



NAME	HAMZA MUHSEN
COURSE	SYSTEM ANALYSIS & DESIGN
ASSIGNMENT TITLE	USE ANALYSIS AND DESIGN TECHNIQUES TO SOLVE BUSINESS PROBLEM
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CONTENTS

1. feasibility study.....	3
2. Show how conducting the feasibility study has helped you in preparing the proposal.....	12
3. assess the importance of creating the feasibility study.....	13
4. evaluate it's role in solving the business problem.....	14
5. Define software development methodology.....	15
6. SCRUM, PROTOTYPE, AND WATERFALL STRENGTH AND WEAKNESSES.....	15
7. COMPARE BETWEEN SCRUM, PROTOTYPE AND WATERFALL MODELS WITH A REFERENCE TO SNAP STATE SYSTEM.....	17
8. SELECT BEST METHODOLOGY TO IMPLEMENT AND JUSTIFY ANSWER.....	18
9. INTERVIEW.....	19
10. SIMILAR SYSTEMS.....	22
11. WHY INTERVIEW AND SIMILAR SYSTEM.....	23
12. USER STORIES.....	24
13. ASSESS THE EFFECTIVENESS OF THE ANALYSIS AND THE SRS DOCUMENT.....	26
14. ASSESS THE EFFECTIVENESS OF THE DESIGN PROCESS AND THE SYSTEM SPECIFICATION.....	27
15. SHOW HOW THE DESIGN MEETS WITH USER REQUIREMENTS STATED IN THE PREVIOUS STAGE.....	28
16. REFERENCES.....	54

SOLUTION REPORT

FEASIBILITY STUDY (SNAP STATE SYSTEM)

ECONOMIC STUDY

IN REAL ESTATE SYSTEMS RELATED TO ECONOMIC STUDY, **THERE WILL BE COSTS SUCH AS SYSTEM DEVELOPMENT, DESIGN, INTEGRATION, AND MAINTENANCE.** IN ADDITION, THERE ARE **ADDITIONAL COSTS** SUCH AS MARKETING, SUPPORT FOR THE SYSTEM, AND OTHERS.

THE REVENUE WILL BE HIGHER AND COVER THE COSTS BY ADDING THE **MEMBERSHIP PRICE**, WHICH IS DETERMINED ACCORDING TO FEATURES AND ADVANTAGES, **AND IMPLEMENTING THE MARKETING STRATEGY**. THE MAIN SOURCE OF INCOME (REVENUE) IN THIS SYSTEM IS THE MEMBERSHIP PRICE. IN MY OPINION, THE SYSTEM'S REVENUE PROVIDES STRONG ECONOMIC FEASIBILITY. THE POTENTIAL DEADLINE FOR DEVELOPMENT WEBSITE IS NEARLY ONE YEAR.

Here are more details related to the economic study:

- Development Costs

Costs	Price
2 Front and 2 backend developers	Front end developers (500 JOD per developer) and backend (700 JOD per

	developer) = 2400 JOD per month until the end of website the development.
Database administrator for database setup and management	500 JOD per month.
User-to-user instant messaging tool.	1000 JOD (one-time tool Cost).
Front end, backend, database tools.	2000 JOD (one-time tools cost).
One UI and One UX designers.	Each designer = 700 JOD = 1400 JOD per month.
Two Quality assurance and testing web	Each quality assurance 500 JOD= 1000 JOD per month.
Servers' setup and management	700 JOD per month.
Domain name setup and hosting	300 JOD per month.
Security tools and platforms	4000 JOD per year. (Yearly subscription)

- Marketing costs

Costs	Price
Social media ads and marketing	1000 JOD per month
SEO optimization	1000 JOD per month.
Promotional events and collaborations	4000 JOD per event. (nearly each six months = 1 big event)

- Continuous Costs

Cost	Price
Website maintenance	5000 JOD per year
Website monitoring (related to security)	1000 JOD per year
Website updates and improvement	5000 JOD per year

- Revenue: As I said before the main revenue is from the subscription plan which includes:

Subscription plan category	Price per month
Basic	6.38 JOD (equal to 9\$)
Pro	13.47 JOD (equal to 19\$)
Business	70.17 (equal to 99\$)

- Calculate the revenue after 3 years of deployment the website in the market: I will make assumptions for this section to get better image of the website revenue:

First Year

Subscription Plan	Number of user (Expected users)
Basic	500
Pro	250
Business	50

With:

- Yearly User rate of growth:
- 20% yearly user growth.
- And Retention Rates 70 % for each subscription plan.

So, the revenue:

First year revenue without calculating the costs:

- Basic= $3,189.60 \text{ (monthly)} * 12 \text{ (year)} = 38,275.20 \text{ JOD}$ (yearly and without defining costs)
- Pro= $3,366.80 \text{ (monthly)} * 12 \text{ (year)} = 40,401.60 \text{ JOD}$ (yearly)
- Business= $3,508.56 \text{ (monthly)} * 12 \text{ (yearly)} = 42,102.72 \text{ JOD}$ (yearly)

Second year:

- Basic= $(3,189.60 * 1.2 \text{ (20\% growth)} = 3,827.52) * 12 \text{ (year)} = 45,930.24 \text{ JOD}$ (yearly)
- Pro= $(3,366.80 * 1.2 \text{ (20\% growth)} = 4,040.16) * 12 \text{ (year)} = 48,481.92 \text{ JOD}$ (yearly)
- Business= $(3,508.56 * 1.2 \text{ (20\% growth)} = 4,210.272) * 12 \text{ (yearly)} = 50,523.264 \text{ JOD}$ (yearly)

Third Year:

- Basic= $(3,827.52 * 1.2 \text{ (20\% growth)} = 4,593.024) * 12 \text{ (year)} = 55,116.288 \text{ JOD}$
- Pro= $(4,040.16 * 1.2 \text{ (20\% growth)} = 4,848.192) * 12 \text{ (year)} = 58,178.304 \text{ JOD}$ (yearly)
- Business= $(4,210.272 * 1.2 \text{ (20\% growth)} = 5,052.3264) * 12 \text{ (yearly)} = 60,627.9168 \text{ JOD}$ (yearly)

Overall:

$38,275.20 + 40,401.60 + 45,930.24 + 48,481.92 + 50,523.264 + 55,116.288 + 58,178.304 + 60,627.9168 = 439,634 \text{ JOD}.$

Summary:

First Year Revenue	Second Year Revenue	Third Year Revenue
120,778 JOD	144,934 JOD	173,922 JOD

Estimate Costs (three years):

First Year:

- Development Costs: 82,600 JOD per year (nearly)
- Marketing Costs: 32,000 JOD per year (nearly)

- Continuous Costs: 11,000 JOD per year(nearly)
- Total Cost for Year 1 = 82,600 + 25,600 + 6,000= 125,600 JOD first year cost, comparing with the first-year revenue: 120,779 JOD, the revenue for the first year = - 4,820.48

Second year:

- Marketing Costs: 32,000 JOD per year (nearly)
- Continuous Costs: 11,000 JOD per year(nearly)
- Total Cost for Year 2 = 32,000 + 11,000 = 43,000JOD second year cost, comparing with the second-year revenue: 144,935 JOD, the revenue for the second year = 101,935– 4,820.48 (revenue for first year) = 97,114.52 JOD.

Third year:

- Marketing Costs: 32,000 JOD per year (nearly)
- Continuous Costs: 11,000 JOD per year(nearly)
- Total Cost for Year 3 = 32,000 + 11,000 = 43,000JOD third year cost, comparing with the third year revenue: 173,922 JOD , the revenue for the third year = 130,922 JOD.

Summary:

First Year Revenue With cost estimates	Second Year Revenue With cost estimates	Third Year Revenue With cost estimates
- 4,820 JOD	97,114 JOD	130,922 JOD

Note that these estimates are based on our assumptions and the future of our system, so they are not accurate, but the real estimates will be close to these estimates.

TECHNICAL STUDY

IN THIS SYSTEM, IF WE USED AND SELECTED THE **MOST EFFICIENT TECHNOLOGY REQUIREMENTS** (SUCH AS PROGRAMMING LANGUAGES AND FRAMEWORKS USED IN SYSTEM IMPLEMENTATION, SELECTING THE TOOL FOR DATABASE CREATION AND MANAGEMENT), WE COULD **ASSESS THE SCALABILITY OF THE SYSTEM** (CONTROL AN INCREASING NUMBER OF CLIENTS AND PROPERTY LISTINGS), **AND IMPLEMENT THE MOST SECURE MECHANISMS FOR AUTHORIZATION AND AUTHENTICATION**. THE SYSTEM SHOULD BE TECHNICALLY WORKABLE IF THIS TECHNICAL STUDY IS APPLIED AND CHOSEN.

IN ADDITION, WE SHOULD IDENTIFY THE FUTURE RISKS RELATED TO TECHNICAL ISSUES, HIRE EFFICIENT EMPLOYEES TO AVOID THESE ISSUES, DEAL WITH THEM IF ANY ISSUE ARISES, OR TRAIN EXISTING EMPLOYEES TO DEAL WITH THE SYSTEM AND ISSUES.

Here are more details:

- **Architecture**
 - Front end
 - **React.js** for responsive user interfaces.
 - **CSS and javascript** for styling the interfaces.
 - Backend
 - **Node.js** for scalable backend.
 - **PHP my admin and Xampp** for database.
 - **JSON Web Tokens** enable Verification of Users.
 - **WebSocket** for user-to-user instant messaging.
- **Security:**
 - **JSON Web Tokens** enable Verification of Users.
 - **HTTPS** for data encryption.
 - **Nessus** is frequently employed for identifying vulnerabilities and evaluation.
- **Scalability:**
 - Employ **database sharding** provides flexibility by distributing data over various servers.
 - **Load Balancing** for distributing incoming traffic into various servers.
- **Testing**
 - **Jest** for testing React components in frontend.
 - **Mocha** for backend testing.
 - **End to End testing** (for testing the entire website overflow).
- **Maintenance and monitoring**
 - **Datadog** for monitoring website performance.

- **Sentry** for quickly identifying errors on the website.
- **UpdraftPlus** for pack up and recovery.
- **SQL Server Management Studio** for backup and recovery for database.

- **Technical risks:**

- Technical risks that are related during the development and implementation stages (Front end, backend, database, etc.) which have a high impact on the progress of the project. The best thing to avoid this risk is to hire experienced developers to handle any risk found during the implementation.
- New cybersecurity threats make it more difficult for our security tools to detect and solve these attacks. These attacks will absolutely have a powerful impact on our project and make the user's data in danger thus decreasing the reputation in the market. The best solutions for this is to deal with third party companies related to security, and implement disaster recovery plans.
- Employees or insiders causing damage to the system's data, either purposefully or mistakenly. Solution is to train the employees or stakeholders to become more efficient in using the system and learn the meaning of "social engineering cyber security".

LEGAL STUDY

THE SYSTEM IS RESPONSIBLE FOR **COMPLYING WITH RULES RELATED TO FINANCIAL TRANSACTIONS AND REAL ESTATE, AS WELL AS INFORMATION PROTECTION AND PRIVACY. VERIFYING THE OWNERSHIP OF CODE AS WELL AS RIGHTS TO INTELLECTUAL PROPERTY.** IF ALL THESE ARE PROPERLY PLANNED AND EXECUTED, THE SYSTEM SHOULD BE LEGALLY FEASIBLE.

IN ADDITION, BEFORE LAUNCHING THE SYSTEM, WE SHOULD GET LEGAL CONFIRMATION OF OUR SYSTEM FROM LEGAL EXPERTS TO AVOID ANY LEGAL ISSUES.

Here are more details:

- Create an accurate user agreement and terms of service explaining the system's conditions of use.

- Add terms about property listing guidelines, changes, and cancellations.
- Create a privacy policy that explains exactly how information from users will be gathered, saved, and employed.
- Ensure that property listings follow the Jordan's real estate rules and regulations.
- Subscription plan terms and conditions, particularly costs, renewal, and cancellation rules, should be clearly stated.
- Add warnings about the platform's position as a facilitator of communication instead of a party to real estate transactions.

In our system, user agreement and term of services:

Hello and welcome to "Snap state" You will agree to each of the following conditions of use by using and gaining access to our services:

- In order to use our platform, users have to be 18 or older.
- Users take responsibility for the correctness of information submitted, including property postings.
- Snap State acts as a facilitator of communication. We do not participate in real estate deals and cannot ensure the truth of property data.
- Snap State has the ability to change or modify these conditions at any time. Any modifications will be communicated to users.
- Snap State has the right to remove user accounts following violations of the terms of service or unacceptable behavior.

Add, modify, and delete property guidelines:

- Property listings in Jordan have to stick to Jordanian real estate laws. Users are accountable for the correctness and integrity of the data they give.
- Users can make changes to their property listings at any time. Modifications may be reviewed for conformity with guidelines.
- Users have the option to cancel property listings. If necessary, returns will be issued according with our return policy.

Privacy:

- We gather private and property-related information for the purposes of setting up accounts, communication, and platform development.
- We make efforts to protect user data and avoid unwanted access.
- User data is processed to power the site and could be used with others for communication reasons.

Subscription plan policy:

- Users are able to subscribe to premium plans for an additional cost.































- Subscriptions renew automatically unless cancelled. Renewal fees will be charged on the day of the renewal.
- Users don't have a choice of canceling their memberships at any time. Termination requests have to be sent before the planned renewal date.

Communication policy:

- Snap State enables interaction between users but isn't a party to property deals.
- Users are reminded to perform investigation on property data and to communicate securely.

