ONLINE REAL ESTATE WEB APPLICATION IN KURDISTAN, IRAQ

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ONLINE REAL ESTATE APPLICATION IN KURDISTAN, IRAQ

ARYA BURHAN MOHAMMED

A thesis submitted in fulfilment of the
requirements for the award of the degree of
Bachelor of Computer Science (Software Engineering)

School of Computing
Faculty of Engineering
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DEDICATION

This thesis is dedicated to my dearest mother, who stays by me when things seem hopeless and taught me that the best sort of knowledge and the opportunity to study my degree.

ACKNOWLEDGEMENT

I'd want to express my gratitude to Dr. Mohammed Shihab, my project supervisor, for his support, direction, and willingness to share his knowledge with me throughout the creation of this project. This thesis would not have been the same if it hadn't been for his continual attention and encouragement. I'd also like to offer my heartfelt gratitude to my family for their unwavering support throughout my life, particularly during my university life.

I have the opportunity to finish this thesis because of their unwavering love and prayers. My dearest sister, especially my parents, who stood by me when things went bad and taught me that the best kind of knowledge to have, are the ones gained through experience.

ABSTRACT

The Online Real Estate is a website platform that assists real estate agents and sellers to boost their property sales and reduce the work load and time consumed when trying to sell a property, also it is for people who also buy properties so they can buy properties in a more efficient and less time-consuming way from their homes. The system will assist users to move into the digital world of e-commerce and show the advantages of using online website to buy and sell properties which can be very helpful because of the ease availability and use. The online real estate website will not require any technical past experiences from users because of the user-friendly interface and the features made to help the customers.

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LIST OF ABBREVIATIONS

ERD	-	Entity Relation Diagram
HTML	-	Hyper Text Markup Language
SDLC	-	Software Development Life Cycle
SDD	-	Software Design Documentation
SRS	-	Software Requirement Specification

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In 1981, 22% of home buyers looked in newspaper adverts to find a property, while 8% used friends as information to get updates on the real estate market. In 2018, 44% of people started their search for a home on the internet (Nichols J, 2017). The word we live in today is increasing digitally, and finding a home is no exception. The Online Real Estate website that allows buyers to search by area and community are now available. There are several commercial real estate online web platforms that offer a variety of real estate properties and services customized to the local demands of the market. Thousands of commercial properties can be found on those websites and platforms. Home properties are available for sale in different categories. Urban, industrial, home town, land, and other properties are available to buy. The goal this such websites are to make a community full of investors, property managers, and other real estate agents or professionals. Selecting homes with required features for landlords, appraisers, local and national buyers.

In 2016, the average home buyer used a mobile device, either their cell phone or a tablet to search for properties online, the home buyer looked at websites that had professional photos, featured home listings, and information about today's home buying process (Nichols J, 2017). This website platform will be made to have a website with a user-friendly interface and new features using the new technologies in this demand for a platform that could help sellers and buyers to view available properties listed for sale with every information and images and description of the property. HomeSale Web Application is a php-based website with the most up-to-date JS controls, providing the web pages a beautiful and interactive appearance.

Searching for homes is something that almost every buyer does on their mobile device (Nichols J, 2017). The interactive search is a standard feature on these websites and it is the most important element, it allows the buyer user to choose their requirements in order to find the preferred or wanted set of results from the database. The searching algorithm must be powerful enough to incorporate all of the features that a buyer user would want and expect.

1.2 Problem Background

"The more you know about your customers, the more you can provide them with information that is increasingly useful" (Jay Baer, 2017). This is why we want to find the current issues with Online real estate platforms which users face.

Currently there are many real estate websites available internationally but in the Kurdistan region of Iraq there are limited number of these platforms available thus people are only using other methods in buying and selling their homes, only a small percentage of sellers and buyers are using such platforms. The reason why people are still using old ways for real estate business is the lack of availability of real estate websites and the current platforms are old styled designed and not user friendly to use, and there are many other issues with them such as lack of information on these websites which makes them not a reliable source to buy properties from, another issue is users can not advertise their property promoted means they cannot have much users to view and check their properties for sale.

1.3 Project Aim

The stake holders for this system can be real estate agencies or any investor who wants to have their own online platform. "The real estate market works as a mediator between property owners and property buyers. Home owners can list their properties on the website, set a price and wait for buyers to view their listing, buyers also have the ability to search and check property photos and descriptions" (Nikolaieva A).

The aim of this project is to develop an online real estate platform that meets the user needs based on the problems we have now in the Kurdistan region of Iraq, and make people and my community move towards easier and much more efficient ways of buying and selling properties.

1.4 Project Objectives

The objective of online real estate platform is to provide easy access for people who are willing to buy new homes or people who want to sell their homes.

1. To elect requirements of current Real Estate platforms in Kurdistan and implement an online real estate website in Kurdistan region of Iraq.
2. To design Online Real Estate application for users to have easier access to the platform in order to buy or sell properties in the Kurdistan region of Iraq.
3. To test the Online Real Estate solution based on comparing to current existing systems.

1.5 Project Scope

1. This project scope with focus on the Kurdistan region of Iraq.
2. The platform system will maintain user uploads and data records.
3. Users for this system will include real estate agents and other users that provide properties for sale.
4. This website platform will allow users to browse through properties listed for sale from many real estate agents and other users.
5. This project satisfies the user requirements.

1.6 Project Importance

The importance of this project is to improve the way of selling and buying properties in Kurdistan region of Iraq. The system will help users to easily browse

through the website and view the listing made by other users and also, they can list their properties for sale for free. Through this platform users will save a lot of time because of the ease of use and also because they don’t have to visit a real estate agent in person in order to buy or sale a property. Users will be able to view detailed and verified information about the home or property they choose and also view pictures, contact details and more details. Overall, this system will help and serve my community in many ways.

1.7 Report Organization

In this chapter (Chapter one) the system will be introduced, the first chapter will discuss about the projects introduction, the project's goal and the objective. In the second chapter, the process goes deeper into the websites history, present processes, and systems. presently in use in this chapter and in the second chapter the system will be compared with an existing system platform. In the third chapter the methodology and justification will be discussed.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In the chapter, the Online real estate sale & buy system named HomeSale is talked about to have an overview of the whole system. This chapter also lets us choose key factors for the needed functions in the system progress. Also, we will research the related websites and compare them to my website systems to the HomeSale website which has similar process. The search and comparison have been done to modify these processes in order to fix the issues that have we mentioned in chapter one with better technologies and features to make the project. The system is important for the community and sellers as “investors should be prepared for the ways online property listing platforms, smartphone apps” (Esajian, P). “A growing disconnect between homeowners and real estate agents is among the biggest changes happening in real estate investing.” (Esajian, P). Online real estate system is a fast-developing trend among home buyers and sellers in the community as “Real estate housing markets are expected to shift as a new wave of homebuyers hits the market” (Esajian, P). Many people suggest others to use online platform for advertising a home or buying a home since it benefits the community.

2.2 Reviewing Similar Systems

There are three similar system that are currency being discussed, and there are different featured for these two systems and platforms. In this section we will get the background information about these systems and based on these information’s we will compare and develop an Online real estate system with similar systems.

2.2.1 Trulia

Trulia is a website where you can buy or sell your home based on your specifications and the website will show you the available homes alongside with contact info, also users can sell their own home thought this website.

The features of this platform are:

1. Post a property for sale.
2. Search based on user needs.
3. Sort search results.
4. Get information about every property for sale.
5. Register to the website.

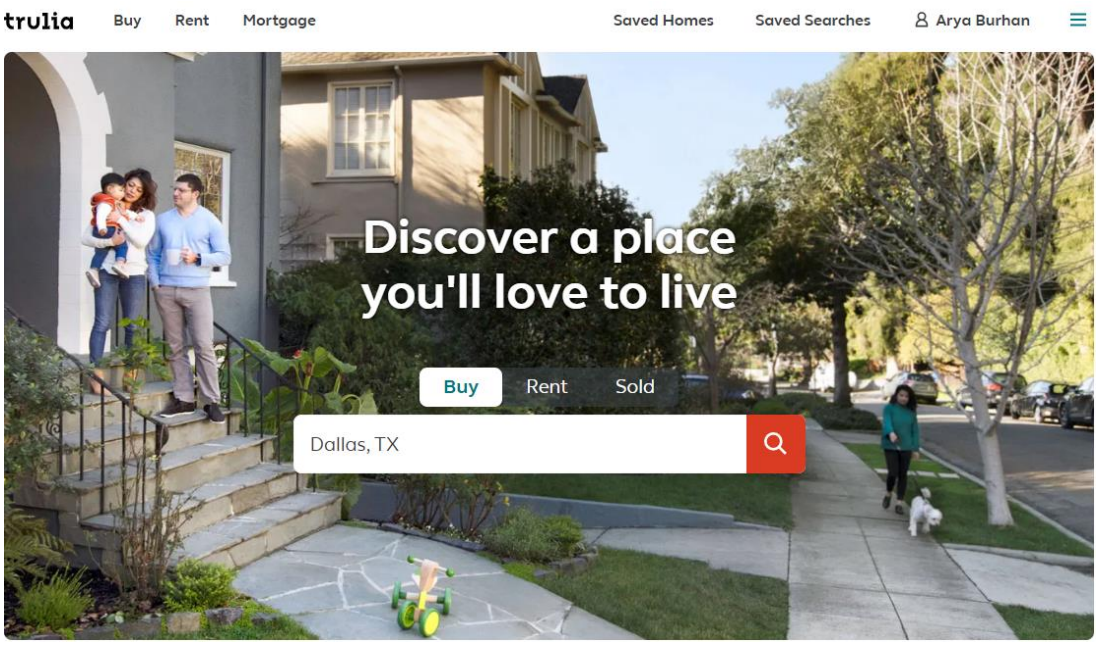

Figure 2.1 UI of home screen

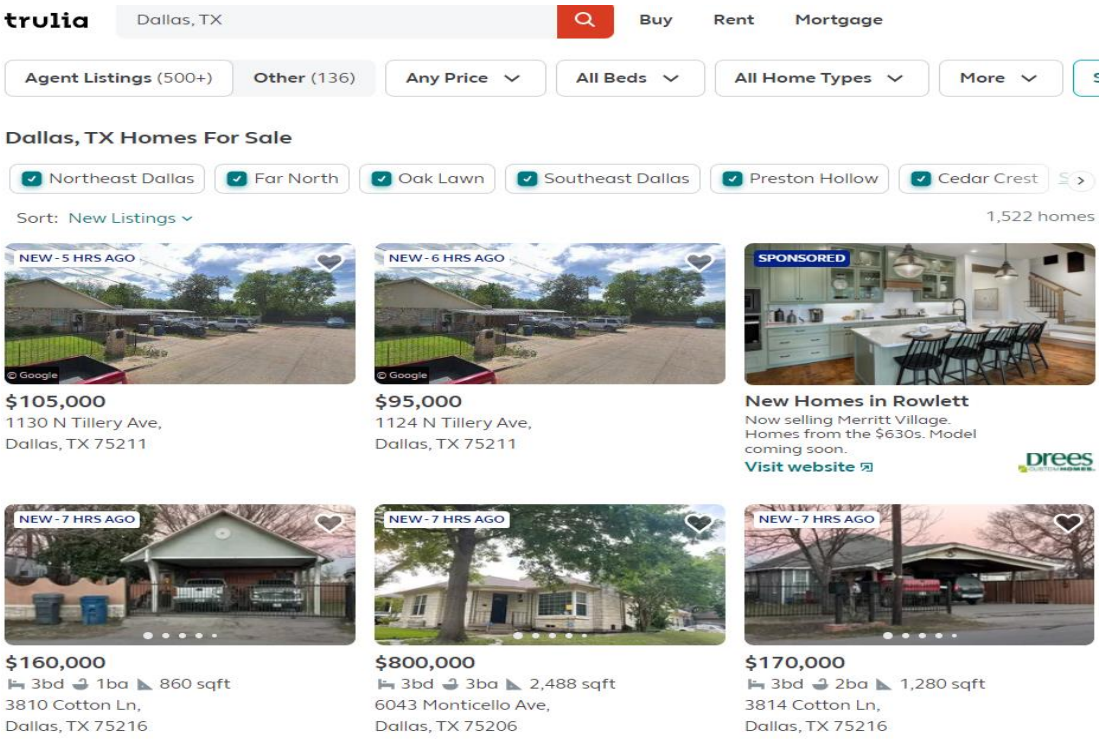

Figure 2.2 UI of search result screen

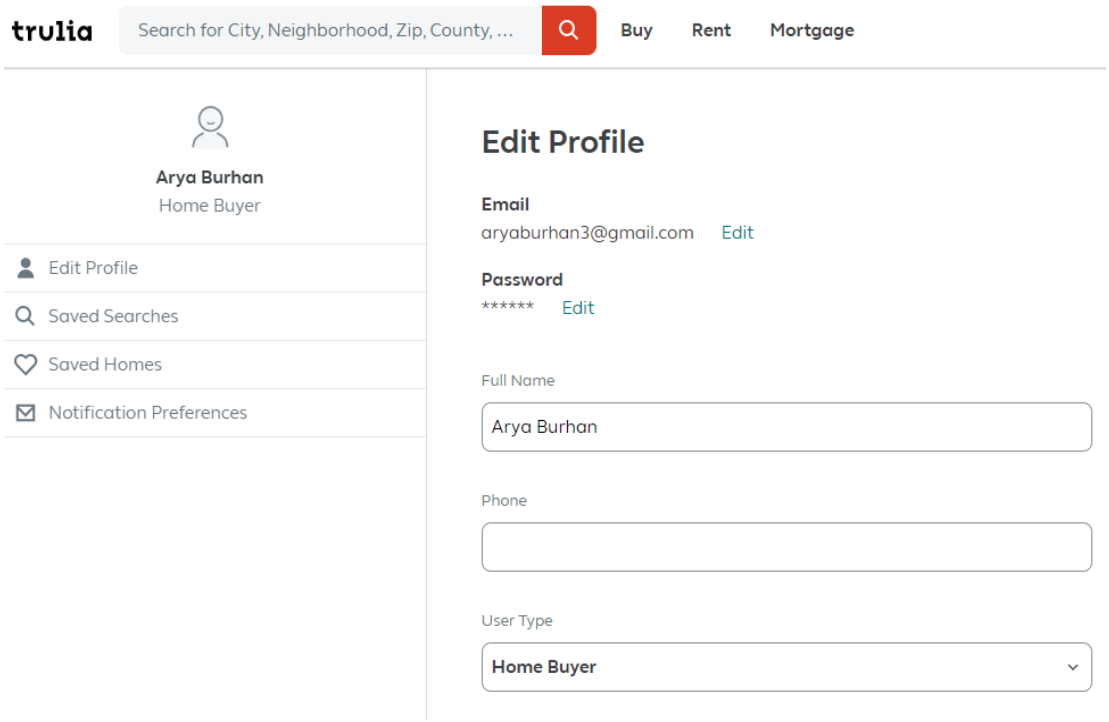

Figure 2.3 UI of user profile

2.2.2 Homele

Homele is a website where you can buy or sale your property in Kurdistan region of Iraq, on this platform easily you will be able to search and find any property you wish for.

The features of this platform are:

1. Sign Up and Login to the platform.
2. List properties for sale.
3. View and edit user profile.
4. Search based on categories.
5. Easily contact the seller through email or phone number.

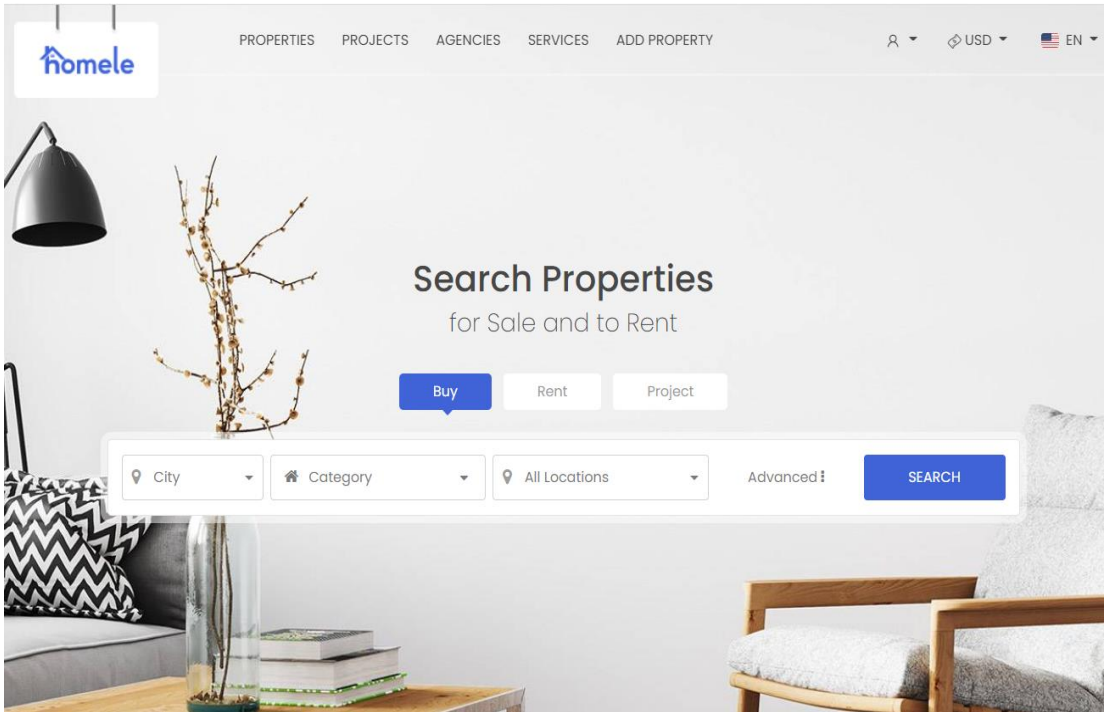

Figure 2.4 UI for home screen

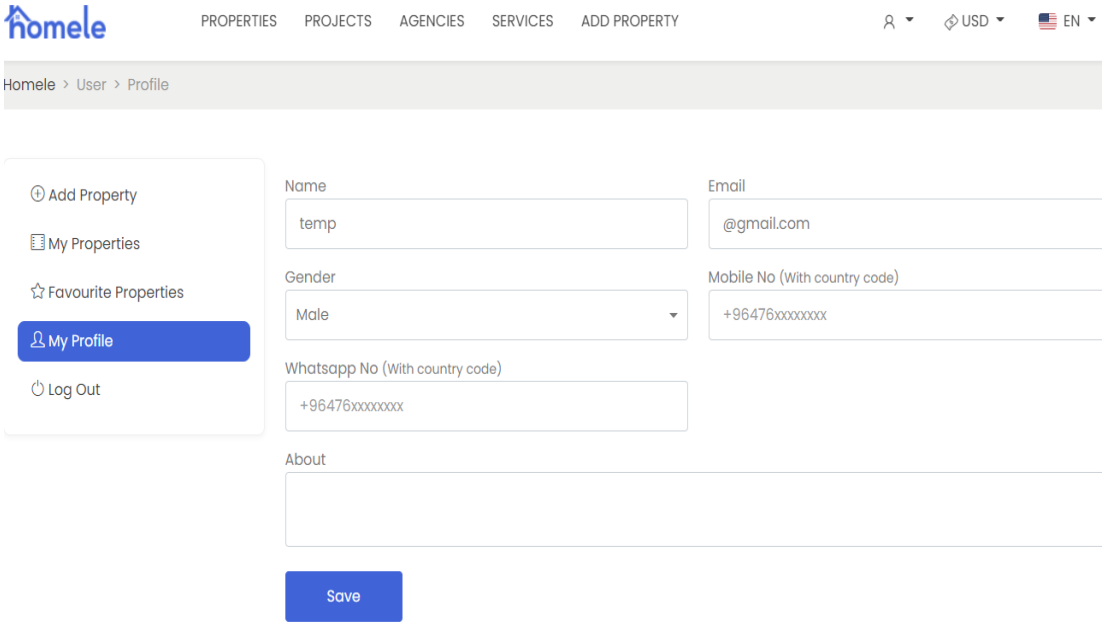

Figure 2.5 UI for user profile

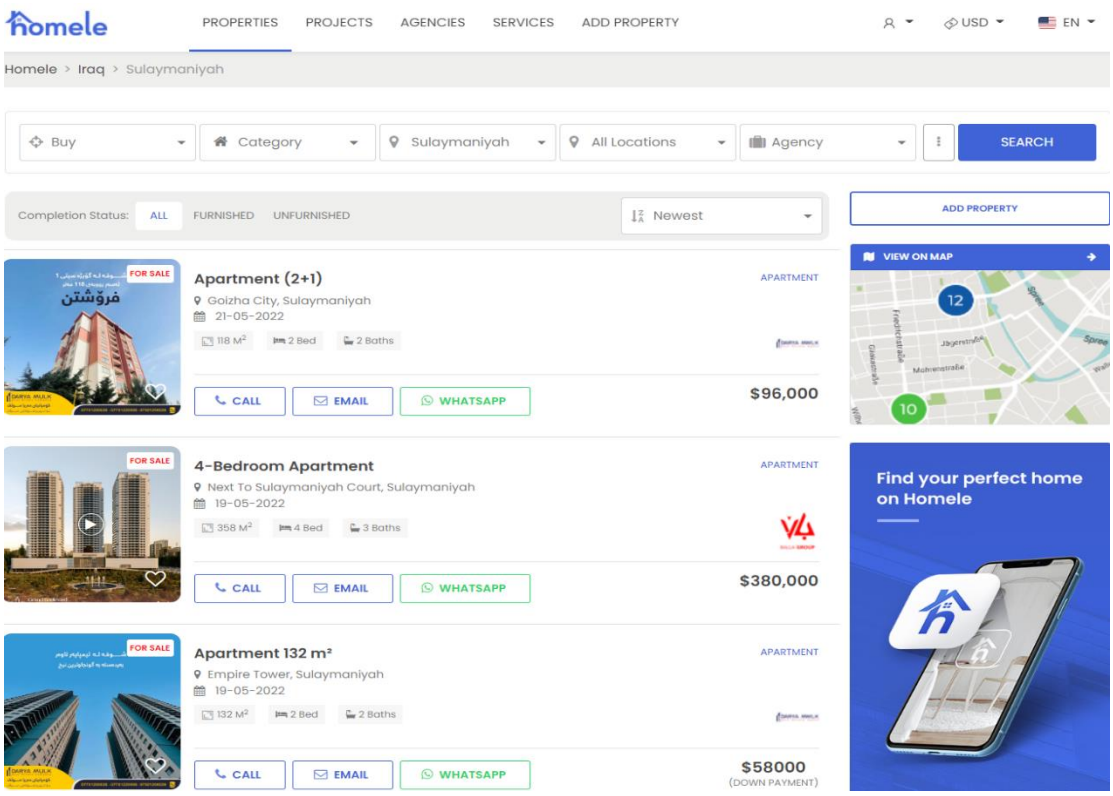

Figure 2.6 UI for Search Result

2.2.3 Holpror

Holprop is an international web application where you can buy or sale properties as an agent or an owner, and lets you to list up to 2 properties for sale on free basic account, and since it is international it means you can list up your property for sale or search for properties anywhere in the word.

The features of this platform are:

1. User register and login to the website.
2. Changing the website language.
3. Filter searches.
4. Email seller

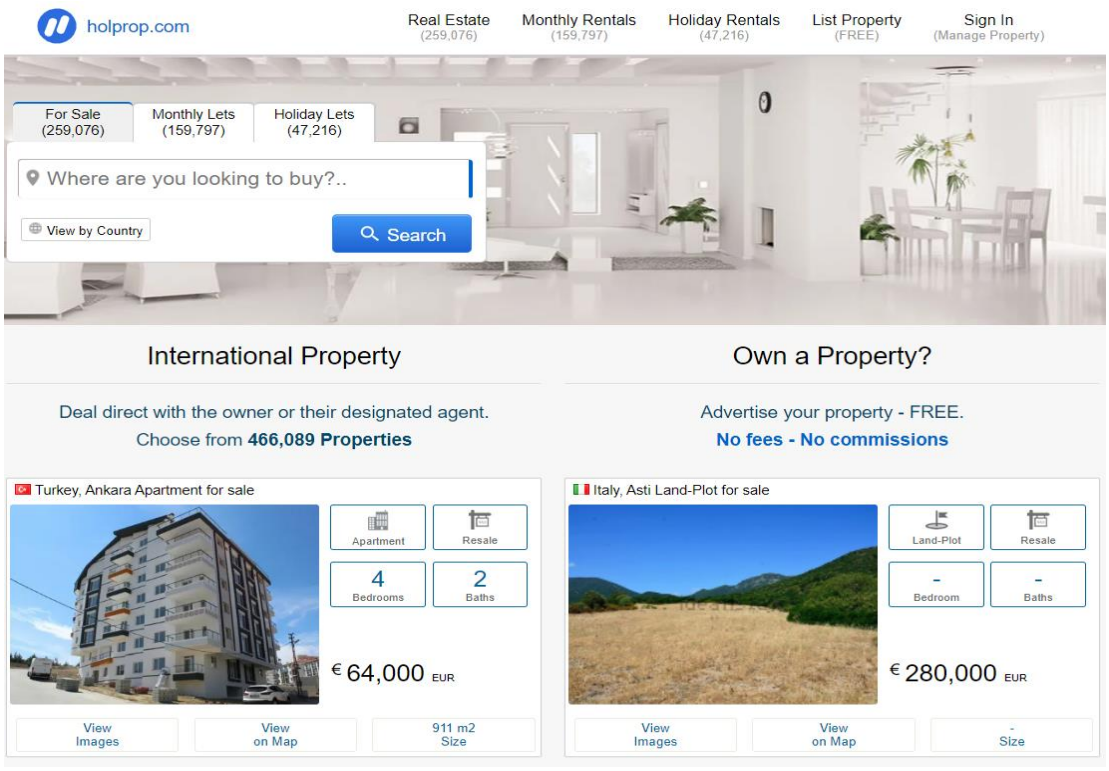

Figure 2.7 UI for dashboard

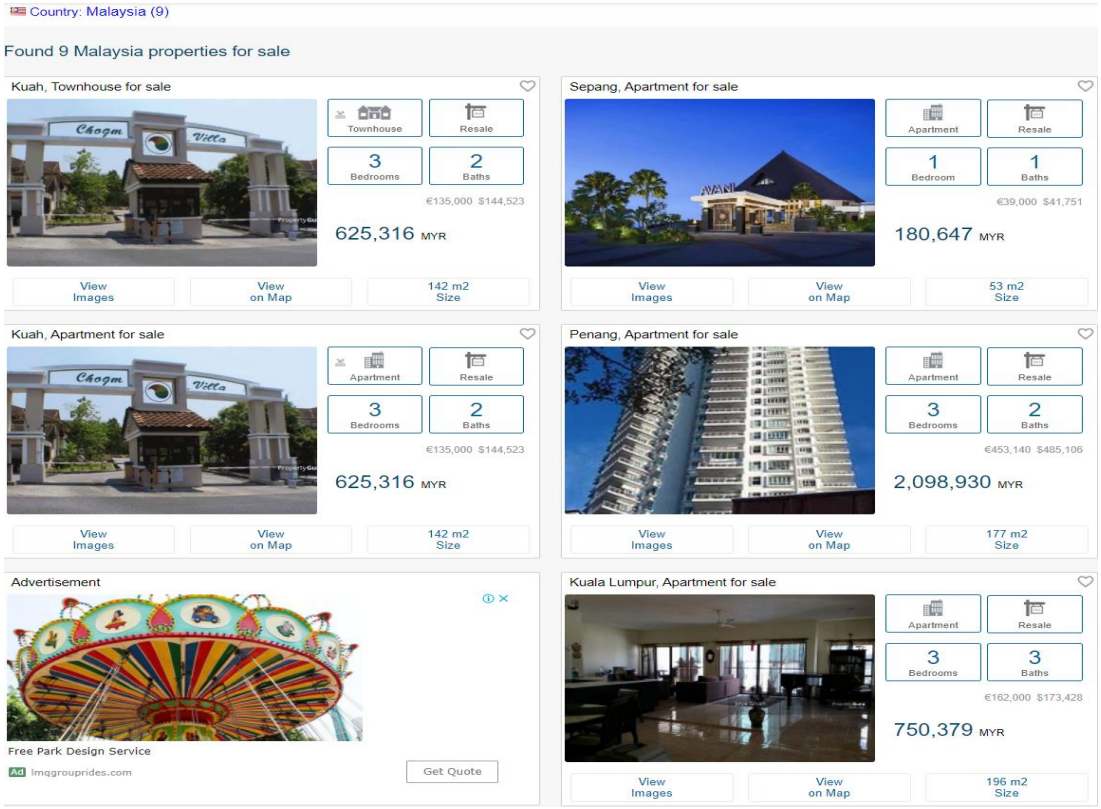

Figure 2.8 UI for Search

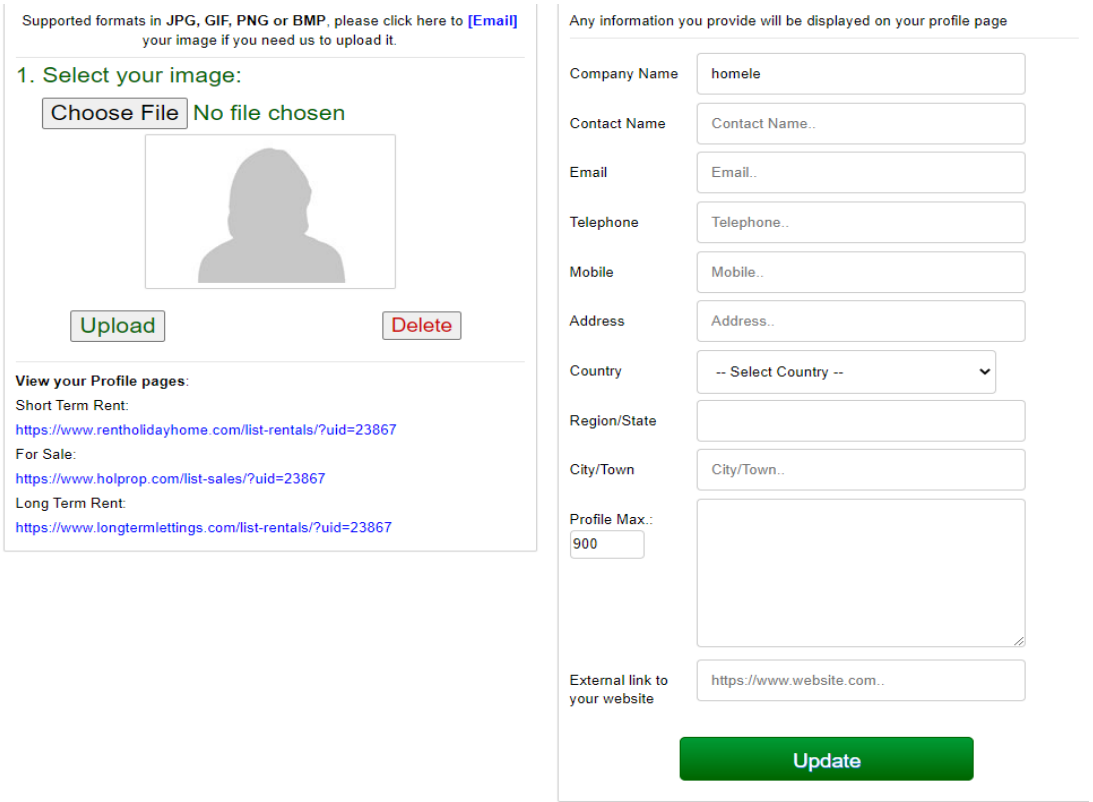

Figure 2.9 UI for User profile

2.3 Current System Analysis

The traditional methods of buying and selling a house or a property is through an agent that work at real estate agencies which this method is still used in many countries and places in the word especially in Iraq and Kurdistan region. The current system is mostly paper written record such as when a buyer looks to buy a home, they must visit an agency and then an agent will search for the buyer's specific requirement on a paper-based document and when the buyer wants to check and look at the home the agent will go with the customer and give a house tour to the buyer. When a seller wants to sell their home or property the must go through the same process and also give the agent their contact info thus in case someone wants to buy the home, they can contact the owner. This process is long and time consuming especially for a buyer.

