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**SCHOOL OF ENGINEERING AND TECHNOLOGY**

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**SEG2202 SOFTWARE ENGINEERING**

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**FINAL ASSESSMENT COURSEWORK**

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**PROGRAMME:** BSc (Hons) in Computer Science

**YEAR / SEMESTER:** Year 2 Semester 4

**PROJECT TITLE:** Real Estate Marketplace Based On Data Mining (PropertyHunt)

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**INSTRUCTIONS TO CANDIDATES**

- This is an **INDIVIDUAL** coursework.
- This coursework will contribute **50%** to the Final Assessment component.

**IMPORTANT NOTICE**

The University requires students to adhere to submission deadlines for any form of assessment. Work handed after the deadline will be regarded as a non-submission and marked zero.

**Academic Honesty Acknowledgement**

Saurabh Varughese M. Kovoor

"I ..... (student name) verify that this paper contains entirely my own work. I have not consulted with any outside person or materials other than what was specified (an interviewee, for example) in the assignment or the syllabus requirements. Further, I have not copied or inadvertently copied ideas, sentences, or paragraphs from another student. I realize the penalties (*refer to page 16, 5.5, Appendix 2, page 44 of the student handbook diploma and undergraduate programme*) for any kind of copying or collaboration on any assignment."

SVMK 12/7/2021

..... (Student's signature / Date)

## **SE Project Report (100%→50%)**

You are working in a software development company. Your task is to review a software project from the preliminary stage to project analysis and design which includes the system functionality, prototype design and UML diagrams of the system. The deliverable of the project will be a softcopy report which will be submitted to the eLearn. The report should include the following content:

### A) Project Preliminary Stage (30%)

Introduction:

A clear description of the system you are addressing. An introduction of the work relevant to your project.

Project Objectives and Project Scope:

Project objectives are what you plan to achieve by the end of your project. This might include deliverables and assets, or more intangible objectives like increasing productivity or motivation. Project scope is a detailed outline of all aspects of a project, including all related activities, resources, timelines, and deliverables, as well as the project's boundaries.

Software Process Model:

A software process model represents the order in which the activities of software development will be undertaken. It describes the sequence in which the phases of the software lifecycle will be performed. Justify a software process model that you will apply to develop the system.

### B) Project Analysis and Design (30%)

Requirements Plan:

The Requirements Plan is a necessary tool for establishing how requirements will be collected, analyzed, documented, and managed throughout the lifecycle of a project. Identify the stakeholders with their role.

System Functionality:

To describe the system functionality of the system being developed, this will include the functional requirements and non-functional requirements. Justify why the functions are necessary for the system.

Prototype Design:

Prototypes can take many forms, such as simple sketches or storyboards used to illustrate a proposed experiential solution, or digital interfaces of the system.

### C) UML Diagrams (40%)

You are required to draw four UML diagrams to define and visualise the system being developed by using Visual Paradigm tools. The criteria of each diagram can refer to the marking rubrics attached. The diagrams are:

- Use case diagram
- Class diagram
- Sequence diagram
- Activity diagram

<b>Criteria</b>	<b>Marks</b>	<b>Unsatisfactory &lt;40%</b>	<b>Average 40-59%</b>	<b>Good 60-69%</b>	<b>Excellent 70+ %</b>
<b>A) Project Preliminary Stage</b>	<b>30%</b>				
Introduction	0-10	Poorly introduce the topic, the idea is not clear, and the information is irrelevant.	Introduce the topic with some missing information, the outline is clear with some irrelevant information.	Introduce the topic clearly, the idea is clear, but statements require improvement.	Introduce the topic clearly, the idea is clear, and the statement is complete.
Project Objectives & Project Scope	0-10	Project objectives and project scope severely underdeveloped. Task unclear / confused.	Subject valid and relevant. Some shortcomings in clarity of purpose and associated objectives. Task definition could improve but clear & explicit.	Subject valid and relevant. Appropriate rationale. Task clear and explicit. Scope for study appropriate.	Clear statement of problem and associated objectives. Persuasive and comprehensive rationale.
Software Process Model	0-10	No justification for selected software process model. No understanding of methodology and implication.	Some justification and rationale for software process model. Reasonable methodology selected.	Appropriate selection of and justification for software process model. Appropriate methods used. More advanced understanding of limitations.	Correct selection of and justification for software process model. Full understanding of values and limitations of method.
<b>B) Project Analysis and Design</b>	<b>30%</b>				
Requirements Plan	0-10	No understanding of the requirements process plan.	Some understanding of the tasks and adequate coverage of the requirements plan.	Good knowledgeable of the requirements plan. Ample coverage of the subject matter in sufficient technical detail.	Excellent understanding and insight knowledge of the requirements plan. Comprehensive coverage of technical detail.
System Functionality	0-10	Weak and unacceptable analysis of system functionality.	Appropriate analysis, but limited critical awareness system functionality.	Competent analysis of system functionality.	High level analysis of system functionality. Critical competence.
Prototype Design	0-10	Poorly thought-out design. Design is inconsistent. Has issues with scaling or layout on different viewport sizes.	Adequately thought-out design. Design is somewhat consistent. With some issues with scaling or layout on different viewport sizes.	Well thought-out design. Design is mostly consistent. With one or two issues with scaling or layout on different viewport sizes.	Excellently thought-out design. Design is consistent. Has no issues with scaling or layout

<b>C) UML Diagrams</b>	<b>40%</b>				
Use Case Diagram	0-10	Use cases don't cover any of the desired features mentioned in the requirements document.	Use cases cover some of the desired features mentioned in the requirements document.	Use cases cover most of the desired features mentioned in the requirements document.	Use cases cover all the desired features mentioned in the requirements document.
Class Diagram	0-10	Class diagram shows no relationship between the various classes.	Some classes are in the diagram with missing methods, attributes and relationships.	All classes are mentioned in the diagram with their methods, attributes and relationships, but the layout and presentation are not organised.	All classes are mentioned in the diagram with their methods, attributes and relationships are well presented.
Sequence Diagram	0-10	Unclear and doesn't depict any scenario from the Use Cases.	Depicts a few scenarios properly using appropriate arrows but with a few flaws in notations.	Depicts most of the scenarios properly using appropriate arrows but with little to no flaws in notations.	Depicts all the scenarios from the Use Cases in a clear manner using appropriate arrows. All notations are correct and well presented.
Activity Diagram	0-10	Activity diagram doesn't show the flow of the action.	Activity diagram shows the procedural flow of most of the actions but doesn't clearly explain the business-level functions.	Activity diagram shows the procedural flow of all actions in an activity that explains the business-level functions but has minor flaws with the notations and presentation.	Activity diagram shows the procedural flow of all actions in an activity that explains the business-level functions in a clear manner. All notations are correct and well presented.
<b>Overall Project Marks</b>	100%	Additional comments by Examiners			

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# **Project Title: Real Estate Marketplace Based On Data Mining (PropertyHunt)**

## **Introduction**

For this Software Engineering (SEG2202) Project, I plan to develop a web application or platform for a real estate and property marketplace that also uses data mining for property recommendations. From the buyers' point of view, they can use the platform to search and browse property listings as well as obtain potential real estate investment opportunities, catering to their specified requirements and preferences. They can also put up postings themselves, indicating that they're interested in purchasing a particular property in a certain area. Then, they'll get offers of potential real estate for acquisition.

This is where the application of data mining and its principles remain prominent in a system/marketplace like this. Through this, the system can effectively recommend property listings, posted by sellers on the platform, available for purchase or rent. These recommendations cater to the buyer's preferences and recent activity or searches on the platform. You can find a more detailed list of user data that's used for the data mining model in the Project Scope section.

A traditional approach to acquiring real estate involves more searching and researching by the buyers in order to get their ideal property and make a wise purchasing decision. Plus, the intended buyer would have to frequently travel to potential property zones to gain information about them. All of this would only take up more of the buyers' and sellers' precious time. Instead, through this proposed online marketplace, each individual listing comprehensively provides the interested buyer with most of the preliminary information and details they require to place a particular property in consideration and contact the corresponding seller. On top of that, sellers can even upload a virtual or video tour of the property, which can provide more information.

Meanwhile, from the sellers and agents point of view, they can advertise and promote their properties on the marketplace. Using the data mining techniques, they can rest assured knowing

that their property listings are being matched with potential buyers with similar requirements and criteria. This allows the sellers to obtain more number of leads for the property since the listing is being promoted as recommended choices for users. At the same time, they're obtaining more quality leads that have a higher chance of conversion and sale success, since the listing is directed and caters to the user with exact requirements as the posting does. Furthermore, this online platform makes it easier for sellers to track their interested clients/buyers, as when an interested buyer selects to contact a buyer, they can choose to be added to the seller's list of interested buyers or clients.

This can save time and money for the sellers, since they don't have to invest in third-party advertising, like newspaper listings, or online ads like Facebook and Google Ads. This is because the system will recommend and push the property listings to potential buyers, based on the data gathered. Thus, providing sellers with a constant flow of buyer traffic to their listings through this marketplace itself.

In a nutshell, the platform aims to conduct and maintain a smooth relationship between both the buyer and seller, fulfilling both parties' interests.

## **Project Objectives**

As mentioned in the introduction, the platform primarily functions as an online marketplace for real estate interactions, such as contacting, purchasing and selling. However, this can be further divided to pinpoint the more specific goals or objectives the online system should accomplish:

Firstly, the marketplace aims to display comprehensive property listings with most of the necessary details needed by the average property buyer. This allows them to make comparisons and draw rational conclusions about properties in their consideration, based on the given information. Hence, allowing them to make wiser purchasing decisions. Besides that, the seller's contact information is crucial for the potential buyer to contact and inquire. Towards the end, we can measure the success of this objective by checking if the listings are displayed in a readable manner. Also, whether buyers and sellers can successfully upload their listing with the required

data fields. Conversely, the system should give an appropriate error message, when there's an incorrect input.

Secondly, this marketplace aims to allow buyers or property enthusiasts to search for a particular real estate according to their desired requirements. Thus, a search function is necessary, with appropriate filters. The filters will be similar to the list of information above, where the users can filter the property search results, according to location, number of rooms and bathroom, etc. A sorting functionality can be added, allowing users to sort the search results according to their most prioritised criteria, for instance, price, date of posting, and space measurement. The specific filters and sorts can be found in the requirements section. The success rate of the search function can be determined, by checking if it can successfully return property search results along with filtered or sorted search results.

Thirdly, aside from searching for properties, the system should also allow buyers to submit their own posting of their requirements for a desired property. From there, the system can recommend available listings that fit the buyer's preferences. As mentioned previously, through data mining, the system will have a better understanding of the buyer's needs, thus improving the relevancy and accuracy of the suggested real estate. Besides that, sellers can find this posting by users, and manually offer their listings as well. To prevent spam offers, the system will determine if the seller's offer is relevant with the user's request and preference. So if the seller's offer doesn't match the buyer's preference, the offer will either be blocked or placed lower in the list of recommendations. For this, we can determine the success rate by testing the data mining model whether it's able to return appropriate and relevant recommendations.

Fourthly, the system should allow sellers to manage their property listings. This means they can add, delete or update their property postings. In terms of adding, the system requires that sellers add the key info required by buyers to make a purchasing decision, such as address, space measurement, number of rooms and bathrooms, seller contact info, etc. The complete list of information displayed on a property listing can be found in the requirements section. They can also add pictures, videos, and/or virtual tours. This further improves the chances that the listing is

promoted and recommended to buyers. Both buyers and sellers should have the option to delete any of the listings they've posted or update its information.

Fifthly, the system will be able to perform loan calculations to determine the monthly amount of repayment and the loan structure. This gives both the buyer and the system an idea of the buyer's budget and the type of real estate they can afford. Thus, the system can recommend properties suited for the customer's budget. Also, the buyers can narrow down their property wishlist and make a more rational and feasible buying decision. This loan calculation can be performed through the system's algorithm that uses the desired loan amount along with an additional 20%-30% cash the user needs to pay, which includes other property fees such as stamp duties. Finally, the algorithm will provide a detailed and useful breakdown of the user's loan structure and amount they can get. The system can even recommend banks, lenders, and financial institutions that can finance or provide the loan, for the customer to choose. The algorithm will need to undergo experimental testing to determine if it can successfully calculate buyer's loans and return an appropriate value.

## **Project Scope**

The scope of this project includes 3 stages:

- 1) Developing the interface of the marketplace, it's pages and the layout of the property listings — Developing the interface with the search function where any user can browse the available property listings — Creating the login and registration page for buyers and sellers — Creating the interface and pages of the marketplace where both registered buyers and sellers can upload property listings

This first part is essential in designing the base marketplace before letting the applications of data mining take effect. Thus, it'll have most of the components as a regular online marketplace, such as a search function, homepage, account page, etc. The priority is to create a well-designed user interface (UI) to give the users a smoother experience, whether they're browsing, uploading listings, handling customers, or even logging in. At the same time, ensuring the objectives of the project are met.

- 2) Developing and integrating the data mining model/application to collect user information used to determine recommended properties for buyers

As mentioned in the intro, data mining is crucial for the system to better understand the buyer's intent or property preferences. Thus, it'll be able to provide more suitable real estate recommendations. Hence, this step involves developing the proper data mining model and integrating it with the marketplace.

- 3) Testing the data mining model and the functional and non-functional components of the online property marketplace

This stage involves experimental testing and analysing the results, where the results are used to determine if the objectives of the project have been met. We'll need to make sure functional components, such as account registration, login, search function, listing page, listing upload system are working optimally. Unit testing can be performed to determine if these functional components are working as intended. Besides that, the data mining model or the property recommendations feature will also be checked, analysed, and refined if improvements can be made. As for the non-functional requirements/components, we can perform beta testing and user acceptance testing (UAT), to understand how the marketplace feels to interact with from the users' point of view. For now, the main non-functional requirements the platform should meet is intuitiveness and ease-of-use.

## **Project Limitations or Boundaries**

For now, at its first iteration, the system will possess a few limitations and several boundaries:

Firstly, the web platform is aimed to target the market of a particular population or the properties available in a specific location, in this hypothetical case, people interested in real estate in the Klang Valley. Thus, the stakeholders include, property sellers, agents, owners, real estate buyers, enthusiasts, tenants, banks/lenders, property investors, etc.

Secondly, the system will require the buyer to register an account in order to enjoy most of the benefits and features of the marketplace. This includes being able to post a listing of their desired

property, receiving recommendations of potential real estate, loan calculations, and being able to view sellers' contact info. If the user doesn't already have an account with the platform, they'll still be able to browse through the marketplace and look at listings. However the contact info of sellers will be hidden to prevent them from getting spam calls and data theft. For this, the buyer will have to use their phone number to start an account, to prevent bot accounts or large numbers of spam accounts from being created.

Likewise, the seller will also need to register for a seller account with the platform. This is to ensure there are only genuine sellers on the platform posting actual property listings. Plus, there's accountability in the form of seller ratings, if there is incorrect or false information regarding a particular property or if there's improper interactions. Thus, saving the buyer time from viewing properties with incorrect details and not fulfilling their requirements and preventing misunderstandings.

Thirdly, the system doesn't possess a built-in messaging function where buyers can directly contact the seller within the app or platform. Instead, each property listing has the corresponding seller's contact information where the buyers can further link up with the sellers to arrange a house tour and other inquiries. Thus, they can use other third-party communication apps or tools to further discuss a potential real estate acquisition, such as Whatsapp, Facebook Messenger, Telegram, phone call, or email.

# Software Process Model

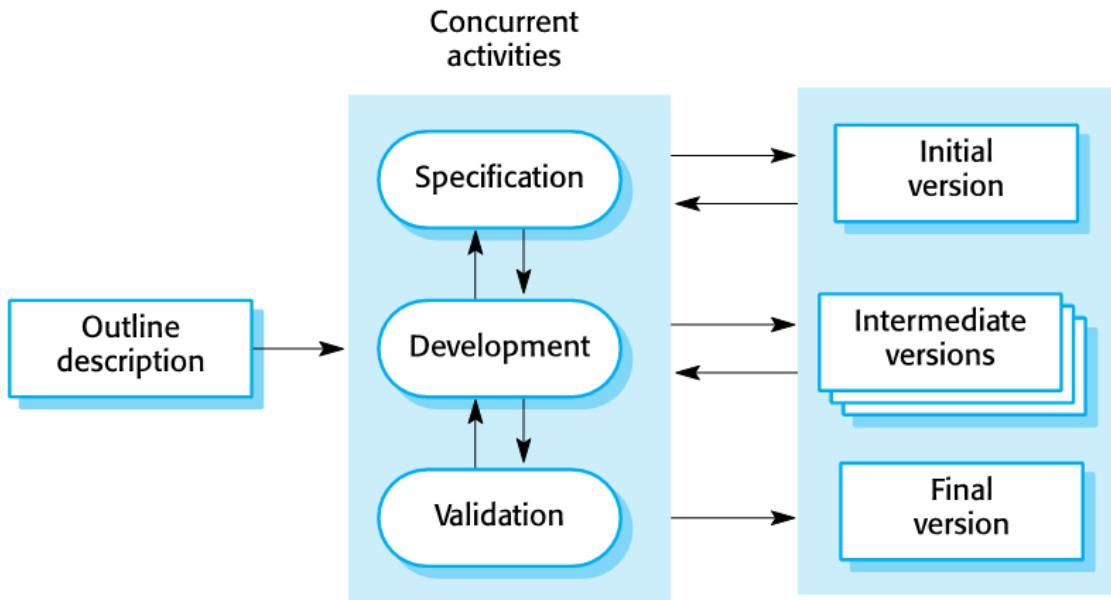


Figure 1.0: The Incremental Development Model [1]

In order to develop this Real Estate Marketplace System, we follow the above incremental development model as the entire software process model or Software Development Life Cycle (SDLC) with emphasis on agile method or approach as the development method.

## Introduction to the Incremental Development Model

Overall, similar to other software process models, the incremental model comprises the 4 main stages or development activities, which are specification, development (contains design and implementation), validation, and evolution. Essentially, what sets it apart from other process models and is the primary characteristic that makes it suitable for this Real Estate Marketplace system, is that the system is developed in several increments until the final product (Final version) is completed. Each increment introduces new added components or functionality to the system and each of the versions of these increments are termed as builds [2]. Therefore, certain processes, which includes specification, development and validation are interleaved, this means that each increment of the system goes through these steps sequentially. Hence, each increment of the Real Estate Marketplace system has to be evaluated and tested completely, especially by the customer, user or proxy, and fulfil the requirements at that stage before moving on to the development of the following increment.

