Department of Software Engineering

University of Gujrat

Get into Payback

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Submitted By

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STATEMENT OF SUBMISSION

This is certify that Ahsan Mehboob Roll No. 19011598-023, Ali Shan Roll No.19011598-044 and Muhammad Adnan Roll No. 17221598-151 has successfully completed the final year project named as GIP(Get into Payback) at the Department of Software Engineering , University of Gujrat, to fulfill the requirement of the degree of **in Software Engineering**.

Adeel Shahzad
Project Supervisor

Project Coordination Office
Faculty of C&IT -UOG

____
Head of the Department

Acknowledgement

We truly acknowledge the cooperation and help make by ________________, Chairman, Department of Software Engineering, University of Gujrat. He has been a constant source of guidance throughout the course of this project. We would also like to thank ______________________ for his help and guidance throughout this project. We are also thankful to our friends and families whose silent support led us to complete our project.

Date:

Abstract

This web-based property investment application aims to simplify and enhance the property investment experience for both low and high-budget investors. With a user-friendly interface and a range of features, the platform empowers investors by offering opportunities to invest in various types of properties, including lands, buildings, and houses. Real estate agents play a crucial role in posting saleable properties, which are showcased to potential buyers and investors. The application provides buyers with access to a comprehensive database of available land options, allowing them to make informed decisions based on their preferences and needs. Additionally, the platform displays houses available for rent, catering to those seeking temporary accommodation. Transparency is a key focus, as the system provides all the necessary information about each property, enabling investors and buyers to assess current and future property values. Flexibility is provided to investors, allowing them to fully or partially invest in properties for a fixed duration. Collaborating with real estate agents ensures a diverse selection of properties, catering to different investment strategies and budget requirements. The system also includes a material estimation module that accurately calculates the materials required for construction or renovation purposes. This module assists users in planning, budgeting, and effectively managing their projects. By offering a seamless user experience, transparent information, and investment opportunities, this web-based property investment application aims to simplify the investment process and empower investors. It facilitates interactions between buyers and sellers, while providing valuable tools for decision-making, optimizing plans, and effectively managing property projects.

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Chapter 1: Project Feasibility Report

1.1. Introduction

The property sector has always managed to capture the interest of many in Pakistan. However, working with it is not a simple story of just buying a plot or home and selling it at a higher price. To be a success in the trade and earn handsome rewards, you need to know the basics of real estate investment in Pakistan. These involve numerous intelligent considerations and financial know-how. As technology effect every filed of our life and like other fields it also effected the real estate. Technology makes it easier for everyone to understand the concept of real estate investment by providing online facilities to the investors and to real estate agents. The real estate investment project aims to develop a mixed-use property in a rapidly growing urban area. The property will consist of commercial and residential spaces, including office buildings, retail spaces, and apartments.

1.2. Project/Product Feasibility Report

We can create a feasibility report of our Project by doing complete feasibility study to define Problem and its Solution, Scope and its importance. In the end this report will show whether or not a project should be undertaken and the reasons for that decision. It also includes planning and scheduling of project. This Feasibility report can contain following Contents:

- Technical
- Operational
- Economic
- Schedule
- Specification
- Information
- Motivational
- Legal and Ethical

1.2.1. Technical Feasibility

We have chosen the following tools for our project:

ReactJS: (ReactJS is a front-end JavaScript framework for building user interfaces based on UI components)

SQL/Firebase: (for Database Integration)

SQL, JavaScript, HTML5, CSS3, jQuery: (other programming languages for web development)
Visual Studio Code: (Software tools for coding and designing diagrams)
The system is feasible for all these above-defined or context technology operations.