SCHEDULE

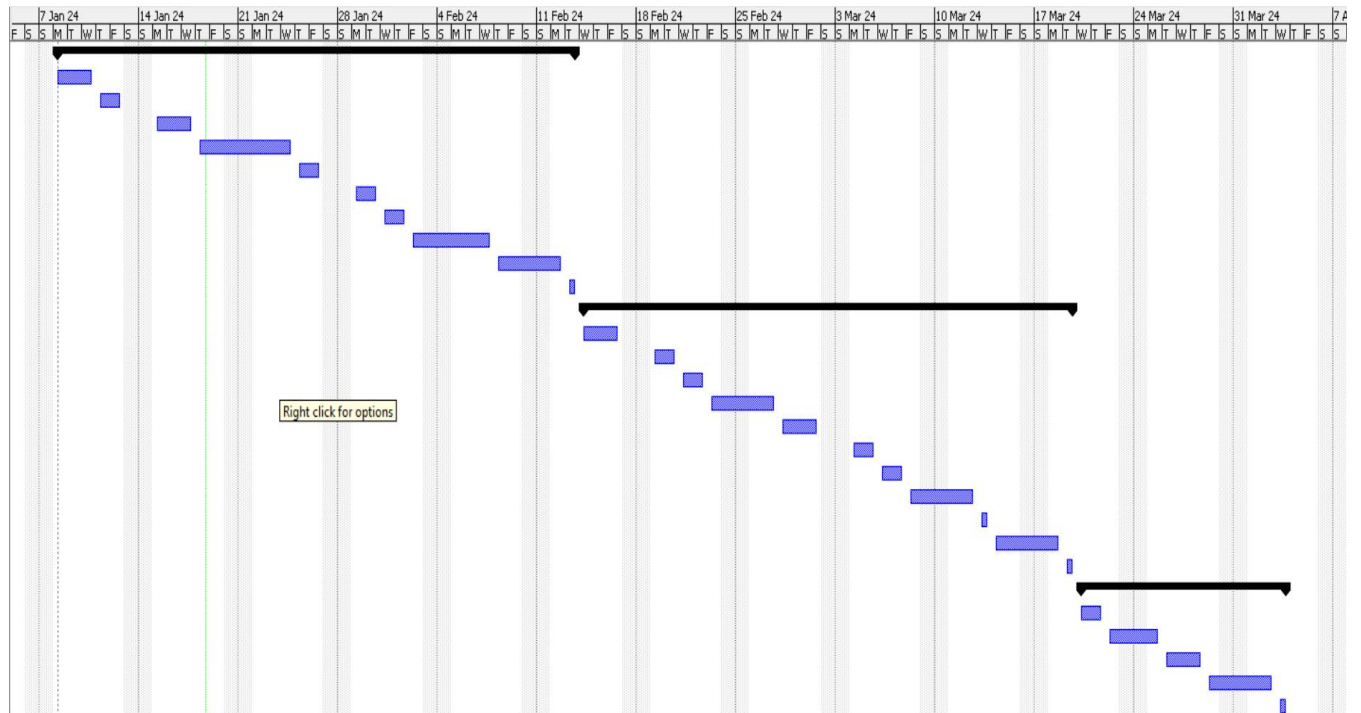
In this system, the Prototype model will be used due to several reasons: gather the system requirements from wireframes (gathered majority of requirements), interviews, use cases, and similar systems. Here are more details about the schedule of the system:

		Name	Duration	Start	Finish	Predecessors
1		Planning and designing project	27 days?	1/8/24 8:00 AM	2/13/24 5:00 PM	
2		Identify the project goals and objectives.	3 days?	1/8/24 8:00 AM	1/10/24 5:00 PM	
3		Identify the project scope.	2 days?	1/11/24 8:00 AM	1/12/24 5:00 PM	
4		Design wireframes	3 days?	1/13/24 8:00 AM	1/17/24 5:00 PM	
5		Make interviews	5 days?	1/18/24 8:00 AM	1/24/24 5:00 PM	
6		Create a use case, and user stories	2 days?	1/25/24 8:00 AM	1/26/24 5:00 PM	
7		Determine similar systems	2 days?	1/27/24 8:00 AM	1/30/24 5:00 PM	
8		Generate SRS document	2 days?	1/31/24 8:00 AM	2/1/24 5:00 PM	
9		Create and deliver a system specification document	4 days?	2/2/24 8:00 AM	2/7/24 5:00 PM	
10		Initial development of the core framework	3 days?	2/8/24 8:00 AM	2/12/24 5:00 PM	
11		Get approval from stakeholders	1 day?	2/13/24 8:00 AM	2/13/24 5:00 PM	
12		Property features & User authentication	25 days?	2/14/24 8:00 AM	3/19/24 5:00 PM	
13		Create and implement database for the system	3 days?	2/14/24 8:00 AM	2/16/24 5:00 PM	
14		Implement database sharding for database scalability	2 days?	2/17/24 8:00 AM	2/20/24 5:00 PM	
15		Implement user authentication	2 days?	2/21/24 8:00 AM	2/22/24 5:00 PM	
16		Implement user profiles and registration functionality	3 days?	2/23/24 8:00 AM	2/27/24 5:00 PM	
17		Create a property listing, add, and modify pages	3 days?	2/28/24 8:00 AM	3/1/24 5:00 PM	
18		Add "search" feature.	2 days?	3/2/24 8:00 AM	3/5/24 5:00 PM	
19		Test database	2 days?	3/6/24 8:00 AM	3/7/24 5:00 PM	
20		Test property listing, add, and modify pages	3 days?	3/8/24 8:00 AM	3/12/24 5:00 PM	
21		Test user authentication	1 day?	3/13/24 8:00 AM	3/13/24 5:00 PM	
22		Define and solve issues during testing	3 days?	3/14/24 8:00 AM	3/18/24 5:00 PM	
23		Get approval from stakeholders.	1 day?	3/19/24 8:00 AM	3/19/24 5:00 PM	
24		Subscription plans (membership) and payme...	11 days?	3/20/24 8:00 AM	4/3/24 5:00 PM	
25		Implement subscription plans	2 days?	3/20/24 8:00 AM	3/21/24 5:00 PM	
26		Implement payment methods	2 days?	3/22/24 8:00 AM	3/25/24 5:00 PM	
27		Testing the subscription plan functionality and pay...	3 days?	3/26/24 8:00 AM	3/28/24 5:00 PM	
28		Define and solve issues during testing	3 days?	3/29/24 8:00 AM	4/2/24 5:00 PM	
29		Get approval from stakeholders	1 day?	4/3/24 8:00 AM	4/3/24 5:00 PM	
30		User chatting	7 days?	4/4/24 8:00 AM	4/12/24 5:00 PM	
31		Employ basic chatting functionality.	3 days?	4/4/24 8:00 AM	4/8/24 5:00 PM	
32		Test chatting functionality.	2 days?	4/9/24 8:00 AM	4/10/24 5:00 PM	
33		Define and solve issues during testing	1 day?	4/11/24 8:00 AM	4/11/24 5:00 PM	
34		Get approval from stakeholders.	1 day?	4/12/24 8:00 AM	4/12/24 5:00 PM	
35		Overall testing	10 days?	4/13/24 8:00 AM	4/26/24 5:00 PM	

	📅	Name	Duration	Start	Finish	Predecessors
36	📅	Improve user interfaces and the user experience	2 days?	4/13/24 8:00 AM	4/16/24 5:00 PM	
37	📅	Configure SEO	3 days?	4/17/24 8:00 AM	4/19/24 5:00 PM	
38	📅	Perform full general system testing	2 days?	4/20/24 8:00 AM	4/23/24 5:00 PM	
39	📅	Define and solve issues during testing	2 days?	4/24/24 8:00 AM	4/25/24 5:00 PM	
40	📅	Prepare for deployment.	1 day?	4/26/24 8:00 AM	4/26/24 5:00 PM	
41		Deployment	22 days?	4/27/24 8:00 AM	5/28/24 5:00 PM	
42	📅	Configure the system in a living environment	7 days?	4/27/24 8:00 AM	5/7/24 5:00 PM	
43	📅	Follow-up and monitor the system	7 days?	5/8/24 8:00 AM	5/16/24 5:00 PM	
44	📅	Implement user support and training as needed	7 days?	5/17/24 8:00 AM	5/27/24 5:00 PM	
45	📅	Get approval from stakeholders.	1 day?	5/28/24 8:00 AM	5/28/24 5:00 PM	

TIMELINE

There are no delays in terms of time in this project because the time specified in the previous schedule to complete each task exceeds the expected time to complete the task so there is much time to complete each task, and the other reason is too quick as soon as possible to deploy the system in the market and get profits.



- Project Proposal: helped me in “**costs, risks, and benefits sections**” by considering the economic study in the feasibility study.
- In addition, the technical study helped in defining the best technical solution that aligns with the available resources as well defining alternative solutions to achieve the project goals and objectives.
 - Project Proposal: helped me in “**costs, risks, solution considered, and alternative solution**”.
- Legal study in feasibility study helped us in when defining the project goals, objectives, and costs analysis by considering that the system is aligns with the Jordanian policies, rules related to the financial transactions, and other regulation, so when wrote the project proposal, we considered the legal study.
 - Project Proposal: helped me in all the project proposal but specifically in “**project summary and description**”

ASSESS THE IMPORTANCE OF CREATING THE FEASIBILITY STUDY

As shown in the previous point, the feasibility study has helped me a lot in defining and creating a structural project proposal with evidence that indicates the success of the system to encourage the investors and stakeholders to accept the project proposal.

Feasibility study is not about creating project proposals, it is an important stage in the project that defines the analysis of big aspects in the project such as economic, technical, schedule, etc.

When creating the feasibility study, it will give some risks that need to be consider during the project stages, which helps the project managers and the team responsible to solve the risks in the beginning of the project to reduce the costs that may exist if not solved in the proper time and reduce the time of the project.

In addition, the conclusions got from feasibility study offer stakeholders, especially the investors with valuable data about the project's viability. Information in feasibility study can let the stakeholders know all the information needed in the project such as costs, revenue, milestones, time, and make decisions such as modifying a section or information related to a section, increase or reduce resources.

Legal study which is one of the sections in the feasibility study that helps the project in avoiding any issues related to legal by making sure that all the project aspects align with the rules and regulations.

In summary, there are a lot of benefits of using and implementing the feasibility study in the project and the main importance of it is to analysis the system and decrease the risks that may happen during the project stages because when getting less risks, it will help the project and stakeholders from paying to get more resources (humans, money, etc.).

EVALUATE IT'S ROLE IN SOLVING THE BUSINESS PROBLEM

In context of Snap state system, the feasibility study was like a road map that tells the present and future of the project and the success of my Snap state system. From the economic section to the timeline, the feasibility study shows if we can afford the system costs and time or not.

The feasibility study was one of important plans in this project in defining the goals and objectives of Snap state system that encourage users to use my system and subscribe for premium features so it was like a diamond because without the feasibility study, I wouldn't define the best view of system goals, resources, tools, and time in this project.

It helped me in the beginning to get view and vision of the economic, technical, legal and timeline situations that my system needs to implement such as the costs of maintaining and developing the Snap state system as well as the profits got from deploying the system in real environment.

In addition, the feasibility study helps me in defining the best technical tools and development tools that I need to implement my system to achieve the system goals and user satisfaction. It also helped me to see the time needed to implement my system in a real environment, so it was like seeing the future.

Ultimately, the feasibility study enabled me to generate an overall strategic plan about my real estate system. It allowed me to think behind current problems and assume

my future success. This is like putting on a set of glasses that allows me to focus on the bigger picture and make plans for a successful future.

DEFINE SOFTWARE DEVELOPMENT METHODOLOGY

In Snap state system, there were two software development methodology preferred to use in the system which are: **Agile Scrum** and **prototype** methodology. The choice of selecting these two based on the project goals and objectives along with the cost, schedule, and time. I will provide an additional methodology related to the traditional which is waterfall methodology.

AGILE SCRUM

Is a methodology used in project management and it is considered one of the flexible methodologies in project management which focuses on the sharing and collaboration and stakeholder feedback in system development. It has something called sprint which is short development cycles between 1-4 weeks.

PROTOTYPE

Is methodology that focuses on creating an initial version of the software to test and evaluate software concepts, design, functionalities. In addition, the prototype is used to gather the system requirements.

WATERFALL

The software development stages in this methodology are sorted and processed sequentially from the first phase to the next phase until the final phase. Each phase must be fully completed to move into the next phase.

SCRUM, PROTOTYPE, AND WATERFALL STRENGTH AND WEAKNESSES

AGILE SCRUM STRENGTH

- Very powerful methodology in requirements changing when the stakeholders want to change the requirements of the system.
- It helps in cases where the requirements are still ambiguous and not fully gathered.
- Ongoing feedback from the stakeholders provides and encourages continuous improvement and enhances the system development.
- Sprints in Agile scrum require customer and stakeholders' engagement which provide a software that aligns with the customer needs and requirements.
- Needs less time to completely develop the system than other methodologies.
- Usually, the agile scrum needs less costs than other methodologies and it requires less control and documentation.

AGILE SCRUM WEAKNESSES

- It requires a team that is very experienced in doing the project tasks perfectly with the time defined and with high quality to ensure stakeholders' satisfaction. So, it is not recommended to implement this methodology if the organization doesn't have an experienced team.
- Being required to always communicate between teams and stakeholders can need a lot of resources especially if the team responsible is large and contains more than 10 people.
- It could be difficult to combine with a traditional project management method.

(Vasiliauskas, 14 scrum advantages and disadvantages in 2024 2023) [1]

PROTOTYPE STRENGTH

- Creating an early version can help the team and stakeholders in gathering more system requirements if the requirements are not clearly defined.
- Creating an early version of the software and getting user feedback early can help to check if the system achieves and covers the user needs and requirements, which is useful in reducing the risks related to the technical way.
- It covers and involves users in the development process.
- It gives a physical representation of the software which makes it easier for the stakeholders to view and make decisions about the software.
- It provides better communication between teams and stakeholders.

PROTOTYPE WEAKNESSES

- It needs more resources than other methodologies, especially if the system has a lot of requirements and complex.

- It may need more time to finish the system.
- The final software may not satisfy the stakeholders or users.