For this Real Estate Marketplace system, we can convert the system into the following components where each will be progressively added to the system per increment cycle as in the diagram above:

Component 1: Interface and Pages of the Real Estate Marketplace (with Post Layout and Search and Filters Function)

Component 2: Login and Registration System

Component 3: Real Estate Details Uploading System (Registered Buyers and Seller can post desired or available property listing respectively)

Component 4: Property Recommendation System for Buyer with Data Mining Model

### **Values of the Incremental Development Model**

The first benefit or reason the incremental development model is employed is so that clients can obtain value and evaluate or test systems earlier in the development process. Especially with an agile method, an incremental method enables partial utilisation of this Real Estate Marketplace system, so we can avoid an extensive development time. In contrast to the waterfall development model where it only has a single delivery which is the final system, for incremental development, as there are multiple increments, each increment has its own deliverables [3]. So, each increment delivers part of the required functionality, where the most important or urgently-needed requirements are incorporated first, especially user requirements [2]. Hence, typically the first version (initial version) or deliverable of the incremental model comprises the core product, then the supplementary features will be developed and incorporated in the following increments. For this case, the main or base feature of this Real Estate Marketplace is its interface, pages and the layout of real estate listings and postings available. So, by completing it early, the customer can test and use the base system's early version and help them grasp the idea of the end system and the following requirements. Simultaneously, by delivering the real estate marketplace system in operational parts, this can boost the morale of the clients or software buyer, since they're being included in the development process actively and can see their requirements being fulfilled.

Overall, this shows that the incremental development model is important for products that need to be unveiled to the market early. This is especially crucial for a real estate marketplace as it needs to gain a large initial audience or user base. Hence, we also placed developing the registration module with a higher priority (component 2) so that the client can begin their marketing, by collecting a mailing or waiting list of users through the registration system, so that when they officially unveil the system they'll have a large initial user base uploading real estate listings and desired property posts.

Moving on, by breaking the Real Estate Marketplace System into these 4 incremental builds, the clients and stakeholders can manually review the system's earlier versions faster than possible with a waterfall model to see if the requirements are being met. So, this helps the developer to obtain user and customer feedback on the system and progress made. Thus, it's a more realistic evaluation approach where the clients can obtain a practical utilisation of the Real Estate System. Plus, it's easier for both the customer and developer to test and debug these smaller iterations, such as they only have to focus on the registration system's operation and interface when they reach that module. Also, as mentioned before, high priority requirements are included first, hence they undergo the most evaluation and testing. Thus, we placed the system pages and interface as the first module, so that every other component can later be individually incorporated to this base system. Plus, the customer is free to suggest changes to the operation of these pages and interface, so the developer can rectify them before proceeding to the next iteration. Thus, this crucial component of the system is checked after every iteration, ensuring it fulfills the customers changing requirements and isn't subject to any errors. So, this can massively reduce the risk of an overall project failure, especially if there are any changes or additional requirements.

Therefore, this incremental model is more suitable for a system where the requirements are clear and can be implemented in phases. Hence, this makes it a limitation for systems where the requirements and incremental components are unclear. However, this can be avoided through thorough preliminary research and planning, like for this Real Estate Management System, the components to be developed at each increment (See Introduction to Incremental Development Model Section) and requirements to be covered (See Functionality Section) have been

predetermined. Additionally, this makes it clear that an incremental model is generally more suitable for smaller-scale systems with a well-defined and simple scope, like for this Real Estate Marketplace system. Its functionalities are relatively simple, excluding the data mining model, has relatively fewer components (4), and the constraints are easy to implement or abide by.

Along with that, the earlier increments which serves as a prototype that clients can interact with and helps them elicit requirements for later increments [1]. Especially in a real estate system like this, we need to provide space for the user's additional requirements. For instance, after seeing the system in practical use, they may have suggestions for improvements, such as a better UI design suited to their predetermined branding. Alternatively, the client may prioritise different user data to be collected within the data mining application. So, with the modules being implemented individually, the client can change the requirements accordingly where they see best fit. Therefore, with an incremental model, the Real Estate Marketplace system is more flexible to functionality changes and ensures risk management. Hence, in the event there are requirement changes, the cost and risk of failure can be reduced, as the risky components are identified and handled earlier. Hence, why we placed the base system design as component 1, so it's requirements can be completed and frozen, before moving on to the following increments.

Overall, through an incremental model, the end product can be more accurate and ensures that all the requirements that the client initially stated and later elicited are fulfilled.

## Requirements Plan

### Introduction

The process of requirements engineering or the requirements planning stage involves several stages to ensure that the final system is designed and implemented to fulfil its required functionalities. Typically, these generic processes are similar for most software development projects even for this real estate marketplace system, which includes, requirements elicitation, analysis, validation, and management.

However, although similar, the implementation of these requirements stages differ depending on the application domain or objectives, the stakeholders involved and the developers in charge of fulfilling the requirements.

Therefore, the following requirements plan, goes over how these stages were conducted and the outcome of each stage for the development of this real estate marketplace system.

With thorough planning and research, it ensures the final software requirements specification (SRS) or system functionality document comprehensively highlights all the necessary functional and non-functional requirements the software should fulfil and ensures it fits into the competitive market of real estate marketplace web platforms. Simultaneously, reducing the chances of neglecting any critical system functionalities and ensuring the implementation stage proceeds smoothly with minimal backtracking.

Although we're implementing the incremental development model which allows for additional requirements to be elicited and proposed by the stakeholders, by covering most of the requirements through the initial software plan, we'll encounter lesser problems when implementing new functionalities which will be less critical and easier to incorporate, owing to the solid foundation.

## **Requirements Elicitation**

This first stage is intended to identify the methods in which we discover or elicit requirements that the real estate system should fulfil.

## **Stakeholders in the Real Estate Marketplace System**

The initial part of the requirements elicitation stage is determining the stakeholders of the project and system. The stakeholders refer to everyone who's involved or interacts with the real estate system, in this case includes end-users, system administrators, engineers/developers performing maintenance. Therefore, it's crucial to ensure that the proposed requirements and functionality

cater to these stakeholders, since they'll be using the final system. So, they serve as a source of requirements as well.

Based on this reflection and observing other real estate websites, I categorised and listed some common characteristics of the stakeholders, especially the end users:

- a) A similar location, the Klang Valley

This real estate marketplace system focuses on a small-niche audience of real estate enthusiasts and properties in the Klang Valley. Thus, most of these stakeholders, especially the end-users, will be residing in the Klang Valley. Thus location is a key common characteristic among the stakeholders, and this will be important when determining the web platform content and search engine optimisation (SEO) targeting or keyword strategy.

- b) The age of the audience is young adults to adults (approximately ages 18-65)

The legal minimum age to purchase and rent property in Malaysia and the Klang Valley is 18 years, where they'll legally be able to enter into such a contract. Whereas the maximum age of the property buyer is most likely 65, the average retirement age in Malaysia, since it's harder to obtain longer term house loans at an older age close to retirement. However, property sellers can be of any age. So, this will help us determine the design choices for the web platform, in terms of color scheme, where a professional option will be chosen and for font size and style a legible and clear option will be ideal.

- c) The audience has an interest or at least basic knowledge in real estate and using such marketplace websites

Considering that the audience is intending to sell, rent, or purchase property, they'll have tried other similar "competitor" real estate marketplace sites. Thus, in order to remain consistent at the same time competitive in this market of real estate websites, the website should have common elements and maintain some closeness to these alternatives. This will ensure the website is easy-to-use and has a lower learning curve, where the end-user will know and learn to use each functionality quicker and where to click or navigate to in the web platform to achieve their goal, whether it's uploading property listings, researching property details, registering for a buyer/seller account, etc. Thus, this can be helpful in determining the design and layout of the

web pages and functionalities to include. Also, it helps us determine the website content and keywords to use which should be closely-linked to the real estate niche. For instance, we can use keywords for anchor text like “Properties for sale in Petaling Jaya, Selangor”.

Moving on, the following are all the specific stakeholders of this real estate marketplace system that I have identified:

- Real Estate Agents or Sellers who want to advertise their property on the platform, which is available for sale or rent.
- Real Estate buyers, tenants, or investors who are interested in purchasing or renting property.
- System administrators who are responsible to review the properties listed for sale or rent and verify users’ (buyer and seller) account registration information.
- Bank, lender, or financial institution staff who can change their loan information, interest rate, fees, and contact information
- Other real estate enthusiasts or browsers who want to get a general valuation and details of properties in a particular area
- IT staff or developers responsible in maintaining the system operation and security

## **Methods of Requirement Discovery, Elicitation or Collection**

Now we’re at the stage where we pinpoint the sources or specific methods of obtaining the requirements of this real estate web platform system. The following section will explain how these requirements discovery methods were implemented or conducted.

Therefore, altogether there are 2 main methods I’ve employed to identify these requirements, which include interviewing potential stakeholders and reviewing and researching similar real estate marketplace web platforms:

## **1. Interviewing**

For this method of requirements elicitation we closely interact with the stakeholders to identify and discover their requirements or needed functionalities of the system. So, during this stage, we'll elicit the domain requirements from the interviewees point of view. Although we won't be able to identify and understand every domain requirement, we can gather the information and requirements proposed by the stakeholders and classify and analyse them in the following stage requirements analysis.

I further broke down this interviewing stage into 2 substages, mainly closed and open interview:

### **i) Closed Interview**

This mode of interviewing involves a pre-planned list of questions for the interviewee. Through this, I can reach out to a larger audience of interviewees or stakeholders as I can mass send these list of questions. Thus, the stakeholders and their characteristics I identified in the previous section are prioritised to be interviewed through this mode of interviewing. This mainly consists of general property enthusiasts, property buyers, and sellers. Thus, the level of experience and knowledge regarding properties of the interviewee doesn't have to be as high as for the open interview, where time is more critical.

There's also a degree of randomness through this method of interviewing as the survey is mass sent and anybody can reply compared to the open interview. Thus, helping us generate a good variance in types of responses and helping us identify more requirements for the system.

The way I executed this interview process is, firstly, I created a Google Form and entered the questions I carefully thought out to ensure the responses will allow me to gather required system functionalities and problems to overcome. Then, I sent the survey to my friends and family members who have interest or experience with real estate. I also promoted the survey on my social media accounts, such as LinkedIn, Facebook, and Instagram to gain more respondents. Overall, I carried out the survey for a span of around 1 week between 20/7/2021-27/7/2021. Afterwards, I gathered the results from the survey and analysed its results.

The following is a link to the Google Form:

[https://docs.google.com/forms/d/e/1FAIpQLSeUvq2-YDK71LMfv91b5GgB\\_IqUqCYJvyCpW-8q3Avu12LVCA/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSeUvq2-YDK71LMfv91b5GgB_IqUqCYJvyCpW-8q3Avu12LVCA/viewform?usp=sf_link)

A screenshot of the Google Form and the list of questions can also be found at Appendix A.

### **Explanation or Motive of Survey Questions**

Here's a brief explanation on the objectives of preparing these questions. Question 1 is a typical form of verification in surveys which I primarily use to point the answers to a particular respondent. Moving on, for Question 2, we're aiming to prioritise respondents who are 18 and above years of age, as this is a key characteristic of stakeholders as they're more likely to be able to enter into a real estate contract and be able to rent and purchase properties. Thus, they're more likely to research properties and use such real estate marketplaces and are more likely to have knowledge in this field. For Question 3, we're aiming to prioritise respondents in the Klang Valley, because, again, this a key characteristic of stakeholders and end-users I'm targeting. Question 4 helps us find which is the most used real estate marketplace system among the population of respondents and from there we can review and research these platforms to determine what sets them apart and special features they provide. Thus, it's especially helpful for our next method of requirements elicitation which is ethnography and reviewing alternative real estate marketplaces. So, for further information on how this ethnography is conducted, refer to the following section. Question 5 - 6 is to further understand the level of the respondents knowledge, where question 5 we can realise the motive or objective for the respondents to use these platforms and question 6 to know their level of experience. Question 7 and 8 is where I aim to gather the system requirements or functionalities that are most necessary for the user. Question 9 is for me to determine the layout of the property listings, where I'll place the most requested or prioritised information or feature on top, allowing the viewer to see it clearly and almost instantly. Question 10 and 11 is where I analyse problems with present real estate marketplaces, and the impact of security or spam problems for the user experience.

### **Results**

From conducting this survey, all in all I managed to achieve my goal and accumulate a representative 30 responses. Therefore, from analysing these responses I found that, firstly, most of the respondents preferred using PropertyGuru for their real estate research. Moving on, in descending order of number of respondents, majority used these marketplaces for renting (10), the second highest was for purchase (investment) (8), for purchase (own-stay) (5), for selling (4), for renting out (3). This helps us determine what aspects of the marketplace to focus on, especially when reviewing other websites. Also, a majority of respondents (25), have actually viewed properties based on information from these online postings and through contacting the seller's on the platform. Therefore, these respondents will be prioritised when analysing their answers to the other questions especially question 10, since they've provided sensitive information to the system and have essentially achieved the end goal of using such a system, which is to communicate with sellers securely and arrange a property viewing session. Additionally, through this survey I managed to find some useful ideas of requirements and functionalities to add as well as a new level of priority for some of these features. From the responses, I've placed a higher priority for features, such as uploading desired property posting, displaying property listing, property recommendations, and contacting property sellers securely. Features such as loan calculation were proposed less, however, it's still essential to such a marketplace system. Typically, respondents pay more attention to the property's selling price, rental rate, space measurement, and location, so, this part of the listing should be highlighted or positioned higher for more emphasis. Finally, in terms of problems and challenges with real estate marketplace systems, majority of respondents (13) are very concerned with their data privacy when using such platforms. Besides that, a common problem that they propose include, seller's promoting false listings or information and hard to find information on listings.

Overall, this round of closed interviewing or surveying has highlighted the importance of a well-designed and layout of a property listing page. In addition to that, in order to remain competitive we shall improve the security of user's inputted data, especially through limited access.

## **ii) Open Interview**

An open interview allows for us to explore or dive deeper into various issues, the system domain and functionalities with the interviewee or stakeholder. Thus, this involves more direct communication and informal queries with the interviewee to pick their brain and understand the system from their point of view. Unlike for a closed interview there isn't a predefined set of questions except for springboard questions to get the discussion started.

Thus, as opposed to a closed interview, this mode of interviewing may be more time critical as both the interviewer and interviewee's time is limited. Hence, the number of interviewees for this interviewing mode is lower, so to conserve time, we select more knowledgeable interviewees or potential stakeholders regarding real estate marketplace systems.

Thus, I limited having an open interview with 3 interviewees, which consisted of 1 former real estate system administrator, 1 former software developer, and 1 property seller. Thus, there's still a degree of randomness to the obtained responses. I performed the interviews through either a video call or a messaging thread.

## **Results and Analysis**

To summarise the rounds of open interviewing, the first interview with the system administrator, I received a basic understanding of a system administrator's role in maintaining the real estate marketplace system and the functionalities they require. Some of the key notes they touched on is the importance of system admin reviewing seller's property listings before publishing and as well as reviewing buyer and seller account creation to prevent multiple spam accounts from being created. A simple way to limit the amount of accounts created by a single user is by requiring them to input their unique phone number, as per inspiration from some popular online platforms today like Clubhouse and GoTrade. On top of that, system admins will also have to monitor the account registration.

The second discussion with the software developer introduced me to other ways to improve user's data security, which was mainly by limiting access to this information. In the event where exchange of contact information is needed, a I'm Interested form can be employed, ensuring that users are knowingly providing access to their info, also a disclaimer message can be shown

beforehand. Also, they prioritised the use of a data mining model to improve the recommended property listings for users.

Thirdly, the discussion with the property seller was helpful to identify functionalities that property agents and agencies require. This short discussion of 5 minutes introduced me to the importance of allowing sellers to create an agent or agency page to improve their reputability on the platform. Thus, they need a page where they can showcase all their live listings, recent sales, and agents on the platform.

## **2. Ethnography or Reviewing Similar Real Estate Marketplace Web Platforms**

Ethnography in requirements engineering is the qualitative study or analysis of how users interact with a system. In this case, we can review similar real estate marketplace systems from a users' point of view. This allows us to gain a deep understanding of how the overall system domain and its functionalities should work. Therefore, this method of requirements elicitation, is beneficial for understanding existing processes in other real estate systems, however it'll be difficult to identify possible additional features we can incorporate. However, we could analyse the problems with the existing systems and improve on them, especially in terms of reducing user spam and improving their privacy and security.

These alternative real estate marketplace systems have a similar target demographic and stakeholders as mine. So, we can gain inspiration from these platforms to generate a list of requirements our desired web platform should also fulfil. This makes the site reputable as it fits into the market of real estate websites and can perform similar functionalities. Plus, as it has common components, such as the registration, listing upload form, listing layouts, and navigation bars, this improves the platforms user-friendliness since they're already familiar with the other platforms. Thus, the learning curve is lower, ensuring the non-functional requirement ease-of-use is met.

Therefore, I can identify the implementation of different functionalities and features that are integral to their website and for end user interaction. These key functionalities I analysed were:

- Web pages used
- Website and pages design and layout
- Features promoted

I made a list of these websites analysed and gathered their key info to a note-taking app, Google Keep. This makes referring back far easier. Thus, the real estate marketplace platforms I analysed includes:

- a) PropertyGuru.com.my
- b) EdgeProp.my
- c) PropertyQueen.com.my

## **Results and Analysis**

From analysing these systems, the following are some key information or things to take note:

- PropertyQueen allows agents/agencies to create a page for their agency to showcase their listings, property agents and information. Thus, we can allow sellers on our platform to create similar pages, so a functionality for this shall be added.
- The layout of the property listings page on all these websites, and the positioning of key information. So, we can take note of this and what some common key information that should have a higher priority in listings include.
- For their home loan calculator, PropertyGuru uses a loan enquiry form for interested buyers to contact these lenders. Therefore, to protect these lenders from spam enquiries and to ensure they only get serious enquiries, we can use a similar form, where only after the buyer submits the form will the lender's contact info be revealed. From there, either party can use this information to proceed with communications.

# **System Functionality or Software Requirement Specification (SRS)**

After gathering and analysing the data from the requirements elicitation stage, we categorised and organised the requirements collected in order of priority. After that, we arrive at the requirements specification stage, which is essentially the process of writing down the functional and non-functional requirements of the real estate marketplace system in a comprehensive requirements document, known as the Software Requirement Specification (SRS).

## **Functional Requirements**

These are system requirements which provide complete technical information about the real estate system's domain. So, it entails the functionalities and services that the system provides. This involves high-level description of functionalities of the system.

With that said, the following are functional requirements I've identified that this system should fulfil:

1. Users shall be able to register for a buyer or seller account on the system.

For this real estate marketplace, there are 2 types of accounts that the user can register for, whether a buyer or seller account. Both accounts have different purposes and have access to different functionality. For instance buyer's can publish desired property postings, access seller's contact information, and obtain recommended property. Whereas sellers can publish property listings, manage interested buyers, etc. So, it can be said that seller and buyer accounts have a different view. Also, only registered users have access to saving properties and searches to their wishlist.