1.2.2. Operational Feasibility

The digitalization of the real estate sector in Pakistan is a change that has become the need of the hour. The inevitable approach of the internet and technology has taken over all economic sectors, including the real estate market of Pakistan. There are thousands of real estate agents are present in every city of Pakistan but there are still using hand to hand approach to reach to their customers (property seller/buyer, investors).In order to facilitate them this project will play an important role by bringing them to an online platform where everyone can easily approach them and get their job done.
At first this service will only be served in Pakistan only but later on I can be extended. For that purpose, building permit, zoning permit, Environmental Impact Assessment (EIA), No Objection Certificates (NOCs) from relevant authorities, land use conversion certificate, and other licenses and permits such as flood protection permit or wetlands permit may be required for a real estate project in Pakistan, depending on the location, nature, and scope of the project and the local laws and regulations that apply.
As this project is web based, therefore it can be easily prepared and served all over the Pakistan.

1.2.3. Economic Feasibility

Proposed System is economically feasible in term of cost benefit analysis and budget of our project. The application is economically beneficial for real estate agents as they can earn through it and get more customers/investors. On the other hand, the economic factor will arise fall on deployment of the web application micro services. Because each Microservice has its own database and has their own server logic according to their modules, so we have to deploy them on their relevant servers and have buy their domain names and hosting for making the system available 24/7. If this project gets successful, it can generate revenue of 2cr to 3cr within one year. Economically our Project has many benefits.

1.2.4. Schedule Feasibility

Our project has its high probability of its completion on time. In this regard we divide the project into tasks with proper dependencies and duration and make Work breakdown structure and used Critical Path method to achieve the milestones and also, we will follow the deadlines given by the PMO for submission of all project related documents and tasks.

1.2.5. Specification Feasibility

The objective of this project is to develop a web-based application that should facilitate (Low + high) budget investors by providing them an opportunity to invest money in properties (lands + buildings + houses). Real estate agents will post saleable properties on the portal which will be show to buyers and investors. Investors can fully or partially invest in that property for a fix duration. All the required information will be provided by real estate agents which will help the investors and buyers to know the current or future value of that property.

1.2.6. Information Feasibility

Our project is reliable and feasible. The system possesses information feasibility because all the information regarding project is completely available and meaningful and there is no ambiguity in it. Any other information is gathered from authentic sources from internet. As far as design and content is concerned, the surveys and researches available related to the system will be utilized and undertaken for help in this regard.

1.2.7. Motivational Feasibility

As this web application regards, making it easier for real estate agents, buyers & investors to get more recognition and customers, our team is deeply motivated and determined to work hard towards our goal. Our teamwork makes it easier to work together and solve newly arising issues.

1.2.8. Legal & Ethical Feasibility

Legally and ethically, we have legal rights to use tools that are used to develop our Project. Moreover, there is no violation of any rules and regulations by the government and there is not any kind of liabilities on the system. Our system does not have copyright infringement issues. All of the information of the users will be kept confidential. Only authorized access will be allowed to access confidential data, if necessary.

1.3. Project/Product Scope

The past few months of upheaval in Pakistan had impeded the growth of the real estate sector in Pakistan. It is an admitted fact that a nation's growth is judged on how the property development projects are under-development in that country. More building and housing projects transit the economy of that country from austerity to prosperity. Business gurus are indecisive to invest their money in any business other than real estate due to unpredictable USD flight against the PKR. So, real estate demand in 2022 has dramatically risen due to many factors. Many investors around the country rely on the real estate sector due to its high-yielding.

Real Estate is one of the fastest growing industries in Pakistan. The worth of real estate in Pakistan is 1.5 T USD. The measured potential in just the three major cities, Karachi, Lahore and Islamabad is more than $300B.

Real Estate contributes 3% to the GDP of Pakistan altogether.

1.4. Project/Product Costing

A metric is some measurement we can make of a product or process in the overall development process. Metrics are split into two broad categories:

- **Knowledge oriented metrics**: these are oriented to tracking the process to evaluate, predict or monitor some part of the process.
- **Achievement oriented metrics**: these are often oriented to measuring some product aspect, often related to some overall measure of quality of the product.

