGROUND

2.1 Introduction:

RentHub emerges as a transformative response to the challenges inherent in the modern urban accommodation search. A decade ago, the process was fraught with uncertainties and time-consuming searches, a struggle carved in the personal experiences of individuals seeking suitable living spaces. The frustration of vast searches and lengthy commutes became the momentum for RentHub, a comprehensive platform born from the commitment to redefine and simplify the accommodation search paradigm. Growing alongside the expansion of urban areas and increasing mobility, RentHub goes beyond being a mere app; it stands as a commitment to efficiency, convenience, and empowerment. The motivation behind RentHub lies in sparing others from the challenges encountered during crucial accommodation searches, fostering a project fueled by empathy and a commitment to positive impact. As we delve into RentHub's background, subsequent sections will unveil the specific challenges addressed and the creative features that position RentHub as a game-changer in the realm of accommodation searches—an evolution towards a seamless and empowered future. Welcome to RentHub, where the past struggles pave the way for a redefined and enriched housing search experience

2.2 Related Works:

For nearly 17 years, "bdHousing.com" has maintained its dominant position as a widely recognized platform for property owners to promote their properties for rent or sale, while also allowing property seekers to find their ideal houses. It has earned the reputation of being Bangladesh's biggest online property-selling website.

"Renthome" is an online marketplace dedicated to helping people discover land, affordable homes, or commercial spaces. Their objective is to furnish clients with the latest marketing report and facilitate easy communication with brokers, developers, and landlords. Positioned as Bangladesh's premier ready-to-buy-and-sell platform, they have structured their system to offer comprehensive property information at any given point.

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The renowned Bangladeshi marketplace "Bikroy.com" includes a section for house rentals and buy-sell market. However, certain problems have been identified. These platforms lack proper location tracing with an updated map location system, and a secure live end-to-end chatting system has not been integrated.

Offering an online platform with a robust financial foundation and an impressive interface, all fortified with an up-to-date security protocol. Financially stable individuals can join to find appropriate housing, while those who have undergone proper background checks can list their houses for sale or rent.

Upon reviewing similar systems in the basic project plan, it is evident that online house rental services in Bangladesh need significant upgrades. The envisioned internet-tech-friendly system, built on new technology and subject to regular updates, seeks to address home rental challenges uniquely. A distinctive feature is a direct chatting system that allows tenants to communicate directly with landlords, eliminating intermediaries. The primary purpose is to facilitate direct connections between house buyers/tenants and house owners/landlords.

The platform prioritizes a user-friendly atmosphere with maximum attention to user safety and privacy. Financially stable individuals and those with a respectable background interested in the house-renting business are welcome to participate. Recognizing the current trend of people favoring easy-to-use systems with ample information, the system aims to be captivating and informative.

2.3 Comparative Analysis:

In the realm of property transactions, numerous apps worldwide enable seamless renting, buying, and selling experiences, often free of charge. Surprisingly, Bangladesh lacks a major app catering to these requirements. To bridge this gap, we've developed an innovative app—the first of its kind in Bangladesh—aimed at performing tasks similar to well-established foreign and property rent apps. Our app is poised to revolutionize property transactions in the country, fostering inclusivity, efficiency, and cost-effectiveness for all residents. What sets us apart is our special focus on the often-overlooked demographic of university students, particularly those residing in university

areas. By directing our attention to this specific group, we not only manage a critical market need but also provide a platform for professionals in the field to access a broader customer base, particularly at the grassroots level. Our mission is to make property rent more accessible and streamlined for the people of Bangladesh, paving the way for a transformative and pioneering solution in the realm of home rent apps.

2.4 Scope of the Problem:

We aimed to develop a unique app to streamline the process of finding rental houses, introducing a concept to the house rental market in Bangladesh. However, our journey faced challenges. Initially, we conducted on-site research in various areas to understand house prices and availability, engaging with property owners and managers for valuable understandings. Deciding on features based on this research was the next step, but creating a complex set of features proved to be a tough task, leading to some errors along the way. Despite these challenges, we persevered and successfully created a stable app. Working as a solo developer had its limitations, particularly in covering all aspects of the app. Limited manpower was a important factor that may have impacted the app's perfection, but we made concerted efforts to address these constraints and deliver the best possible solution for the house rental market in Bangladesh.

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 the app. Many of the property owners and their consumers were also hesitant to disclose their personal information where other users of the app could check their experience. Gaining the knowledge of development 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 house owners. We tweaked our features to ensure that only the details a user wants to make public, can be seen by others. So, the privacy of our users is ensured.

CHAPTER 3
REQUIREMENT SPACIFICATIONS

3.1 Business Process Model:

In business, there's a game plan, like steps they follow to do their thing and stick to their mission. We call these steps business strategies. It's basically the story of how they make things happen. Now, picture this story as a map. This map is called a business process modeling diagram. It's like a picture that shows the order of things a business does. So, here's a simple map, a business process diagram for the RentHub app:
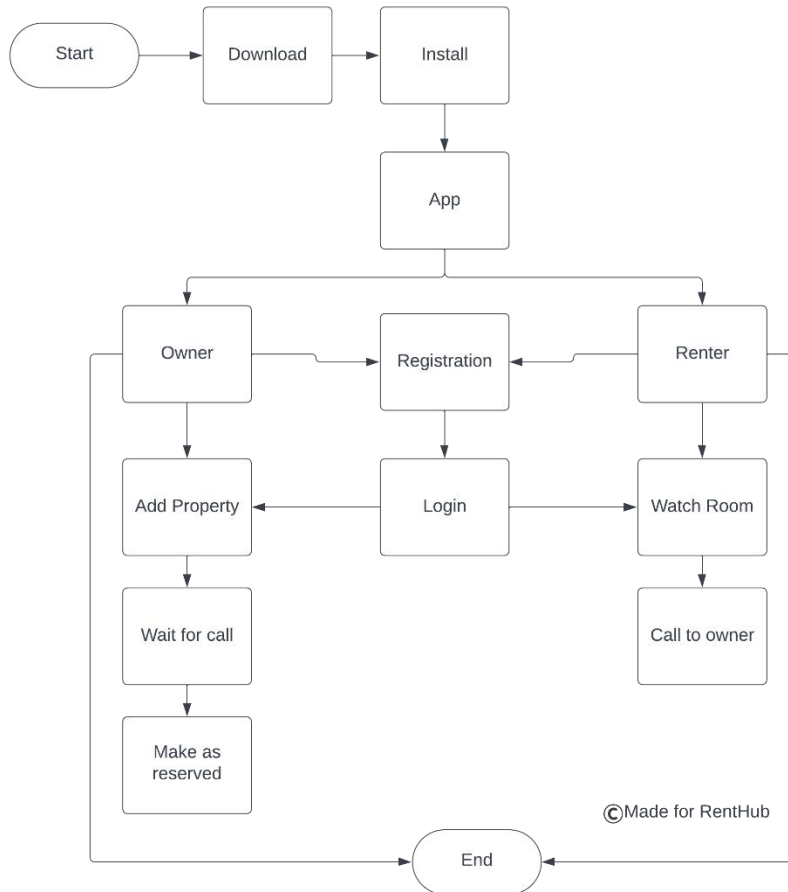

Figure 3.1: Business Process Model

The image is a flowchart that outlines the process of using an app made for RentHub. The steps include downloading and installing the app, registering, and either adding a property as an owner or watching a room as a renter. The final steps involve waiting for a call and marking the property as reserved.