Thus, registration is performed through a pop-up or overlay window which contains the registration form that displays when the user clicks the Register button on the menu navigation bar. Thus, they can register from whichever page they're at on the website. On top of the registration form, the users can select whether they're registering for a buyer or seller account. From there, the form will have different input fields depending on the type information needed to

create the corresponding account. After submitting, the system performs input validation to check if the registration form inputs are correct and not left empty. Once filled and the input validation check is passed, the form is submitted for the system administrator to check.

Hence, the system administrator shall be able to verify the users' account registration information. Thus, there will be a short time span from when the user submits the registration form and is approved to join the platform. During this time, the system administrator has to check whether the user inputted valid data and is safe to join the system.

Overall the goal of this registration form is for users to create an account with the system to access certain functionalities that's locked to normal unregistered users.

For ease of use, the users will not be directed to a separate page to fill in their credentials. This overlay window for user registration was inspired by Zillow.com.

2. Users shall be able to log in to their buyer or seller account.

After users' registration is complete and approved, their account is created and they'll be able to log in. Thus, the system shall also provide a means for the user to log in to their account on the web platform. This allows them to access their account seamlessly and securely, ensuring their account is free from breaches.

Similar to the registration, this can be achieved through a dialog window that displays when the user clicks the login button on the menu bar. Then, they can select whether they're logging in to a buyer or seller account. Thus, users can login from any webpage in the website as long as it has the navigation bar.

After entering their login credentials, the system performs data validation to check if the inputs are correct and not left empty. If so, an appropriate error message is shown. After the form is submitted again and the data validation is complete the inputs are compared with the login credentials stored in the backend to authorise the login.

### 3. Users shall be able to edit account information

Once the users are logged into their account, one functionality they can perform is updating their account information on the Account page. Both buyer and seller accounts have access to change this information, although the input fields are different for both. The purpose of this account page is to display all things unique to their profile, essentially their profile page. Thus, updating their account information is to change the information that's displayed on their profile to other users who visit their profile. This is especially true for property sellers, who want to improve their validity, so they should add information such as license no., agency name, seller rating, etc.

In this account page, a buyer will be able to view and manage their watchlist, saved searches, desired property postings, and recommended property listings to view. Whereas for sellers, on their account page they can view and manage their watchlist, saved searches, property listings, desired property postings they've replied to and other such similar postings they can reply to.

### 4. The platform shall have a home page to direct users to other pages and display recommendations

This home page acts as the landing page of the web platform, which is the first page the user sees when entering the site URL or arriving on the website. Thus, this page needs the most important components and has a high priority to be well designed. Also, the priority of this page is to direct users to the next or other pages they want to go to, whether to search for properties or agents, view a property listing, view a buyer's desired property listing, register for an account, calculate home loan, etc.

For registered and logged in users, this homepage is where the system will display recommended picks for the user, for instance recommended property listings for buyers and recommended buyer's desired property postings for sellers to respond. Plus, this recommendation system is based on machine learning to ensure the recommendations are personalised for the particular user account logged in to the system. The following sections will explain how these recommendation system functions and the user data it collects to achieve this.

5. A system user shall be able to search and browse property listings

There shall be a search function within the system which allows the system user to input any associated name, parts or the whole address, or information about the particular property or even seller/agent/agency they're looking for, and the system shall return the appropriate and corresponding results. For instance, if the user enters "Ampang", the search results of properties and agents in the Ampang location should be successfully returned. This search bar shall also be placed on the menu bar so it'll appear and they can access it on every webpage on the platform.

After that, from clicking the search result, they'll be successfully redirected to the corresponding property listing or agency's page.

Also, the overall purpose of the search function is for the user to specifically access uploaded property listings and agents/agencies on the platform. So, it's one of the most important components of the web platform. The priority here is that the search function successfully returns correct results according to the input.

- View their property listings, access contact information
- Seller has the option to make themselves private so they don't appear in search results, but their properties do (maybe this might seem contradicting - no need to mention)

6. The user shall be able to sort and filter the search results.

Along with the search function, the system shall also provide a functionality to sort and filter the search results. Especially if a particular search returns many results, having a sorting and filter function allows the user to focus on the results that fulfil their most prioritised criteria.

Thus, with the filters function they can exclude results that are outside of their budget or some other exclusion criteria. So, the users shall be able to filter search results in terms of:

- Selling price range
- Rental rate range
- Space measurement range
- House type (Condominium, Villa, Bungalow, etc.)
- Tenure type (Freehold, Lease, Any)

- Furnishing type (Fully, Partial, None, Any)
- Range of number of bedrooms and bathrooms
- Floor level (Low, High, Any, etc.)

They can also limit the search results whether to properties for sale, rent, or both, or only agents/agencies.

Whereas with the sorting function they can be shown results that fit their primary criteria first.

Thus, users can sort the search results by order of:

- Price (Lowest/Highest)
- Space Measurement (Lowest/Highest)
- Date of Posting (Oldest/Newest)
- Relevance (Default option)

7. Users shall be able to view property listings available for sale or rent with its details, and agency pages uploaded by a registered property seller or agent.

An essential part of a real estate marketplace system is the property listings page, which is a web page that displays the listing of the property that's available for sale or rent along with all its necessary details needed by the average property buyer, uploaded by the registered property seller or agent. Thus, every property listing follows the same layout or format, thus a common template can be used.

Therefore, the purpose of this section is so that the system displays all the information of a particular real estate property in a readable manner and well-designed manner. Thus, it's easy for the user or buyer to arrive at the property listing page and skim and find important information easily. Also, by having a consistent layout and design, this makes it easier for the buyer to compare different property listings, and draw wiser purchasing decisions based on the comprehensive information that's provided.

All in all, the system will display the following information about the particular property listing provided by the seller:

- Property address or location \*
- Property selling price, rental rate, or price per square feet\*
- Status of property, whether it's up for sale, rent, or both \*
- House type, condominium, terrace, bungalow, townhouse, etc. \*
- Space measurement (in square-feet) \*
- Number of bedrooms and bathrooms \*
- Floor level (ground, low, mid, high, penthouse)
- Tenure (leasehold, freehold) \*
- Sellers information, (name, agency, registration, and contact information, including phone number and email address) \*
- Pictures, videos, and virtual tours
- Date of posting\*
- Furnishing (none, partial, fully)
- Description
- Property Features
- Facilities

Note : \* means required/compulsory

By accessing these property listings, using the data mining model, the system will also better understand what the user is searching for. Hence, it'll also display recommended similar listings for the buyer to check out.

On this property listings page, only registered and logged in buyers shall be able to access or reveal the property seller's contact information. This is to ensure that the seller's contact information isn't leaked freely and only serious buyers will reach out to them. If an unregistered site visitor intends to access the seller information, they shall be prompted to login or register for an account with the system. The prompt will have 2 links to the login and registration page respectively.

Also, there's a simple contact form for the buyer to express their interest in a particular property listing. Like before, users can only access this feature if they're logged into a buyer account. So, after filling in the form, they can also write an optional message to the seller, then click the I'm Interested button to enter the seller's list of interested buyers. By completing the contact form and clicking I'm Interested the buyer is giving permission for the seller to access their contact information and proceed to reach out to them whether by email or phone number to further discuss the property details. The buyer will be shown a disclaimer message to notify them what happens when filling up this I'm Interested form. After accepting the disclaimer, the buyer will be added to the seller's list of interested buyers/clients. So, they can use this feature to learn more about the property listing, while limiting seller's access to their information. This ensures the privacy and security of the buyer's contact information as the seller can only retrieve it, if the buyer provides permission. So, this is the only mode of direct communication on the platform as the system doesn't possess a standalone messaging feature.

Other than appearing as a page, property listings also appear on other pages such as the home page and search results. This is to show a simplified version of the property listing with only the essential or main information. If the listing appeals to the user then they can click the More Info button which links to the property listing page where they can gain more information. So, this simplified listing found in search results and in recommendations are to give a brief and quick look at the property listing.

8. The system shall allow registered buyers to save a property listing, agent to their watchlist and save searches as well as manage these saves

Additionally, on these property or agent listings, whether the page or the search result, the logged in user can add them to their watchlist by clicking the corresponding icon or button. Besides that, they can also save their searches, with filters and sorts, for later use as well. Then, they can access these saves on their accounts page for a later time. Thus, understandably, to access this feature, the user has to be logged in to their buyer or seller account. If they try clicking the Save button without being logged in, the system shall prompt them to log in or register for an account.

Basically, this Saving function is to help the user to make comparisons between their saved property listings more efficiently. Also, this ensures that they can return to the saves at a later time, which can especially come in handy with saving agent pages and searches. Thus, this feature is especially helpful when researching properties and agencies, as they can save their state or searches and return to it at a later time.

Plus, the user shall also be able to share these saves to others on their social media platforms or through email. This can be achieved through a share function.

Simultaneously, within this accounts page, users shall be able to manage their watchlist, where they can delete properties from their watchlist as well. This will prevent their watchlist from becoming overcrowded and ensures it only displays their required saves or most prioritised saves.

9. A registered property seller shall be able to create, upload, and manage property listings available for sale and rent, along with its required and additional details.

In order to have property listings to display, it's crucial that the system shall allow sellers to create listings of properties that are available for sale and rent that they wish to promote. For this, after clicking the Upload Listing button, there shall be a separate page with a form to allow logged in sellers to add details and information about the particular property listing. Basic data validation should be conducted on the form inputs, to ensure required fields are not left empty. The required details and other property listing information to be added can be found in the 7th functional requirement.

After data validation is passed and the form has been submitted, the property listing should be placed under review before it's live or published. During this time, the system administrators will check the property details to check legitimacy before approving.

Once the post is live, it'll appear on the seller's profile under live property listings and begin being recommended to buyers. Sellers shall be able to update certain information of the property

listing. This ensures updates and additions to the property listing are efficiently conducted on the seller's end.

Overall, the seller shall have the ability to add, update and delete any property listing. Once a property is sold, the seller can mark it as sold, and it'll enter the agent's and agency's recent sales chart.

10. Users shall be able to view agencies, their pages and information on the platform

Similar to the property listing page, there's also a page for agencies that buyers can search and view on the web platform. This page is intended to display all the information regarding the particular agency, including their contact and registration information, agents, live listings, and recent sales. Thus, it acts as a profile page for these agencies to display their listings and area of expertise as well, for instance properties for sale in a particular area. So, it can help improve their legitimacy and reputability to potential buyers. This can be further supported by a rating system, in this case an agency rating which is the average of all the seller ratings. This seller and agency ratings are given by buyer accounts which signifies the seller's level of customer support and quality of service.

Like in property listings, logged in buyers can also contact the agency and enter their list of interested clients through the I'm Interested form. This allows for a secure method of communication between the buyer and seller.

11. The seller shall be able to see the list of interested clients or users

As mentioned earlier, a buyer shall enter the seller's list of interested buyers once they willingly fill and submit the I'm Interested form available on the property listing or agent's page. This list of interested buyers should be accessible to the seller on their account page. Thus, the purpose of this list is so that sellers can easily manage their clients and access their information through the list. So, through a click of a button the seller should be able to send an email or call the buyer.

This list shall display the following information about the buyer:

- Buyer ID

- Buyer Name
- Phone
- Email
- Date Added
- ID of the listing they responded
- Listing Name or heading
- Property space measurement
- Selling price/rental rate
- Message sent

12. The registered buyer shall be able to create, upload, manage property postings with their desired preferences

Besides property sellers, this system shall also allow property buyers to upload postings but of properties they want or desired property postings. Thus, only logged in sellers shall be able to view and respond to these postings, offering one of their own property listings. Besides that, the system shall also recommend properties based on the requirements inputted by the buyer. So, like for property listings, the desired property posting shall display information in a readable and well-designed manner showing all the information that the buyer has added, so the seller can understand the requirements of the buyer, and from there find and offer a suitable property listing. The system shall display the following information about the desired property posting as entered by the buyer:

- Status of property, whether one that's up for sale, rent, or both \*
- First and second choice property location (at least 1 is required) \*
- Tenure of property
- Rental range of property
- Selling price range of property
- Space measurement range
- Number of bedrooms and bathrooms
- Furnishing preference (All, Fully, Partial, None)
- Comments
- Contact details\* (available from buyers account registration)

Note : \* means required/compulsory

This offer is also subject to review by the system administrator, in case the seller spam offers a similar property listing to multiple users or the offer isn't relevant and doesn't fulfil the requirements in any way whatsoever. After it has passed approval, the property will enter the posting's list of responses. Then, the buyer can either ignore, add it to their watchlist, or click "I'm Interested" and enter the seller's list of interested buyers.

The main purpose of this functionality is, from the seller's perspective, this is another way for them to promote their property listings. Plus, this mode of advertising is likely to generate more quality leads to their property listing because they're interacting with real serious buyers and they'll already know the buyer's requirements, so they can tailor the offer accordingly as well.

From the buyer's point of view, besides the search function, this is a way for them to obtain suggestions of property listings to view. Especially for users who don't want to spend too much time researching properties, they can instead tell the system the criteria they're looking for through uploading a desired property posting, then either the system will recommend property listings or professional property agents can offer their listings as well. Ensuring they're only being exposed to listings that are close to or meet their pre-specified requirements. Thus serving as an alternative to obtaining property recommendations, like their very own property advisor.

Therefore, along with displaying the posting, firstly, the system shall also provide a method for the registered buyer's to upload and manage their desired property postings. They can click the Upload Desired Property Posting button on their account page and redirect them to a separate page with the form for uploading. If the user isn't logged in, the system will prompt them to register or log in to their buyer account.

In this form, the buyer shall add details, information, and preferences about the desired property. Also, basic data validation should be conducted on form inputs, to ensure required field's are not left empty. The data fields of this desired property posting form can be found towards the

beginning of the section. No system administration approval is needed to check the buyer's property posting.

Once the posting is live, it'll appear on the buyer's profile page under live desired property postings and it'll begin receiving responses, such as recommendations from the system and pushed to sellers in their homepage and searches.

Along with that, the buyers shall have the ability to update and manage information of this property posting. This allows for changes to be made, in case there are additional criteria the user would like to add or even a change of heart. All this ensures that the updating of these desired property postings is efficient. The buyers can also delete postings they no longer need or make it private so it no longer receives offers and responses.

All in all, the system shall allow for the buyer to add, update and delete these desired property postings, for efficient management of responses and as another avenue of finding potential good quality real estate acquisitions opportunities.

13. A registered seller shall be able to view and respond to desired property postings

As mentioned earlier, registered sellers shall be able to find buyer's desired property postings, either on their homepage as recommended choices or they can search for these property postings using the search function. From there, they can read and understand the requirements of the buyer and offer one of their property listings. To ensure the responses are relevant and haven't been mass sent or offered for multiple desired property postings, the system administrator should review the responses. Here they'll determine the relevancy and prevent the user from receiving spam, unrelated, or inaccurate real estate responses. Overall, as mentioned before in the previous requirement, through this functionality the seller can promote their property listings to more buyers and generate quality leads.

14. A logged in buyer shall be able to use the Home Loan Eligibility Calculator to obtain the loan repayment structure and connect them to reputable banks/lenders

The system shall allow registered and logged in buyers to perform loan calculation to determine the amount of home loan they're eligible to receive, also known as the home loan eligibility calculator. So, if a normal user tries accessing the Loan Calculator option through the menu bar or home page, the system shall prompt them to register or log in to a buyer account. The home loan eligibility calculator functions, by taking in some important user input regarding their desired loan. It'll also add to the final estimate an additional 20-30% fees users need to pay, which include property fees, such as stamp duties. The following are the information that the loan calculator requires:

- Desired loan amount \*
- Desired interest rate \*
- Loan Term \*
- Rate type (Floating, Fixed, All)
- Bank
- Maximum Percentage of income spent on Loan (%)

**Note :** \* means required/compulsory. Also, the rate type and bank options are to filter the list of banks and financiers the system returns.

Then, after entering and passing the basic data validation checks, it'll return a an estimated loan repayment structure, where it displays:

- The proportion of loan repayment, between principle and interest payment
- The maximum total monthly mortgage repayment
- The maximum principal payment
- The maximum interest payment

Besides the loan structure estimation, the system will display a list of real banks/financiers/lenders and their specific loan types or plans for the buyer to compare. This will allow the buyer to make a wise decision regarding which financier they should choose. Then, they can select an Enquire button next to the chosen bank which will return a contact form for them to fill in with their contact information (Name, Email, Phone Number) for the bank to reach out to them. This form also performs basic data validation to ensure all data fields are filled and

are not left blank. After submitting the contact form the system shall reveal the contact information of the bank, in case the buyer would like to contact directly. This section is for the buyer and bank to connect so the buyer can gain more information about the loan and they can further discuss.

This form of communication is to preserve the privacy of the buyer, so that they'll only be contacted when the user chooses to enquire about the loan by submitting the form. Also, this benefits the bank as they'll only be contacted by serious loan applicants and their contact information isn't being leaked to every site visitor.

Overall, this functionality of the loan calculator is for the buyer to understand the mortgage and loan repayment for a particular property and to keep that in consideration when comparing properties. Thus, there shall be a prompt on every property listing, displaying the estimated monthly repayment for that particular property if a home loan is applied. Then after clicking that prompt they'll be redirected to this loan calculator. Along with that, this calculator will connect the buyer to reputable lenders, with loan details that appeal to the buyer.

15. The platform shall use a recommendation system based on a data mining model to recommend property listings to buyers

The main use of the recommendation system is to recommend property listings to buyers which can be found on their homepage or account page, under Recommended Properties. The effect of these recommendations are more profound when the buyer is logged in to their, whereas for normal users the properties under the recommended list will only be the most viewed or the general properties that are specially recommended for other users.

So, if a user is logged in when accessing the web platform, these recommended real estate listings are suggested based on the customers':

- Past or previous searches of properties.
- Property listings that have been viewed.
- Engagement with the particular property listing. (i.e. the session duration of viewing, sections that are viewed or clicked, interactions on the listing page)

- Saved properties in their wishlist.
- Requirements or features they're looking for in a property
- Budget and amount of loan they're able/worthy to apply. This is determined through the buyer's loan calculation.

So, these criteria will be considered or used when developing the data mining model.

The overall purpose of this recommendation system in recommending property listings to buyers is so that buyers don't have to spend too much time researching to get their ideal property.

Instead, the system will recommend listings that will most likely fulfil their requirements and specially caters for them based on the above criteria. This is considered a time conserving option for the buyer, instead of searching for particular listings. Also, the buyer may have a hard time starting off their research, so by having these recommendations they have somewhere to start from.

