Rent On

A Real Estate Rental solution

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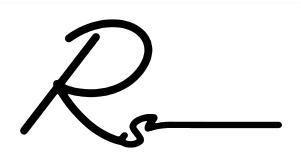
Declaration

I hereby declare that this project has been prepared by me, Mustakim Billah Rafi, under the supervision of Ridwanullah Yusuf, Adjunct Faculty, Department of Computer Science and Engineering, Independent University, Bangladesh (IUB). I also declare that neither this project nor any part of it has been submitted elsewhere for the award of any degree. All sources of knowledge used have been duly acknowledged. The design and development of this project are solely my personal efforts.



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Acknowledgments

I have put in significant effort for the successful completion of this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

I am highly indebted to my supervisor, **Ridwanullah Yusuf**, Adjunct Faculty, Department of Computer Science and Engineering, Independent University, Bangladesh (IUB), for his guidance and constant supervision. I also appreciate the valuable information and support provided throughout the project.

Lastly, I am thankful to my parents and the course members of Independent University, Bangladesh (IUB), for their constant cooperation and encouragement, which helped me complete this project. I also express my special thanks to industry professionals for dedicating their time and attention to providing insights related to the project who were always receptive to my queries and provided valuable technical expertise to help me overcome challenges during this project.

Dedication

We dedicate the project to God my maker, my strong pillar, my source of motivation, sense, knowledge and understanding. He has been the source of my capacity throughout this program. I am also dedicated to my supervisor. I am grateful to those who have inspired me in all the manner and whose encouragement has created certain that I provide it all it takes to end that that I actually have started. My love for you all can never be quantified. God bless us.

Abstract

Rent On is an online rental service that provides authentic and secure property with affordable price. Designed for busy individuals, particularly bachelors and service holders, it offers area based affordable room, flat, shop and plot. Whether it is mainly the bachelor's room and family’s flat. Rent On brings shop and plot for business enthusiast persons. The platform provides an easy-to-use ordering system, ensuring authentic and secure property, allowing you to find desired property with affordable price without the hassle rather than searching directly.

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Introduction

1.1 Overview

The objective is to develop an innovative online platform that simplifies and streamlines the real estate rental process. Designed to bridge the gap between property seekers and owners, the platform ensures transparency, efficiency, and reliability. It features verified property listings, advanced search filters, secure communication channels, and tools for tenant screening and payment management.

The platform provides a seamless, user-friendly experience for tenants to find their ideal homes and landlords to connect with reliable tenants. By addressing market inefficiencies and fostering trust, this solution transforms the rental process into a comprehensive, secure, and hassle-free journey for all stakeholders.

1.2 Purpose

The purpose of this web project is to modernize and streamline the real estate rental process by providing an efficient, transparent, and secure platform for property seekers and landlords. It aims to:

1. **Simplify Property Search:** Help tenants easily find rental properties tailored to their preferences through advanced filters and verified listings.
2. **Enhance Landlord Efficiency:** Enable property owners to effectively manage listings, attract reliable tenants, and reduce vacancy rates.
3. **Promote Transparency and Trust:** Address common challenges like fraudulent listings, hidden fees, and unclear rental terms.
4. **Digitize Rental Processes:** Provide tools for tenant screening, digital lease agreements, and secure payment systems to save time and effort.

1.3 Beneficiaries and Benefits

Property Seekers (Tenants)

1. **Verified Listings:** Eliminates the risk of fraudulent or misleading listings, ensuring trust.
2. **Transparency:** Clear information on rental terms, costs, and property details.
3. **Convenience:** Digital tools for scheduling visits, signing leases, and paying rent online.

Property Owners (Landlords)

1. **Faster Tenant Acquisition:** Exposure to a large pool of potential tenants reduces vacancy periods.
2. **Tenant Screening:** Integrated tools for background and credit checks ensure reliable tenants.
3. **Efficient Management:** Digital lease agreements, automated reminders, and payment tracking streamline operations.
4. **Market Insights:** Data analytics on rental trends and listing performance to optimize rental strategies.
5. **Enhanced Visibility:** Professional listing tools, including high-quality photos and virtual tours, attract more tenants.

Society at Large

1. **Improved Housing Market Transparency:** Promotes trust and reliability in the rental market.
2. **Economic Growth:** Efficient rentals boost economic activity in the real estate sector.
3. **Better Urban Living Standards:** Helps tenants find suitable, affordable housing that meets their needs.

1.4 Objectives

The primary objective of the project is to **develop a user-friendly, transparent, and efficient online platform** that bridges the gap between property seekers and property owners. It aims to simplify the rental process by offering comprehensive tools and features, including verified property listings, advanced search capabilities, secure communication, digital lease management, and payment systems. By addressing market inefficiencies, reducing risks of fraud, and enhancing trust, the platform seeks to create a seamless and reliable solution for real estate rentals, benefiting all stakeholders in the rental ecosystem.

1.5 Organizational structure

The organization, **Rent On**, will operate with a streamlined structure to efficiently manage its real estate rental platform. At the top, a **Leadership Team** will oversee strategic planning, innovation, and operations. **A Product Development Team** will handle platform design, functionality, and maintenance, ensuring a seamless user experience. A dedicated **Marketing and Growth Team** will focus on brand visibility and user acquisition through digital campaigns and partnerships. The **Customer Support Team** will provide 24/7 assistance to users, addressing queries and concerns. A specialized **Verification and Compliance Unit** will ensure property authenticity and adherence to rental laws. Lastly, the **Data Analytics Team** will gather insights on user behavior and market trends to optimize services, driving growth and continuous improvement.

Chapter 2

Background Study

2.1 Background

The real estate rental market, particularly in **urban areas**, faces significant challenges such as limited access to verified property listings, lack of transparency, and inefficiencies in the rental process. **Tenants often struggle with finding suitable properties due to unreliable information and fraud, while landlords face difficulties in finding reliable tenants and managing their properties effectively.**

Existing platforms in Bangladesh, like **social media groups or basic listing websites, fail to provide comprehensive solutions**, leaving a gap for an innovative approach. The rise of digital platforms globally and increasing adoption of technology locally present an opportunity to revolutionize the rental experience. This project aims to address these challenges by creating a user-centric, secure, and efficient online platform.

2.2 Reasons Why We Need Rent On

Transparency and Trust: Current rental platforms lack verified listings, leading to scams and misleading information. Rent On will ensure authentic, reliable property listings.
Efficient Search Process: Tenants struggle to find properties that meet their criteria. Rent On will offer advanced search filters and AI-driven recommendations to simplify the search.
Secure Transactions: Rent On will facilitate secure communication, digital lease signing, and online payment, reducing the risk of fraud and payment issues.
Time and Cost Efficiency: Both tenants and landlords will benefit from streamlined processes, reducing time spent on property searches, tenant management, and payment collection.
Market Growth and Urbanization: As cities like Dhaka grow, Rent On will meet the increasing demand for efficient, tech-driven rental solutions.

2.3 Features

Verified Property Listings: Ensures all property listings are authentic and verified, reducing the risk of fraud and misinformation for tenants and landlords alike.
Advanced Search Filters: Allows tenants to easily search for properties based on location, price, type, amenities, and more, streamlining the process of finding the perfect rental.
Digital Lease Agreements: Facilitates paperless, legally binding lease agreements, reducing paperwork and ensuring that both parties are clear on terms.
Online Payment Integration: Enables secure, hassle-free rent payments directly through the platform, providing landlords with instant payment confirmations and tenants with payment reminders.
Renter Screening Tools: Offers background checks, credit history, and rental history verification, helping landlords find reliable tenants and ensuring a smooth rental process.
Virtual Tours and Photos: Allows potential tenants to take virtual tours of properties, helping them make informed decisions without needing to visit in person.
Property Management Dashboard: Provides landlords with an intuitive dashboard to manage listings, track payments, and monitor tenant applications.
Market Insights and Analytics: Offers landlords data-driven insights on rental trends, competitive pricing, and property performance, helping them make informed decisions.

These features make Rent On a comprehensive, transparent, and user-friendly platform for both property seekers and landlords.

Chapter 3

Inception

3.1 Overview

The inception phase marks the beginning of the needed engineering process. This step aids in orientation and the formation of a primary draft regarding the project design. After analyzing the requirements for the Rent On platform, the scope and nature of the problem to be solved were identified. The goal of this phase is to establish consensus on requirements and resolve any conflicting needs among the stakeholders of this project. To achieve this, we have undertaken the following initial steps:

- Thinking About the topic.
- Find out Stakeholders.
- Gather Project Requirements.

3.2 Thinking

At the very first time, how we need to think about the topic. Where do we find those requirements? Who are the users of this system? In these steps, it may take different time. We have chosen stakeholders who supported the character and quality of the project and its product deliverable.

3.3 Stakeholders

A stakeholder could be a person or organization that has rights, share, claims or interests with regard to the system or its properties meeting their desires and expectations. To place it a lot of merely, the interests of stakeholders have some influence on the project, thus their opinion must always be taken into consideration. If you are not doing that and overlook one in every of the key stakeholders, you'll be able to ruin the entire project and it'll be far more expensive than simply possessing a development bug within the project. A stakeholder may be a group or one that has interests that will be suffering from associate initiative or has influence over it. Stakeholders can be found anywhere for a project. Stakeholders provide opportunities and limitations for the system and are the source of requirements. In this **Rent On** platform, There are Four (4) Stakeholders.

- Renter (Customer)
- Property Owner
- Platform Admin
- Payment gateway

3.4 Gathering Requirements

Requirements collection is the process of maintaining a list of requirements (functional, non-functional, technical, etc.) from the various stakeholders. The process is not as straightforward as just asking the stakeholders what they want their system to do, as in different cases, they are not aware of all the guarantees that exist, and may be limited by their immersion in the current state.

3.4.1 Techniques

Interviews - These are a necessary tool at the beginning of the process for getting background information on the business problems and understanding a current-world perspective of what the system being proposed needs to do. We need to make sure that our interviews cover a diverse cross-section of different stakeholders, so that the requirements are not skewed towards one particular function or area.

Questionnaires - One of the challenges with interviews is that we will only get the information that the person is consciously sensible of. Sometimes there are hidden requirements and features that are better obtained through questionnaires. By using carefully chosen, probing questions (based on the information captured in prior interviews), we can drill-down on specific areas that the stakeholders don't know are important, but can be serious to the eventual design of the system.

User Observation - One amongst the simplest ways in which to work out the options of a system that doesn’t end in "paving the cow path" is to watch users really performing arts, their daily tasks, and ideally recording the actions and activities that manifest itself. By understanding the holistic context of however they perform the tasks, you'll write needs which will reinvent the processes instead of simply automating them, and can make sure that usability is preponderant.

Workshops - Once we've outlined the broad set of potential needs outlined, can we be compelled to reconcile divergent opinions and contrastive views to confirm that the system will meet the wants of all users and not simply the foremost vocal cluster? Work shows square measure is an important tool that may be accustomed to validate the initial needs, generate extra detail, gain accord and capture the restrictive assumptions.

Brainstorming - This can be a robust activity, which may be performed either within the context of a piece show or on its own. By considering completely different components of the system and considering 'what-if' situations, or 'bluesky' ideas, we are able to escape from the context of the current-state and contemplate visionary ideas for the long run. Tools like whiteboards or mind mapping packages are terribly useful during this part.

