



An-Najah National University

Faculty of Engineering & Information Technology

Department of Computer Engineering, Critical Thinking and
Research Skills

Software Graduation Project

PropertyPro

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First and foremost, we express our sincere thanks and heartfelt gratitude to God. Without His blessings that guided us every step of the way, we would not have achieved successful completion of this project. We extend our heartfelt gratitude to our dear parents and beloved families. Thank you for the unwavering support that has consistently uplifted our spirits. Your kind and encouraging words have been a solid foundation upon which we have leaned and drawn strength from. Lastly, we would like to express our heartfelt appreciation to all those who have contributed in any way and provided invaluable assistance. Your support means a great deal to us.

ABSTRACT

"PropertyPro" is a user-friendly mobile application designed to simplify the process of finding the right place to live. It offers a wide range of features to cater to various housing needs, making it a valuable tool for users seeking their ideal living arrangements, whether it's for a short-term stay, a long-term rental, or purchasing a property.

The user can act as a property owner or buyer at the same time, if the user wants to offer his property he needs to add a description for it, also he can add pictures and videos to describe his property.

The application has a search and filtering system. This allows the user to refine his property searches based on specific criteria, such as location, budget, and property type.

In addition, "PropertyPro" integrates Google Maps, allowing users to visualize and explore properties in their region or anywhere they need, enhancing their property search experience.

One of its standout features is "RoomieMatch," a unique tool that helps students and potential roommates find each other based on shared academic backgrounds, interests, and preferences.

Moreover, the app ensures a smooth reservation process by providing availability information for rental properties. This feature helps you stay updated on property availability.

Furthermore, there is a notification feature, and Chating system.

Also, there is a web dashboard for the admin, he can see and manage all the users and properties in the application, also he can see statistics about revenues he got from the properties added.

There is a web site also for users who want to see the properties and reserve chalets.

In summary, "PropertyPro" is a user-friendly and comprehensive mobile application that simplifies property transactions and enriches the housing search experience. Whether you're a student or anyone in need of housing, this app offers a range of helpful features to assist you in finding the perfect place to live, whether it's for a short-term stay, a long-term rental, or property purchase.

DISCLAIMER

“Mohammad Haitham” Hinnawi and Qotayba Darawshi collaborated on the completion of this paper. The authors acknowledge full responsibility for any errors identified within. The ideas, suggestions, findings, and opinions expressed in this paper solely belong to the authors and do not reflect the viewpoint of An-Najah National University.

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CHAPTER 1

INTRODUCTION

1.1 Statement of the problem

Finding a place to live is currently complicated and time-consuming. Existing platforms lack a comprehensive solution for both property owners and those seeking accommodations. Users face challenges in efficient property searches, uncertainties in reservations, and a lack of effective tools for property management. "PropertyPro" aims to address these issues, providing a user-friendly platform that streamlines property searches, improves reservation processes, and offers efficient management tools for property owners.

1.2 Objective

The objective of our project is to simplify and enhance the process of finding, reserving, and managing various types of properties, with a specific focus on chalets. The app aims to provide a user-friendly platform for both property owners and seekers, addressing current challenges in property searches, reservation uncertainties, and management inefficiencies. By offering a comprehensive solution, "PropertyPro" seeks to streamline the entire property transaction experience, making it more convenient, transparent, and efficient for all users involved in the process.

1.3 Importance of work

PropertyPro is important because it makes finding and managing places to live way easier. The app is easy to use, whether you're looking for a short stay, a long rental, or buying a property. For property owners, can offer their properties in easy way, all what they need to do is add information about the property and pay for app admin for the service. There's a cool "RoomieMatch" tool for students or people looking for roommates. Plus, Google Maps is built-in for checking out locations, and you can chat directly with property owner. The web version is there too for those who prefer browsing.

1.4 Organization of the report

The first chapter is the introduction, where the definition of the problem and the objectives of the project, The second chapter is the Constraints, and Earlier coursework. This chapter shows the project's constraints and it shows how earlier coursework has been used in doing the project well. After that, we have the Literature Review chapter. The next chapter is the Methodology. This chapter explains the hardware components used in the project, the structure of the system, the mechanism, and the admin web page. Then we have the Results and Discussion chapter which contains the final results of the project, and discussion of them. The final chapter is the Conclusion of the project, what we learnt, and future work that can be done to the project.

CHAPTER 2

CONSTRAINTS, STANDARDS AND EARLIER COURSEWORK

2.1 Constraints

We faced some obstacles during the project, like learning programming libraries and technologies from scratch which include Flutter, NodeJs. We faced a problem in organizing the time to work because of the bad conditions we are going through in Palestine especially Gaza.

2.2 Standards

MVC (Model View Controller)

The Model-View-Controller (MVC) pattern was employed in our system. We split the entire project into three parts, making it easier to track the flow of work. These components areas follows:

- The Model: It represents the database we used, MySQL.
- The View: It represents the graphical user interface (GUI) that will be used by users
- The Controller: It represents the back-end server built with Node.js for the application and website.

2.3 Earlier coursework

During our Computer Engineering studies, we enrolled in several courses that provided us with valuable knowledge and skills. These courses included Web Programming, Object-Oriented Programming, and the Advanced Database course, which served as a foundation for learning front- end and back-end development and working with real databases. Additionally, the Software Engineering and Advanced Software courses were instrumental in helping us adhere to soft- ware engineering standards while writing our code. The knowledge gained from these courses greatly contributed to our project and accelerated the programming process, allowing us to rely on our existing knowledge rather than constantly referring to external resources. Furthermore, at the beginning of the semester, we independently learned Flutter, Dart, Node.js which further expanded our expertise in software development.

CHAPTER 3

LITERATURE REVIEW

Property Pro stands out as a fantastic tool for anyone navigating the world of property management. Its homepage, acting like a friendly map, effortlessly guides users through a variety of listings for sale, rent, or student rentals. With an intuitive filtering system, users can easily tailor their searches, ensuring a personalized and efficient exploration of available properties.

One of the standout features is the simple and streamlined process of adding a property. With just a click, users can effortlessly contribute to the platform. But what makes Property Pro truly exceptional is the recent addition of the Roommate Match feature. Specifically designed for students on the lookout for compatible living arrangements, this feature allows users to answer a few questions, specify their desired city, and receive personalized suggestions for potential roommates based on shared interests.

Beyond these features, Property Pro excels in user-friendliness. The property details page provides a comprehensive understanding of a property, complete with photos and videos. The platform's responsive design ensures a consistent and enjoyable experience across different devices.

Now, with the integration of Stripe for secure payments, Property Pro takes reliability to the next level. Users can confidently add properties, knowing that transactions are handled through a secure and trusted payment gateway.

Property Pro is not just a property management platform; it's a friendly guide that simplifies the property exploration and roommate matching experience. With its easy-to-use features and recent enhancements, Property Pro has become the go-to companion for anyone on the journey to find their ideal home.

CHAPTER 4

METHODOLOGY

4.1 Non-Functional Requirements

Screen Adaption:

This program has the capability to dynamically adjust its interface to fit various screen size

Authentication and Authorization:

We secured our application and API using JSON Web Tokens (JWT) for robust authentication and authorization.

User-Friendly:

Our app is made to be easy to use. Every page has simple icons and links that make it easy to move around and go back to the last page. This setup ensures a smooth and straightforward experience for use

4.2 Database

Our project utilizes a MySQL database, leveraging its relational model to efficiently organize and manage data. The relational model of MySQL provides several advantages, including structured data relationships, data integrity, and ease of querying. To enhance functionality, we employed MySQL features such as triggers. These features contribute to data consistency, automation of actions, and overall optimization within our database implementation.

4.3 Backend

The project relies on Node.js with the Express framework for the backend, providing a robust and scalable foundation for server-side development. We chose the Express framework to streamline backend development, leveraging its minimalistic yet powerful features for routing, middleware management, and overall server configuration.

4.4 Frontend

Our frontend development is accomplished using the Flutter framework and Dart programming language. Flutter allows for a unified codebase, enabling consistent user experiences across web and mobile platforms. Dart's modern syntax and Flutter's widget-based approach contribute to efficient and maintainable UI development

4.5 Design

4.5.1 Login and Registration

In our system, the registration process is designed to ensure the validity of user-provided email addresses. During registration, users are required to input a valid and active email address. This serves as a critical step in maintaining the integrity of user data and ensuring effective communication. Upon successful submission of the registration form, an email verification message is automatically sent to the provided email address. This email contains a unique verification code the user is required to put that code in the app confirm the authenticity of their email and activate their account.