2.4 Comparison between existing systems

Table 2.1 Shows the Comparison of Similar Systems and proposed system

Name:	Trulia	Homele	Holprop	HomeSale
Deployment:	Website	Mobile App / Web	Website	Website
Features:	1- Allow user to search for a property based on location and map. 2-User can register and login. 3-User can filter search result.	1- Allow user to search for a property based on category and location. 2-User can register and login. 3-User can edit profile.	1- Allow user to search for a property internationally. 2-User can list properties for free. 3-User can sign in and sign up.	1-Allow user to search for a property based on location. 2-User can register and login. 3-User can list properties for sale.

	4-User can manage profile. 5-User can list property for sale. 6-User can save property to view later.	4-User can search for properties for Rent. 5-User can view location of property on map.	4-User can email property seller.	4-User can Save any liked properties. 5-User can manage profile. 6-User can view full property details and contact the seller. 7-User can upload pictures of their property. 8-User can remove properties listed for sale. 9-User can request inquiry for any properties 10-Directly contact seller trough Phone & Email
Security:	OTP Verification	OTP Verification	OTP Verification	Password Hashing Data validation
Technology:	Web Technology	Mobile Application / Web Technology	Web Technology	Web Technology

2.5 Literature Review of Technology Used

In this part I will discuss the technologies used to develop HomeSale web application.

2.5.1 Front End technologies

The front end of a website is what user sees, or it's called the user interface, the front-end request data from backend and backend is responsible of delivering data quickly. For this project we will be using HTML, CSS, JS and PHP.

HTML stands for hypertext markup language which makes up most of webpages and online applications. HTML is used to create pages and make them functional. Markup language is a computer-readable language used to design webpages and make the text you use more dynamic. Hypertext is just a text within a text. CSS adds fonts, colours, and layouts to your website, making it nicer to look and use. HTML allows you to build the framework of your website with the help of CSS.

CSS is a language for expressing how web pages should look. It enables the presentation to be customized for different devices, including huge displays, small screens, and printers. CSS is not dependant on HTML. The separation of HTML and CSS makes website maintenance much easier, customize pages for different scenarios and share style sheets across several pages. CSS just like HTML has a simple structure making mastery quite straightforward. If you have a basic understanding of HTML and CSS, you will be able to learn other technologies like JavaScript and PHP much more quickly and easily.

JS or JavaScript is a text-based computer language that is used to generate interactive web pages on both the client and server sides. JavaScript is used to make a dynamic and interactive website; JS is very popular for front-end or client-side process as it is used by 97% of all websites.

2.5.2 Back End Technologies

Backend system manages the databases and data processing, backend is used as response for front-end requests and actions. Backend also cannot be access by users which is also called server side. The backend for this project will be done in MySQL and PHP.

PHP is a popular a scripting language that is open-source for creating both static and dynamic websites and web applications and also its free to use. PHP can be embedded in HTML code, and the benefit of PHP is because it is free and open-source, because many people and developers prefer to use PHP for their work. PHP is used in the majority of websites, because of this we will use PHP for this project.

MySQL is free and open-source database that lets you manage a database by connecting databases to software. It is a dependable, powerful, and a reliable solution with advanced capabilities. MySQL is recognized as the safest and most reliable database available. MySQL is also built to work with a variety of systems, programming languages, and technologies, including other database management systems. MySQL was built for speed, and it still has that reputation, even if it comes at the sacrifice of some additional functionality. The advanced features of MYSQL are: Data security, on-demand scalability, high performance.

2.5.3 XAMPP

XAMPP is a simple, lightweight web server solution that makes it extremely easy for developers to set up a local web server for testing and deployment. XAMPP is multi-platform, supporting Linux, Mac OS and Windows. XAMPP was chosen due of its mobility and ease to use. XAMPP works with PHP and MySQL.

2.5.4 Visual Studio Code

Visual Studio Code is the text editor used to create the system. VS Code is a cross-platform programming environment that works with a wide range of operating

systems, as well as the web and the cloud. It makes it easier for users to navigate the interface, allowing them to write code fast and precisely. This is a free Microsoft source code editor. VS. A fast source code editor is a feature of Visual Studio Code that is ideal for everyday use. Visual studio code supports most of the languages.

2.5.5 Password Hashing

Password hashing, also known as hashed password, is a one-way transformation that transforms one string into another. Hashing is used for security and authentication. Using hashed password is much safer because in case your system got hacked, the hackers will only be able to view the encrypted hash formed and not the real password.

2.6 Chapter Summary

In this chapter, the existing system is illustrated, and the HomeSale System's future status is described. Furthermore, the investigations look at how the HomeSale System differs from other similar systems in order to improve its functionality and overall performance. The HomeSale System is a website-based platform that meets mentioned standards. After understanding user requirements and needs and the processes in the existing system, in order to create a property selling and buying website. The main priority was an online system to eliminate the long process of old way of buying and selling homes that has shown are time consuming. Making sure that the user interface is reliable, user friendly, easy to use and fast. Also, the main objective was making interactive platform that is easy to use where listing, searching a home is easier.

CHAPTER 3

SYSTEM DEVELOPMENT METHODOLOGY

3.1 Introduction

Methodology is an important and crucial factor that must be focused on to ensure a planned and efficient growth process. It's a software development method. It also serves as a roadmap to ensure that the system's development stays on track. The process of constructing a system will be easier to organize with a methodology, minimizing the system development cost, maximizing the development duration, and fulfilling the objectives through time management. “Successful projects are managed well. To manage a project efficiently, the manager or development team must choose the software development methodology that will work best for the project at hand” Synopsys (2017).

In this chapter we discuss the methodology used in the development process of the Online Real Estate system. It is a must to choose a methodology for the project because it will determine how the project development process will be done. Methodology is a way of planning, organizing, and managing the development of a system, methodology also refers to the specific outputs and artifacts that development teams produce and complete.

3.2 Methodology

The best process model for Online Real Estate system is iterative development. Because iterative development is based on the methodical repetition of small cycles known as iterations, and its goal is to make a project that will meet the needs of the people or stakeholders. We follow the Software Development Life Cycle (SDLC) for this project, which it begins with a simple implementation first and gradually increased

in complexity and feature set until the final system is complete. It demonstrates that an iterative model does not begin with a complete set of requirements.

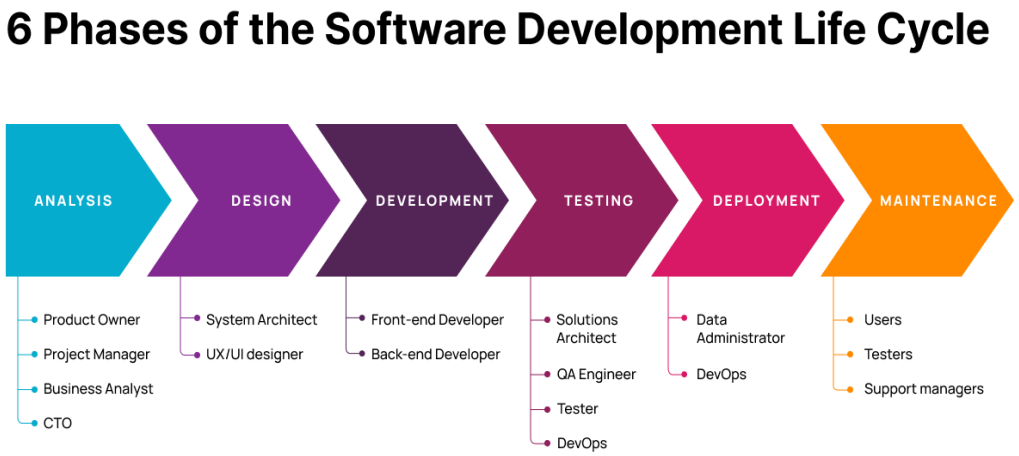

Figure 3.1 Software Development Life Cycle

3.2.1 Iterative Development

iterative development process does not follow a rigid process, the initial planning is not required to be well-defined and proceed to iteration of each phase of SDLC with extensive testing until the system behave as the developer desires. This step of iteration allows the developers to reviewed and changed the previous cycle until its meet all the requirements. “Iterative development is a way of breaking down the software development of a large application into smaller chunks. In iterative development, feature code is designed, developed and tested in repeated cycles.” (Francino, Y). In (SDLC) there are five stages and the stages are, Analysis, Design.

3.2.1.1 Analysis

Analysis is the first and most important stage of (SDLC) and all of the project depends on this stage because it gets the clients requirements and information and then designs a system to meet client’s needs. In this stage a Gantt chart displaying the tasks will be made with the important dates also a questionnaire survey of the community will be taken.

3.2.1.2 Design

In this stage we simulate how the system will be and how it will work, this design in turned into code in the implementation phase. Design depends on the requirements and information's gotten from the analysis phase; the analysis is followed when designing the system. During this phase the system initial design is completed and the user interface, design architecture, database is all determined.

3.2.1.3 Implementation

In this phase we will start writing the codes using the tools we chose during the development of the system, PHP, MYSQL, HTML, CSS and JS was used in this project to create an Online Real Estate system. When implementing testing will be done too side by side to see if there are any errors so that it can be fixed until we meet the requirement, then we move to the next phase after testing.

3.2.1.4 Testing

Testing is where we compare the system that we implemented to the requirements to make sure the requirements are meet, after testing the system it will be ready to use. During this phase problems maybe discovered and in the end a report will be generated stating the system has been tested.

3.2.1.5 Evaluating

In evaluating phase I compare product to current systems that we have, the Online Real Estate will be compared to the current system that we mentioned in Chapter (2).

3.3 Justification of (Iterative Development)

Iterative development is chosen as the best process model for developing the Online Real Estate system because it allows the system to adapt to changes as they occur during development. It is simple to ensure that the current iterations are

progressively better than earlier iterations because it uses the iterations idea. It can also aid in improving the quality and predictability of software development by providing immediate feedback between iteration.

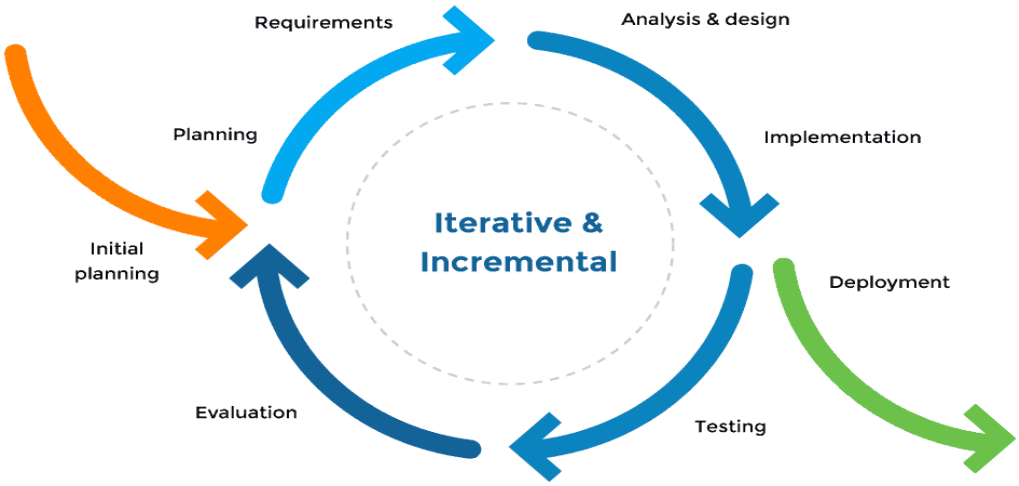

Figure 3.2 Iterative Development Phases

3.4 Technology & Tools

In this part I will go through the technology used also the software's used to develop the Online Real Estate system. For this system HTML, MySQL, PHP, CSS and JS will be used to construct the system.

3.4.1 HTML

HTML, which stands for Hypertext Markup Language, allows us to create and organize sections, paragraphs, and using elements, tags, and attributes. HTML is not considered a programming language because it can't provide dynamic functionality. Tim Berners-Lee is the creator of HTML framework. HTML runs on web browsers and allows linguistic interoperability across numerous programming languages, Visual Studio Code and Sublime text is commonly used for HTML development.

3.4.2 MySQL

MySQL is an open-source relational database management system or (RDBMS) with a client-server model. RDBMS is a software used to create and manage databases based on a relational model. a relational database management system; its primary function is to save and retrieve data requested by other programs. It's often utilized in systems that employ the PHP framework.

3.4.3 PHP

PHP is a widely used open-source scripting language for making web applications both static and dynamic websites. PHP can be embedded in HTML code. PHP is open-source so it is free to use and it is accessible to anyone and can be used at any time. Many developers prefer PHP to work with because in contrast to other traditional programming languages, is simple and well-organized.

3.4.4 CSS

CSS which stands for Cascading Design Sheets is a programming language that is used for styling and laying out web pages, CSS includes changing the font, color, size, and much more.

3.4.5 JavaScript

JS a scripting language for creating a dynamic web page which you can update material, control multimedia, animating graphics, and much more.

3.5 Hardware & Software Requirement Analysis

3.5.1 Software Justification

Software needs that match the minimum specification while also meeting the preference requirement.

Table 3.1 Software Specification

Software	Device Speciation
Software	Device Speciation
OS Edition	Windows 11
Integrated Development Environment	XAMPP, Sublime Text, VS Code
Database Management System	MySQL
Framework	HTML, CSS, JS AND PHP
Web Browser	Google Chrome
Visual Modelling & Design Tool	Visual Paradigim
High Fidelity Prototype	Figma
Microsoft Power Point 2019	For Presentation Slides
Microsoft Word 2019	To document project report, SRS and SDD

3.5.2 Hardware Justification

Hardware justification is critical in software development to ensure that it can run at its best in any given user context.

Table 3.2 Hardware Specification

Hardware	Device Speciation
Processor	Intel(R) Core i3-9100f CPU @ 2.50 GHz
Installed RAM	4.00 GB
Installed SDD	500GB
System Type	64-bit operating system, x64-based processor
Input device	Mouse, Keyboard

3.6 Method Used

For this project I will use Quantitative survey type because it is close-ended thus it makes it more accurate and much less time consuming since it ask the respondents to choose from a list of options and participants are not exhausted by these kinds of questions because they do not take much time to answer, we won't use qualitative survey type because of the lack of statistical representation also it uses open-ended questions so the questions can be complex which this makes to take longer time to get feedback from participants.

For the sampling technique I will use non probability for this project, non-probability has many types but for this project I will use random sampling technique because we can choose a subset of individual from larger population and because it is the simplest form of data collection and it also requires less knowledge to complete the research.

For the distribution I am going to use online distribution over face to face because of the current covid epidemic also we can reduce the time taken, cost and the headache involved in the process of face-to-face survey.

For this survey sampling size, I am choosing minimum of 25-30 because samples between 25-30 are sufficient for this project and also it is the most common sampling size for this kind of studies, also it increases the accuracy of the survey result.

3.7 Result of Survey

Students from Qaiwan International University were polled. This poll was completed by 25 students using a Google form. All of the responders were chosen at random from the faculties. The survey was conducted by done during a single day this part will explain the outcome and analysis of the survey.

Here Are the results of the Google Form Survey.

Question 1

For Q1, 28% of responders stated that sometimes they have used the current system, 20% always used, 20% Never used, 16% often used and 16% rarely used.

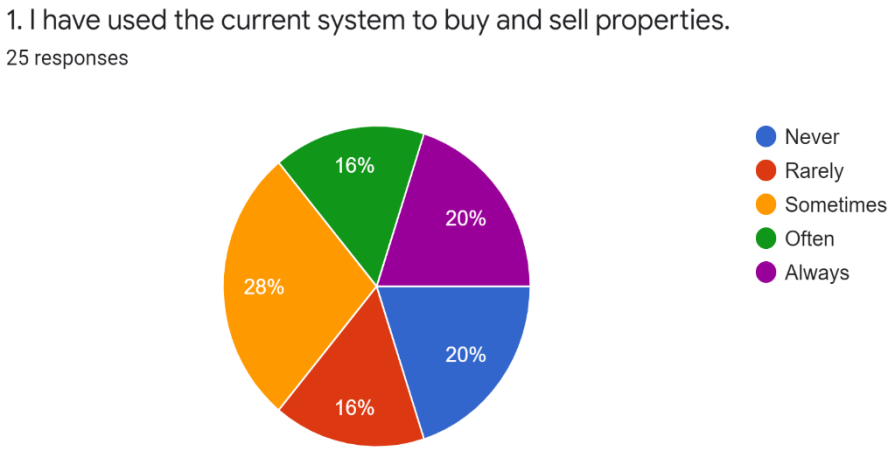

Figure 3.3 result for Question 1 of survey

Question 2

For Q2, 44% of the responders have often experienced problems with the current Real Estate System. 20% sometimes experienced, 16% rarely experienced, 12% never experienced and 8% always experienced problems.

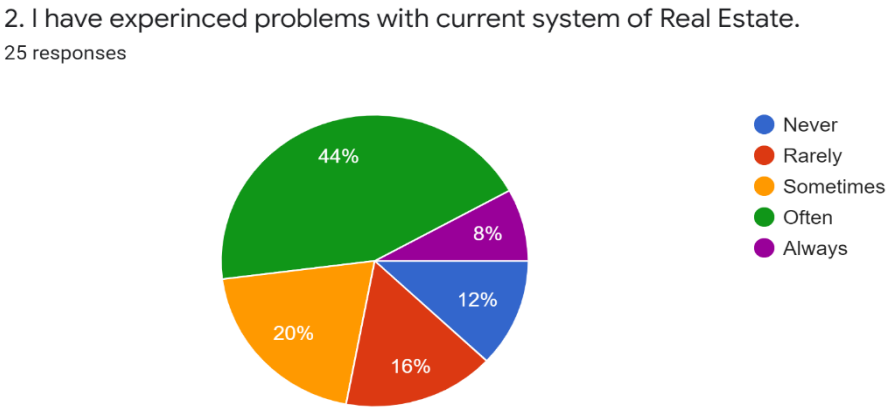

Figure 3.4 result for Question 2 of survey

Question 3

For Q3, 52% of responded agree that the current system is time consuming, 24% Strongly agree, 16% disagree and 8% are neutral.

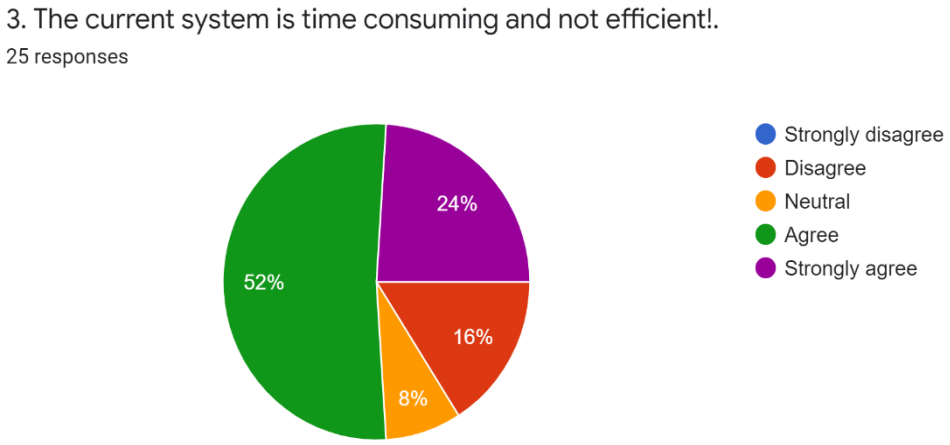

Figure 3.5 result for Question 3 of survey

Question 4

For Q4, 40% agree that current system is hard for them to sell property, 40% are neutral, 12% strongly agree and 8% disagree.

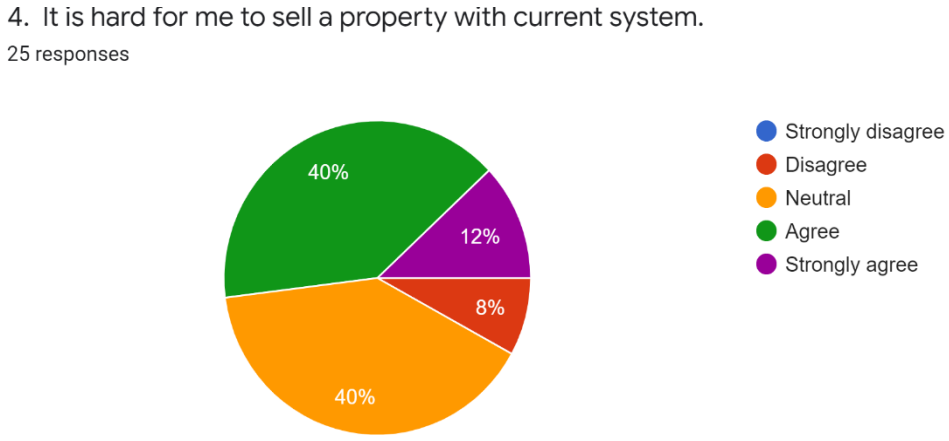

Figure 3.6 result for Question 4 of survey

Question 5

For Q5, 40% agreed that current system is hard to buy properties with, 28%are neutral, 20% strongly agree and 12% disagree.

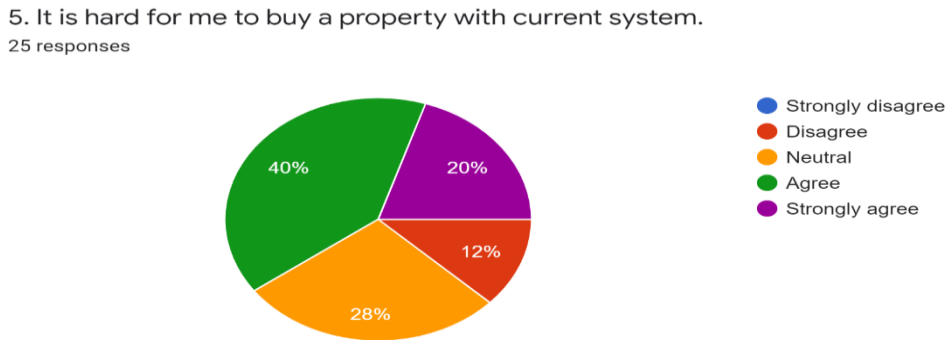

Figure 3.7 result for Question 5 of survey

Question 6

For Q6, 36% said the quality is Very poor of current system 36% poor, 12% fair and 12% good.

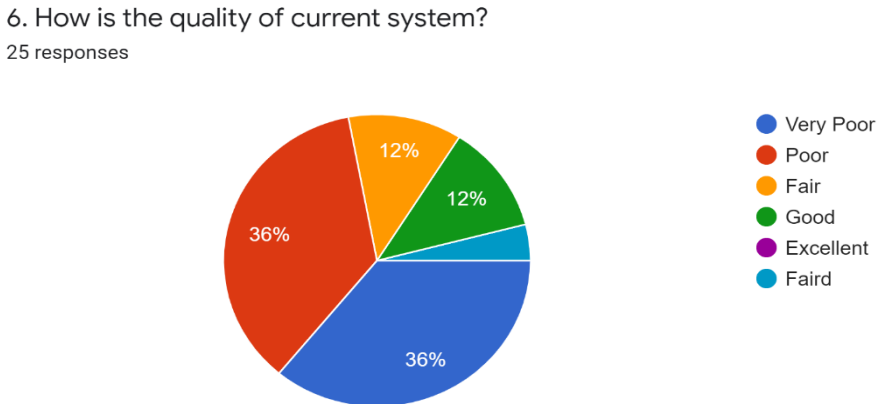

Figure 3.8 result for Question 6 of survey

Question 7

For Q7, 32% are not satisfied at all with current system, 32% slightly satisfied, 28% moderately satisfied, 4% very satisfied and 4% completely satisfied

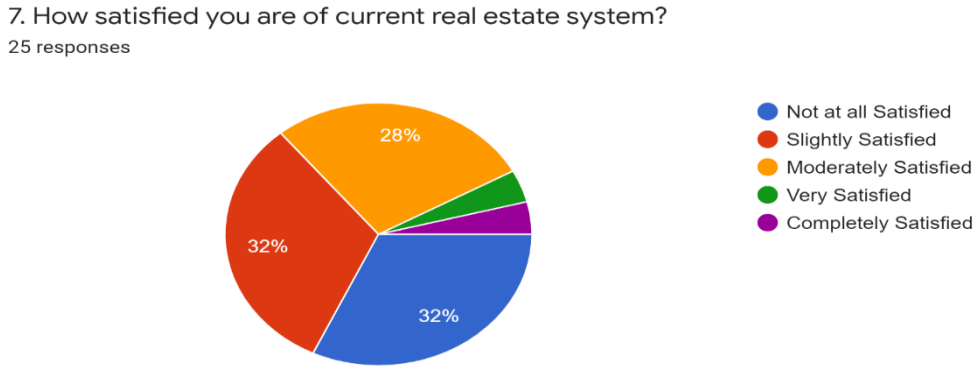

Figure 3.9 result for Question 7 of survey

Question 8

For Q8, 48% said that availability of online Real Estate system is extremely important, 40% very important, 8% slightly important and 4% moderately important.

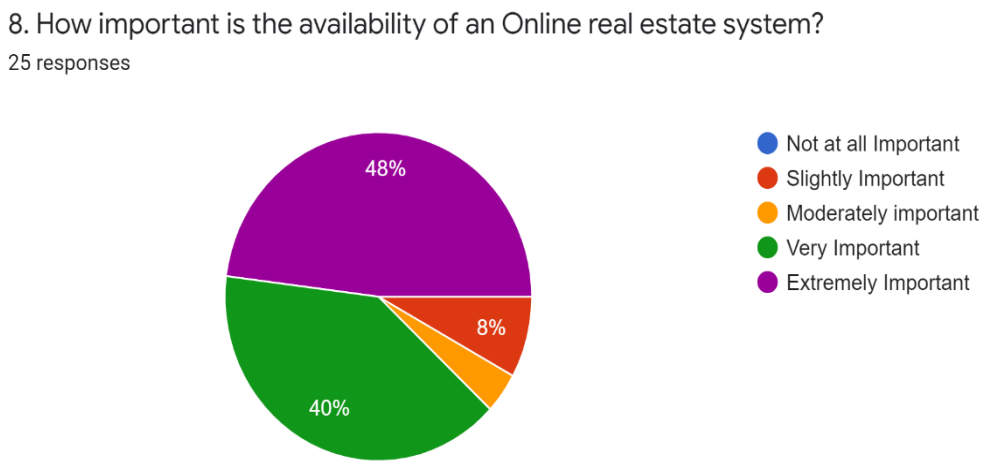

Figure 3.10 result for Question 8 of survey

Question 9

For Q9, 52% of responders agreed to buy property on online website, 28% strongly agree 16% neutral and 4% strongly disagree.

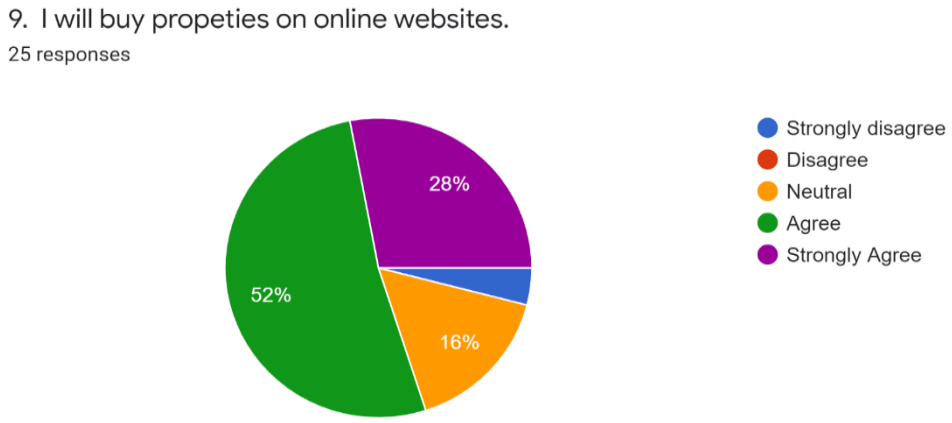

Figure 3.11 result for Question 9 of survey

Question 10

For Q10, 40% of responded agreed to sell on online website, 36% strongly agreed 20% neutral and 4% disagree.

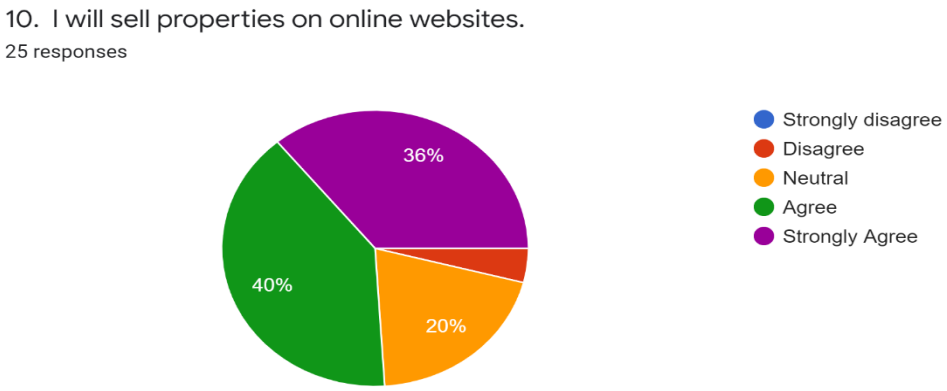

Figure 3.12 result for Question 10 of survey

Question 11

For Q11, 56% strongly agree that online system will make process of buying & selling more efficient, 32% agree and 12% are neutral.

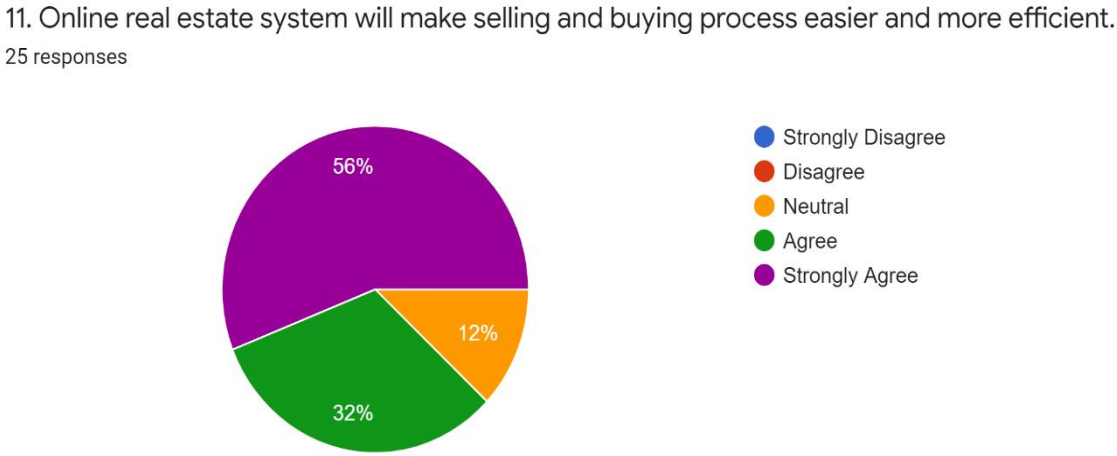

Figure 3.13 result for Question 11 of survey

Question 12

For Q12, 40% prefer online websites, 32% strongly agree and 20% are neutral.