For the sellers, this is also beneficial, since they can get organic traffic of interested buyers since their listings are being promoted for free to these buyers. Besides gaining more interested views or traffic, the leads are also more quality as the listings are recommended to buyers with similar requirements. Thus, higher quality leads means there's a higher probability of conversion and the seller can get the leads faster.

Another way this recommendation system benefits sellers is this model shall also be used to recommend buyer's desired property postings to sellers based on past postings the seller has responded to, or their area or location of expertise. Thus, they'll have a better selection of desired property postings to reply to that are specifically selected for them.

## **Non-Functional Requirements**

As opposed to functional requirements, these form of requirements entail the behaviour and properties the system should possess as well as constraints the system should comply with. So, often these non-functional requirements have a more crucial need to be fulfilled as they dictate

how the entire system functions instead of singular components as seen with functional requirements. Therefore, if not fulfilled it could render the system unusable.

For this real estate marketplace system, the following are the primary non-functional requirements that I've identified that need to be fulfilled:

1. The real estate marketplace system shall ensure user's security and privacy on the platform, free from any information leaks

Since the system collects sensitive user data for account registration, property listings, desired property posting creation, etc., the system needs to ensure this uploaded data is safe and secure from unauthorized access, leaks, or any form of breaches. A primary example of such sensitive data includes the user's contact information, such as their phone numbers, email, and address. Thus, the primary way we ensure the security of this data and the user's privacy on the platform is through limited access to these information.

On the platform, the user, especially the buyer is always in charge of how their information is being accessed. The only way for their contact information can be accessed by another user on the platform, is if the buyer themselves willingly fills the I'm Interested form to enter the Seller's list of interested clients. Also, if the buyer willingly fills the loan enquiry form to enter the Bank/Lender's list of clients as well. Additionally, before submitting these contact forms, the user will be shown a disclaimer and privacy policy they have to accept and an explanation of how their data is handled and who has access to them. Thus, essentially, giving permission to the seller or lender to access this contact information, so they can reach out to the buyer and have further communication about a particular property listing or loan enquiry. Hence, it's clear that contact information is crucial for this communication to take place, so the system shall ensure this user data is always protected from unauthorized access that can lead to users being subjected to phishing schemes or unwarranted spam promotions.

Along with that, the system also protects the sellers and lenders contact information as well, so they're only being accessed by serious and legitimate buyers. This is because the seller's contact information on the property listing shall only be accessed by a logged in buyer. Thus, in the

event of any breaches we can trace back to the particular buyer account. Whereas for the bank or lender, the information is only revealed when the buyer submits the loan enquiry form. Overall, the system aims to protect the data of all system users, including buyers, sellers, or banks.

2. The real estate marketplace system should have moderate to high page loading speed and moderate to low page size

As this real estate marketplace system will be deployed as a web platform, it's crucial that users shall be able to load and access the platform in a lesser amount of time. Specifically, we can measure this web platform speed using reputable online performance tools, such as GTMetrix and Google PageSpeed Insights. The metric for measuring the site speed we can use or focus on is First Contentful Paint (FCP), Time to Interactive, and Fully Load Time.

Thus, it's expected that the web platform's FCP should not exceed 1 second, Time to Interactive should not exceed 1.5 seconds and Fully Load Time should not exceed 4 seconds. We obtained these limits by analysing the speed of other real estate marketplace system's and calculating the average. This includes, PropertyGuru.com.my, iProperty, and EdgeProp. By doing this, we can ensure that in terms of the web platform's loading speed it remains competitive with the other websites in the same niche or market.

Overall page loading speed is very essential to the real estate marketplace system as it's more efficient and provides a much better on-page user experience. Thus, this can reflect on the website's overall reputability, brand and reliability, leading to lower abandonment and bounce rate as well. Optimising site speed is also essential for the web platform's search engine optimisation (SEO) performance to ensure high search rankings, allowing it to compete with the other competitor sites and garner a consistent flow of users.

However, this page load speed is affected by various factors, some of which are often out of reach of the developer, for instance a low internet download speed of the site visitor.

Nonetheless, the developer shall perform all the site speed optimisation that's available to them, such as optimising the web platform's page sizes, using a Content Delivery Network (CDN) to deliver the website content rapidly to the users in a particular area.

So, another non-functional requirement is that the size of the web platform page's should be relatively low as well, to ensure optimal site loading speed. For this we can measure page sizes using the Pingdom Website Speed Test Tool and GTMetrix. The size can be measured by Mbytes or Megabytes and ideally every page size on the web platform shall not exceed 3MB. This is the average page size of other similar real estate marketplace websites I've analysed as mentioned previously.

3. The real estate marketplace system should be online and live at all times except for during maintenance.

To ensure the platform is always functional and accessible the marketplace system shall experience little to no downtime. So, this is another measurable non-functional requirement, which we can test in terms of time or seconds the platform is inaccessible. Thus in the event, downtime does occur it shall not exceed 5 seconds in any one day. Thus, the unexpected downtime is not noticeable and users can resume with their tasks on the system almost instantly. The system should overall be able to handle numerous concurrent users and activities/interactions, at the same time be less prone to crashes and backend errors.

This is to preserve the reputation and reliability of the system. Besides that, it's to ensure that the user's activities or tasks aren't halted midway. Overall, by keeping platform crashes and downtime to a minimum, this can ensure the user experience is conserved.

4. The real estate marketplace platform should be easy to use or intuitive for all system users.

It's crucial that the system has a lower learning curve so that users almost instantly understands where all the buttons and required information is available on the web platform, so ensuring the platform is easy to use and optimal user experience. A key example of this is the property listing page, where the layout of information should be simple to understand and labeled or identified so that users know where to look to find their desired information about a particular property. By making the platform easy to use the number of errors or failures encountered by the user on the system can be significantly reduced as well, since there are appropriate and indicative error

messages. Thus, we can measure the system's ease of use during the User Acceptance Testing (UAT) or Beta Testing, where real users can test out various functionalities within the system. During this, we the developers have to calculate the rate of failure occurrence. Thus, to ensure optimal usability, the average number of such failure occurrences should be limited to 2 errors per minute.

Plus, another way the system's ease of use can be improved, is the system shall provide help frames or simple tutorials guiding users through performing certain functionality. For instance, this can be implemented at the loan calculator feature showing users where and what data to input, then after that how to read and analyse the results or estimates the calculator returns, and how to compare and enquire about a particular loan with the corresponding lender using the enquiry form.

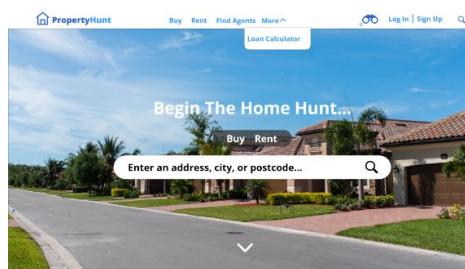
## Prototype Design

This section will display the prototype design of the pages of the real estate marketplace system. For this, I used the online prototyping tool Adobe XD. The following is a link to the designs at Adobe XD which you can access:

<https://xd.adobe.com/view/f3fa2c7e-625f-4e7d-9f2d-4d476c1d6e3f-a6a9/>

I've also attached pictures of the design in this section to support the brief narrations. However, for a clearer and more zoomed in image I would recommend viewing through the above link on Adobe XD and using a PC.

## Home Page



### How can PropertyHunt help you...



### Recommended Picks For You



[View More](#)

### Latest Projects



[View More](#)

### Browse by Cities



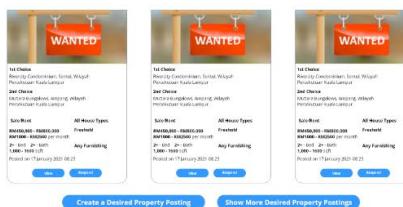
[View More](#)

### Explore Featured Agents and Agencies in Klang Valley



[Find More Agents and Agencies](#)

### Desired Property Postings by Buyers



## **Explanation of Homepage**

This home page is the landing page of the system.

It starts with the sticky header which maintains on the viewport as the user scrolls down. This header section is consistent in terms of functionality and design across every page in the website. Another consistent element is the footer which is the same on every page of the website. At this header section, there's the navigation bar with the centered menu consisting of 4 buttons namely, Buy (links to search results with properties for sale), Sell (links to the Property Listing Upload page), Finding Agents (links to search results with agents). So, these link to the corresponding page when users click on it. More buttons can be added under More as more pages are added to the system. Currently, it contains the Loan Calculator option which links to the loan calculator page. Besides that, to the left the header contains the website logo that reflects the brand, PropertyHunt. This links back to this homepage. To the right, there's the watchlist button which displays the user's watchlist and saved searches when clicked, the log in and Sign up button which displays the login and registration form respectively as an overlay on the parent page. At the end there's a search button used to search everything on the website.

Next, in this Homepage there's the search function which allows users to search for properties and agents/agencies on the platform. Here, they can filter the search results to only display properties for sale or rent.

After that the next section of the homepage is a Services section which showcase what the website does for users. The links beneath each services, links to its corresponding page.

The content of this page may appear different for each type of user, namely, unregistered regular users, logged in buyer accounts, and logged in seller accounts. This is mainly evident with the Recommended Picks section, where this displays the recommended listings specific to the particular user and their profile. If the user is a logged in buyer, this section will display property listings more specifically and accurately, whereas unregistered users will see most viewed listings or listings recommended for other users. So, users can click the More Info button on the property listings and be redirected to the corresponding property listing page. They can also select View More and it'll display a search results page of recommended listings.

After that, there options where users can see Latest Projects or perhaps filter property listings according to cities.

Then, there's a section which shows featured agents and agencies on the platform. Again, users can either view more details about a particular agency, and be redirected to the particular agency/agent page or obtain a search results page of agents.

Towards the bottom, there's a Desired Property Postings by Buyers section, which shows wanted property postings by other buyer accounts. Sellers can click View to learn more information about the property posting or click Respond and they can offer one of their property listings. Under that, there's a button which buyer's can click to create such a desired property posting. So this links the user to the desired property posting upload page. If another type of user clicks this button the register window will be prompted for the seller to register for a buyer account as this functionality is restricted to them.

As mentioned before this footer section will appear similar across every web page of the system. Finally, at the footer section, again there's the website logo and there are linked social media icons/buttons that direct the users to the websites social media pages when clicking on the corresponding icons. Then, there are links to the corresponding search results pages which either show properties for sale or rent. Then links to the site about, contact, privacy policy, terms and conditions, advertise with us page. Finally, at the bottom, there's a simple copyright message.

## Registration Form

There's 2 types of registration forms, for buyers and sellers. Both forms can differ in terms of input fields. This allows for specialised data fields to be added for each form. For now, the input fields are standard and are slightly similar, except seller's who have to state their role. After the input field there's a box to tick to subscribe to the website newsletter, followed by a privacy policy statement, and a button to confirm the registration. After the registration each will have more inputs to fill on their account page.

### For Buyer

Sign Up to PropertyHunt X

buyer      seller

First Name  
Malaysia (+60)

First Name  
Phone Number

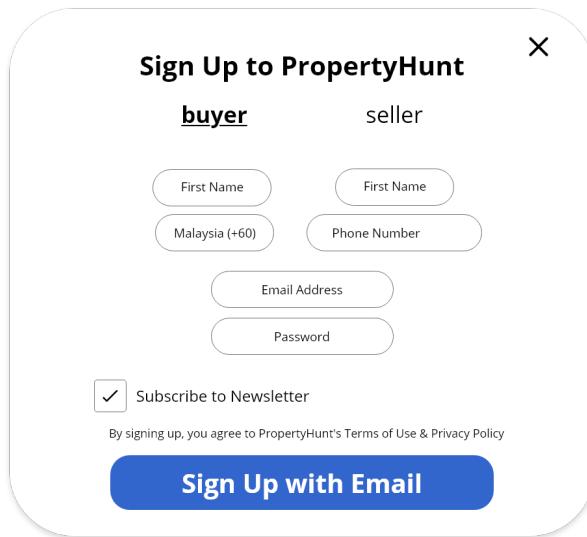
Email Address

Password

Subscribe to Newsletter

By signing up, you agree to PropertyHunt's Terms of Use & Privacy Policy

**Sign Up with Email**



### For Seller

Sign Up to PropertyHunt X

buyer      seller

First Name  
Malaysia (+60)

First Name  
Phone Number

Email Address

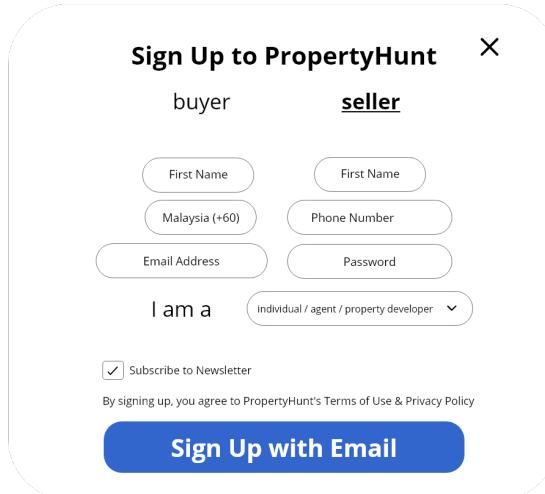
>Password

I am a

Subscribe to Newsletter

By signing up, you agree to PropertyHunt's Terms of Use & Privacy Policy

**Sign Up with Email**



## Login Form

Similar to the registration form, there are 2 separate login forms as well, to make login form handling more efficient. At the top, users can select whether they require the buyer or seller form. Then, there are the standard login credential input fields. A Remember Me tickbox to make logging in again easier and a Forgot Password button to help users who can't access their account. Finally, the Log In button submits the log in form along with their credentials.

### For Buyer

**Log In to PropertyHunt** ×

**buyer**      **seller**

Email Address

Password

Remember Me      [Forgot Password](#)

**Log In**

### For Seller

**Log In to PropertyHunt** ×

**buyer**      **seller**

Email Address

Password

Remember Me      [Forgot Password](#)

**Log In**

## Buyer Account Page

PropertyHunt

Buy Rent Find Agents More

Log In | Sign Up

Display Name  
Member since 18/12/2023

Edit Profile Settings

**Profile**

**Profile Details**

Name: John Edwards  
+ Add Home Address

Date of Birth: + Add Date of Birth

Monthly Income Range (RM): + Add Monthly Income Range (RM)

**Location Details**

Current Place of Stay: Citizenship: + Add Citizenship

+ Add Home Address

+ Add Home Address

**Contact Details**

Email Address: example@mail.com  
Phone Number: +60140901259

**Property and Agent Watchlist**

Sang Suria Condominium  
Petaling Jaya, Selangor, 47100 Kuala Lumpur, Malaysia  
Sale/Rent: Condominium | Freehold | Any | Fully | 3+ Bed | 1 Bath | 1,200 sqft | Posted on 17 January 2021 08:25 | Saved

Sang Suria Condominium  
Petaling Jaya, Selangor, 47100 Kuala Lumpur, Malaysia  
Sale/Rent: Condominium | Freehold | Any | Fully | 3+ Bed | 1 Bath | 1,200 sqft | Posted on 17 January 2021 08:25 | Saved

NEX Realty Sdn. Bhd.  
Selling: Residential | View Details | Contact Seller

Show All Saved Properties and Agents

**Saved Searches**

Kuala Lumpur Sale  
Price: 1000-2000 | Any | Any | 1 Room - 1000 | Condominium | Freehold | Any | Fully | 1+ Bed | 1 Bath | + Add | Edit | Delete | More info | Show All

Kuala Lumpur Sale  
Price: 1000-2000 | Any | Any | 1 Room - 1000 | Condominium | Freehold | Any | Fully | 3+ Bed | 1 Bath | + Add | Edit | Delete | More info | Show All

Kuala Lumpur Sale  
Price: 1000-2000 | Any | Any | 1 Room - 1000 | Condominium | Freehold | Any | Fully | 3+ Bed | 1 Bath | + Add | Edit | Delete | More info | Show All

Show All Saved Searches

**Desired Property Postings**

1st Choice  
Petaling Jaya, Selangor, Malaysia  
Price: 1000-2000 | Any | Any | 1 Room - 1000 | Condominium | Freehold | Any | Fully | 3+ Bed | 1 Bath | + Add | Edit | Delete | More info | Show All

2nd Choice  
Petaling Jaya, Selangor, Malaysia  
Price: 1000-2000 | Any | Any | 1 Room - 1000 | Condominium | Freehold | Any | Fully | 3+ Bed | 1 Bath | + Add | Edit | Delete | More info | Show All

3rd Choice  
Petaling Jaya, Selangor, Malaysia  
Price: 1000-2000 | Any | Any | 1 Room - 1000 | Condominium | Freehold | Any | Fully | 3+ Bed | 1 Bath | + Add | Edit | Delete | More info | Show All

Create a Desired Property Posting

Show All Desired Property Postings

**Recommended Property Listings for You**

Sang Suria Condominium  
Petaling Jaya, Selangor, 47100 Kuala Lumpur, Malaysia  
Sale/Rent: Condominium | Freehold | Any | Fully | 3+ Bed | 1 Bath | 1,200 sqft | Posted on 17 January 2021 08:25 | \*Based on Your Preferred Location and budget | Save to Watchlist | More info

Sang Suria Condominium  
Petaling Jaya, Selangor, 47100 Kuala Lumpur, Malaysia  
Sale/Rent: Condominium | Freehold | Any | Fully | 3+ Bed | 1 Bath | 1,200 sqft | Posted on 17 January 2021 08:25 | \*Based on Your Preferred Location and budget | Save to Watchlist | More info

Sang Suria Condominium  
Petaling Jaya, Selangor, 47100 Kuala Lumpur, Malaysia  
Sale/Rent: Condominium | Freehold | Any | Fully | 3+ Bed | 1 Bath | 1,200 sqft | Posted on 17 January 2021 08:25 | \*Based on Your Preferred Location and budget | Save to Watchlist | More info

Show All Recommended Properties

**Footer**

- PropertyHunt
- Popular Properties for Sale >
- About PropertyHunt
- Privacy Policy
- Popular Properties for Rent >
- Contact PropertyHunt
- Terms and Conditions
- Advertise With Us

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## **Explanation of Buyer Account Page**

This is the account page of the buyer that they see after logging in. First, it displays the Display Name of the account, a profile picture, how long they've been a member for. There's a button for them to click in order to edit their profile and a settings button to access other account settings.

Then, in the profile section there are more details that the buyer can add to their profile. This is optional and won't be shown to other user. Some details are important for the buyer to respond to property listings, namely the Contact Details.

After that is the watchlist section with their saved properties and agents. They can remove items from this watchlist by clicking the Saved button again. They can display all the saved items in the watchlist by clicking the corresponding Show All button. As always clicking the property item will direct to the corresponding property listing page and clicking the agent will link to the agent/agency page.