Most of the work in the cost estimation field has focused on algorithmic cost modeling. In this process costs are analyzed using mathematical formulas linking costs or inputs with metrics to produce an estimated output. The formulae used in a formal model arise from the analysis of historical data. The accuracy of the model can be improved by calibrating the model to your specific development environment, which basically involves adjusting the weightings of the metrics.

1.4.1. Project Cost Estimation by Function Point Analysis

Function-oriented software metrics use a measure of the functionality delivered by the application as a normalization value. Since 'functionality' cannot be measured directly, it must be derived indirectly using other direct measures. Albrecht, who suggested a measure called the function point, first proposed function-oriented metrics. Function points are derived using an empirical relationship based on countable (direct) measures of software's information domain and assessments of software complexity.

- **Step-1:**

Counting the Functional Point:

Scale varies from 0 to 5 according to the character of **Complexity Adjustment Factor (CAF).** Where count total is the sum of all function point entries obtained the table and F_i is **Value Adjustment Factor (VAF)** is based on 14 general system characteristics (GSC's) that rate the general functionality of the system being counted. Each characteristic has its associated description that help to determine the degree of influence range on a scale of zero to five, from no influence to strong influence.

0- No influence
1- Incidental
2- Moderate
3- Average
4- Significant
5- Essential

Value Adjustment Factor (VAF) Table:

1.1.Value Adjustment Factor (VAF) Table:

Sr. No	Factors	Influence Value
1	Data Communication	2
2	Distributed Data Processing	0
3	Performance Criteria	4
4	Heavily Utilized Hardware	1
5	High Transaction Rates	2
6	Online Data Entry	3
7	Online Updating	4
8	End User Efficiency	3
9	Complex Computation	2
10	Reusability	3
11	Ease of Installation	0

12	Ease of Operation	4
13	Multiple Sites	3
14	Facilitate Change	4

F_i=2+0+4+1+2+3+4+3+2+3+0+4+3+4=33

F_i=33

- **Step-2:**

Calculate Complexity Adjustment Factor (CAF):

CAF= [0.65+ (0.01*F_i)]

CAF= [0.65+ (0.01*33)]=0.98

CAF=0.98

- **Step-3:**

Calculate Unadjusted Function Point:

Information domain values are determined and counts are provided in the table:

Parameter	Simple	Average	Complex
User Inputs	3	4	6
User Outputs	4	5	7
User Inquiries	3	4	6
External Files	7	10	15
External Interfaces	5	7	10

Information domain values are defined in the following manner:

Number of user inputs: 23
Number of user outputs: 5
Number of user inquiries: 4
Number of files: 2
Number of external interfaces: 2

In Case of our project the count of above, parameters are as follows:

Parameter	Simple	Average	Complex	UAFP
User Inputs	3	4*23	6	92

User Outputs	4	5*5	7	25
User Inquiries	3	4*4	6	16
External Files	7	10*2	15	20
External Interfaces	5	7*2	10	14
			Total:	**167**

To compute function points (FP), the following relationship is used:

FP est. = Count Total * [0.65 + 0.01 * (Fi)]
FP est. = 167*0.98=163.66
FP est. = 163.66

Finally, **Total Project Cost** and **Total Project Effort** are calculated given the average productivity parameter for the system.
According to IT labor rate the cost of developer is 60$ per day and assuming the productivity parameter for our project is 59.63$ per day we get:
The formulae are given as follows:

Cost / FP = labor rate / productivity parameter

Total Project Cost = FP est. * (cost / FP)
Total Project Cost = 98* (60/59.63)
Total Project Cost = 98.60

Total Estimated Effort = FP est. / productivity parameter
Total Estimated Effort = 98.60/ 59.63
Total Estimated Effort = 1.65

To calculate Lines of code (LOC):
LOC_per_FP for OO languages = 30
LOC = FP × LOC_per_FP
LOC = 163.66×30
LOC= 4909.8 or 4.9KLOC