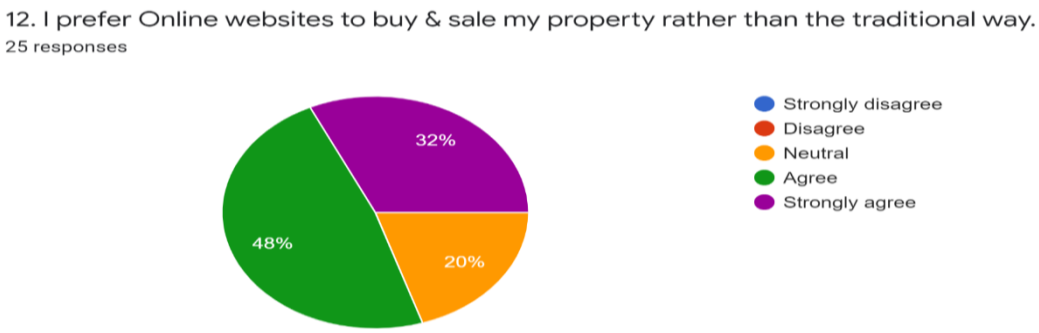

Figure 3.14 result for Question 12 of survey

Question 13

For Q13, 36% are extremely familiar with online systems. 28% very familiar, 24% moderately familiar and 12% slightly familiar.

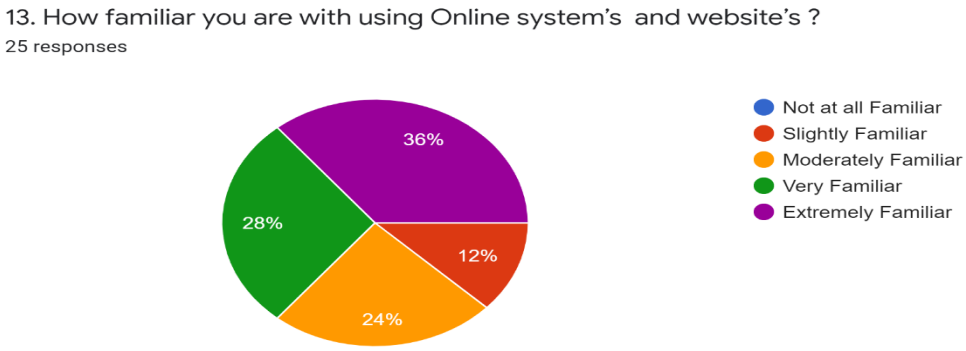

Figure 3.15 result for Question 13 of survey

Question 14

For Q14, 32% are often using online platforms, 28% always use, 24% sometimes use, 12% never use, and 4% rarely use.

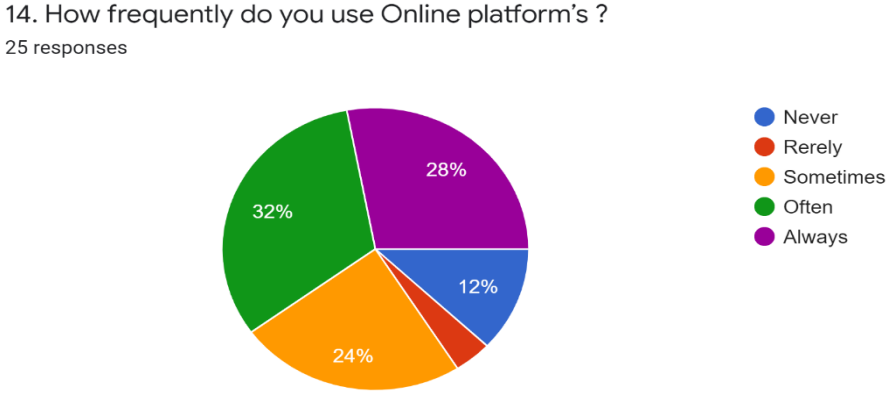

Figure 3.16 result for Question 14 of survey

Question 15

For Q15, 48% wants the performance to be above standards, 36% far above standards, 12% meets standards and 4% below standards.

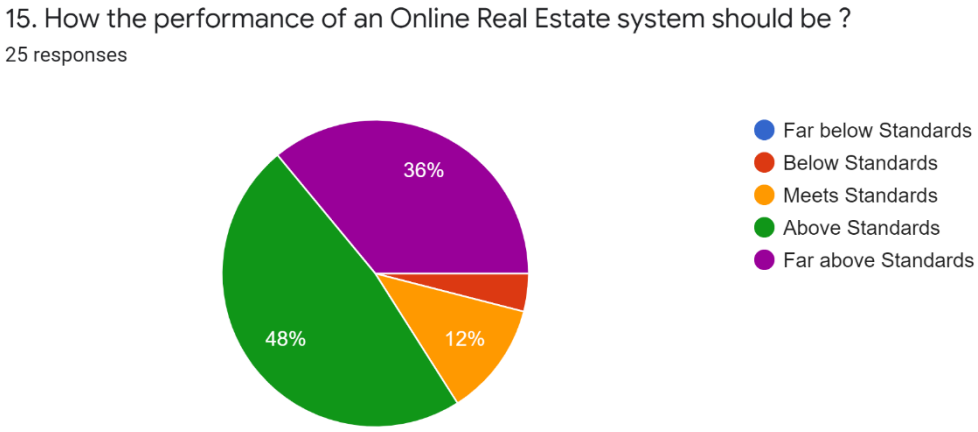

Figure 3.17 result for Question 15 of survey

3.8 Chapter Summary

In this chapter we discuss how methodology is used to create the Online Real Estate System. And justification is provided to show why the methods used are suitable for the development of this system. Each phase is discussed in detail to make sure that everyone participating in the project understands it. Also, this chapter includes the list of hardware and software requirements.

CHAPTER 4

REQUIREMENT ANALYSIS AND DESIGN

4.1 Introduction

The Online Real Estate System will be further analysed and designed in this chapter. A user case diagram, a sequence diagram, a class diagram, a UML diagram, and an interface diagram are among the diagrams that will be generated. End Users and module will be defined in detail. Aside from that, the Software Requirement Specification (SRS) was used, which documents the System's use case description, sequence diagram, and activity diagram. This project's system architecture design was also detailed out using the Software Design Description (SDD). “Requirement’s analysis and design definition involves organising requirements, modelling requirements and designs, validating information, identifying solutions that answer the business needs, and assessing the potential value gained by performing these tasks. Requirement’s analysis has the benefit of having a clear set of requirements” (Nicholas, J).

4.2 Requirement Analysis

This section outlines the HomeSale Website's functional and non-functional needs.

4.2.1 Functional Requirement

The functional requirements depict the system's behaviour and were derived from the survey results. In addition, the functional requirement was created using a UML model, which included use cases, sequence diagrams, and activity diagrams. This system has numerous basic characteristics, which are listed below.

Admin

The administrator has complete control over the website:

1. Manage the entire properties, delete/edit the information of listed properties.
2. Manage the entire website data, Admin users have the ability to delete, and change the user's information.
3. Control the entire website's content.
4. Admin can check and delete contact messages.

User

The user has control of the following tasks:

1. User shall be able to look for available properties for sale.
2. User shall be able search for desired home by location.
3. User shall be able to add/edit information in their profile, such as name and contact number.
4. User shall be able to list a new property listing.
5. User shall be able to edit info on already listed properties by them.
6. User shall be able to delete listing that has been already made by them.
7. User shall be able to save any listings for later.
8. User shall be able to request inquiry for any property they like.

4.2.2 Non-Functional Requirement

4.2.2.1 Security

- Login is required

When a user connects in to the system, only their approved username and password will be allowed to access the system.

4.2.2.2 Usability

- Ease of use

The system's user must be able to utilize it after less than 0.5 hours of training.

- Clear to understand

The website must have a well-organized user interface and easily identifiable icons to allow users to navigate without becoming confused.

4.2.2.3 Performance

- Time to respond

Response times for the website should not exceed one second.

- Multiple users at the same time

Multiple users should be allowed to utilize the app at the same time.

4.2.2.4 Reliability

- Availability of the application

The application will be available to users 24 hours per day and seven days in a week.

- Reliability

The application will give accurate cycling data and report it to the system in a format that is free of anomalies.

4.2.3 Use Case Diagram

A use case diagram is used in the HomeSale System to represent the relationship between an actor and their actions or functions. Each performer has a distinct personality and mannerisms. Each entity is separated by the module.

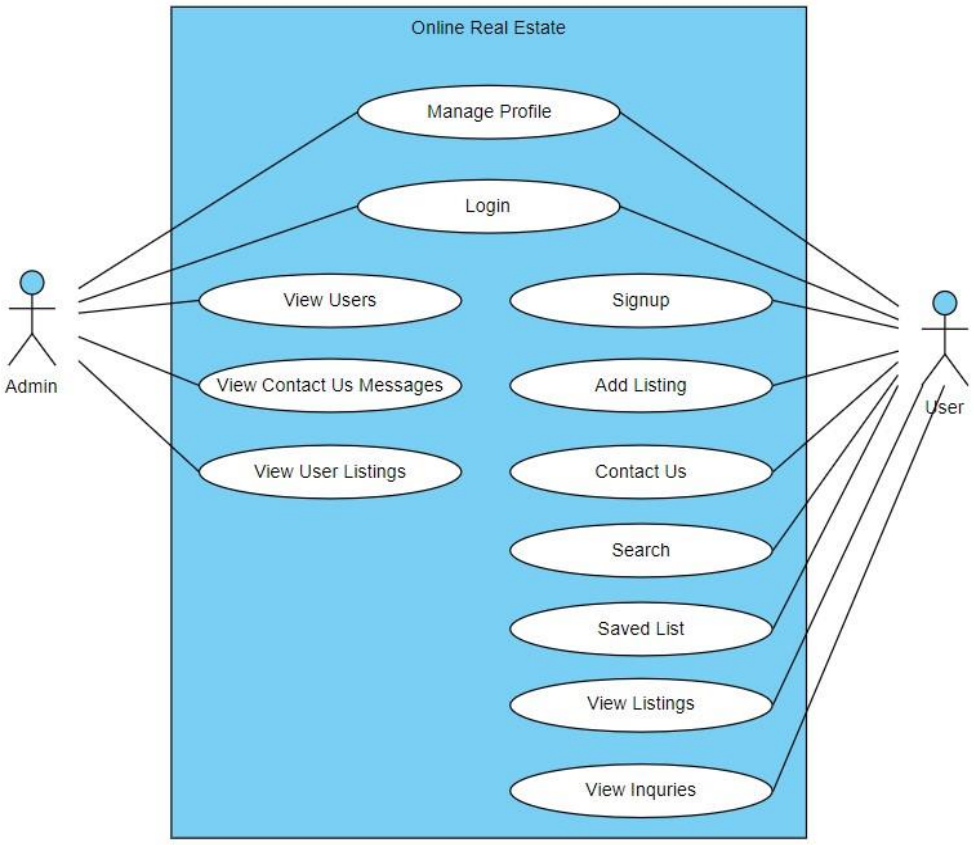

Figure 4.1 Use Case Diagram

Table 4.1 Description of Actors

No.	Actors	Description
1	Admin	A user who is in charge of the system's configuration, maintenance, and any other operations that involve data.
2	User	A user can search for properties based on their requirement, also can manage its profile, add listings manage their listings.

Table 4.2 Summarizes the system's capability based on the use case shown in Figure 4.1

NO.	USE CASE	DESCRIPTION
1	Manage User	This use case allows an admin to edit and delete users.
2	Manage Listing	This use case allows an admin to manage a user property that is listed for sale.

3	Manage Messages	This allows admin to view and delete contact messages
4	Add Listing	This use case allows a user to list a property for sale.
5	Search Properties	This use case allows user to search a property by location or many other things.
6	Manage Properties	This use case allows users to manage their properties that they listed for sale.
7	Manage Profile	This use case allows a user to manage their account to edit their details and data.
8	Login and Logout	This use case allows user and admin to login and logout the system.
9	Save Listing	This use case allows user to save the properties that they like and check it later.
10	Signup	This use case allows user to sign up for an account.
11	Inquiries	This use case allows users to send inquiry to any property they like

4.2.4 Sequence Diagram

The process flow involved in the HomeSale System is depicted using sequence diagrams. The sequence diagram shows every interaction, including objects, classes, and entities. This diagram is based on a HomeSale System case study.

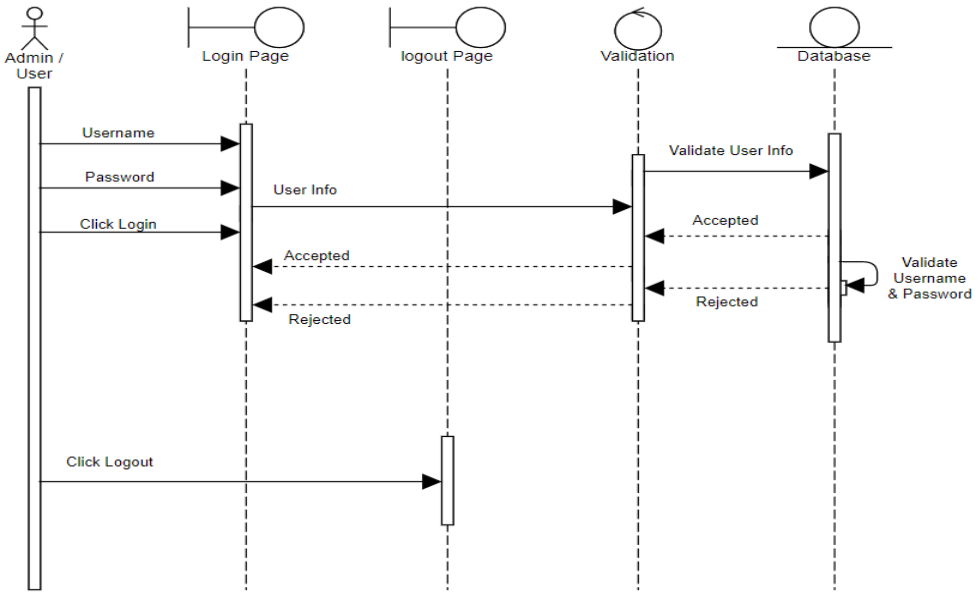

Figure 4.2 Sequence Diagram <<Login & Logout>>

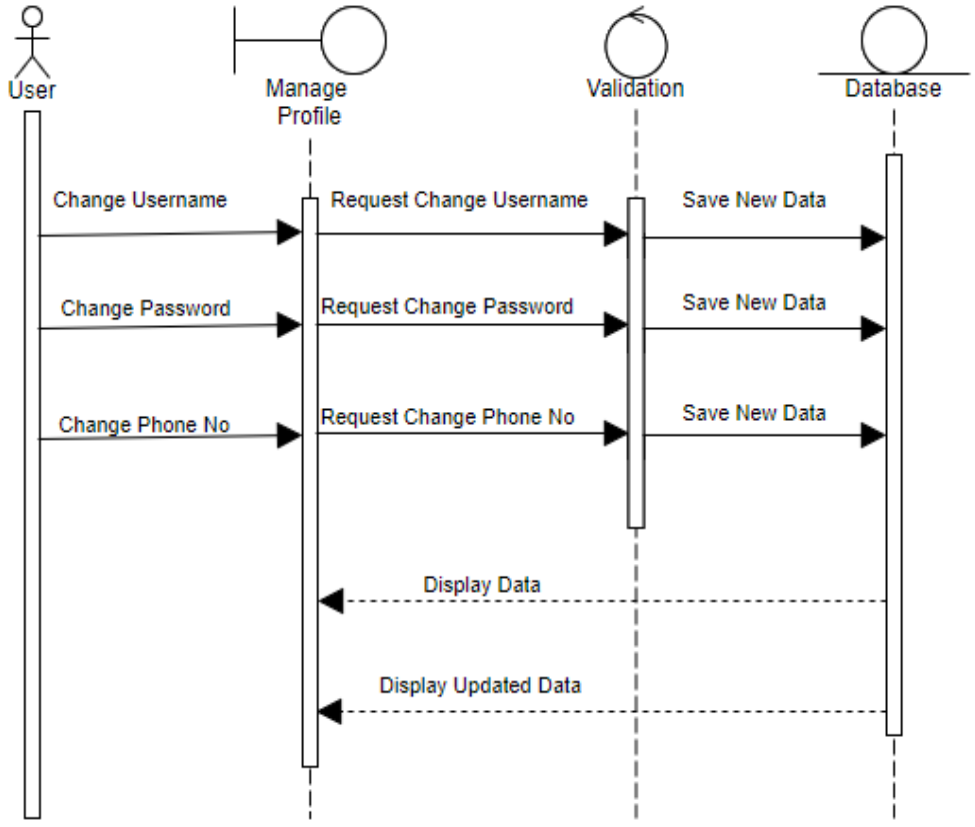

Figure 4.3 Sequence Diagram <<Manage Profile>>

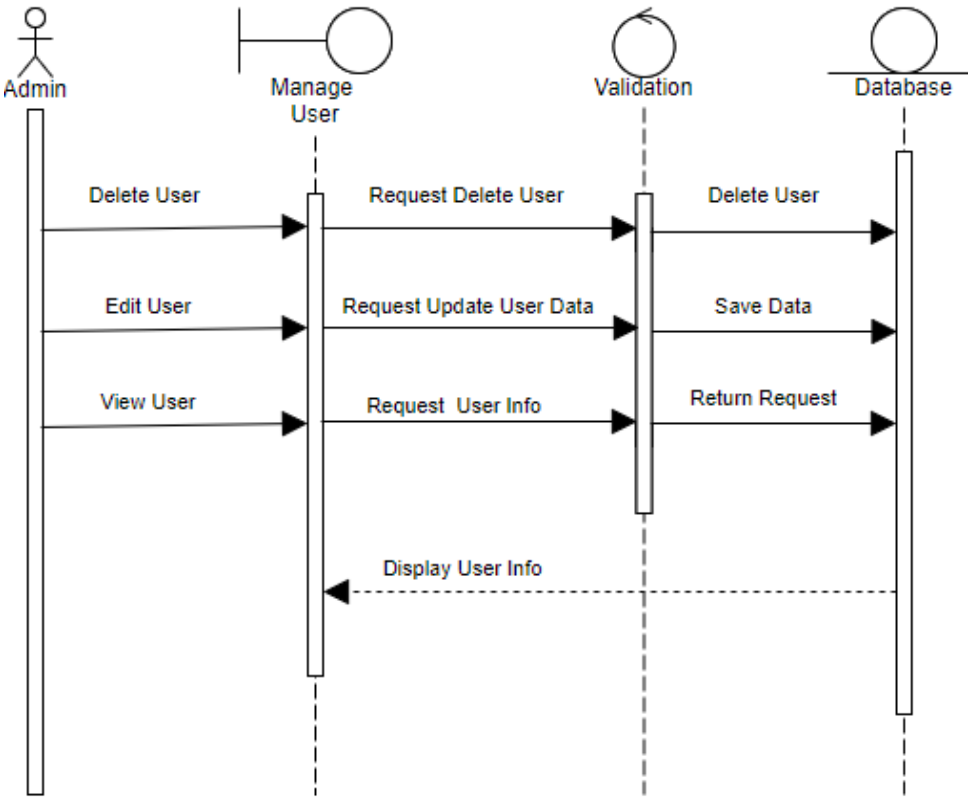

Figure 4.4 Sequence Diagram <<Manage User>>

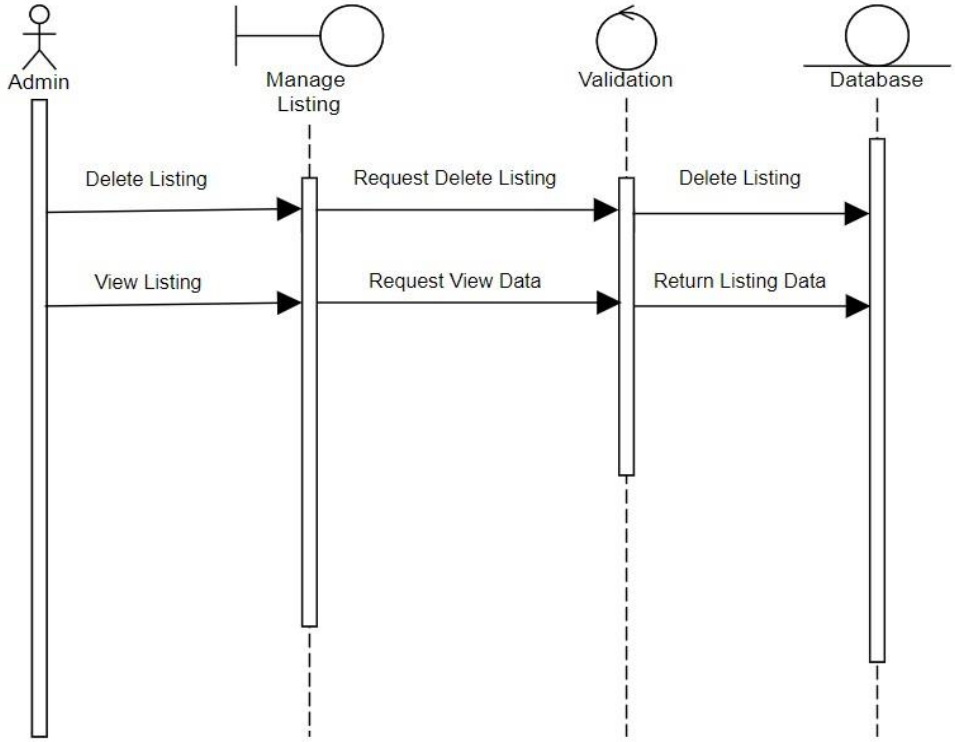

Figure 4.5 Sequence Diagram <<Manage Listing>>

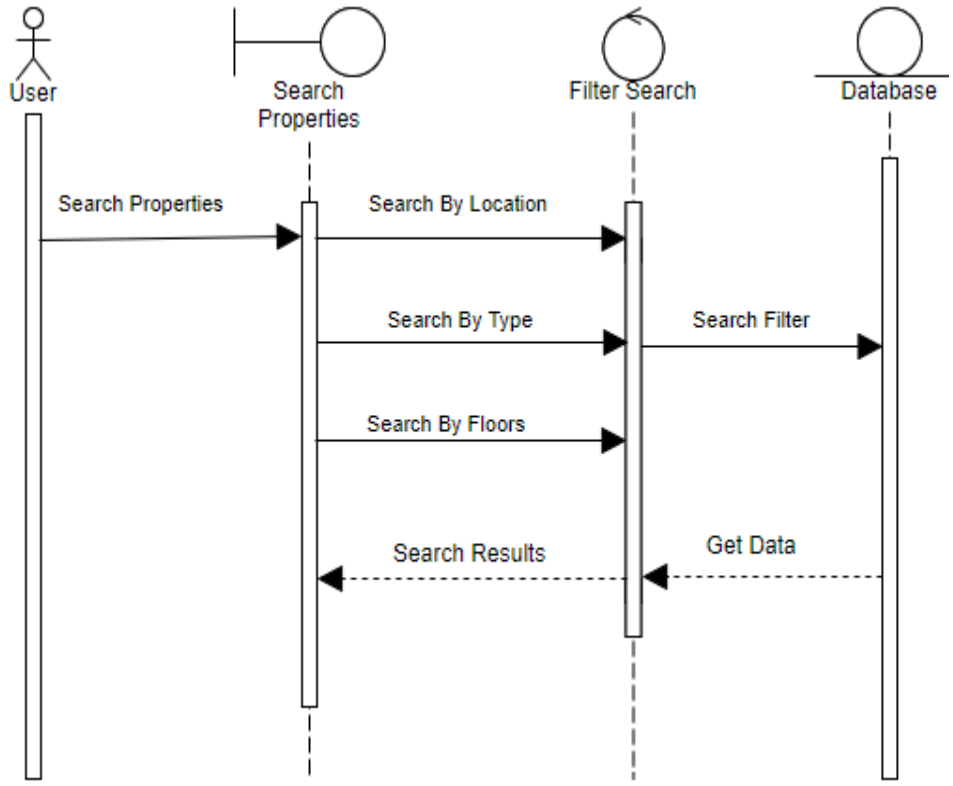

Figure 4.6 Sequence Diagram <<Search Properties>>

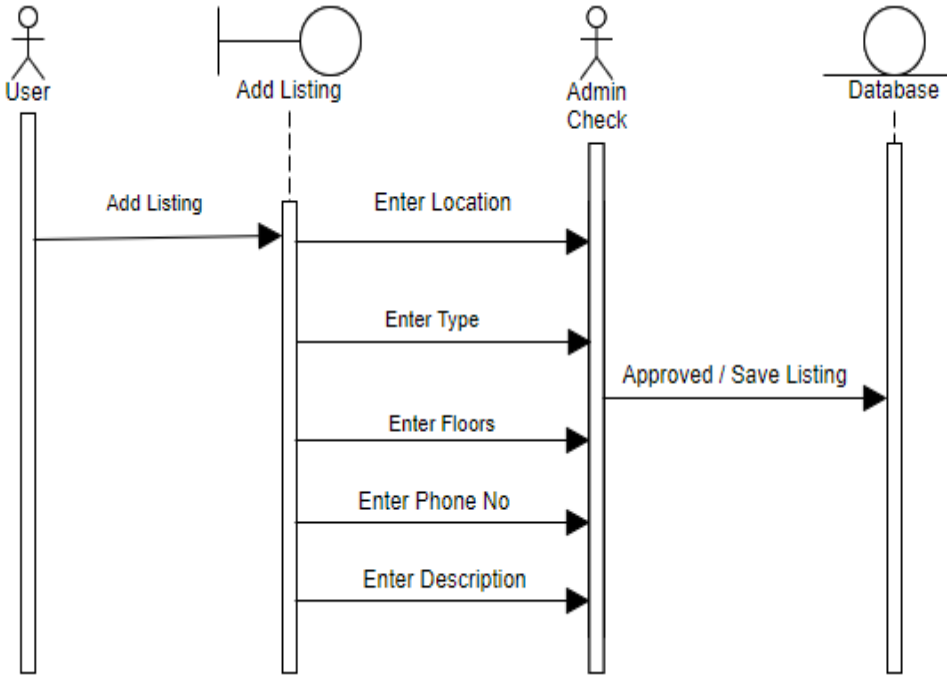

Figure 4.7 Sequence Diagram <<Add Listing>>

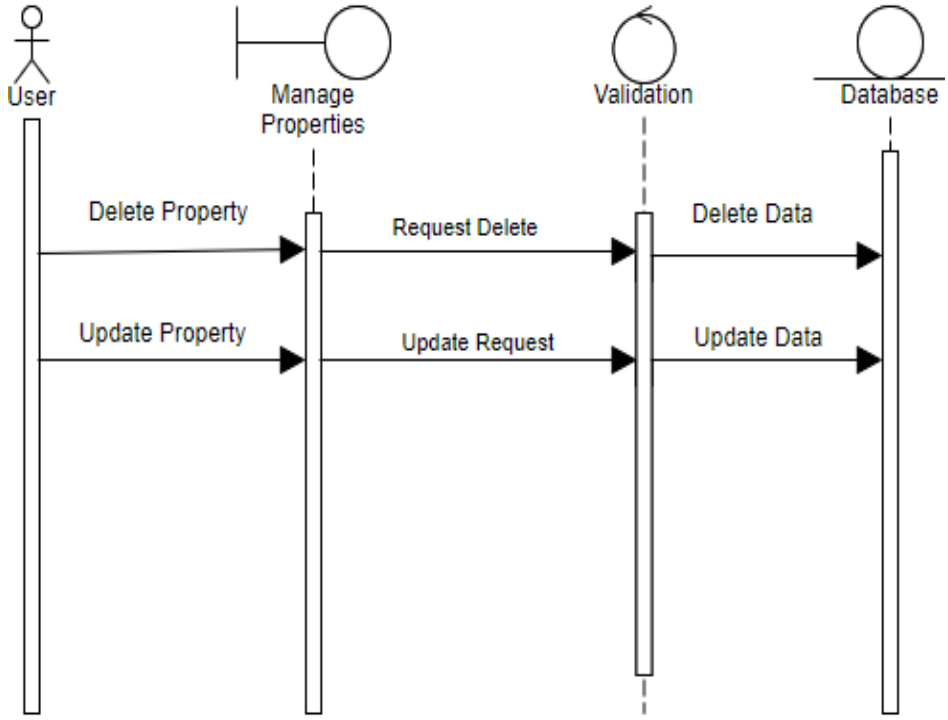

Figure 4.8 Sequence Diagram << Manage Properties>>

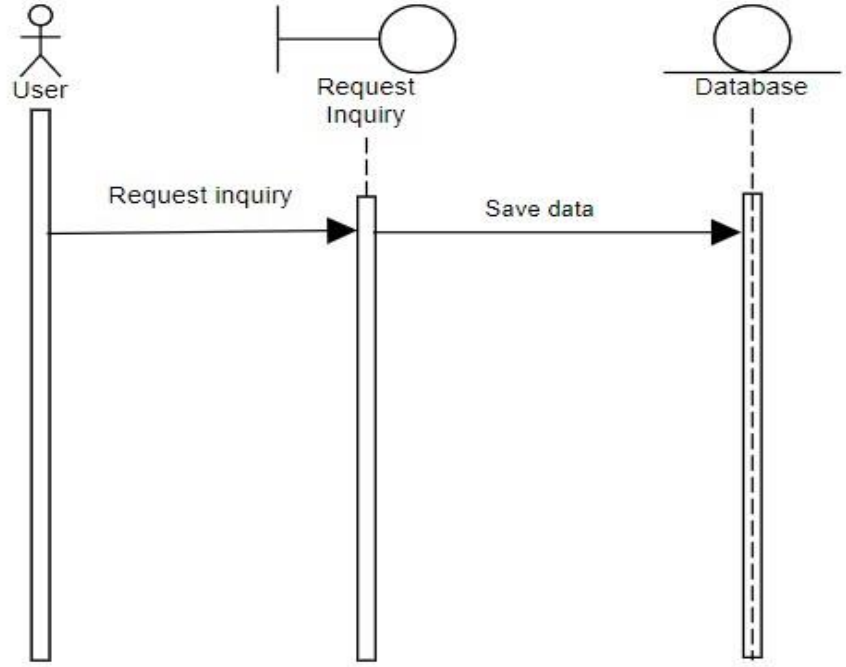

Figure 4.9 Sequence Diagram << Inquiry Request >>

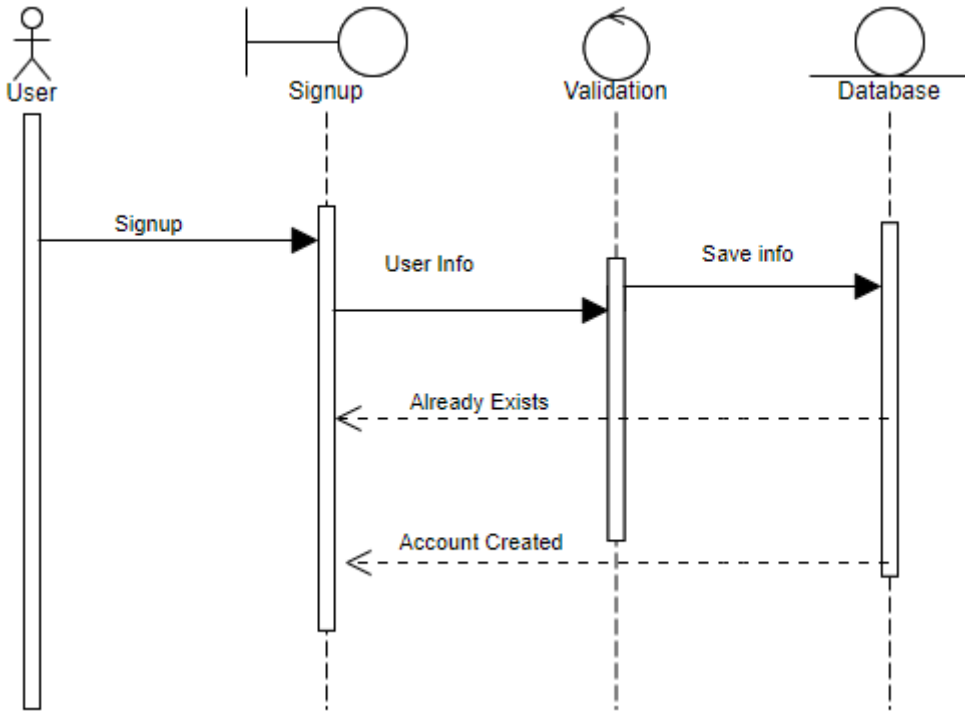

Figure 4.10 Sequence Diagram << Signup >>

4.2.5 Activity Diagram

An activity diagram depicts the movement of activities from one to the next. This activity diagram can be thought of as a system operation. The activity diagram for the Online Real Estate System is created based on the use case.