(Advantages and disadvantages of prototype model 2022) [2]

WATERFALL STRENGTH

- The system requirements must be identified clearly and fully understood before implementing the waterfall methodology.
- Make it easy for the team to manage and control the waterfall progress because each stage has defined deliverables.
- Easy to put timelines for the waterfall stages and defined the time to finish the project.
- It makes the big and complex projects more easier to implement by dividing it into stages.

WATERFALL WEAKNESSES

- It is inflexible to change any requirements after begins the waterfall stages so the organization must define and ensure the requirements before implementing the waterfall stages.
- If there was a change in the requirement, it would need more resources than the resources defined.
- In this methodology, it is difficult to get feedback from the users, so it has less user engagement.

(M, 10 Top Software Development methodologies: Pros and cons 2022) [3]

COMPARE BETWEEN SCRUM, PROTOTYPE AND WATERFALL MODELS WITH A REFERENCE TO SNAP STATE SYSTEM

Category	Scrum	Prototype	Waterfall
Resources	Average and adapted to real estate system requirements.	Costly in terms of resources however suitable for developing a real-state system that satisfies our goal.	High with difficulties during development changes.
Users and stakeholder engagement	Frequent feedback which is essential for defining the best requirements of real-estate system.	Early feedback to enhance the system requirements alongside UI/UX.	Doesn't contain user engagement until the final stage of the project. Not recommended in our system.
Requirements defining	Doesn't require understanding and define all the requirements. (Recommended in our system)	Doesn't require understanding and define all the requirements. In addition, it helps to define additional requirements by using an early edition of the software. (Recommended)	Require understanding and defining all the requirements before start developing the software.
Flexibility	Exceptionally adaptable in changing real estate marketplace circumstances.	Iterative improvements are employed to match characteristics to real estate demands.	Robust structure with few modifications throughout development.
Risk	Focus on ongoing enhancement based on feedback from customers.	Prototype facilitates the earliest recognition of system requirements.	Detailed documentation to handle risks associated with projects.
Documentation	Doesn't need documentation	Basic documentation that shows the main features in the system.	Detailed documentation from the first phase to the final phase.
Team skill	Requires experienced team. (More costs)	Between experienced and non-experienced.	Requires skilled team.
Time needed	Less time to finish.	Middle time to finish.	Need more time

(M, 10 Top Software Development methodologies: Pros and cons 2022) [3]

SELECT BEST METHODOLOGY TO IMPLEMENT AND JUSTIFY ANSWER

Based on the information above, our system objectives and needs, the best methodology to use is the prototype methodology because in our system at this point, the requirements are still not clearly defined, and we need to gather requirements. So, we will not use waterfalls because the requirements in waterfall must be defined clearly before implementing the methodology. Scrum and prototype are the recommended methodologies to use in this system, but I prefer the prototype because it will help more to gather requirements and fully understand them from the initial version of the website.

In addition, real estate systems contain various stakeholders, and each stakeholder has his specific needs, so we need to use a methodology that contains user engagement to ensure that the system aligns with the user needs and expectations. Waterfall methodology is not recommended to use in this case because the user engagement is

used after finishing the final phase and this does not achieve what we want in real estate system.

In scrum methodology, it has continuous feedback from the stakeholders which is good, but it will cost a lot of resources and we want to try decreasing the costs of the project, but it is still an option to use. On the other hand, when using the prototype methodology, it gives us the opportunity to early engagement with our stakeholders via prototype to get feedback from them which will ensure that the final product aligns with their needs and expectations which is what we need.

As we know, the real estate marketplace is changing a lot thus the user requirements will also change. The waterfall is not recommended because the time needed to develop the system is very long thus the system requirements of the system will be old and not satisfy the stakeholders. Also in waterfall, we can't modify the requirements through the development, and if we want to change the requirements, it will need double the available resources to change so the waterfall in real estate system is not recommended to use.

On the other hand, prototype methodology is suitable in this case because the iterative modification on the prototype allows us to adapt quickly to changes in the real estate market.

All the previous points are the most important features for me to select the prototype methodology, the other features like (risk, documentation, team skills) are not important as the point mentioned in this section.

I am not underestimating the waterfall or scrum model, because each one has its own strengths but, in our system, "real estate", the prototype with its strengths is the best choice to use in this system.

INTERVIEW

GENERAL IMPORTANCE OF INTERVIEW

Interviews are one of the most popular methods of gathering information and requirements by asking open questions not yes/no questions. Interviews have many advantages and disadvantages. Most important advantages and disadvantages:

- Completely understand the requirements by asking open questions.
- Being face-to-face with stakeholders allows the analyst to obtain knowledge that could have been difficult to capture or communicate in writing.
- Analysts may get instant feedback, enabling them to make immediate modifications and explanations to the requirements collecting process.
- Interviews consume a lot of time when interviews large numbers of individuals.

- The success of an interview is determined by the interviewer's ability to ask relevant questions, search for specifics, and analyze replies.

IMPORTANCE OF INTERVIEW IN SNAP STATE SYSTEM

Interviews are the best method to collect the requirements of Snap state system, the reason of this selection because it provides to deep conversations with the participants and gives us the opportunity to fully understand the user's requirements, needs, problems, and solution. It also allows for understanding on confusing topics and the exploration of stakeholder perspectives. So, the main purpose of the interview is to get insights and define the user's pain points, what are the features and requirements they want in the platforms.

INTERVIEW QUESTIONS

I interviewed four people and asked each one five questions to get insights and ideas of the Snap state system.

- **How crucial is personal information safety when using a real estate communication system?**

- o Expected requirement from the question "The importance of the security in the system specially in user authentication."
- o (Ibrahim) My primary concern is security. I would never use a platform which fails to value the security of my personal data. For me, a strong security system is essential.
- o (Ali) I have previously expressed worries regarding security on the internet. Considering that the system provides safe and easy to use authentication gives me confidence in using it for my real estate business.
- o (Mohammad) Security is unavoidable. Systems that utilize user authentication tools to protect critical data are appreciated. It's a prerequisite for every real estate system I'd accept.
- o (Ahmad) My data safety is an agreement killer. In my method of choice, a system that has advanced security capabilities is critical. It increases trust in the system.

- **Could you tell me about your experience in managing property-related deals on other real estate websites? Which characteristics do you consider to be the most important?**

- o Expected requirement from the question "Importance of easy search, view properties, user profile management, and property management (add, modify, and delete)"
- o (Ibrahim) I've used platforms that made property management difficult. I always look for a system where user profiles can be easily customized and where the management of property-related actions makes the entire process more effective and

relaxing. Also, I personally always prefer to search about specific properties rather than browsing the properties page, so I recommend and prefer to use search functionality.

o (Ali) Property management with search functionality that is straightforward to use is an evolutionary step. The flexibility to add, change, or delete properties using simple user interfaces simplifies my experience, making the platform wonderful to use. Also, for me, one of the biggest features is to easily modify my account information anytime I want, and modifications should be saved.

o (Mohammad) I want systems that know the user's point of view. Simple property control and user profiles customized to my goals are aspects that contribute to my overall happiness with a real estate platform. I also want to show the information of the property page in an understandable way.

o (Ahmad) For me, an easier search functionality and handling of properties system is important. I prefer systems which prioritize improving the customer experience by making it straightforward to show the information of properties in an efficient way and manage property-related activities with a few clicks like adding, modifying and deleting my properties with few clicks.

• **What are your thoughts on real estate website subscription plans and special features? What would convince you to upgrade to a more costly plan? And do you prefer to modify you subscription plan if your existing plan still not finished?**

o Expected requirement from the question “Importance of subscription plans in the system, listing properties as special, and modify subscription”.

o (Ibrahim) Subscription plans with extra benefits are really valuable to me. I'm more likely to pay if the system provides unique advantages such as more visibility and higher earnings by selling the property faster. If there is a way to make a specific property as special so that it appears on the home page and special pages would be fantastic.

o (Ali) I'm interested in possibilities for subscriptions that really improve my experience. Premium benefits that improve efficiency or give fresh features would be an excellent reason for me to upgrade. In addition, I will be very happy if there is a subscription modification by modifying the subscription plan.

o (Mohammad) Systems offering content through paid subscriptions are appealing to me. If premium features meet my needs, I will consider upgrading.

o (Ahmad) Subscription plans that provide real advantages attract my interest. If a system can show that premium features enhance my real estate experience greatly, I consider it an investment that is worthwhile. Making properties special is very good for me to increase productivity and profit.

- **How significant is real-time communications in a real estate platform in your opinion? In what way does it have on your ability to communicate with different users?**

- o Expected requirement from the question “Importance of communication between users”.

- o (Ibrahim) It is critical to communicate in real time related to real estate sector. It enables quick interaction and negotiations. For effective interaction on a real estate system, an encrypted and easy to use messaging system is required.

- o (Ali) I’m really surprised that there are not many systems implemented the chatting feature. Is it too expensive to implement it? Because I had many issues with this problem, every time I want to buy something, I should call the seller’s phone number which is very bad for me. I wish that many systems, specifically the real estate systems to use the chatting features to chat and inquire about specific properties.

- o (Mohammad) Systems that encourage real-time communication seem attractive to me. It’s an absolute must for me because it optimizes the communication process, allowing me to interact better with homeowners or buyers.

- o (Ahmad) In real estate, efficient interaction is critical. Real-time messaging not just speeds up engagement but additionally guarantees that users can talk about property information or purchases in a safe and timely way.

- **How important, in your opinion, are reliable admin functions for a real estate platform? What do they add to the system's overall success?**

- o Expected requirement from the question “Importance of admin in the system”.

- o (Ibrahim) The system's success depends on comprehensive admin capabilities. Administrators inspire trust in users by making sure the system is well-organized, listings are of outstanding quality, and problems are resolved as soon as possible.

- o (Ali) A successful platform relies on administrative capabilities. They contribute to efficiency in general, guarantee of quality, and user pleasure. A organized system encourages confidence and dependability.

- o (Mohammad) Administration works are critical to platform success. They play an important role in managing and running the whole thing, guaranteeing that it works smoothly and operates the demands of homeowners and property seekers.

- o (Ahmad) Administration tools are essential to a real estate platform's performance. They give the necessary resources required for effective control, to guarantee the system is maintained properly, safe, and reactive to user requirements.

METHOD TWO : SIMILAR SYSTEMS (AQAR)

We also considered similar systems such as Aqar, which specializes in real estate management. We gather several information from their system such as:

- Initial design of the website (property listing, single property details, etc).
- Create accounts for users.
- Categories of properties.
- Search requirements.

Their system is very similar to the Snap State System, but they deployed it in Saudi Arabia, unlike us. The Snap State System focuses on Jordan only and then makes future improvements by deploying our system in other countries.

In addition, the Snap state system has more features and requirements than Aqar, such as real-time chatting between users' "communication," which is missing in the Aqar system. Also, the Snap state system is more user-friendly and easier to use than Aqar but we used their system to gather requirements and additional information to use in our prototype and final website.

Here is the link of their website <https://sa.aqar.fm/>

WHY INTERVIEW AND SIMILAR SYSTEM

Interviews and similar systems are chosen in this system to gather requirements. Interviews are the best method to collect the requirements of Snap state system, the reason of this selection because it provides to deep conversations with the stakeholders and gives us the opportunity to fully understand the stakeholders needs, problems, and solution. It also allows for understanding on confusing topics and the exploration of stakeholder perspectives. So, the main purpose of the interview is to get insights and define the user's pain points, what are the features and requirements they want in the platforms.

In snap state system, the prototype methodology is used in this project, so the interviews are not enough and we must see similar systems to see what are the main features and requirements to use it in the prototype. So use similar systems as reference is required to implement a robust system that aligns with stakeholders needs and expectations.

USER STORIES

From the interviews I did, I found the best requirements that can meet the user's needs and cover the pain points. From the interviews:

User story one:

- As a user, I want secure, user-friendly user authentication to protect my information.
- As a user, I want to easily modify my account information and update my information.
- Standards for Acceptance:
 - o The platform must use strong authentication methods such as email and password.
 - o Passwords must adhere to high security standards, and recovery mechanisms should be available.
 - o Implement easy to use interface for modifying user's account.
 - o Implement a secure tool on all the system's interfaces to protect the user's and system's data.

User story two:

- As a user, I want to use a user friendly, and easy to use interface to add, modify or delete properties.
- As a user, I want to use simple search functionality to search for specific properties, categories, etc.
- As a user, I want to show all the properties in the platform alongside property information in an efficient and understandable way.
- Standards for Acceptance:
 - o The system's interfaces should be easy to use, user friendly, allowing users to easily add, modify or delete properties.
 - o The system must implement a straightforward search functionality for properties name, categories, etc.

User story three:

- As a user, I'm looking for simple subscription options with extra benefits that bring significant advantages to my property experience, attract me to upgrade.
- As a user, I want to modify my subscription plan if subscribed and select another subscription plan.
- As a user, when I subscribed, I want to mark a specific property as special on the system to increase my productivity and profit.
- Standards for Acceptance:

- o Subscription plans must be clarified and priced, with each tier's features and benefits outlined.
- o Users must be allowed to change and upgrade their subscription plans with ease.
- o Users should be able to mark their properties as special in case they are subscribed.

User story four:

- As a user, I'd like a secure and straightforward real-time chatting service which enables me to interact with other users at all times throughout real estate transactions.
- Standards for Acceptance:
 - o The chatting service ought to enable immediate interaction as well as receiving push notifications regarding new messages.
 - o Users can start chatting and reply promptly.
 - o The chatting service should be secure and encrypted to protect user's information.

User story five:

- As a user, I want administrators to manage the system and increase my confidence in using the system.
- As an administrator, I want comprehensive features such as generating reports, managing users, managing and control properties, deleting user accounts, and communication between other customers.
- Standards for Acceptance:
 - o Admin pages should include these features: generating reports, managing users, managing and control properties, and deleting user accounts.
 - o A dashboard must be available on the website that shows real-time data regarding user involvement and system efficiency.
 - o Admin can communicate with users to clarify and solve issues, clarify updates, etc.