1.4.2. Project Cost Estimation by using COCOMO'81 (Constructive Cost Model)

Boehm's COCOMO model is one of the mostly used models commercially. The first version of the model delivered in 1981 and COCOMO II is available now. COCOMO 81 is a model that allows one to estimate the cost, effort, and schedule when planning a new software development activity, according to software development practices that were commonly used in the 1970s through the 1980s. It exists in three forms, each one offering greater detail and accuracy the further along one is in the project planning and design process. Listed by increasing fidelity, these forms are called Basic, Intermediate, and

Detailed COCOMO. However, only the Intermediate form has been implemented by USC in a calibrated software tool.

For our Project:
Following are estimated values:

KLOC =4.5
Project Type = Organic

COCOMO:
As type of our project is organic, so formulas for calculating effort, schedule and persons are:

Basic COCOMO:

- **Effort:**
  PM (person-month) = 2.4(KLOC) $^{1.05}$
  PM = 2.4(4.5) $^{1.05}$
  PM = 2.4(4.85)
  PM =11.64

- **Schedule:**
  TD (No of months estimated for software development) = 2.5(PM) $^{0.38}$
  TD = 2.5(11.64) $^{0.38}$
  TD = 2.5(2.54)
  TD = 6.35

- **No of Personnel:**
  Persons = Effort/ Schedule
  Persons = 12.73/6.57
  Persons = 1.83

Intermediate COCOMO:

EAF is (effort adjustment factor) which reflects 15 predictor variables, called cost drivers.

Product Attribute	
Required Reliability	High – 1.15
Database Size	High – 1.08
Product Complexity	Nominal – 1.07
Hardware Attribute	
Run time constraints	Nominal – 1.00
Memory Constraints	Nominal – 1.00
Volatility of virtual machine	Low – 0.87
Requirement turnaround time	Nominal – 0.87

Personnel Attribute	
Analyst Capability	Nominal – 1.00
Application experience	Nominal – 1.00
Software Engineer Capability	Nominal – 1.00
Virtual Machine Experience	Low – 0.90
Language Experience	Nominal – 1.00
Project Attribute	
Software Tools	Nominal – 1.00
Application of SE methods	Nominal – 1.00
Requirement schedule	High – 1.04

Table 1.4.2 – Intermediate cocomo

Calculation of EAF:

EAF=1.15×1.08×1.07×1.00×1.00×.87×.87×1.00×1.00×1.00×.90×1.00×1.00×1.00×1.04

EAF =1.08

- **Effort:**

  PM (person-month) = 2.4(KLOC) $^{1.05}$ × EAF

  PM = 2.4(4.5) $^{1.05}$ × 1.08

  PM = 2.4(4.85) × 1.08

  PM =12.57

- **Schedule:**

  TD (No of months estimated for software development) = 2.5(PM) $^{.38}$

  TD = 2.5(12.57) $^{.38}$

  TD = 2.5(2.61)

  TD = 6.54

- **No of Personnel:**

  Persons = Effort/ Schedule

  Persons = 12.57/6.54

  Persons = 1.92

Project Cost:

Cost / FP = labor rate / productivity parameter

FP =163.66

Productivity parameter (PP) = KLOC/PM

PP = 4.5/12.57

PP = 0.357

Cost = labor rate / productivity parameter × FP

Cost = 13/0.357 × 163.66

Cost = approx. 5959.6

1.4.3. Activity Based Costing

Activity-based costing (ABC) is a methodology that measures the cost and performance of activities, resources, and cost objects. Resources are assigned to activities, then activities are assigned to cost objects based on their use. Activity-based costing recognizes the causal relationships of cost drivers to activities.

Activity-based costing is about:

- Measuring business process performance, activity by activity.
- Estimating the cost of business process outputs based on the cost of the resources used in producing the product.
- Identifying opportunities to improve process efficiency and effectiveness.