Here is the description of the image:

➢ This image is a flowchart that outlines the process of using an app made for RentHub. The steps include downloading and installing the app, registering, and either adding a property as an owner or watching a room as a renter. The final steps involve waiting for a call and marking the property as reserved.

➢ The image is a flowchart with clear, labeled steps connected by arrows indicating the flow of actions.

➢ It begins with "Start" leading to "Download", then "Install", culminating in accessing the "App".

➢ From "App", it bifurcates into two paths: one for "Owner" and another for "Renter".

➢ For Owners:

  • They proceed to "Registration", and then "Login".

  • After logging in, they can "Add Property".

  • They must then "Wait for a call" from interested renters.

  • Once contacted, they can mark the property as "Make as reserved".

➢ For Renters:

  • They also proceed to "Registration", and then "Login".

  • After logging in, they can opt for "Watch Room" listings on the app.

  • If interested, they initiate a "Call to the owner".

➢ Both paths converge at marking the property as reserved and lead to "End".

➢ There's a copyright note at the bottom right corner indicating it's made for RentHub.

Based on the diagram, it appears that "RentHub" is a platform that connects renters and landlords. Renters can register, log in, find a home, call the landlord, and logout. Landlords can add homes and mark them as reserved. Both renters and landlords have access to selling/buying consultancy services.

3.2 Requirement Collection And Analysis:

Gathering knowledge and figuring out what our app needs are crucial steps. We went to different places, talked to people living there, and asked landlords about rent price. We even took photos to see how good the rooms were. This research helped us decide what features our app should have and make it good for users. Then comes the important job of figuring out what exactly we need for the project and organizing it in a way that fulfills all those requirements. This involves careful planning and looking closely at the basic requirements at different stages of the development process. The main goal is to make sure our users are happy, and everything we need aligns with what users want. As we continue developing the app, it's important to understand what we really need and organize everything in a way that makes the project successful. Our interactions with users and their feedback play a big role in making RentHub a user-friendly and impactful solution.

The process of developing or enhancing a project must proceed gradually. Once one part is improved, the next segment is worked on or developed. This is the ongoing cycle of project development and improvement. Following these steps, gathering and applying the necessary resources becomes a critical phase in the overall process.

Technologies and tools required for development of the platform:
● IDE: Android Studio.
● Programming Languages: Java
● Database: Back4App and Room Database.
 ● Adobe XD for UI design.
 ● Android devices for application testing.
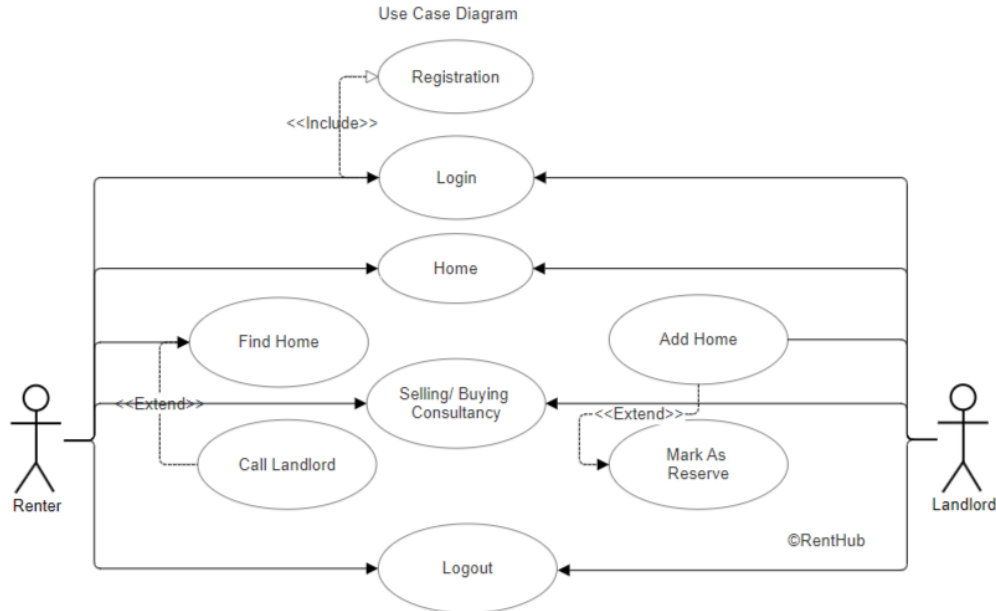
3.3 Use Case Modeling And Description:

Figure 3.2: Use Case Diagram

This use case diagram outlines the relations between "Renter" and "Landlord" . The renters can register, login, find a home, call the landlord, and logout. The landlords can add homes and mark them as reserved. Both renters and landlords have access to selling/buying consultancy services.

There are two actors represented: "Renter" on the left and "Landlord" on the right.

➢ The "Renter" interacts with five use cases:
- "Registration"
- "Login"
- "Find Home"
- "Call Landlord", which extends from "Find Home"
- "Selling/Buying Consultancy", which is shared with the "Landlord"
- "Logout"

➢ The "Landlord" interacts with three use cases:
- "Add Home"
- "Mark As Reserve", which extends from "Add Home"

- A shared use case with Renter, "Selling/Buying Consultancy"
➢ Arrows show that both actors must log in before accessing other functionalities.
➢ There are "<<include>>" connectors indicating mandatory actions that are included within other actions.
➢ There are "<<extend>>" connectors indicating optional extended functionalities associated with certain actions.

Based on the diagram, it appears that "RentHub" is a platform that connects renters and landlords. Renters can register, login, find a home, call the landlord, and logout. Landlords can add homes and mark them as reserved. Both renters and landlords have access to selling/buying consultancy services.
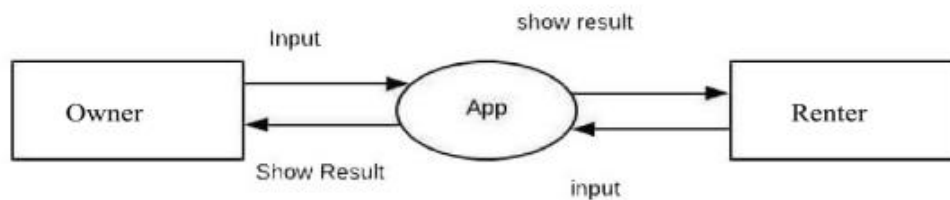
3.4 Data Flow Diagram:

Figure 3.3: Data Flow Diagram

The image is a simple flow diagram illustrating the interaction between an "Owner", an "App", and a "Renter". There are three labeled rectangles representing different entities: "Owner" on the left, "App" in the middle, and "Renter" on the right. Arrows indicate interactions between these entities. The Owner provides "Input" to the App as indicated by an arrow labeled "Input" pointing towards the App. The App shows results to both the Owner and Renter as indicated by arrows labeled "Show Result" pointing away from it. There is also an arrow labeled "input" from Renter to App indicating that Renters can also provide input.