Likewise the saved searches function similarly as well. Users can manage these by updating, deleting or viewing all the saved searches. They can click search again, to perform the search again with the same filters and sorts.

Then, there's a section displaying their desired property postings. By clicking the create button, this redirects to the upload desired property posting page, where they can fill their preferences and details to create a new posting, this will be described in the next section. Clicking the show all button will direct them to their list of desired property postings.

Finally, at the bottom is the recommended properties section, which similar at the homepage, shows specialised property listings that the system chooses for the buyer through data mining. So, they can click the show all button to show a list of such recommended properties.

## Upload Desired Property Posting Page

 **PropertyHunt**
Buy Rent Find Agents More 
 Log In | Sign Up 



Buyer  
**Display Name**  
Member since 19/12/20



**Add a Desired Property Posting**

Have an idea of your dream home but don't know where to begin looking or searching? Let our smart home recommendation system help you and hear what other top-certified agents have to offer you!

You can save time, effort & money by creating Desired Property Postings through the request form below, and allow Hundreds of PropertyHunt Top Property Agents contact you!



Interested \*:  For Sale  For Rent      Houses Type:

**Property Location**

First Choice Location:  

First Choice State\*:

First Choice City\*:

Second Choice Location:  

Second Choice State:

Second Choice City:

**Budget/Property Type**

Tenure:

Min Rental Rate (RM):  Max Rental Rate (RM):

Min Selling Price (RM):  Max Selling Price (RM):

**Property Size/Details**

Min Number of Rooms:  Max Number of Rooms:

Min Number of Bathrooms:  Max Number of Bathrooms:

Min Space Measurement (sqft):  Max Space Measurement (sqft):

Furnishing:

**Additional Details**

Comments:

**Contact Details**

Contact Name\*:

Contact Number\*:

Contact Email\*:

\* means required.

I agree to the terms and conditions

### **Explanation of Upload Desired Property Posting Page**

This page is basically a form that buyers fill to post their desired property posting. Therefore, it consists of many data fields that the user can fill in describing the preferences of their ideal property. After the profile details and the heading and explanation to this feature, are the input fields of the form. They can be divided into Property Location, Budget/Property Type, Property Size/Details, Additional Details, Contact Details (taken from the buyer account page). Some of these fields are required while others are optional as indicated with the \*. Finally, there's a checkbox to agree with the terms and conditions, then the Submit button will send the form.

## List of Desired Property Postings



Buy Rent Find Agents More ▾



Log In | Sign Up



Your Live Desired Property Postings

Manage Listings | Statistics

Upload New Desired Property Posting

No.	Posting ID	Posting Name	For Sale/Rent	Status	Date Uploaded	Selling Price (RM)	Rental Rate (RM/Month)	Size (sq.ft)	Responses	Actions
1	218932139	Sang Suria Condo	Both	Online	17-01-2021, 08:25	530,000	1,500	1,256	12	<a href="#">Update</a> <a href="#">Delete</a> <a href="#">View Responses</a>
2	218932131	Desa Villas	For Sale Only	Offline	19-07-2020, 09:30	840,000	N/A	2300	24	<a href="#">Update</a> <a href="#">Delete</a> <a href="#">View Responses</a>

Customer Support



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Properties for sale in Kuala Lumpur

Properties for sale in Petaling Jaya

Properties for sale in Subang Jaya

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[Popular Properties for Rent >](#)

Properties for rent in Kuala Lumpur

Properties for rent in Petaling Jaya

Properties for rent in Subang Jaya

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## Explanation of List of Desired Property Postings

When buyers click the Show All Desired Property Postings button, they're redirected to this page. Basically, it's a place where the users can manage all their property postings, whether to update its details, delete the posting altogether, or view the responses from sellers or the system to the particular posting. At the top, there's a button to upload a new posting, basically this directs to the Upload Property Posting page, for the buyer to create another posting.

## Seller Account Page

PropertyHunter | Log In | Sign Up | Q

**Profile**

**Profile Details**

Name John Edwards	Date of Birth + Add Date of Birth
Role + Add Role (Agent/Seller/Unspecified)	Company/Agency + Add Company/Agency

**Location Details**

Current Place of Stay + Add Home Address	Citizenship + Add Citizenship
---	----------------------------------

**Contact Details**

Email Address example@mail.com	Phone Number +60140901259
-----------------------------------	------------------------------

**Live Property Listings (13)**

**Upload New Property Listing**

**Manage All Live Property Listings**

**Property and Agent Watchlist**

**Show All Saved Properties and Agents**

**Desired Property Postings You've Replied to...**

**Other Recommended Desired Property Postings to Check Out...**

**Show All Desired Property Postings**

**Footer Links**

- PropertyHunter
- Popular Properties for Sale >
- About PropertyHunter
- Privacy Policy
- Popular Properties for Rent >
- Properties for rent in Kuala Lumpur
- Contact PropertyHunter
- Terms and Conditions
- Advertise With Us

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Similar to the buyer account page, also have an account page, only they can view to store information and data exclusive to their profile. So, like before, it starts with the profile data that other users can see namely, their role, profile picture, display name, member since date, and seller rating. Then, there's an edit profile button to change any of these profile info except for seller rating, given by other users/buyers, role, and member since date. After that, is the profile section with their profile details they can add.

After that, is a section displaying their live property listings. It displays the number of property listings and an upload button which links to the property listing upload page. Then, there's a list of property listings which they can manage, whether to view (links to property listing page), update, reuse the listing as a template or view its interested buyers. At the bottom of that is a Manage All button, which links to the list of property listings page, which provides a more comprehensive look at their property listings and where they can manage these listings.

Then there's a section for the seller's watchlist, where they can manage items of the watchlist.

After that, is a section which shows their history of desired property postings they've replied to. This allows for them to keep track of the property they've responded.

Finally, there's a section which recommends more desired property postings for them to check out and respond to. These postings are specifically recommended to these sellers based on these seller's recent activity and past responses. So, it uses the data mining model to recommend property postings as well. At the bottom of that is a Show All button where the sellers can see more of such recommended postings.

## Property Listing Page

**Property Hunt**

Buy Rent Find Agents More

Log In | Sign Up

Post on 17 January 2021 08:15

**Sang Suria Condominium**  
Persekitaran Perdana, Seksyen 13/100 Bandar Legor, Petaling Jaya, Selangor, Malaysia

**For Sale/Rent**  
RM330,000  
RM1500 per month

**Space Measurement**  
1,254 sq ft

**Freehold**  
**Fully-Furnished**  
**High-Level**

**Home Loan**  
Estimated Monthly Repayment:  
RM330

**Calculate Your Loan For This Property Now!**

**Lis Ngoppen**  
Lis Ngoppen  
6th Floor, Wisma 100, No. 100, Jalan 13/100, Petaling Jaya, Selangor, Malaysia  
Seller Rating: 4.8/5  
Phone: +6012 345 6789 | Email: lis.ngoppen@protonmail.com | Get in Touch Regarding This Property!  
Name\*: Enter your full name here  
Phone\*: Enter your phone number here  
Email\*: Enter your email here  
Message: I am interested in this property. Please contact me as soon as possible.  
Save to Watchlist | Like This Property? Save it to your Watchlist, then compare and decide later!

**Description**  
Sang Suria Condominium, Seksyen 13/100 Bandar Legor, Petaling Jaya, Selangor, Malaysia  
Key Features:  
- 11 floors  
- 12 units per floor  
- 12 units per floor, 3 units per floor  
- Fully Furnished, located at Petaling Jaya, Selangor, Malaysia  
- Located in a prime location  
- Easy access to major roads  
- Shopping convenience nearby  
- 24-hour security system  
- Swimming pool  
- Gymnasium  
- Pet-friendly building  
Kudos! Leave a message/review for further communication and coverage viewing.

**Location - Explore the Neighbourhood**  


**Property Details**

Property Type	House Type	Tenure Type	
For Sale/Rent	Condominium	Freehold	
Space Measurement	1,254 sq ft	Space Measurement Price	RM330,000
Selling Price	RM330,000	Rental Rate	RM1500 per month
Rentable Area	1,254 sq ft	Number of Bathrooms	2
Number of Rooms	3	Number of Carports	2
Furnishing	Furnished	Floor Level	High Level
Developer	Kudu	Occupancy Status	Vacant
Lasting ID	21883185	Built Year	2002
		Date Posted	17 January 2021

**Property Features**

- ✓ Air Conditioning
- ✓ Water Heater
- ✓ Renovated

**Facilities**

- ✓ Fitted Court
- ✓ Tennis Court
- ✓ Central Parking
- ✓ 24-Hour Security
- ✓ Mini Market
- ✓ Cafeteria/Restaurant

**Transaction History at Sang Suria Condominium**

Date	Selling Price	Space Measurement
Sold on 03/09/2020	RM330,000	1,254 sq ft
Sold on 23/05/2020	RM330,000	1,254 sq ft
Sold on 23/05/2020	RM330,000	1,254 sq ft
Sold on 12/04/2020	RM330,000	1,254 sq ft

**Similar Listings**

**Sang Suria Condominium**  
Persekitaran Perdana, Seksyen 13/100 Bandar Legor, Petaling Jaya, Selangor, Malaysia

**Sale Price**  
RM330,000 ++

**Information**  
RM330,000 ++  
3 Bed | 2 Bath | 1,254 sq ft | Magnetic Realty  
Posted on 17 January 2021 08:15

**Save to Watchlist**

**Sang Suria Condominium**  
Persekitaran Perdana, Seksyen 13/100 Bandar Legor, Petaling Jaya, Selangor, Malaysia

**Sale Price**  
RM330,000 ++

**Information**  
RM330,000 ++  
3 Bed | 2 Bath | 1,254 sq ft | Magnetic Realty  
Posted on 17 January 2021 08:15

**Save to Watchlist**

**Sang Suria Condominium**  
Persekitaran Perdana, Seksyen 13/100 Bandar Legor, Petaling Jaya, Selangor, Malaysia

**Sale Price**  
RM330,000 ++

**Information**  
RM330,000 ++  
3 Bed | 2 Bath | 1,254 sq ft | Magnetic Realty  
Posted on 17 January 2021 08:15

**Save to Watchlist**

**Show Other Similar Listings**

**Other Listings in Sang Suria Condominium**

**Sang Suria Condominium**  
Persekitaran Perdana, Seksyen 13/100 Bandar Legor, Petaling Jaya, Selangor, Malaysia

**Sale Price**  
RM330,000 ++

**Information**  
RM330,000 ++  
3 Bed | 2 Bath | 1,254 sq ft | Magnetic Realty  
Posted on 17 January 2021 08:15

**Save to Watchlist**

**Sang Suria Condominium**  
Persekitaran Perdana, Seksyen 13/100 Bandar Legor, Petaling Jaya, Selangor, Malaysia

**Sale Price**  
RM330,000 ++

**Information**  
RM330,000 ++  
3 Bed | 2 Bath | 1,254 sq ft | Magnetic Realty  
Posted on 17 January 2021 08:15

**Save to Watchlist**

**Sang Suria Condominium**  
Persekitaran Perdana, Seksyen 13/100 Bandar Legor, Petaling Jaya, Selangor, Malaysia

**Sale Price**  
RM330,000 ++

**Information**  
RM330,000 ++  
3 Bed | 2 Bath | 1,254 sq ft | Magnetic Realty  
Posted on 17 January 2021 08:15

**Save to Watchlist**

**Show Other Listings in Sang Suria Condominium**

**Property Hunt**

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## **Explanation of Property Listing Page**

This is an important page of the real estate marketplace system. This serves as a template to how other property listing pages appear as well. It basically shows in depth of all the information regarding a particular property as uploaded by the seller. At the top is the media of the property listing, either images, videos or virtual tours of the particular property. Then, there are buttons, to share the property listing, send it as an email and save it to their watchlist. Saving to the watchlist requires for the user to log in to a buyer account.

Next is the main information of the property that the users typically need first, which includes posting date, property name, property type, location, for sale/rent, pricing, space, number of rooms, tenure, furnishing type and level. So, these are the main info they typically need regarding the property, so it shall be kept minimal, clean and easy to read.

To the right is the property seller's information. Users can reveal the contact information but for privacy reasons they'll need to log in to a buyer account to access it. Below that, is an I'm Interested form, which is a simple contact form, where the message is optional, and users can fill and submit to express interest in that particular property. After submitting by clicking the I'm Interested button, a disclaimer and confirmation will be shown, then they'll be added to the seller's list of interested clients/buyers. From there, the seller can reach out to the buyer as they have their information.

After that, is a loan calculator button which shows the typical estimated monthly repayment amount for that particular property. By clicking this button, they'll be redirected to the Home Loan Calculator page to obtain more information and breakdown regarding the loan. After that, is a button motivating the buyer to add the property to their watchlist. So, these 2 buttons when clicked by an user not logged in, will redirect them to the registration form to create a buyer account. Otherwise, if the buyer is logged in it'll perform the corresponding action.

Next, is the Description section, which contains a description of the property listing written by the seller. They can write anything but the submission is subject to review from the system admin. Under location, there's an interactive menu, in this case a Google Maps integration, which shows the location of the property and its surroundings.

For additional information, users can check the next section which is the Property Details section. Then, there's the property features and facilities section displaying the additional features the property offers. After that, is a transaction history, which shows the users the recent property purchases or rentals in that particular area or location.

Finally, there's a Similar and Other Listings section to display other similar property listings or listings in that particular area.

## Upload Property Listing Page

[PropertyHunter](#) Buy Rent Find Agents More [Log In](#) | [Sign Up](#) [Search](#)

### Upload a Property Listing

Gain quality leads for your property listing. Whether it's up for sale, rent, or even both, we're sure to connect you with the top-quality buyers.

Simply fill the form below, and after passing a quick verification, it'll be up and live!

**Property Details** **Upload Media** **Review Listing** **Verification** **Live Ad**

**Contact Details**

Contact Name*	Provided	Agency/Company*	Provided
Contact Number*	Provided		
Contact Email*	Provided		

**Listing Information**

For Sale/Rent/Both:  For Sale  For Rent Houses Type: [Choose a House Type](#)

**Property Location**

Location:  Enter an address, city, or postcode...

Name (Condominium, Town, Suburb):

Address First Line:

City:

Postal Code:

State: [Choose a State](#)

Interactive Map:

**Property Pricing**

Tenure: [Choose a Tenure \(Freehold/Leasehold/All\)](#) Monthly Maintenance (RM) (For Sale Properties):  Per sqft

Asking Rental Rate (RM):

Asking Selling Price (RM):

**Property Size/Details**

Space Measurement (sqft):  Number of Carparks:

Number of Rooms:  Floor Level: [Select a Floor Level](#)

Number of Bathrooms:

Furnishing: [\(All / Fully / Partial / None\)](#)

**Additional Details**

Description:

Facilities:  Barbeque Area  Nursery  Business Centre  
 Swimming Pool  Jacuzzi  Playground  
 Cafeteria/Restaurant  Salon  Sauna  
 Club House  Futsal Court  Covered Parking  
 Mini Market  Tennis Court  24 hour Security

Features:  Air Conditioning  Water Heater  Renovated  
 Washing Machine  Swimming Pool View

Enter Additional Features

Enter Additional Facilities

**Property Media**

Image Files: Click this icon or drag and drop image files of your property listing. Any image format is acceptable (i.e. PNG, JPG, GIF).

Image Files: Click this icon or drag and drop video files of your property listing. Any video format is acceptable (i.e. MP4, MOV, etc.).

Virtual Tour File: Click this icon or drag and drop virtual tour files of your property listing. Any format is acceptable (i.e. PPT, PDF, etc.).

I agree to the terms and conditions.

[Save Draft](#) [Submit](#) [Reset](#)

[PropertyHunter](#)

**Popular Properties for Sale >**  
Properties for sale in Kuala Lumpur  
Properties for sale in Petaling Jaya  
Properties for sale in Subang Jaya

**Popular Properties for Rent >**  
Properties for rent in Kuala Lumpur  
Properties for rent in Petaling Jaya  
Properties for rent in Subang Jaya

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### **Explanation of Upload Property Listing Page**

This page is similar to the upload desired property posting page from before, but this form page is for the sellers to input details and create a property listing. So, it begins with a heading and a brief description of the page.

Then there's a simple flowchart showing users at which stage of the uploading process they're currently at. Next, is the input data fields which users can fill with information regarding the particular property listings. In short, the data fields are organised into a few subsections, namely, Contact Details (obtained from seller account page), Listing Information, Property Pricing, Property Size or Other Details, Additional Details, and Property Media. So, in a way, they're ordered in terms of priority as well. Finally there are buttons to manage the upload form, they can either save it and continue later, submit it for verification and approval, or reset the form which makes all the input fields blank.

## List of Property Listings

The screenshot shows the 'List of Property Listings' page on the PropertyHunt website. At the top, there is a navigation bar with links for 'Buy', 'Rent', 'Find Agents', 'More', 'Log In', 'Sign Up', and a search icon. Below the navigation bar, a heading says 'Your Live Property Listings' with three buttons: 'Manage Listings', 'Statistics', and 'Upload New Property Listing'. A table displays two property listings:

No.	Listing ID	Listing Name	For Sale/Rent	Status	Date Uploaded	Selling Price (RM)	Rental Rate (RM/Month)	Size (sq.ft)	Interested Buyers	Actions
1	218932139	Sang Suria Condo	Both	Online	17-01-2021, 08:25	530,000	1,500	1,256	12	<a href="#">Update</a> <a href="#">Delete</a> <a href="#">Reuse Listing as Template</a> <a href="#">View Interested Buyers</a>
2	218932131	Desa Villas	For Sale Only	Offline	19-07-2020, 09:30	840,000	N/A	2300	24	<a href="#">Update</a> <a href="#">Delete</a> <a href="#">Reuse Listing as Template</a> <a href="#">View Interested Buyers</a>

Customer Support

The screenshot shows the footer of the PropertyHunt website. It includes social media links for Facebook, Instagram, Twitter, and LinkedIn. There are also links to 'Popular Properties for Sale', 'About PropertyHunt', 'Privacy Policy', 'Terms and Conditions', and 'Advertise With Us'. Below these, there are links to 'Popular Properties for Rent' and 'Properties for rent in Kuala Lumpur', 'Properties for rent in Petaling Jaya', and 'Properties for rent in Subang Jaya'. At the bottom, a copyright notice reads '© 2021 PropertyHunt Malaysia Sdn. Bhd. All rights reserved.'

## Explanation of List of Property Listings

After a property listing is successfully uploaded, it's stored in this list for the seller to easily manage them. So this page shows the seller the information and status and allows them to manage the uploaded property listings. Here, they can update its details, delete the particular property listing, reuse it to create another property listing, or view the interested buyers for that particular property. So, clicking the View Interested Buyers button will redirect the seller to the list of interested clients/buyers page. This page is explained in the next section.

