

**DEVELOPMENT OF THE WEB APPLICATION PROPERTY LISTING FOR  
REAL ESTATE DIGITAL TRANSFORMATION**

**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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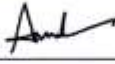
**JANUARY 2024**

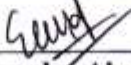
## APPROVAL


This Project titled “**DEVELOPMENT OF THE WEB APPLICATION PROPERTY LISTING FOR REAL ESTATE DIGITAL TRANSFORMATION**”, submitted by Anfal Bin Razzak 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 26.01.2024.

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## DECLARATION

I hereby declare that, this project has been done by us under the supervision of **Dristi Saha**, Lecturer, Department of CSE Daffodil International University. I 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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Finally, I must acknowledge with due respect the constant support and patience of my parents.

## **ABSTRACT**

The Real Estate is a comprehensive web application designed to streamline property transactions, enhance user experience, and facilitate efficient management for real estate professionals. The system employs robust technologies and incorporates key features to meet the demands of modern real estate operations. The user-friendly and responsive interface ensures a seamless experience across various devices. The application offers a secure and efficient email/password-based authentication system, allowing users to register, log in, and toggle between login and registration views effortlessly. The core functionality includes distinct dashboards for users based on their roles – User Dashboard, Agent Dashboard, and Admin Dashboard. Each dashboard provides a customized experience, allowing users to manage their profiles, view properties, and perform various operations based on their roles. Property management features include adding properties by agents, including property title, location, images, and price range. Admins can verify or reject these properties, impacting their visibility on the All Properties page and the homepage advertisement section. Users can view, search, and sort properties, with additional functionalities like reporting and adding a property to their wishlist. The system integrates email and password-based authentication, with options for additional logins such as Facebook, GitHub, or Google. JWT is implemented for secure login sessions, preventing users from being redirected to the login page after reloading private route pages. The application implements Toast notifications for successful CRUD operations to enhance user interaction and provides a 404 (not found) page. For an added layer of security, the Axios interceptor is implemented. In addition, implementing a search functionality and price-based filtering on the All Properties page. The Agent Dashboard visualizes selling statistics through charts, and an additional route, "Advertise Property," allows admins to manage property advertisements.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

The Real Estate website presents a dynamic and innovative solution tailored to meet the evolving needs of the real estate industry. I aim to revolutionize property transactions, enhance user experience, and streamline the day-to-day operations of real estate professionals. Intricate transactions and diverse user roles characterize this website and demand a comprehensive system that addresses the unique requirements of users, agents, and administrators. It responds to this challenge by providing distinct dashboards for each user type – Users, Agents, and Admins – ensuring a personalized and efficient experience for all stakeholders. Critical features include a secure email and password-based authentication system, allowing users to seamlessly register, log in, and toggle between login and registration views. Users can get an incredible experience with an online payment gateway system and make offers to agents for buying a property. The application's architecture incorporates Tan stack query with mutation for optimal data fetching and posting, fostering a responsive and dynamic environment. In addition to meeting essential requirements, they are expected to implement bonus tasks such as search and price-based filtering functionalities on the All Properties page, a comprehensive reporting system, and visualized agent selling statistics. The project strongly focuses on usability and security, incorporating Toast notifications for successful CRUD operations and Axios interceptor for enhanced security. Through REMS, we aim to showcase a culmination of technological prowess, thoughtful design, and practical functionality. This introduction highlights the significance of REMS as a transformative solution in real estate management.

## 1.2 Motivation

Our country has approximately 5,000 construction enterprises, according to the Bangladesh Association of Construction Industry (BACI), which represents engineers and contractors. Even though there are numerous construction enterprises, few Internet forums exist for constructing projects. Lack of motivation is a significant issue for construction project managers since it directly impacts their abilities and productivity. Consequently, this hinders the expansion and financial success of companies and institutions that depend on human capital. To solve this, we aim to develop a dynamic website that provides various choices and tools for anybody working in the construction sector. Some sites need help to obtain a proper address or photographs of the property. There are numerous filter and search problems issues.

On the other hand, if I need to rent a house, I must visit another website. This isn't very comfortable. But I want it all-in-one so everyone can quickly get property or house rent on a single website and feel comfortable.

We have observed that specific online building sites do not have standard payment options like Bkash, Dutch-Bangla, Nagad, or standard bank payments, nor do they have essential security features like SSL. Furthermore, many systems must give customers an easy-to-use login/logout mechanism. Users may access the website in just one login session through a straightforward login process.

Additionally, we've seen that when people post images of their construction projects, they frequently neglect to list the prices of the structures. We suggest adding a pricing function allowing users to enter different costs for different building, construction, or home décor services to improve the user experience. The pricing of projects featured on our site will now be transparent and easily understood thanks to this innovation.

## 1.3 Objectives

Construction Websites benefit from endless options and can tackle a wide range of construction-related issues using this platform.

1. On this website, anybody can buy property easily with online transactions or offline.
2. Here, a property seller is known as an agent, and they also use this website to figure out how many buyers/users are looking after the property.
3. User can find their desired property here with search and price range filtering.
4. If any user wants to add a property to their wishlist, they can do it and remove it if they are not interested later.
5. Students have the best opportunity to rent a room as a bachelor's. We have implemented the rooms on our website, a fantastic feature.
6. Agents can add their lands, but it will be on the pending list because the admin will first check whether they are natural agents or frauds.
7. Admin can have the power to make a user agent, make a user admin, make an agent admin, or remove the user if they are fraud.
8. Admin can find a lot of users and agents by using this website.
9. As we build this website, we also have economic benefits for business purposes.
10. On this website, the payment system is safe cause no fraud will be able to create any problems. After all, we verify everyone.
11. Anyone who wants to pay offline can also do that by contacting the agent via email. But online payment is now easier, faster, and more secure.

## **1.4 Expected Outcomes**

At first, this website is user-friendly and easy to understand and explore. Buyers/users can easily find their expected property/apartment/rooms, etc. Agents can add property information easily, and the admin can approve if the agent is not a fraud. Admin may provide their advertisements without any further issues. Builders and purchasers are particularly interested in the site since it allows them to monitor the entire building line. Thanks to the development of an online payment system, buyers and sellers can safely conduct transactions.

This real estate website aims to improve the user experience by offering valuable features, such as property reviews. By providing a seamless and intuitive experience for searching properties as well as quality assurance and transparency, the website hopes to increase user engagement and interaction. Ultimately, the goal is to achieve higher levels of user satisfaction and retention.

With awesome marketing, building a strong community, and referrals, we're aiming to attract more users to our website. We want to be the go-to place for people looking for properties. The goal of our website is to foster community. of users, real estate agents, and professionals who can collaborate, share knowledge, and network within the real estate industry. We aim to provide clear and concise information that is easy to understand for everyone. We believe that by making the most important information easy to find and by using simple language, we can help all of our users achieve their goals. The website aims to establish a reputable and reliable presence in the real estate portal arena by prioritizing transparency, trustworthiness, and ethical business practices.

In this instance, we are serious and attentive to keep it. We are continually on the lookout for new and unforeseen problems. Our key maintenance concern is monitoring the company's advertisements and consumer payment transactions closely. It is also critical to provide the organization with a beautiful getaway bill.

Ultimately, the expected outcomes for the website encompass making a positive impact on the real estate industry by redefining the property search experience, fostering transparency and trust, and driving innovation and excellence in the real estate portal landscape.

## **1.5 Project Management and Finance**

I've separated the dashboard into three sections here..

1. Admin Dashboard (Only admin can access)
2. Agent Dashboard (Only admin-verified agent/seller can access)
3. User Dashboard (All buyers/ users can access if they signed in this site)

## **1.6 Report Layout**

Each chapter is summarised in the report layout. A synopsis of each chapter is provided:

### **Chapter 1: Overview**

Chapter 1 describes the Estate Ease Real State Property site, including its goals, aims, feasibility study, expected outcomes, and report style.

### **Chapter 2. Background**

The linked obligations and limitations of innovation are explained in this chapter.

### **Chapter 3: Determining the Needs.**

This section explains three diagrams: A Business Process Model, a Use Case Diagram, and a Logical Data Model diagram.



#### **Chapter 4: Design Specification**

This chapter describes the website's design and includes figures related to the design.

#### **Chapter 5: Testing and Implementation.**

This chapter describes how the website's technology was integrated and how the aesthetics were finished. The testing process involves verifying the successful integration.

#### **Chapter 6: Effects on Sustainability, the Environment, and Society**

The efficacy, long-term viability plan, and social rejections of the concept are covered in this chapter.

#### **Chapter 7: Summary and the Prospects of the future.**

This chapter does the final rehearsal and talks about the next strip.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Terminologies**

I immediately realized that my website was a professional and user-friendly real estate business platform for professional builders and regular customers. Business magnets require assistance locating an appropriate building site where they may engage physically. It is also a time-consuming reality, and it is presently quite challenging. As a result, this online platform provides a sense of normalcy and delight in learning about the building intricacies. Furthermore, there is a strong focus on safety, and recently, independent online bill payment options have been introduced, which are not associated with any physical infrastructure in Bangladesh. Here is an opportunity to start a construction firm and alleviate the unemployment problem.

#### **2.2 Related works**

In our country, there are so many Real Estate platforms. Here, I did a deep study and found that –

1. No single website is particularly active and has various issues.
2. No proper website information such as login, logout, user dashboard, etc.
3. There is not enough property price information and details.
4. There is no appropriate location or direction on the site.
5. Their booking systems are not user-friendly.
6. Most websites offer no payment system, which hampers the user experience.

[18] is a prominent real estate website. However, it's simply for general information or suggestions, not a complete explanation of purchasing or selling costs. This website also lacks a payment method.

[19] is another site with only some photo information but no price information, payment options, or anything else.

[20] is one of Bangladesh's most outstanding real estate websites. However, I investigated and saw no price increase in any property or online payment option.

In Bangladesh, several real estate-based websites could be more dynamic. All of these websites are blogging platforms, lacking any listed prices or possible payment options. I thought of it differently and implemented it in my project, where the website must be dynamic with detailed information. There will be an online payment option with high security.

### 2.3 Comparative Studies

In Bangladesh, there is a lot of work in real estate platforms, but not all web applications are dynamic. They have uploaded their blog post, videos, and pictures without detailed information. In Figure 2.1 below, I have added another website's UI home page to show that.



Fig 2.3: User Interface (UI) related work from [18]

Here, we can see just advertisements showing standard construct information, which is essential, and the design is not user-friendly. It looks like a static site.

I will now introduce a website that not only has an excellent user interface but also displays costs. However, because they have not included any online payment gateway systems, people lack the tranquilly necessary to create a pleasant revolution.

I took a snapshot of the B-property website's user interface, shown in Figure 2.3 below.

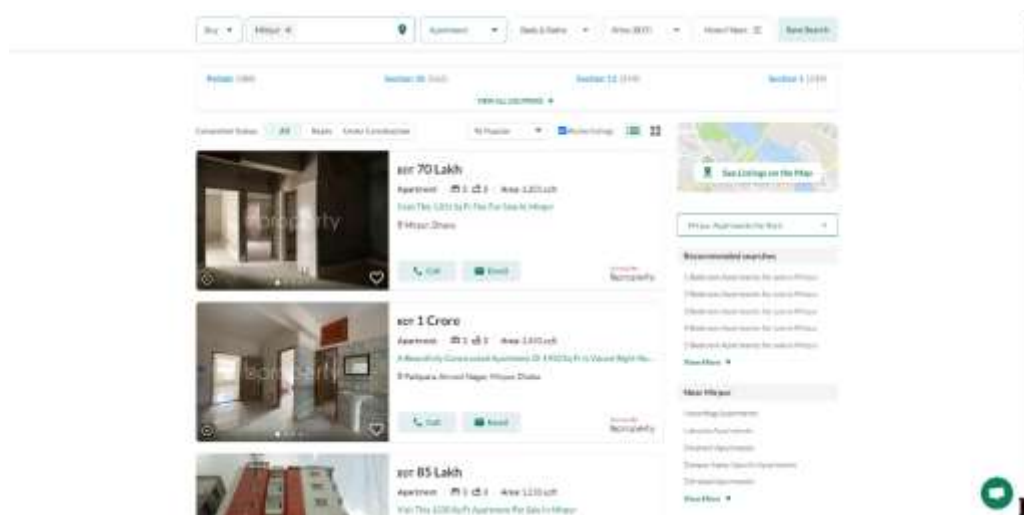


Fig 2.3: User Interface (UI) related work from [20]

## 2.4 Scope of the Problem

After analyzing and reviewing many appropriate web pages, I found that there needs to be a gap between the agency and the buyer.

1. We are collecting the necessary details and tools. (admin support, payment method).
2. No websites have an online payment system.
3. In the internet era, there is no choice for a construction agency.

## 2.5 Challenges

I experienced some severe hurdles when developing this website. As a result, my website will be a dynamic feature with pertinent information, administrative and agency assistance, online payment mechanisms, and so on. Now, I'll go over some of the other difficulties I encountered:

1. Compared to others, I tried to build my website with a fantastic user interface that was more friendly and had accessible features.
2. My website strictly prohibits any fraudulent content, and all posts undergo verification by the administrator.
3. Ensure high security for all the personal information of users and agencies.
4. Added Bangladesh's most secured payment gateway system, SSL Commerce.
5. Ensuring that they get the payment information and forward it to the appropriate agency.
6. I built my website faster compared to other real estate websites, though it was challenging.
7. Trying to build a friendly connection between the agency and users.