Password recovery: In the event of forgetting a password after registration, our system provides a robust password recovery mechanism. Users can initiate the password recovery process by clicking on the "Forgot Password" link on the login page. Subsequently, a verification code is sent to the email address associated with their account.

Upon receiving the verification code, users can enter it in the application to confirm their identity. Once the code is successfully validated, users are granted access to reset their password. This two-step verification process adds an extra layer of security to the password recovery procedure, ensuring that only authorized users can regain access to their accounts.

4.5.2 Interactive Home Page with Google Maps Integration and User-Friendly Filtering

The homepage of our application offers a dynamic and user-friendly experience with an integrated Google Map display showcasing houses available for sale, rent, or student rental. Each property is marked on the map, allowing users to visually explore listings. A sophisticated filtering system enhances the search process, enabling users to refine their searches based on specific criteria such as property type, location, and price range. Clicking on a property marker reveals detailed information, including pricing, features, and contact details, all within the map interface. Users can seamlessly switch between list and map views, offering versatile options for a comprehensive exploration of available properties.

For users interested in more details about a specific property, a simple click on the property marker leads to an individual property details page. This page provides a comprehensive view, offering an array of photos and videos showcasing the property. Users can delve into detailed information such as property specifications, amenities, and any additional features. This approach ensures that users can make informed decisions by having a complete understanding of the property without navigating away from the intuitive map interface. The responsive design further optimizes this experience for users across various devices, providing a seamless journey from initial exploration to in-depth property analysis.

4.5.3 Property Management

Our platform simplifies the process of adding properties, allowing users to enrich our comprehensive listings effortlessly. Clicking the "Add" button starts a user-friendly process where you choose the property type—rental, for sale, or room for rent. For those adding apartments, you can provide specific details about each room, such as dimensions and amenities.

The form guides you through essential property information like the address, overall dimensions, and shared amenities within the apartment. To ensure the seriousness of property contributions and support ongoing platform development, a secure payment through Stripe is prompted for each property addition.

This careful approach ensures the platform receives quality listings from users. After the payment is processed.

4.5.4 Chatting System

Our application boasts a real-time chat system designed for individual users, leveraging socket technology to facilitate instant message delivery. This streamlined communication experience empowers users to engage in swift and responsive conversations with one another.

4.5.5 Chalet Reservation

Our application simplifies chalet reservations with a user-friendly process. Users can easily book a chalet by selecting available dates from the provided calendar. After booking, a convenient list tile displays essential information, including the start and end dates, along with the status of the booking request.

Upon submission, the chalet owner receives the booking request and can promptly review it. The owner has the option to accept or reject the request, ensuring a transparent and efficient reservation process. This two-way communication streamlines coordination between users and chalet owners, providing a seamless and responsive experience for both parties involved in the reservation process.

4.5.6 Feature for User Favorites

Our application includes a convenient "Favorites" feature that allows users to mark properties as their favorites for easy access. Users can mark any property they're interested in, creating a personalized list of preferred options. This feature simplifies the property selection process, allowing users to revisit and compare their favorite listings in one central location.

4.5.7 Notification

Our application notifies users when there's a new rating or review on their property and instantly informs property owners of chalet bookings. For users looking to book, notifications provide real-time updates on the status of their booking request, whether accepted or rejected by the chalet owner, ensuring transparent and efficient communication. The customizable notification preferences offer users the flexibility to stay informed according to their specific needs, enhancing overall user experience.

4.5.8 Rating and Reviews

Our application features a robust rate and review system, allowing users to provide valuable feedback on properties. Users can easily add ratings and reviews to share their experiences, enhancing transparency for others seeking information about a specific property. The rating system enables users to express their satisfaction levels, while detailed reviews provide insights into the unique aspects of each property.

4.5.9 Roommate Match

This feature, designed especially for students seeking ideal roommates. This unique functionality transforms the roommate search process into a personalized experience. Users answer a set of questions that help us understand their preferences, lifestyle, and habits. Once completed, users specify their desired city for room hunting.

Based on this information, our platform suggests a curated list of users who are also in search of roommates within the same city. The matching algorithm goes beyond basic criteria, employing cosine similarity to determine compatibility. This advanced approach ensures that users are connected with potential roommates who share similar interests and preferences, fostering a more harmonious living arrangement.

The "Roommate Match" feature not only simplifies the search for suitable roommates but also enhances the overall experience of finding accommodation. By leveraging cutting-edge technology and personalized insights, we aim to make the process of selecting roommates as seamless and enjoyable as possible for our users.

4.5.10 Payment

Our application seamlessly integrates with Stripe, a leading and secure payment gateway. As part of the property listing process, users are required to make a payment of \$20 for each property added. Through this integration, users can confidently enter their card details directly into the Stripe interface, ensuring a secure and trustworthy payment experience. Leveraging Stripe's API, our system ensures a seamless and efficient payment process, enhancing the overall reliability and convenience for users engaging in property transactions within the app.

4.5.11 Admin Dashboard

Our Admin Dashboard on Property Pro is a versatile tool designed to provide administrators with a holistic view of the platform's performance and effective control over key aspects.

Financial Insights

The dashboard features a user-friendly chart offering a clear overview of the annual profit generated from property transactions. Sourced securely through our Stripe connection, this data enables administrators to make informed decisions about the platform's financial health.

Management Control

Going beyond financial insights, administrators can exercise control over user management and property listings. The Admin Dashboard empowers administrators to delete user profiles, ensuring streamlined control over the user base. Additionally, administrators can efficiently manage property listings by seamlessly deleting properties, contributing to the maintenance of a curated and relevant inventory.

In summary, the Admin Dashboard serves as both a window into financial insights and a powerful control center, providing administrators with the tools they need to make informed decisions and ensure the integrity and quality of Property Pro.

CHAPTER 5

RESULTS AND USER INTERFACE

5.1 Login And Sign up User interface

5.1.1 Login page

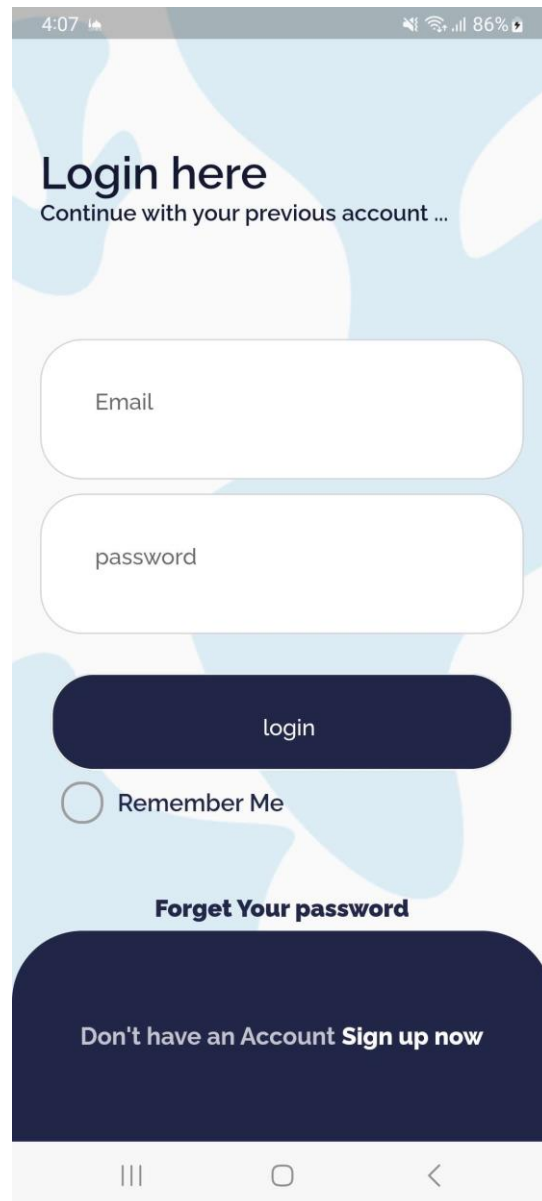


Figure 1: Login Page

5.1.2 Sign up

The user needs to enter a valid email and verify it to create account with this email

The image displays three sequential mobile app screens for a sign-up process. The first screen, titled "Sign Up here" with the subtitle "Create a new account ...", features input fields for "First name", "Last name", and "Phone Number", along with radio buttons for "Male" and "Female". The second screen, titled "Sign Up here" with the subtitle "Welcom I", includes fields for "Email" and "password", and navigation arrows. The third screen, also titled "Sign Up here" with the subtitle "Welcom I", prompts the user to "Enter the code sent to your email." with six input boxes, a "RESEND" link, and a "Verify" button. Each screen has a dark blue footer with the text "Already have an account Login" and a mobile navigation bar at the bottom.