Activity costs are used as the quantitative measurement. If activities have unusually high costs or vice versa, they become targets for re-engineering.

Activity-based management (ABM) is a broad discipline

Basic Cost Drivers:

For each activity state in an activity diagram, the basic cost drivers are:

- Resources: determine what business workers and business entities are participating, and how many instances of each. The allocation of a resource to a workflow implies a certain cost.
- Cost rate: each business worker or business entity instance may have a cost per time in use.
- Duration: an activity occurs for a certain time, therefore a resource can either be allocated for the duration of the activity, or for a fixed amount of time.
- Overhead: any fixed costs that the invocation of a workflow or an activity would incur.

1.5. Task Dependency Table

The following are the steps to develop a task dependency table:

1. Brainstorm for all of the tasks necessary to complete your project, or take the output from a Tree Diagram that you have already produced.

2. Write each task on a Post-It Note or job card.

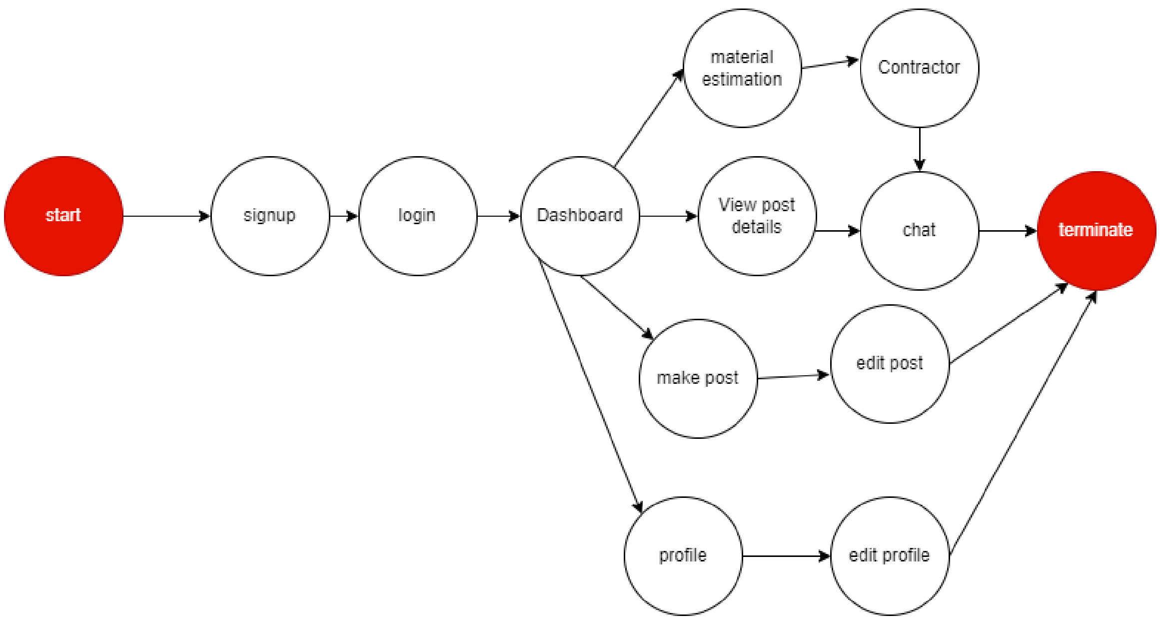
3. Establish which task is the first one that must be carried out and place its card on the left-hand side of a large work surface.

4. Determine whether there are any tasks that can be done at the same time, i.e. tasks that are not dependent on this first task finishing before they can be carried out. If there are, place their job cards vertically above or below the first job card.

5. Then decide which is the next task that must be carried out and place its card on the right of the first card. Determine whether there are any tasks that can be done at the same time as this task. If there are, place their job cards vertically above or below its job card.