# CHAPTER 3

## REQUIREMENT SPECIFICATION

### 3.1 Business Process Modeling

Business Process Model:

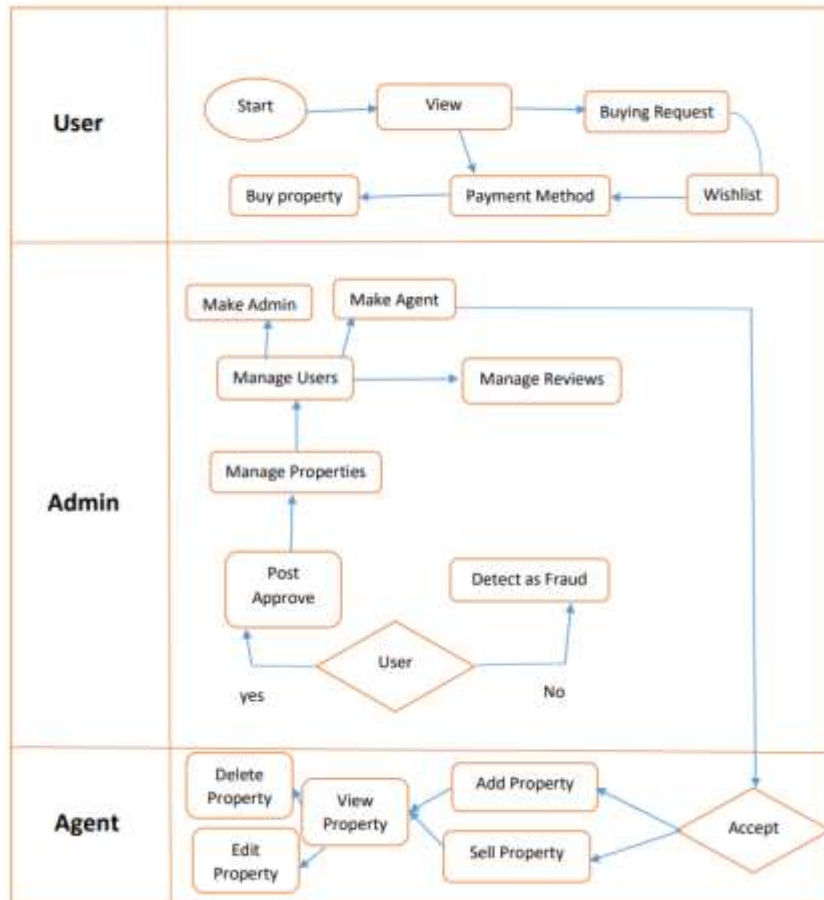


Figure 3.1: Business Process Model Diagram

### 3.2 Requirement Collection and Analysis

Every collection and critical necessity in my web application, such as admin login, user login, registration, and so on. Some of these are mentioned in the table below:

Table 3.2: Requirement and analysis

<b>Serial no</b>	<b>Name of Requirement</b>	<b>Analysis</b>
01	Registration Page	Users may freely visit my website, but if they want to use my site's services and view property data, they must first register, and then they will have access to everything.
02	Login Page	After registration, the user must check in to my site using their email address and password.
03	List of Properties	Only agents can add properties, but the admin will also verify the agent and property. The property will be shown on my website if the admin approves it.
04	Wishlist and payment system	If an user finds his/her desired property, he/she can add that property on the wishlist and pay or he/she can pay direct from the details page.
05	Login System of Admin	The admin needs to log in and maintain the dashboard to modify and manage all the security issues.

### 3.3 Use Case Modeling and Description

The user, the agent, and their relationship are depicted in this use case diagram. The user, agent, and admin relationships, as well as their points of view, accessible tools, and qualities, are all connected here. Agent and admin relationships, as well as their perspective-accessible tools and features, are linked here.

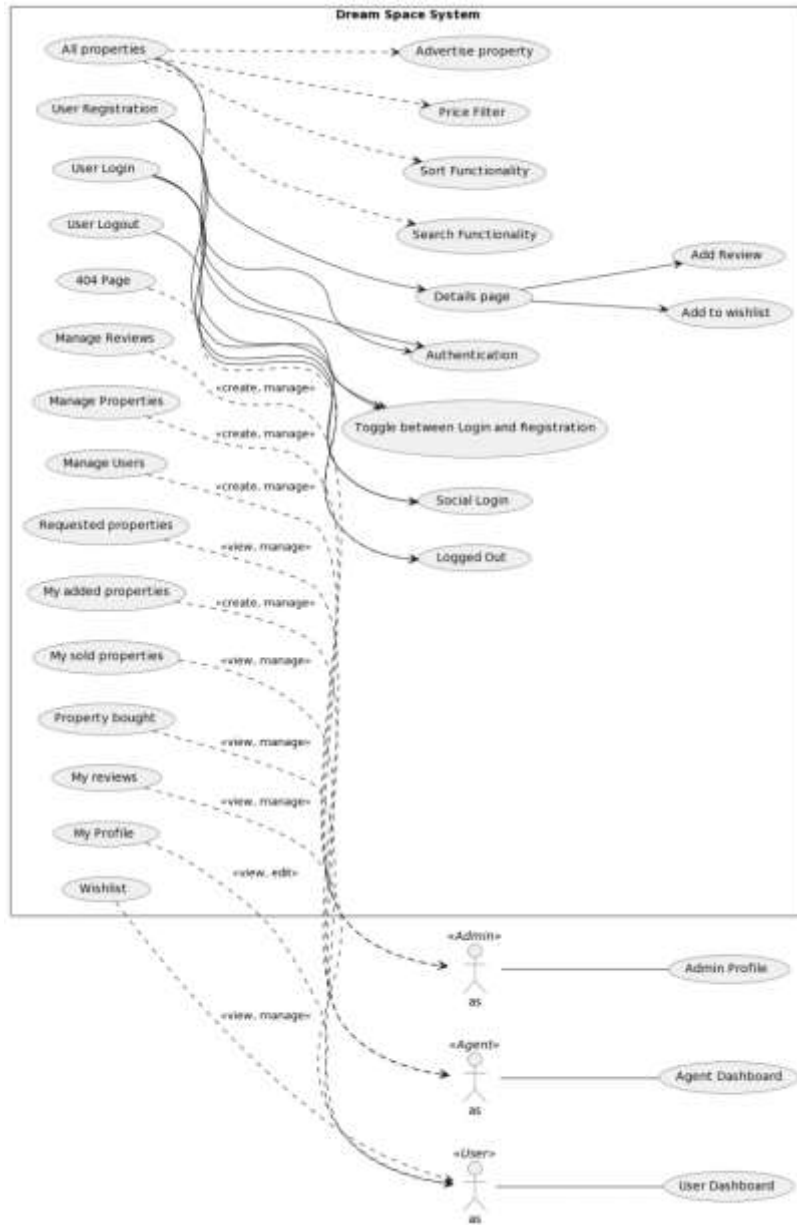


Figure 3.3: Use Case Diagram



### **3.4 Logical Data Model:**

The Logical Data Model, or LDM, is a critical component of a real estate property site. It provides a graphical representation of the data elements and their relationships within the system. By using the LDM, users can better understand how the system stores and retrieves information. The LDM helps to ensure that the data is organized logically and efficiently, which facilitates users' access to and search for relevant information. Additionally, the LDM serves as a blueprint for developers responsible for building and maintaining the system. It allows them to understand the structure of the data and make changes or updates as needed. Overall, the LDM is a crucial tool that supports the functionality and reliability of the Estate Ease platform. Entities and Attributes:

The Logical Data Model for the Estate Ease real estate property portal scenario outlines the primary entities, their attributes, and relationships within the system. By defining the data elements' structure and interactions, the LDM provides a foundational framework for designing the database schema, implementing data integrity constraints, and facilitating data management, retrieval, and manipulation operations effectively and efficiently.

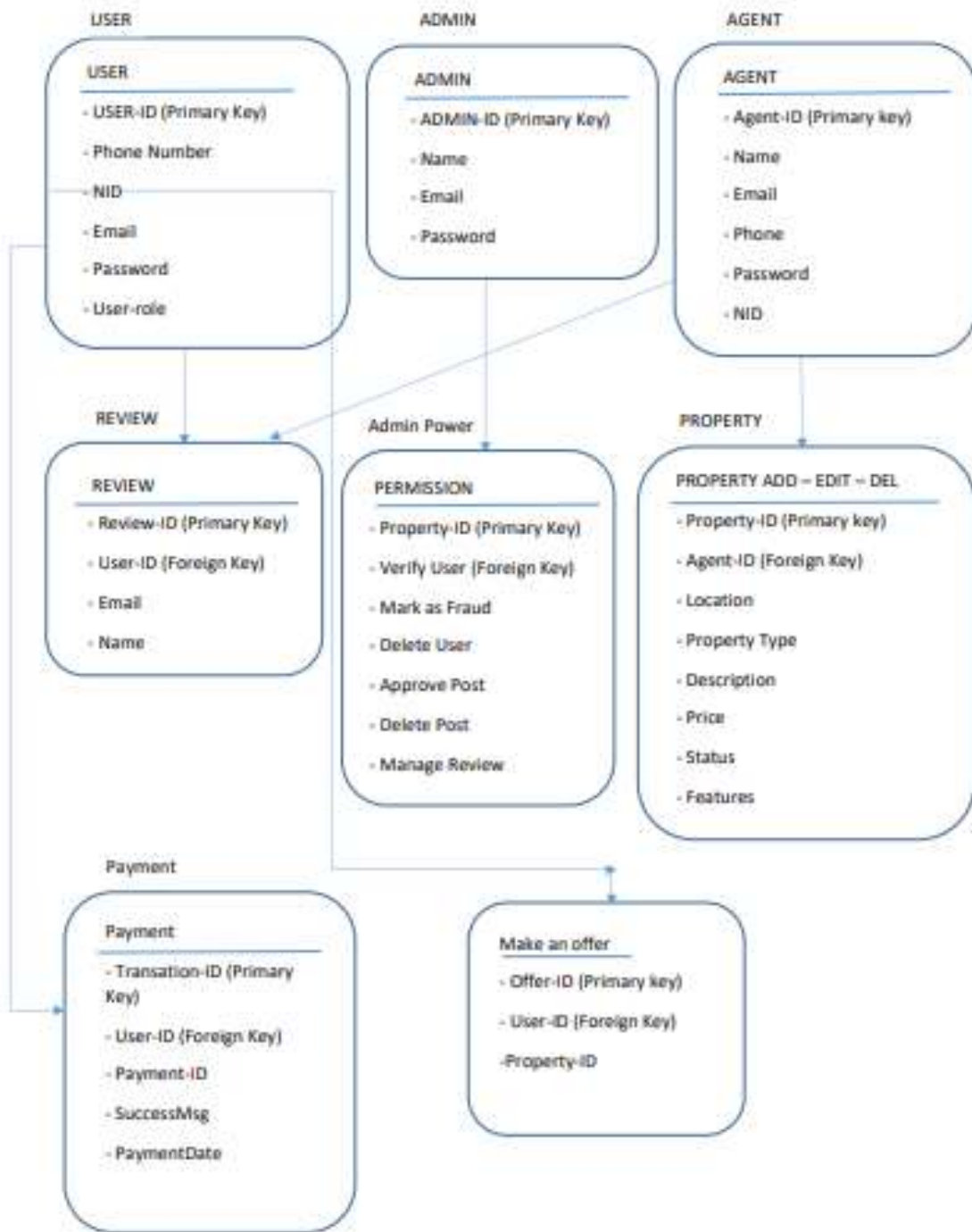


Figure 3.4: Logical Data Model Diagram

### 3.5 Design Requirement

I've previously created a dynamic website, which I briefly mentioned in the last chapter. There are two sections, the Client side (Frontend) and the Server side (Backend), as explained in Chapter 4. I used Reactjs, a JavaScript Library, Tailwind CSS, DaisyUI, and Preline in the front end. For the backend, I have used Expressjs, a nodejs framework; for storing data, I have used MongoDB as a database server. I build this website using MERN Stack technology.

1. **React.js:** I implemented the application's frontend or client-side using React.js. One potent JavaScript library for creating user interfaces is called react, offering a component-based architecture that enhances modularity and reusability in code.
2. **Tailwind CSS:** I used Tailwind CSS, a utility-first CSS framework for styling and design.
3. **DaisyUI:** DaisyUI is an extension for Tailwind CSS that enhances its capabilities. It adds a variety of utility classes and components, allowing for more flexibility and control over the visual aspects of the website.
4. **Preline:** I incorporated Preline into the project. Preline is a tool that helps maintain consistent and clean code formatting.
5. **Express.js:** I used Express.js, a Node.js web application framework on the server side. Express facilitates the development of robust and scalable backend APIs by handling routing, middleware, and other critical functions.
6. **MongoDB:** For the database server, I chose MongoDB, a type of NoSQL database that is designed to store data in a non-tabular format. It gives amounts of data with features like dynamic schema design, horizontal scaling, and automatic sharding. MongoDB is ideal for dynamic and scalable applications because of its excellent performance and simplicity of integration with Node.js.

## CHAPTER 4

### DESIGN SPECIFICATION

#### 4.1 Front-end Design

In my web base project, I created a dynamic and appealing website. The Home/Front page is divided into eight parts. Without registration, users can see the home page just but won't be able to use the website's functionality. To send emails to us, add a review, see a single property detail or payment, or access the dashboard, the user must register and log into my website. On the Client side(front), I have used Reactjs, TailwindCss, DaisyUI and Praline. An admin can manage user and their roles, manage reviews, manage properties and verify properties where an agent can add, and without admin verification, that property will not be posted. Users can view the property, purchase the package, make an offer to the agent for a reduced price, see their wishlist properties, view their reviews, and view their bought property. For friendly behaviour, users need to register and log in first. The author of this platform hires an admin. The agency can add a property, see their added properties, view their sold properties, and see the requested properties where users can make an offer to reduce the price. Social media links like Facebook, YouTube, and Twitter are also available in the footer, so everyone can explore this website to gather more information.