Figure 2: Signup Page

5.1.3 Forget Password

When user wants to reset his password, he will get a verification code on his email, he need to enter it correctly to reset his password

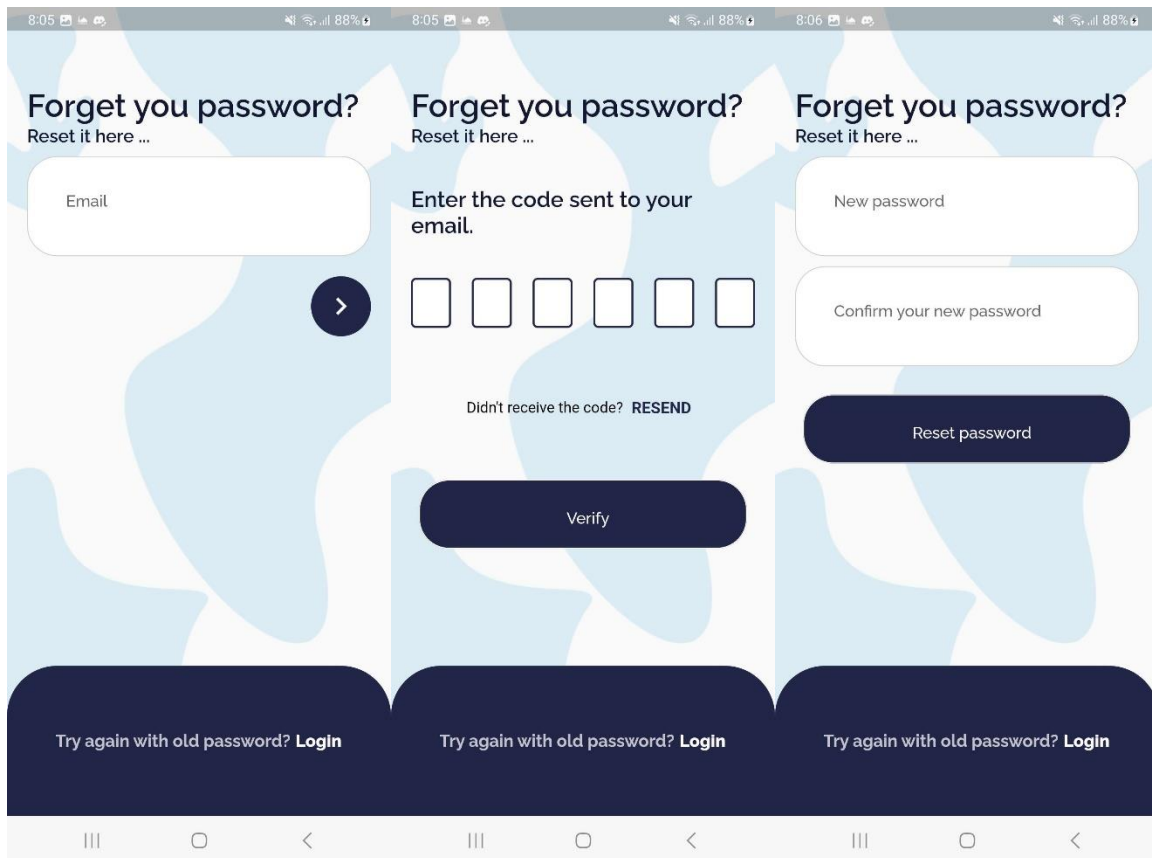


Figure 3: Forget Password

5.1.4 Home page

Home page the user can switch between two views map and list

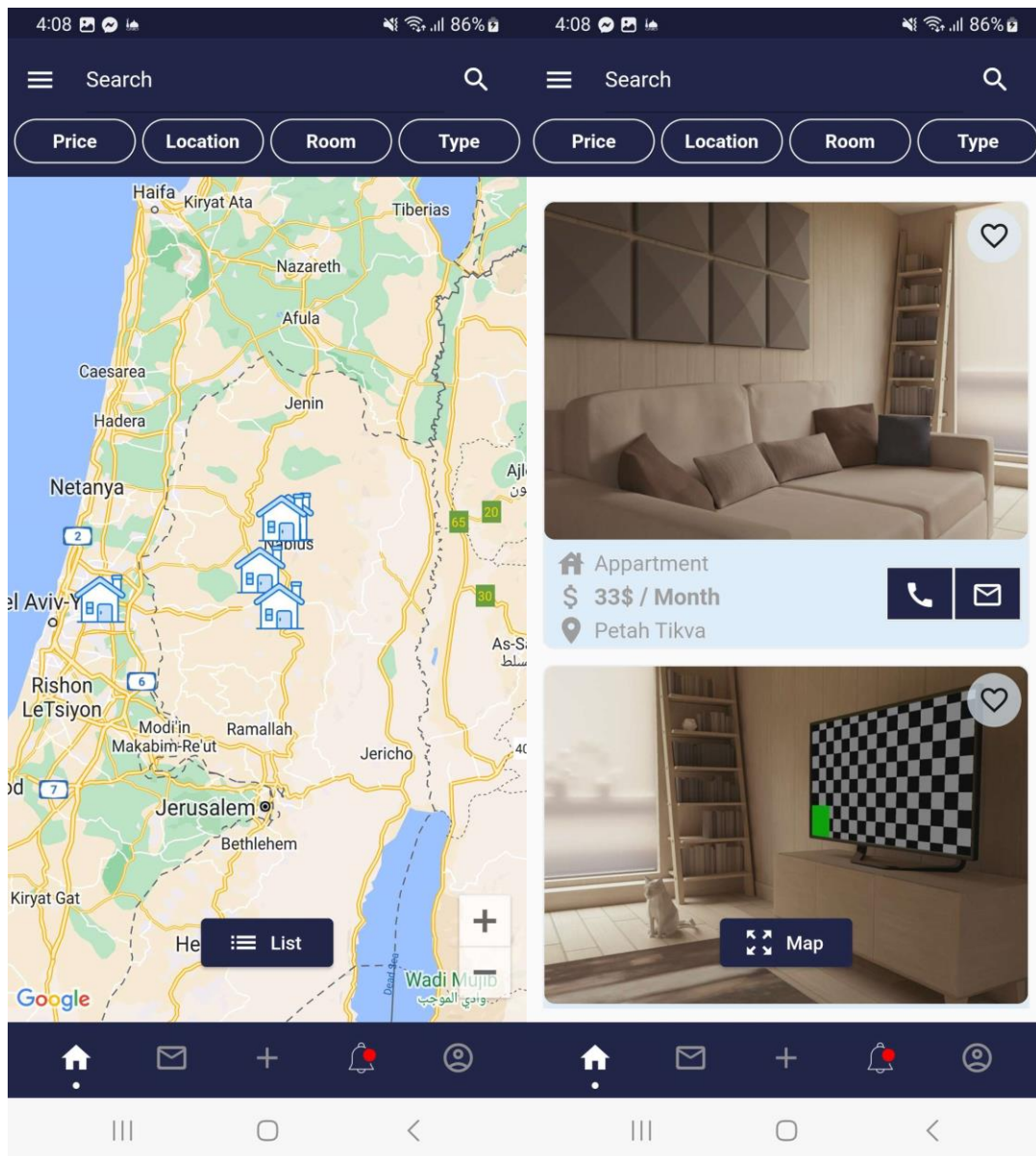


Figure 4: Home Page

When user click on the marker, this Card will appear, it contain a brief information about the property, if the user click on the card, it will move him to the property page which provide a specific information about the property