Role Playing -In situations where the requirements depend thickly on different types of user, formal role-playing (where different people take on the roles of different users in the system/process) can be a best way of understanding how the different parts of the system need to work to support the integrated processes.

Use Cases & Scenarios - Once we have the high-level functional requirements defined, it is useful to develop different use-cases and scenarios that can be used to validate the functionality in different situations, and to discover any special exception or boundary cases that need to be considered.

Prototyping - Stakeholders will not have a transparent plan concerning what they want square measure, however if we tend to place many completely different prototypes of what the long run might be, they're going to grasp the components they like. Wear able to then synthesize the various favored components of the prototypes to reverse-engineer the wants.

3.5 SRS Assumption Dependency

Requirements analysis is sometimes the primary part of large-scale computer code development projects. It's undertaken once a practicability study has been performed to outline the precise prices and edges of a software. The aim of this part is to spot and document the precise necessities for the system. The client, the developer, a promoting organization or any combination of the 3 might perform such study. In cases wherever the necessities don't seem to be clear. The necessities at this stage square measure in end-user terms.

Functional Requirements

1. **User Management**
    a. **User Registration and Login:** Users (renters and owners) can register and log in using email.
    b. **User Profiles:** Renters can manage their rental preferences, while owners can manage property listings and renter applications.
    c. **Role Management:** Assign roles to users (e.g., tenant, landlord, admin) with role-specific features and permissions.
2. **Property Listings**
    a. **Add Property:** Owners can list properties by providing details such as location, price, floor area, and images.
    b. **Manage Listings:** Owners can edit, update, or remove their property listings. And the admin can disable property.
3. **Search and Filter Options**
    a. **Search Functionality:** Tenants can search for properties by location, price range, property type, amenities, and more.
    b. **Advanced Filters:** Filters for nearby schools, public transport, furnished/unfurnished options, and other criteria.
    c. **Saved Searches:** Users can save search criteria for future use.
4. **Lease and Payment Management**
    a. **Digital Lease Agreements:** Generate, review, and sign digital leases securely on the platform.
    b. **Payment Gateway Integration:** Secure payment processing for rent, deposits, and service fees.
    c. **Payment History:** View and download transaction records for both tenants and landlords.
5. **Tenant Screening Tools**
    a. **Background Checks:** Integrated tools for tenant credit and rental history checks.
    b. **Application Status:** Tenants can track the status of their applications in real time.
6. **Notifications and Alerts**
    a. **Email and SMS Notifications:** Alerts for new listings, scheduled visits, lease renewals, and payment reminders.
    b. **In-App Notifications:** Updates for inquiries, application approvals, and system messages.

7. **Administrative Functions**
    a. **User and Property Verification:** Admins can verify property details and user accounts for authenticity.
    b. **Report Management:** Handle reports of fraudulent listings or inappropriate behavior.
    c. **Analytics Dashboard:** Track platform usage, trends, and overall performance.
8. **Analytics and Insights**
    a. **Tenant Insights:** Provide tenants with neighborhood insights, property demand, and average rents.
    b. **Landlord Analytics:** Offer data on listing views, inquiries, and market trends to optimize performance.

These functional requirements ensure that Rent On delivers a comprehensive and seamless rental experience for all stakeholders.

Non-Functional Requirements

1. **Performance and Scalability:**
    a. The platform should handle high traffic volumes, supporting at least 10,000 concurrent users without performance degradation.
    b. It should be scalable to accommodate future growth, including increased property listings and user registrations.
2. **Security:**
    a. The platform must ensure secure handling of user data with encryption for sensitive information like passwords, payment details, and lease agreements
    b. Compliance with data protection regulations (e.g., GDPR, if applicable) to safeguard user privacy.
3. **Availability and Reliability:**
    a. The system should maintain 99.9% uptime, ensuring it is accessible to users at all times.
    b. Implement automated backups and disaster recovery plans to prevent data loss and ensure system recovery within 1 hour of failure.

3.6 Interface Requirement

3.6.1 User Interfaces (UI)

- Login/ Signup Page
- Home page
- Product Dashboard
- Service page
- About page
- Contact us page
- User Dashboard

3.9.2 Hardware Interfaces

- Network connection capable devices
- At least 512mb RAM

3.8.3 Software Interfaces

- Operating System - Windows, Linux, Mac
- Language - React js, Node js, Express js, Tailwind
- Database - MongoDB

CHAPTER 4

System Design

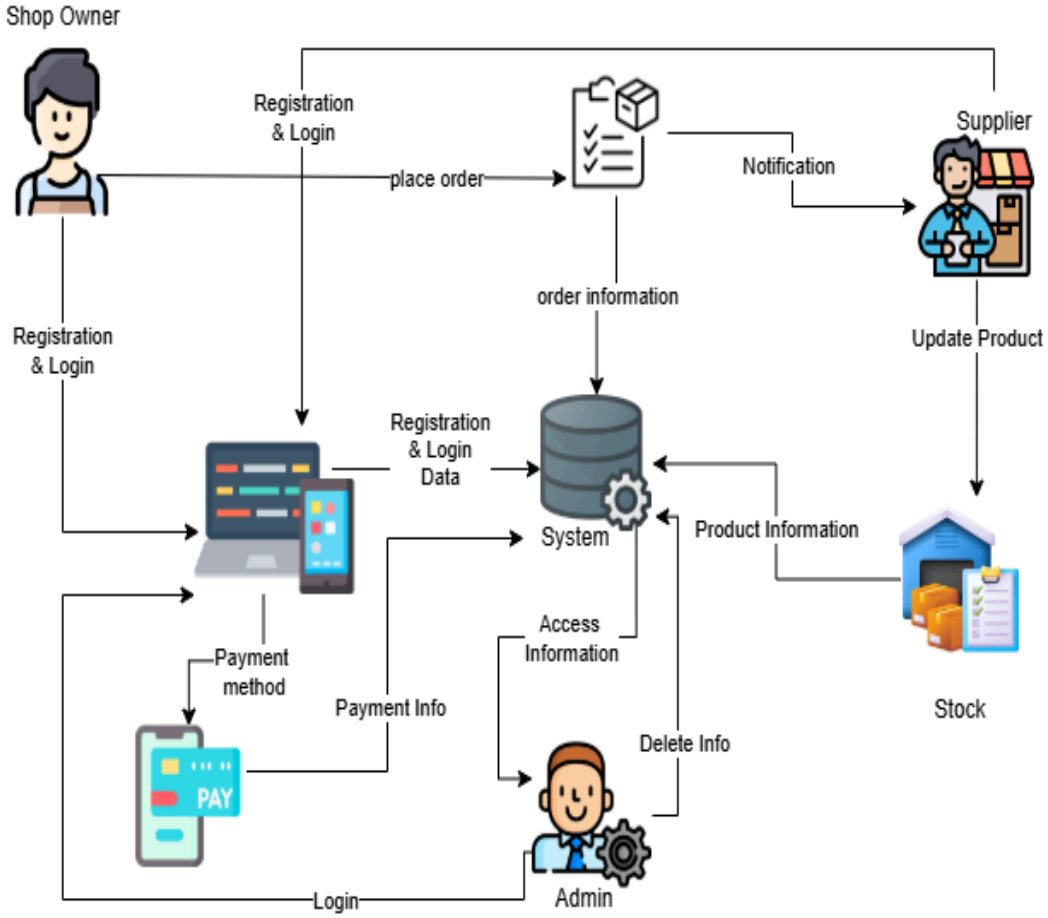
4.1 System Design

Before developing a system, we have to design our system like how to use the case of our system. Data Flow Diagram (DFD) provides a view of how the system or business flows that are able to increase the efficiency and effectiveness to achieve system objectives. For native users we have a Use Case Diagram thus they could easily understand our system. We will design it and that is the State transition diagram showing entities that interact with this system and the last one Gantt charts illustrate the start and finish dates of the marginal elements and summary elements of a project.

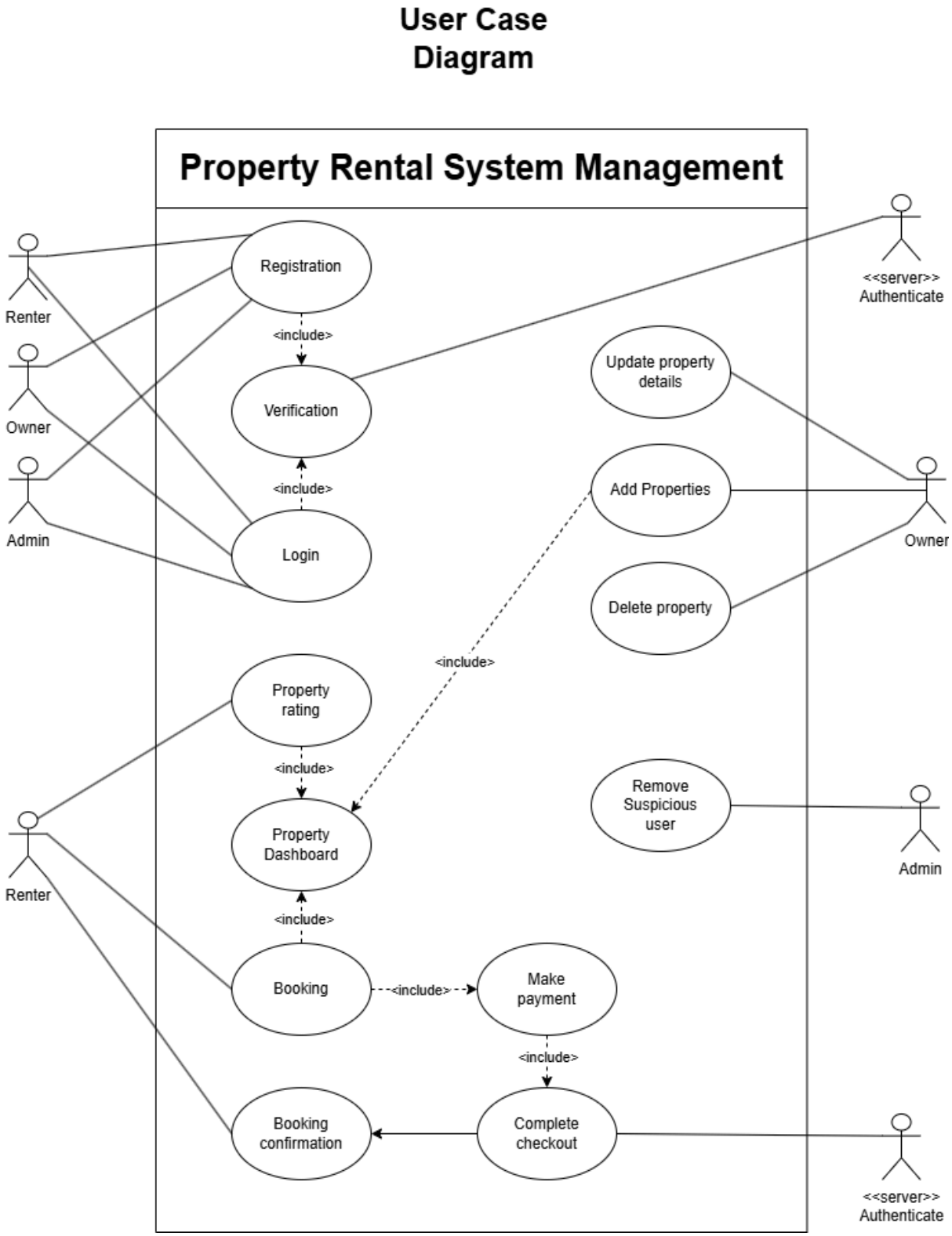
4.2 Use case diagrams and scenario UML

Use Case Diagrams can be used to describe the functionality of a system in a horizontal way. That is, rather than merely representing the details of individual features of your system, UCDs can be used to show all of its available functionality.