##### 4.1.1 User Interface

In this phase, I am showing the Home page sections on my website. Here, at first, we can see a sticky navbar. Then, below, we see a Slider of the properties in the banner/her section. This slider will slide automatically within 2 seconds.



Fig.4.1 Home page (Navbar, Banner/Slider)

Now, the other section is known as Properties. Users can see some properties here with a slider. Here is the view all property option; if the user clicks that section, they will be redirected to the All Properties page.

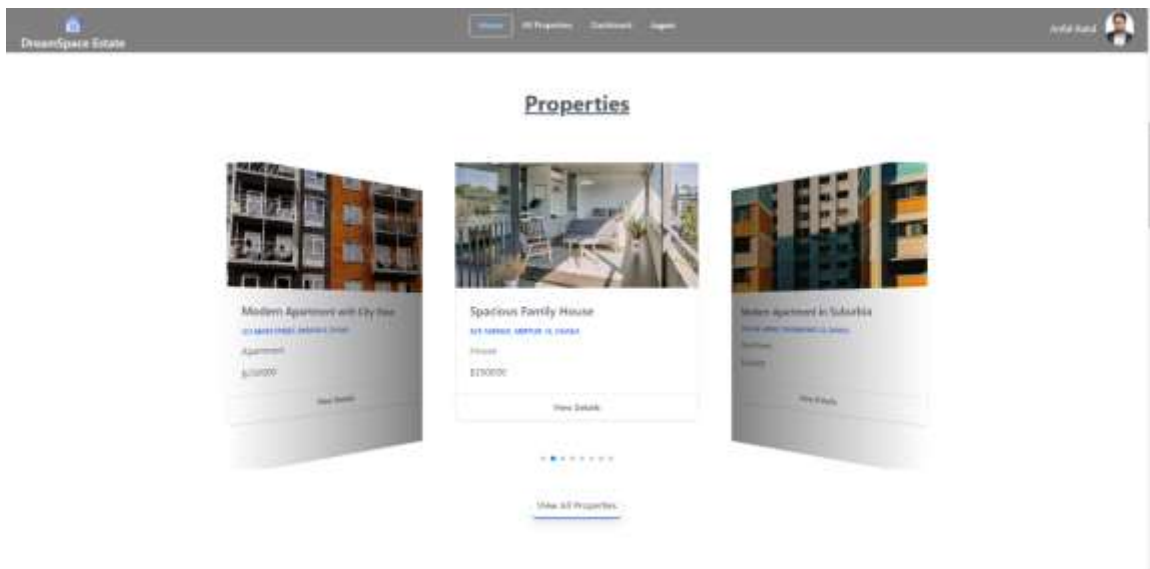


Fig.4.2 Home page (Properties)

Here are the property details: the user must log in, and it is the private route. If the user clicks on view all property, the interface is below:

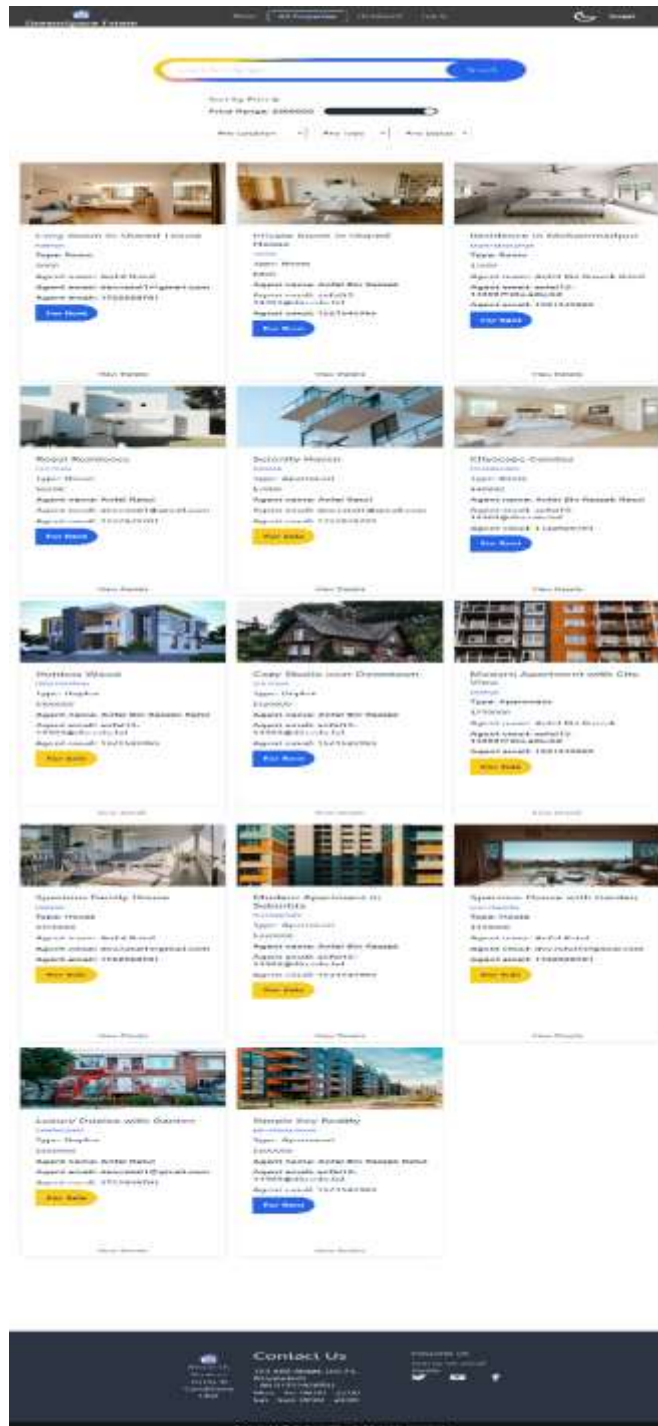


Fig. 4.3 Home page (All Properties)

In the all property section, we see the search option via house/property type and sorting option via price. There is also a view details option; if logged in, the user can see the details; let's see the details interface of a specific property.

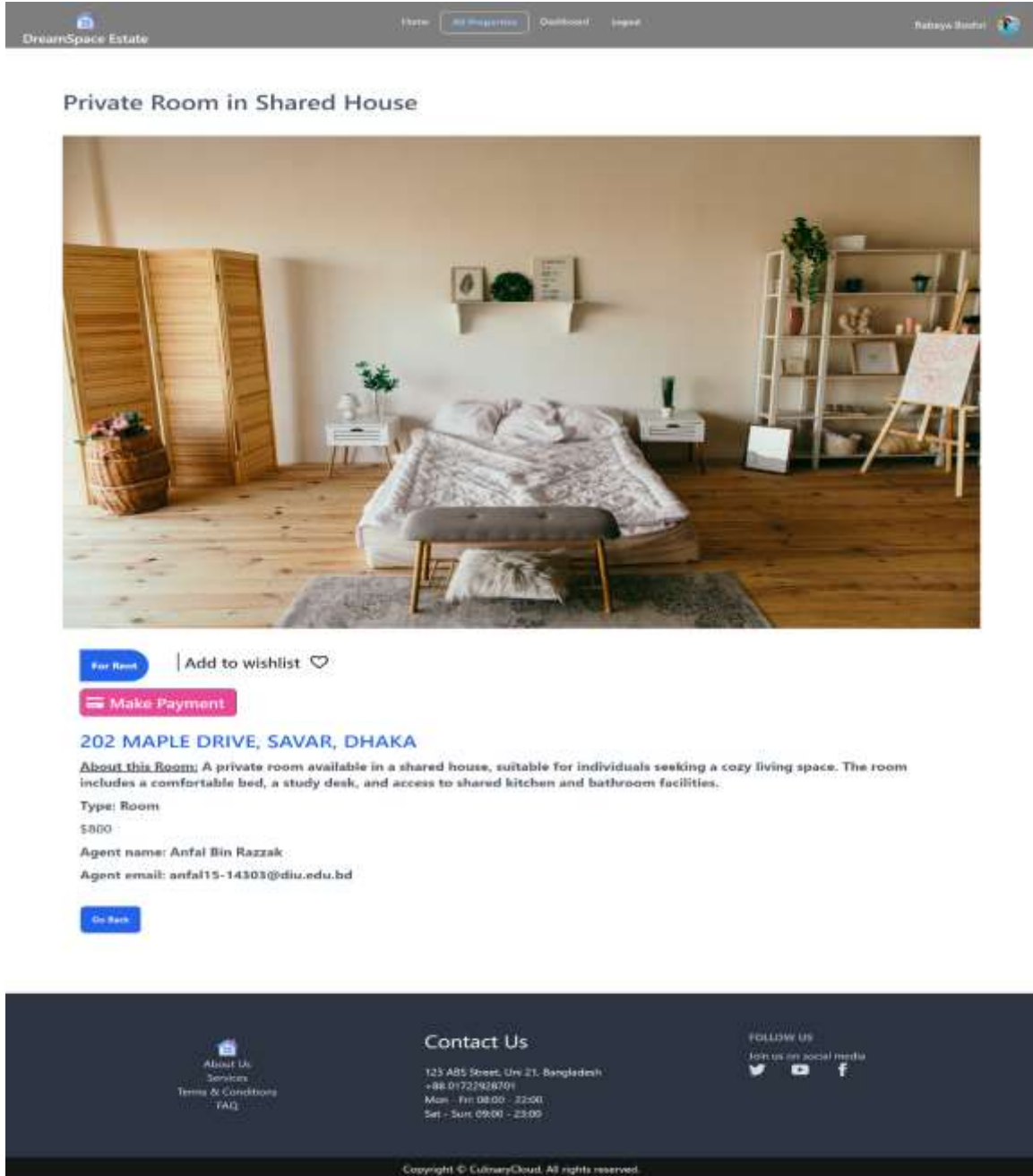


Fig. 4.3 Home page (Single Property Details)

Here are some options. We can see the go-back button where users can return to their previous state/location/page. Then, there is an add to the wishlist button. If a user clicks to add to the wishlist, the property will be added to the wishlist of a user dashboard. There is also a make payment button where users can pay online via bank account or mobile banking like BKash, Nagad, Upay, DBBL, etc. The user interface of the payment sections is below:

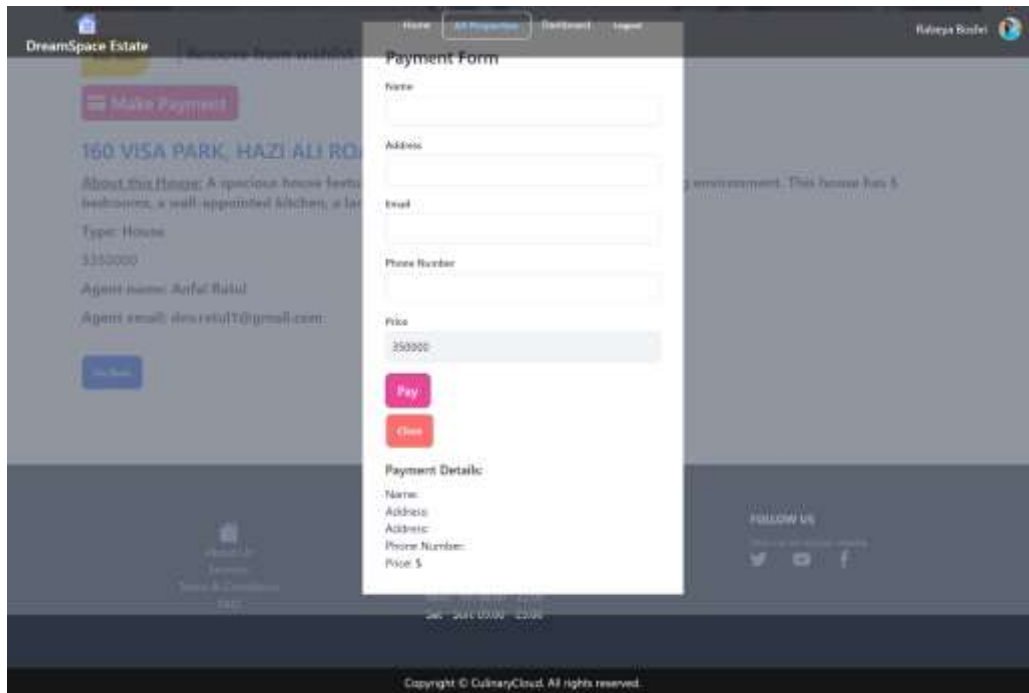


Fig. 4.4 Home page (Modal in payment button)



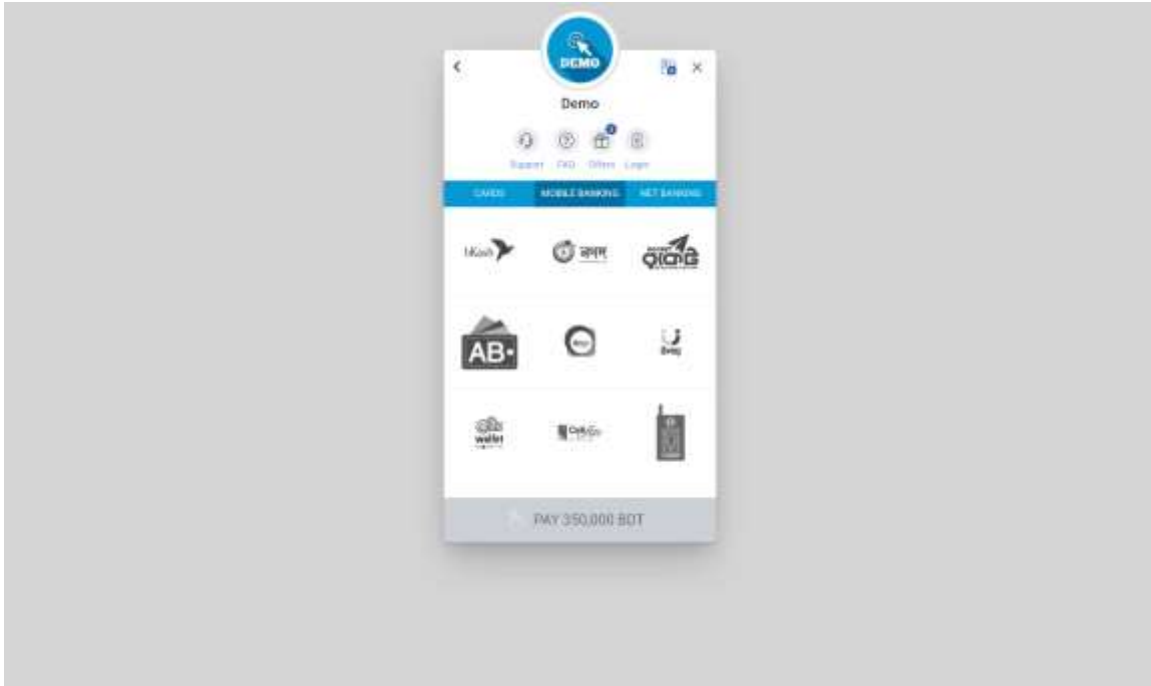


Fig. 4.5 Payment page (SSLCommerz payment option)

**OTP Page**

Do not press browser back or forward button while you are in payment page.