6. Repeat the process until all of the job cards have been arranged in sequence and in parallel.

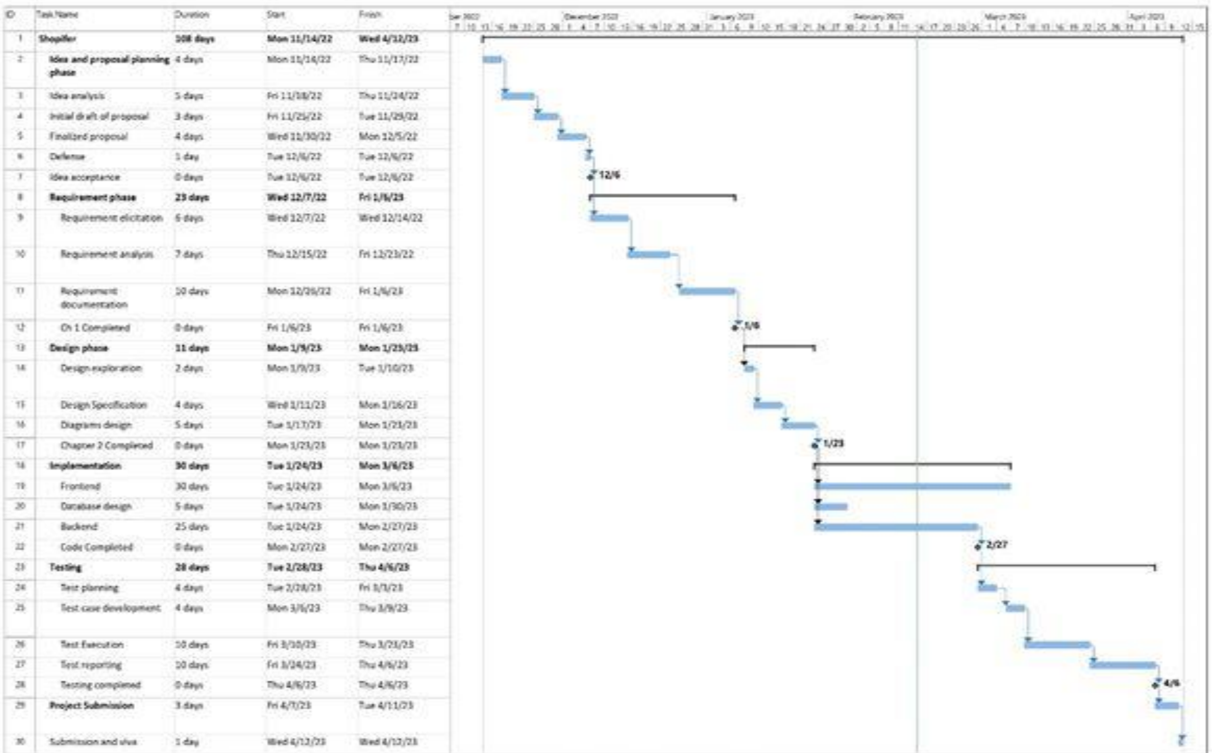
1.6. CPM - Critical Path Method



1.1 CPM

CPM = start -> signup -> login -> dashboard -> make post -> edit post -> terminate

1.7. Gantt chart



1.2 gant chart

1.8. Introduction to Team member and their skill set

Muhammad Adnan: good in Front end development of any website and have experience in it. Although he is also good in UML diagrams of different systems. He is really good in communication.

Skills:

- Researcher
- UML diagrams
- Front end developer: HTML5, CSS3 JS
- Tools: Figma

Ali Shan: has strong grip on UML diagrams and testing different software so he will be good enough for our design documentation with testing of our system also. He is good in research work and content writing (Project documentation).

Skills:

- Requirement Engineer
- UML diagrams
- Front end: HTML CSS JS
- Content writing

Ahsan Mehboob: good enough in frontend as well as backend development but mainly he prefer backend development. Although he also having a strong grip on requirements analysis and designing any system's structure diagrams. Good in leadership.