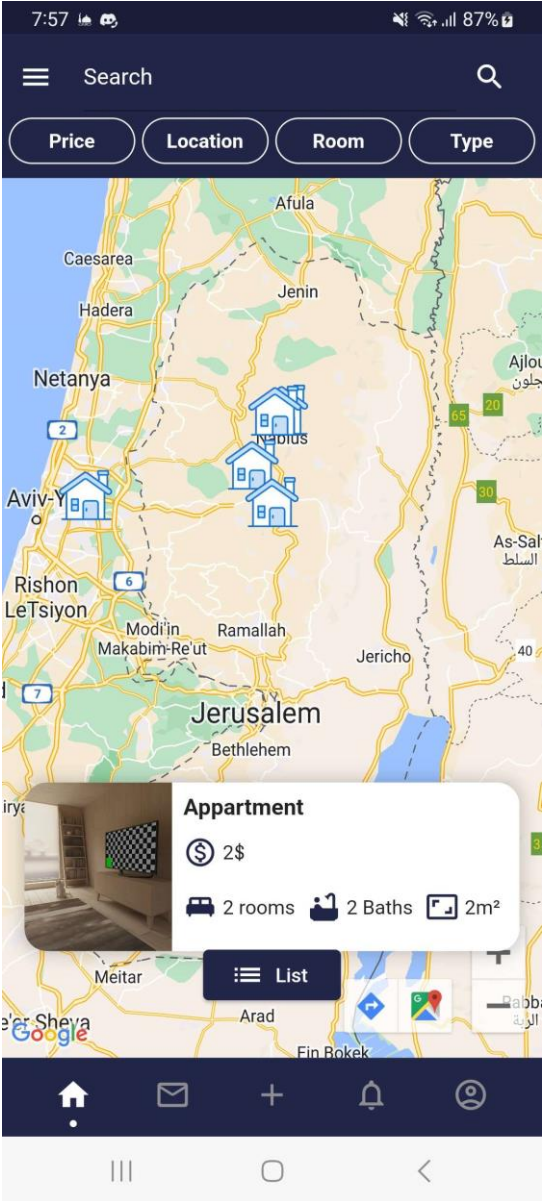


Figure 5: Map Marker Clicked

5.1.5 Filtering

There is 4 types of filter, the user can filter properties on price, location, bedrooms number and property type

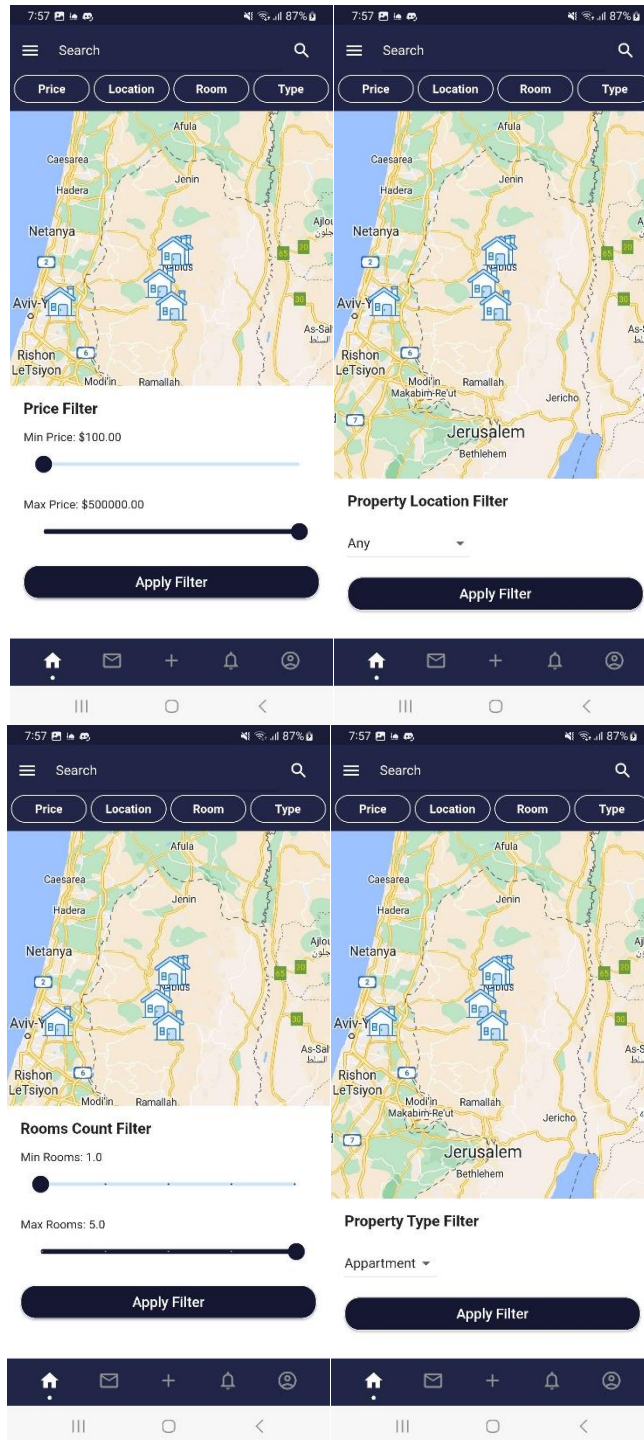


Figure 6: Filtering

5.1.6 Profile Page

On this page, the user can see his information, and there is buttons to show his favorite properties and his own properties

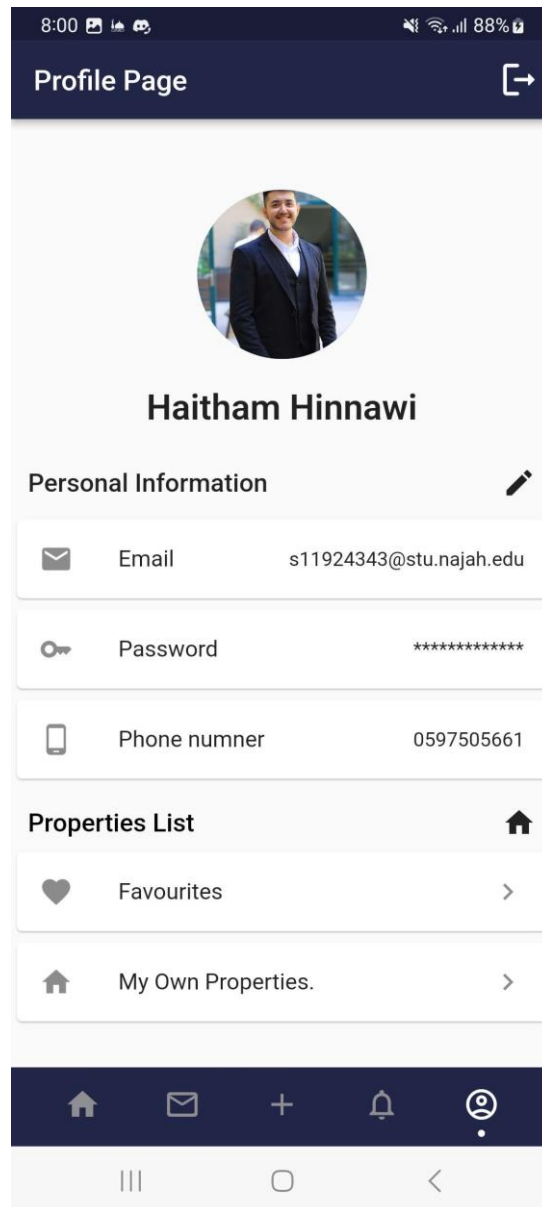


Figure 7: Profile Page

5.1.7 Favorites and Own Properties

In this pages the user can see his own properties and the properties he marked as favorite