Payment Summary	
Please review the following detail for this transaction.	
Amount:	350000.00
Invoice number:	249107209610MYXy3wq78MH
Description:	Products

Enter Card Information	
<p>OTP:</p> <input type="text"/> <p> <input type="button" value="Success"/> <input type="button" value="Cancel"/> <input type="button" value="Success with risk"/> <input type="button" value="Failed"/> </p>	<p>Your entered card information could not be captured or become known to the third party, as all transmitted data is encrypted by the SSL protocol.</p> <p><b>Note</b></p> <ol style="list-style-type: none"> <li>For VISA and MC, look at the back side of your Card to find 3-digit CVV2/ CVC2. For ANEX, look at the upper right corner of the front side of your Card to find 4-digit CSC.</li> <li>The cardholder's name should be entered just as it's written on the card.</li> </ol>

BILLING HERE THE BDC GATEWAY AND CARD INFORMATION WILL BE SAVED AND DUMPY

Fig. 4.6 Payment page (Payment can be success/cancel/failed)

If payment is completed, then a successful interface will be shown; otherwise, a failed interface will be shown. The figures are below:

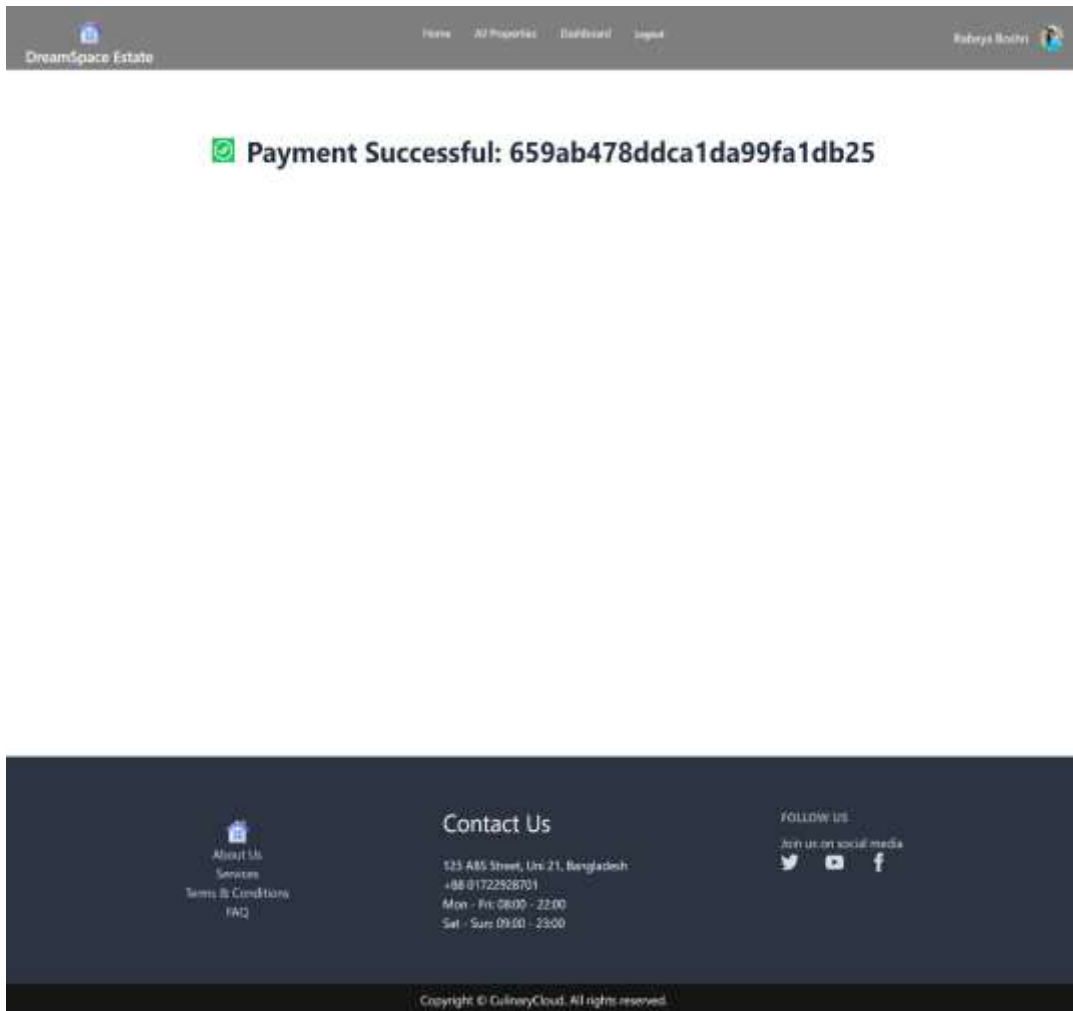


Fig. 4.7 Payment page (Successfully completed)

 **Payment failed: 659ab478ddca1da99fa1db25**



Fig. 4.7 Payment page (Payment failed)

Now, the user can see the steps section on the home page. In this testimonial section, all user reviews can be shown with a slider, the Contact Us section, where a user can contact the owner of the website; why Choose Us section, where users can read about us and why they should use this website, review section where user can add review about this website for security and trust issues, and finally a footer section. Below are all the figures:

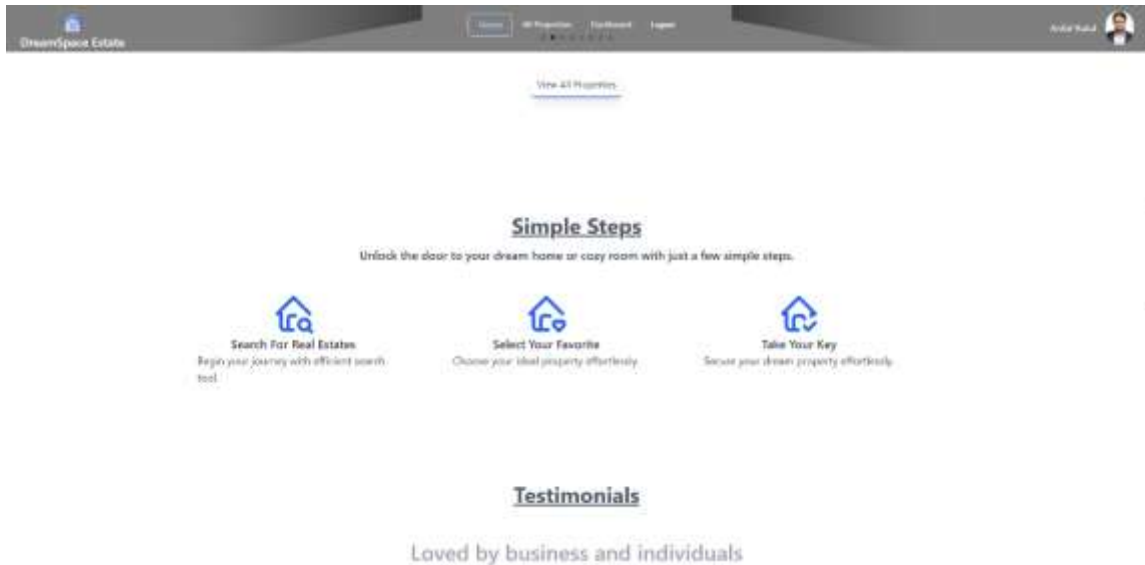


Fig. 4.8 Home page (Simple Steps)

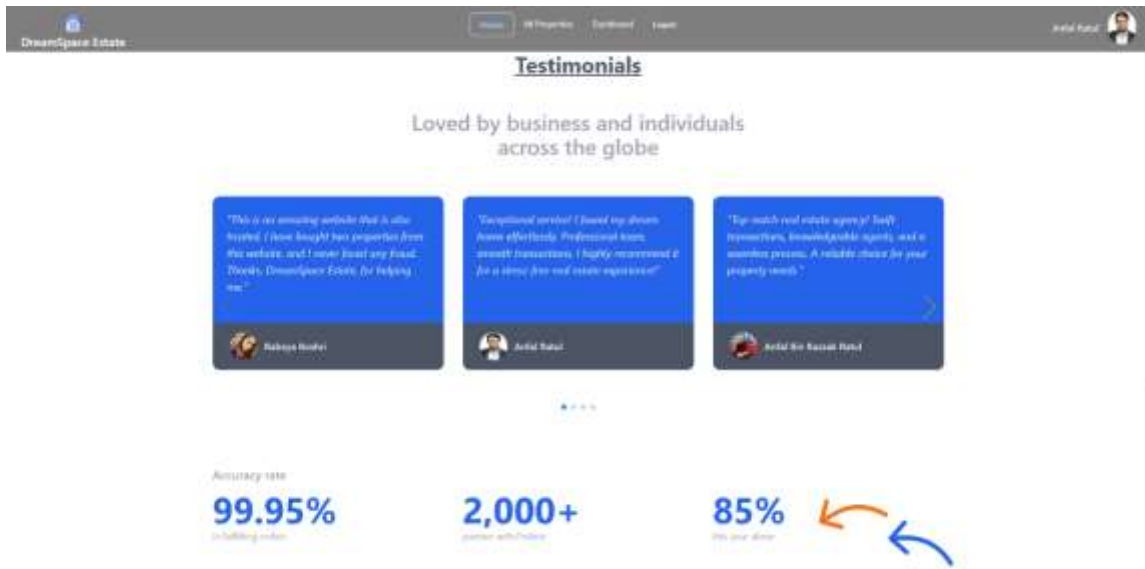


Fig. 4.9 Home page (Testimonials)

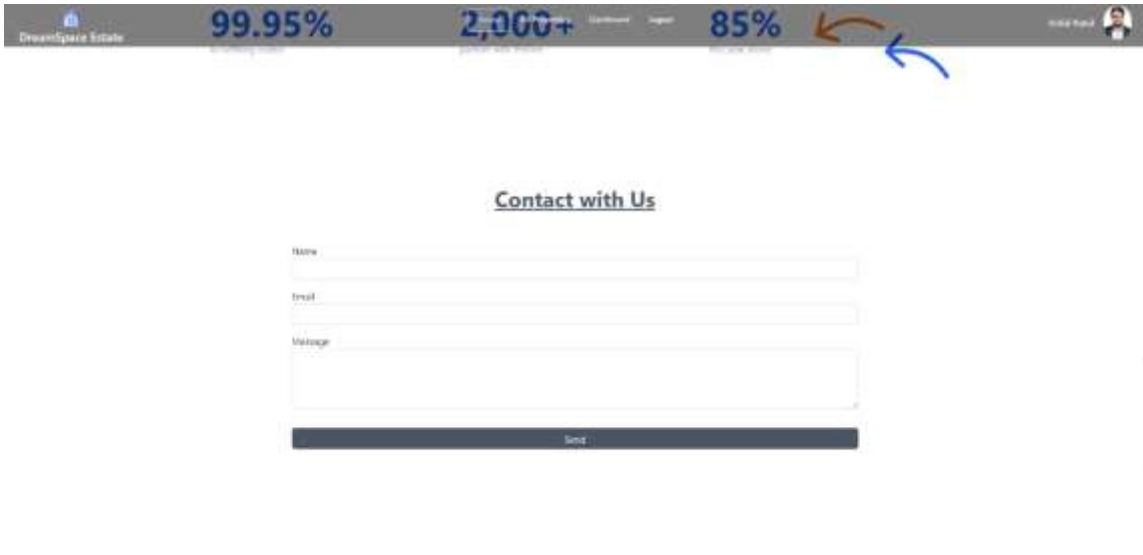


Fig. 4.10 Home page (Contact us)