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Based on the diagram, it appears that the flowchart represents a process where an "Owner" and a "Renter" interact through an "App". The Owner inputs information into the App, which then shows the result to both the Owner and the Renter. The Renter can also input information into the App.
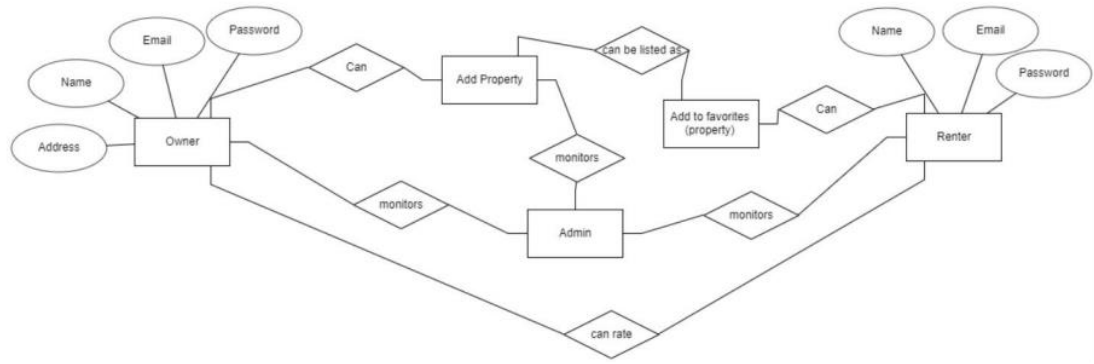
3.5 ER Diagram:

Figure 3.4: ER Diagram

3.6 Design Requirements:

Design Requirements for RentHub User Panels:

➢ **User Register Panel:**

- This panel provides a seamless user registration experience. Users should be able to create accounts by entering essential details such as username, email, phone number, and password. The registration process should be user-friendly, with clear instructions and validation checks for accurate data input.

➢ **Login Section:**

- The login section allows registered users to securely access their accounts. Users should be able to log in using their registered email/username and password. Implement security measures such as encryption to protect user credentials. Additionally, consider incorporating options for social media logins for added convenience.

➢ **Add Property Panel:**

- This panel enables property owners to add their properties to the platform. Property details such as images, rental price, location, and amenities should be easily uploadable. Ensure an intuitive interface for property input, and include validation checks to ensure completeness and accuracy of information.

➢ **Browse House Section:**

- The Browse House Section is the core feature for property seekers. Users should be able to search and browse available houses based on various criteria such as location, price range, and amenities. Implement filters, sorting options, and a map view for an enhanced user experience. Each house listing should provide detailed information and high-quality images.

➢ **Add User Panel:**

- The Add User Panel allows users to create profiles with additional details beyond the registration phase. Users should be able to add information such as a profile picture, a brief bio, and any other relevant details that enhance their profiles. This feature contributes to building a trusted community within the platform.

➢ **Contact Us Section:**

- **Description:** This section provides users with a straightforward way to reach out to customer support or the RentHub team. Include a contact form with fields for name, email, subject, and message. Implement a user-friendly interface to encourage users to share feedback, report issues, or seek assistance.

> **Calling Section:**
>   - The Calling Section facilitates direct communication between users. Property seekers can call property owners or vice versa through the app. Implement a secure and reliable calling feature, ensuring user privacy and data protection. Include call logs and other relevant features for a comprehensive calling experience.

These design requirements aim to create a user-centric platform with a focus on simplicity, security, and functionality, catering to both property owners and seekers within the RentHub ecosystem.

CHAPTER 4
DESIGN SPACIFICATIONS

In this chapter, we will delve into the design aspects of the front end and back end, outlining the requirements for both the design and implementation of the app. The entire application was crafted using the Java programming language, while XML was employed for the front-end design.