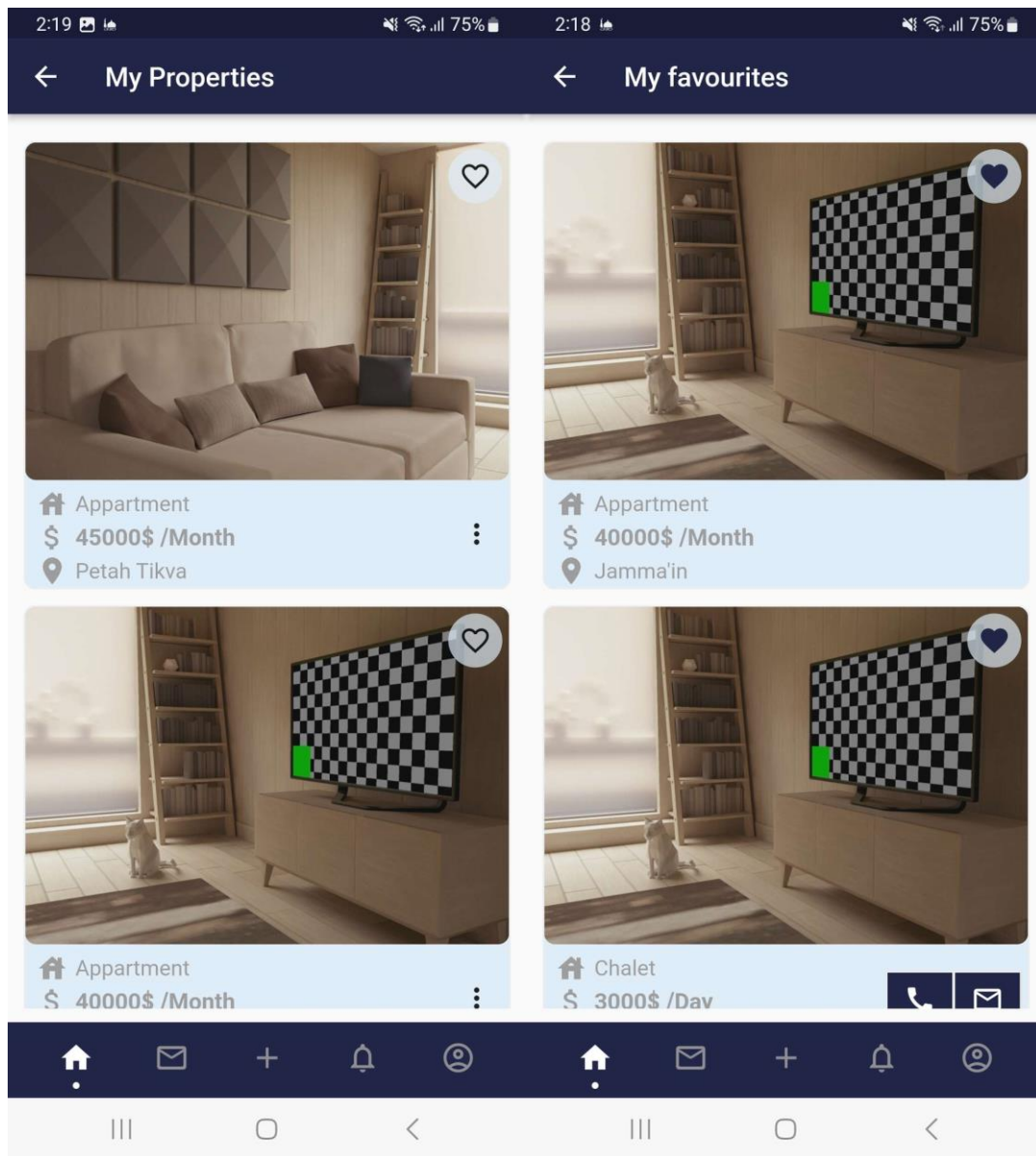


Figure 8: Favorites and Own Properties

5.1.8 Add Property

When the user want to add a property, first step he need to choose how he want to offer it

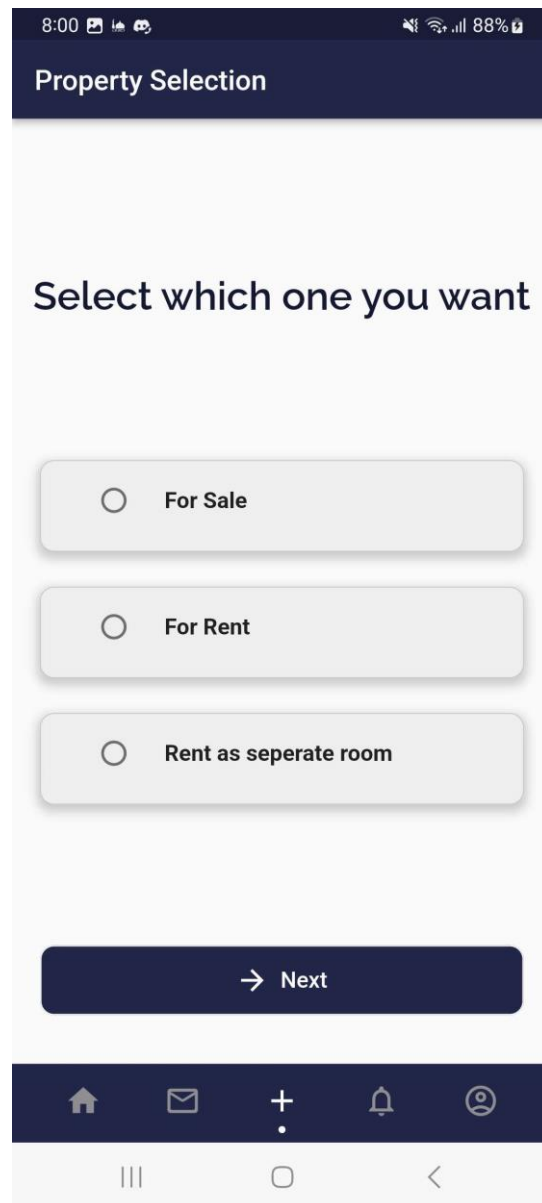


Figure 9: Select property offer type

Then he need to add information about his property, he can add images and video also, and after adding the information, he need to pay amount of money for the app admin

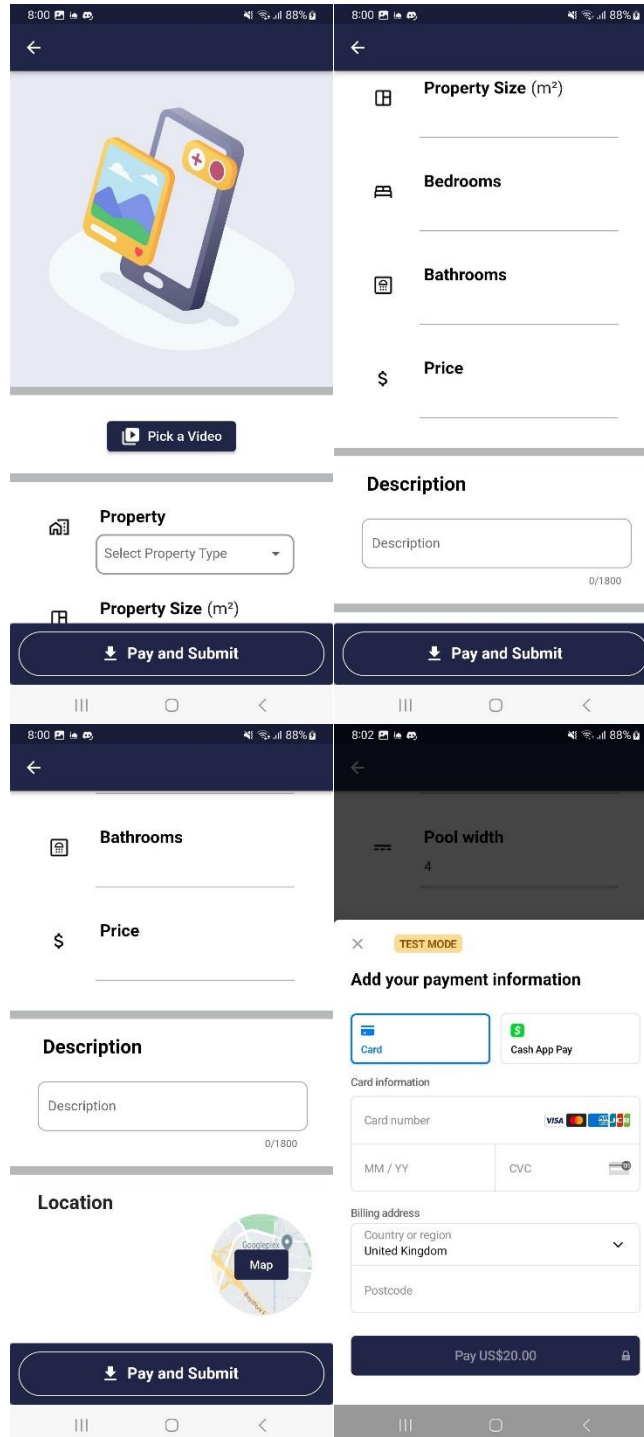


Figure 10: Add Property Info and Payment

5.1.9 Property Page

This page shows the details and information about the property, including images and video if the owner add them