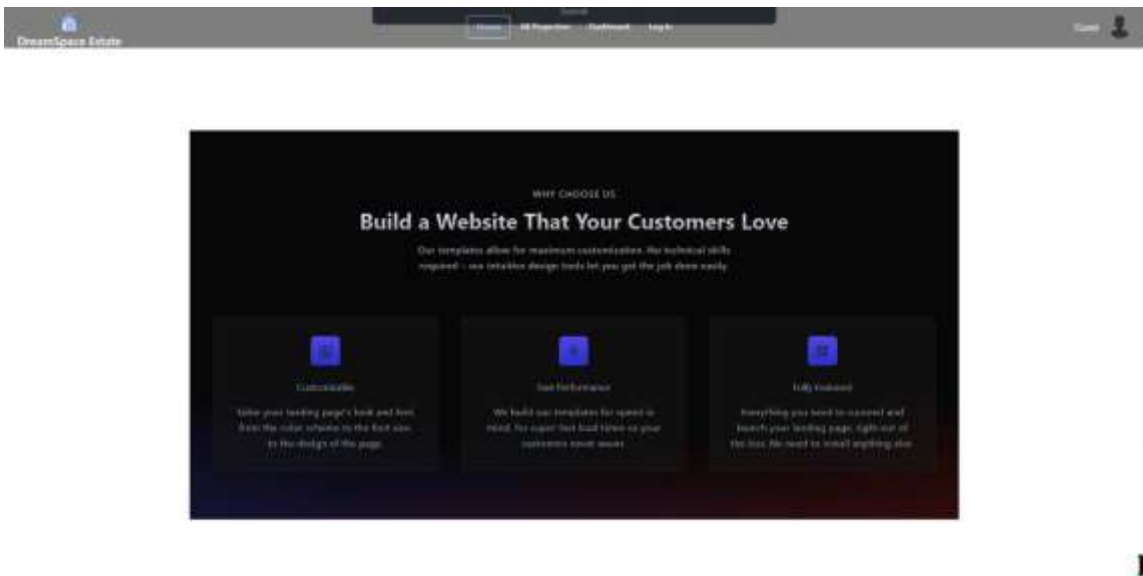


Fig. 4.11 Home page (Why chose us)

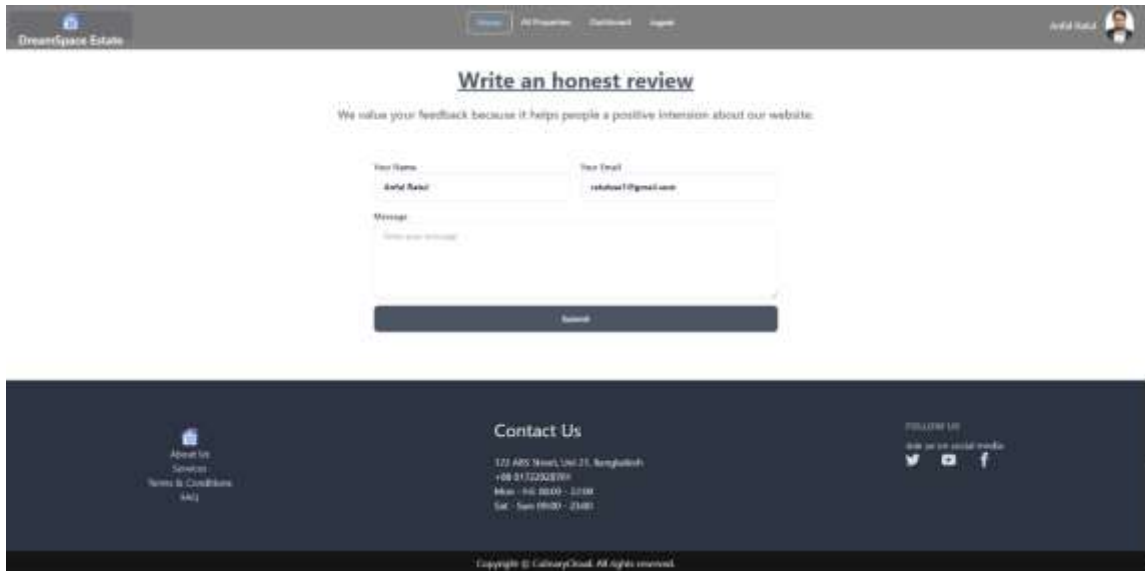


Fig. 4.12 Home page (Review and Footer)

If the user is new, they need to register. They can be logged in if they already have an account. The interface is below:

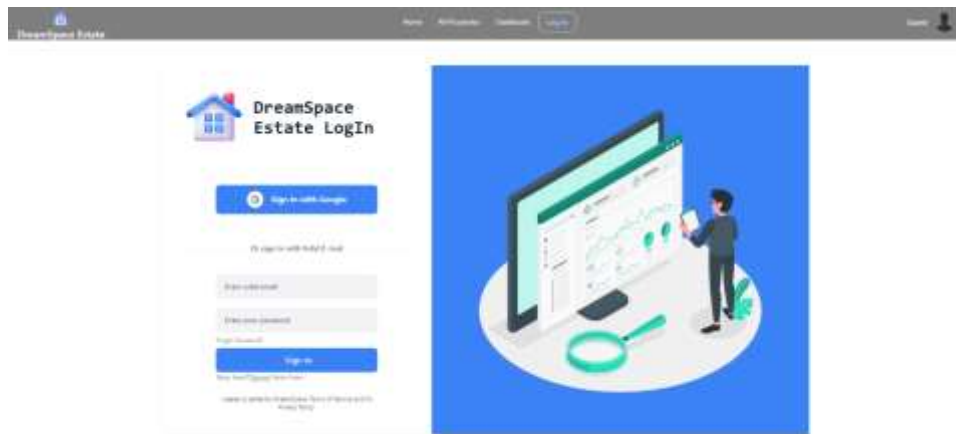


Fig. 4.13 Login page (For existing users)

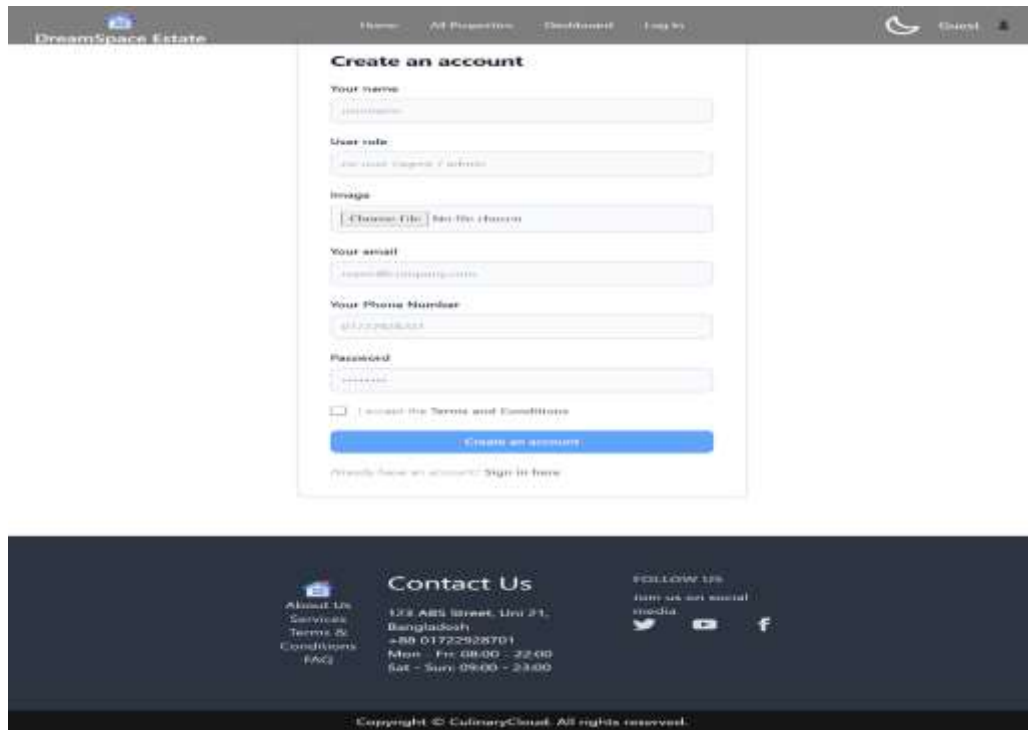


Fig. 4.14 Register page (For new users)

This is the **USER DASHBOARD** section, where users can see and update their profiles. Then comes the user's wishlist, where the user adds his favourite properties. Users can remove a property from their wishlist by clicking the remove button or make an offer to the agent by clicking the make an offer button. User can see their reviews by clicking the reviews section on the dashboard. Users can see the properties that they bought, and there are also two buttons. If users click the “Offered Property” button, they can see the property they offered offline to the agent, and if the user clicks “Online Pay Property”, they can see the properties they bought via online payment. The user interfaces and figures are below:

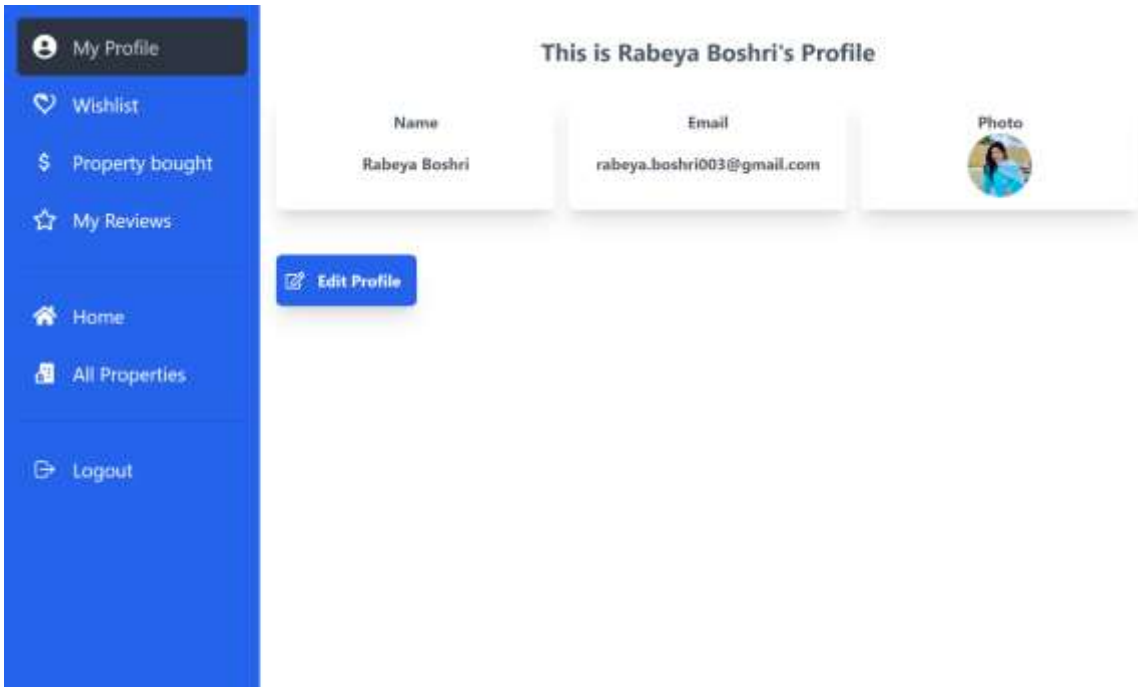


Fig. 4.15 User Dashboard (User Profile)

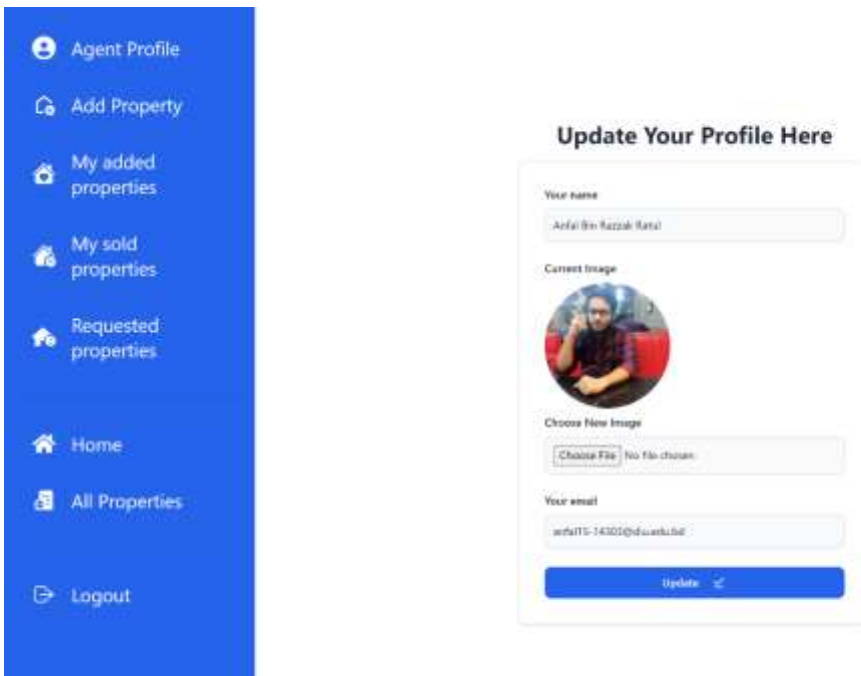


Fig. 4.16 User Dashboard (Update User info)