4.1 Front-end Design:

A crucial component of any application is the front end, representing the user interface that users interact with. The design of the front end plays a key role in determining user experience, interaction time, and the overall usability of features. Researching and gathering requirements for the front-end design were important steps in creating an attractive and user-friendly interface. In the application, when a user engages with the front end, the back end processes the interactions, and the information is subsequently exchanged between the front end, back end, and the database. This synergy ensures a seamless user experience and effective functioning of the application.
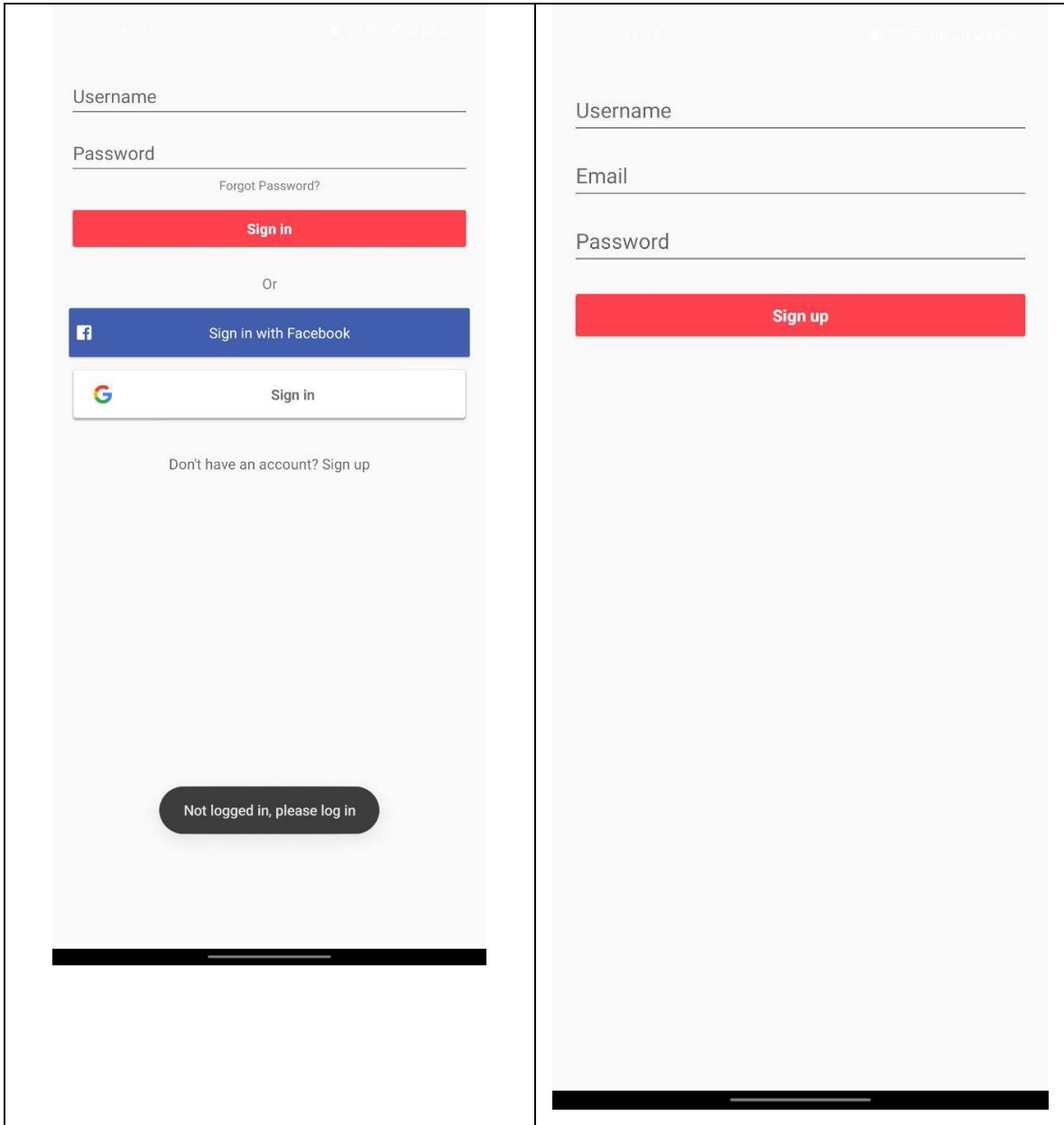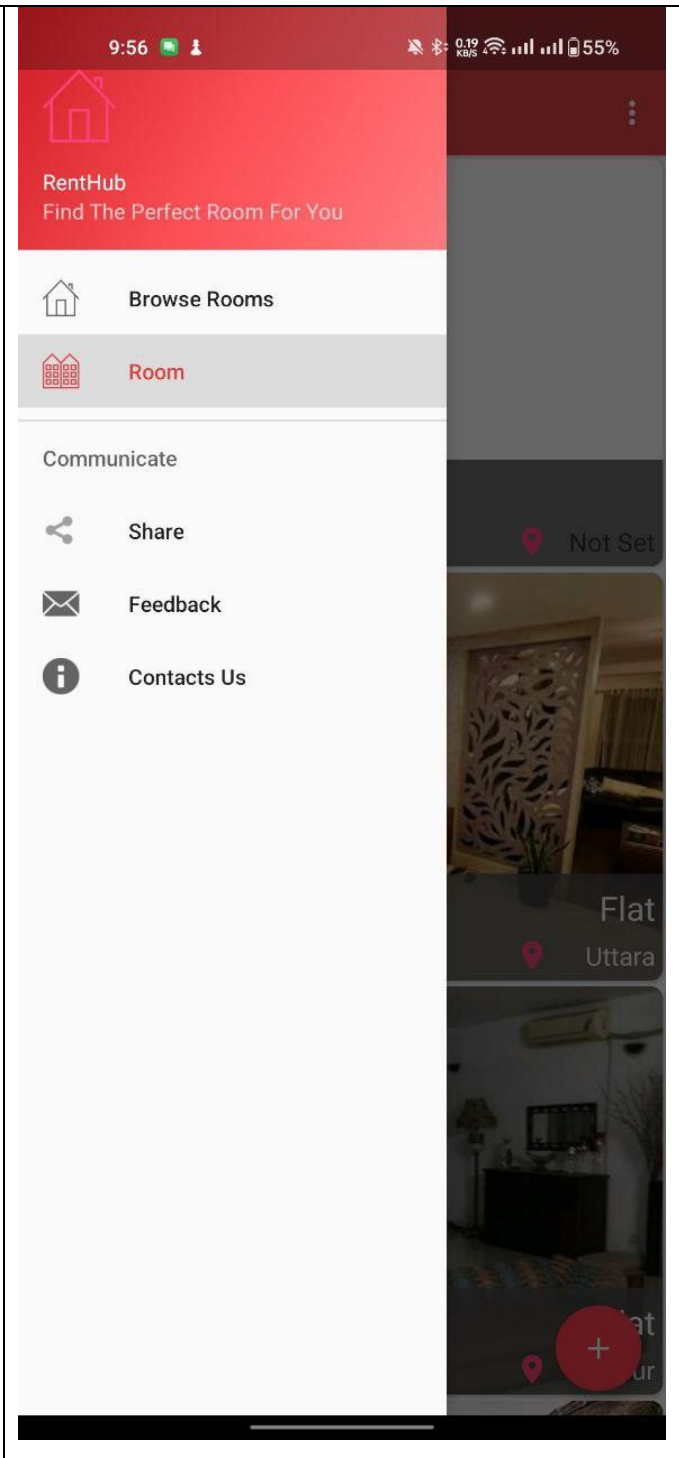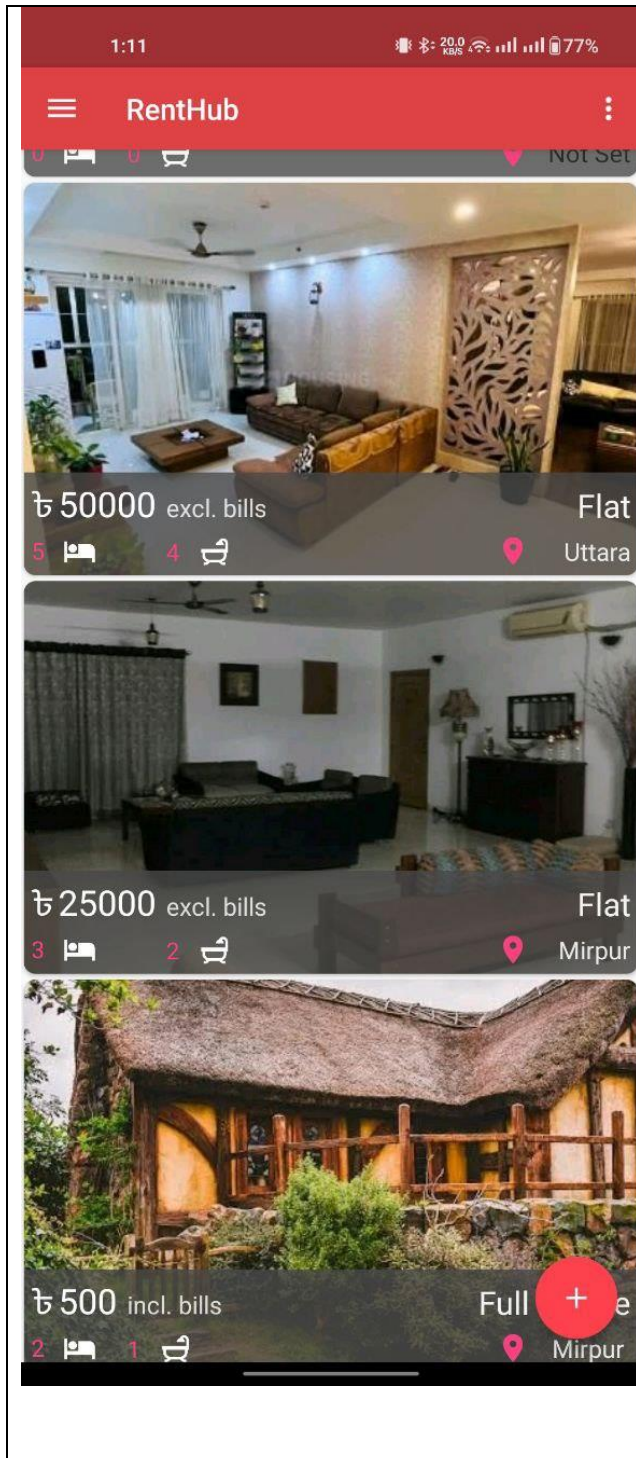
Figure 4.1: Login And Signup
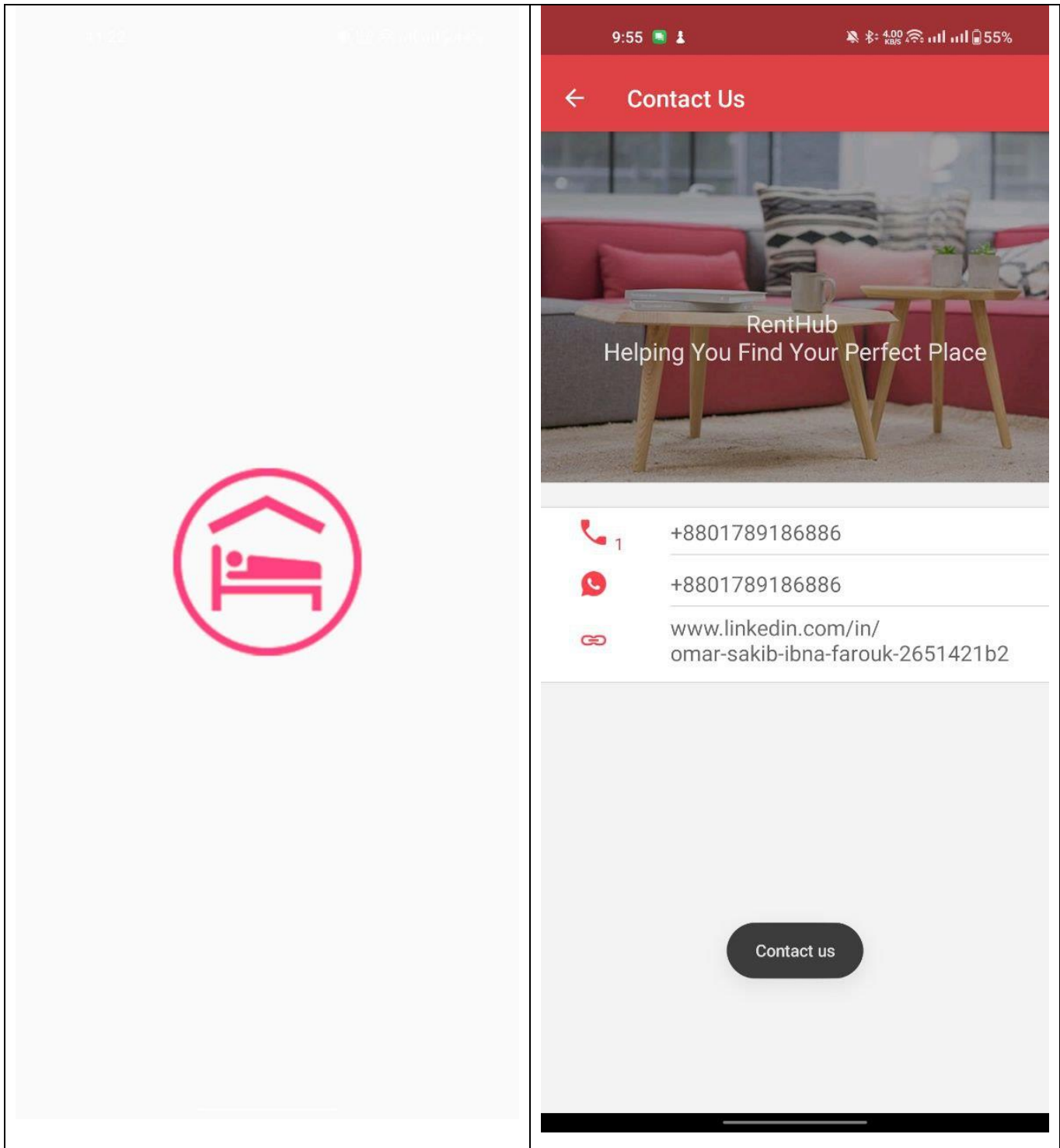
Figure 4.2: Home Page
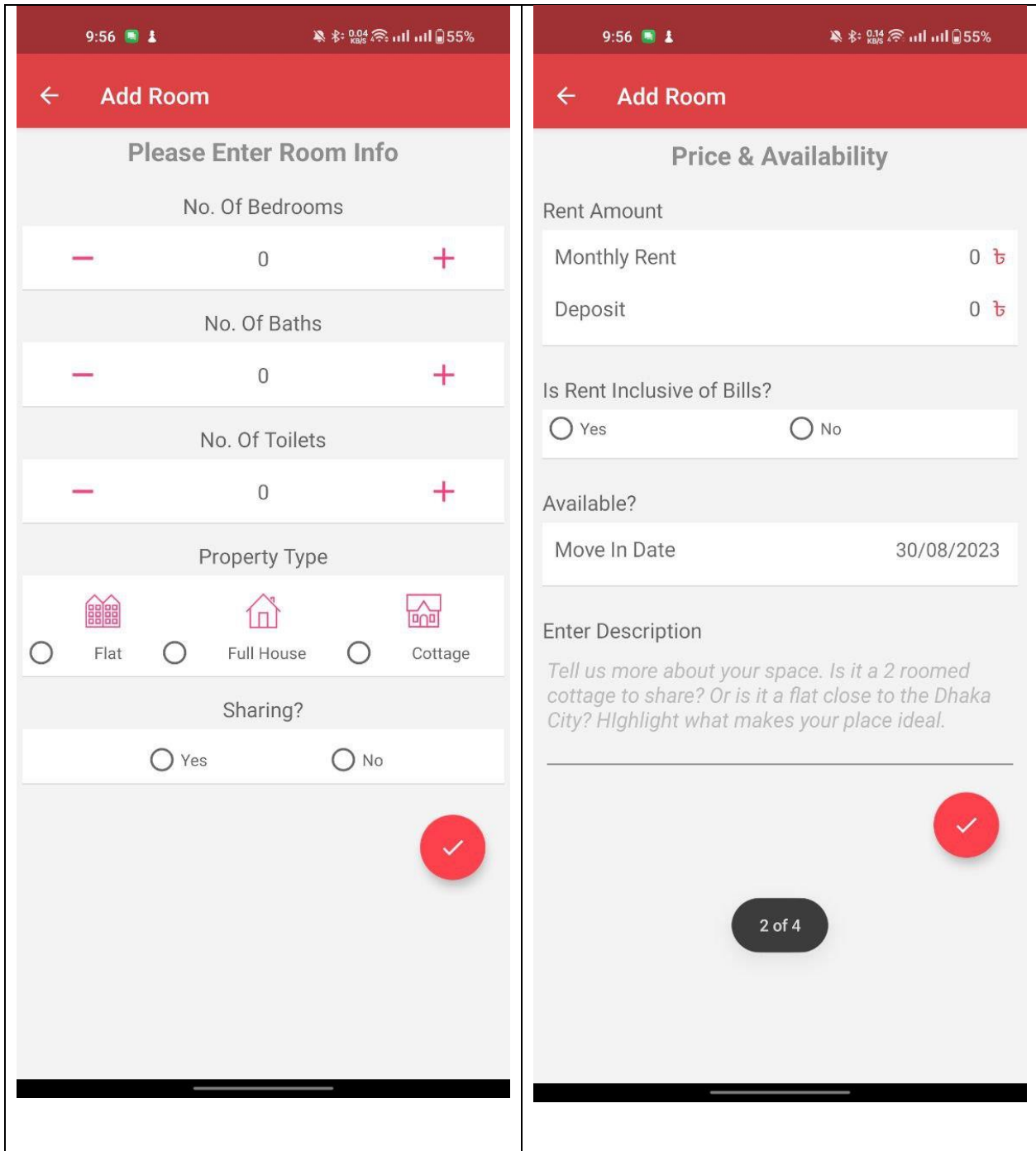
Figure 4.3: Splash Screen and Contact Us
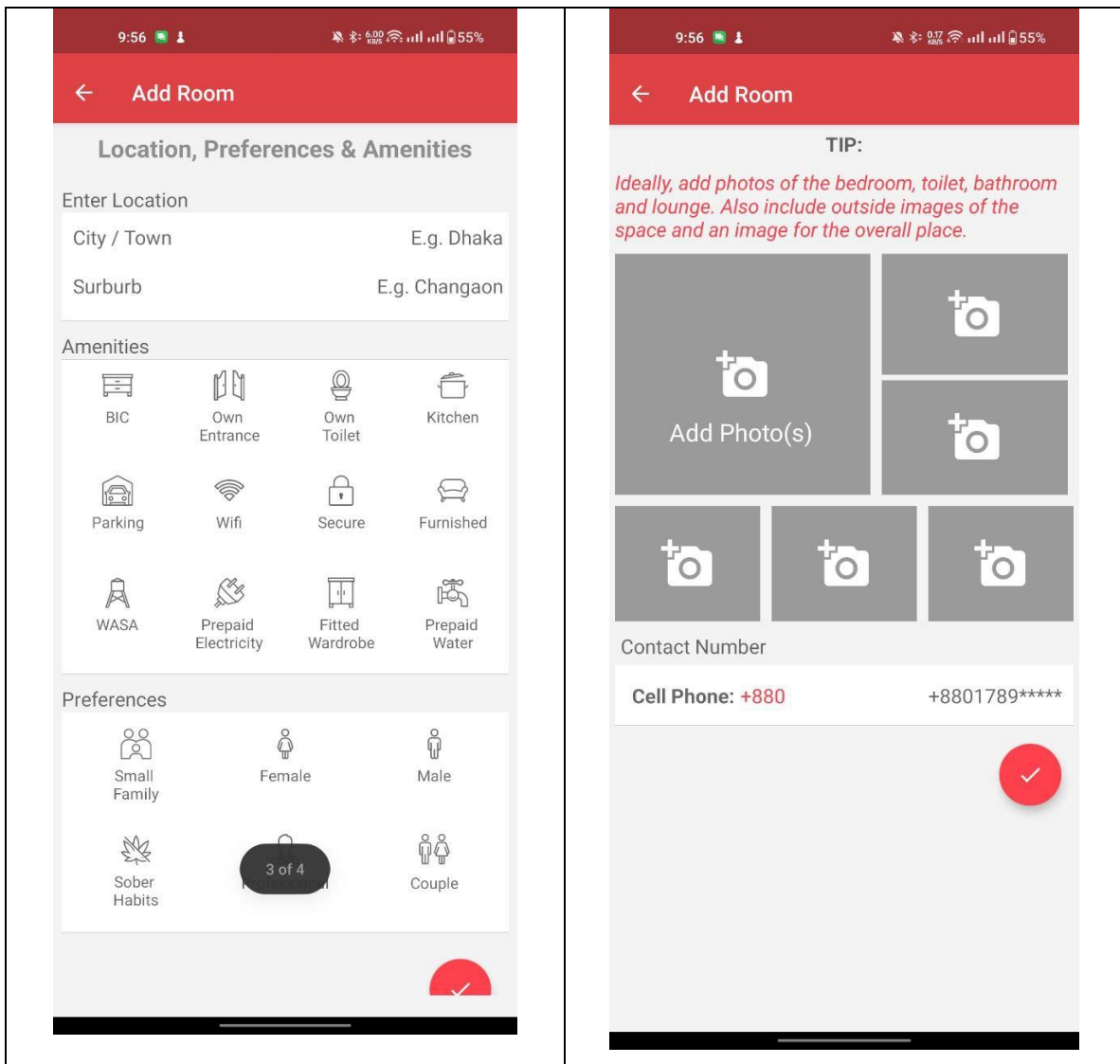
Figure 4.4: Add Rooms