ASSESS THE EFFECTIVENESS OF THE ANALYSIS AND THE SRS DOCUMENT

SRS

System requirement specification was very useful in our system and overall, in every system development because of what it contains all the useful information about the system. By using SRS documents, it helped us in showing in detail the system requirements to use it in the prototype and final product. SRS document in Snap State System was like a communication bridge between the stakeholders and between the stakeholders and team that is responsible to develop our system prototype and final website by containing clear information about the Snap State system requirements, and the purpose of creating this system. So, by using SRS documents, all stakeholders have the same information and details about the system functionalities and overcome the gap that may happen of misunderstanding the system purpose if SRS is not created.

It also offers a foundation for development, directing the adaptive prototype process and guaranteeing alignment with changing user requirements. In addition, SRS can be a reference to the development team for testing and evaluating the prototype and final website by ensuring that all the requirements identified in the SRS document are implemented in the design and implementation stages of the system.

SRS is also useful in the prototype by directing the iterative refinement process and tracking the changes that guarantee the prototype version stays in line with the gaining requirements.

ANALYSIS

By using interviews and similar systems as analysis tools, interviews gave us the opportunity to understand, define the stakeholders' needs, and make a big source of requirements to implement a prototype and system that covers all these needs and ensure user expectations.

On the other hand, analyzing similar systems was very important in understanding and reviewing the standards of the real estate industry to ensure that the prototype covers all the basics functionalities of the real estate industry. In addition, analyzing similar system helped in discovering new special features to implement in our system that are not implemented in other systems. By combining the basics functionalities and special features in analyzing a similar system, it will help the team to develop a special prototype and system that covers all user needs and user satisfaction.

In addition, interviews and similar system methods with the user stories helped in creating a prototype and final system that not only focuses on the functionalities of the system but also focusing on other aspects such as design, and security of the system.

ASSESS THE EFFECTIVENESS OF THE DESIGN PROCESS AND THE SYSTEM SPECIFICATION

In our methodology “Prototype”, wireframes gave us the ability to perform iterative modification on the interfaces based on the stakeholder’s feedback which allows us to offer a system that meets all the requirements and stakeholders needs and expectations. In addition, wireframes provide the stakeholders engagement by interacting with the prototypes and offer quick feedback that may be easily integrated into future versions of prototypes. With the iterative method of prototype which ensures that wireframes can always be adapted to any changes in requirements during the development stages.

On the other hand, the class diagram in our system acts as a template for implementing the system because it contains all technical information about the system architecture such as classes, attributes, and relationships. It helped the team to refer to the system specification during the system implementation to check if that the code meets the system specification document. Also, this helps in guaranteeing unity and consistency during the development phase. Not only that, but also class diagram helped in overcoming the scalability problems and ensure that the system can handle future improvement.

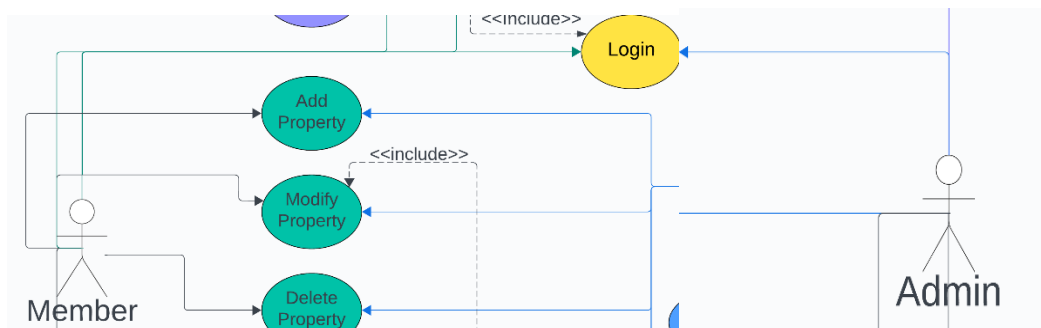
In addition, the physical ERD helps in knowing how the data store and accessed which means that it deals with data management and data management is very important in our system because it deals with various categories of properties and properties themselves, user, and subscription details. Physical ERD helps in prototype methodology because it helps the team development in enhancing the database performance to make sure that the system database is working perfectly and reliable to user interactions. Also, the physical ERD can be merged with prototype to defining how the data will occur which allows us to get feedback from stakeholders on the data related requirements and needs.

Furthermore, sequence diagram helps the development team during the implementation stage by making the developers to refer it for understanding the flow of activities and relationships among various components and providing a guidance for developing features in a way which is compatible with the desired system behavior.

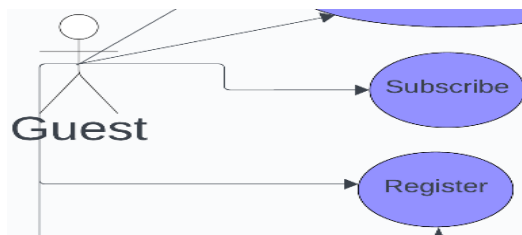
SHOW HOW THE DESIGN MEETS WITH USER REQUIREMENTS STATED IN THE PREVIOUS STAGE

- Users shall be able to register and login securely.

Use case:



As shown in the figures, admin and members have the “login” case in use case diagram.



Guest has only “register” option and case in the case diagram.

Class diagram:



In the table user above, it contains email and password of the user which indicates the login and register requirements. And also mentioned in the operation field of the user table as shown login () and register() .

Physical ERD :

User
P.K ID : INT
email : CHAR
Password : CHAR
Phone Number : INT
is admin : Boolean
is member : Boolean

In the table user above, it contains email and password of the user which indicates the login and register requirements.

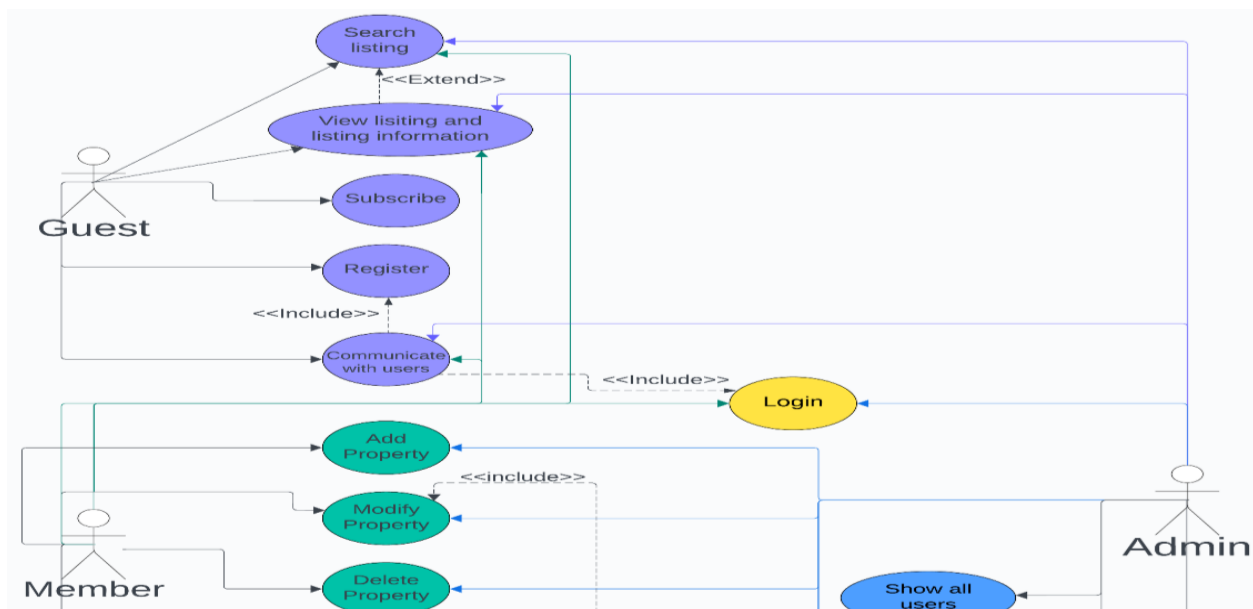
Sequence Diagram:



The web interface features a dark theme with a navigation bar at the top containing a paw print icon and links for HOME, CATEGORIES, BLOG, and CONTACT. On the right of the navigation bar are icons for search, shopping cart, and user profile. The main section is titled 'Sign Up' and contains four input fields: Name, Email, Number, and Password. Below these is a 'User Logo' field with a circular image upload icon. A prominent red 'Sign Up' button is centered below the form. The footer includes the 'RealtyPro' logo, copyright information (2021 © RealtyPro. All rights reserved.), and a grid of links for Home, Pricing, About us, Contact, Facebook, Instagram, Twitter, LinkedIn, Privacy Policy, and Terms Of Service.

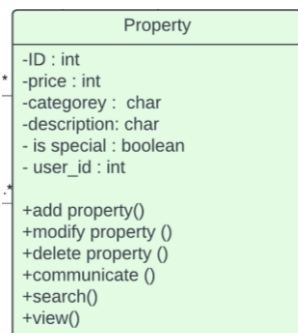
- Users shall be able to easily search and view properties with description.

Use case:



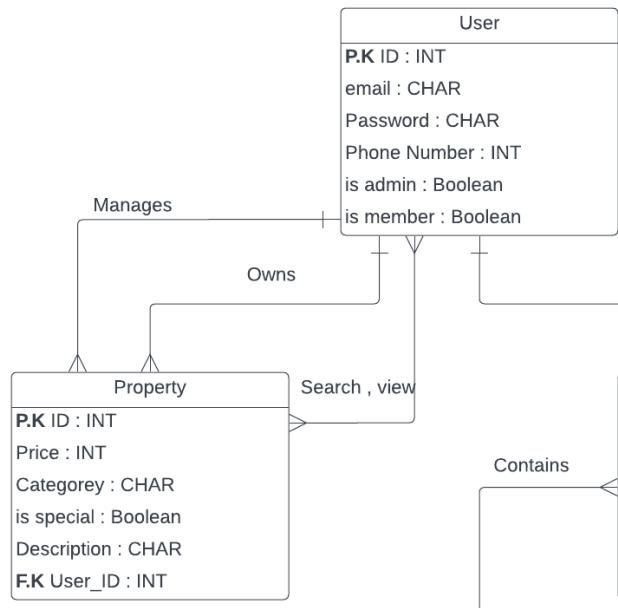
As shown in the figure above, all the actors have the case “search listing” and “view listing information”.

Class diagram:



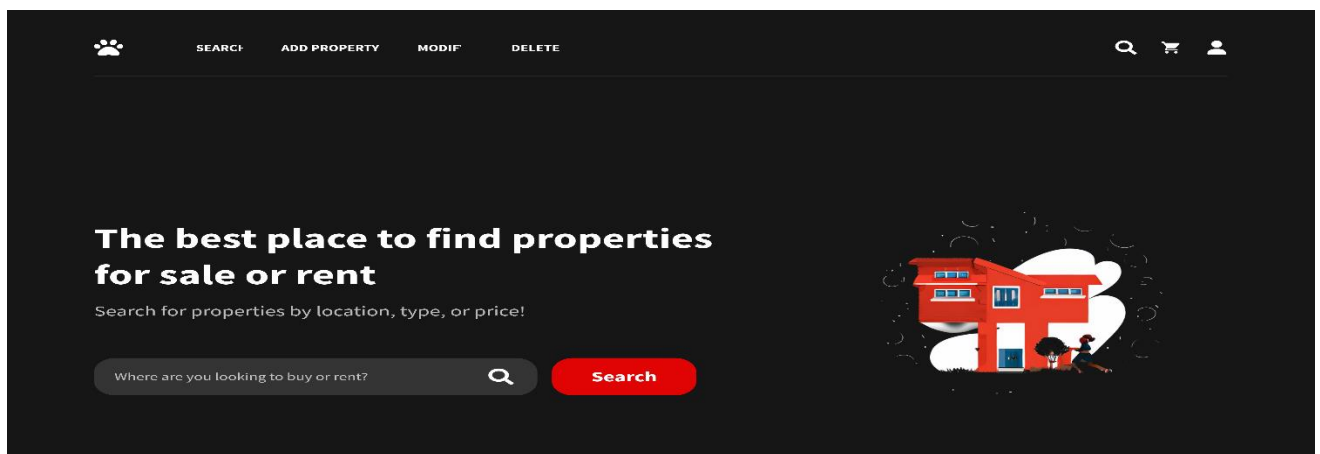
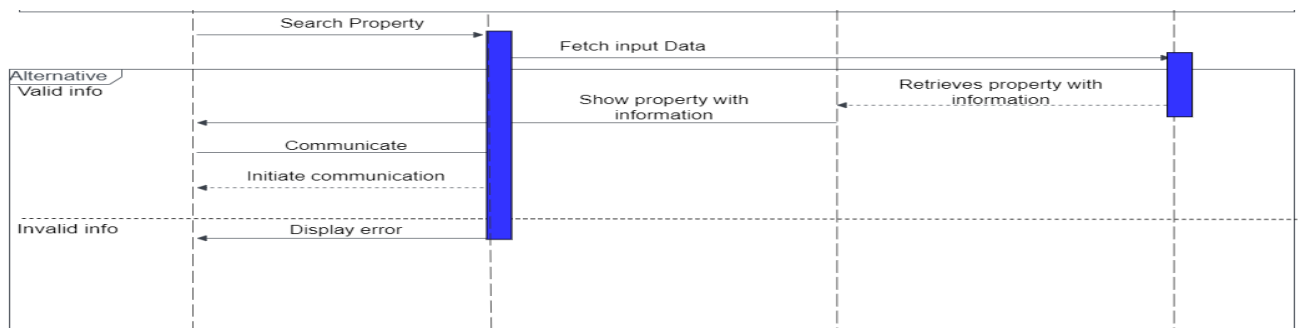
The operations “search ()” and “view ()” in property table indicates to the search and view property with their information.