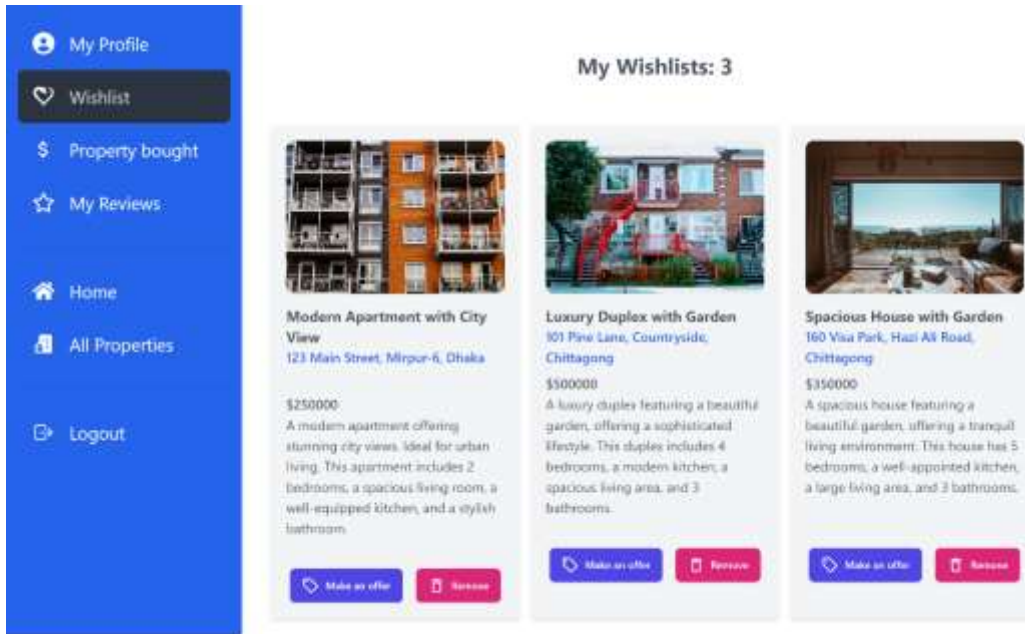


Fig. 4.17 User Dashboard (Wishlist)

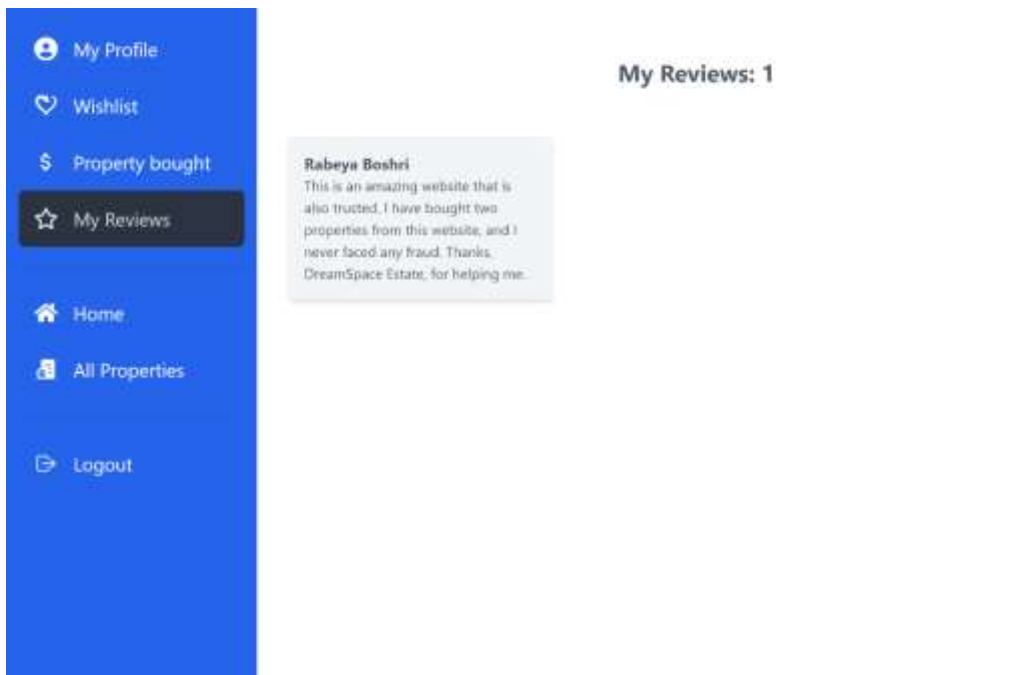


Fig. 4.18 User Dashboard (My Reviews)

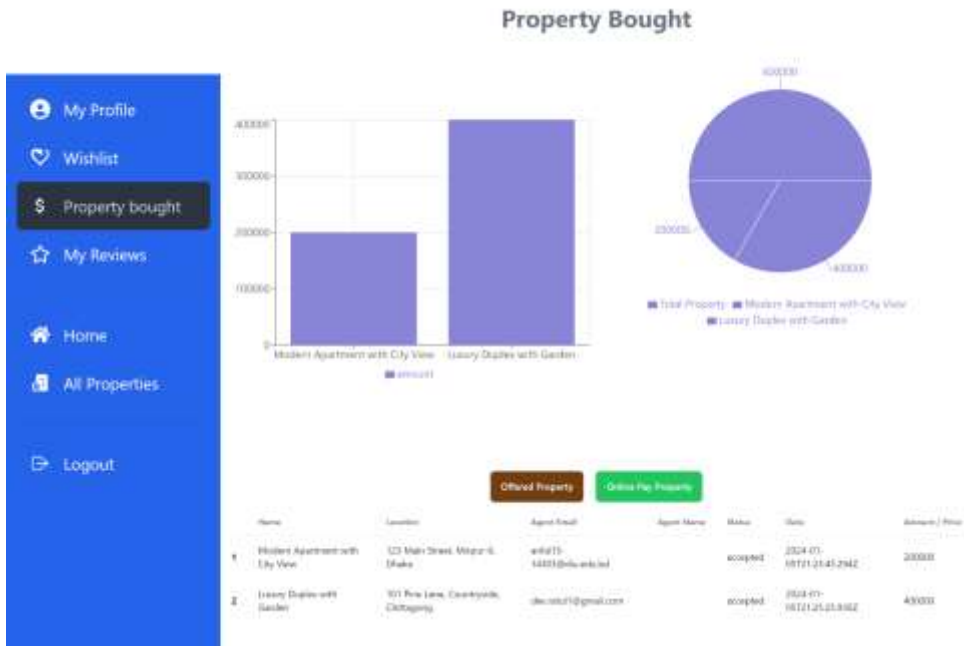


Fig. 4.19 User Dashboard (Offered Property Bought)

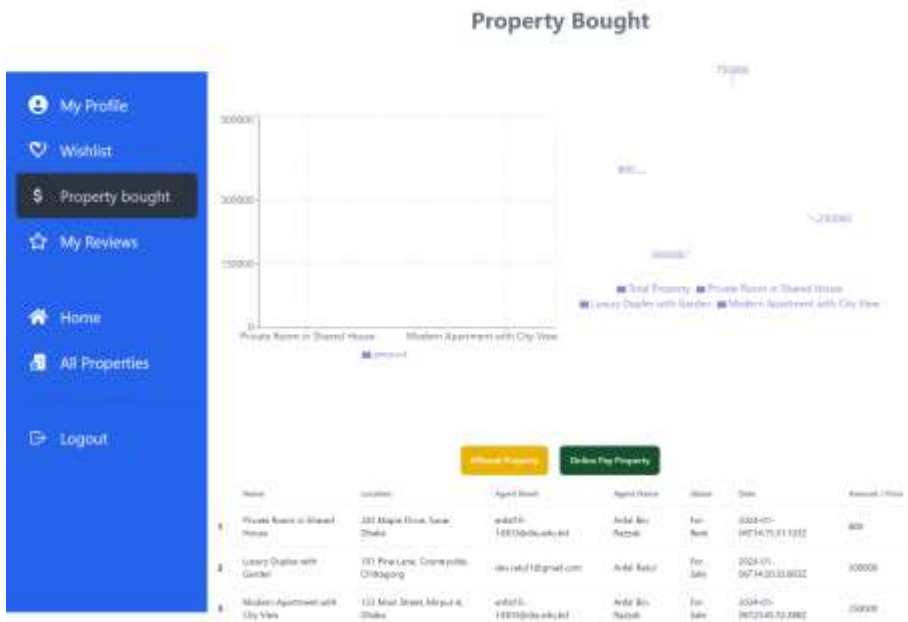


Fig. 4.20 User Dashboard (Online Pay Bought)

This is the **AGENT DASHBOARD** section, where agents can add their property. An agent can see all their properties in the My Added Properties section. They can update and delete their properties from here. Then, in my sold property section, the agent can see offered sold property and online pay sold property via clicking the Offered sold property button and Online Selling Property button. An agent can see the offers the user requested for reduced money for a property in the Requested Property section.

The screenshot displays the 'Add Property' form within the Agent Dashboard. On the left, a blue sidebar contains navigation options: Agent Profile, Add Property (highlighted), My added properties, My sold properties, Requested properties, Home, All Properties, and Logout. The main form area is titled 'Add Property' and contains the following fields and controls:

- Property Title: Text input field.
- Property Location: Text input field.
- Property Image: File upload field with a 'Choose File' button and 'No file chosen' text.
- NID Image: Text input field.
- Agent Name: Text input field.
- Agent Email: Text input field, pre-filled with 'dev.ratul1@gmail.com'.
- Agent Phone Number: Text input field.
- Property Description: Large text area.
- Price: Text input field.
- Status: Dropdown menu with 'Select Status' selected.
- Type: Dropdown menu with 'Select Type' selected.
- Submit Button: 'Add Property' button.

Fig. 4.21 Agent Dashboard (Add Property)

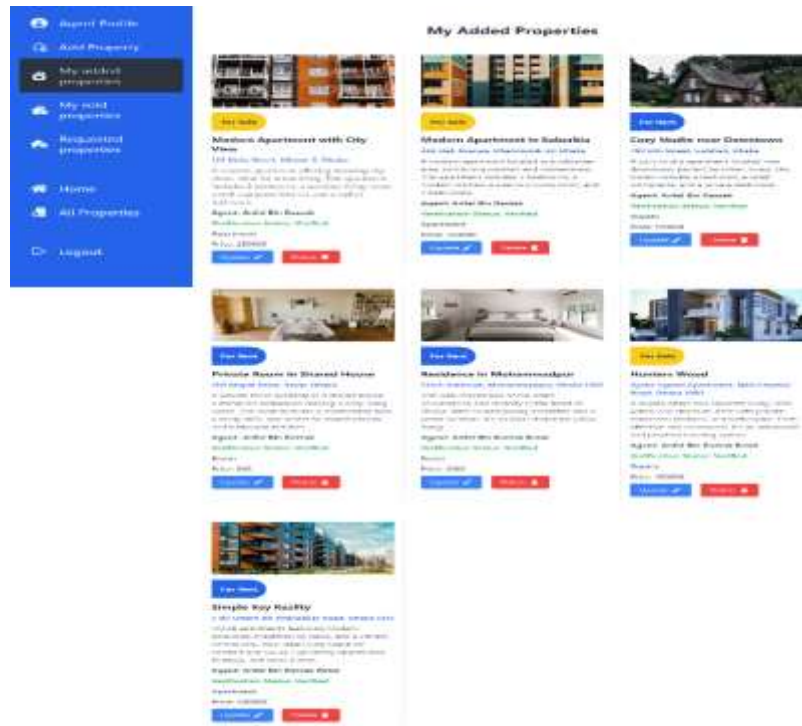


Fig. 4.22 Agent Dashboard (My Added Properties)

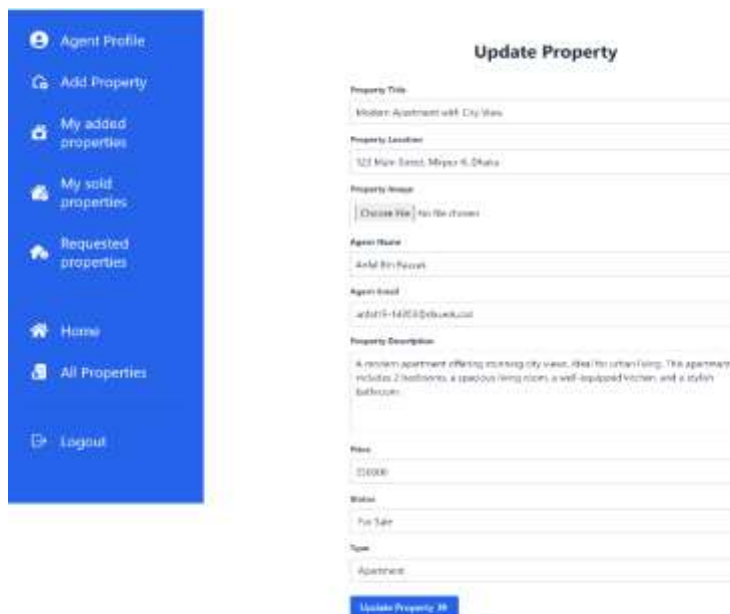


Fig. 4.23 Agent Dashboard (Update Property)