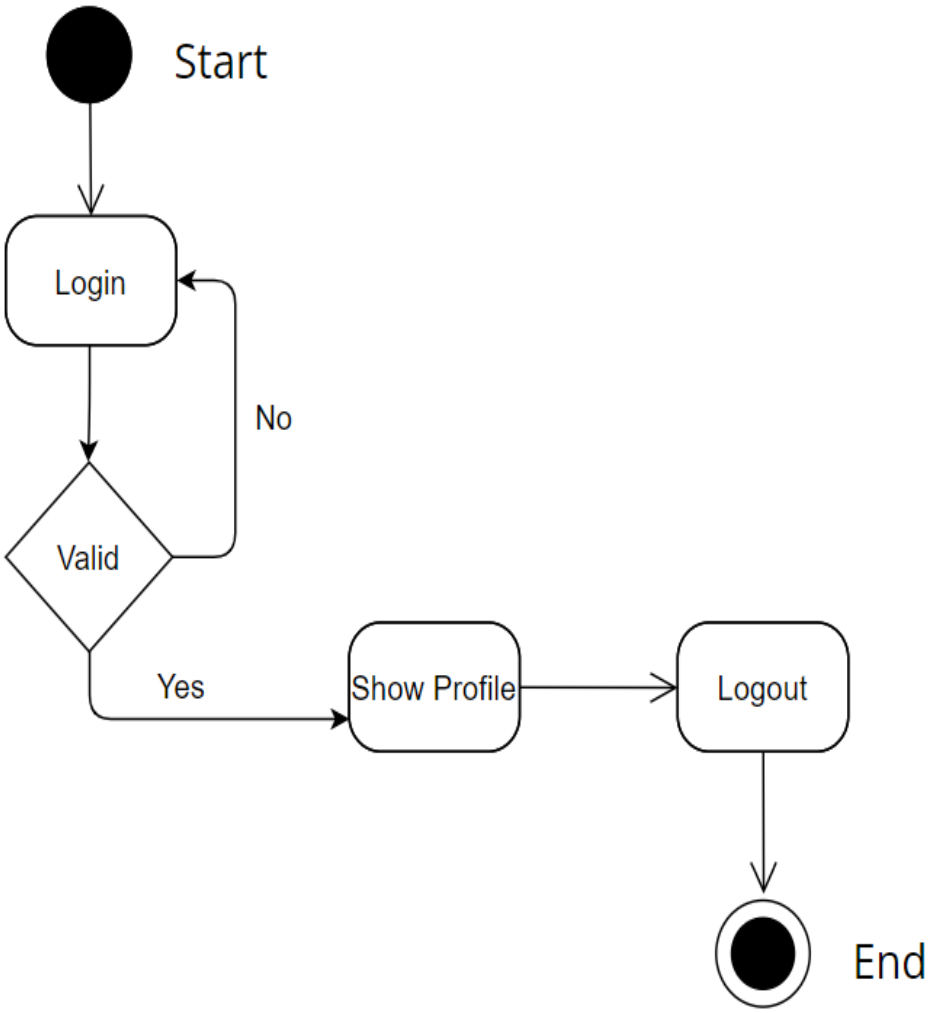

Figure 4.11 Activity Diagram of Login & Logout

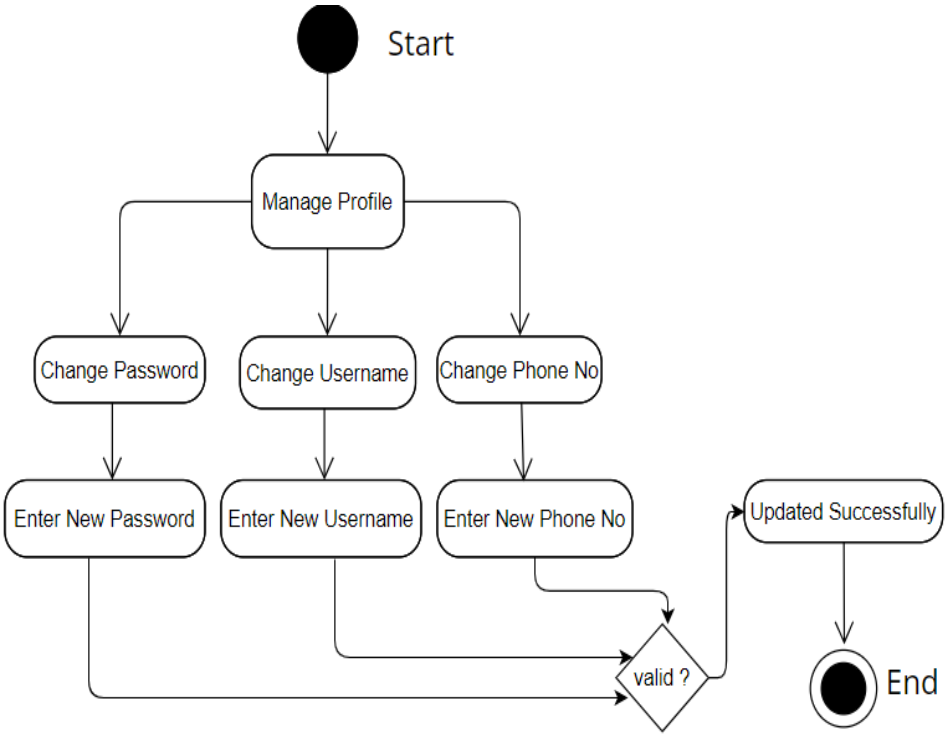

Figure 4.12 Activity Diagram of Manage Profile

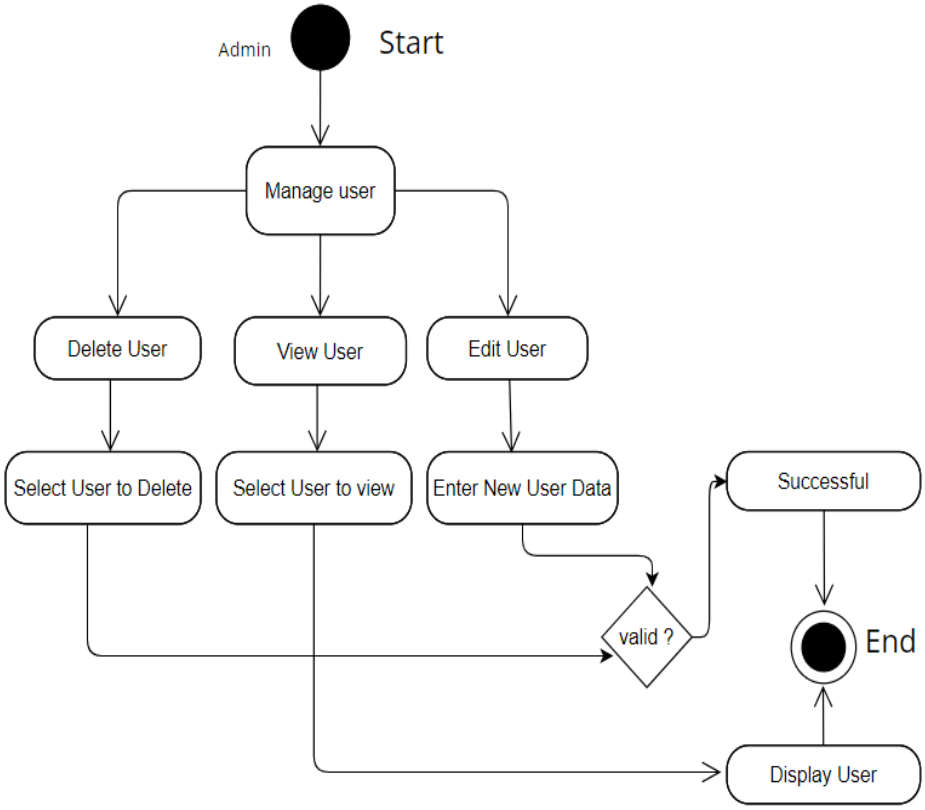

Figure 4.13 Activity Diagram of Manage user

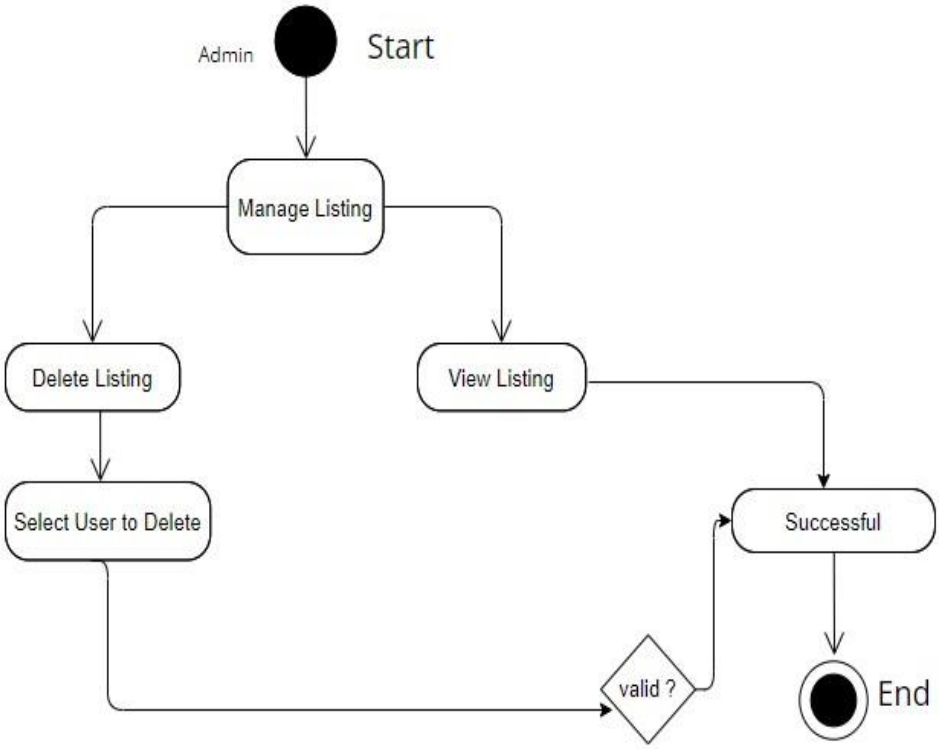

Figure 4.14 Activity Diagram of Manage Listing

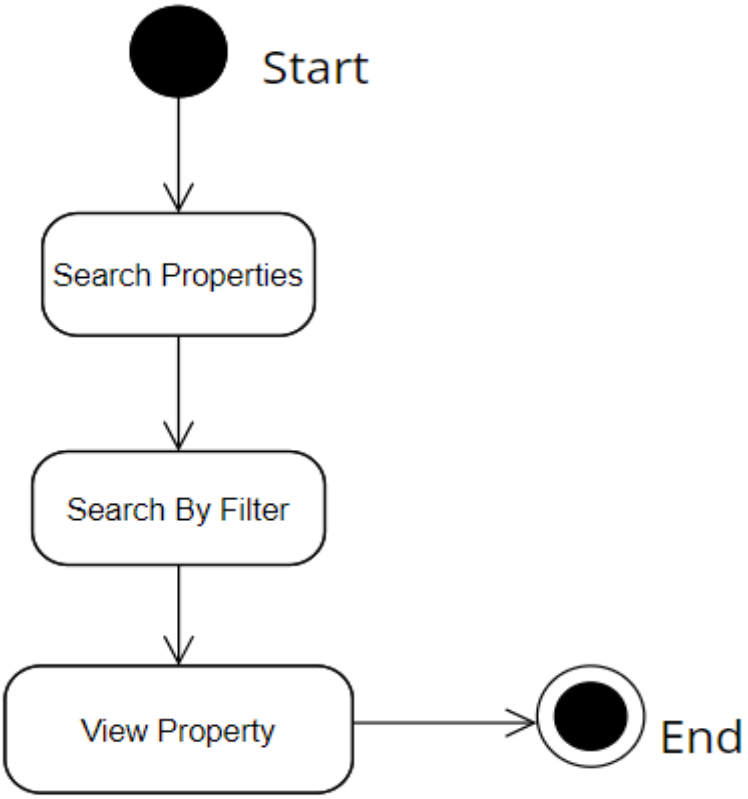

Figure4.15 Activity Diagram of Search Properties

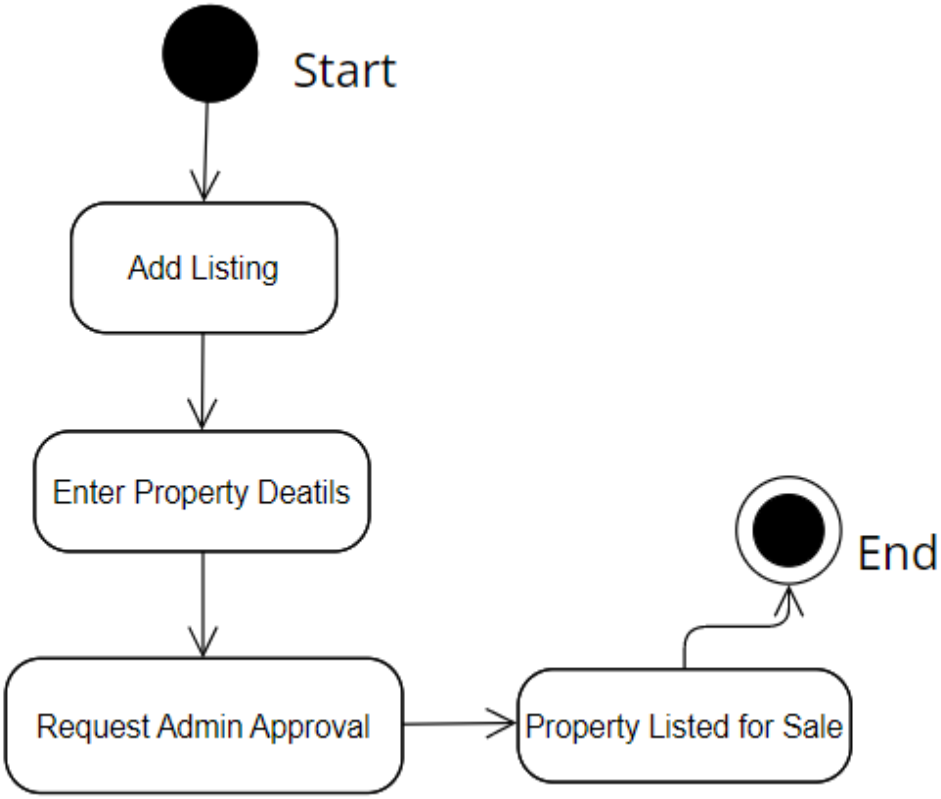

Figure 4.16 Activity Diagram of Add Listing

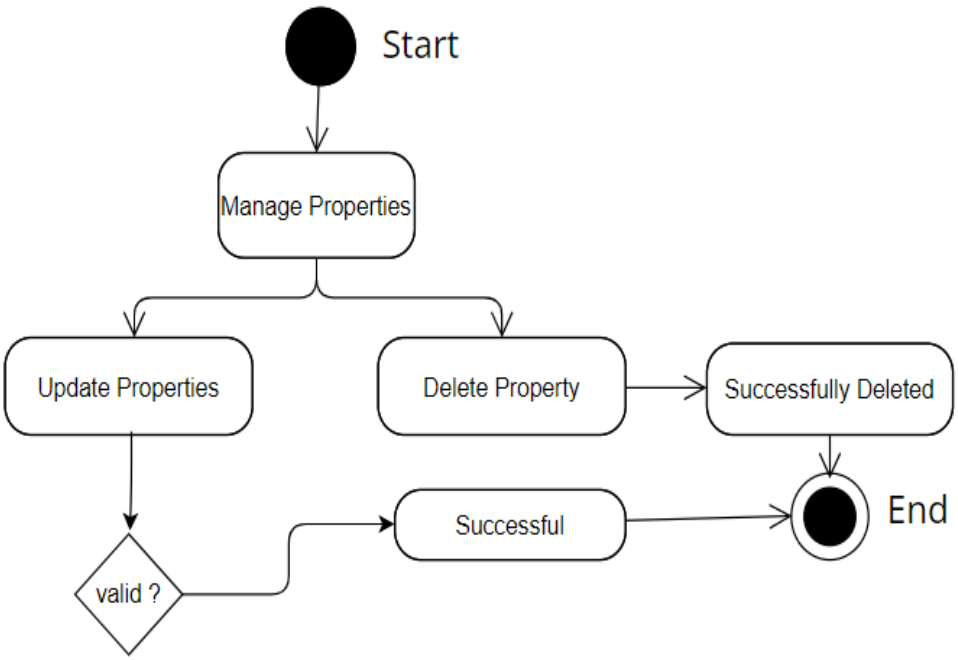

Figure 4.17 Activity Diagram of Manage Properties

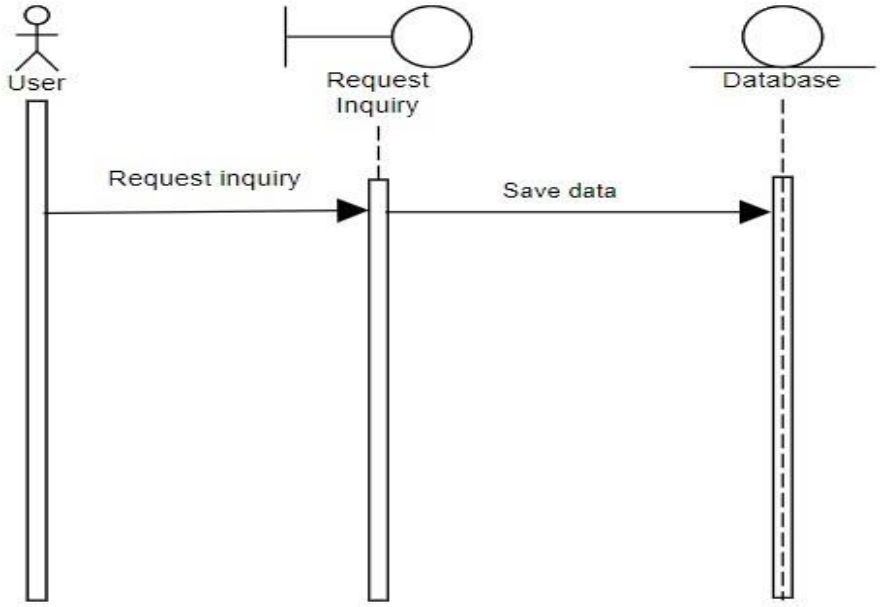

Figure 4.18 Activity Diagram of Inquiry Request

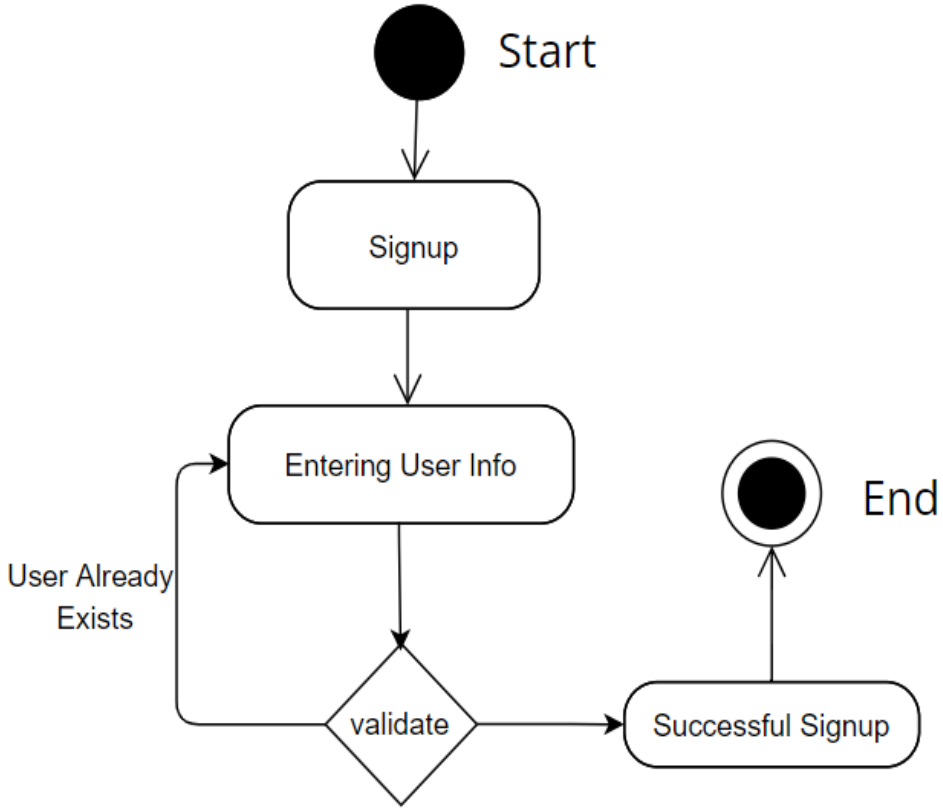

Figure 4.19 Activity Diagram of Signup

4.3 Architecture Design

The structure and behaviours of a system's operation are described by its architecture, which is a conceptual design. Actors or users who interact with this system The levels are represented by three layers: which are data access layer, application layer, and business logic layer. Within the system, each layer has its own set of rules and unique characteristics and responsibilities. The application layer represents the system's User Interface. This layer allows the user to engage with the system and obtain access to its functions. The business logic layer serves as a controller between the application layer and the data access layer. This layer checks user input and transfers data from the application layer to the data access layer.

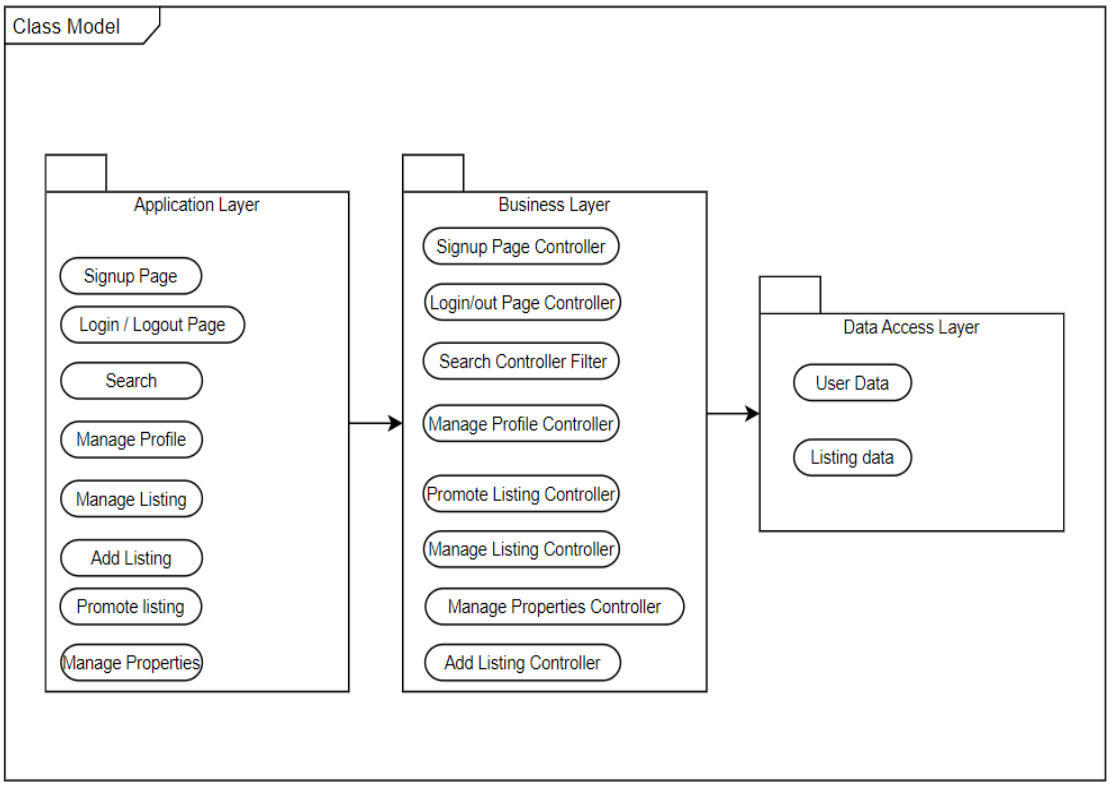

Figure 4.20 System Architecture

4.4 Database Design

Database Design is a framework for data storage, retrieval, and analysis. It is possible to determine the organization and operation. Diagram of Entity Relationships

(ERD) is a database architecture resulting from the development of a model based on entity, attribute, and relationship.

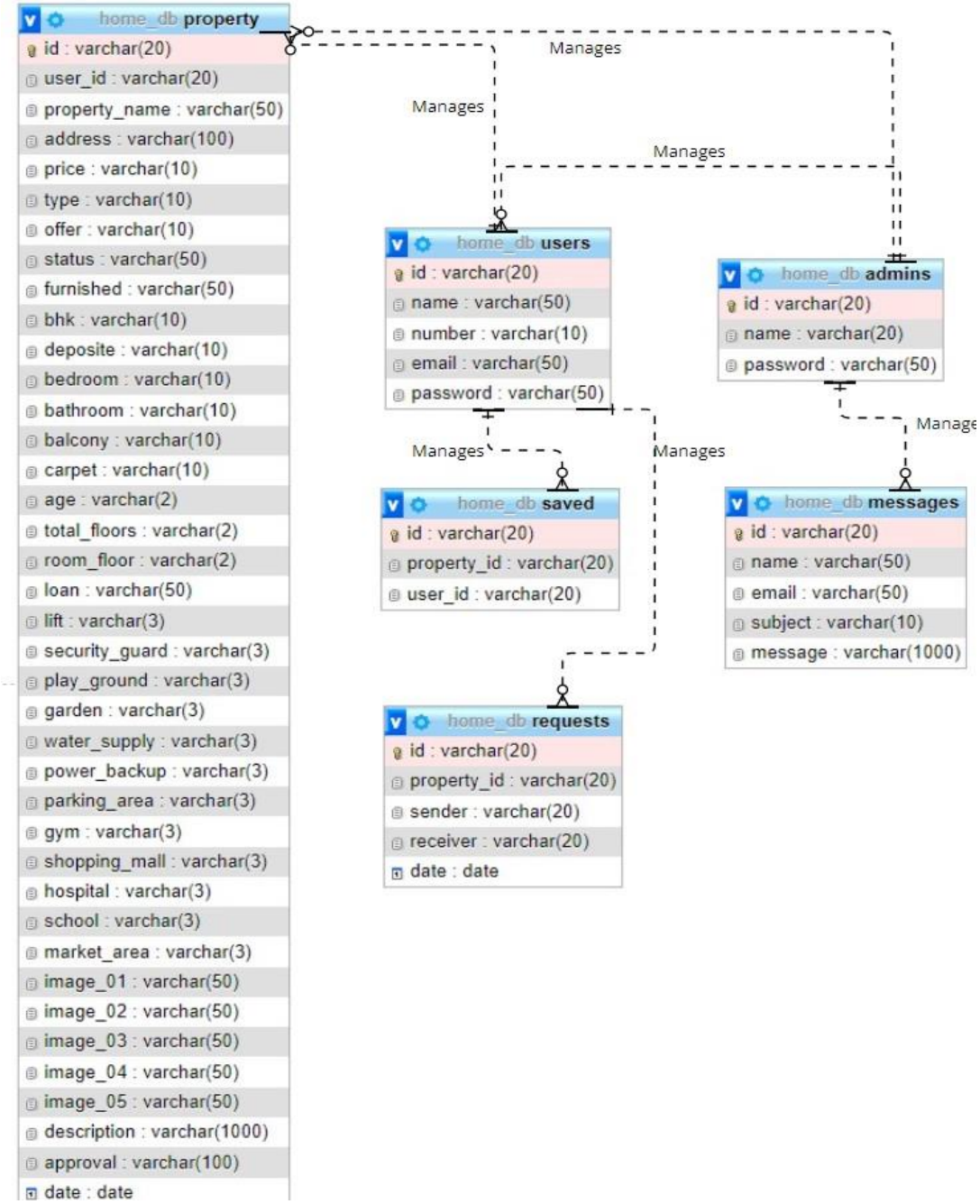

Figure 4.21 Entity Relationship Diagram (ERD)

4.5 Data Dictionary

Table 4.3 Data Dictionary

Table	Attribute	Type	Length	PK	Null
Admin	Admin_ID	Unique identi		PK	Not Null
	UserName		50		Not Null
	Password	Varchar	20		Not Null
Users	User_ID	Unique identi		PK	Not Null
	Name	Varchar			Not Null
	Email	Varchar	50		Not Null
	Password	Varchar	20		Not Null
	Number	Varchar	14		Not Null
Property	Property_ID	Unique identi		PK	Not Null
	User_Id	Varchar	100		Not Null
	Propert_ name	Varchar	50		Not Null
	Address	Varchar	50		Not Null
	Price	Varchar	20		Not Null
	Type	Varchar	20		Not Null
	Offer	Varchar	20		Not Null
	Status	Varchar	20		Not Null
	Furnished	Varchar	20		Not Null
	Bhk	Varchar	20		Not Null
	Deposite	Varchar	20		Not Null
	Bedroom	Varchar	20		Not Null
	Bathroom	Varchar	20		Not Null
	Balcony	Varchar	20		Not Null
	Carpet	Varchar	20		Not Null
	Age	Varchar	20		Not Null
	Total_floors	Varchar	20		Not Null
	Room_floor	Varchar	20		Not Null

	Loan	Varchar	20		Not Null
	Lift	Varchar	20		Not Null
	Security_guard	Varchar	20		Not Null
	Play_ground	Varchar	20		Not Null
	Garden	Varchar	20		Not Null
	Water_supply	Varchar	20		Not Null
	Power_backup	Varchar	20		Not Null
	Parking_area	Varchar	20		Not Null
	Gym	Varchar	20		Not Null
	Shooping_mall	Varchar	20		Not Null
	Hospital	Varchar	20		Not Null
	School	Varchar	20		Not Null
	Market_area	Varchar	50		Not Null
	Image_01	Varchar	50		Not Null
	Image_02	Varchar	50		
	Image_03	Varchar	50		
	Image_04	Varchar	50		
	Image_05	Varchar	50		
	Description	Varchar	1000		Not Null
	Date	Varchar	14		Not Null
Requests	Request_ID	Unique indent		PK	Not Null
	Property_Id	Varchar	50		Not Null
	Sender	Varchar	50		Not Null
	Receiver	Varchar	50		Not Null
	Date	Varchar	50		Not Null
Saved	Save_Id	Varchar	50		Not Null
	Property_Id	Varchar	50		Not Null
	User_Id	Varchar	50		Not Null
Messages	Message_Id	Varchar	50		Not Null
	Name	Varchar	50		Not Null
	Email	Varchar	50		Not Null
	Subject	Varchar	50		Not Null
	Message	Varchar	50		Not Null

4.6 Interface Design

In the interaction between humans and computers, the importance of interface design cannot be overstated. The goal of the interface is to show how the system works. Furthermore, user-friendly design is required to ensure that users can access and interact with system functionalities quickly and effortlessly.