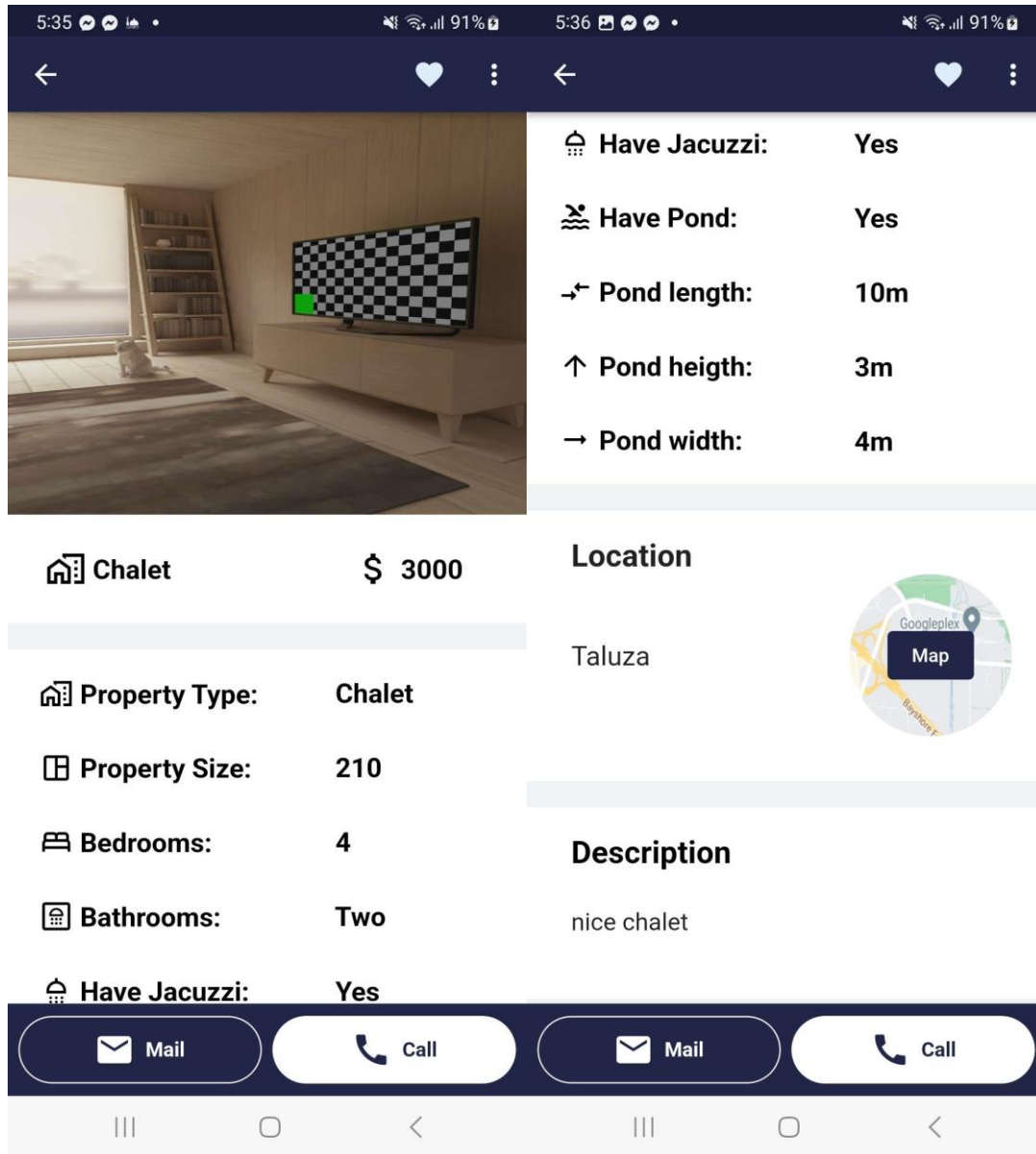


Figure 11: Property Page part1

Also in this page the user can rate the property and give the owner a feedback review
Here is the complete of property page and the reviews page for the property

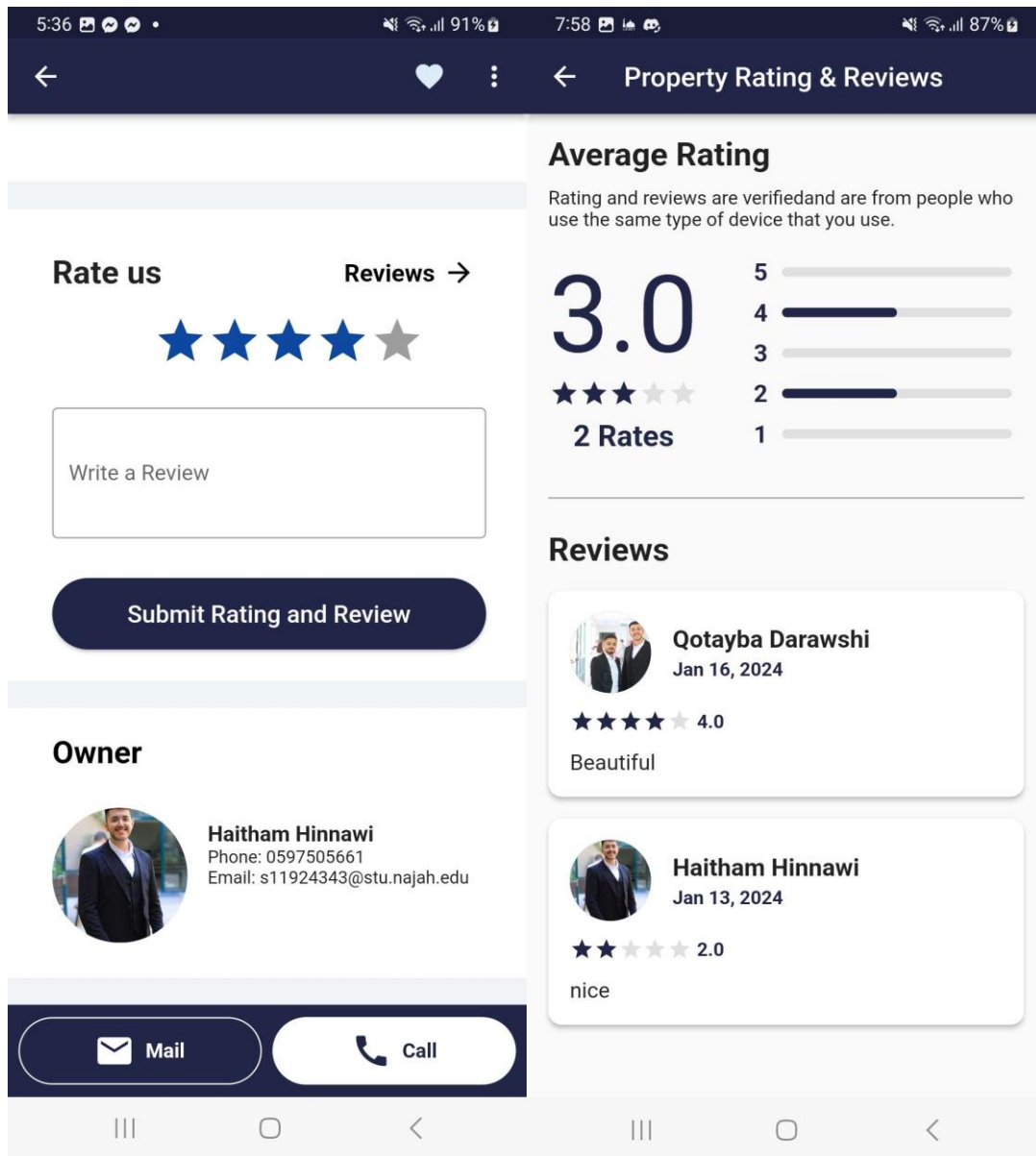


Figure 12: Property Page part2 and Reviews page

5.1.10 Chalet Booking

The user can book a chalet, he need to choose start date and end date from the calendar shown to him, and all the request he made will appear to him under the calendar with their status