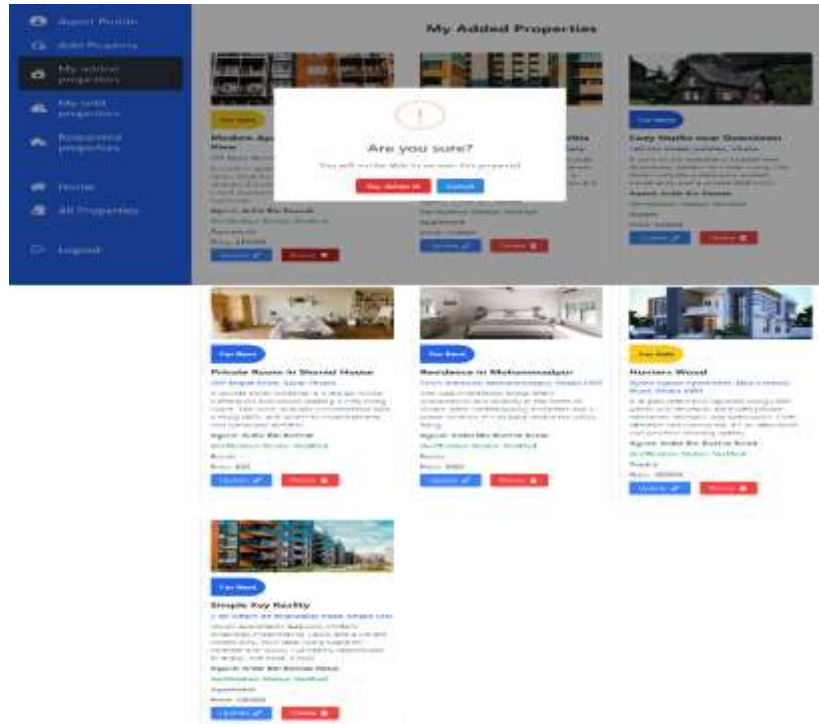


Fig. 4.24 Agent Dashboard (Delete Property)

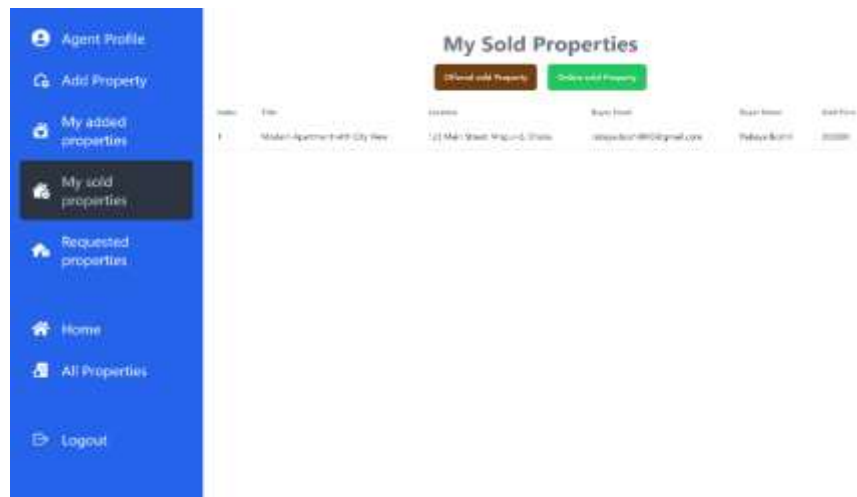


Fig. 4.25 Agent Dashboard (Offered Sold Property)

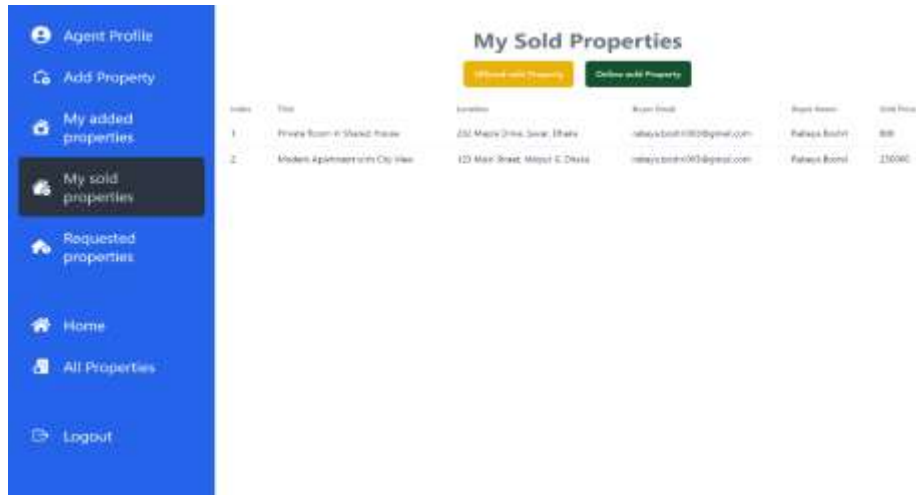


Fig. 4.26 Agent Dashboard (Online pay Sold Property)

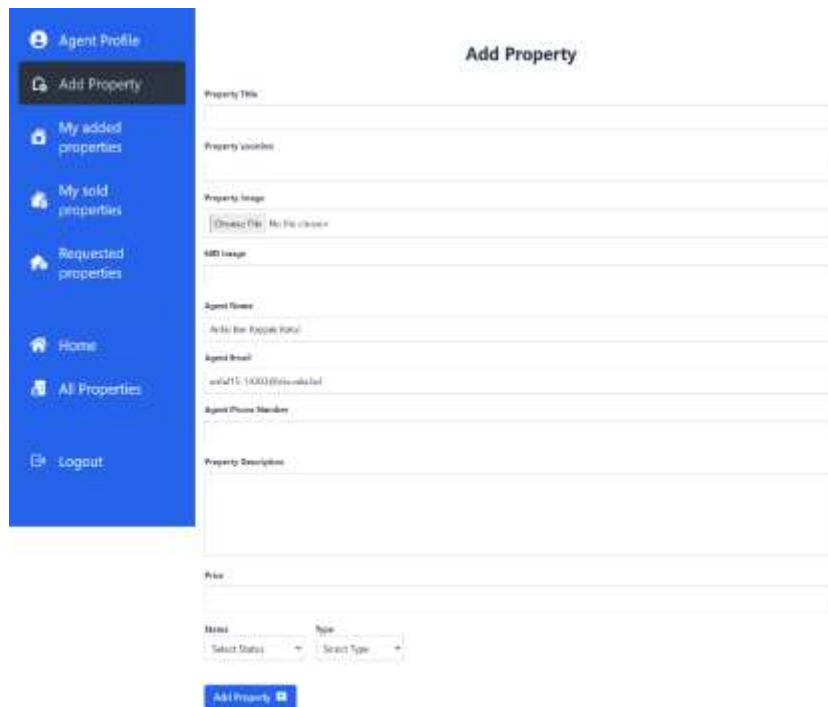


Fig. 4.27 Agent Dashboard (Offered Sold Property)

In the **ADMIN DASHBOARD** section, Admin has full access to a website. Admin can manage reviews. If somebody attempts to use slang on the review, the Admin can delete

that usual review. Admin can manage users also. Admin can make a user agent, make a user admin, or mark an agent as fraud if NID is not given or false information. Also, the Admin can delete a user. Admin can manage properties also; if an agent adds a post, the post will not be shown on the website; it will be under admin review. If Admin approves, then it will be shown. If the Admin rejects it, then it will not be shown. The Admin can approve the post by checking the agent's ID.



Fig. 4.28 Admin Dashboard (Manage Users)



Fig. 4.29 Admin Dashboard (Manage Properties)

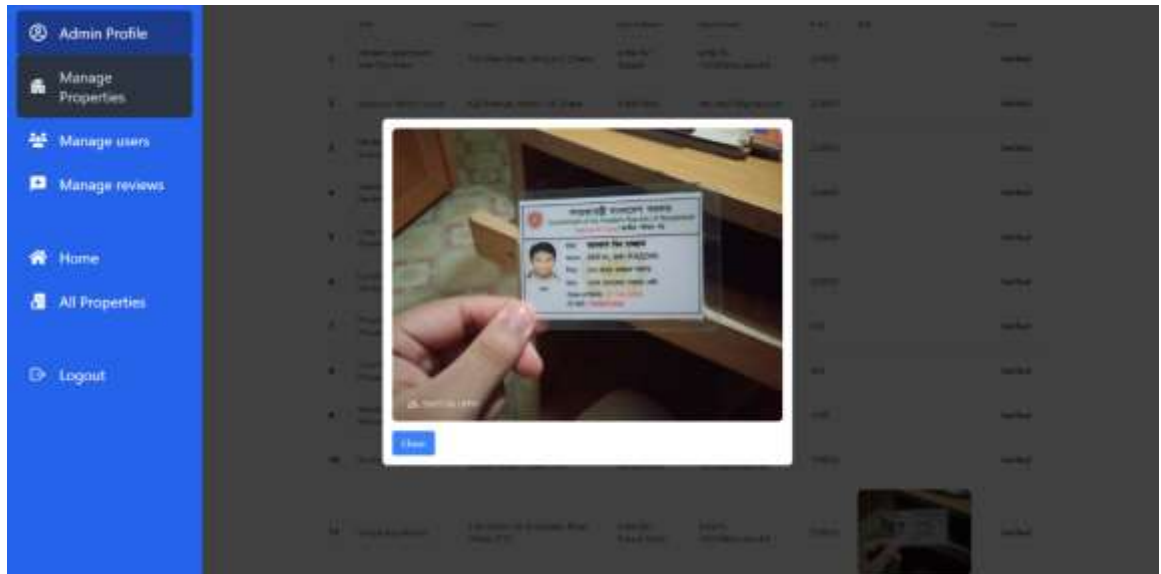


Fig. 4.30 Admin Dashboard (Approve POST by checking NID)



Fig. 4.31 Admin Dashboard (Manage Reviews)



## 4.2 Back-end Design

This DreamSpace real estate website is powered by a robust backend server-side component built with some of the most cutting-edge web technologies available in the industry today.

The backend of this website is built using "ExpressJs", a commonly used framework for developing web applications with Node.js. It is written in JavaScript, which adds type annotations and other features to make code more readable and maintainable. Additionally, the backend uses the MongoDB database, which provides a more user-friendly interface for managing data in the database. MongoDB is a well-known NoSQL database system that stores data as JSON-like documents, allowing it to be very flexible and scalable. It is used extensively in the backend of DreamSpace Estate to store and manage various data related to real estate properties, such as property listings, user information, and transaction details.

Overall, the DreamSpace real estate platform is a refined and powerful tool for anyone purchasing, selling, or renting properties online. Its advanced backend infrastructure ensures that users can access and manage their data quickly and securely, while its user-friendly interface makes it easy for anyone to use.



The screenshot shows the MongoDB Atlas interface for a database named 'realEstateDB'. At the top, there are summary statistics: LOCAL DATA SIZE: 51.7MB, STORAGE SIZE: 2MB, INDEX SIZE: 1MB, and TOTAL COLLECTIONS: 6. A 'CASAR COLLECTION' button is visible in the top right. Below this is a table with the following columns: Collection Name, Documents, Logical Data Size, Avg Document Size, Storage Size, Indexes, Index Size, and Avg Index Size. The table lists six collections: offers, properties, properties, reviews, users, and wishlist.

Collection Name	Documents	Logical Data Size	Avg Document Size	Storage Size	Indexes	Index Size	Avg Index Size
offers	2	67B	33B	30B	1	30B	30B
properties	3	2.23KB	74B	30B	1	30B	30B
properties	9	5.79KB	63B	30B	1	30B	30B
reviews	4	1.38KB	34B	30B	1	30B	30B
users	5	67B	13B	30B	1	30B	30B
wishlist	5	2.9KB	58B	30B	1	30B	30B

Fig. 4.2.1 MongoDB Cluster (All Collections)

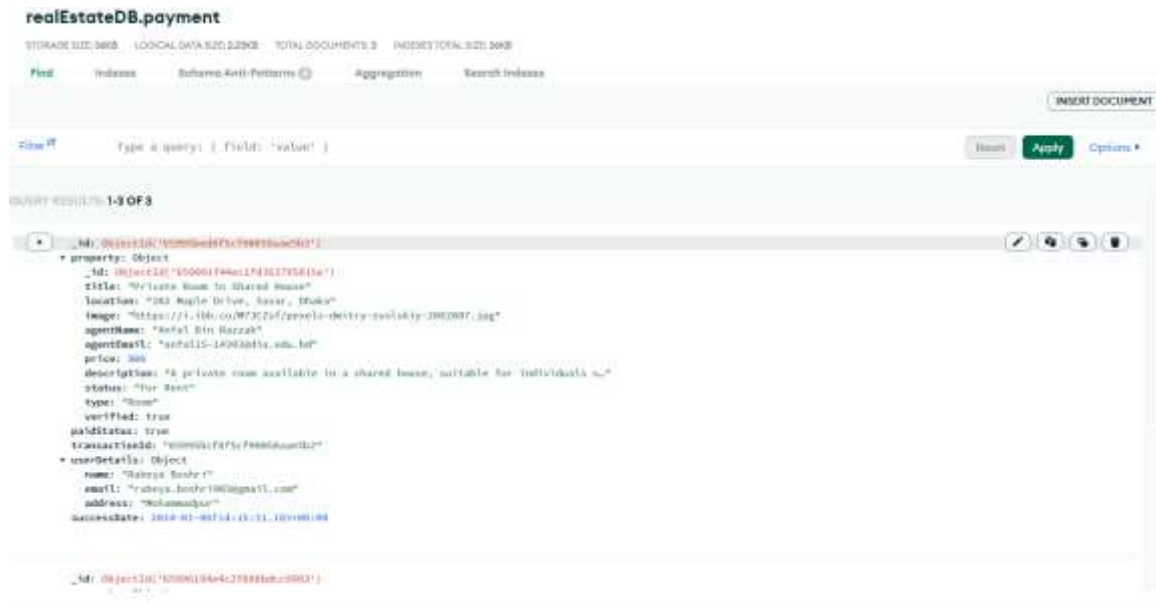


Fig. 4.2.2 MongoDB Cluster (Payment Collections)