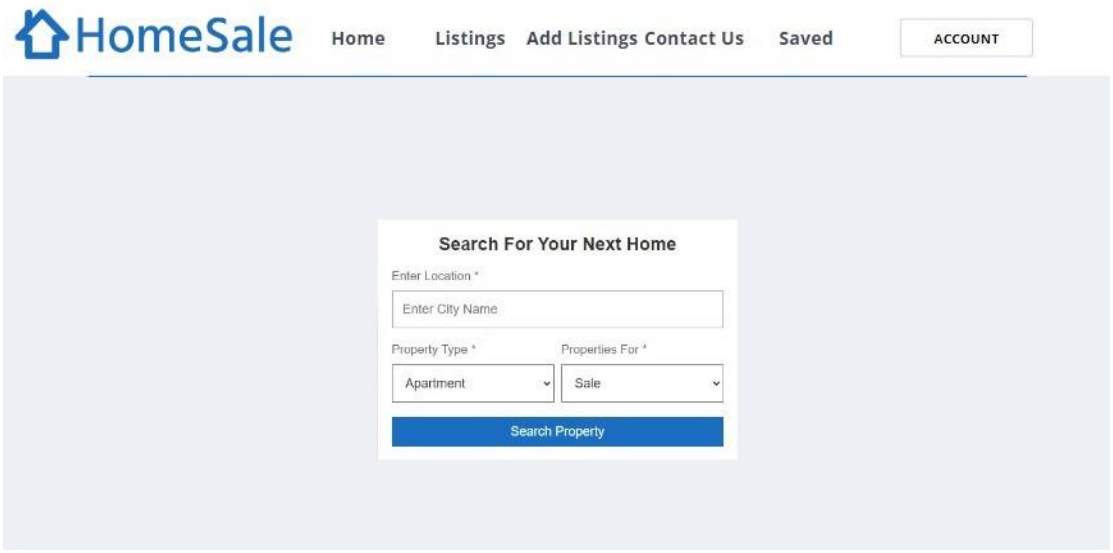

Figure 4.22 Home Page for HomeSale

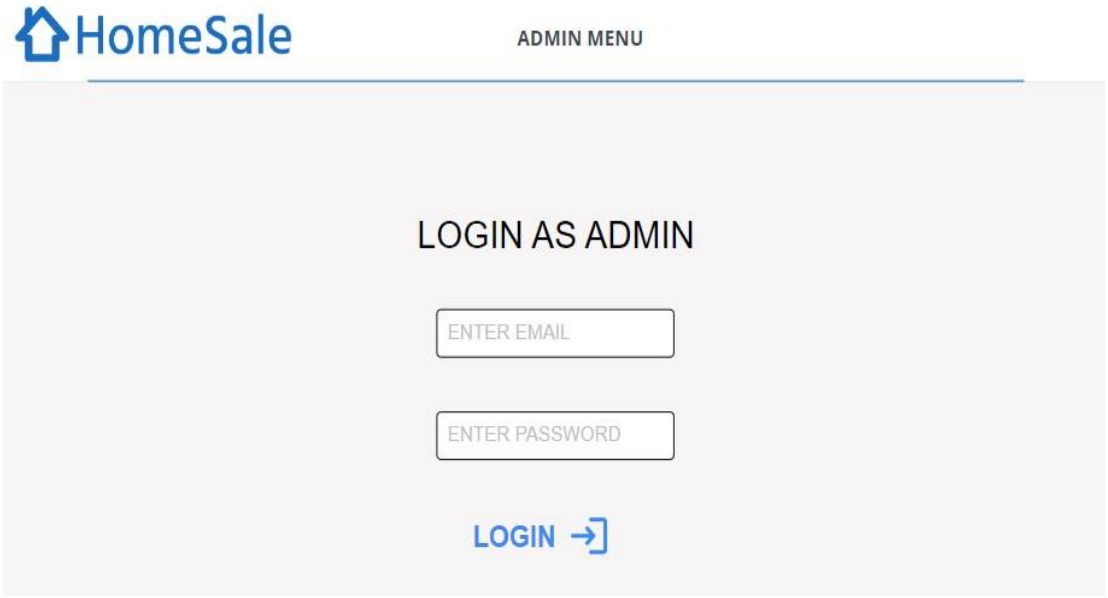

Figure 4.23 Login Page for HomeSale

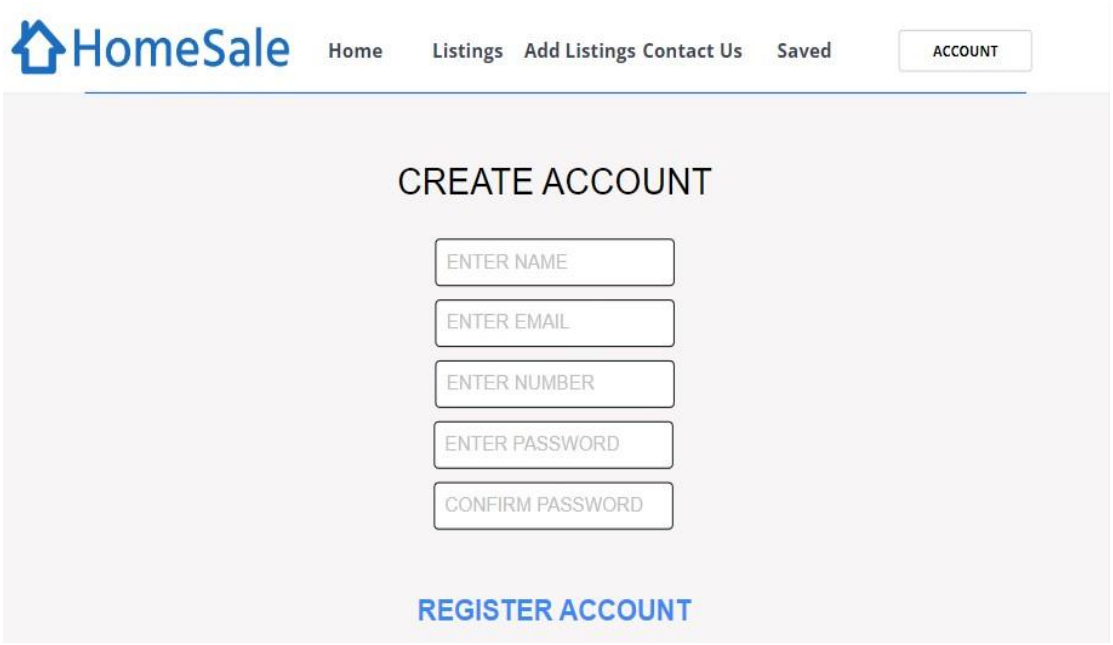

Figure 4.24 Signup Page for HomeSale

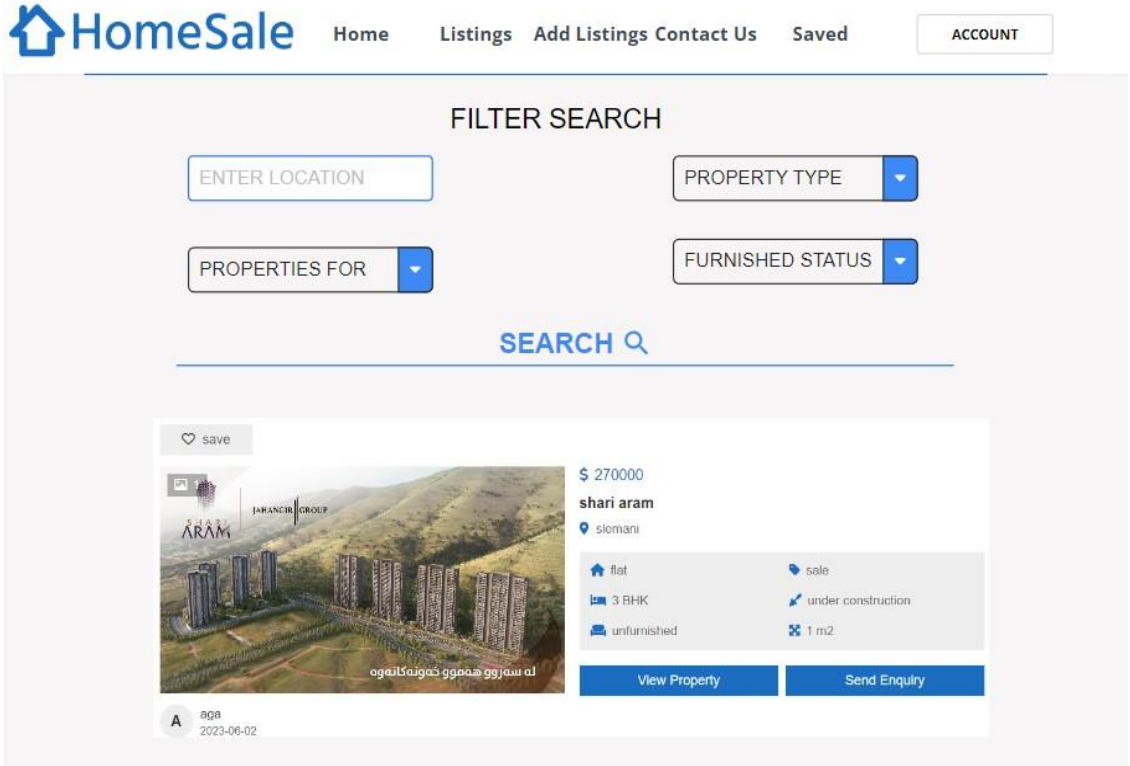

Figure 4.25 Listings Page for HomeSale

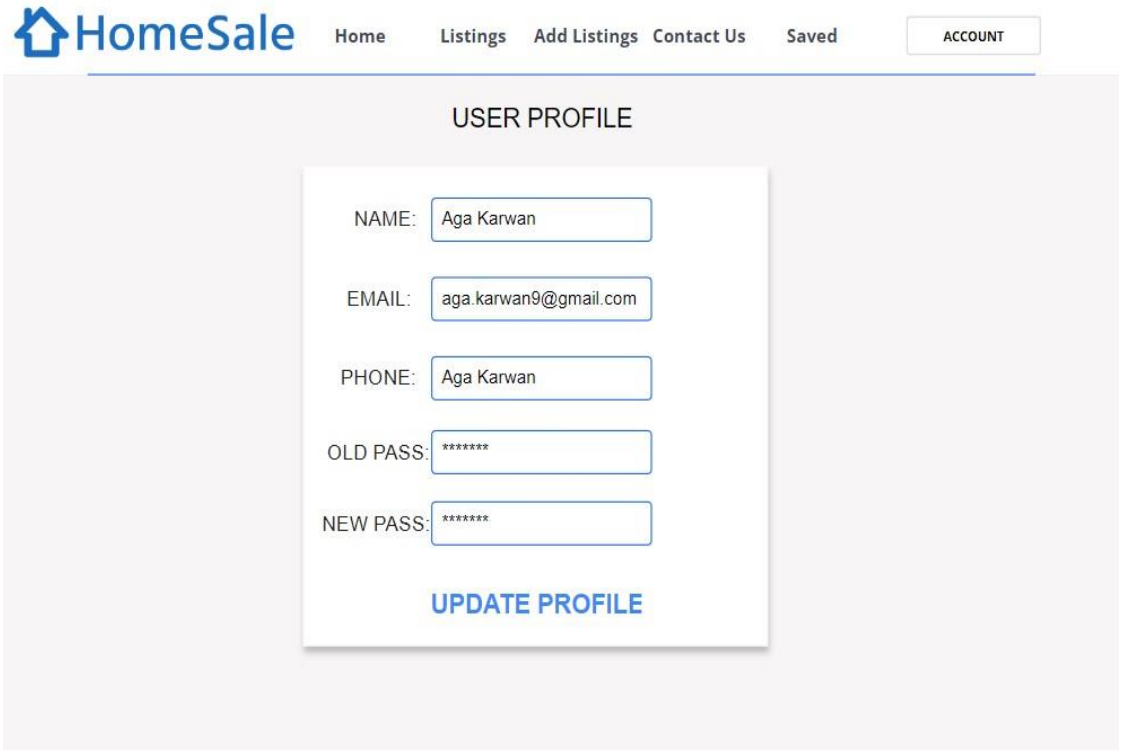

Figure 4.26 User Profile Page for HomeSale

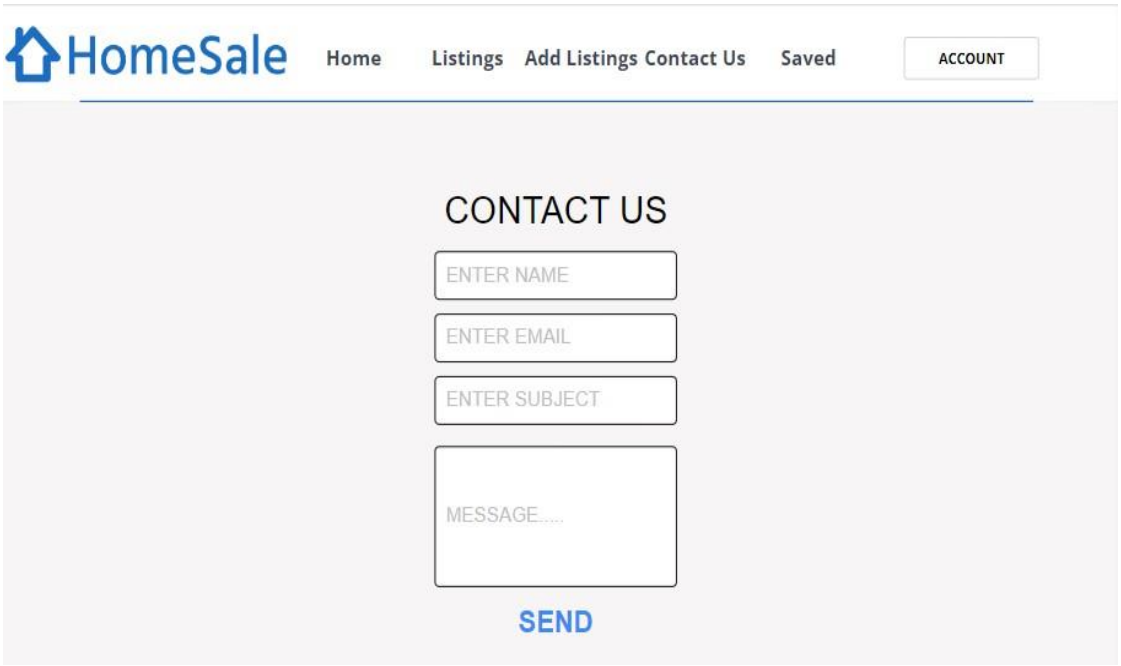

Figure 4.27 Contact Us Page for HomeSale

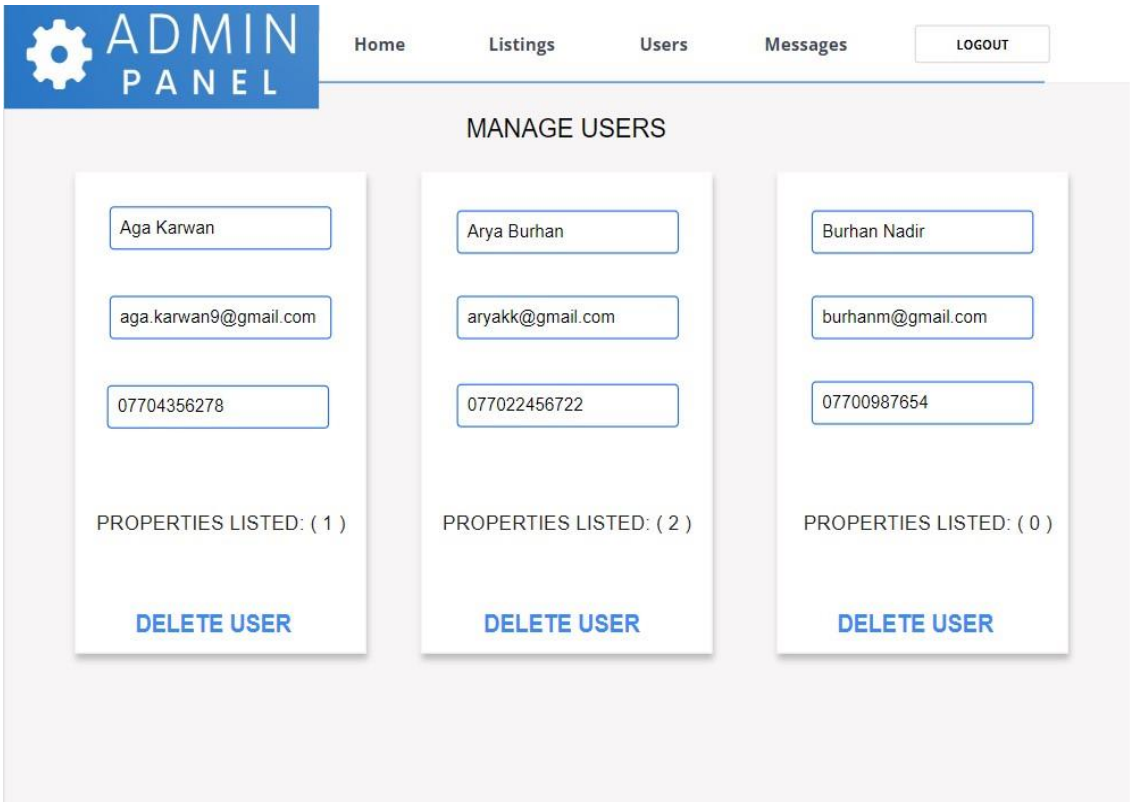

Figure 4.28 Manage User Page for HomeSale Admin

4.7 Page Navigation

Here I will discuss the page navigation for both user and admin type users.

4.7.1 Page Navigation for User

Page navigation for user has six functions to choose from after login to account, managing their properties listed for sale, adding a new listing, managing their profile, using the contact us to complain to the website admin, searching for a property and save lists to check saved properties for later.

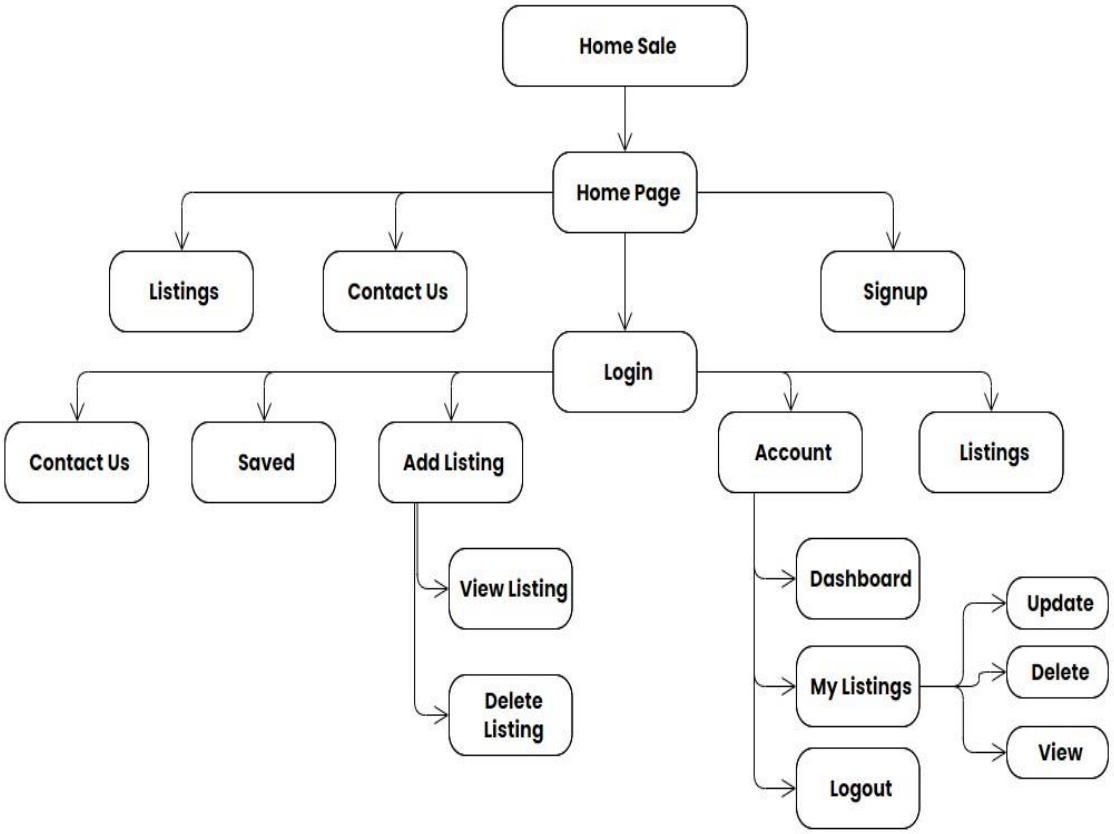

Figure 4.29 Page Navigation for User

4.7.2 Page Navigation for Admin

Page Navigation for admin has four functions one being manage user where admin can delete or edit a user data and the second one is manage listing where the admin can delete a listing, third is View messages where admin can view contact us messages made by users, forth is admin dashboard where admin can view everything and edit its own profile.

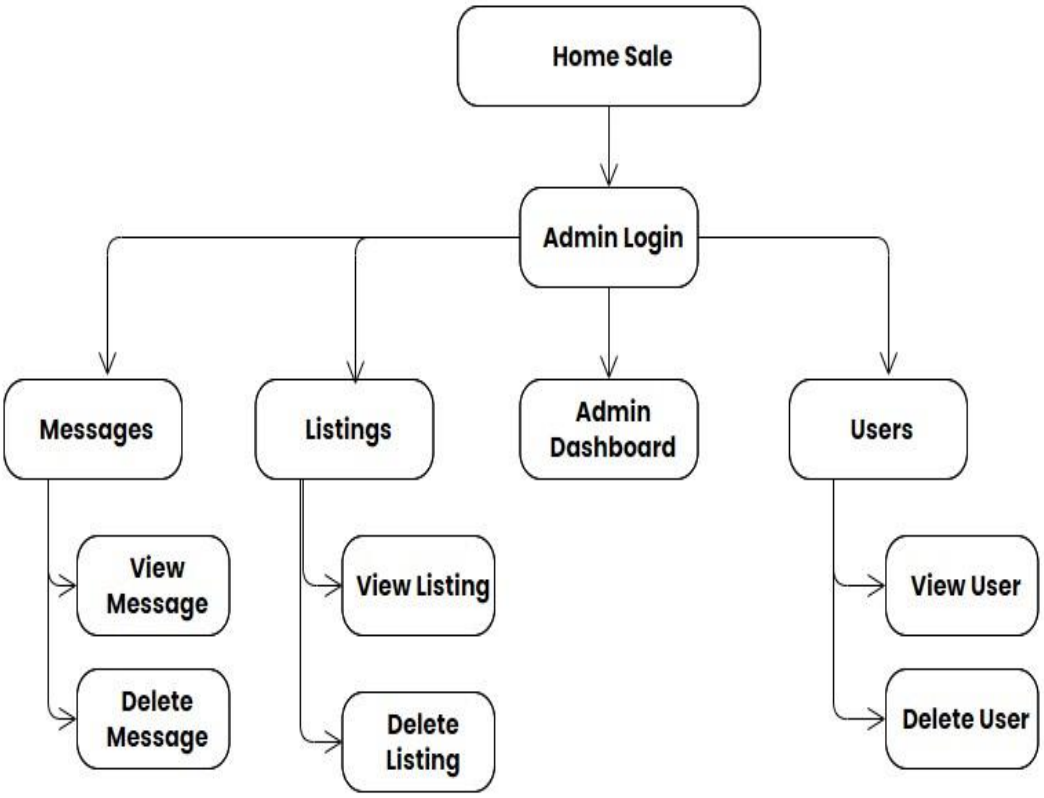

Figure 4.30 Page Navigation for Admin

4.8 Chapter Summary

This chapter covers the fundamental requirements for Online Real Estate Design and analysis of systems. A number of diagrams have been created to make the analysis and design of the system clearer Among these are use case diagrams, sequence diagrams, activity diagrams, architecture design. The ERD and the data dictionary are used to provide an explanation for database design. Each design is useful in the next step of the system development, which is the construction phase.

CHAPTER 5

CONCLUSION

5.1 Introduction

The process of system development in terms of coding based on the system definition is the focus of the implementation and testing. This procedure should be followed after determining the system's objectives and requirements. should follow the rules. To fix the bugs, the development and testing were done iteratively. existing flaws or errors as quickly as possible. To begin, all of the necessary development tools, such as Visual Studio Code and the Xampp package, were downloaded. As it is implemented in both mobile and web-based applications, this technology aids in the development of the Online Real Estate Web Application System. The project structure featured an index HTML file that serves as the system's main entry point, a root module for system control, and pages made up of HTML, JS, and CSS files. After that, the implementation phase began with the creation of a user interface for each function. The HTML and CSS files in each page's folder are primarily coded in this step. Then a new MYSQL project was built to contain all of the relevant data. In order to communicate with MYSQL from the Front-End. After setting up MYSQL, after that the implementation began for every page in the web application system.

5.2 Coding of System Main Functions

PHP, HTML, CSS, and JavaScript were used to construct the Online Real Estate System's front-end design. Programming language for database management systems (DBMS), MYSQL. Additionally, Visual Studio Code is an IDE for programming. The coding for the system's main features will be covered in this part.

5.2.1 Login Page

A login page is an entry page for a website that requests a password to access the website. The website currently employs a number of different authentication methods, although this system still depends on a password-based system. The system encrypts a user's password before matching it to the user database. Figure 5.1 displays the login function's code.

```php
<?php

include 'include/connect.php';

if(isset($_COOKIE['user_id'])){
   $user_id = $_COOKIE['user_id'];
}else{
   $user_id = '';
}

if(isset($_POST['submit'])){

   $email = $_POST['email'];
   $pass = sha1($_POST['pass']);

   $select_users = $conn->prepare("SELECT * FROM `users` WHERE email = ? AND password = ?
      LIMIT 1");
   $select_users->execute([$email, $pass]);
   $row = $select_users->fetch(PDO::FETCH_ASSOC);

   if($select_users->rowCount() > 0){
      setcookie('user_id', $row['id'], time() + 60*60*24*30, '/');
      header('location: dashboard.php');
   }else{
      $warning_msg[] = 'Incorrect Username Or Password';
   }
}
```

Figure 5.1 Code snippet for Login

5.2.2 Registration

In order to access the Online Real Estate Web Application, the users will need to sign up their new accounts. User must enter information during registration, including your name, number, email, password and confirm password. If the same email is entered already have an account, the system will tell you that it already taken and that you need to enter another email. Figure 5.2 displays an example of user registration code.

```php
include 'include/connect.php';

if(isset($_COOKIE['user_id'])){
   $user_id = $_COOKIE['user_id'];
}else{
   $user_id = '';
}

if(isset($_POST['submit'])){

   $id = create_unique_id();
   $name = $_POST['name'];
   $name = filter_var($name, FILTER_SANITIZE_STRING);
   $number = $_POST['number'];
   $number = filter_var($number, FILTER_SANITIZE_STRING);
   $email = $_POST['email'];
   $email = filter_var($email, FILTER_SANITIZE_STRING);
   $pass = sha1($_POST['pass']);
   $pass = filter_var($pass, FILTER_SANITIZE_STRING);
   $c_pass = sha1($_POST['c_pass']);
   $c_pass = filter_var($c_pass, FILTER_SANITIZE_STRING);

   $select_users = $conn->prepare("SELECT * FROM `users` WHERE email = ?");
   $select_users->execute([$email]);

   if($select_users->rowCount() > 0){
      $warning_msg[] = 'email already taken!';
```

Figure 5.2 Code snippet for User Registration

5.3 Interfaces pf System Main Functions

Because it acts as a bridge between the system database and end users, the system interface is an important component. Better user experience is facilitated by a good user interface. An interface that is easy to use is required for systems like the Online Real Estate Web Application. Some of the interfaces are shown in the Figures bellow, Figure 5.3 to 5.4.