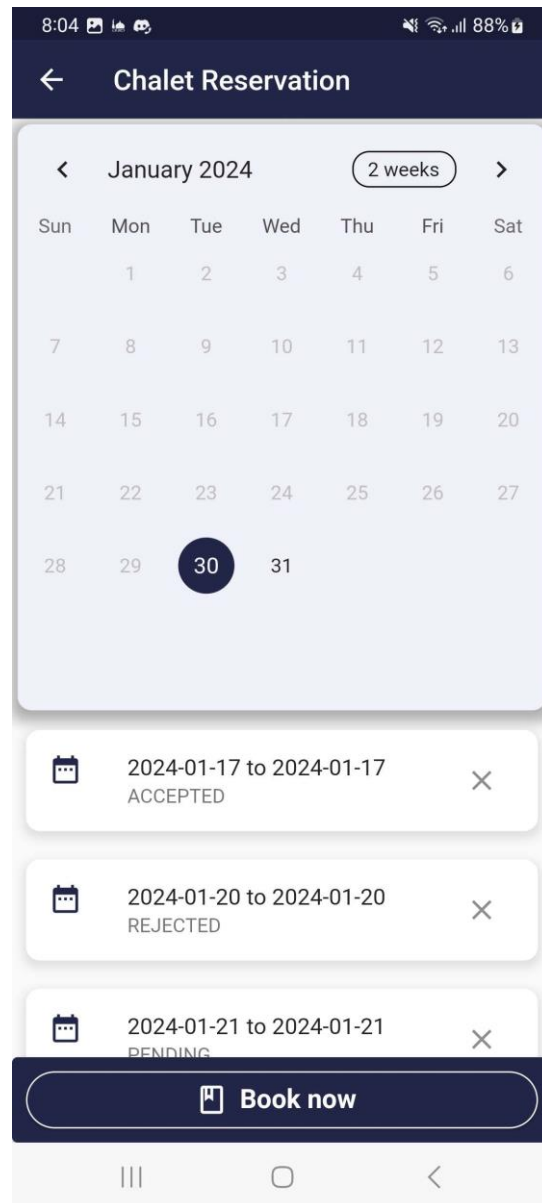


Figure 13: Chalet Booking

And from chalet owner side it appears like this, he can see all requests came to him and also he can see the request details and make action on it, he can accept or reject it as shown

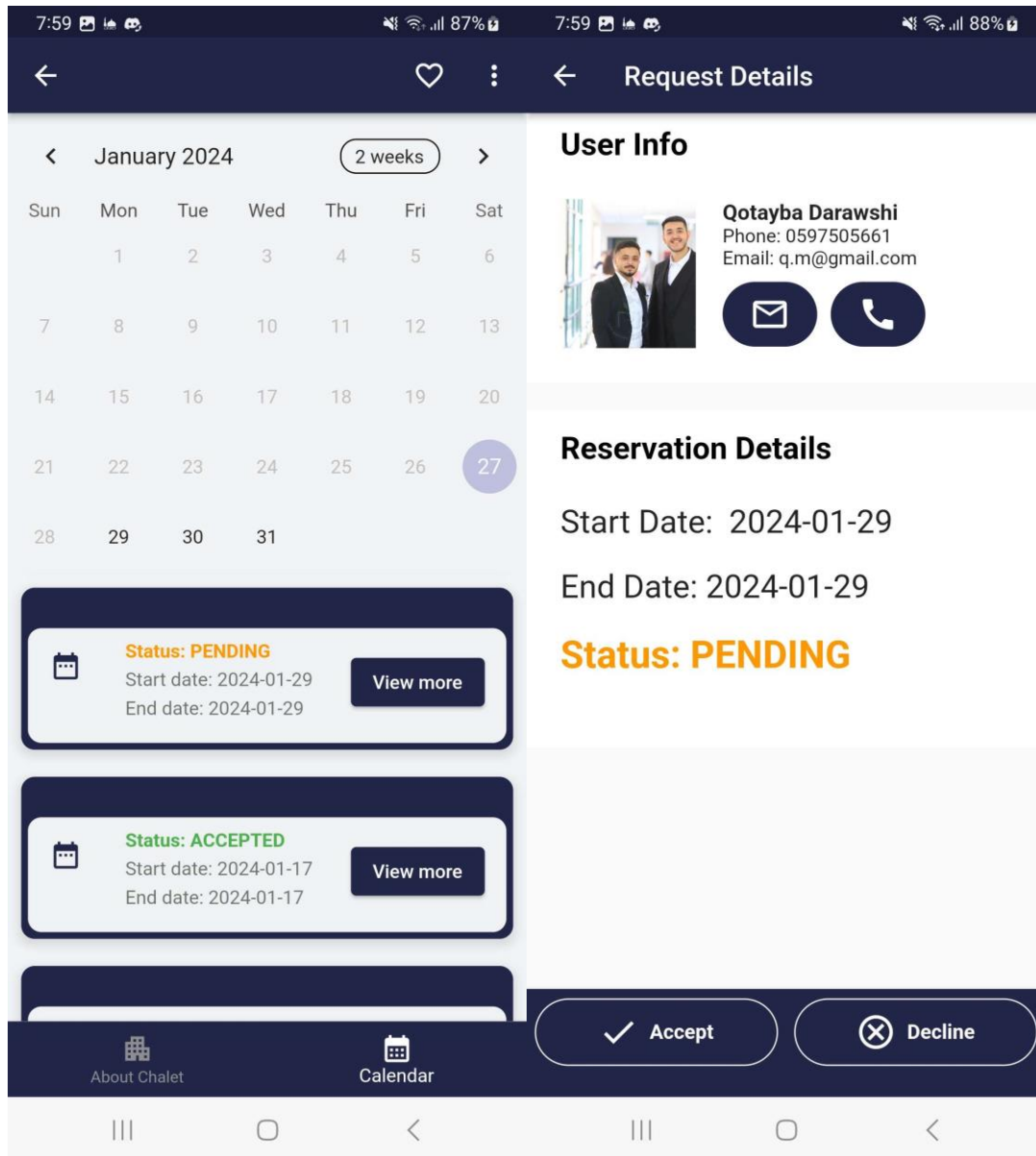


Figure 14: Chalet owner requests and Request Details

5.1.11 Notification

When user request to book a chalet, a notification send to chalet owner that this user request to book your chalet, also if the owner accept or reject the request, a notification sends to the accepted user that the request is accepted and all overlapping requests will receive a reject notification