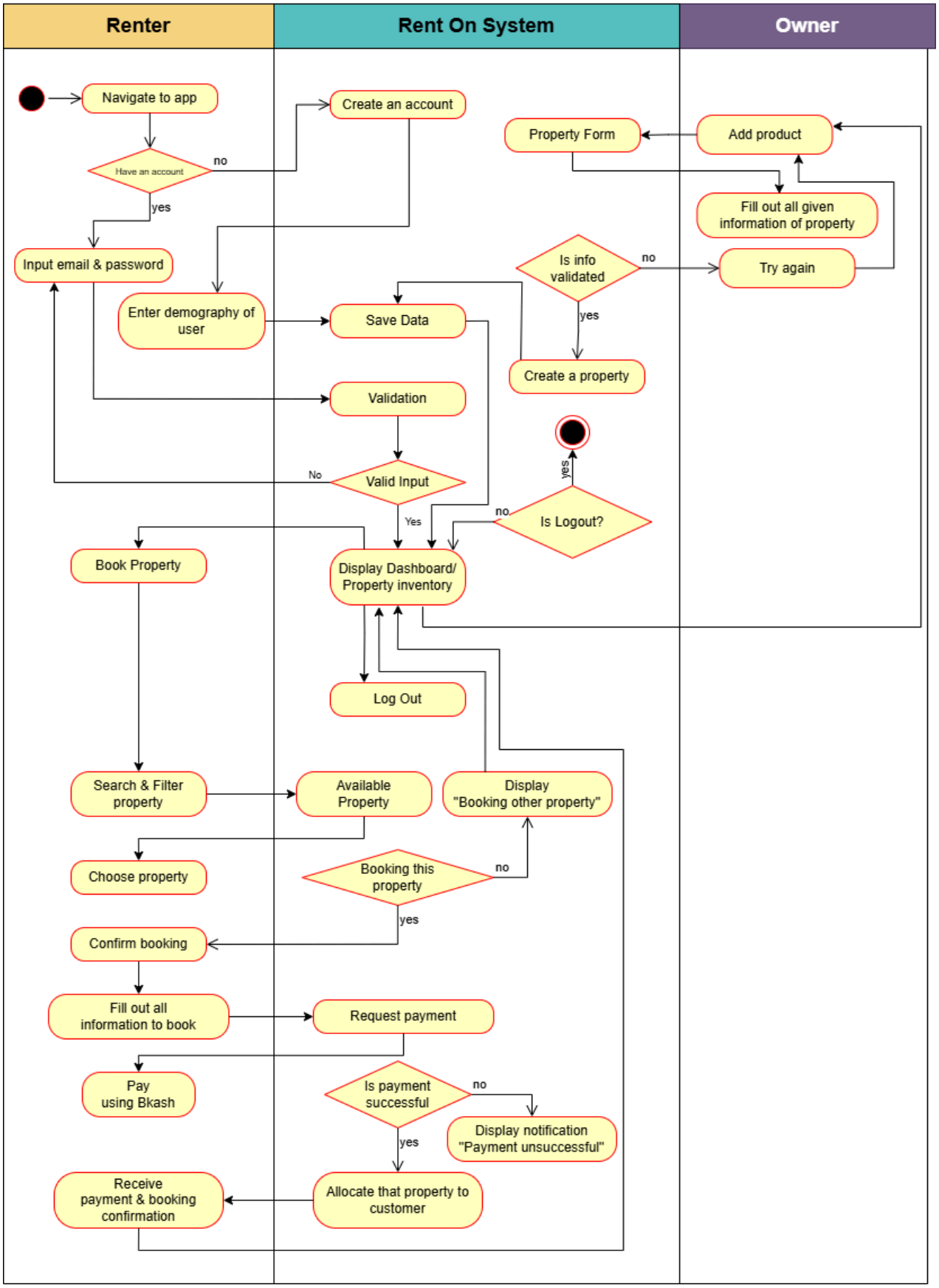
4.1 Flow Chart Diagram



4.2 Use Case Diagram

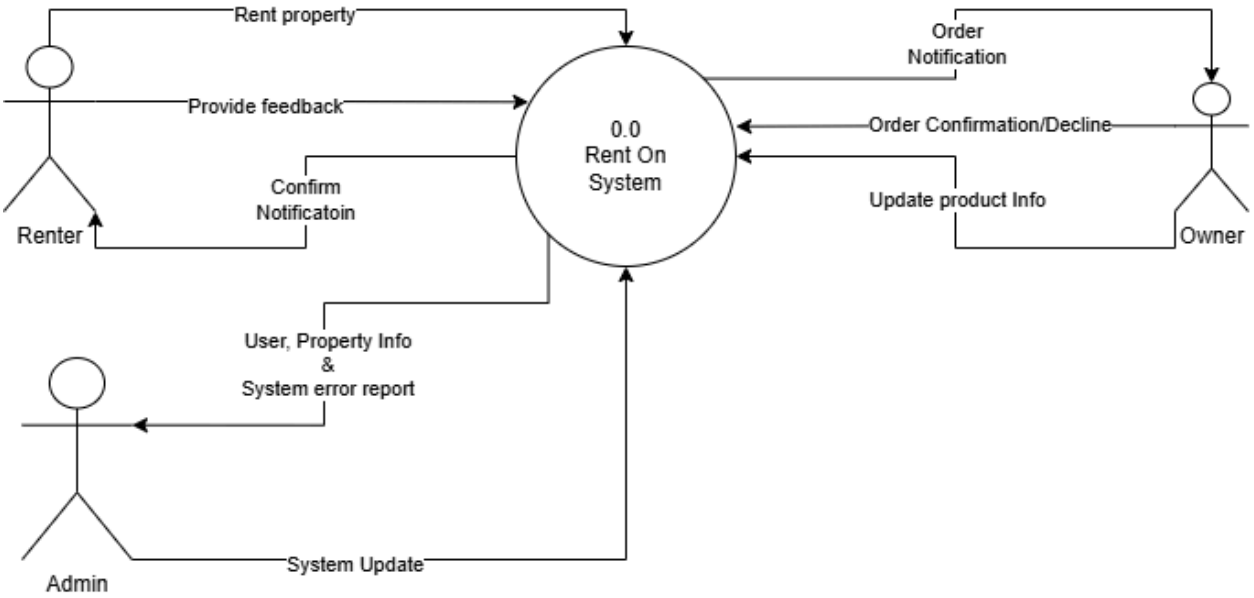


4.3 Activity diagram

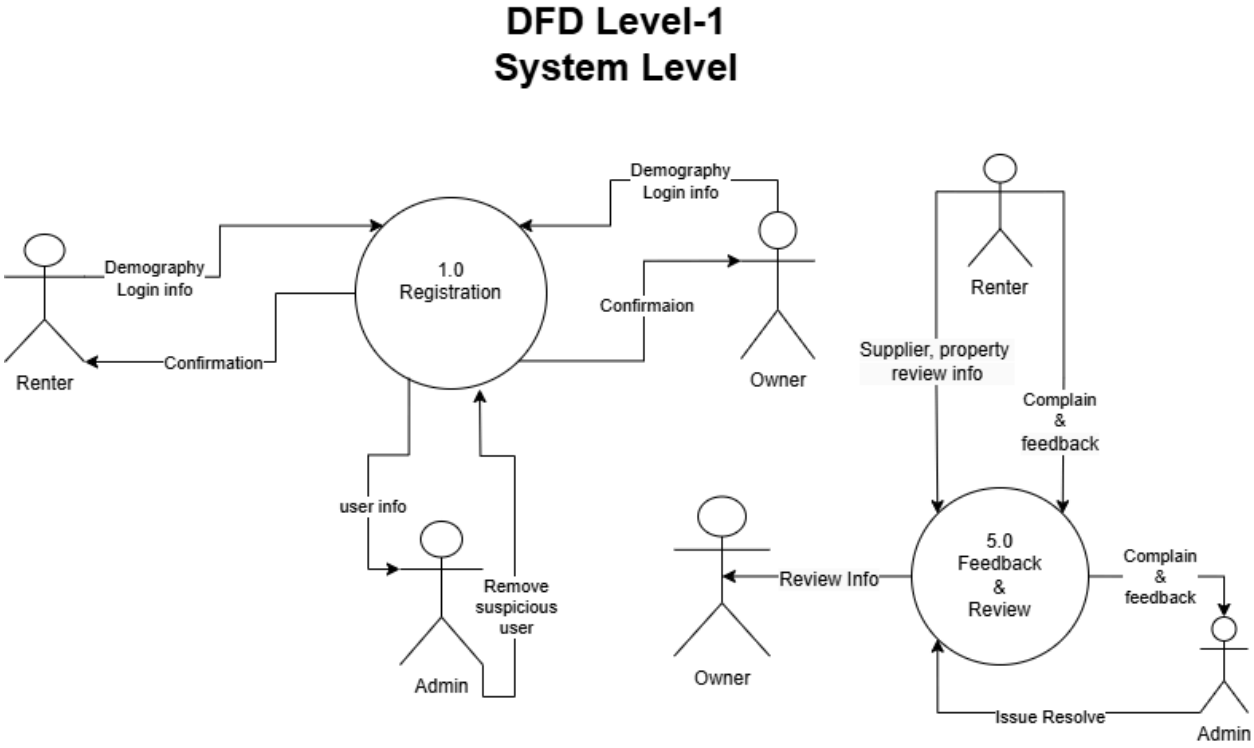


4.4 Data Flow Diagram

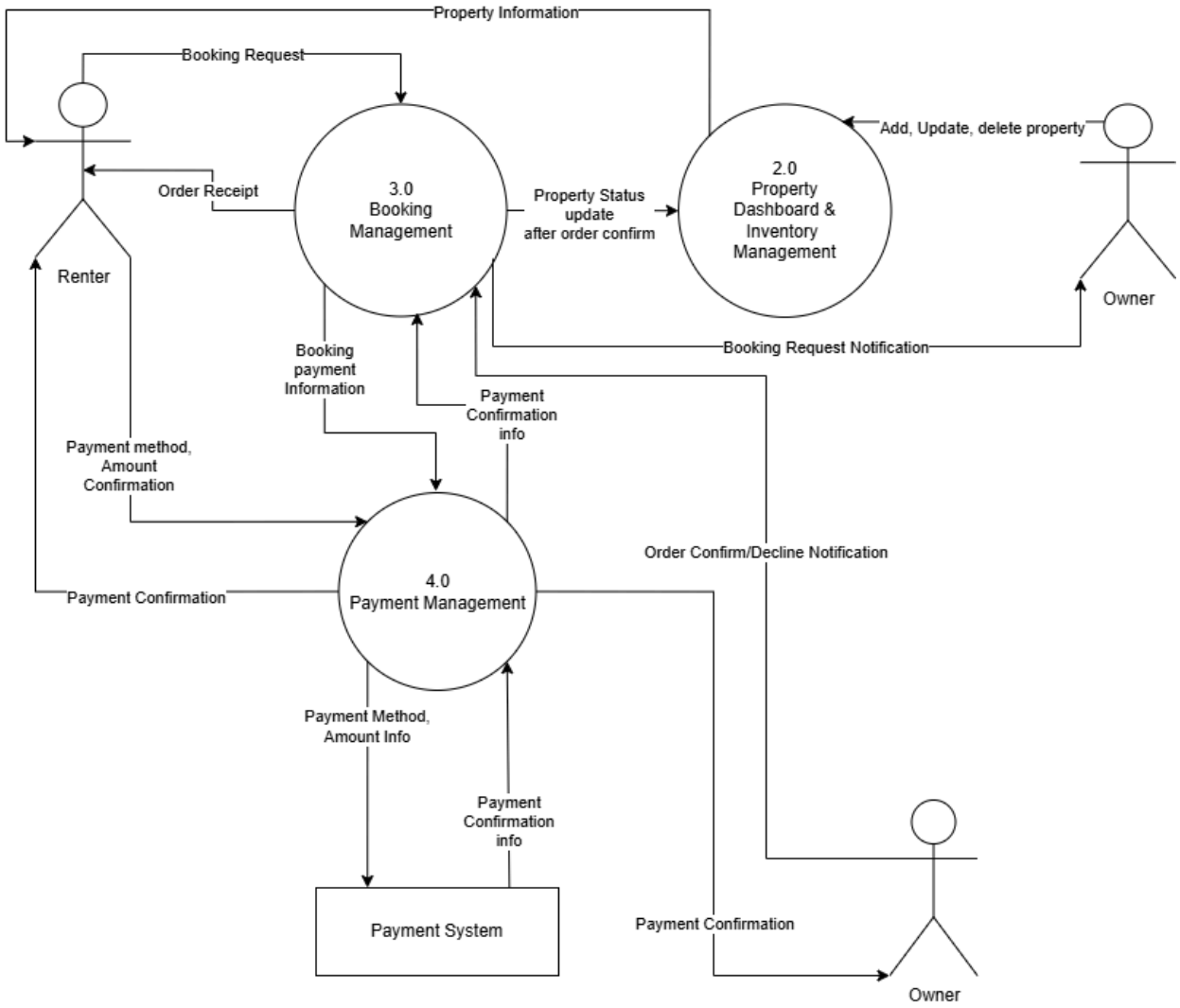
Level 0 - Context level



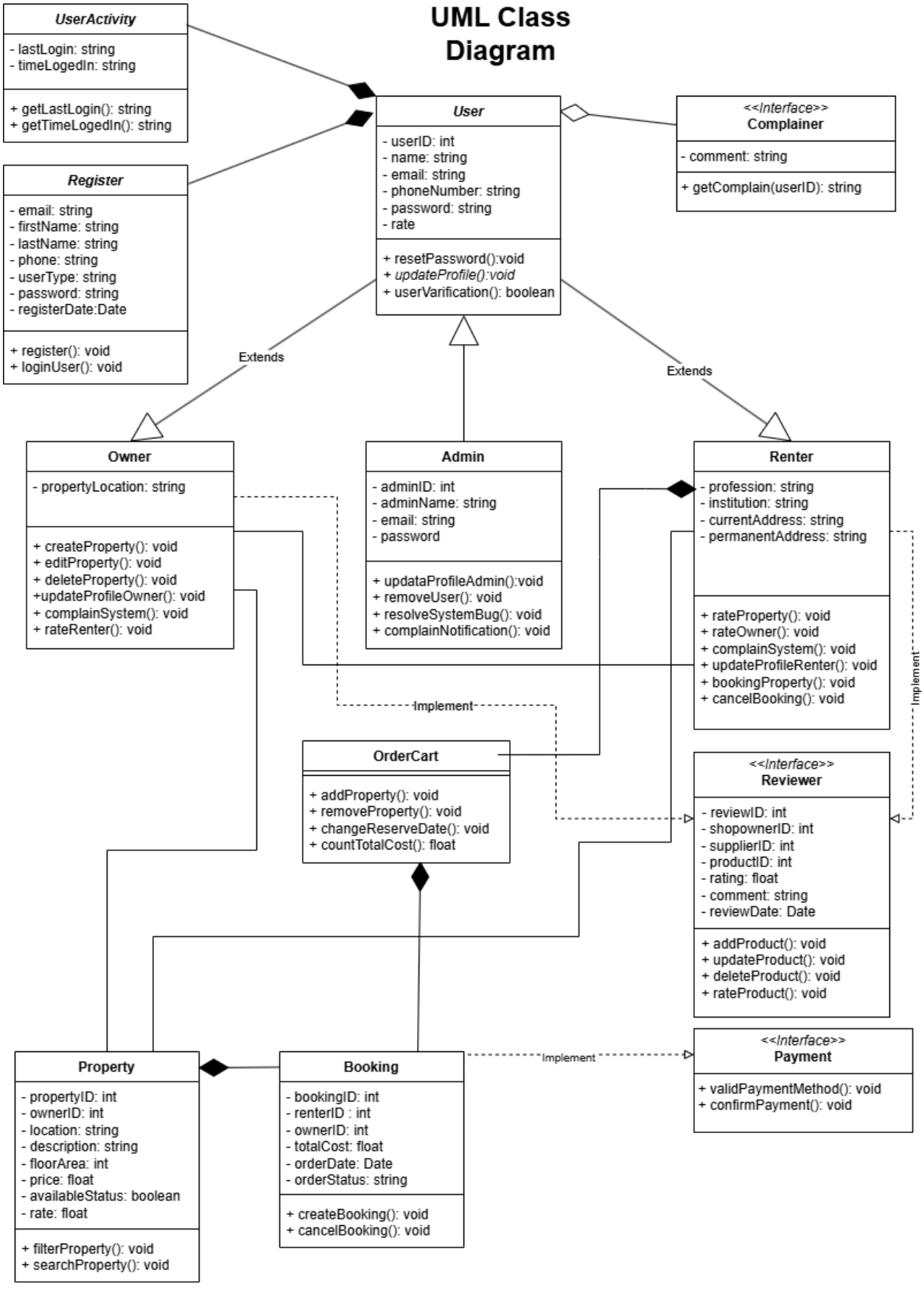
Level 1 - System level



DFD Level-1
System Level



4.5 Class Diagram