Figure 4.5: Add Rooms

Upon initiating the application, users will encounter the splash screen, providing the app with the necessary time to initialize various states. Subsequently, users will be presented with choices to either log in or sign up. Additionally, for existing users who may have forgotten their password, there is a seamless redirection to a dedicated activity enabling them to reset their password. Following successful registration, login, or password reset, users will be welcomed into the application's home feed. In this section, they gain the ability to upload details about their house available for rent, enhancing the user experience and the overall functionality of RentHub.

4.2 Back-end Design:

The back end, often referred to as the "mind" of the application, is not directly accessible to users. Users provide input, which is then processed by the back-end component. Subsequently, the application displays the outcomes of this processing as output. In our application, the back end is exclusively accessible to the developer, serving as the behind-the-scenes mechanism that handles data and processes user inputs. The implementation of the back end was accomplished through the utilization of Back4App.

4.3 Interaction Design and UX:

Interaction design is the management of communication between a system and its users, fostering a cooperative connection. It emphasizes expressive interactions and a harmonious connection between users and the application interface for a delightful experience. User Experience (UX) measures how user-friendly an app is, guiding developers in enhancing it based on user needs. In this project, our focus on UX centers on providing optimal user benefits, ensuring simplicity with a basic and intuitive interface.

A crucial development aspect is the framework shaping impactful UI and UX, significantly influencing the user experience. Our approach involves designing interfaces that effectively display data without congestion, ensuring successful communication. The project incorporates appealing interactions with the UI, offering avenues for user feedback and suggestions. Efficient algorithms enhance system responsiveness, particularly with extensive data. Best practices, like replacing heavier Android components with lighter fragments, contribute to overall device efficiency at every development stage.
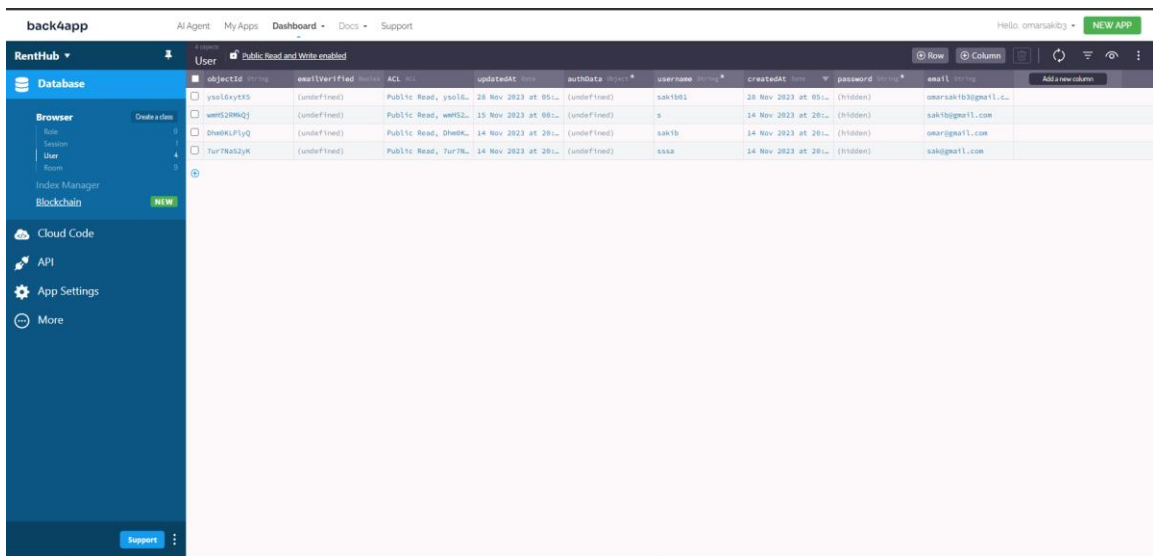
4.4 Implementation Requirements:

In the project development, I leveraged cutting-edge technologies and tools, providing countless advantages in terms of time and effort savings. The front-end implementation involved the use of XML, with Java being the preferred programming language, although Kotlin could also be a viable option. A modern Integrated Development Environment (IDE) is essential for any project, and for Android application development, I utilized Android Studio, an open-source software, leveraging the latest version available. Android Studio encompasses a diverse set of tools for building, debugging, and testing applications. Emulating a real device for testing purposes was facilitated by Android emulators, which distinguish themselves from simulators by mimicking both hardware and software. While various Android emulators are available, the project prioritized testing on a real device over an emulator.

CHAPTER 5
IMPLEMENTATION AND TESTING

5.1 Implementation of Database:

In this section, we present the implementation of our database using Back4App for efficient management. Figure 5.1.1 & 5.1.2 illustrates the database dashboard, providing an overview of our application. To access our app, users are required to register on the database, creating an account that enables successive login to the application.

Fig 5.1: Database Dashboard

This screenshots of a user interface for a database management system, specifically the "back4app" platform. It displays data entries under the "RentHub" database, where various user information is organized in columns such as Object ID, username, password, ACL, etc. The main area of the screen shows a table under the "RentHub" database with columns including Object ID, username, password (which is blurred), createdAt and updatedAt. There are four rows of data entries displayed with different usernames and other associated information.
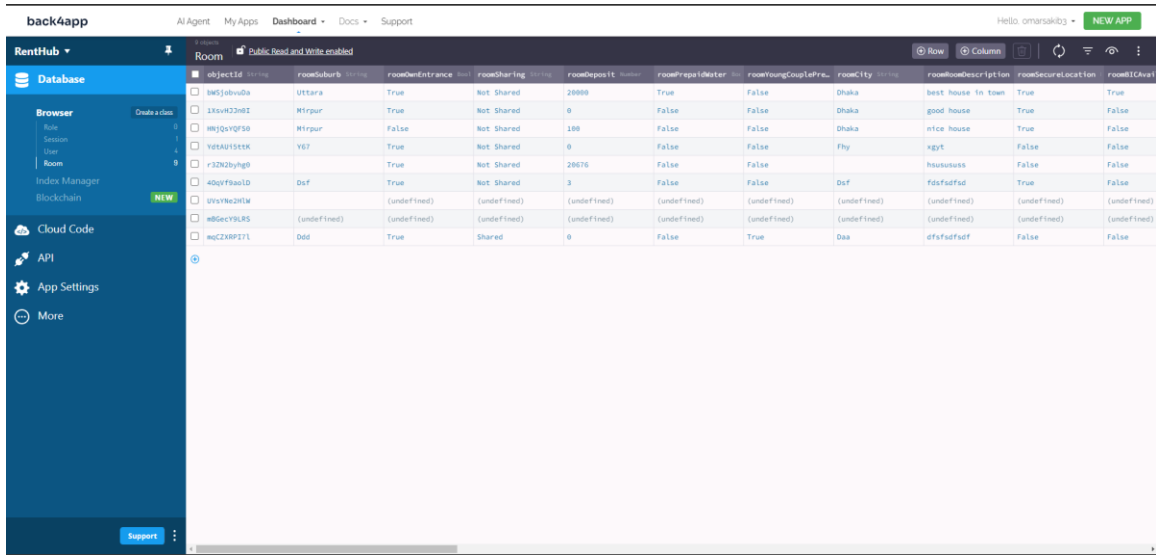
Fig 5.2: Database Dashboard

Back4App serves as the backend for our project's database, offering a user-friendly console on its website. Through this console, configuring Realtime Database, Storage, and Authentication is a straightforward process. The console also offers various security rules that can be easily applied to specific data paths, enhancing the customization and security of our database.