## List of Interested Buyers



Buy Rent Find Agents More



Log In | Sign Up



### Your List of Interested Buyers

Manage Clients | Statistics

No.	Buyer ID	Buyer Name	Phone	Email	Date Added	Listing ID	Listing Name	Size (sq.ft)	Selling Price/Rental Rate (RM)	Message	Actions
1	32323333	John Edwards	0182339090	jedw@gmail.com	19-01-2021, 09:31	218932139	Sang Suria Condo	1,256	530,000 1,500	View Message	
2	32323334	Jacob Smith	0186738989	jsmith@gmail.com	23-01-2021, 10:23	218932139	Sang Suria Condo	1,256	530,000 1,500	View Message	

Customer Support



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Properties for sale in Petaling Jaya

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[Popular Properties for Rent >](#)

Properties for rent in Kuala Lumpur

Properties for rent in Petaling Jaya

Properties for rent in Subang Jaya

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This page has a similar layout as the list of property listings and desired property postings. Basically, it's to allow the seller to manage and retrieve the information of all their interested clients and buyers. Basically these users filled the I'm Interested form on the seller's property listing page. Then, the list stores the buyer's information and contact details and the listing they interacted with. So, through this list, the seller can access and use the buyer's contact information for further communication regarding the property. They can view the buyer's submitted message, email them directly or delete their record by clicking the corresponding button.

## Agent/Agency Page

**Property Hunt**

Buy Rent Find Agents More

Log In | Sign Up

Agency Rating: 4.00

About JM Realty

Contact JM Realty

Phone: Email: Website: www.jmrealty.com

Like This Agency? Save them to your Watchlist, to contact them later!

Our Agents

Lian Wei Jason JM Realty Rating: 4.00  
JM Realty - No. 31871 Agency Reg. No. E111626 13 For Sale/Rent, 1 For Rent Only

Chong Gai Hong JM Realty Rating: 4.22  
JM Realty - No. 31873 Agency Reg. No. E111626 10 For Sale/Rent, 1 For Sale Only

See All Our Agents

Get in Touch with JM Realty!

Name\*: Enter your name here  
Phone\*: Enter your phone number here  
Email\*: Enter your email here

Message: We're interested in this property. Enter the reason below to our further communication.

I Agree to PropertyHunt's Terms of Use and Privacy Policy  
Activity on this website, our disclosure processing, marketing and advertising.

Subscribe to newsletter and other services

Find Interested

Location - Find JM Realty

JM Realty Sdn. Bhd.  
No. 21 Bangunan Pengembangan Jaya Jln Barat Seksyen 8, Petaling Jaya, Selangor

Map

Our Live Listings

Sang Suria Condominium  
Petaling Jaya, Selangor, 61100 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur  
Space Rent: RM1500 ++ per month  
3-Bed: 1,250 sqft JM Realty  
Posted on 17 January 2021 08:05  
Save to Watchlist

Sang Suria Condominium  
Petaling Jaya, Selangor, 61100 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur  
Space Rent: RM1500 ++ per month  
3-Bed: 1,250 sqft JM Realty  
Posted on 17 January 2021 08:05  
Save to Watchlist

Sang Suria Condominium  
Petaling Jaya, Selangor, 61100 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur  
Space Rent: RM1500 ++ per month  
3-Bed: 1,250 sqft JM Realty  
Posted on 17 January 2021 08:05  
Save to Watchlist

Recent Sales by JM Realty

Sold on: 03/07/20	Selling Price: RM480,000	Space Measurement: 1,250 sq ft
3-Bed: 1,250 sqft JM Realty	Rental Rate: RM1200/month	Space Measurement: 1,100 sq ft
3-Bed: 1,250 sqft JM Realty	Rental Rate: RM480,000	Space Measurement: 1,400 sq ft

Load More Transactions

Similar Agencies

NEX Realty SDN. BHD. Subang Jaya, Selangor View Details Contact Seller

NEX Realty SDN. BHD. Subang Jaya, Selangor View Details Contact Seller

NEX Realty SDN. BHD. Subang Jaya, Selangor View Details Contact Seller

Show Other Similar Agencies

Since You Viewed JM Realty, Here are Some Recommend Property Listings...

Sang Suria Condominium  
Petaling Jaya, Selangor, 61100 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur  
Space Rent: RM1500 ++ per month  
3-Bed: 1,250 sqft JM Realty  
Posted on 17 January 2021 08:05  
Save to Watchlist

Sang Suria Condominium  
Petaling Jaya, Selangor, 61100 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur  
Space Rent: RM1500 ++ per month  
3-Bed: 1,250 sqft JM Realty  
Posted on 17 January 2021 08:05  
Save to Watchlist

Sang Suria Condominium  
Petaling Jaya, Selangor, 61100 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur  
Space Rent: RM1500 ++ per month  
3-Bed: 1,250 sqft JM Realty  
Posted on 17 January 2021 08:05  
Save to Watchlist

Show Other Recommend Property Listings

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Properties for sale in Petaling Jaya  
Properties for sale in Subang Jaya

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Properties for rent in Kuala Lumpur  
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### **Explanation for Agent/Agency Page**

This page is intended to display all information about a particular agency and has a similar layout to a property listing page. So, it starts with some media uploads regarding a particular property, which includes images, videos, and virtual tours of their property listings. After that, like before there are buttons to share the page, send the page as an email, or save it to their watchlist. The last button can only be effective for logged in users, else, it'll prompt the buyer to register or log in.

After that, there's the main information regarding the agency which includes their rating and join date. There's an about section which entails the agencies background and description. Then there's a contact section with the agency's contact information, such as phone, email, and website. Users can only access the first 2 contact information if they're logged into a buyer account. Similarly there's an I'm Interested form to the right which is only accessible by buyer accounts. So, users can fill and submit this form to enter the agencies list of clients/buyers. Then they can receive guidance and help in acquiring a particular property.

After that like before there's a button to motivate users to saving the agency to their watchlist.

Next, there's a list of agents of that agency, and their corresponding information and details. Users can view more agents by clicking the See All Our Agents button. Next to that, there's a location section with an interactive map in case the user wants to find or navigate to the agencies location. Then, there's a section displaying all the agency's live listings.

After that is a section showing the recent sales the agency managed to close. This information is to further improve the reputability of the agency.

Finally, there are sections which show other similar agency pages for the user to check out and a list of recommended properties, since they checked this agency page.

## Search Results Page

All Cities ▾
Enter an address, city, postcode, agent or agency name... 
 Log In | Sign Up

\*Number of search results\* Results For Properties for sale or rent, or agents/agencies with \*Search term\*

Min Rental Rate (RM) ▾

Min Selling Price (RM) ▾

Min Space Measurement (sqft) ▾

Furnishing ▾

Max Rental Rate ▾

Max Selling Price (RM) ▾

Max Space Measurement (sqft) ▾

Bedroom ▾

House Type ▾

Tenure ▾

Floor Level ▾

Bathroom ▾

More Filters ▾

Update

Sort By... ▾

**Properties**

JM Realty
Posted on 17 January 2021 08:25



Sale/Rent
Condominium • 3, 242 sqft
 Save to Watchlist

RM30,000 ++ • RM1500 ++ per month
3 3 3 2
 View Details

Sang Sura Condominium
Fully Furnished
 Contact Seller

Persiaran Pavillion, Sentul,
I'm Interested

51100 Kuala Lumpur

Freehold

High Level

JM Realty
Posted on 17 January 2021 08:25



Sale/Rent
Condominium • 3, 242 sqft
 Save to Watchlist

RM30,000 ++ • RM1500 ++ per month
3 3 3 2
 View Details

Sang Sura Condominium
Fully Furnished
 Contact Seller

Persiaran Pavillion, Sentul,
I'm Interested

51100 Kuala Lumpur

Freehold

High Level

**Agents/Agencies**



NEX Realty SDN. BHD.

Subang Jaya, Selangor

View Details
 Save to Watchlist

Contact Seller



NEX Realty SDN. BHD.

Subang Jaya, Selangor

View Details
 Save to Watchlist

Contact Seller

Viewing 1 - 20 of 3902 results

1

2

3

4

>

[!\[\]\(7a1f1bb06e3b40d2fd7ad61efdf708eb\_img.jpg\) PropertyHunt](#)
  
[!\[\]\(c7f46c48739482998be168c62e02524d\_img.jpg\) !\[\]\(cdafdb9ec42ff9041b4b06d374bb6266\_img.jpg\) !\[\]\(028babd810fce820232af8af0dc94fd9\_img.jpg\) !\[\]\(453bb6c1cdf1e9022d6750d800f23347\_img.jpg\)](#)

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### **Explanation for Search Results Page**

This search results page is what's shown when a user utilises the search function. Thus, if a search is successful, the search function will return the list of search results in the following format or page. At the top, is the search bar if users wish to search again. Then, there are the main filters if users want to filter the search results, in terms of cities, properties for sale, for rent, or agents/agencies.

Below that is a section with more filters. First, there's a button called Save Search if the user wishes to save the particular chosen filters and sorts. Then, there are the many filters that the user can use to filter the search results. The update button will reload the page with the filters applied. Underneath that, is the sort function where users can arrange the search results in a particular order of their choice. After that is the search results, which is separated based on type whether, properties or agents/agencies. Users can click View Details to view the corresponding property listing page or agent page. For sellers, they can use this search function to find desired property preferences uploaded by buyers.

Finally, at the bottom is a pagination, if there are more search results than can be fit on a single page.

## Loan Calculation Page



Buy Rent Find Agents More



Log In | Sign Up



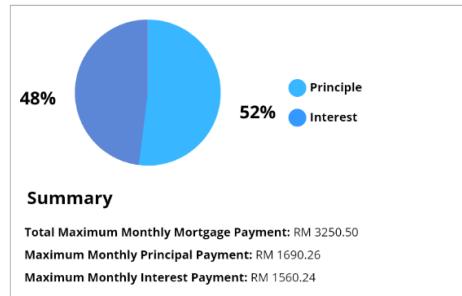
### Home Loan Eligibility Calculator

#### Mortgage Details

Loan Amount	RM 500,000
Interest Rate	2.50%
Loan Term	10 Years
Rate Type	Floating/Fixed/All
Bank	All
Maximum Percentage of Income Spent on Loan (%)	40

**Calculate**

#### Estimated Mortgage and Loan Repayment



### Compare the Best Home Loans

Financier Name	Loan Name	Interest Rate (%)	Monthly Payment	Rate Type	Loan Term (Years)	
Bank A	Tiered Home Loan	3.5	RM3000.00	Fixed	30	<b>Enquire</b> <a href="#">More Info</a> ▾
Bank A	Tiered Home Loan	3.5	RM3000.00	Fixed	30	<b>Enquire</b> <a href="#">More Info</a> ▾
Bank A	Tiered Home Loan	3.5	RM3000.00	Fixed	30	<b>Enquire</b> <a href="#">More Info</a> ▾
Bank A	Tiered Home Loan	3.5	RM3000.00	Fixed	30	<b>Enquire</b> <a href="#">More Info</a> ▾

**Load More**



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Properties for sale in Kuala Lumpur  
Properties for sale in Petaling Jaya  
Properties for sale in Subang Jaya

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Properties for rent in Subang Jaya

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### **Explanation for Loan Calculation Page**

This Home Loan Eligibility Calculator page is for buyers to enter details about a particular desired mortgage or loan and then receive the breakdown of the loan and a list of banks/lenders to enquire with regarding the loan. Thus, this page is only accessible to logged in buyers. If a non-logged in buyer clicks the Calculate Loan button, they'll be redirected to the registration or login page. So, the first part is the form with the input fields, which accepts input regarding the particular loan. After filling that form and clicking Calculate, it'll show the following sections. The section to the right shows the estimated loan repayment structure with a pie chart for visual representation. After that at the bottom, is a list of banks/lenders and their loans, with their corresponding information. So, if a buyer finds a particular loan appealing they can click the Enquire button and it'll bring up the following loan enquiry form. Clicking the More Info button displays more information about the loan. By clicking the Load More button, this will return more loans and expand the list.

The form is titled "Enquire For Loan with Bank A". It contains the following text:  
Bank A, Tiered Home Loan | 3.5% | RM3000.00 per month |  
30 years  
Connect and gain more information about this loan from  
our experts at Bank A

Input fields:  
Name  
Email  
Phone Number

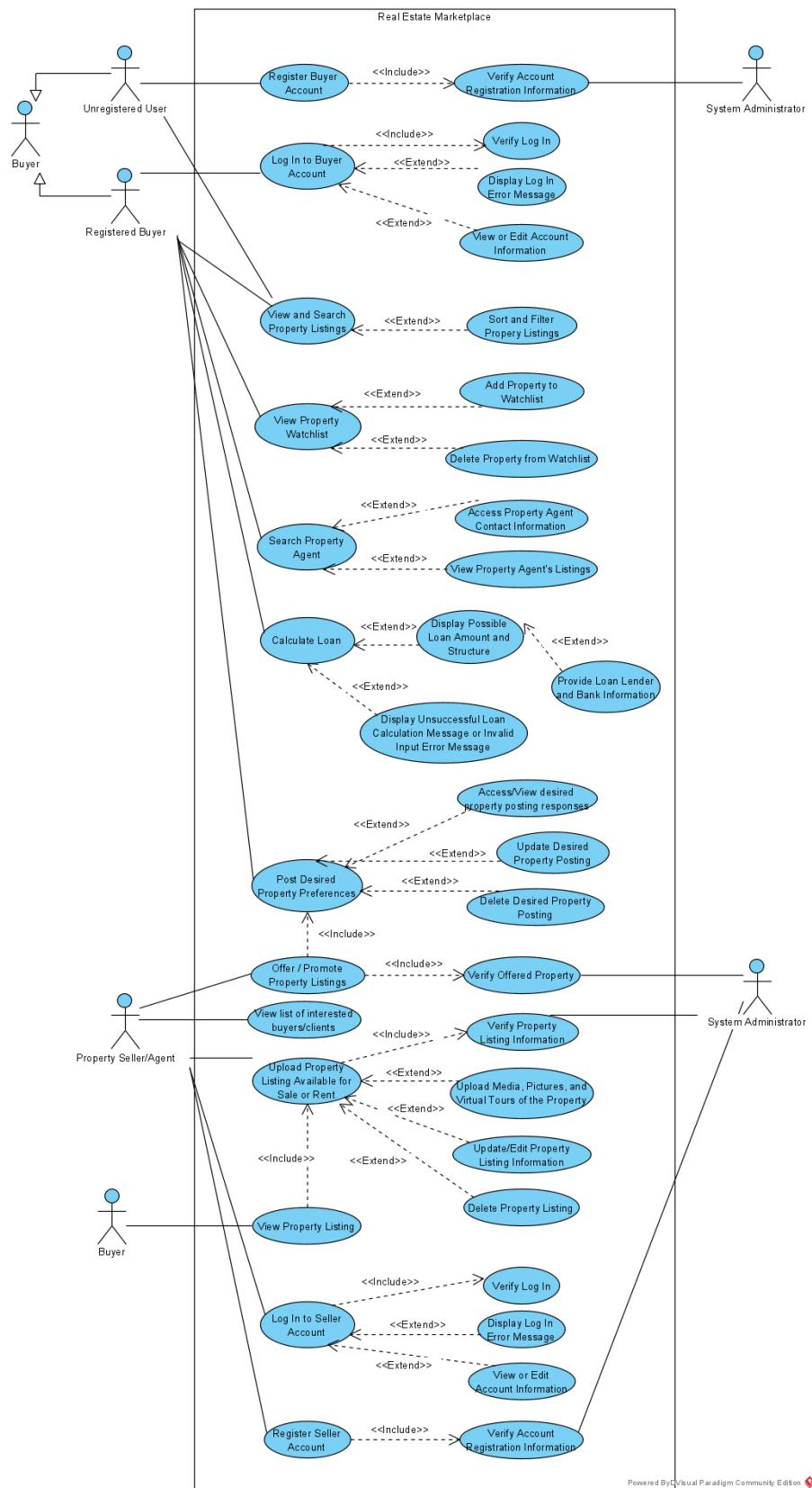
A large blue button labeled "Enquire" is at the bottom.

This loan enquiry form is like a normal contact form. It displays more information regarding the loan. Then, users can fill the input fields and click the Enquire button to submit the form.

## **UML Diagrams**

The following consists of UML Diagrams representing the real estate marketplace system constructed with Visual Paradigm. For optimal clarity and readability, I recommend viewing the vpp file submitted with this submission. However, I've also attached screenshots or exports below as well.

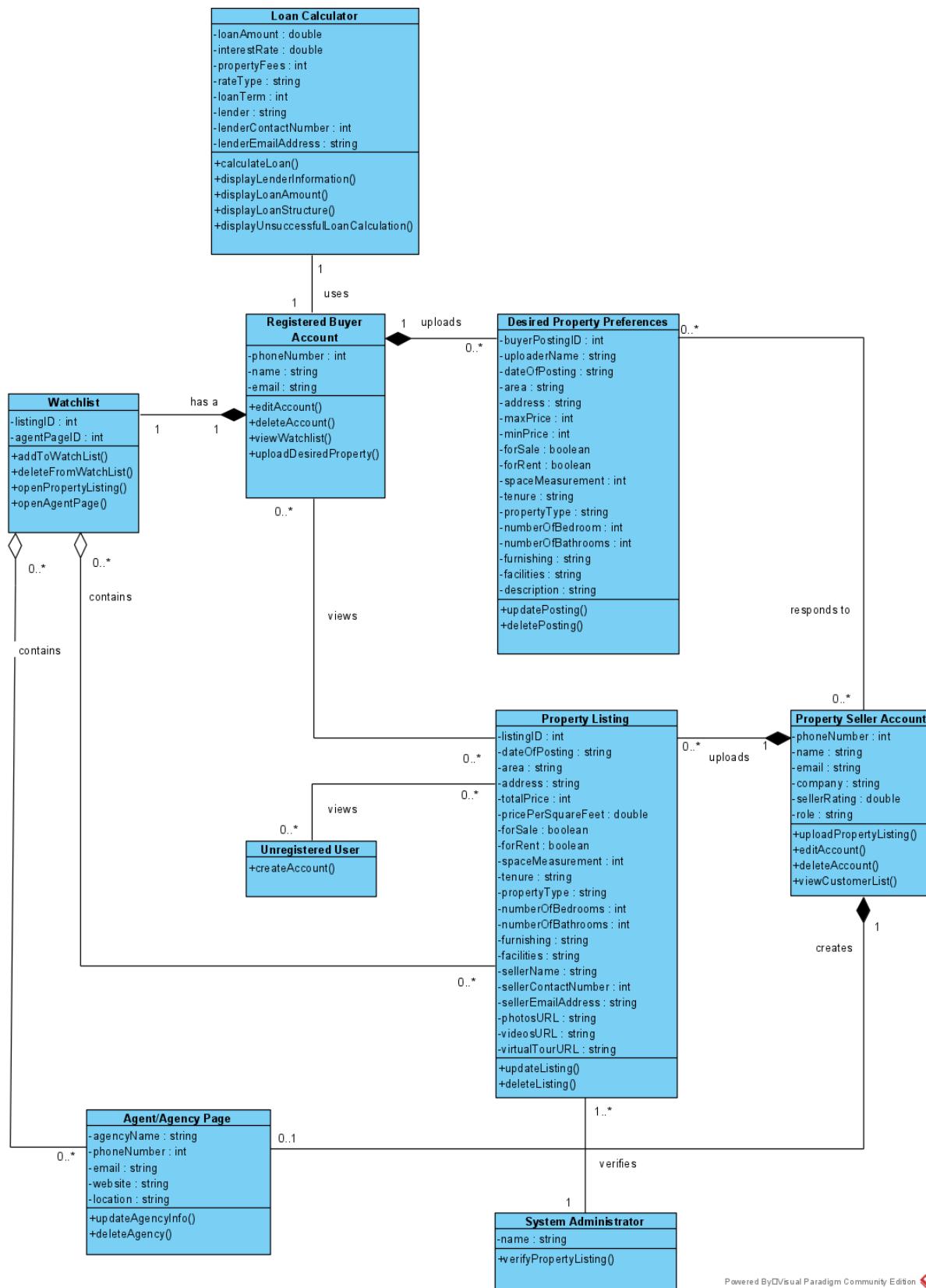
## Use Case Diagram



### **Explanation of Use Case Diagram**

This use case diagram shows all the functionality of the system and how different end users interact with the system. So, it shows all the possible interactions of the user with the real estate marketplace system. It was constructed during the requirements stage to help us visualise the system, its stakeholders, interacting parties, and external actors. It gives an overall impression of the system.