Physical ERD:



As shown in the figure above, all users can search and view for properties with their information.

Sequence Diagram:



Name of property

Now, I know we're pals and all that, but books are not Movable Type blog posts and we do not write paragraphs with blank lines between them and no indention. (We are not "typesetting" an O'Reilly "book.") Apart from simply being wrong and leading to ambiguities when a paragraph ends a page, I find it induces me to leap to the next graf at the tiniest hint of disinterest. Do please fix.

[Start Chatting](#)

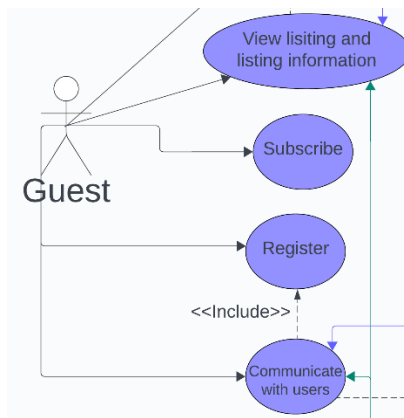
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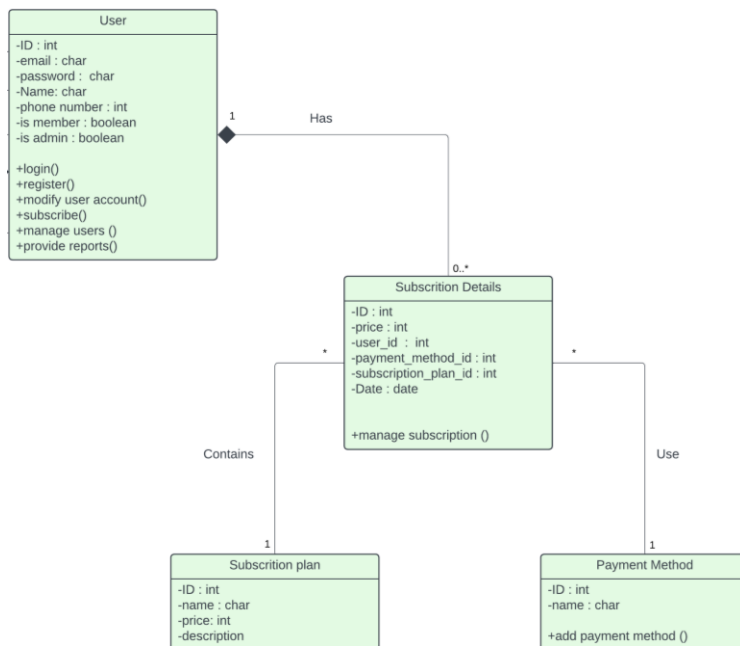
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- Guests shall be able to secure and easily subscribe to the system.

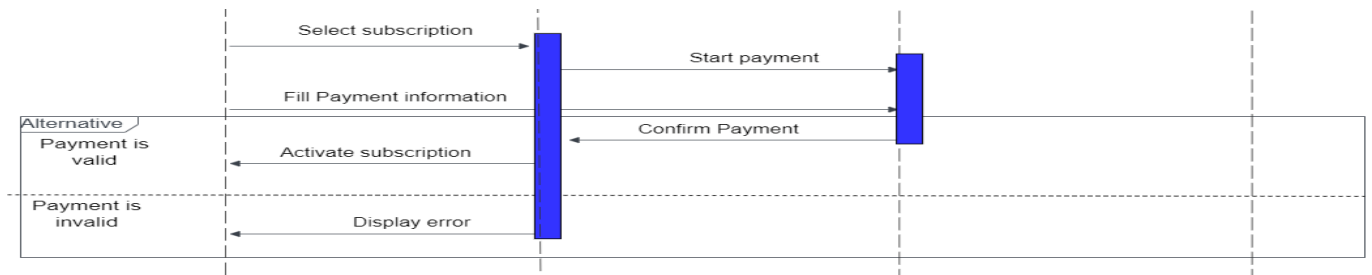
Use case:



Class diagram:



The operation “subscribe ()” in user table indicates that the guest can subscribe to the system.



[HOME](#)
[CATEGORIES](#)
[BLOG](#)
[CONTACT](#)

Categories [Subscribe](#)

Subscribe

"Selected Plan"

Full Name

Email

Phone Number

Select payment Method

Card Number

CVV Number

Expire Date

VAT Number

Subscribe

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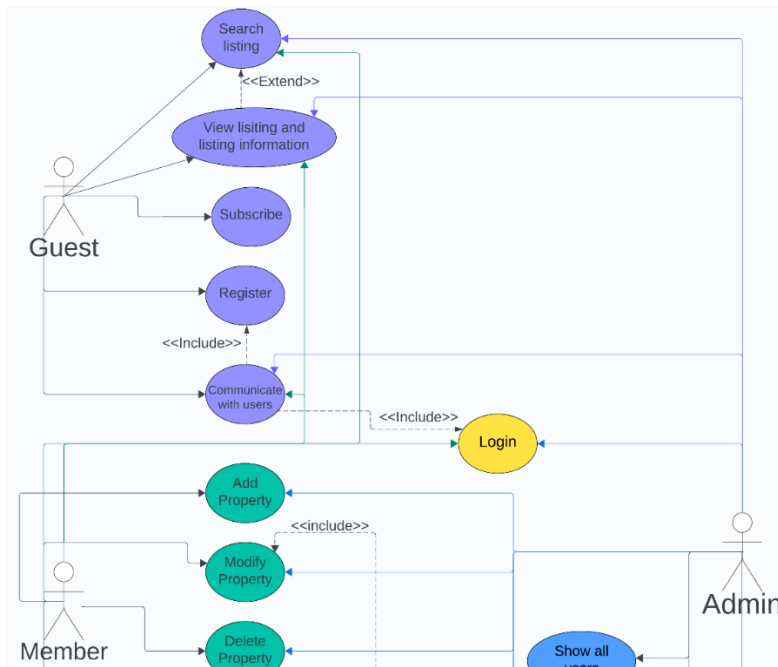
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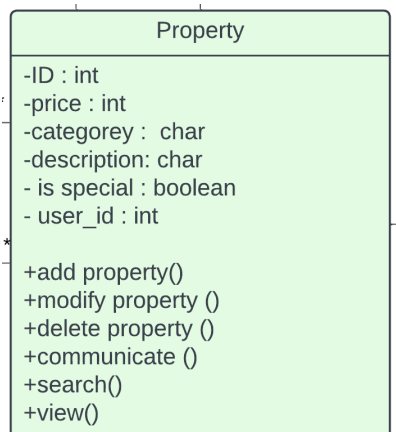
- Users shall have the ability to communicate with each other easily with secure connection.

Usecase:



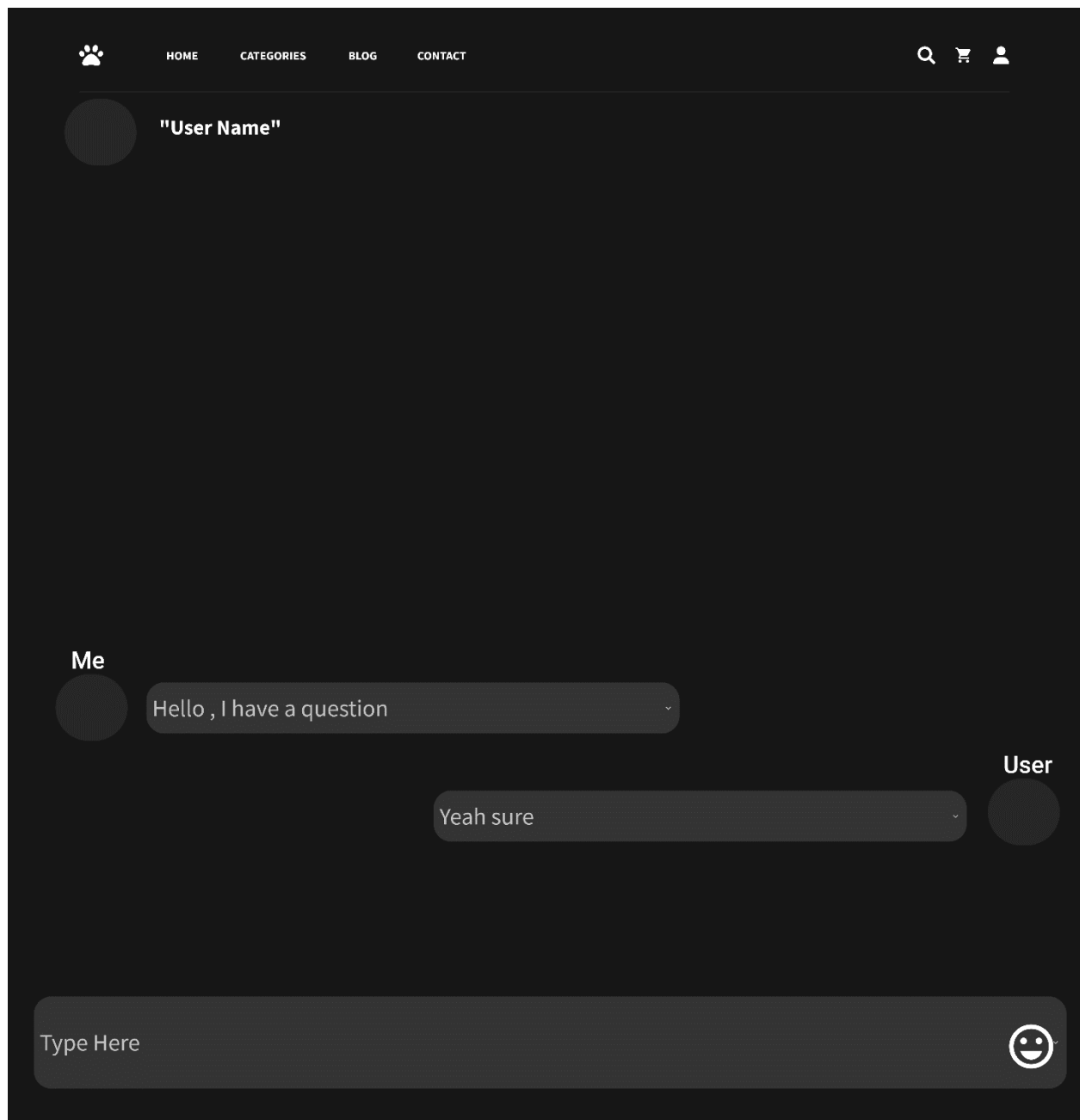
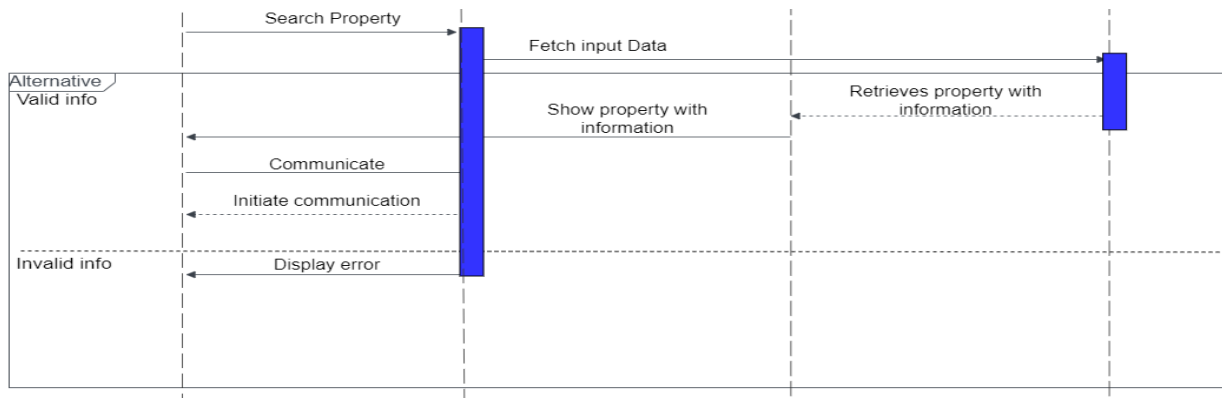
As shown in the figure above, all the actors have the case “communicate with users” which indicates to the communication requirement.

Class diagram:

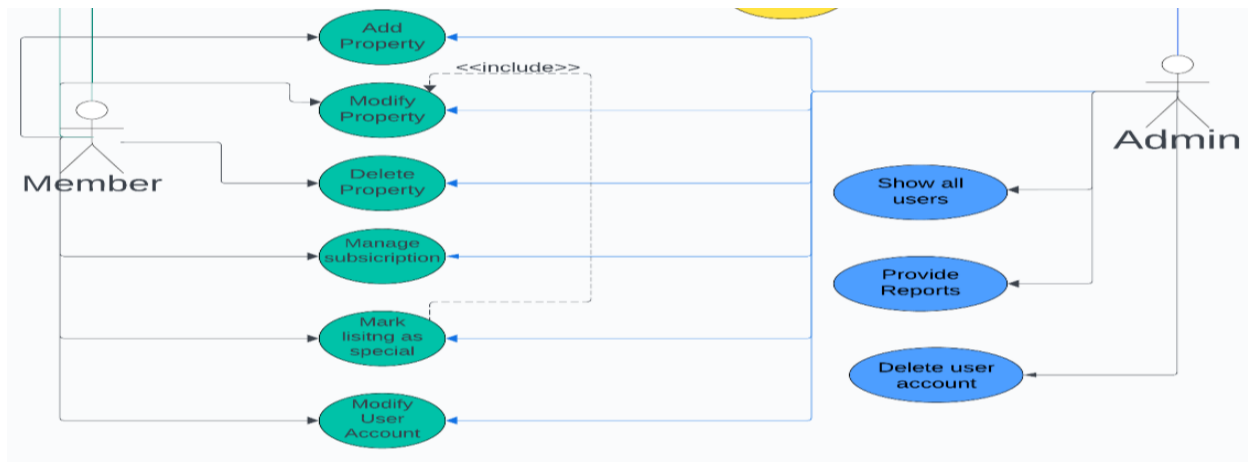


The operation “communicate ()” in property table indicates that the users can communication requirement.