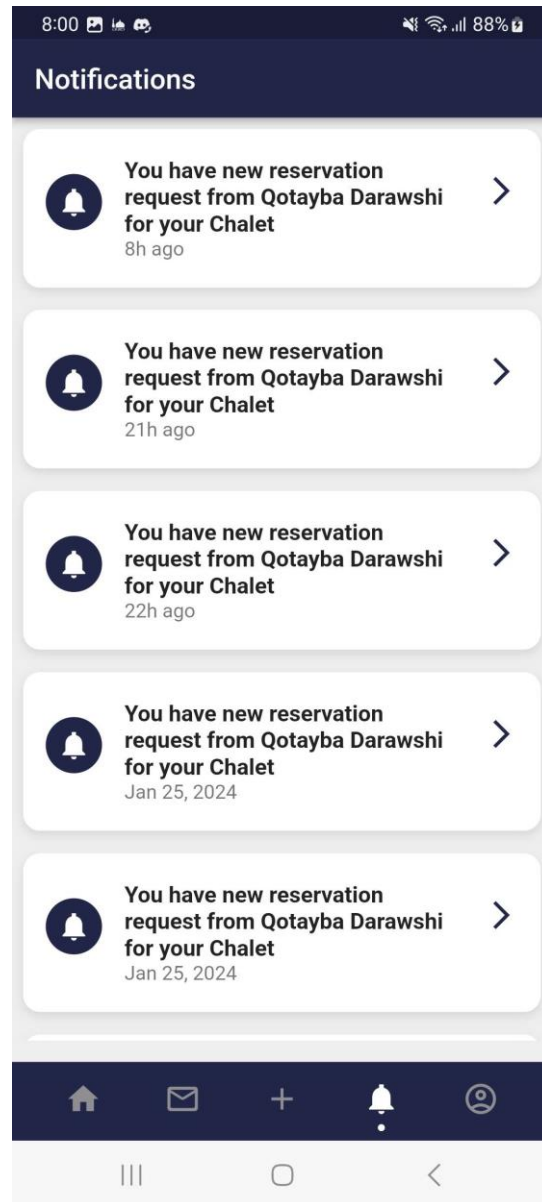


Figure 15: Notifications

5.1.12 Chatting

The user can contact any property owner in the chatting system as shown

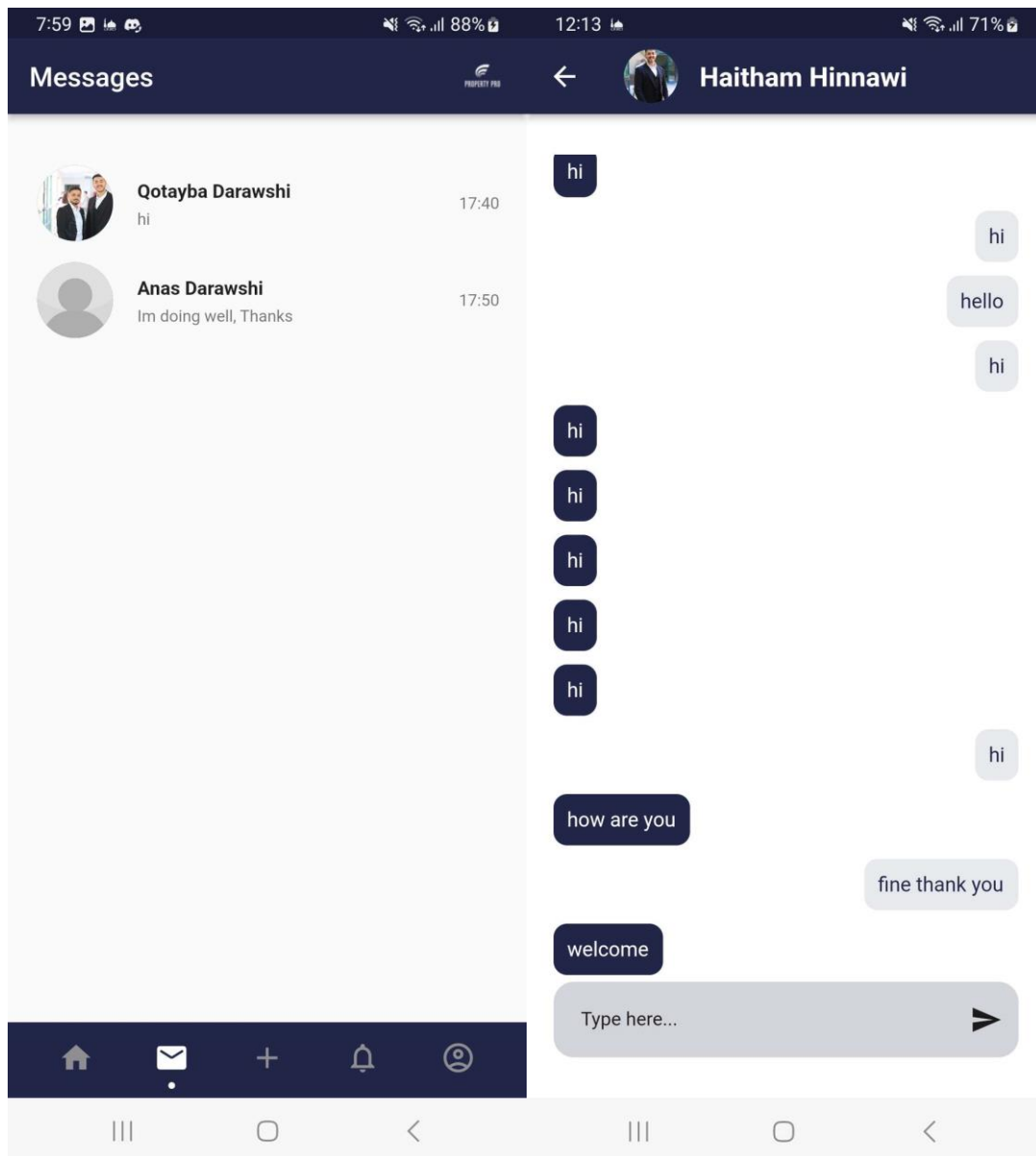


Figure 16: Chatting

5.1.13 Drawer

The drawer contains info about the user, and a shortcuts for some pages like favorites and own properties, also there is a roommate match

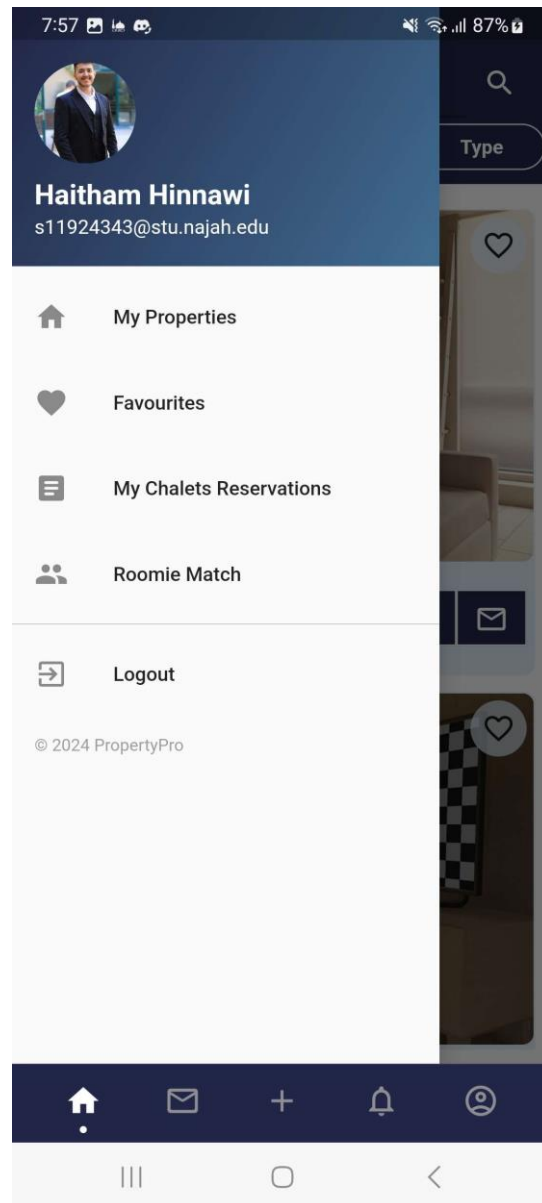


Figure 17: Drawer

5.1.14 Roommate Match

This help users looking for rental rooms to find a compatible roommate, he needs to answer some questions and choose the city he want to find a room and the he will get the best match users, every user with match percentage in as shown

1:03 76%

← Choose your intrests ← Similer room m... edit

City preferd

Nabulus

Are you smoking?

Yes

No

Does not matter

Are you sleeping early?

Yes

No

Does not matter

Do you like watching TV?

Yes

No

Submit

Profile	Match Percentage
Haitham Hinnawi Tab to chat	33%
Haitham Hinnawi Tab to chat	27%
Anas Darawshi Tab to chat	24%

Figure 18: Roommate Match

CHAPTER 6

Discussion and Conclusion

7.1 Discussion and Future Work

Exploring the positive impact of implemented features, the application showcases significant enhancements that collectively contribute to an enriched user experience. Key elements such as real-time chat, notifications, and property favorites play a pivotal role in elevating the platform. The streamlined chalet reservation system fosters transparent communication, enhancing efficiency in the booking process. Integration with Stripe ensures secure transactions, adding a payment element for each property listing. The dynamic Google Map display and versatile property exploration options on the homepage augment user flexibility. The rate and review system continue to be instrumental in promoting transparency and trust. The strategic decision to charge for each property added introduces a judicious monetization element. These implemented features establish a solid foundation for future development opportunities, ensuring the sustained success and relevance of the application in the market.

7.2 Conclusion

In conclusion, the collective impact of the implemented features in our application significantly enhances the overall user experience. Real-time chat, notifications, and property favorites play crucial roles in elevating the platform, fostering an enriched user interaction. The streamlined chalet reservation system enhances communication transparency, streamlining the booking process for increased efficiency. Integration with Stripe ensures secure transactions, incorporating a payment element for each property listing. The dynamic Google Map display and versatile property exploration options on the homepage contribute to heightened user flexibility. The ongoing effectiveness of the rate and review system in promoting transparency and trust is evident. The strategic decision to charge for each property added introduces a judicious monetization element, providing sustainability for future development opportunities. These implemented features collectively fortify a robust foundation, ensuring the continued success and relevance of the application in the market land.