## Class Diagram

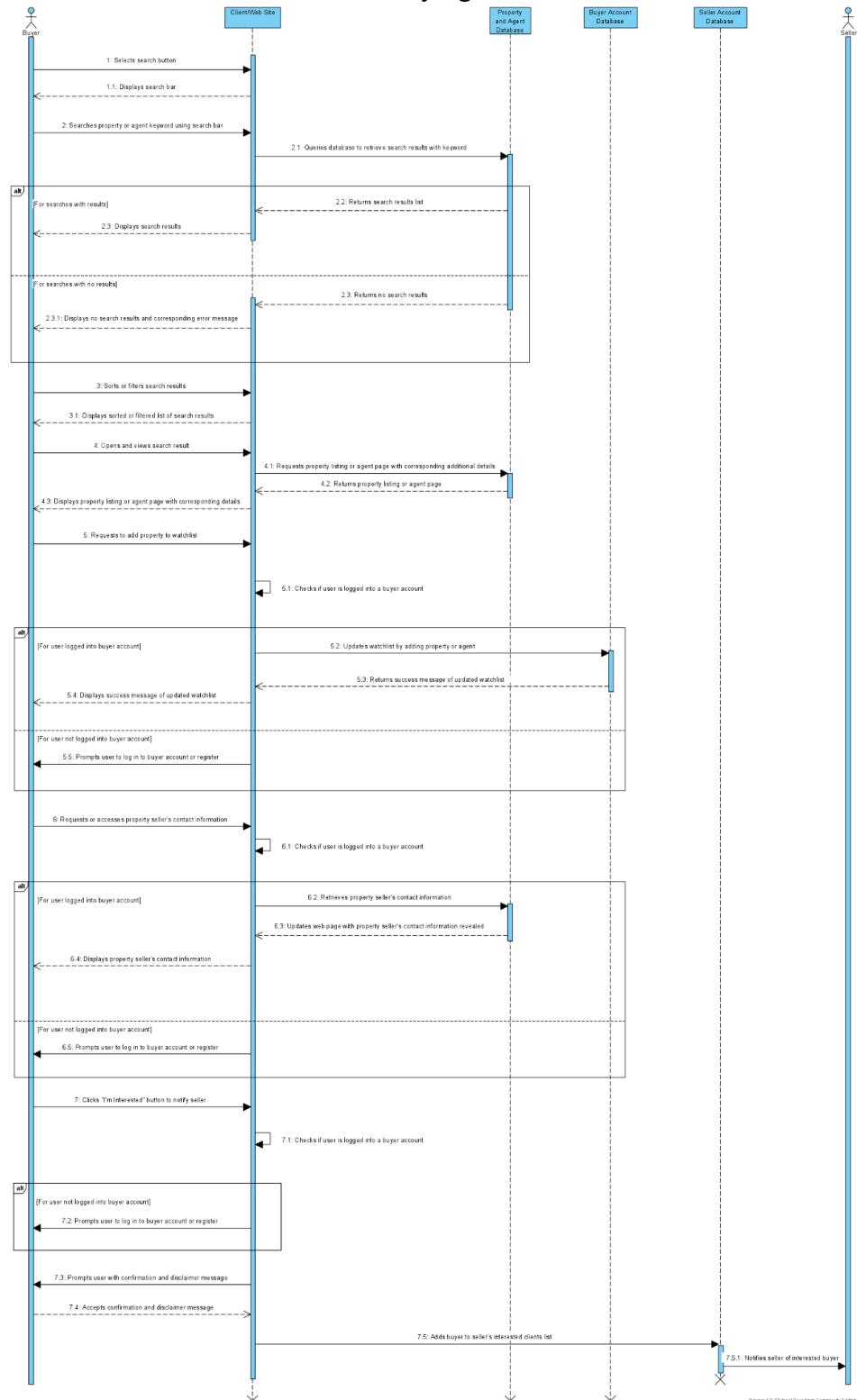


### **Explanation of Class Diagram**

This class diagram is also constructed during the requirements stage towards the latter part before entering the design stage. It helps us to identify the components in the system and their relationship between one another. It also shows the database or the data stored and methods performed by each particular class.

## Sequence Diagrams

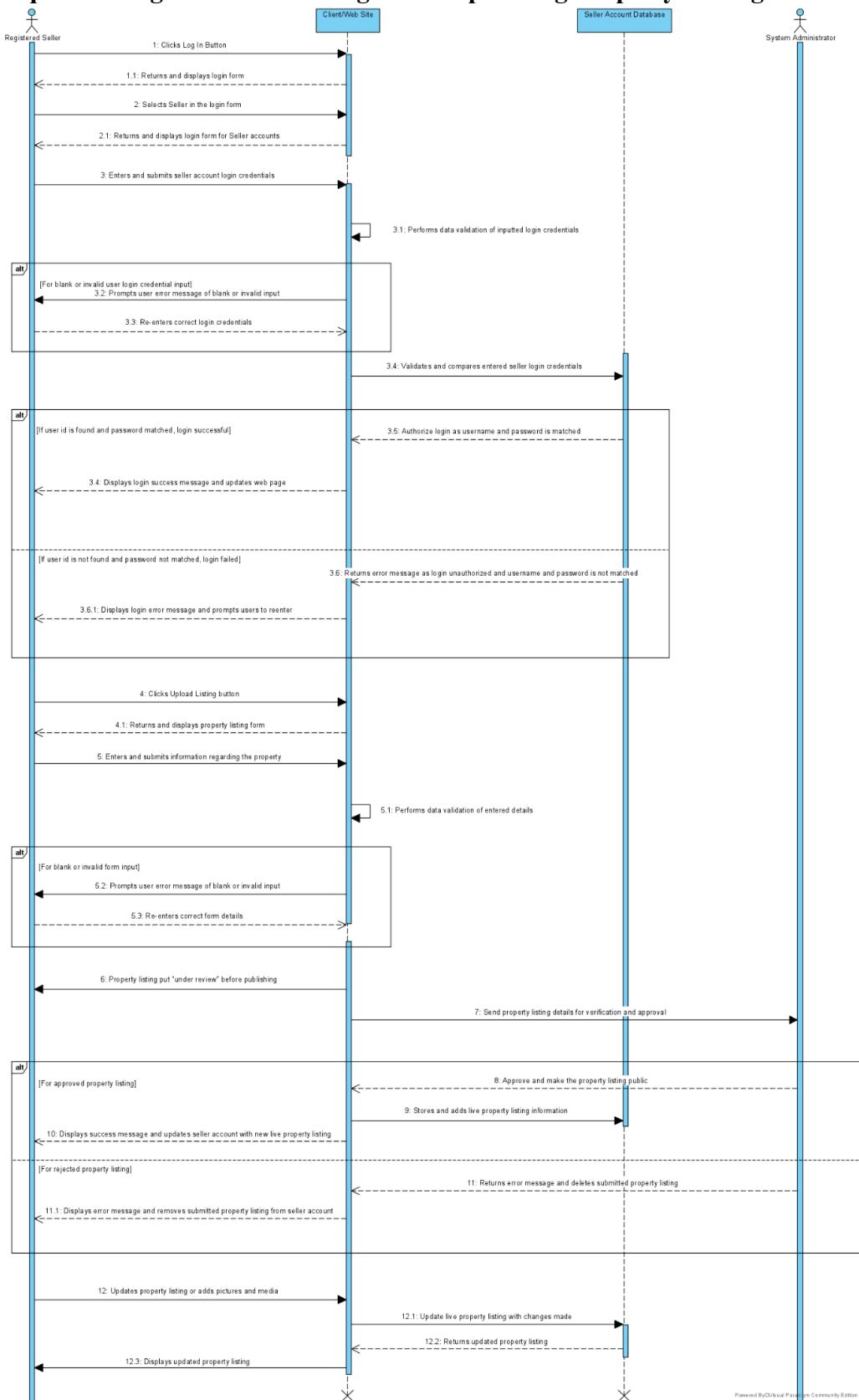
Sequence 1 - Buyer Searching Properties/Agents, Sorting/Filtering Searches, Adding to Watchlist, Access Seller Info, Notifying Seller



### **Explanation for sequence diagram 1**

This sequence diagram is intended to highlight the processes that occur when a buyer is searching a property or agent, sorting and filtering these search results, adding property listings or agents to their watchlist, accessing the seller information on property listings, and notifying the seller of their interest in a particular property by submitting the I'm Interested form.

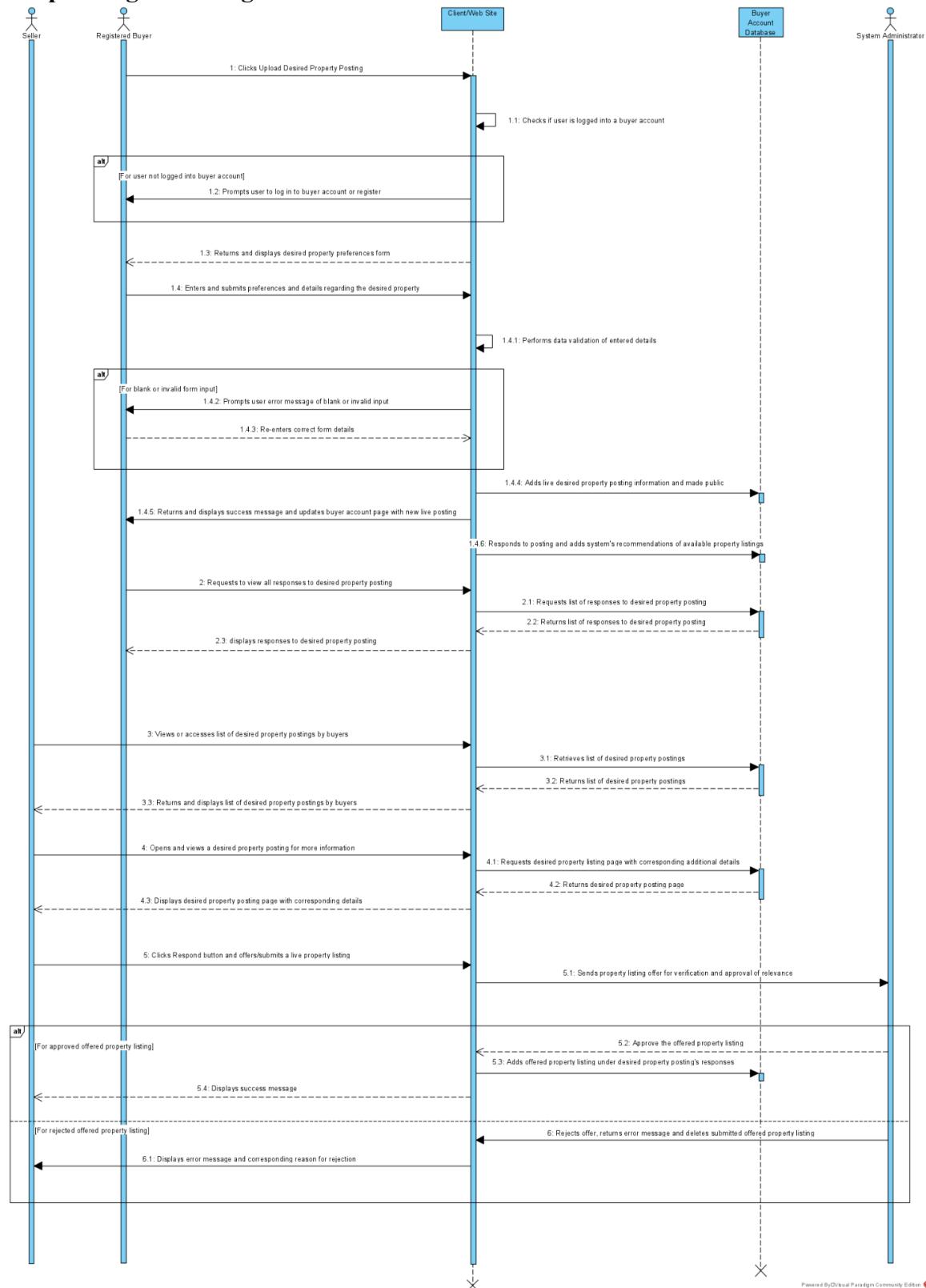
## Sequence Diagram 2 - Seller Login and Uploading Property Listing



## **Explanation for sequence diagram 2**

A sequence diagram highlighting all the activities that occur when a seller logs in and uploads a property listing.

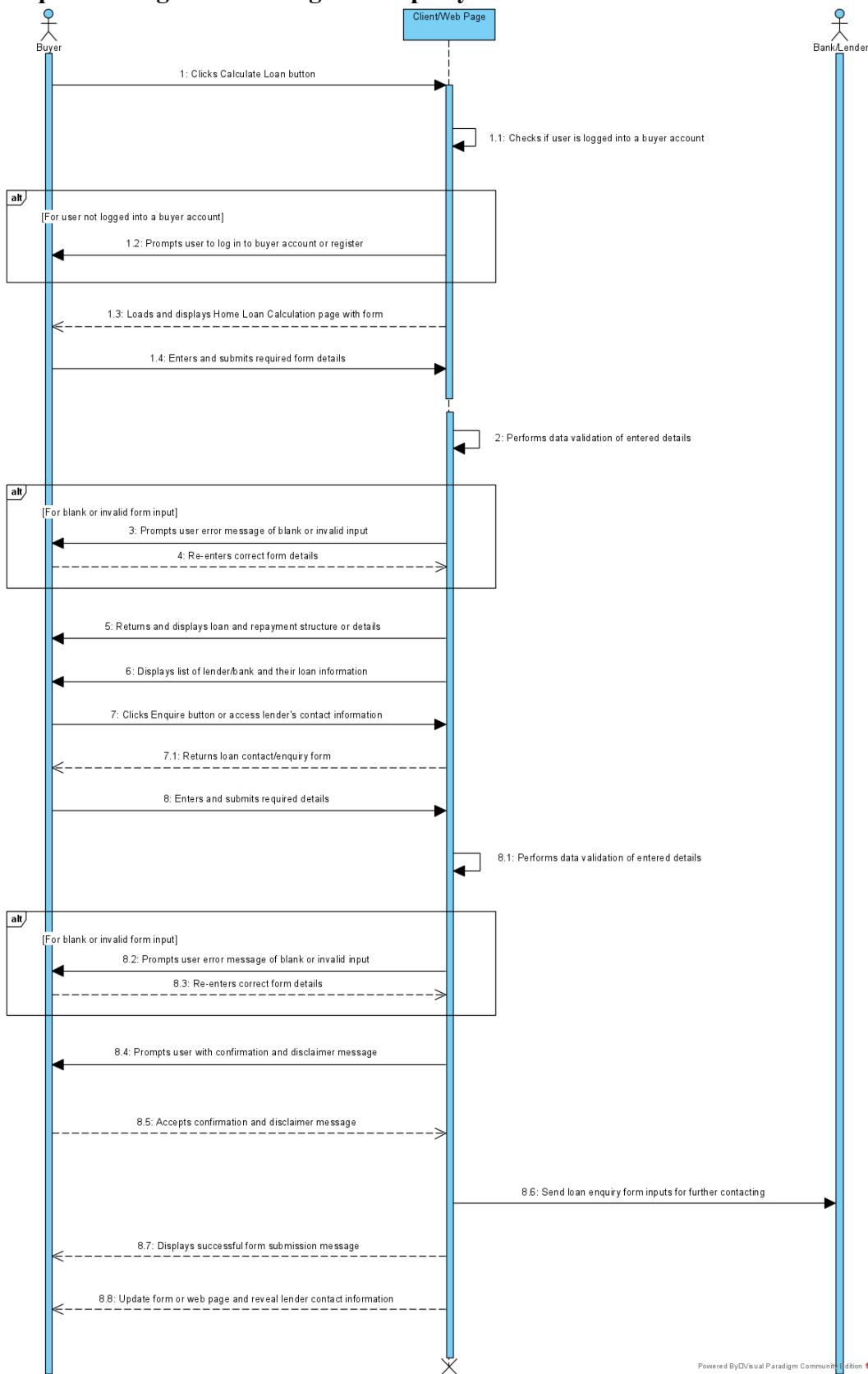
## Sequence Diagram 3 - Buyer Log In and Uploading Desired Property Posting and Seller Responding to Posting



### **Explanation for sequence diagram 3**

A sequence diagram highlighting all the activities that occur when a buyer logs in, uploads a desired property posting and when sellers respond to that particular posting.