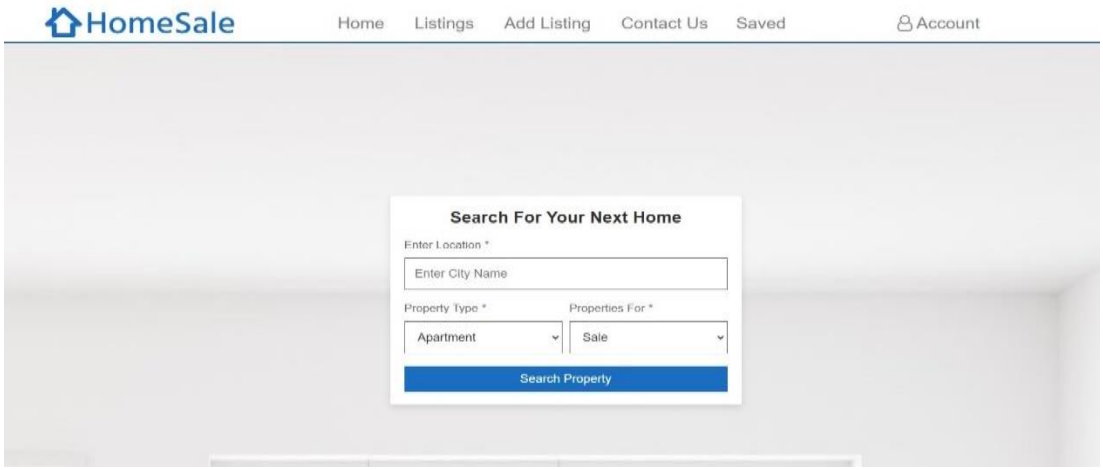

Figure 5.3 Interface for Home Page

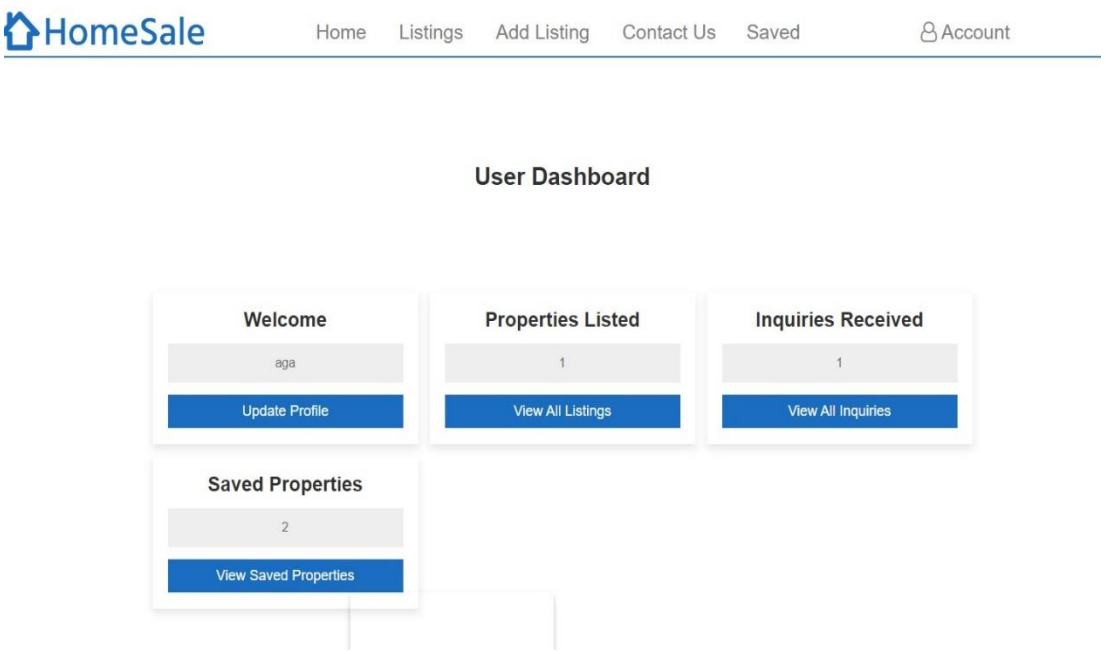

Figure 5.4 Interface for User Profile

5.4 Testing

Software development must include system testing since it can catch errors early and guarantee that the system works as planned. Black-box testing, white-box testing, and user acceptability testing are the three categories of testing that will be used for system testing.

5.4.1 Black Box Testing

I will use black box testing for my project because the focus is on the input and output generated by the system, black box testing does not require a tester to understand what is happening on the code side. This determines how the system responds to expected and unexpected user behaviors, as well as reaction time, usability, and reliability concerns. This testing evaluates critical subsystems such as the UI/UX, web server or application server, database, and integrated system. Black box testing focuses on data key-in during user, application, audit module, and other updates, additions, and deletion.

5.4.2 User Acceptance testing

User acceptability testing (UAT), also known as end user testing, determines the level of software acceptance. A final test is performed after the functional, system, and regression tests have been completed. The testing's objective is to confirm that the system complies with the requirements of the organization. Validation testing is carried out by end users who are familiar with the business requirement. A member of the QIU Corporation personnel is a responsible user for user testing. The user acceptance test for Manage User is shown in Table 5.3.

5.5 Chapter Summary

This chapter describes the processes of implementation and testing. All of the requirements gathered during the previous phase are expressed in the implementation phase as a system that fully complies with the need. The coding procedures must be done correctly to ensure that the required functionality can be provided and that all of the requirements are translated into the system. To ensure that the system developed is error-free, the encoding operations performed throughout the implementation process should be thoroughly checked during the testing phase.

CHAPTER 6

CONCLUSION

6.1 Introduction

This chapter is about the results and achievements of the Online Real estate, the system will be discussed in this chapter, as well as suggestions for future enhancements and overall conclusion about the project.

6.2 Achievement of Project Objectives

The project began with a survey of students from QIU University. The goal is in order to obtain a better knowledge of the situation of the proposed system and benefits of Online Real Estate towards users for the community. After the procedure is finished, the background of the problem, as well as the present status and system, are identified, leading to a proposed solution for resolving the problems that we have now.

The literature review is discussed in the following chapter (Chapter 2). An analysis of the current system as well as three other systems that are currently being used. was conducted during this section. The systems chosen are similar to the proposed system in terms of features and processes. All elements and characteristics that might be useful are added in the proposed system during the analysis Searching for jobs using filters, applying online, and the technology employed are examples of aspects and features that have been combined with the proposed system

In Chapter 3, the system methodology is explained in full. The chosen approach, Iteration Development Methodology, has been explained and justified in relation to the chosen model. Starting with the Planning and Analysis phase and ending with the Evaluation phase, all aspects of the chosen approach are addressed. In addition, Analysis of Software Requirements, that incorporates hardware and software, was presented in this chapter.

The most important parts of the system are covered in Chapter 4. The analysis and design of systems are covered in this chapter. that includes everything from system flow, database design, and diagrams to requirements analysis (use case diagram, sequence diagram, and activity diagram), among other things. This chapter also includes an early interface design for the planned system (HomeSale).

The project's conclusion is detailed in Chapter 5. The Goals of the Project and Suggestions for Future Improvement are the topics of this chapter.

6.3 Chapter Summary

This chapter cover the conclusion about the project and the Online Real Estate system. A brief description of each chapter is also concluded.

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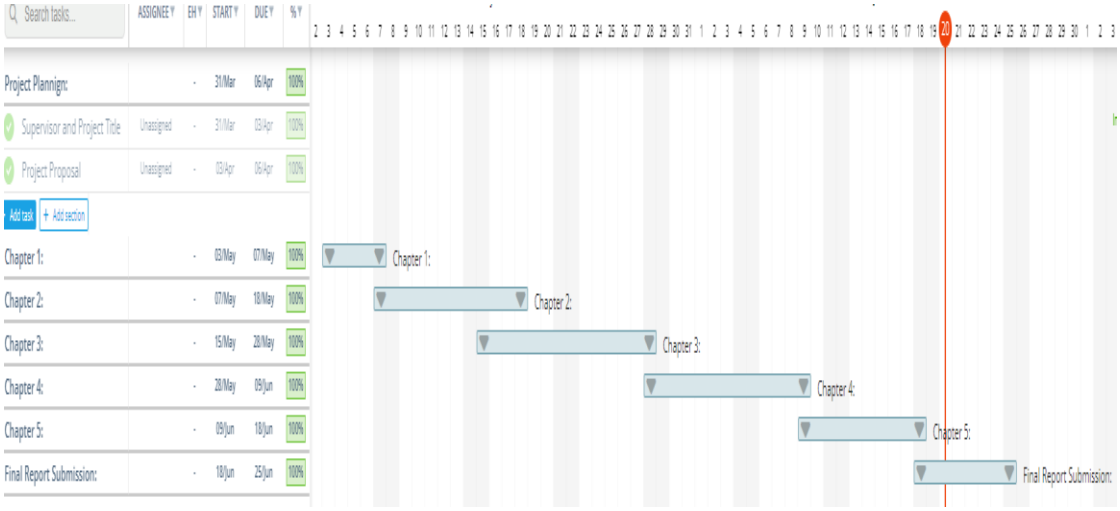
APPENDIX A

GANTT CART FOR PSM1 AND PSM2



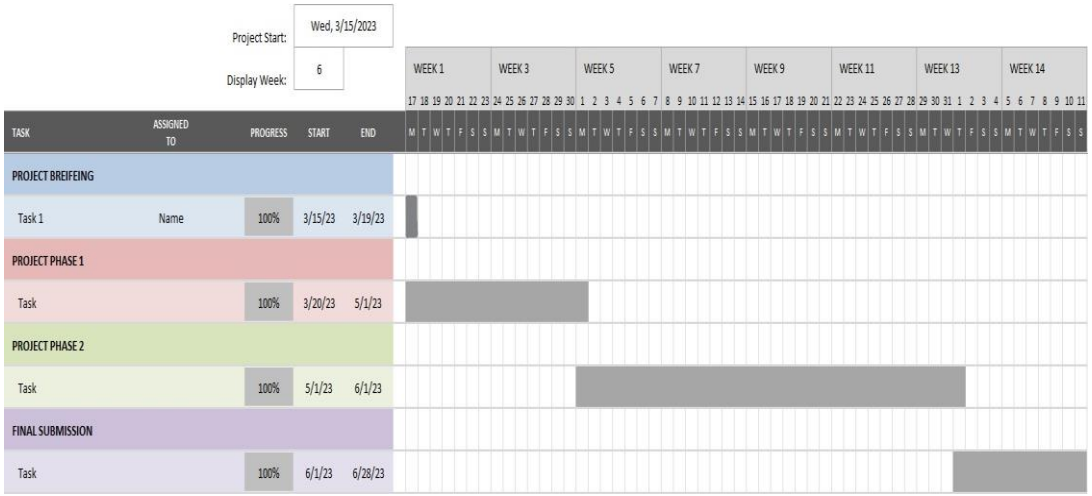


Figure 1.1 PSM1 and PSM2 Gantt Chart

APPENDIX B

SOFTWARE REQUIREMENT SPECIFICATION (SRS)

1. Introduction

1.1 Purpose

A Software Requirement Specification (SRS) is a document that outlines the functional and non-functional requirements of a software system in great detail. This Software Requirement Specification (SRS) is intended to outline the precise requirements of the Online Real Estate System. It also includes use scenarios that demonstrate how the user and the system interact. This document includes contains various diagrams, including a sequence diagram and a flow chart. Activity diagram.

1.2 Scope

Online Real Estate is a website that will be used to serve the community in Kurdistan region for selling and buying properties, every user will be able to experience free use of a fast, reliable, user-friendly website that is designed to help users by reducing time taken in the process of buying and selling homes and the cost.

1.3 Definition, Acronyms and Abbreviation

Table 1.1 Definition, Acronyms and Abbreviation

Acronym/ Abbreviation/ Terms	Definition
SRS	**Software Requirement Specification**
UC	**Use Case**

1.4 Reference

System Design Architecture Lecture slides on QIU eLearning

1.5 Overview

This Software Requirement Specification (SRS) will be divided into three sections, the first of which will cover the introduction, which will provide you an overview of the entire SRS. The second element is an overall description of the system, which includes a description of the requirements that will limit how the system is constructed and operated. The third section is a detailed need that goes into great detail about the system Specifications.

2 Overall Description

The HomeSale website is made up to 11 modules in total. The modules are listed below:

1. Manage Listing
2. Manage User
3. Login and Logout
4. Add Listing
5. Manage Profile
6. Manage Properties
7. Search Properties
8. Signup
9. Saved Listing
10. View Inquiries
11. Contact Us

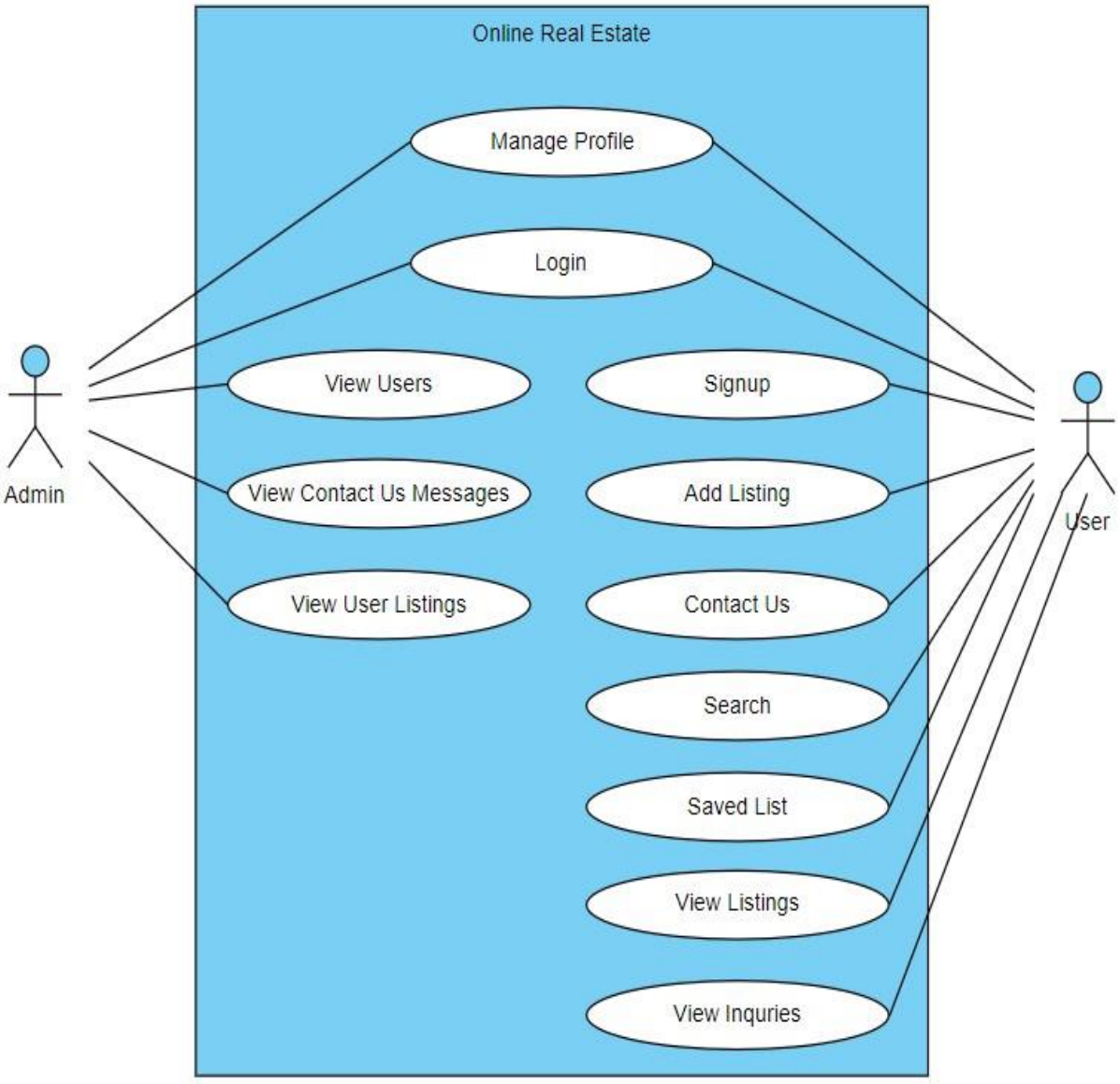


Figure 2.1 Use Case Diagram for Online Real Estate

2.1 Product Perspective

Online Real Estate system is a web-based system that is made to improve property buyers and sellers experience in Kurdistan Region and Iraq, this website is built in a user-friendly way and also it is very efficient and reliable. The website will reduce the time taken to buy or sale a home from days to a few minutes from their phone or laptop.

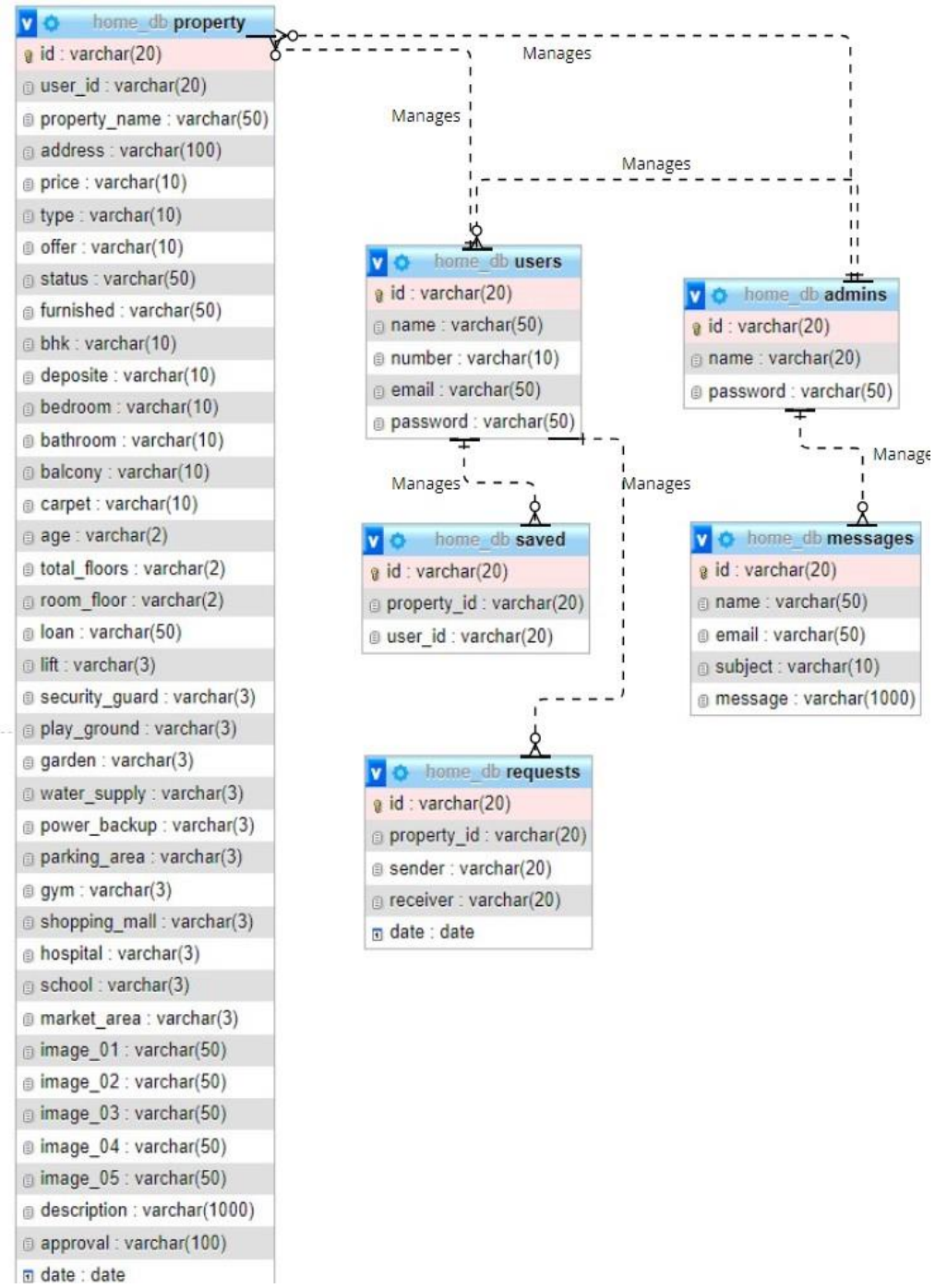


Figure 2.2 Entity Relationship Diagram for Online Real Estate

2.1.1 System Interface

To ensure that the Online Real Estate System functions properly,

2.1.1 Software Interface

1. Software: Device Speciation
2. OS Edition: Windows 10 Pro
3. Integrated Development Environment: Visual Studio Code, XAMPP
4. Database Management System: MySQL
5. Framework: HTML, CSS, JS AND PHP
6. Web Browser: Google Chrome
7. Visual Modelling & Design Tool: Online Visual Paradigim
8. High Fidelity Prototype: Moqups
9. Microsoft Power Point 2020: To create the presentation slide.
10. Microsoft Word 2020: To document project report, SRS and SDD

2.1.2 Hardware Interface

1. Processor: Intel(R) Core (TM) i5-4300U CPU @ 1.90GHz 2.50 GHz
2. Random Access Memory: 8 GB
3. Hard Drive Capacity: 500 GB 4. Operating system architecture: 64-bit operating system, x64- based processor
4. Input device: Mouse and keyboard
5. Output device: Printer
6. Pen and Touch Display: No pen or touch input is available for this display

2.2 Product Function

Table 2.1 Data Description

NO.	USE CASE	DESCRIPTION
1	Manage User	This use case allows an admin to edit and delete users.
2	Manage Listing	This use case allows an admin to manage a user property that is listed for sale.
3	Manage Messages	This allows admin to view and delete contact messages
4	Add Listing	This use case allows a user to list a property for sale.
5	Search Properties	This use case allows user to search a property by location or many other things.
6	Manage Properties	This use case allows users to manage their properties that they listed for sale.
7	Manage Profile	This use case allows a user to manage their account to edit their details and data.
8	Login and Logout	This use case allows user and admin to login and logout the system.
9	Save Listing	This use case allows user to save the properties that they like and check it later.
10	Signup	This use case allows user to sign up for an account.
11	Inquiries	This use case allows users to send inquiry to any property they like

2.2 User Characteristic

Table 2.2 Description of Users

No.	Actors	Description
1	Admin	A user who is in charge of the system's configuration, maintenance, and any other operations that involve data.
2	User	A user is anyone who can search for properties based on their requirement, also can manage its profile and can add listings, Save listing, manage their properties and also manage their profile and many more.

2.3 Constraints

These are the constraints of Online Real Estate System:

Security

- Login is required.

When a user connects in to the system, only their approved username and password will be allowed to access the system.

Usability

- Ease-of-use

  The system's user must be able to utilize it after less than 0.5 hours of training.
- Clear to understand

  The website must have a well-organized user interface and easily identifiable icons to allow users to navigate without becoming confused.

Performance

- Time to respond

Reliability

- Availability of the application

  The application will be available to users 24 hours per day and seven days in a week.

- Reliability

  The application will give accurate cycling data and report it to the system in a format that is free of anomalies.

2.5 Assumptions and Dependencies

1. The Online Real Estate System, will begin with the user signing up for an account and start to sell properties or search for properties through personal preferences.

2. Using the website to look for properties whenever a user posts a property for sale.

3. User will be able to view property details and contact the owner, also user can manage their properties listed for sale, also user can manage its profile data.

2.6 Dependencies

1. If the server's operations are down due to technical problems, users of the Online Real Estate system will not be able to access the system.

2. If the admins are unavailable due to any problems, the users' requests such as promotion requests and requests to list a property for sale won't be answered.

3. Specific Requirements

3.1 System Features

Table 3.1 UC001 Login Use Case Description

Use Case Name	Login
Use Case ID	UC001
Actors	1. admin 2. User
Description	This use case illustrates how users interact with the system after logging in.
Pre-Condition	1. There is WIFI connection 2. Users must sign up before
Normal Flow	1. The user logs into the system. 2. The login page is displayed by the system. 3. The user enters its username and password. 4. The user clicks the Sign In button. 5. The system verifies the user's identity. If the authentication fails, the first exception flow is used. 6. Users are redirected to the user's Profile after successful login.
Alternative	
Exception	1. Authentication is unsuccessful. i. An error message appears, indicating that the username or password is invalid. A message from the system appears, suggesting that the authentication be retried.
Post-Condition	1. Successful login of users into the system Users are redirected to their Profile.

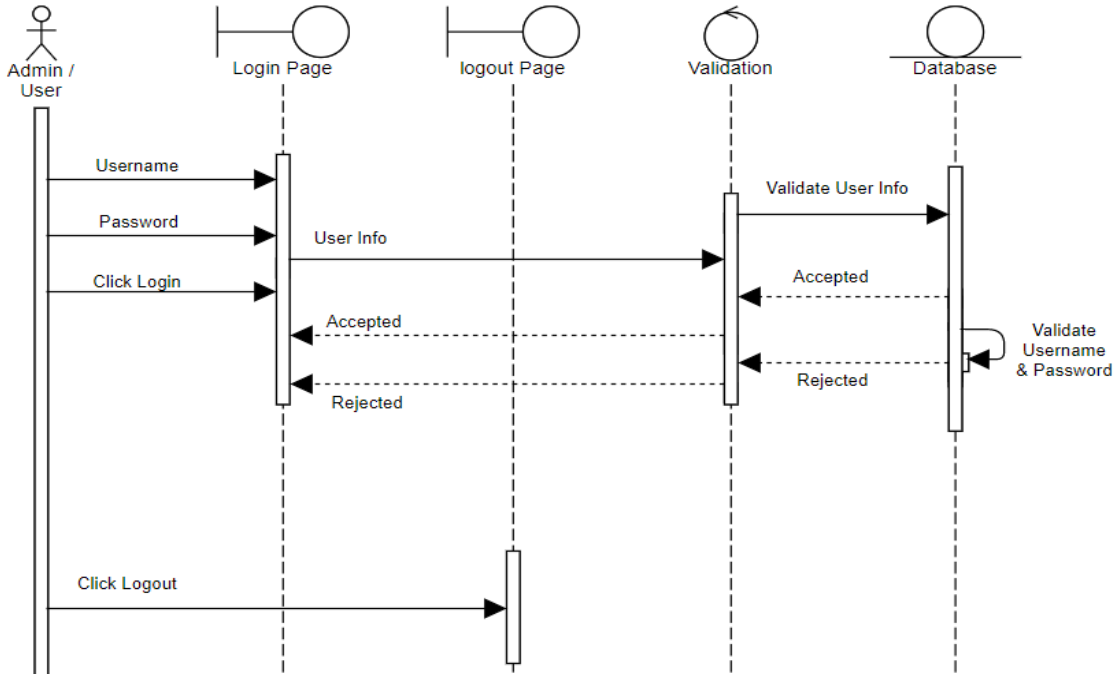


Figure 3.1 Sequence Diagram for Login

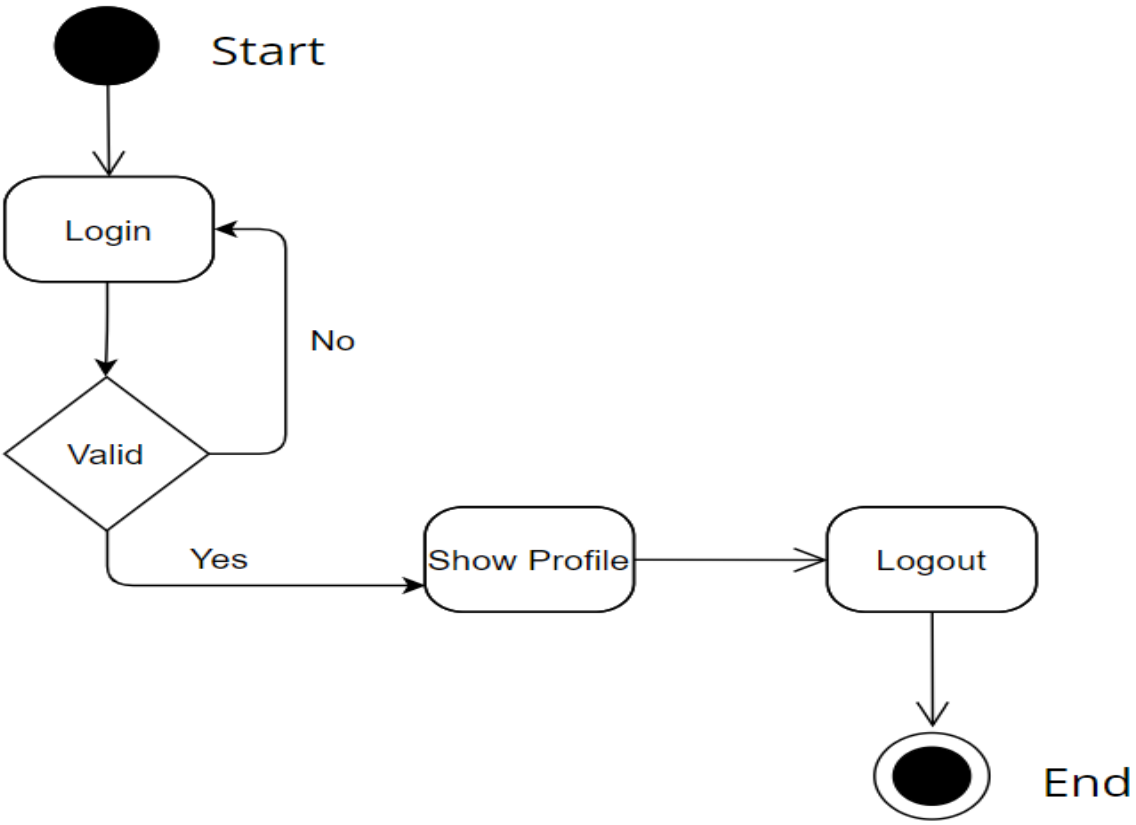


Figure 3.2 activity diagram Of Login Process.

Table 3.2 UC002 Signup Use Case Description

Use Case Name	Signup
Use Case ID	UC002
Actors	1. User
Description	This use case explains how users can sign up for their own account.
Pre-Condition	1. There is WIFI connection
Normal Flow	1. The Users presses the Register button. 2. The system brings up the registration form page. 3. users fill out their information. 4. The users press the Submit button. 5. The user is redirected to the home page by the system.

Alternative Flow	
Exception	i. Error message appear
Post-Condition	The system account has been successfully made for the user.