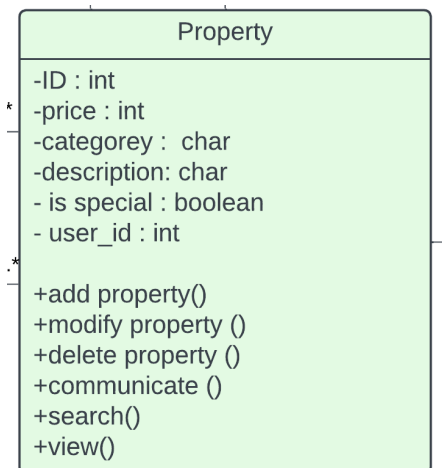
Sequence diagram:



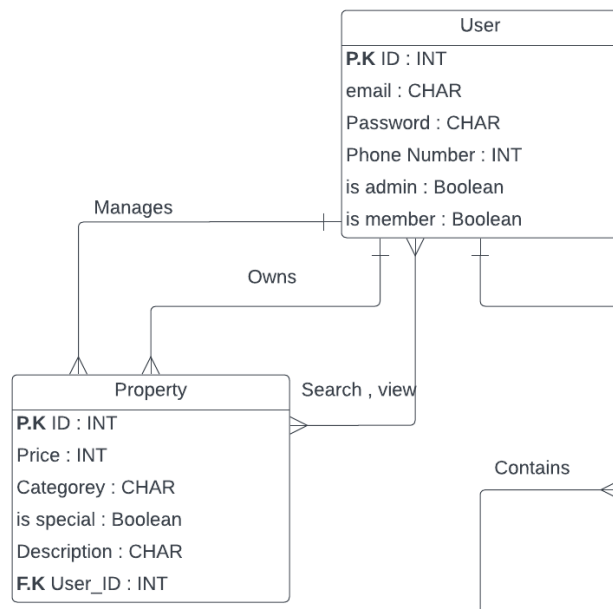
- Members and admin shall have the ability to add, modify, or delete properties with effortless.



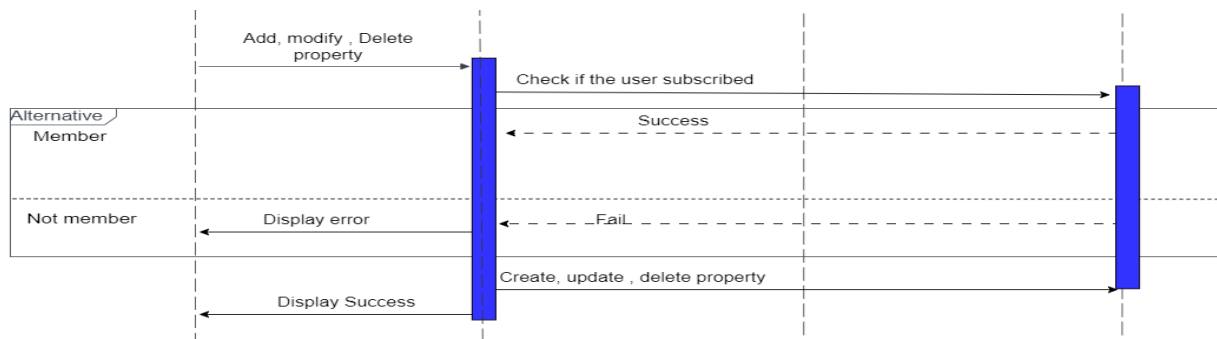
Class diagram:



Physical ERD:



Sequence diagram:



Property Listings

Residential PropertiesCommercialVacationPropertyPropertyProperty

Subscribe NowLoginAdd Property

< Go

Add Property Photos

Upload Photos
or Use Drag & Drop

Add a New Property

Property Name

Property Price

Property Description

Property Category

Mark As special (For members only)

Upload Property Photos

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Subscribe NowLoginAdd Property

< Go

Modify Property listing

Upload Photos
or Use Drag & Drop

Modify Property Information

Property Name

Property Price

Property Description

Make it special

Mark As special (For members only)

Update Property

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Add Listing

Scheduled

Comments

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Accounts

Refunds

Reports

Help & Onboarding

Search for a property

Add Property

Property Title

Enter property title

Price

Add a price

Category

Dropdown

Description

Property Preview

Property Gallery

Price

Property Images & CTA

Cover Images

Click or Drop Images

Special Property

Make it special

Special or not

Admin Page

Add Property

< Go

Modify Property lisitng

Upload Photos

or Use Drag & Drop

Modify Property Information

Property Name

Property Price

Property Description

Make it special

Mark As special (For members only)

Update Property

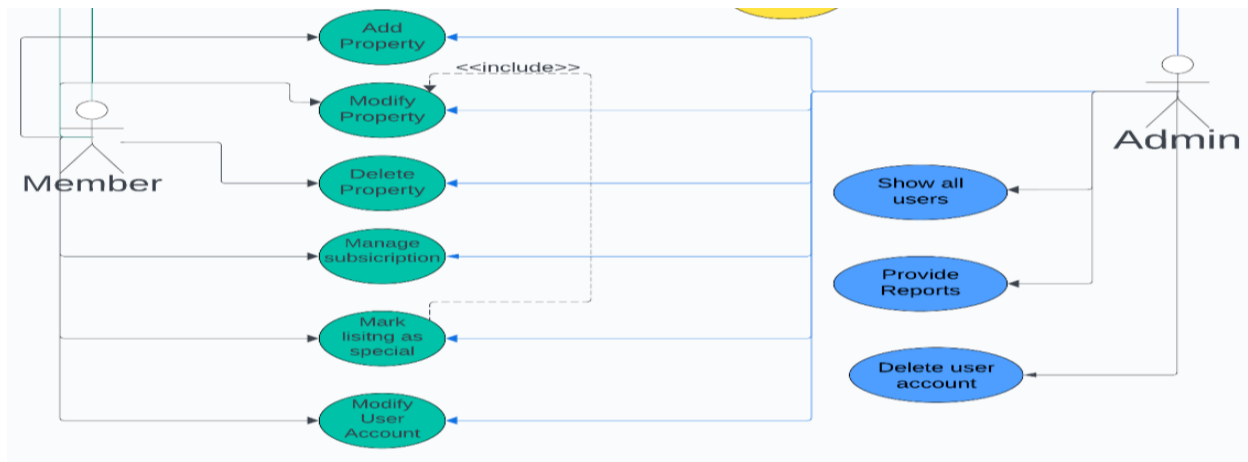
User Information

User Name

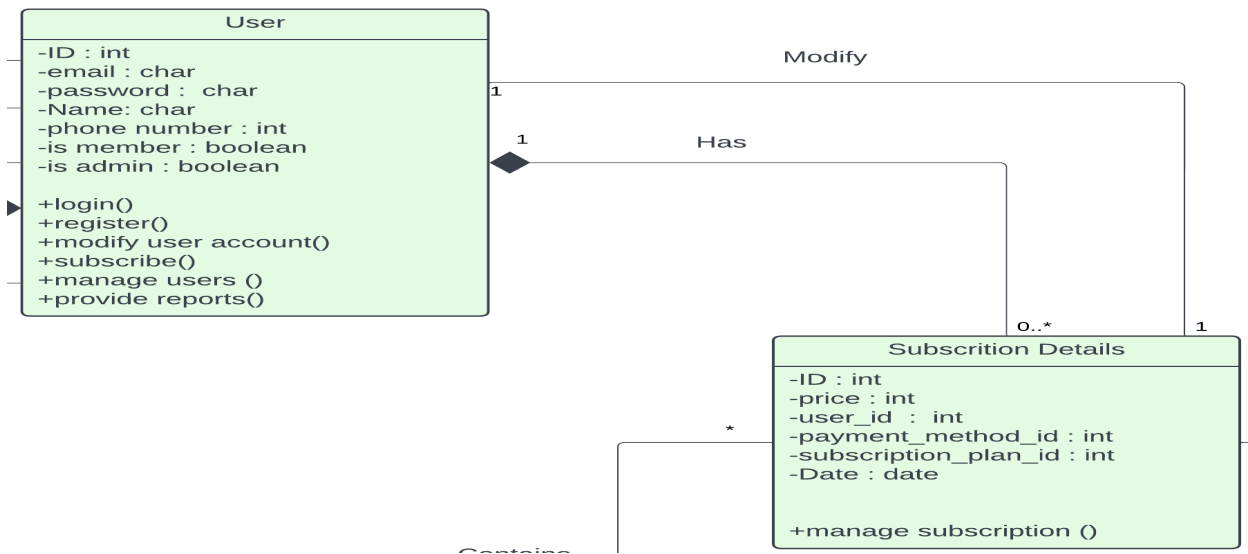
Phone Number

Chat Now

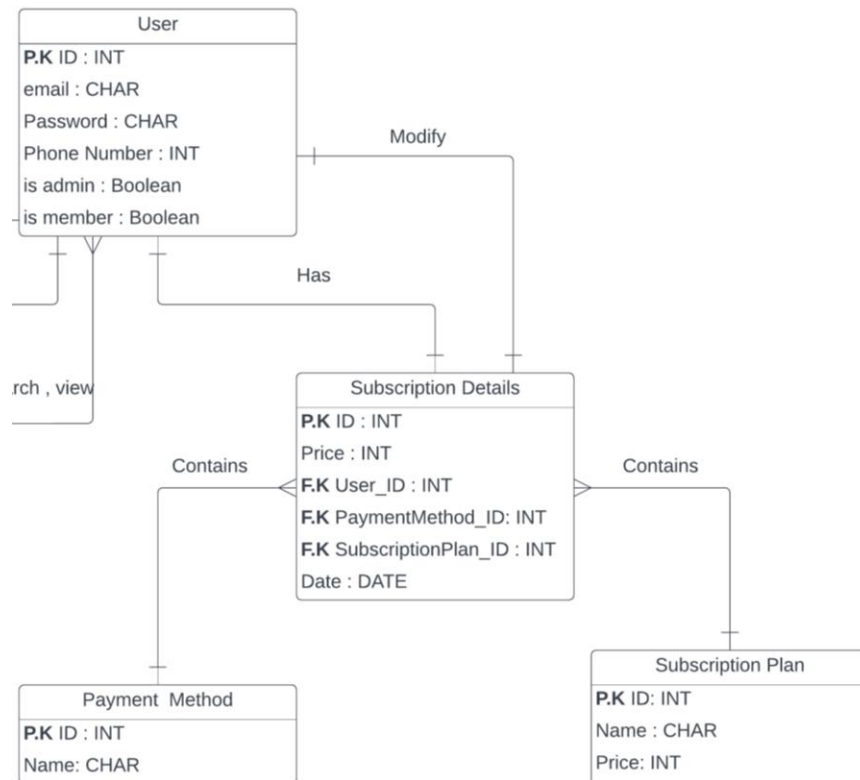
- Members and admin shall easily have the ability to modify the member's subscription.

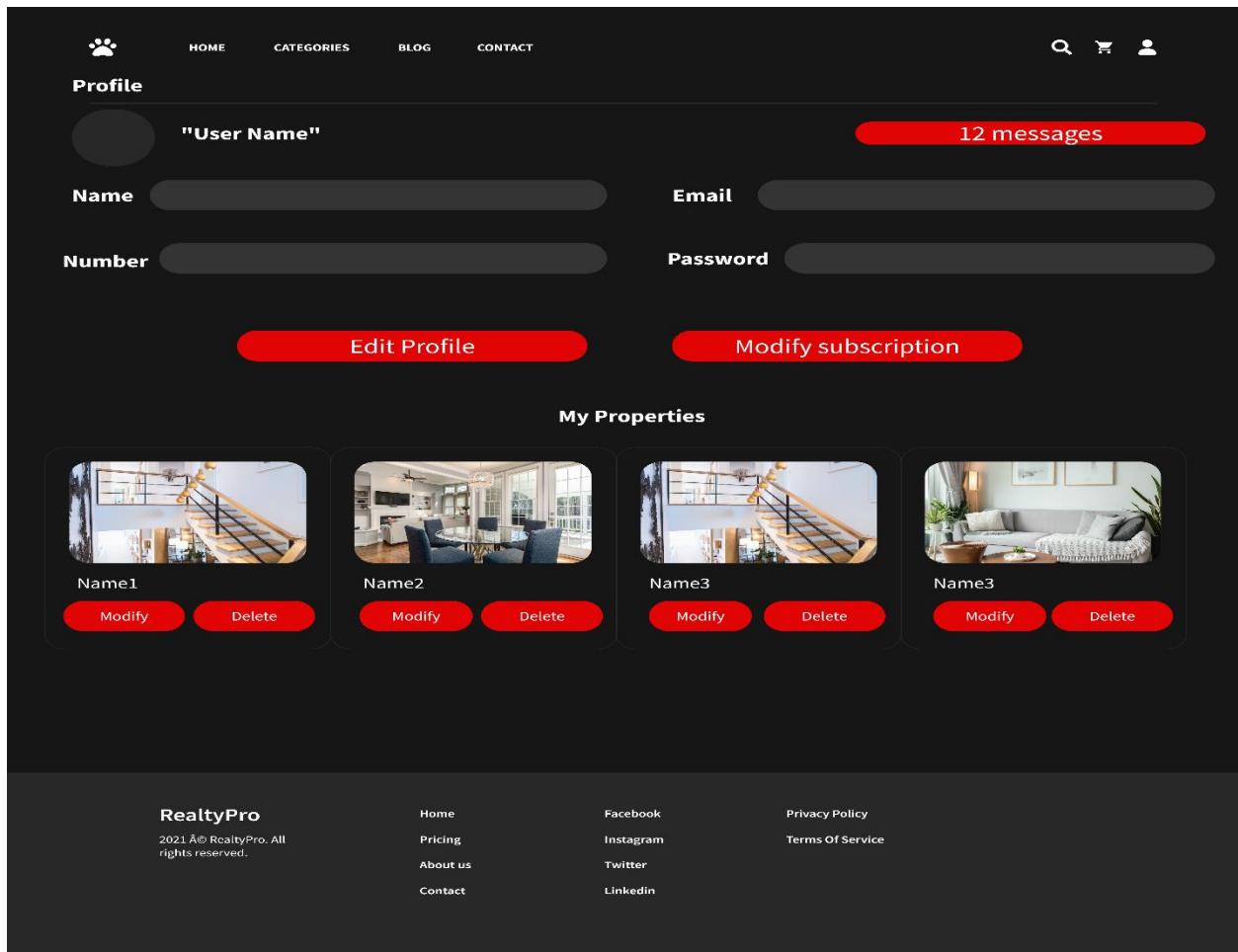


Class diagram:

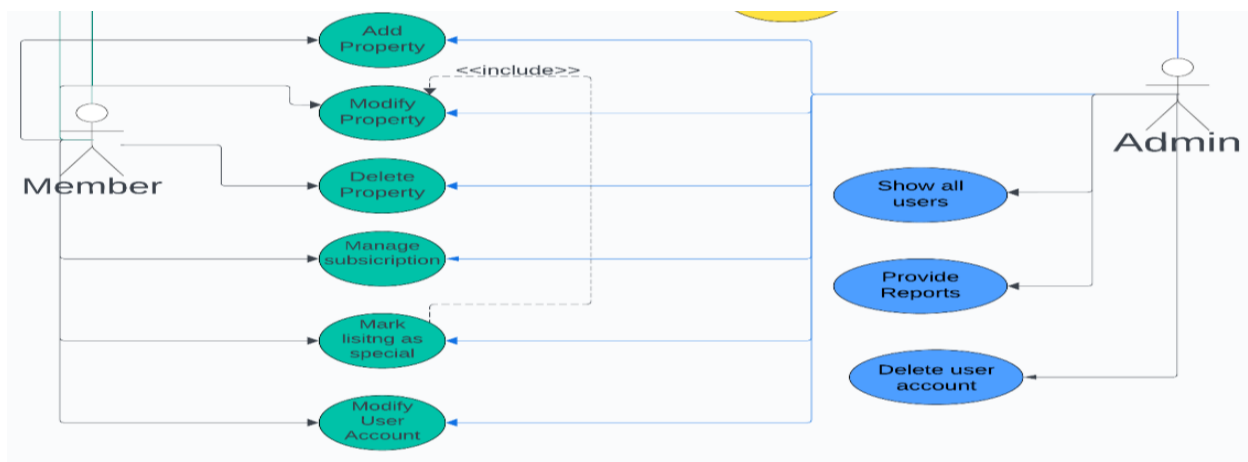


ERD:

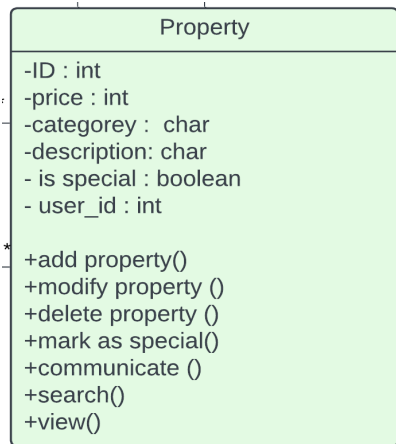




- Members and admin shall have the ability to mark user's properties as special in the system.

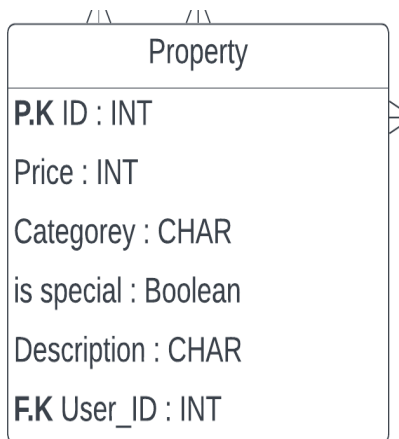


Class diagram



Operation “mark as special ()” to mark properties as special. Also the attribute “is special ” is related to the mark properties as special.

Physical ERD:



Attribute “is special” is related to the mark properties as special.

Property Listings

Subscribe NowLogin

Residential PropertiesCommercialVacationPropertyPropertyPropertyAdd Property

< Go

Modify Property listitng

Upload Photos
or Use Drag & Drop

Modify Property Information

Property Name

Property Price

Property Description

Make it special

Mark As special (For members olny)

Update Property

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Admin PageAdd Property

< Go

Modify Property listitng

Upload Photos
or Use Drag & Drop

Modify Property Information

Property Name

Property Price

Property Description

Make it special

Mark As special (For members olny)

Update Property

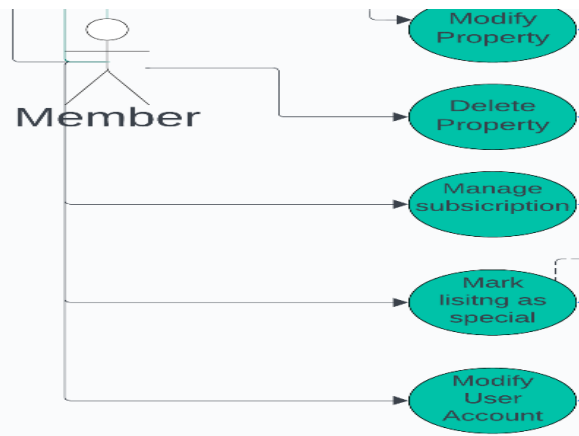
User Information

User Name

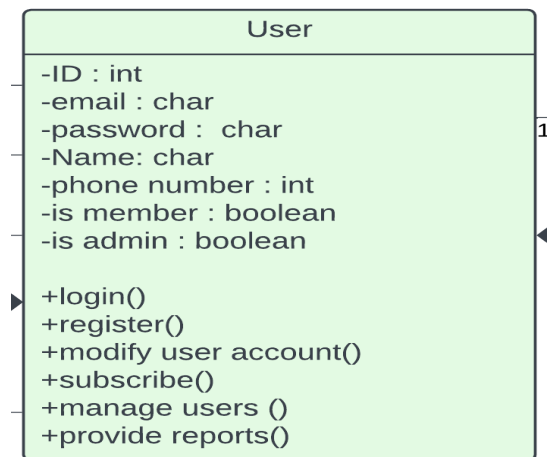
Phone Number

Chat Now

- Members shall have the ability to modify their account information easily.

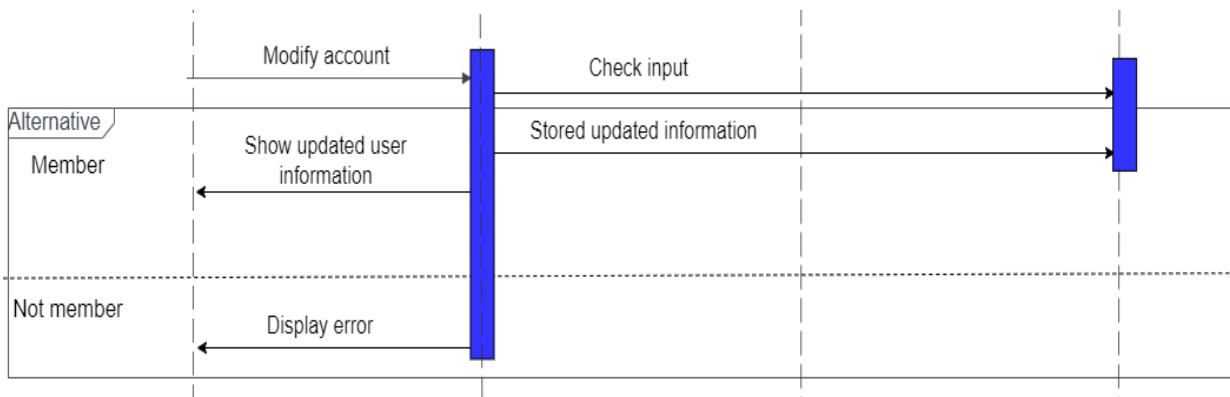


Class diagram:

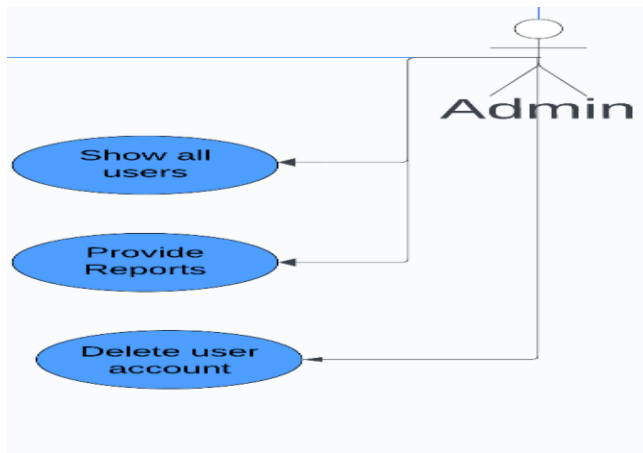


Operation “modify user account ()” is used to meet this requirement and let member modify his information.

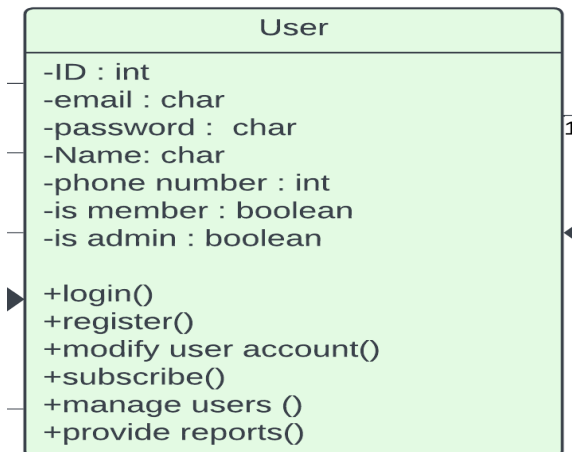
Sequence Diagram:



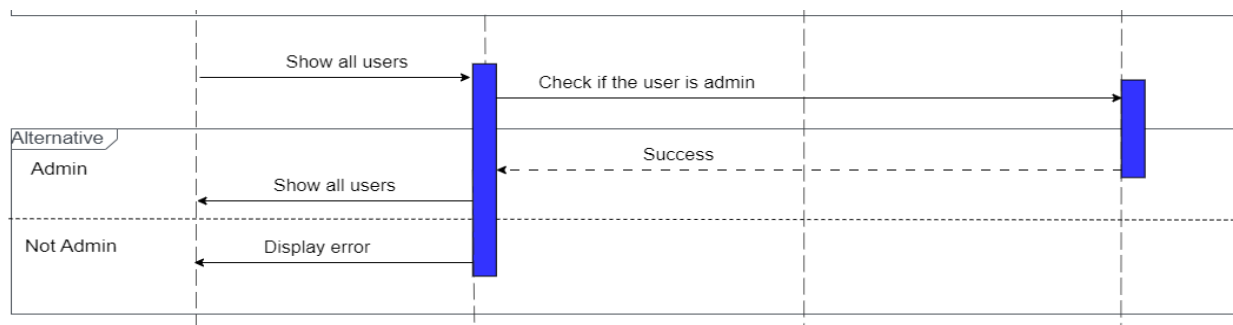
- Admin shall have the ability to show all the users registered in the system.

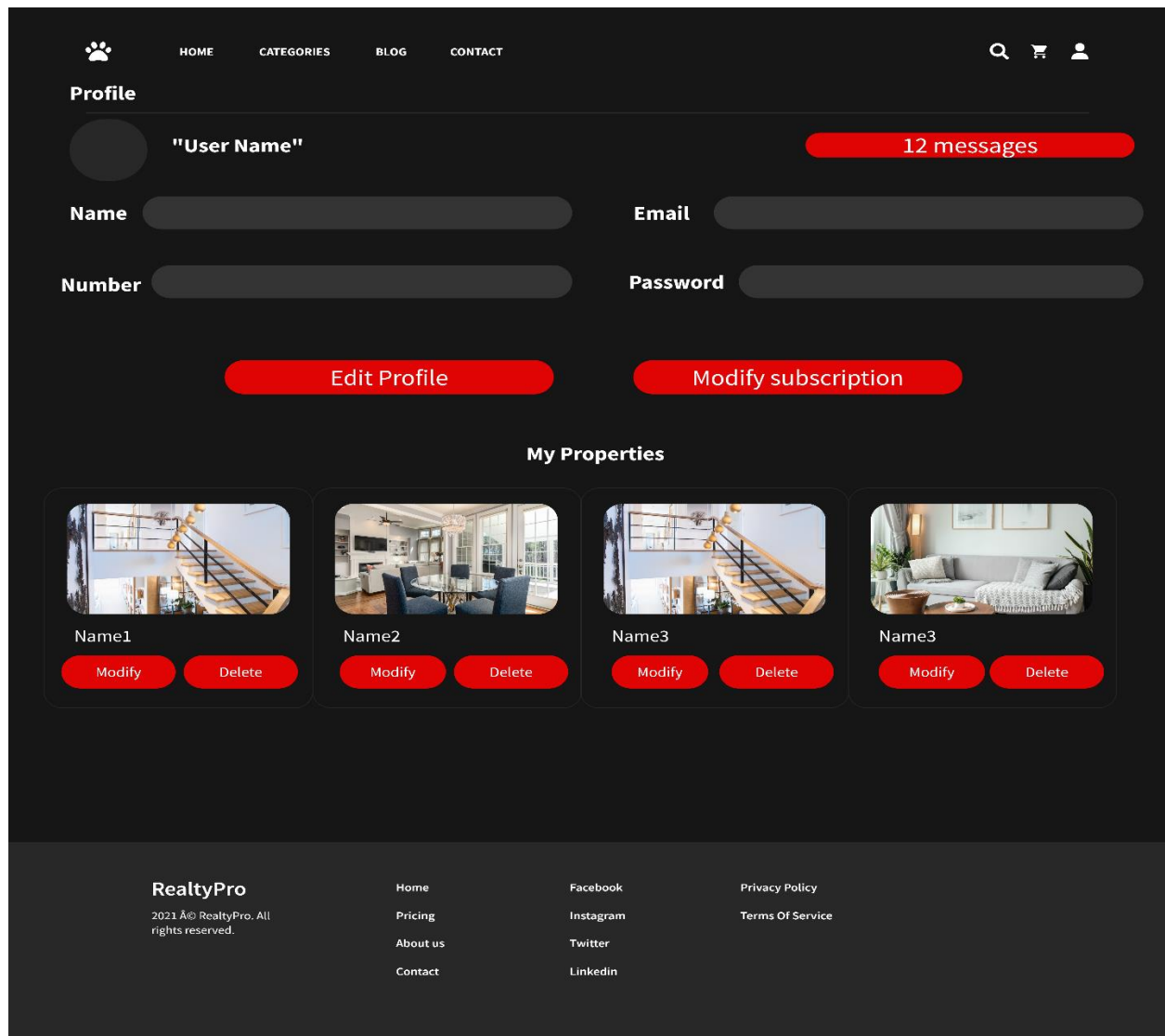


Class Diagram:

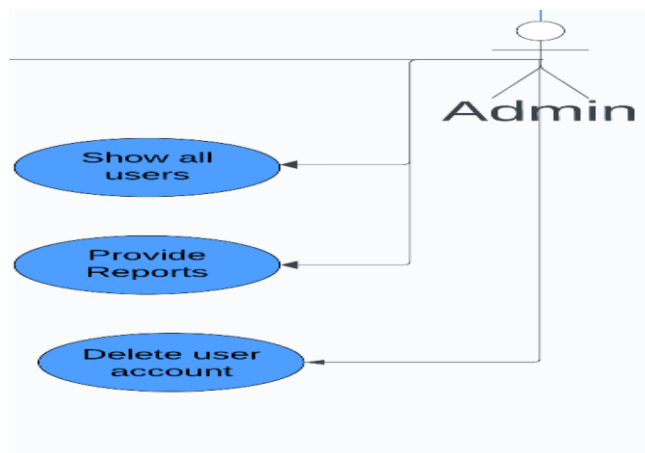


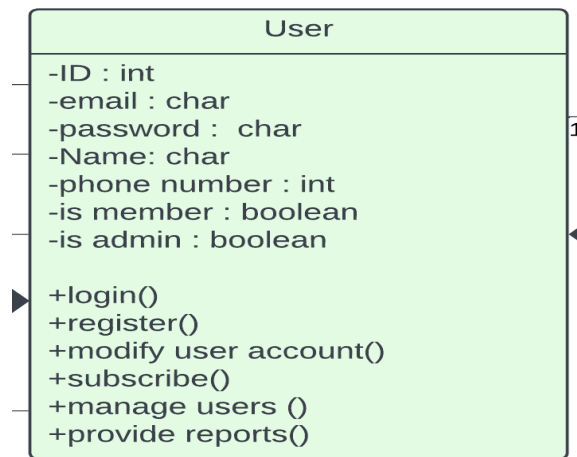
Operation “Manage users ()” is related to only admin and it is responsible to manage users such as show, modify, and delete users from the system. So, this operation satisfy the requirement.



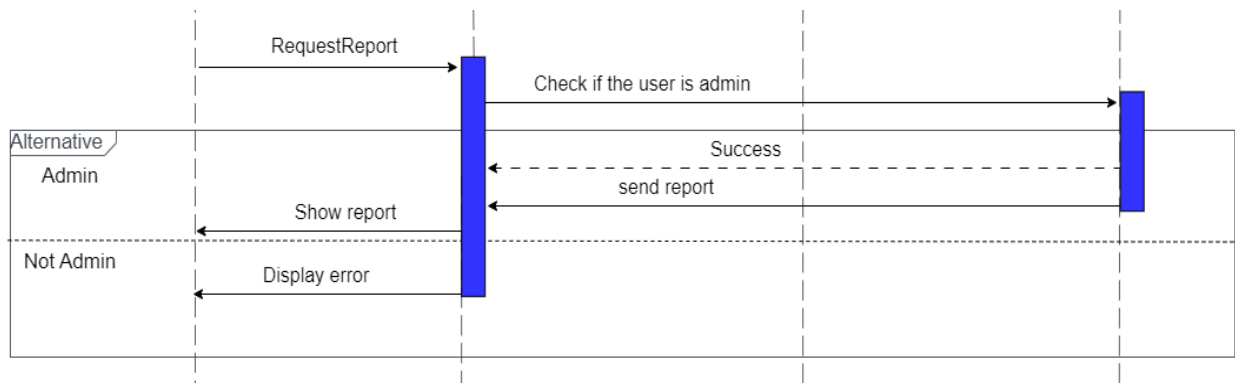


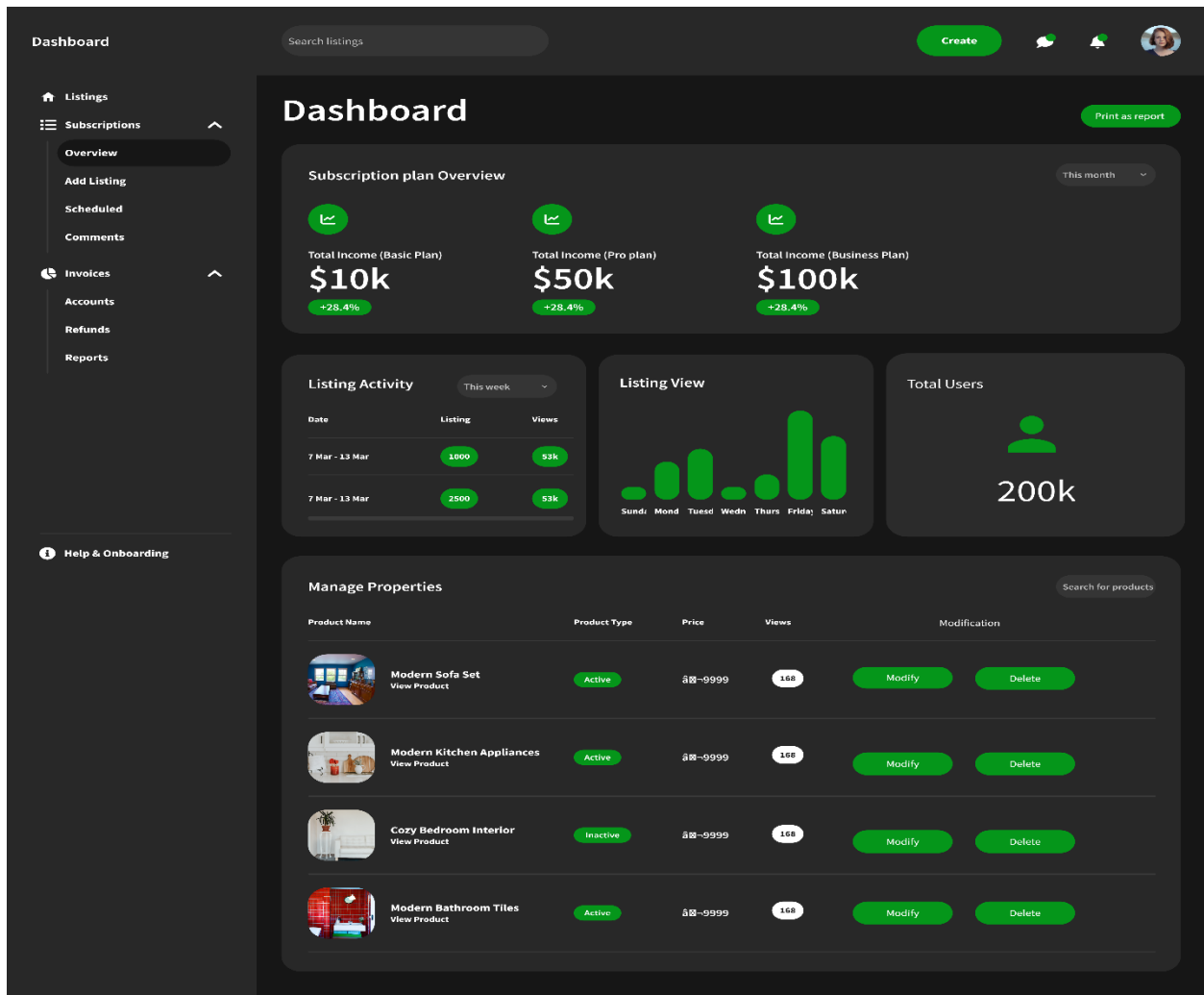
- Admin shall have the ability to provide reports easily.



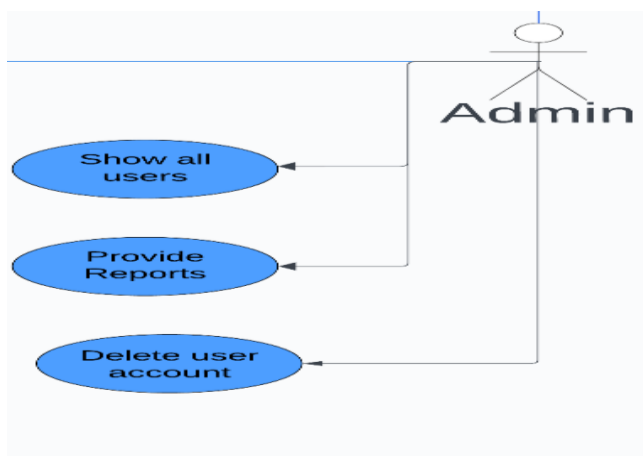


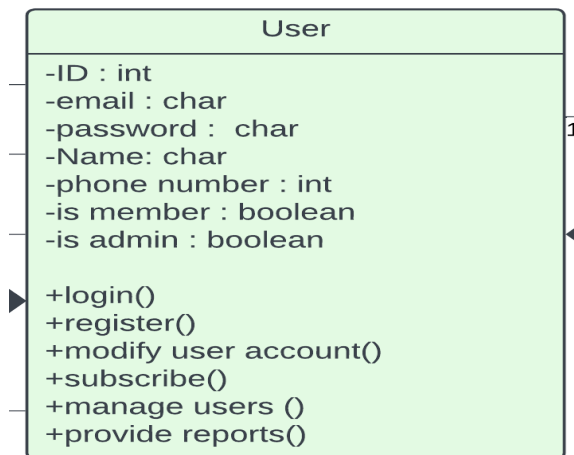
Operation “provide reports ()” is related to only admin and it is responsible for generating reports about the system. So, this operation satisfies the requirement.



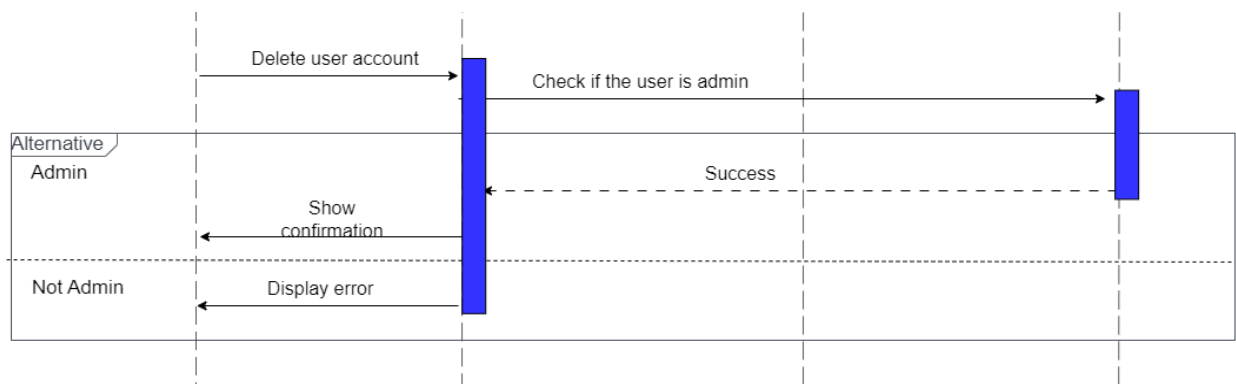


- Admin shall have the ability to manage users by modifying or deleting user's accounts if necessary.






Operation “Manage users ()” is related to only admin and it is responsible to manage users such as show, modify, and delete users from the system. So, this operation satisfies the requirement.



After review all the user requirements , I think that the design specification document covers all the system user requirements by providing screenshots of multiple charts used in system design to give evidences.




All Users




User Name
ID

ModifyDelete




User Name
ID

ModifyDelete




User Name
ID

ModifyDelete




User Name
ID

ModifyDelete




User Name
ID

ModifyDelete




User Name
ID

ModifyDelete



User Name
ID

ModifyDelete



User Name
ID

ModifyDelete

Show More

Dashboard

🏠 Listings

☰ Subscriptions

^

Overview

Add Listing

Scheduled

Comments

🕒 Invoices

^

Accounts

Refunds

Reports


📘 Help & Onboarding

Search for a listing


Add Listing

🔍

🔔



Modify User Account



Upload Photos

Delete account

Name

Enter the listing name

Email Address

Enter your email address

Phone number

Enter the location

Subscription plan

Subscription plan

Login

Old Password

Enter your old password

New Password

Enter a new password

Confirm New Password

Re-enter the new password

Update Password

Payment Information

Payment Method used

Confirm Update

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