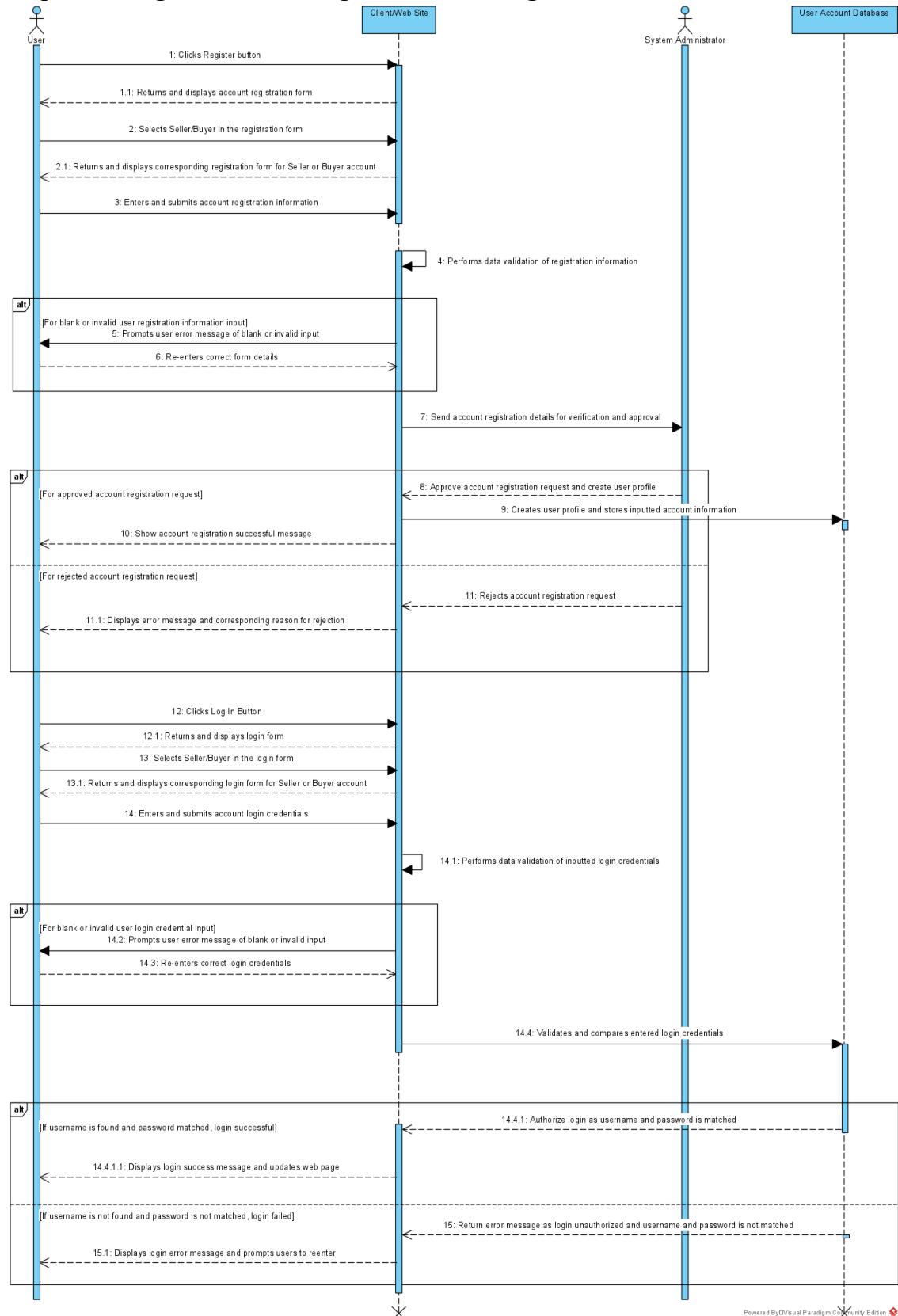
## Sequence Diagram 4 - Using the Property Loan Calculator



### **Explanation for sequence diagram 4**

A sequence diagram highlighting all the activities that occur when a buyer uses the loan calculation functionality.

## Sequence Diagram 5 - User Registration and Login

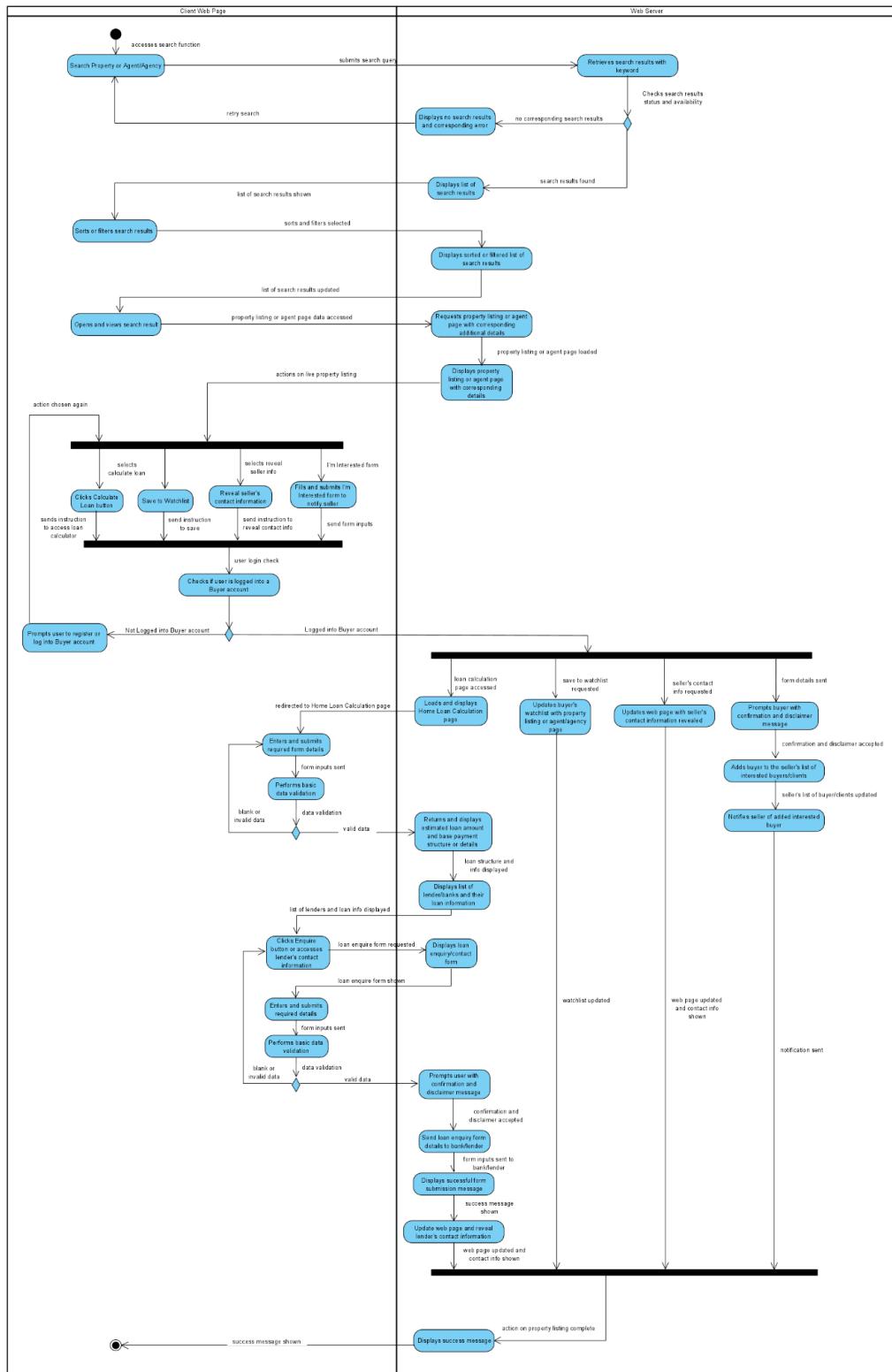


### **Explanation for sequence diagram 5**

A sequence diagram highlighting all the activities that occur when a user registers for a buyer or seller account, and when they log in to a buyer or seller account.

# Activity Diagrams

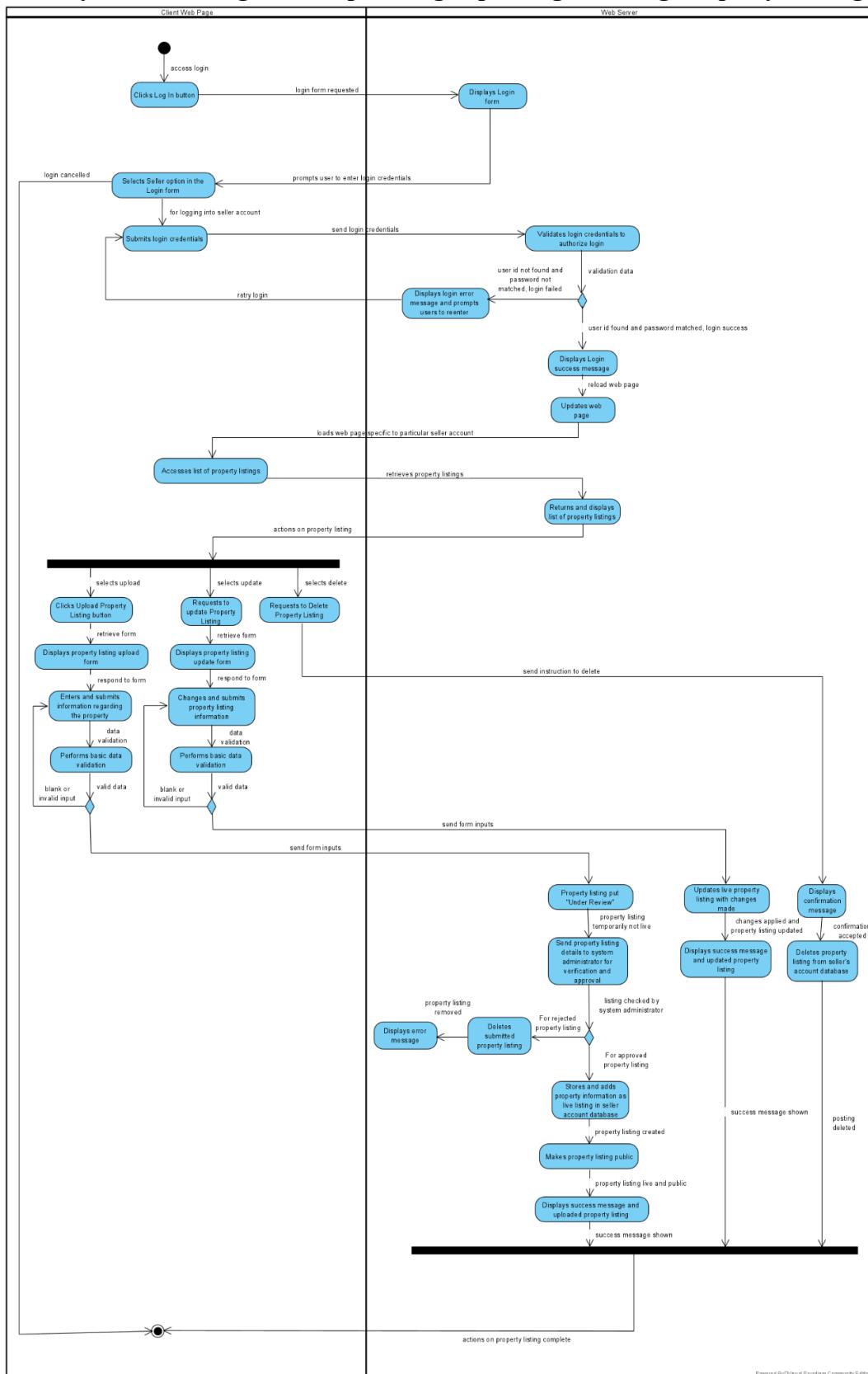
## Activity 1 - Buyer Searching Properties/Agents, Sorting/Filtering Searches, Adding to Watchlist, Accessing Seller Info



### **Explanation for Activity diagram 1**

An activity diagram that shows the flow of processes and activities when a buyer is searching properties or agents, sorting or filtering those search results, adding that result to their watchlist, or accessing the seller's information.

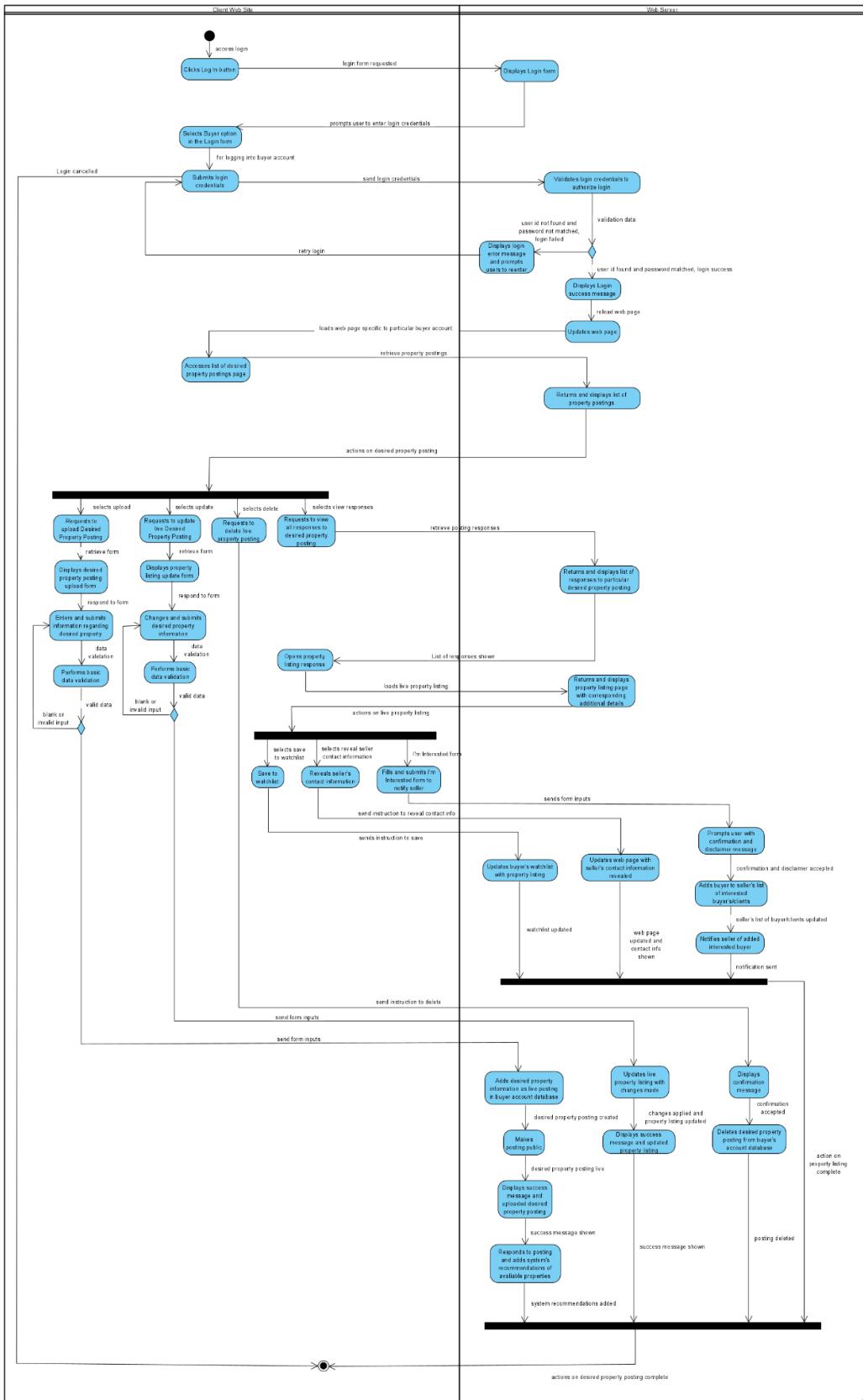
## Activity 2 - Seller Login and Uploading, Updating, Deleting Property Listing



### **Explanation for Activity diagram 2**

An activity diagram that shows the flow of processes and activities when a seller logs in and uploads, updates, or deletes a property listing

## Activity 3 - Buyer Log In and Uploading Desired Property Posting



### **Explanation for Activity diagram 3**

An activity diagram that shows the flow of processes and activities when a buyer logs in and uploads a desired property posting

## References

- [1] I. Sommerville, Software Engineering, Pearson Education Limited, 2016.
- [2] "Incremental Model in SDLC: Use, Advantage & Disadvantage," Guru99, 20 January 2021. [Online]. Available: <https://www.guru99.com/what-is-incremental-model-in-sdlc-advantages-disadvantages.html>. [Accessed 16 June 2021].
- [3] N. Sharma, "Difference between Incremental Model and WaterFall Model," TutorialsPoint, 9 June 2020. [Online]. Available: <https://www.tutorialspoint.com/difference-between-incremental-model-and-waterfall-model>. [Accessed 16 June 2021].

## Appendix A



**Survey of Real Estate Marketplace Systems**

This is a survey to discover the functionalities a modern real estate marketplace system should possess. Please feel free to answer and thank you very much in advance. By submitting this form you agree to participate in this survey.

\* Required

What is your name? \*

Your answer \_\_\_\_\_

What is your age? \*

Your answer \_\_\_\_\_

Which city do you reside in? (i.e. Kuala Lumpur, Petaling Jaya, Ampang) \*

Your answer \_\_\_\_\_

Name an online real estate marketplace you've visited or used recently. (i.e. PropertyGuru, EdgeProp, etc.) \*

Your answer \_\_\_\_\_

Why are you interested in real estate or what properties do you view through online marketplaces? \*

For Purchase, own stay  
 For Purchase, investment  
 For Renting  
 For Selling  
 For Renting Out

Have you ever live viewed a property from an online posting? \*

Yes  
 No

What functionalities or features are the most important to you or do you use the most on an online real estate marketplace system?

Your answer \_\_\_\_\_

Name another feature you'll like to be added.

Your answer \_\_\_\_\_

What do you look at first in a property listing?

Your answer \_\_\_\_\_

On a scale of 1-5, how big is privacy or spam a problem for you when using real estate marketplace systems?

1    2    3    4    5

Not Concerned                    Very Concerned

What other problems are there with existing real estate marketplace systems?

Your answer \_\_\_\_\_

## **List of Questions**

1. What is your name?
2. What is your age?
3. Which city do you reside in? (i.e., Subang Jaya, Petaling Jaya, Kuala Lumpur)
4. Name an online real estate marketplace you've visited or used recently.
5. Why are you interested in real estate or what properties do you view through online marketplaces?
  - For Purchase, own-stay
  - For Purchase, investment
  - For Renting
  - For Selling
  - For Renting Out
6. Have you ever live viewed a property from an online posting?
7. What functionalities or features are the most important to you or do you use the most on an online real estate marketplace system?
8. Name another feature you'll like to be added.
9. What do you look at first in a property listing?
10. Is privacy or spam a concern for you when using real estate marketplace systems?
11. What other problems are there with existing real estate marketplace systems?