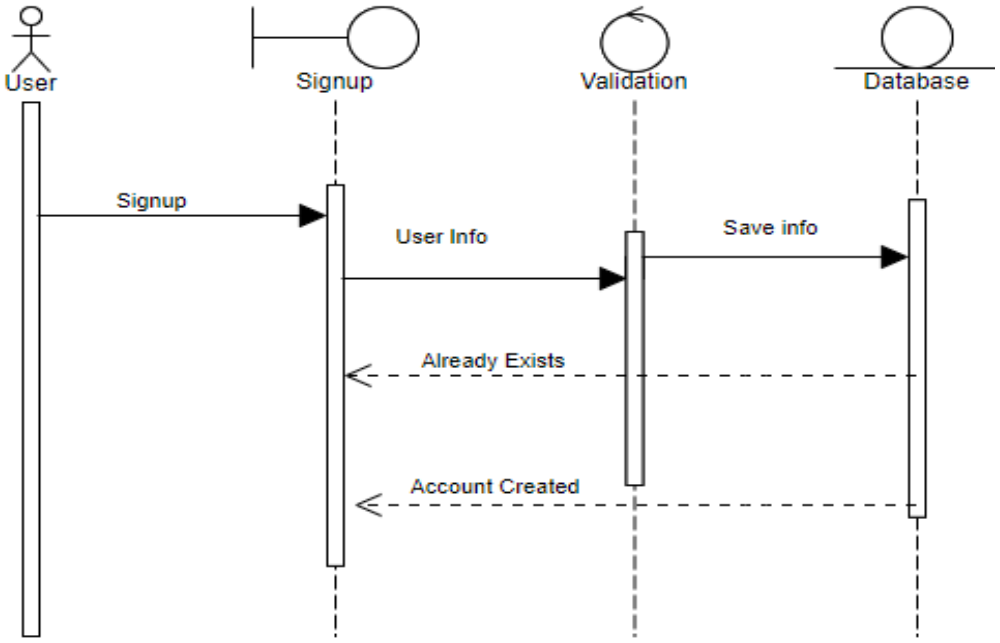


Figure 3.3 Sequence Diagram for Signup

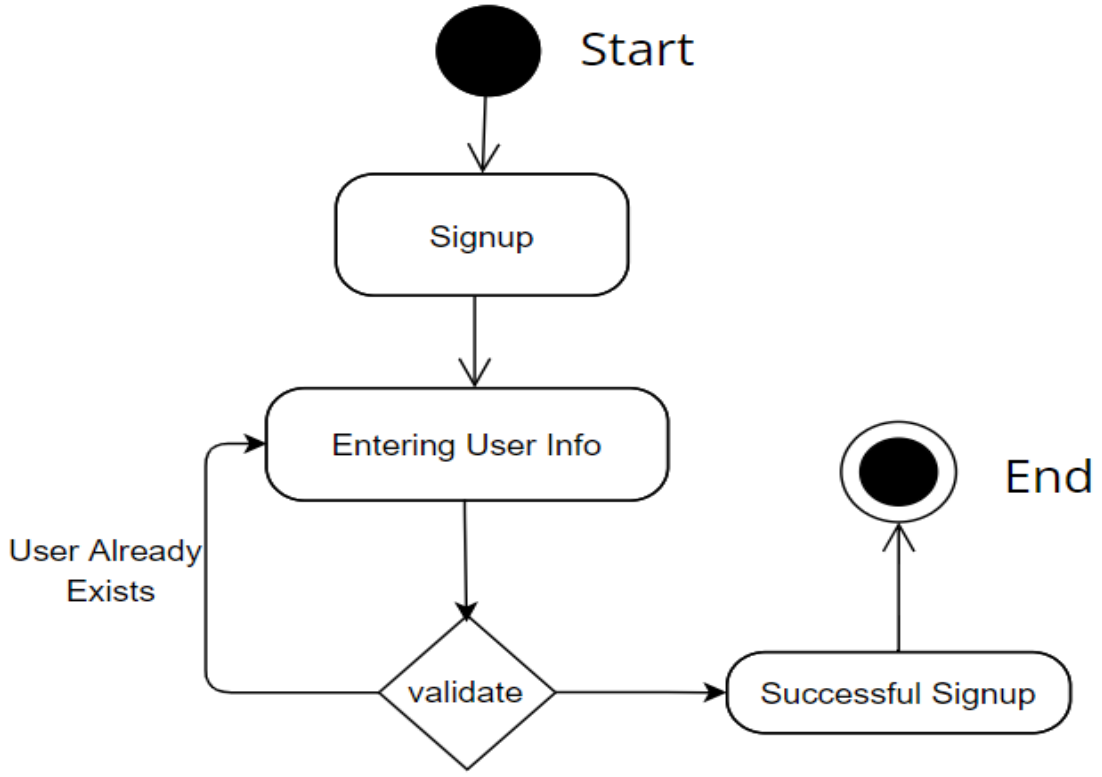


Figure 3.4 Activity Diagram of Registration

3.1.1 UC003: Manage User

Table 3.3 UC003 Manage User Use Case Description

Use Case Name	Manage User
Use Case ID	UC003
Actors	1. Admin
Description	This use case explains how the system's admin manages the users.
Pre-Condition	1. A network connection is available. 2. The admin has already signed in to the system.
Normal Flow	Select Manage User from the Admin menu delete and view users. 1. Alternative flow 1 is used if the admin wants to delete a user. 2. If the administrator wants to view the users, alternate flow 2 is used.
Alternative Flow	**1 Delete User** 1. Select user to delete 2. The system indicates that the delete was successful. **2 View User** 3. Admin clicks on the user's name 4. The user's information appears.
Exception	
Post-Condition	The task (Delete and view) performed by admin

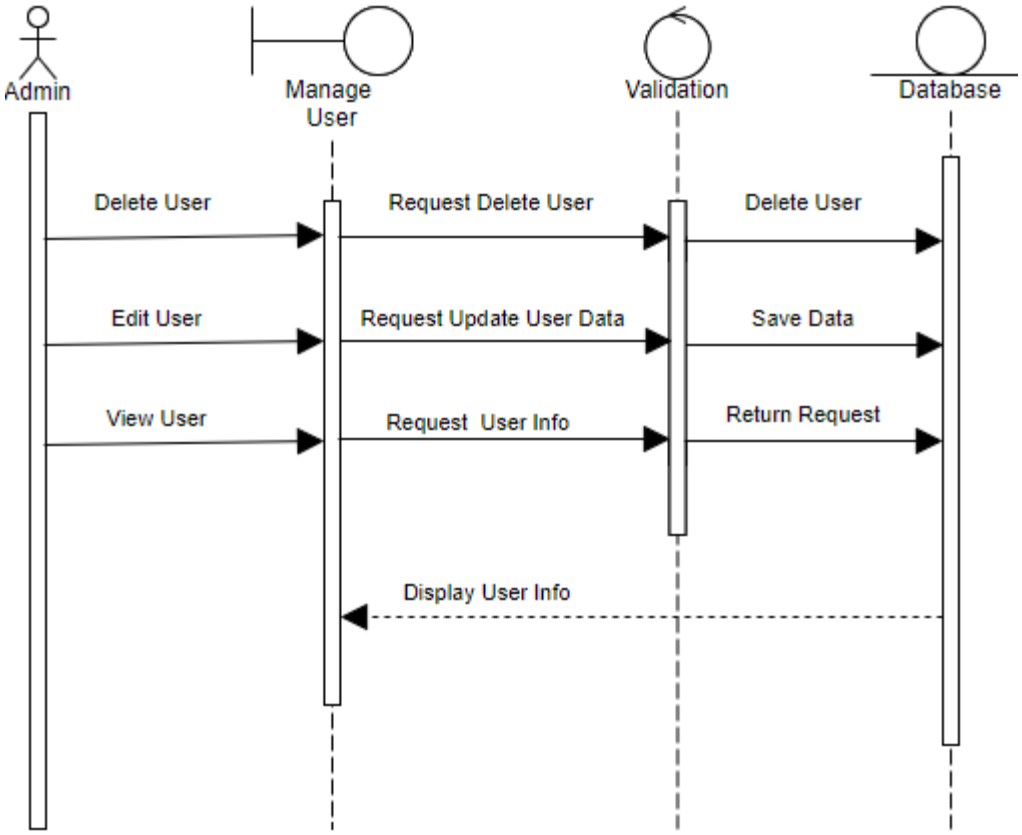


Figure 3.5 Sequence Diagram for Manage User

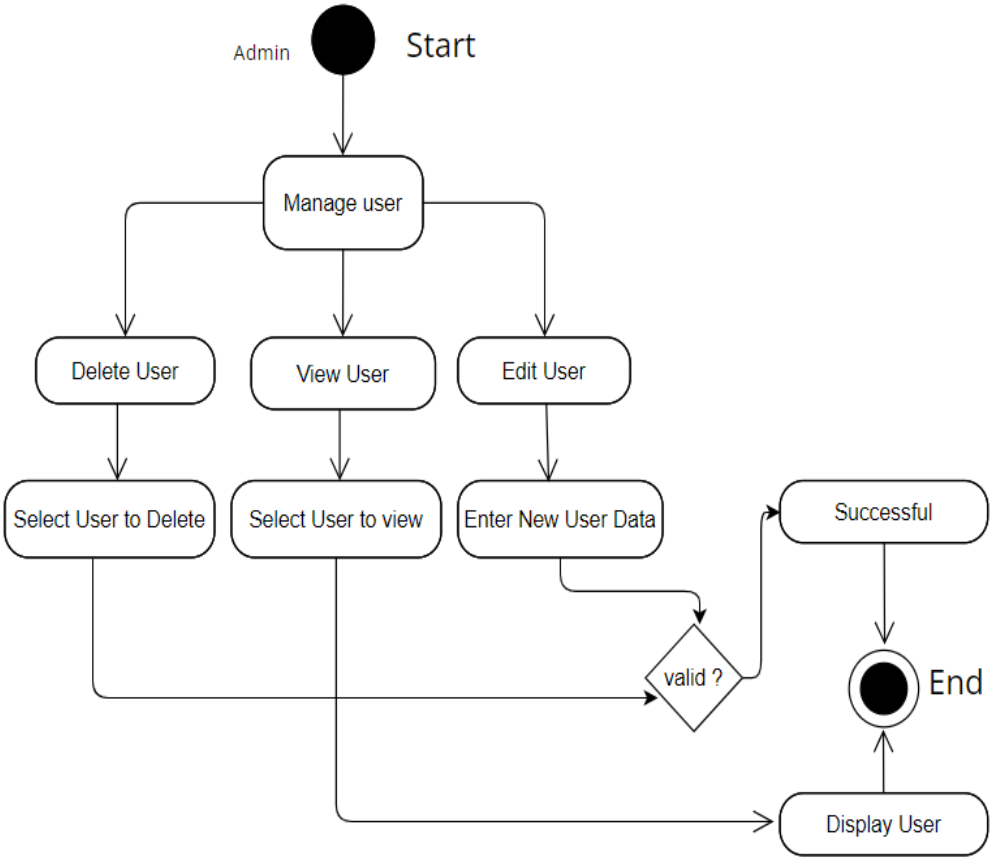


Figure 3.6 Activity Diagram for Manage User

Table 3.4 UC004 Manage Listing Use Case Description

Use Case Name	Manage Listing
Use Case ID	UC004
Actors	1. Admin
Description	This use case explains how the system's admin manages the listings made by users.
Pre-Condition	1. A network connection is available. 2. The admin has already signed in to the system.
Normal Flow	Select Manage Listing from the Users menu to delete and view listings. 1. Alternative flow 1 is used if the admin wants to delete info. 2. if admin wants to view properties, alternative flow 2 is used
Alternative Flow	**1 Delete** 1. Click remove property. 2. The system indicates that the delete was successful. **2 View** 1. Click property to view 2. The property detail will be shown to the admin.
Exception	
Post-Condition	The task (Delete, View) performed by Admin.

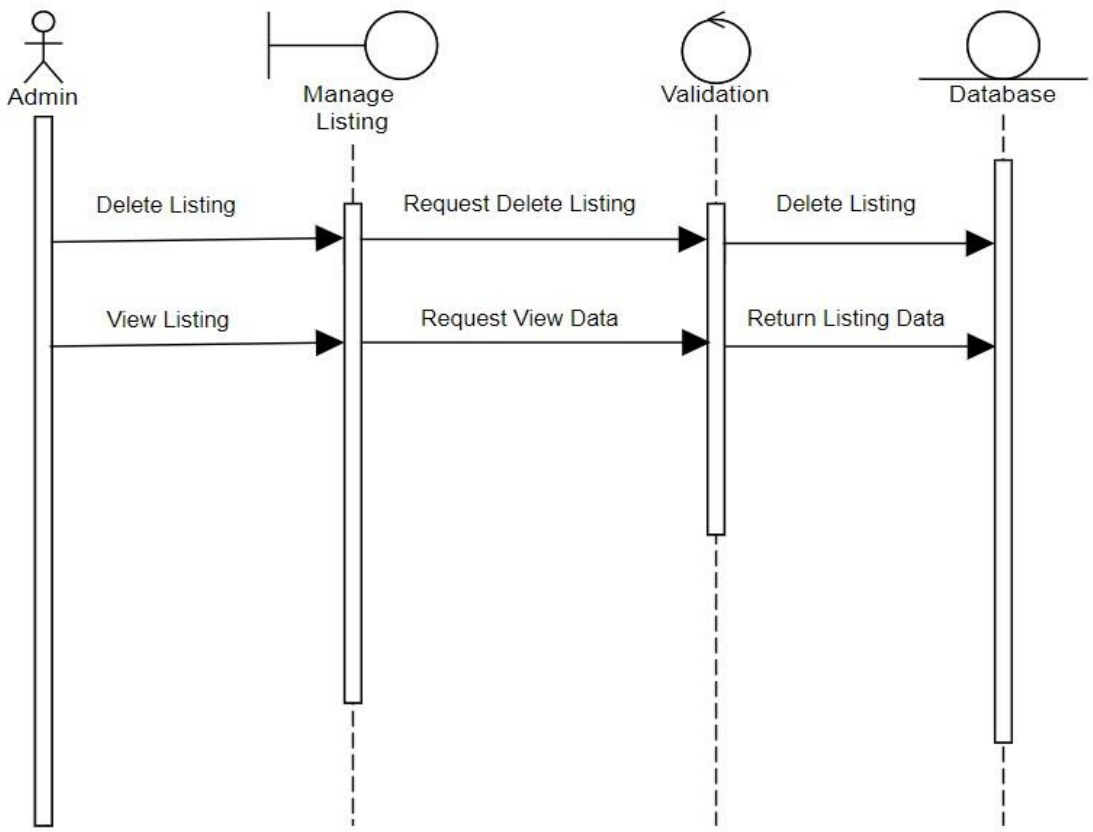


Figure 3.7 Sequence Diagram for Manage Listing

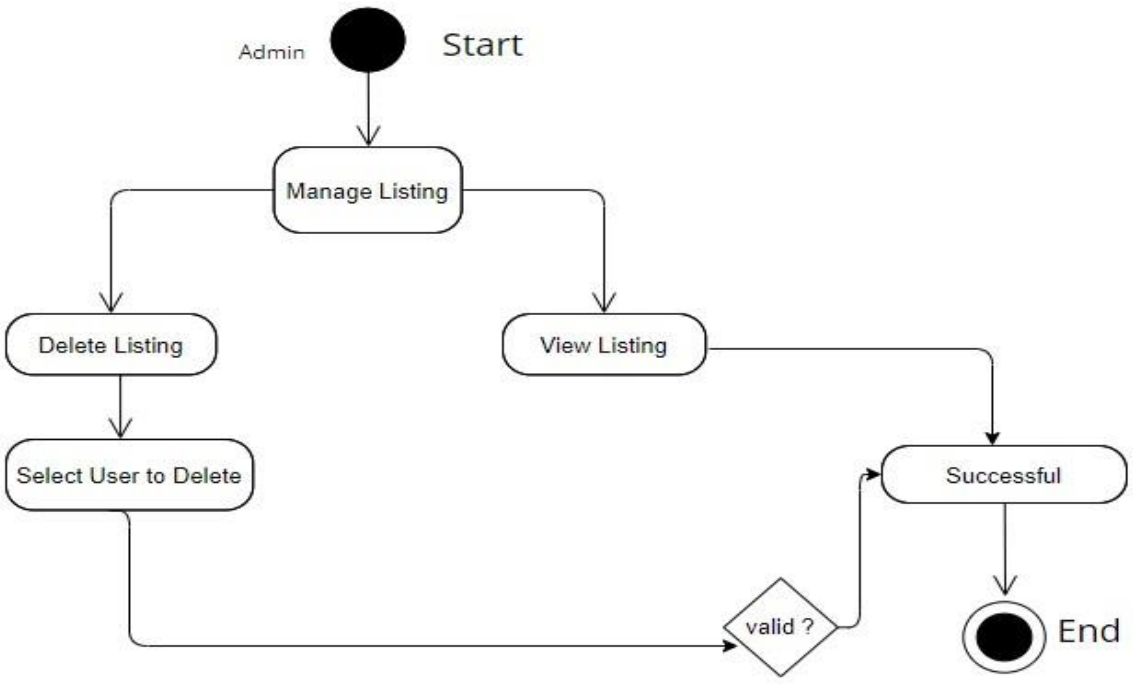


Figure 3.8 Activity Diagram for Manage Listing

3.1.2 UC005: Add Listing

Table 3.5 UC005 Add Listing Use Case Description

Use Case Name	Add Listing
Use Case ID	UC005
Actors	User
Description	This use case explains how the user add a new listing to the system
Pre-Condition	1. A network connection is available. 2. The user has already signed in to the system.
Normal Flow	1. User selects add listing. 2. User enters property details fully. 3. Listing is made.
Alternative Flow	
Exception	
Post-Condition	The task Add Listing will be performed by the user.

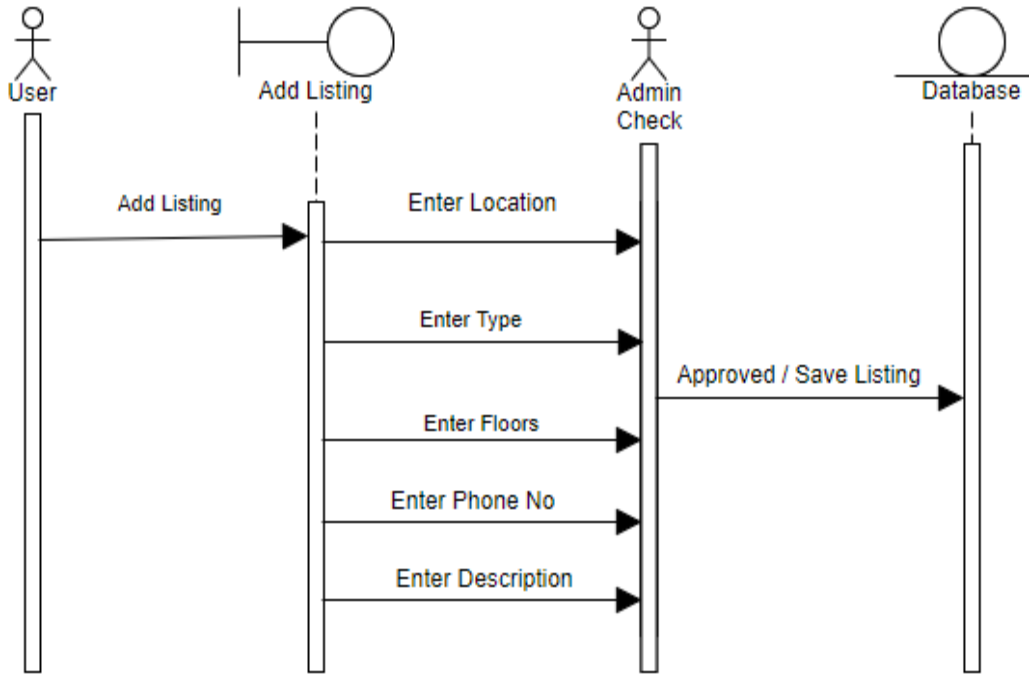


Figure 3.9 Sequence Diagram for Add Lasting

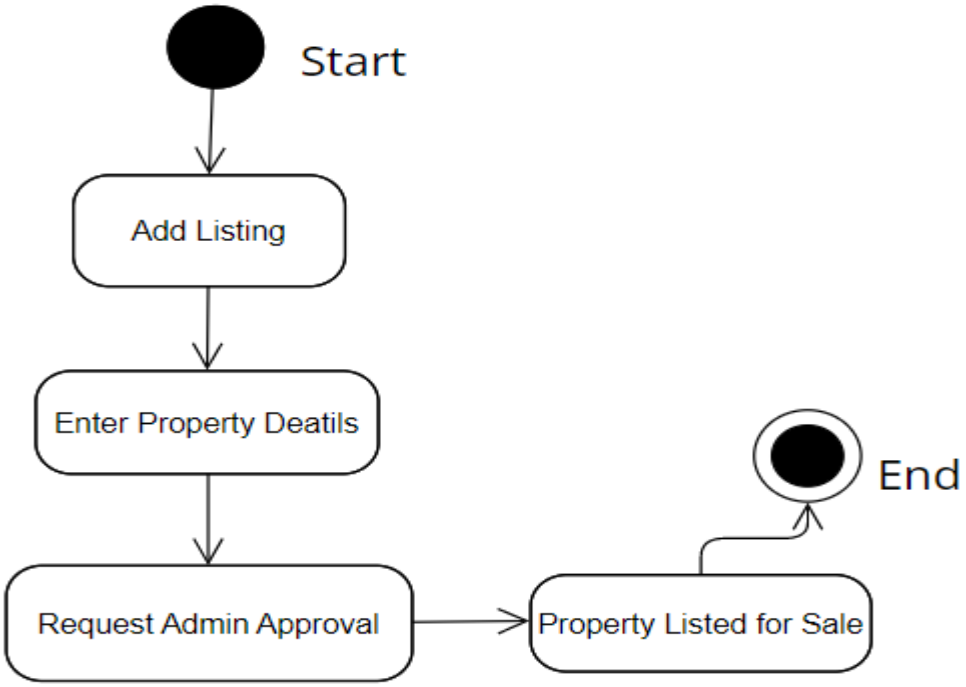


Figure 3.10 Activity Diagram for Add Listing

Table 3.6 UC006 Search Properties Use Case Description

Use Case Name	Search Properties
Use Case ID	UC006
Actors	1. User
Description	This use case explains how the system's users search for properties.
Pre-Condition	1. A network connection is available.
Normal Flow	1. User click search 2. User applies search filter 3. User will be showed list of properties for sale 4. User click a property 5. Property detail will be shown to the user.
Alternative Flow	3.1. No search result found.
Exception	
Post-Condition	The task (search) performed by user.

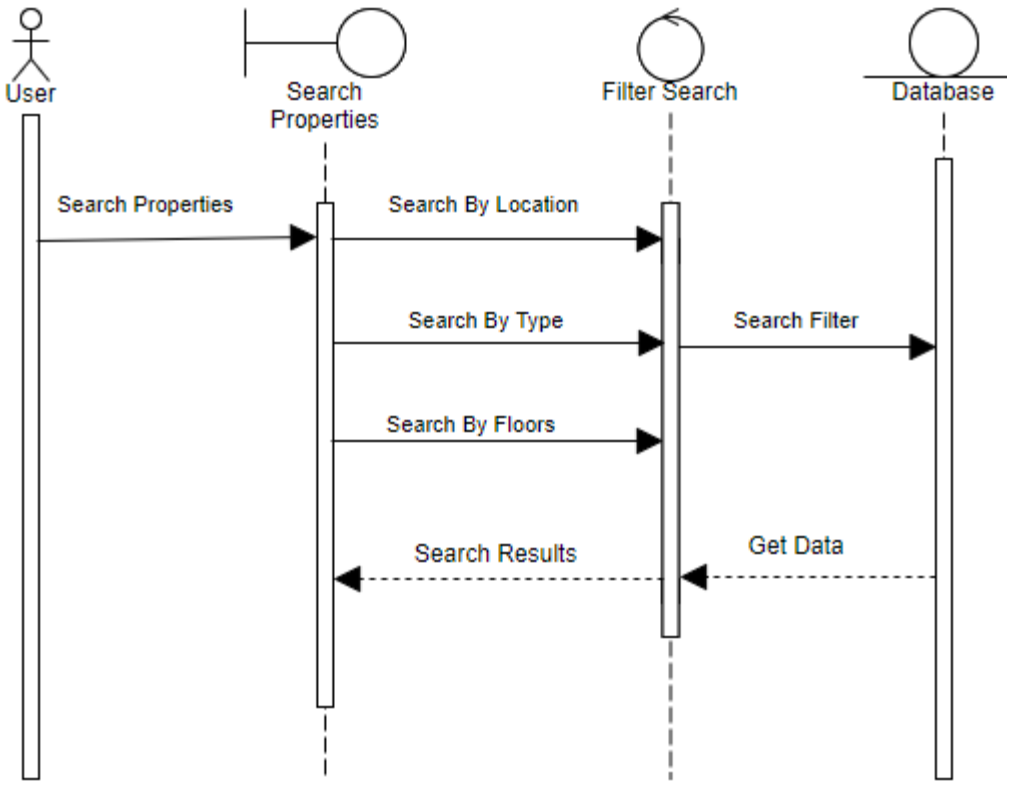


Figure 3.11 Sequence Diagram for Search Properties

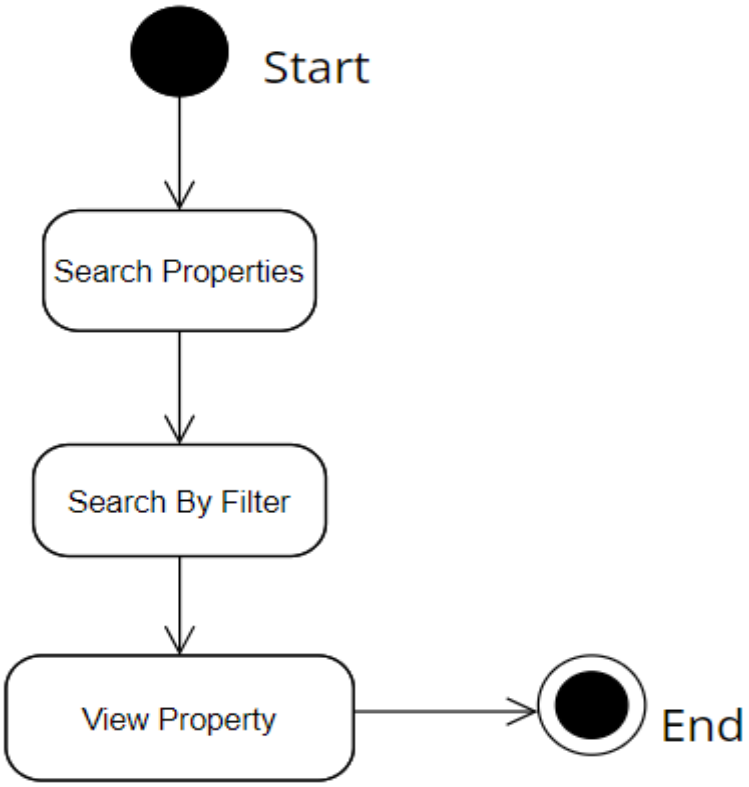


Figure 3.12 Activity Diagram for Search Properties

Table 3.7 UC007 Manage Properties Use Case Description

Use Case Name	Manage Properties
Use Case ID	UC007
Actors	1. User
Description	This use case explains how the system's user manages its properties.
Pre-Condition	1. A network connection is available. 2. The user has already signed in to the system.
Normal Flow	1. User selects manage properties 2. User has two options delete and update, 3. User chooses to delete property 4. Click property to delete 5. Property Deleted Successfully
Alternative Flow	3.1 User chooses to update property 3.1.1 User changes property details and data 3.1.1 User click save to save changes successfully
Exception	
Post-Condition	The task Manage Properties is performed by the user.

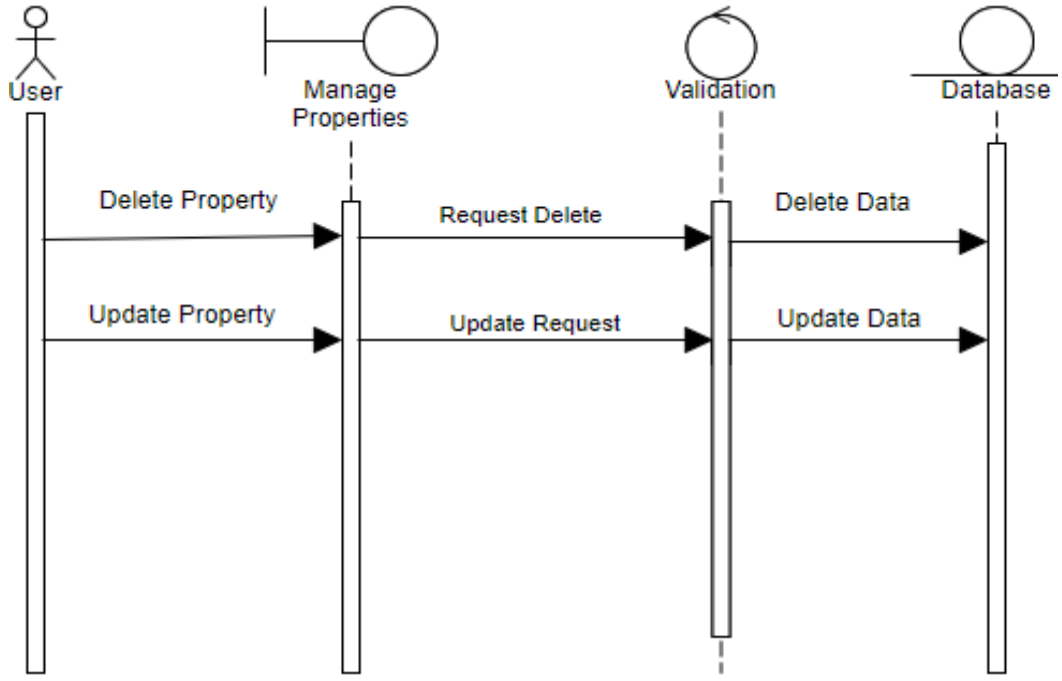


Figure 3.13 Sequence Diagram for Manage Properties

Table 3.8 UC008 Manage Profile Use Case Description

Use Case Name	Manage Profile
Use Case ID	UC008
Actors	1. User
Description	This use case explains how the system's user manages their profile.
Pre-Condition	1. A network connection is available. 2. The user has already signed in to the system.
Normal Flow	1. User clicks manage profile 2. User has three options 3. User chooses to change username 4. User enters new username 5. New username is updates
Alternative Flow	3.1 User chooses change password 3.1.1 User enters new password 3.1.1 New password updates 3.2 User chooses change phone number 3.2.1 User enters new phone no 3.2.2 New phone number is updated
Exception	
Post-Condition	The task (Manage Profile) performed by the user.