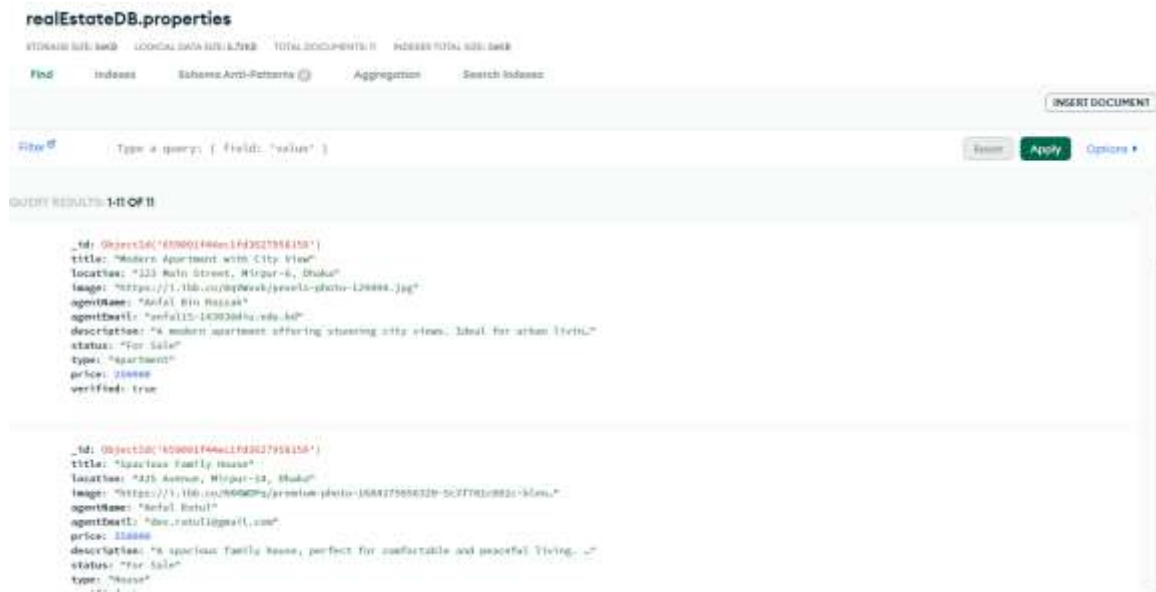


Fig. 4.2.3 MongoDB Cluster (Property Collection)

### **4.3 Interaction Design and User Experience (UX)**

DreamSpace Estate Property Portal's Interaction Design and User Experience (UX) focuses on developing a user-centric, intuitive, and engaging platform. The platform will be developed to achieve this goal using a detailed understanding of user personas representing homeowners, renters, and administrators. This understanding will be obtained by mapping user journeys and interactions across the platform. This will help identify critical touchpoints, decision-making stages, and opportunities for enhancing the user experience. The platform will have a clear and intuitive navigation structure with organized menus, categories, and filters. Users will be able to find and retrieve information quickly. They will be able to find desired features and information.

Interactive elements, such as buttons, sliders, tooltips, and animations, will be incorporated into the platform to engage users and enhance usability. Feedback mechanisms, such as notifications, confirmations, and error messages, will be implemented to provide real-time feedback and guidance to users during their interactions. The platform will offer personalized property recommendations based on user preferences, search history, and behaviour to enhance the property discovery experience. Advanced search filters and sorting options, such as area, home type, features, and rental price, are new features that allow users to filter search results efficiently, making it easier to find relevant information. The platform will make property reviews easily accessible and prominently displayed on property listings, providing users with valuable insights and information.

An interactive review interface with comment sections and multimedia capabilities will encourage users to share their experiences and insights effectively. By incorporating best practices in interaction design, user interface design, personalization, accessibility, and performance optimization, the UX design aims to deliver a seamless, enjoyable, and memorable user experience. This will facilitate successful interactions, transactions, and relationships within the real estate ecosystem.

## 4.4 Implementation Requirements

Implementation Requirements for DreamSpace Real Estate Property Portal:

1. **Front-end Framework:** Use React.js for better performance and tailwind CSS with DaisyUI and Preline, a utility-based tailwind CSS framework.
2. **Back-end Framework:** Develop the back-end using Node.js with Express.js to create scalable APIs.
3. **Database Integration:** Use MongoDB for efficient data modeling, storage, and retrieval.
4. **API Development:** Design and implement RESTful APIs to handle user requests, property listings, and interactions.
5. **Authentication:** Integrate secure authentication mechanisms like JWT with Firebase to protect user accounts and data.
6. **State Management:** Implement state management solutions with Context API to manage application state and data flow.
7. **Error Handling:** Develop robust error handling and validation mechanisms to ensure data integrity and application reliability.
8. **Testing:** Conduct comprehensive unit, integration, and end-to-end tests using testing frameworks compatible with React, Node.js, and MongoDB.
9. **Performance Optimization:** Optimize codebase, database queries, and server configurations to enhance platform performance and responsiveness.
10. **Security Measures:** Implement security protocols, data encryption, and firewall protections to safeguard user information and platform integrity.
11. **Deployment:** Deploy in Vercel, firebase and Netlify for safety.

## CHAPTER 5

### IMPLEMENTATION AND TESTING

#### 5.1 Implementation of Database

I used MongoDB as the primary database to store and manage the data for the DreamSpace real estate project. MongoDB was chosen for its capacity to manage vast volumes of unstructured data and its adaptable document-oriented data format. MongoDB, on the other hand, offered a more explicit interface for interfacing with the client side. My technology enabled me to create a compelling and scalable solution for data management in my project.

#### 5.2 Implementation of Front-end Design

One of the essential tasks, and often a primary aim, is to make the front design incredibly appealing and user-friendly. For that, we are attempting to construct our website while maintaining it as is, even though we have many features. One of the challenges is to make the website responsive to all electronic devices, including smartphones, tablets, laptops, and PCs. Tailwind CSS is used for many parts and strives to keep the responsive code formula consistent across all sections. Reactjs is employed to provide user-friendly interaction. This stage should come after our first design. I have tried to keep a simple and attractive home page.

1. All options and functionalities on our website should be easily comprehensible.
2. Users may instantly register and log in.
3. A visually appealing and informative card, carousel, and Tailwindcss theme are employed in this case.
4. It is simple to filter out several possibilities in this project.

### **5.3 Testing Implementation**

To guarantee a real estate property website's success, it is vital to examine functional and non-functional prerequisites comprehensively. This involves setting quantifiable benchmarks for functionality, usability, performance, security, and other pertinent factors. An all-encompassing test plan must be formulated to direct the testing endeavours efficiently. Functional testing is crucial to ensure that a software program or product is operating as intended by the user and meets their expectations. It ensures the accuracy and comprehensiveness of the portal's features, functionalities, and user interactions. Non-functional testing, encompassing performance, security, usability, and compatibility testing, must assess and confirm the system's dependability, scalability, security, and user experience. Conducting User Acceptance Testing (UAT) with actual users and stakeholders is essential to verify that the system aligns with the business requirements and to gather feedback for ongoing enhancements. It is necessary to create specific testing environments and clearly describe and handle the needs for test data. It is advisable to use a well-balanced method combining automated and manual testing to achieve thorough and accurate validation and optimise testing efforts. It is important to thoroughly document the testing processes, methodologies, findings, and recommendations. It is necessary to create thorough test reports. To promote collaboration, aid decision-making, and support ongoing improvement within the development and testing teams. A dependable, secure, and user-friendly real estate property portal that effectively meets user expectations, regulatory requirements, and business objectives can be developed by adhering to this structured and comprehensive approach.

## 5.4 Test Results and Reports

Test Result and Reports Is Given Below-

Table 5.1: Test data and type

<b>Table No</b>	<b>Description</b>	<b>Text data</b>	<b>Expected result</b>	<b>status</b>
01	Sign in user	Via Email and password	The full home page with properly registered data	Pass
02	All user can view property details	Add to wishlist Make Payment	View wishlist Give information	Pass
03	Online Payment	Payment information	Payment successfully done	Pass
04	Online transaction	Jump into payment information	Easily view form account	Pass
05	Sign in Admin	Email and password	Jump into Admin Dashboard.	pass
06	Packages created	Import valid information	Profile makers for users	Pass
07	Approval of Admins	Admin verified	Approval confirmation	Pass
08	View Transaction	See the transactions	View only	Pass
09	Sign in Agent	Can sell property	Accept or reject offer from users	Pass
10	Agent Property Actions	Access to update their own property and see if it's valid	Agent can add, update, delete Property	Pass

## **CHAPTER 6**

### **IMPACT ON SOCIETY, ENVIRONMENT, SUSTAINABILITY**

#### **6.1 Impact on Society**

There are several real estate sites across the world. If you want to buy or sell a home, you must make an appointment with us. This can be a time-consuming and challenging process. Anyone may use our website to buy, sell, rent a home, etc., from the comfort of their home. We offer several advantages, including an online payment method that alleviates the stress of selling, renting, or buying property and redesigning dwellings, among other things.

In our society, many people are very much interested in buying/selling land and reshaping homes, so this website makes a good impact on our society.

#### **6.2 Impact on Environment**

Around the world, there are several real estate sites. If a person wants to buy or sell a home, they must contact us in person, which is time-consuming and complicated. Anyone may use our real estate website from the comfort of their home to buy, sell, or rent a home. We provide various benefits, including an online payment option that reduces the burden of selling or buying property and renovating homes.

Because many people are interested in buying, selling, or renting land and modifying houses, this website dramatically impacts our society.



### **6.3 Ethical Aspects**

In the contemporary world, we occasionally hear that fraudsters and agencies do not provide a pleasant environment, which is only sometimes the case. However, our website maintains excellent security, and with the admin panel monitoring and resolving any difficulties that arise, there is no potential to violate ethical issues. As a result, the possibilities of an unethical situation are slim.

### **6.4 Sustainability Plan**

When the ordinary user utilizes this website professionally, the website's sustainability improves day by day. If required, we will continue to add features. The advertising charge is kept to a minimum and must be kept within a reasonable budget. I'm optimistic about it.

## **CHAPTER 7**

### **CONCLUSION AND FUTURE SCOPE**

#### **7.1 Discussion and Conclusion**

##### **Discussion:**

A Real Estate Property Portal's development and operation bring opportunities and challenges across technology, business, society, and the environment. However, this digital shift raises concerns about data privacy, cybersecurity, and equitable access. From a business standpoint, the portal is a strategic initiative to broaden market reach and foster stakeholder collaboration.

##### **Conclusion:**

Real Estate is a user-friendly web application in Bangladesh that revolutionizes property transactions by offering a secure, feel-free platform. With instant online payments, location-specific searches, and transparent negotiations, it empowers users, agents, and owners alike. Challenges like secure transactions and fraud detection are tackled, while plans include dynamic updates, a mobile app, and enhanced user account management for a seamless real estate experience.

## **7.2 Scope for Further Developments**

This project also contains a lot of future scopes because every project has some restrictions; presently, I'm pointing to one of the future scopes,

1. In the future, I'll add a live chat option to contact each other.
2. Using predictive analytics to provide consumers with personalized real estate suggestions based on their tastes and search history.
3. Introducing technologies that promote cooperation among buyers, renters, and brokers expedites decision-making processes.
4. We can make it into an Android app for more straightforward smartphone use.
5. User account creation and administration will be more beneficial in the future.

## References:

I have taken some ideas for my website and designs from others. So now, I am inserting these links below as references:

[1] Frontend React Framework use: <https://react.dev/> [last accessed on 25.12.23 at 01 AM]

[2] For react routing: <https://reactrouter.com/en/main> [last accessed on 25.12.23 at 01:30 AM]]

[3] Project deployed in vercel: <https://vercel.com/dashboard> [last accessed on 09.01.24 at 04 PM]

[4] UI/UX design: <https://tailwindcss.com/> [last accessed on 26.12.23 at 02 PM]

[5] Tailwind Utility library used: <https://preline.co/docs/index.html> [last accessed on 26.12.23 at 03 PM]

[6] Firebase: <https://console.firebase.google.com/> [last accessed on 27.12.23 at 01 AM]

[7] Database use: <https://www.mongodb.com/atlas/database> [last accessed on 07.01.24 at 03 PM]

[8] Image hosting site: <https://imgbb.com/> [last accessed on 11.01.24 at 04 AM]

[9] Backend Integration: [expressjs.com](https://expressjs.com) [last accessed on 10.01.24 at 12 PM]

[10] Tailwind Utility library used: <https://daisyui.com/> [last accessed on 11.01.24 at 03 PM]

[11] ThemeForest: <https://themeforest.net/> [last accessed on 12.01.24 at 05 PM]

[12] Frontend Form use: <https://tailwindflex.com/> [last accessed on 12.01.24 at 06 PM]

[13] For Email Sent: <https://www.emailjs.com/> [last accessed on 13.01.24 at 08 PM]

[14] Project Image collection 1: <https://www.pexels.com/> [last accessed on 14.01.24 at 04 PM]

[15] Project Image collection 2: <https://unsplash.com/> [last accessed on 14.01.24 at 05 PM]

[16] Project Image collection 3: <https://pixabay.com/> [last accessed on 15.01.24 at 03 AM]

[17] Charts: <https://recharts.org/en-US/> [last accessed on 16.01.24 at 01 AM]

[18] "<https://www.bdhousing.com/>" related works of bdhousing

[19] "<https://www.propertyalebd.com/>" related works of propertyalebd

[20] "<https://www.bproperty.com/>" related works of bproperty

## PROPERTY LISTING FOR REAL ESTATE DIGITAL TRANSFORMATION

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### ORIGINALITY REPORT

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<b>4%</b>	<b>3%</b>	<b>0%</b>	<b>0%</b>
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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Exclude bibliography Off