4.6 Sequence Diagram

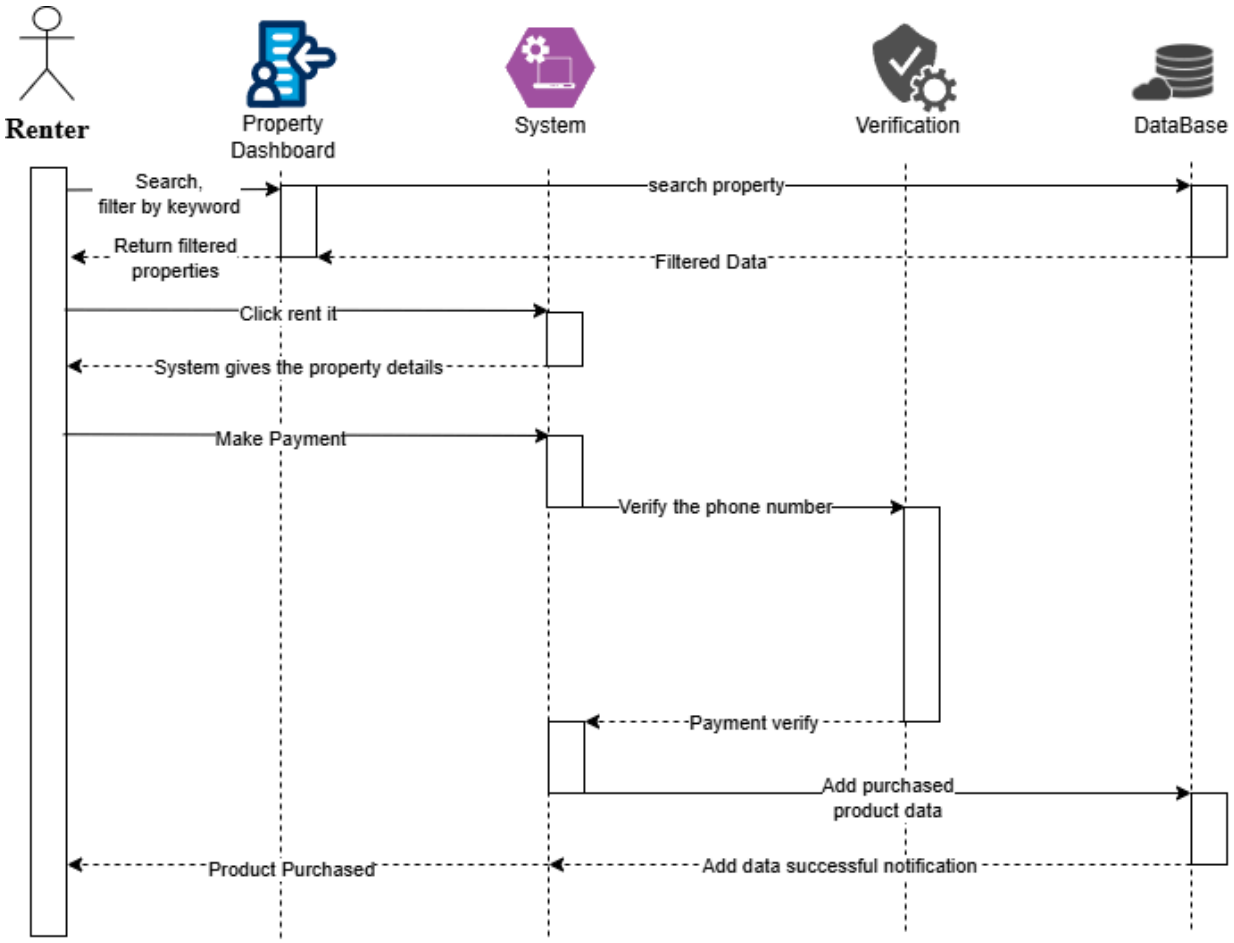


Figure 02: Booking sequence diagram

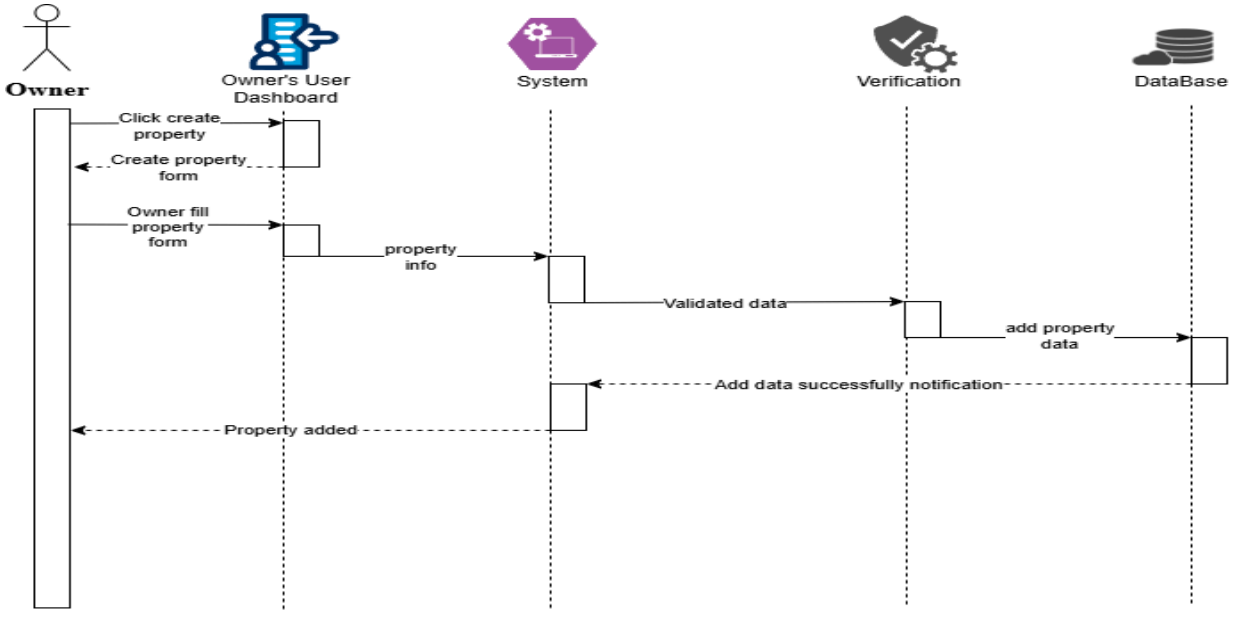


Figure 03: Owner add property sequence diagram

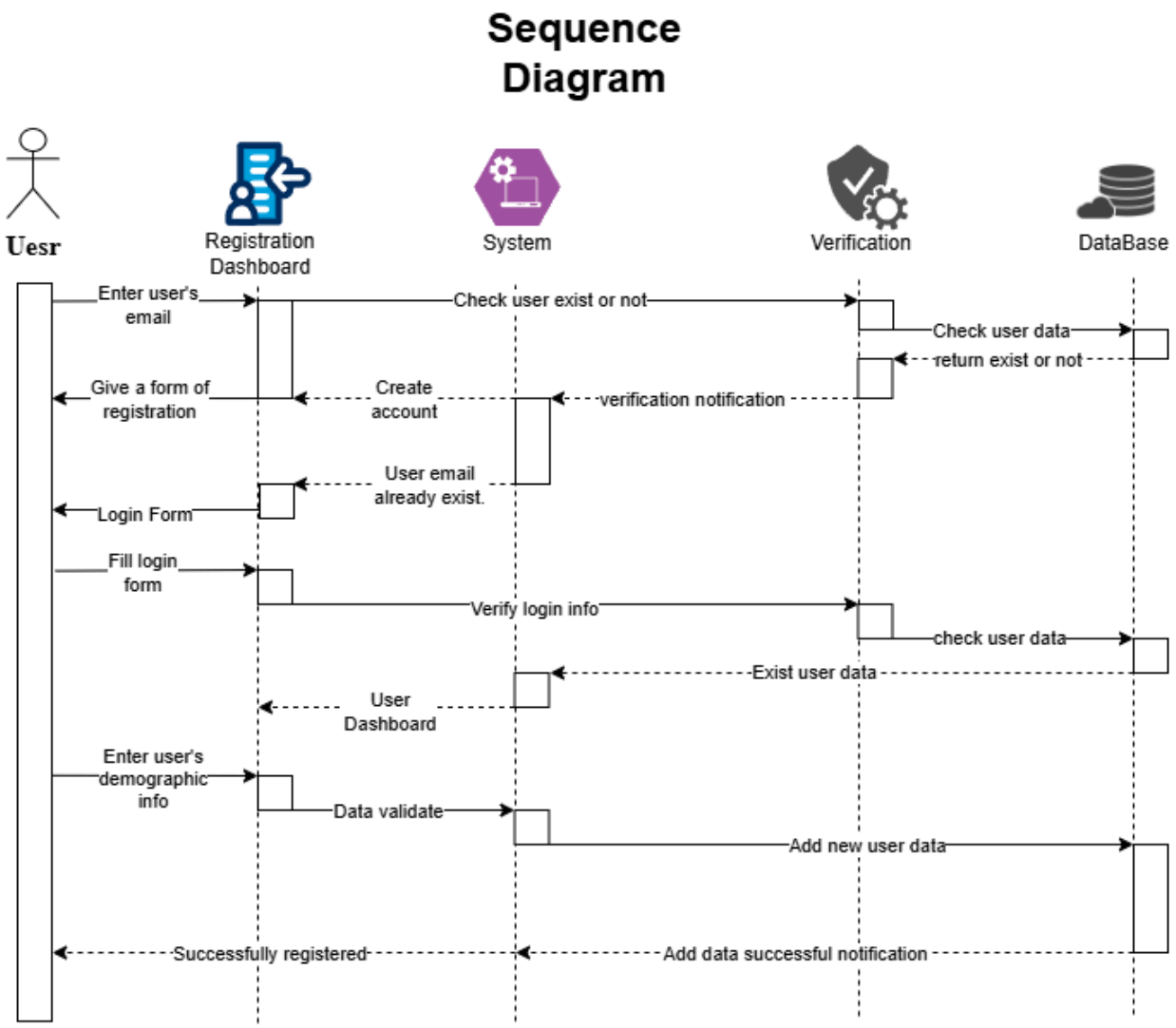
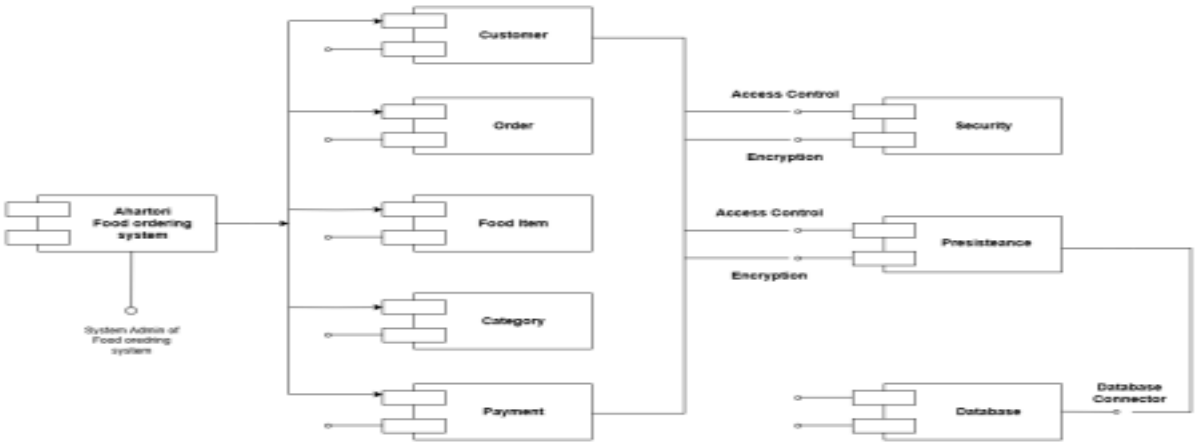


Figure 01: Registration sequence diagram

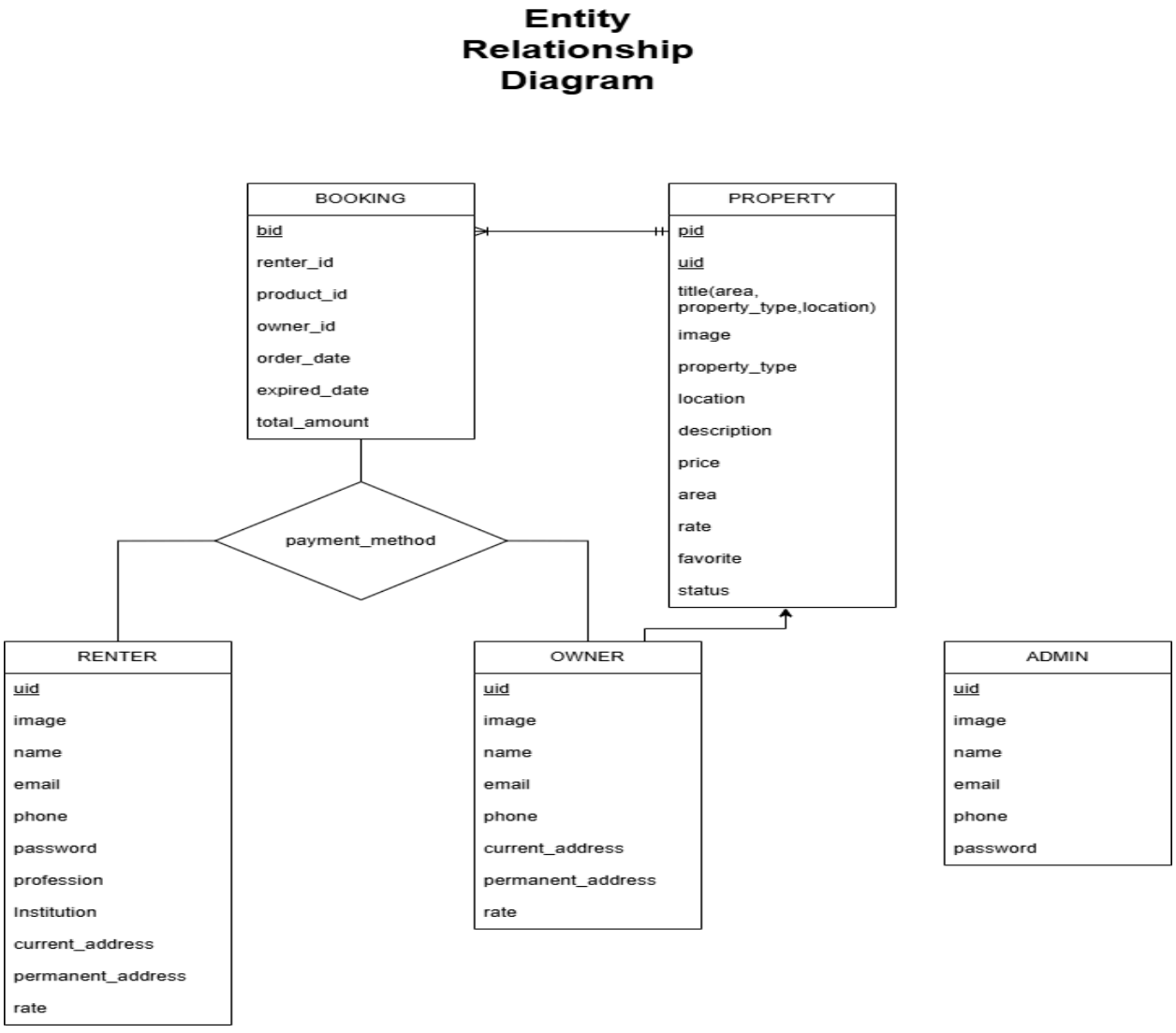
4.7 Component Diagram

UML Component diagrams are used in modeling the physical aspects of object-oriented systems that are used for visualizing, specifying, and documenting component-based systems and also for constructing executable systems through forward and reverse engineering. Component diagrams are essentially class diagrams that focus on a system's components that are often used to model the static implementation view of a system.