5.2 Implementation of Front-end Design:

The user interface, known as the front end, includes the part of the application visible and interactive for users. Since users are generally clueless of the complex technical details running in the background, their evaluation of the app hinges mostly on its visual appeal and user experience. Earlier, we delved into the detailed requirements for this front-end component. To bring the envisioned design to life, XML was employed as a tool of choice. Despite the availability of newer design libraries such as Material Design and Components, XML remains a prevalent and effective choice. While technologies like Jetpack Compose exist, they have not gained widespread adoption. Therefore, the decision to utilize XML was grounded in its ability to prepare efficient layouts, ensuring a smooth and responsive front-end experience for users.

5.3 Testing Implementation:

The testing phase is a vital step in the development process before the application is deployed. Various testing methods, including black box and white box testing, unit testing, and integration testing, were employed in this project. The initial implementation of the project involved the use of an architecture pattern, facilitating the separation of business logics from other platform-oriented logics and components. This segregation allowed for independent testing of different aspects. Additionally, manual testing was performed using various devices, and real-life user testing was conducted on platforms such as UserTesting.

5.4 Test Results and Reports:

Testing is done to know if a system will function properly or not in a real life situation. And to put those functions in maximum use, use cases are written while considering and covering all the practical scenarios which a system could face in its working life and try to find bugs in it. The below table contains test cases and their verdicts for My Mentor application.

TABLE 5.1: Table of Test Case And Result

	Case	Input	Outcome Expected	Actual Outcome	Result	Test Date
1	Splash Screen	Opened App Using Different Devices	Show Splash Screen Successfully	Opened Successfully	Passed	20 November 2023
2	Login	Providing Valid Credential	Logging In Successfully	Logged In Successfully	Passed	20 November 2023
3	User Name	Provided Existing Credential	Error	Showed Error	Passed	22 November 2023

4	Post Features	Posted An advertisement	Display Post On Home	Displayed On Home	Passed	22 November 2023
5	Calling	Call The Owner	Calling Will be Successful	Calling Was Successful	Passed	23 November 2023

CHAPTER 6

IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

6.1 Impact on Society:

RentHub stands as a catalyst for positive societal changes, helping common challenges in the housing search. The platform's user-friendly digital solution simplifies the process, saving time and effort for users, especially university-area students. By offering real-time updates and availability information, RentHub addresses the unique accommodation needs of this demographic. Through a commitment to transparency and a user feedback loop, RentHub empowers individuals with knowledge for informed property transactions, adjusting to evolving needs. Beyond convenience, RentHub aims to reduce housing-related stress, contributing to overall well-being and making a positive impact on society. In a parallel effort, the primary motive behind developing this application was to simplify the learning process, saving learners' time and promoting a sense of community. The application aims to promote collaborative learning, creating a positive impact on individuals' lives and contributing to a safer and better world.

6.2 Impact on Environment:

RentHub positively impacts the environment through its digital approach, reducing the ecological footprint associated with traditional housing processes. The platform's commitment to digitization minimizes paperwork, lowering paper consumption and promoting sustainability. By providing a paperless solution for property transactions, RentHub contributes to tree conservation and reduces energy consumption.

Moreover, RentHub's user-friendly digital interface reduces the need for physical commuting and paperwork, resulting in reduced carbon emissions from travel. The platform's efficient housing search process aligns with broader efforts to promote eco-friendly practices in real estate.

However, it's essential to acknowledge that, like many technologies, the use of devices for applications may contribute to environmental challenges, such as carbon emissions

from manufacturing and energy consumption. As technology advances, there is a collective hope for better eco-friendly manufacturing processes in the future.

In summary, RentHub's digital platform actively encourages environmental conservation by minimizing paper usage and reducing carbon emissions, while realizing the broader environmental challenges associated with device manufacturing.

6.3 Ethical Aspects:

RentHub is deeply committed to ethical standards, underlining user privacy, data security, and fair access to housing information. The platform empowers users through real-time information, informed decision-making, and transparency in property transactions. It actively promotes eco-friendly practices by minimizing paper usage and reducing the environmental impact of physical commuting. RentHub encourages community building, values user feedback for continuous improvement, and ensures inclusivity without discrimination. In summary, RentHub's ethical approach spans privacy, inclusivity, transparency, environmental responsibility, community support, and a feedback-driven improvement process. The app's ethical implications include making the property market more accessible, inclusive, and affordable, particularly benefiting individuals in poverty-stricken areas who may have been overlooked by traditional property channels.

6.4 Sustainability Plan:

Android technology keeps changing, with new things introduced almost every month. To make sure our project stays relevant, we need a sustainability plan. This might involve using a better architecture pattern like MVVM, which makes the app more scalable and easier to test. We can also consider switching to Kotlin, a newer and more user-friendly programming language. By using the latest technologies, we ensure that our app will last a long time in the world of Android.

CHAPTER 7
CONCLUSION AND FUTURE SCOPE

7.1 Discussion and Conclusion:

Significant effort has been invested in developing this Android app, encompassing every aspect from the registration to logout pages and all features in between. The application caters to two user types: owners/sellers and renters/buyers. Sellers can upload property details on their profiles, allowing potential buyers or renters to assess suitability from their profiles. The app includes a dedicated chat system for both parties and a rating feature aimed at transforming the property market. Every element has been meticulously incorporated, emphasizing a comprehensive approach to reshape the user experience in property transactions.

7.2 Scope for Further Developments:

The future development scope for RentHub, our Android app, is expansive and aims at elevating user experience and market presence. The plan includes cross-platform compatibility, extending the app to iOS for a broader user base, coupled with UI optimizations and bug fixes to ensure seamless performance. Feature enhancements, such as a built-in browser and text editor for programmers, will add versatility. Transitioning from Java to Kotlin aligns with industry trends, offering benefits like Kotlin Coroutines for efficient threading. Exploring emerging technologies, such as Kotlin Multiplatform Mobile (KMM), can transform RentHub into a hybrid app compatible with iOS and desktop platforms. Continuous user feedback integration, advanced security measures, AR features for virtual property tours, in-app educational resources, and sustainability initiatives will contribute to the app's evolution. Regular updates, technological adaptability, and a commitment to user satisfaction will drive RentHub's success in the dynamic landscape of property transactions.

APPENDIX

8.1 Appendix: Project Reflection

I initiated the development of this application in Spring 2021, driven by a singular objective – to craft a responsive and user-friendly platform. My focus extended beyond creating a mere app; I aspired to bridge the gap hindering self-learners, facilitating their learning journey and resourcefulness. The overarching goal was to empower users to achieve more by offering timely and relevant guidance. In the realm of modern technology, my philosophy diverges from the prevalent trend. While devices are inevitable in today's world, I believe they should serve as tools to simplify and enhance lives, fostering success rather than addiction. This endeavor is a manifestation of my dedication to create something aligned with my principles, anticipating that the app will manifest its intended positive impacts.

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