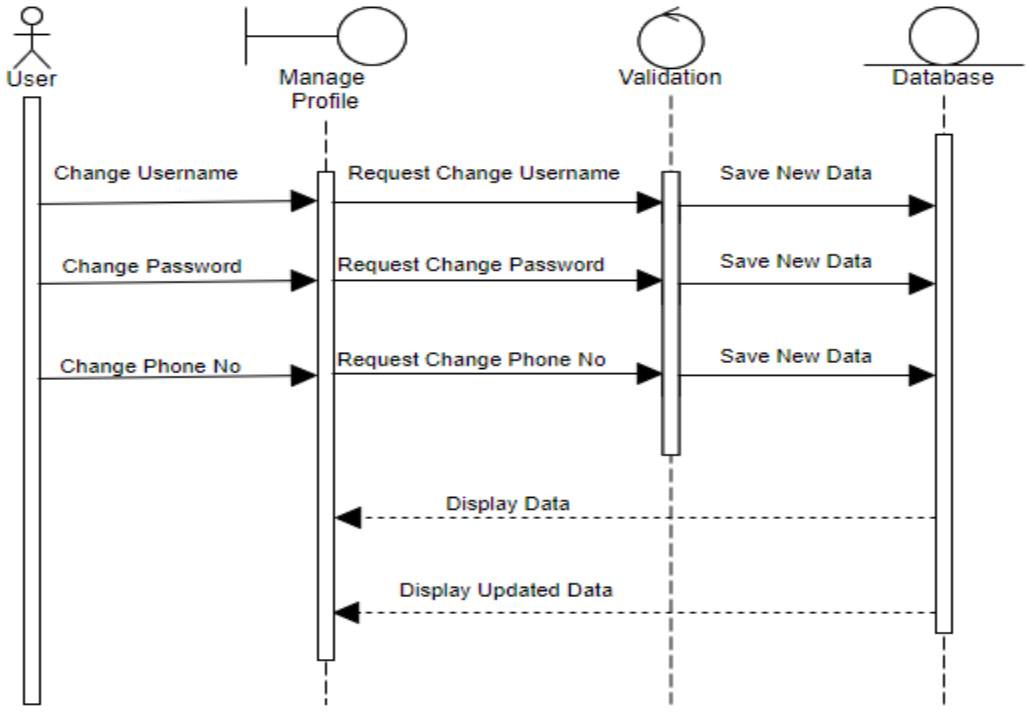


Figure 3.15 Sequence Diagram for Manage Profile

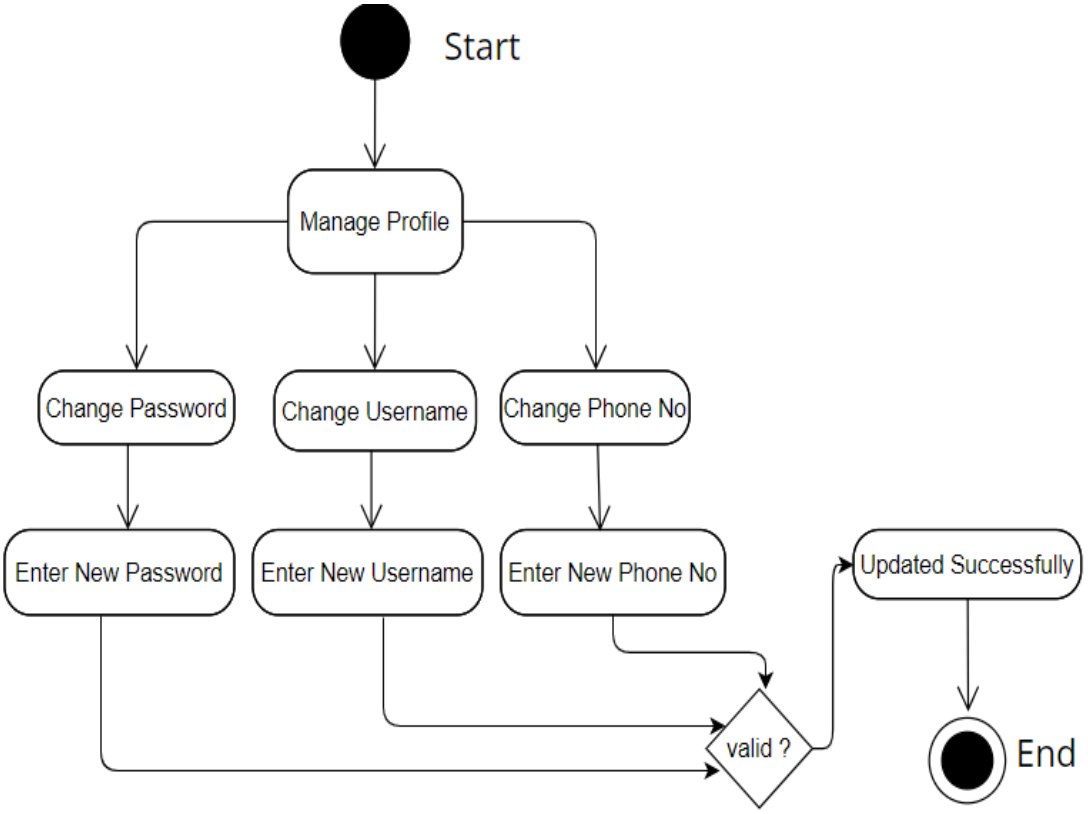


Figure 3.16 Activity Diagram for Manage Profile

Table 3.9 UC009 Save Listing Use Case Description

Use Case Name	Inquiry request
Use Case ID	UC009
Actors	1. User
Description	This use case explains how requests inquiry on a listing.
Pre-Condition	1. A network connection is available. 2. The user has already signed in to the system.
Normal Flow	1. User selects property to send inquiry 2. User clicks on send inquiry 3. The property owner gets the inquiry request.
Alternative Flow	
Exception	
Post-Condition	The task (inquiry request) performed by user.

3.2 Performance Requirement

- Time to respond Response

  times for the website should not exceed one second.

- Multiple users at the same time

  Multiple users should be allowed to utilize the app at the same time.

3.3 Other Requirement

1. Even people with little technical knowledge should be able to comprehend and use the interface.
2. The user interface should be simple and user friendly for people who use the system on a daily basis.

APPENDIX C

SOFTWARE DESIGN DESCRIPTION (SDD)

1. Introduction

1.1 Purpose

The purpose of this document, Software Design Description (SDD), is to explain the proposed system's architecture and system design. This document serves as a roadmap for the creation of the Volunteering Opportunities System. System architecture, database design, and user interface design are the three key sections of the Software Design Description paper. A view of form perspective is included in the system architecture. The information contained in the database The system's data dictionary is included in the design. The user interface follows. For a better understanding of the proposed system, the design is documented.

1.2 Scope

This document will cover the development of this system, including the system architecture, database design, and user interface design. The suggested system's basic design has been chosen as layered architecture. Admin and User are all users of this system.

1.3 Definitions

Table 1.1 Definition, Acronyms and Abbreviation

Acronym/ Abbreviation/ Terms	Definition
SRS	**Software Requirement Specification**
SDD	**Software Requirement Documentation**
UI	**User Interface**

1.4 Scope

This paper will provide an overview of the system by detailing the system's history and the proposed system's goal. Furthermore, through analyzing the system, this article describes the system architecture.

2 Architecture Design

2.1 Layered Architecture

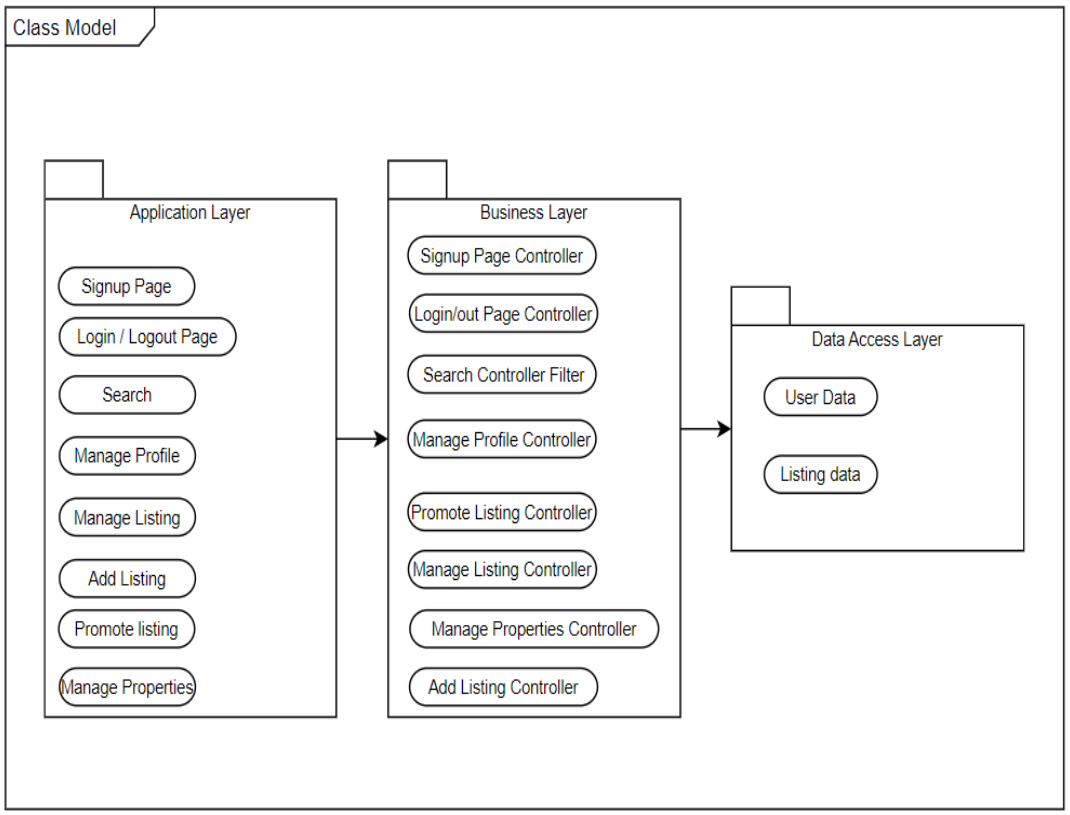


Figure 2.1 Package Diagram for Online Real Estate System

3 Database Design

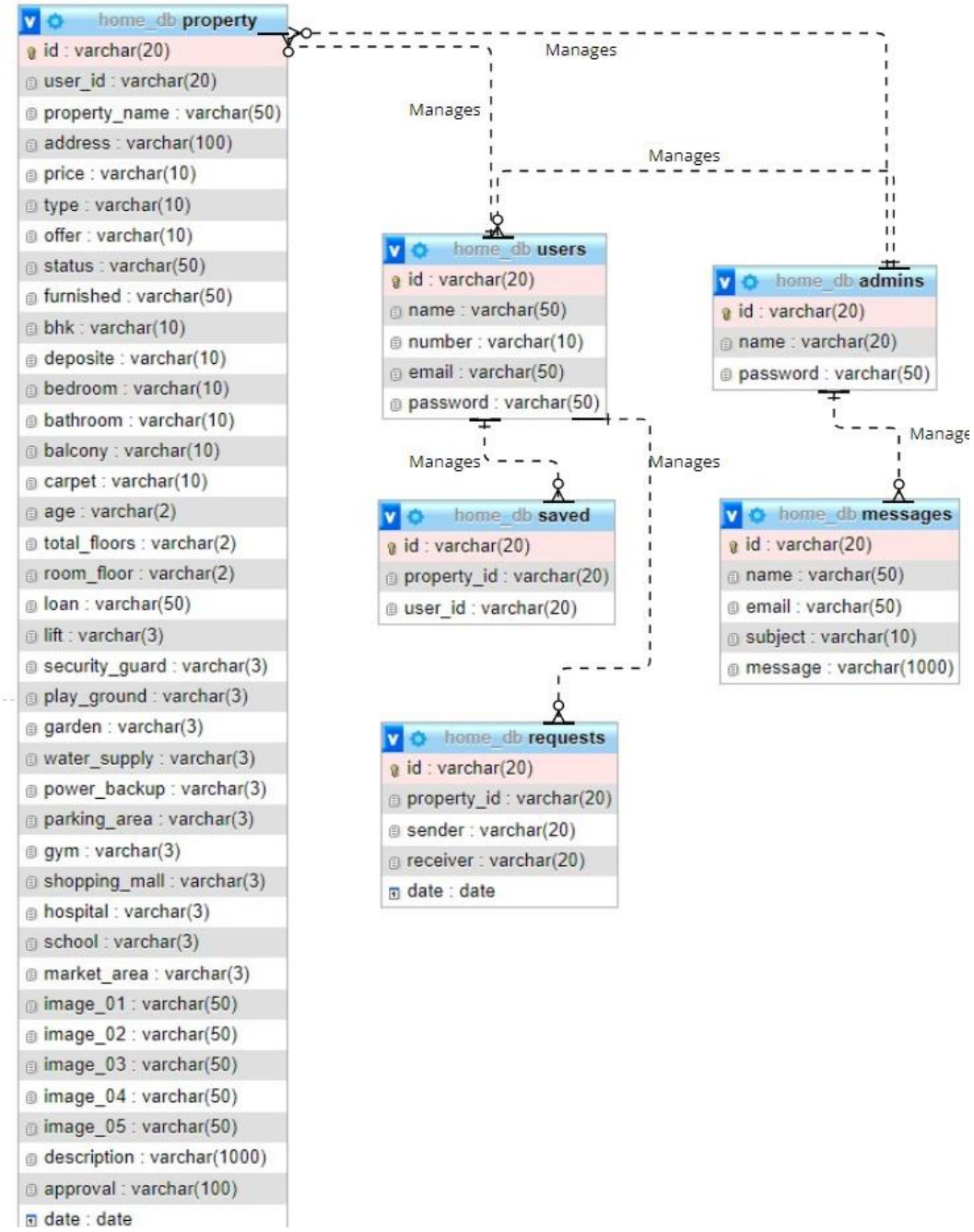


Figure 3.1 ERD of Online Real Estate

Table 2.1 Database Dictionary

Table	Attribute	Type	Length	PK/FK	Null
Admin	Admin_ID	Unique identifier		PK	Not Null
	UserName		50		Not Null
	Password	Varchar	20		Not Null
Users	User_ID	Unique identifier		PK	Not Null
	Name	Varchar			Not Null
	Email	Varchar	50		Not Null
	Password	Varchar	20		Not Null
	Number	Varchar	14		Not Null
Property	Property_ID	Unique ID		PK	Not Null
	User_Id	Varchar	100		Not Null
	Propert_ name	Varchar	50		Not Null
	Address	Varchar	50		Not Null
	Price	Varchar	20		Not Null
	Type	Varchar	20		Not Null
	Offer	Varchar	20		Not Null
	Status	Varchar	20		Not Null
	Furnished	Varchar	20		Not Null
	Bhk	Varchar	20		Not Null
	Deposite	Varchar	20		Not Null
	Bedroom	Varchar	20		Not Null
	Bathroom	Varchar	20		Not Null
	Balcony	Varchar	20		Not Null
	Carpet	Varchar	20		Not Null
	Age	Varchar	20		Not Null
	Total_floors	Varchar	20		Not Null
	Room_floor	Varchar	20		Not Null
	Loan	Varchar	20		Not Null
	Lift	Varchar	20		Not Null

	Security_guard	Varchar	20		Not Null
	Play_ground	Varchar	20		Not Null
	Garden	Varchar	20		Not Null
	Water_supply	Varchar	20		Not Null
	Power_backup	Varchar	20		Not Null
	Parking_area	Varchar	20		Not Null
	Gym	Varchar	20		Not Null
	Shooping_mall	Varchar	20		Not Null
	Hospital	Varchar	20		Not Null
	School	Varchar	20		Not Null
	Market_area	Varchar	50		Not Null
	Image_01	Varchar	50		Not Null
	Image_02	Varchar	50		
	Image_03	Varchar	50		
	Image_04	Varchar	50		
	Image_05	Varchar	50		
	Description	Varchar	1000		Not Null
	Date	Varchar	14		Not Null
Requests	Request_ID	Unique ID		PK	Not Null
	Property_Id	Varchar	50		Not Null
	Sender	Varchar	50		Not Null
	Receiver	Varchar	50		Not Null
	Date	Varchar	50		Not Null
Saved	Save_Id	Varchar	50		Not Null
	Property_Id	Varchar	50		Not Null
	User_Id	Varchar	50		Not Null
Messages	Message_Id	Varchar	50		Not Null
	Name	Varchar	50		Not Null
	Email	Varchar	50		Not Null
	Subject	Varchar	50		Not Null
	Message	Varchar	50		Not Null

4 User Interface Design

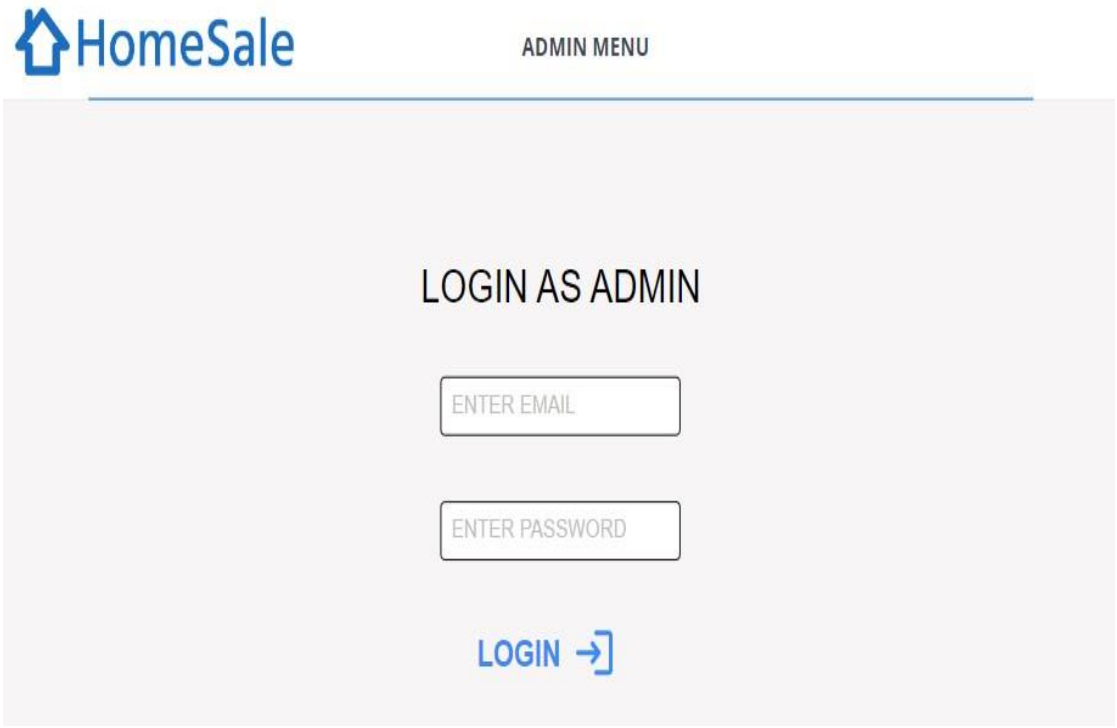


Figure 6-2 Login Page for HomeSale

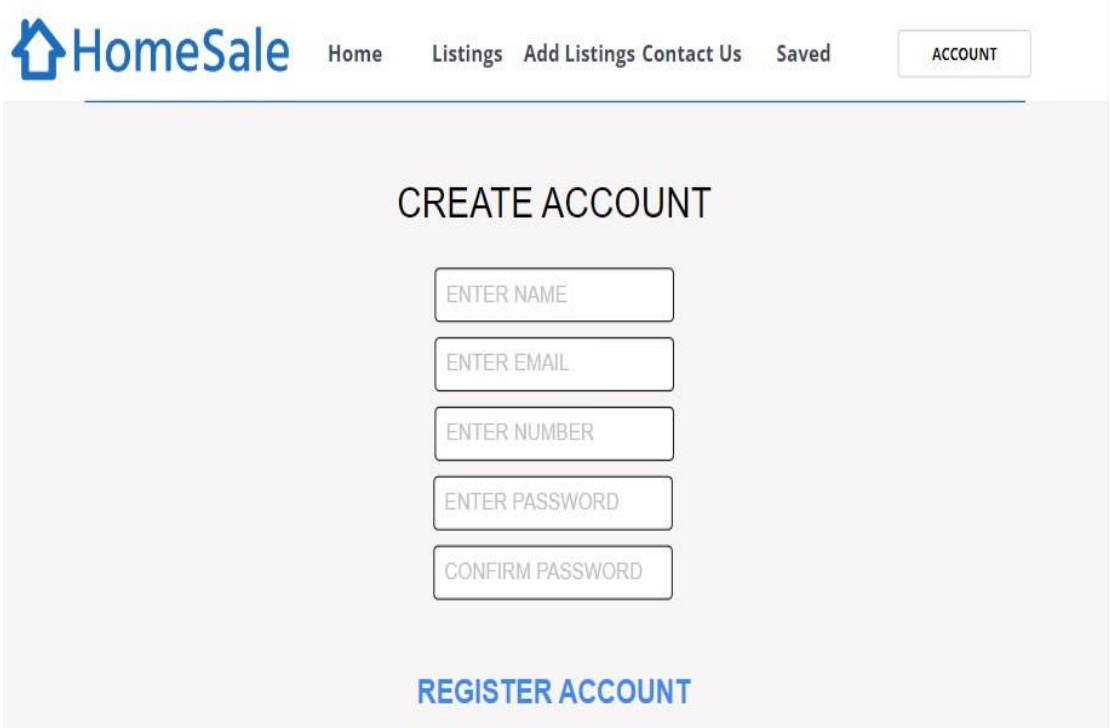


Figure 6.3 Signup Page for HomeSale

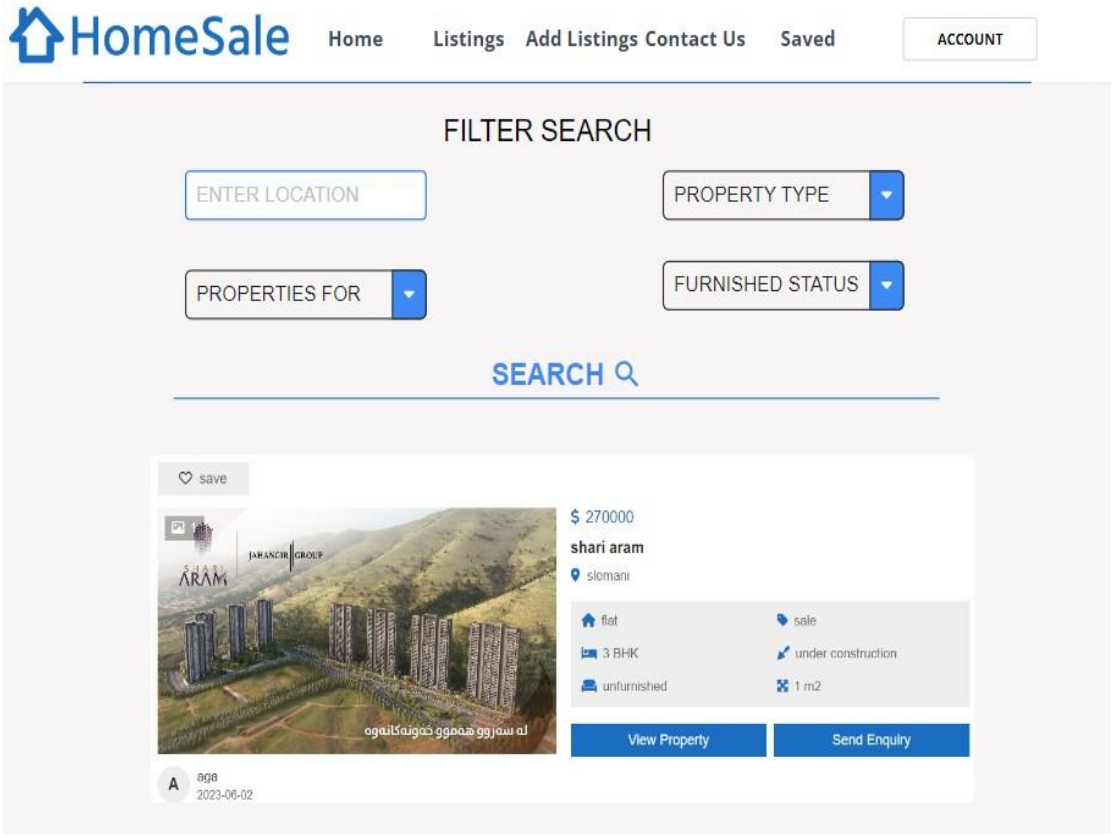


Figure 6.4 Listings Page for HomeSale

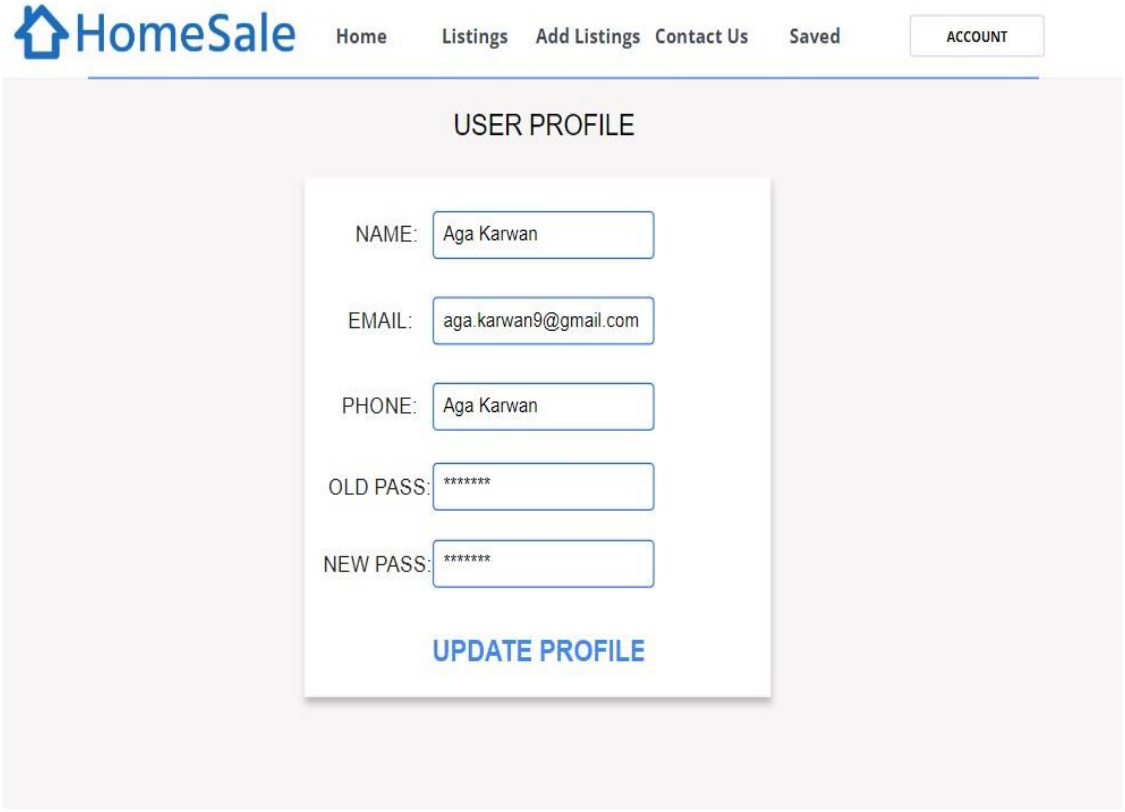


Figure 6.5 User Profile Page for HomeSale

APPENDIX D:

SOFTWARE TESTING DOCUMENT (STD)

1. Introduction

1.1 Purpose

Unit testing will be performed for each class in the proposed project. System testing is highly crucial in system development to ensure that constructors and methods are working properly. There are three types of testing for system testing: black box testing, white box testing, and acceptance testing.

1.2 Scope

This STD is intended for the following groups:

- Admin

- User

1.3 Definitions

Table D.1 Definition, Acronyms and Abbreviation

Acronym/ Abbreviation/ Terms	Definition
STD	**Software Testing Documentation**

1.4 Overview

The testing consists of Two testing:

- Black Box Testing
- User Acceptance Testing

2. Testing

Black Box Testing

I will use black box testing for my project because the focus is on the input and output generated by the system, black box testing does not require a tester to understand what is happening on the code side. This determines how the system responds to expected and unexpected user behaviours, as well as reaction time, usability, and reliability concerns. This testing evaluates critical subsystems such as the UI/UX, web server or application server, database, and integrated system. Black box testing focuses on data key-in during user, application, audit module, and other updates, additions, and deletions

Table D.2 Test Cases for Signup

Use Case		Registration	
Description		The user must enter detail and signup.	
Date		20/6/2022	
Tester		Arya Burhan Mohammed	
Input	Expected Results	Actual Results	Status
Click the "Register"button after typing valid username, password.	The message "Successfully registered" is displayed,	The message "Successfully registered" appears on the screen.	Pass
If the username, password is all the same, click the "Register" button.	The warning "Invalid username"is displayed.	The warning "Invalid username"is displayed.	Pass
Click the "Register"button after typing valid username, password.	The notice "Failedto set password alert" appears.	The message "Failedto set password" appears.	Pass

Table D.3 Test Cases for Login

Use Case		Login	
Description		The user must input a valid username andpassword before pressing the "Sign In" button.	
Pre-Condition		You must register	
Date		20/6/2022	
Tester		Arya Burhan Mohammed	
Input	Expected Results	Actual Results	Status
Click the "Sign In" button using a validusername and password.	The alert messagewas successfully displayed, and thepage was redirected to thehome page.	Successful alert message displayed and redirect to homepage.	Pass
If your username and/or password are incorrect, click the"Sign In" option.	The messag e "Unsuccessful Login" is displaye d.	The notificatio n"Unsuccessful Login" appears.	Pass

Table D.4 Test Cases for Manage User

Use Case		Manage User	
Description		To manage a user is required to click on“Manage User” menu.	
Pre-Condition		User must login.	
Date		20/6/2022	
Tester		Arya Burhan Mohammed	
Input	Expected Results	Actual Results	Status
Click “View UserDetail” button	Display the selected Userdetails.	Display the selectedUser details.	Pass
Click “Delete User”button	Display alert message “User Detail had been deleted”.	Display alert message “Userdetail had been deleted”.	Pass

Table D.5 Test Cases for Manage Listing

Use Case		Manage Listing	
Description		Admin managing listings made by users.	
Pre-Condition		Admin must login.	
Date		20/6/2022	
Tester		Arya Burhan Mohammed	
Input	Expected Results	Actual Results	Status
Click the "Delete" button	The message “Listing was deleted” appears	The message “Listing was deleted” appears	Pass
Click “View listing” button	The “property details” message appears	The “property details” message appears	Pass

Table D.6 Test Cases for Add Listing

Use Case		Add Listing	
Description		The user adding a new listing	
Pre-Condition		User must be logged in.	
Date		20/6/2022	
Tester		Arya Burhan Mohammed	
Input	Expected Results	Actual Results	Status
Click the "Add Listing” button and fill in property details	The message “Listing has been added” appears	The message “Listing has been added” appears	Pass

Table D.7 Test Cases for Search Properties

Use Case		Search Properties	
Description		Searching property by user	
Pre-Condition		User must have internet connection.	
Date		20/6/2022	
Tester		Arya Burhan Mohammed	
Input	Expected Results	Actual Results	Status
Click the "Search" button after filtering by your choice	The page redirects and shows available properties for sale.	The page redirects and shows available properties for sale.	Pass

Table D.8 Test Cases for Manage Properties

Use Case		Manage Properties	
Description		The user Managing its listed properties for sale	
Pre-Condition		The user must be logged in.	
Date		20/6/2022	
Tester		Arya Burhan Mohammed	
Input	Expected Results	Actual Results	Status
Click the "Delete" button and select property to delete	The message "Property has been deleted" appears	The message "Property has been deleted" appears	Pass
Click the "Update" button and select property to edit	The message "Property has been updated" appears	The message "Property has been updated" appears	Pass

Table D.9 Test Cases for Manage Profile

Use Case		Manage Profile	
Description		The user Managing its profile details	
Pre-Condition		The user must be logged in.	
Date		20/6/2022	
Tester		Arya Burhan Mohammed	
Input	Expected Results	Actual Results	Status
Click the "Change username" button and enter new data	The message "username has been updated" appears	The message "username has been updated" appears	Pass
Click the "Change Password" button and enter new data	The message "Password has been updated" appears	The message "Password has been updated" appears	Pass
Click the "Change Phone No" button and enter new data	The message "Phone number has been updated" apear	The message "Phone Number has been updated" appears	Pass

Table D.10 Test Cases for Inquiry Request

Use Case		Inquiry Request	
Description		The User sends an inquiry to a property for sale	
Pre-Condition		The user must be logged in.	
Date		20/6/2022	
Tester		Arya Burhan Mohammed	
Input	Expected Results	Actual Results	Status
Click the "request inquiry" button and select property to send inquiry	The message "Inquiry Request has been sent" appears	The message "Inquiry Request has been sent" appears	Pass

User Acceptance Test

User Acceptance Testing (UAT), often known as end user testing, is a method of determining if software is acceptable or not. A final test is run after the functional, system, and regression tests have been completed. The goal of the testing is to ensure that the system meets the organization's requirements. Validation testing is carried out by end users who are familiar with the business requirement.

Table D.13 User Acceptance Test for manage user Module

TC#	**Action**	**Expected Result**	**Pass/Fail**
1	Clicks on "ManageUser" button	Display list of User page	Pass
2	Clicks on "delete"button	User will be deleted	Pass
3	Click view user details	User will be displayed	Pass