4.2.5 ERD Diagram

Entity-relationship (ER) diagram, a graphical representation of entities and their relationships to each other, typically used in computing in regard to the organization of data within databases or information systems. An entity is a piece of data and object or concept about which data is stored.



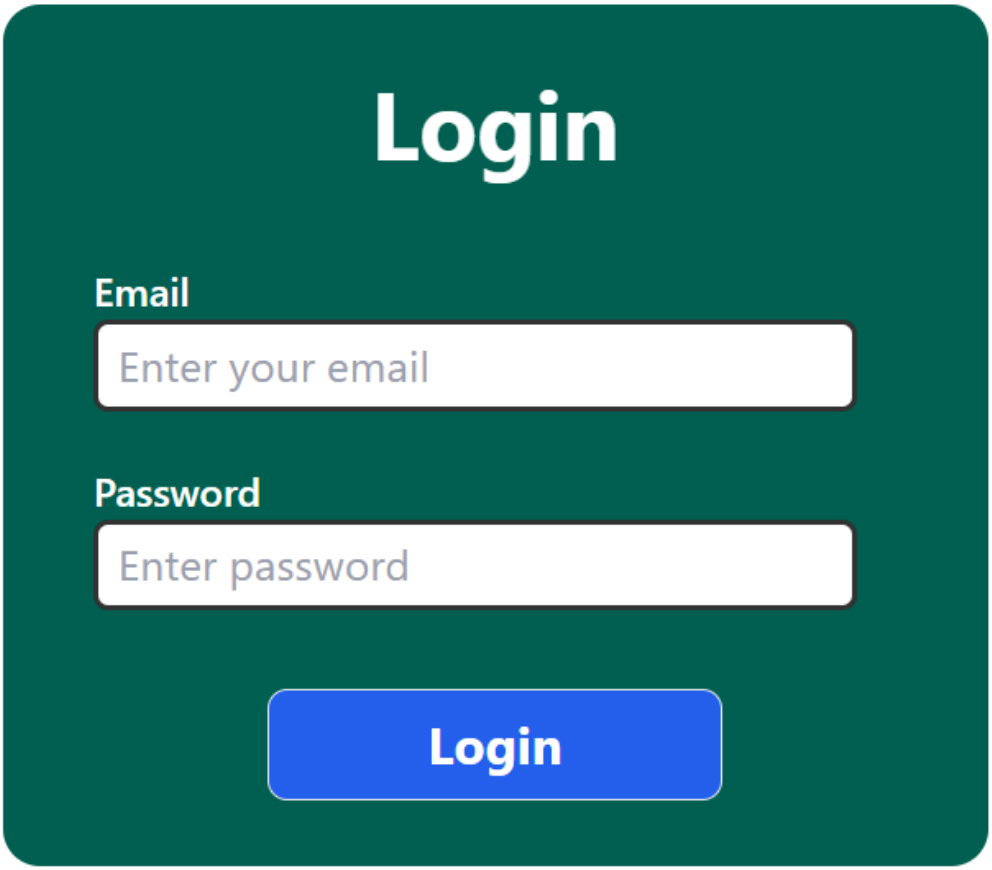
CHAPTER 4

System Design

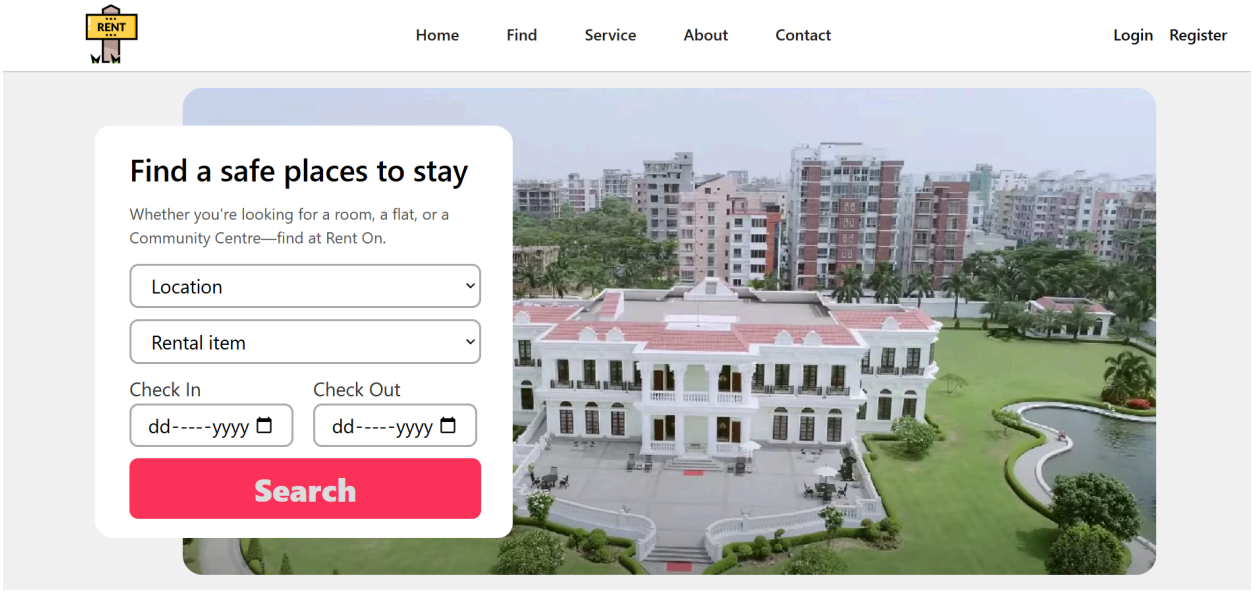
6.1 User Interface

Registration Page:

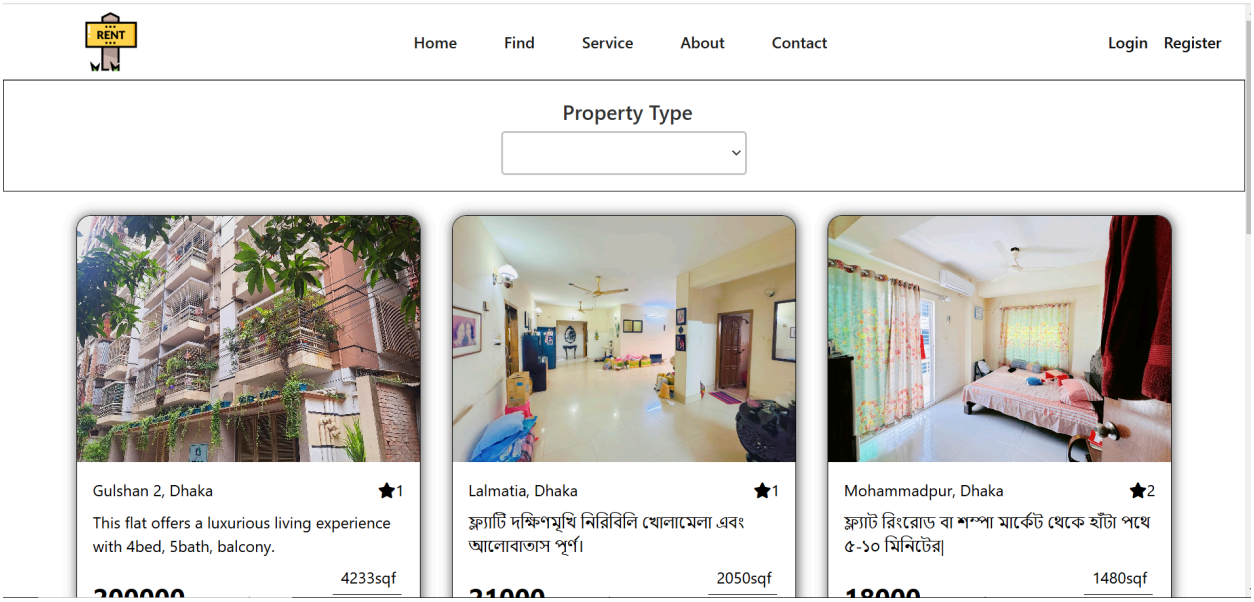
Login Page:



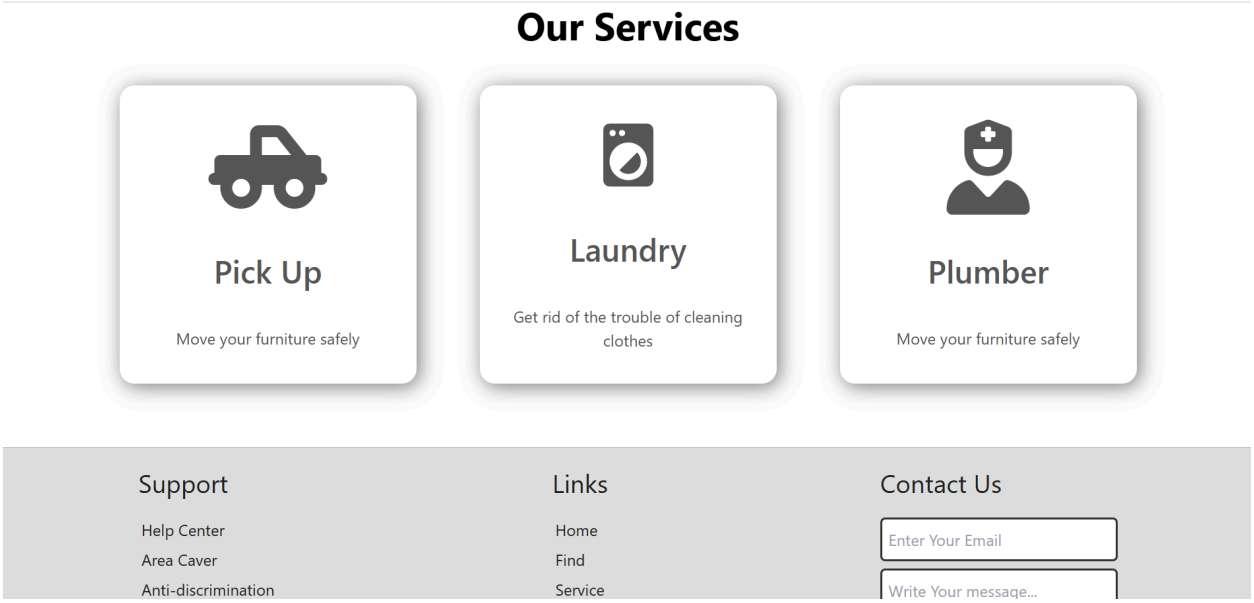
Home Page:



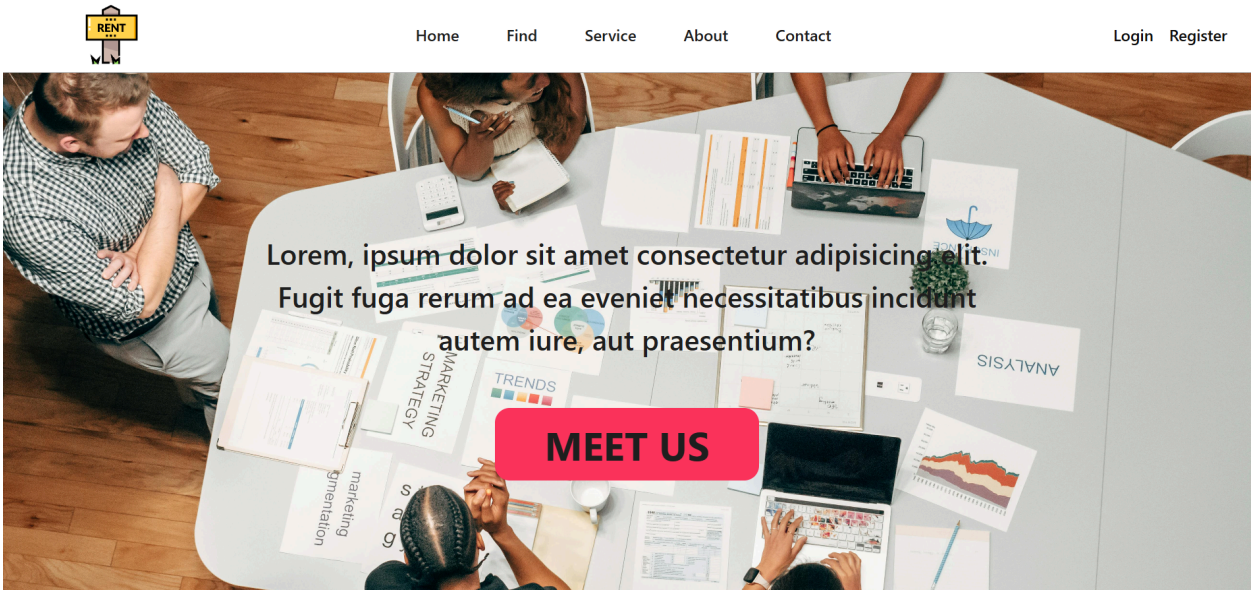
Product DashBoard:



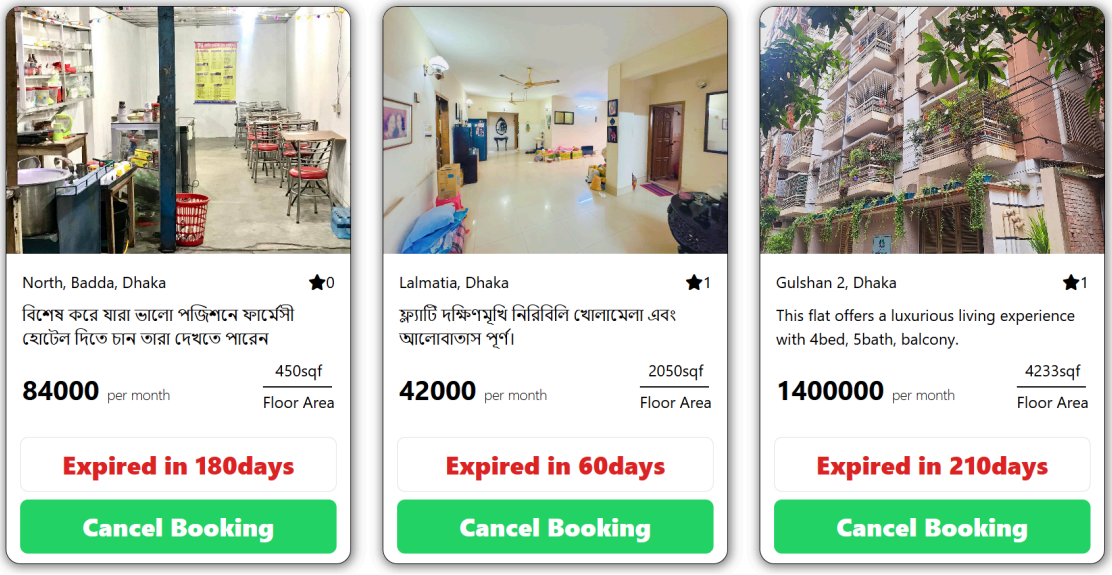
Service Page:



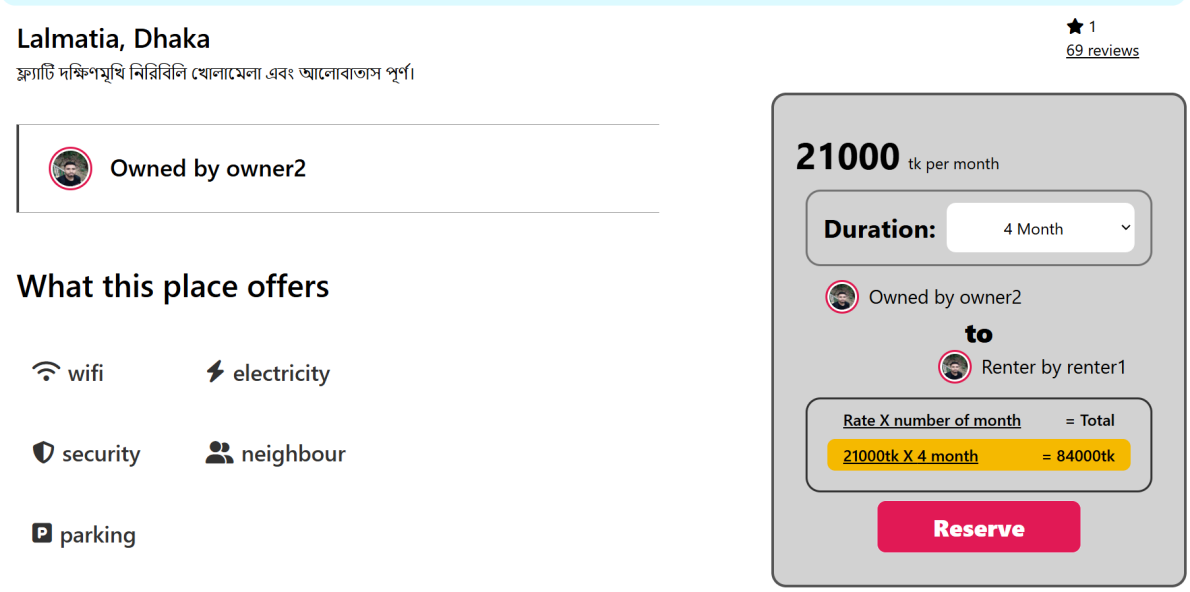
About page:



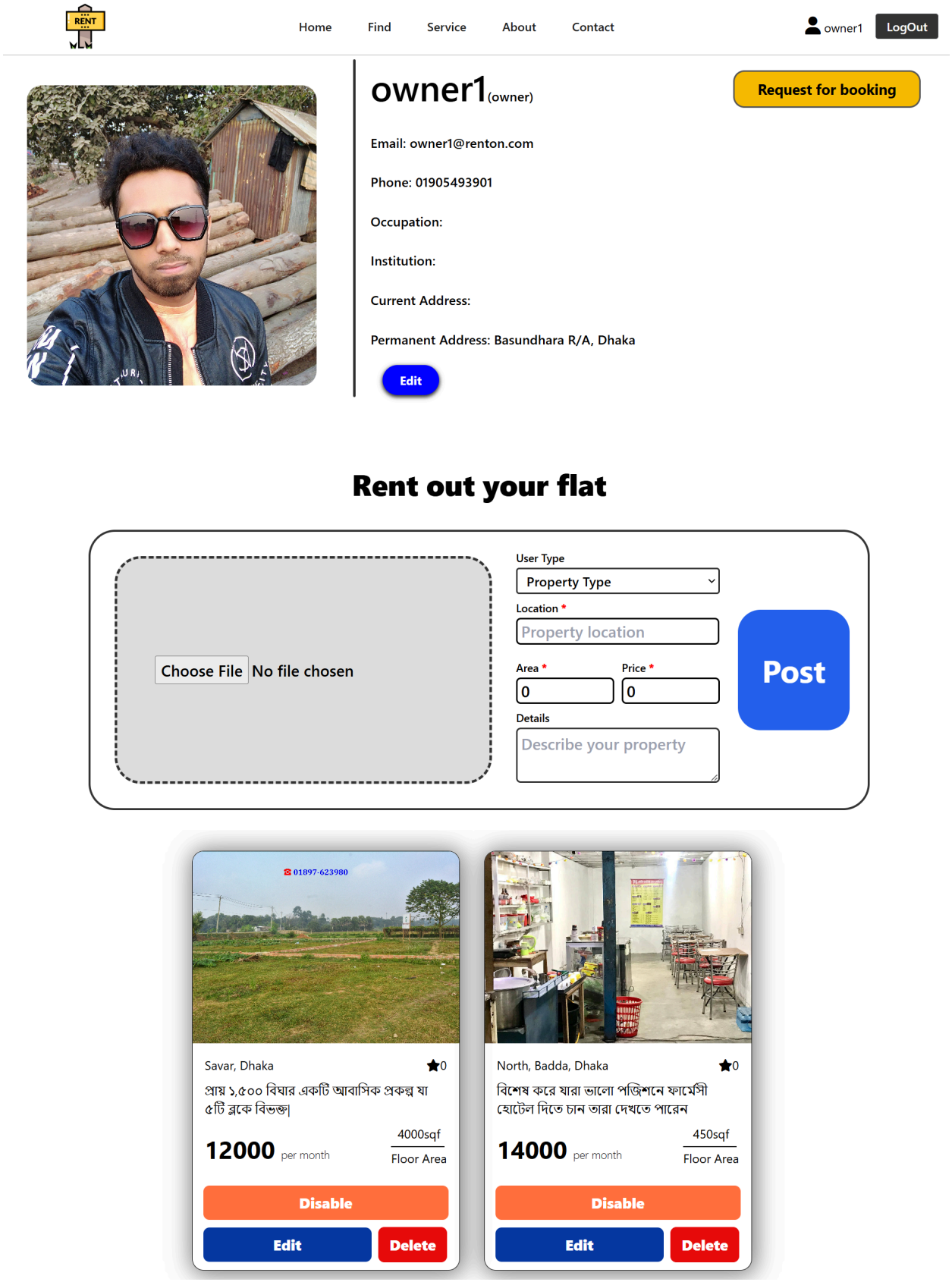
Renter Dashboard:



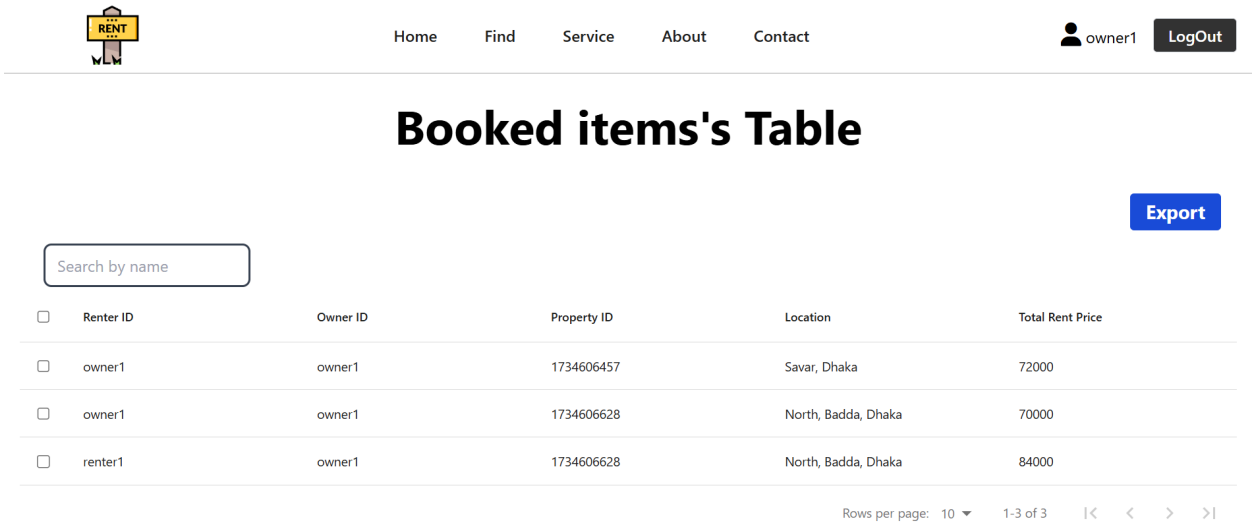
Booking page:



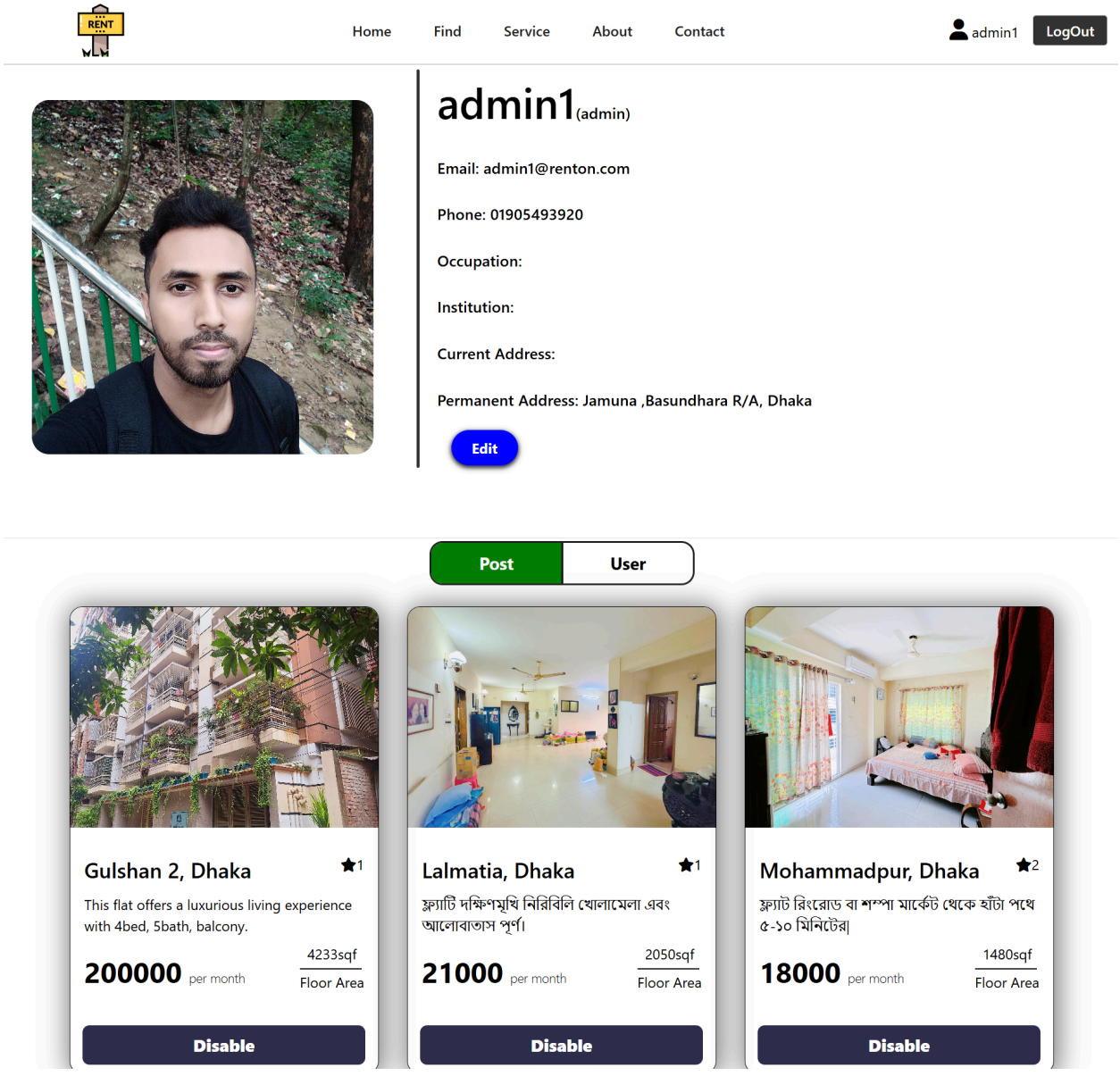
Owner Dashboard:



Booked Product list of owner:



Admin Dashboard:



Term and condition page:

Terms & Conditions Template

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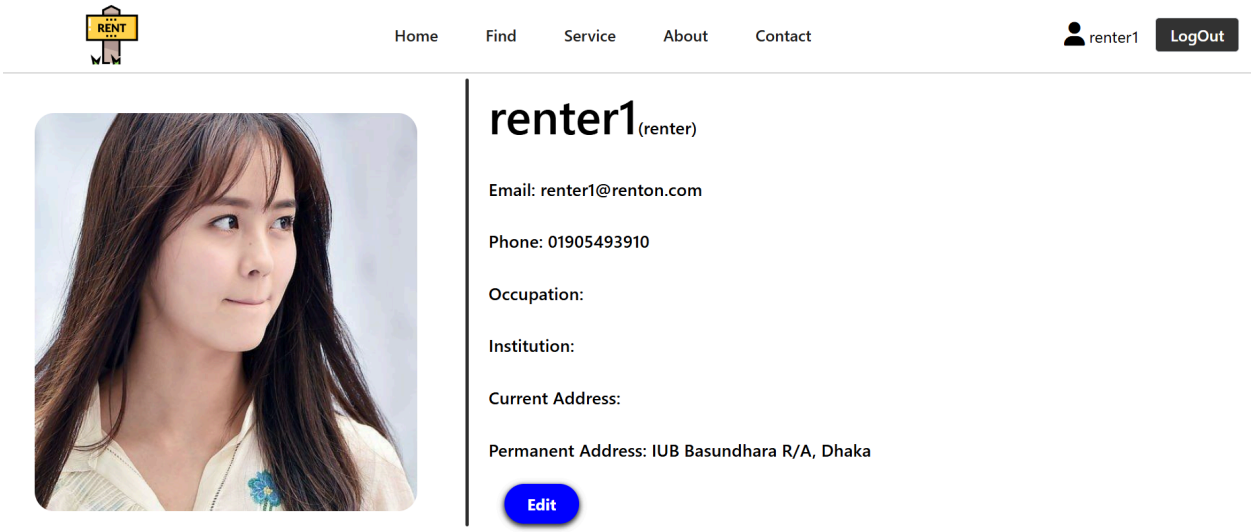
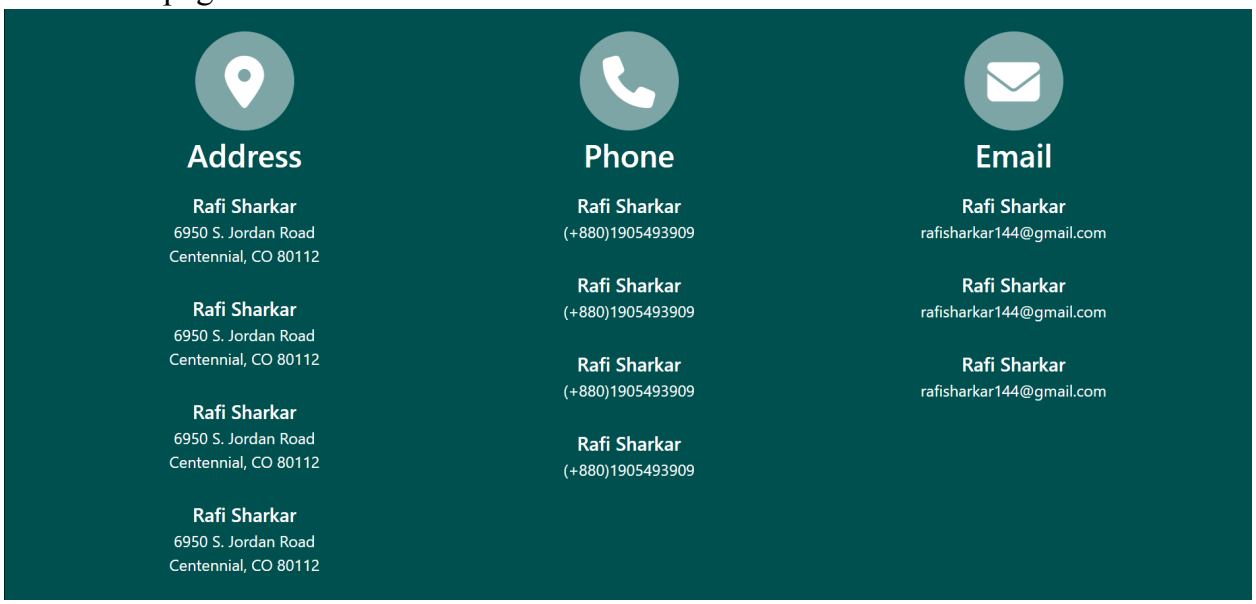


Contact Us page



Chapter 6

Conclusion

6.1 Conclusion:

The Rent On project is a transformative initiative designed to address inefficiencies and challenges in the real estate rental ecosystem. By providing a user-friendly, transparent, and secure platform, it bridges the gap between property seekers and landlords, simplifying the rental process for all stakeholders.

With innovative features like verified property listings, advanced search options, tenant screening tools, and secure payment systems, Rent On enhances trust and convenience in the rental market. It leverages modern technology to promote efficiency, reduce fraud, and create a seamless rental experience.

Ultimately, Rent On has the potential to redefine the real estate rental landscape, supporting urban growth and fostering trust in the housing market.

6.2 Constraints

Requirement Collection Problem

1. Conduct detailed stakeholder interviews and surveys.
2. Use iterative prototyping to validate user requirements before full implementation.

Data Connection Issues

1. Implement offline functionality where possible, such as caching orders locally and syncing when the connection is restored.
2. Optimize the app for low-bandwidth conditions.

No/Limited Knowledge of Internet

1. Provide tutorial videos or visual guides for first-time users.
2. Simplify the platform with intuitive navigation and minimal steps for essential actions.

Screen Size Constraints

1. Adopt responsive web design principles to ensure the platform adapts to any screen size.
2. Use larger touch targets and readable fonts for mobile devices.

Software Fragmentation

1. Develop the platform using cross-platform frameworks to ensure compatibility.
2. Regularly update the app to support new OS versions and resolve bugs.

Data Collection and Correctness

1. Introduce data validation rules for critical fields like addresses and phone numbers.
2. Incorporate feedback mechanisms to identify and correct data errors swiftly.

6.3 Further suggested work

In the future, Payment gateway will also deliver advanced filtering and data insights.