Skills:

- Requirement Engineer
- UML diagrams
- **Front end:** HTML5 ,CSS3, JS, Jquery, Bootstrap and TailwindCss
- **Backend:** C++, java, and python
- Data analyst
- **Data bases:** Sql server , Mysql and MongoDb

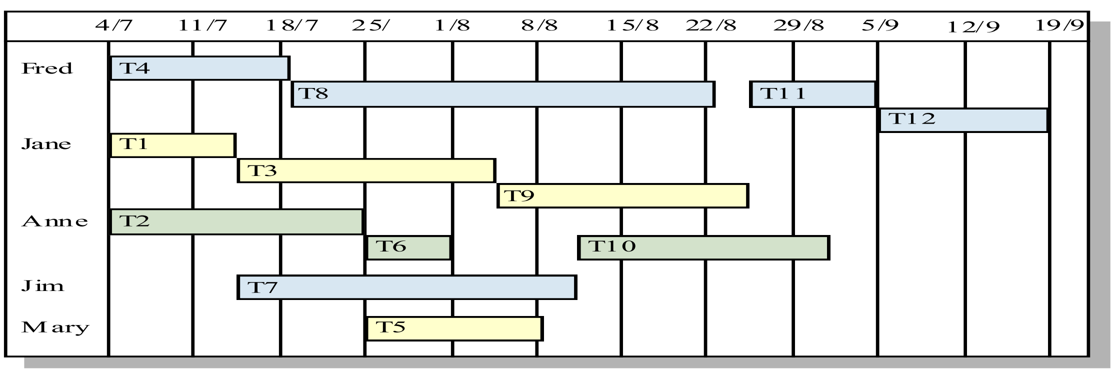
1.9. Task and Member Assignment Table

Task	Duration (days)	Dependencies
T1	8	
T2	15	
T3	15	T1(M1)
T4	10	
T5	10	T2, T4(M2)
T6	5	T1, T2 (M3)
T7	20	T1 (M1)
T8	25	T4 (M5)
T9	15	T3, T6 (M4)
T10	15	T5, T7 (M7)
T11	7	T9 (M6)
T12	10	T11 (M8)

Allocation of People to Activities:

Task	Engineer
T1	Jane
T2	Anne
T3	Jane
T4	Fred
T5	Mary
T6	Anne
T7	Jim
T8	Fred
T9	Jane
T10	Anne
T11	Fred
T12	Fred

Staff Allocation:



1.10. Tools and Technology with reasoning

Tools:

- **Vs Code:**

It support designing of diagrams in it and also it's the best code editor for MERN apps that's why we are using it. With the usage of vs code's many use full extension, our work will be completed quickly and easily.

Technologies:

- **Frontend:**

HTML5, CSS3, JS, NodeJS

- **backend:**

Java Script

For any website design, html, css and JS are the fundamental units and must required.There latest versions are HTML5, CSS3 and JS. That’s why we are using it and we are good enough in this technology that we can make frontend easily.

- **DataBase:**

MySQL / Firebase

As both are power full data base technologies, we will use one of them.

**Selection of all tools from the given list depends on needs & demands*

1.11. Vision Document

The major goals of our proposed system are to bring real estate in digital world/manner. The website can facilitate the real estate agents, investors and other buyers in the following ways:

- To save users time by providing all the required information of the property.
- To increase sales of properties by making post on the site.
- To provide unique user experience that will help to gain loyal customers(investors/buyers).
- To facilitate in finding available properties in their required region.

The main objectives of website are following:

➢ Real estate agent:

Agent can make a post of properties by providing required information which is necessary for an investor or buyers to understand the value of the property. Agent can set minimum investment required for posted properties according to the value or rate of the property. He can update the status of the post and can decide how many people can invest in single property.

➢ Investors:

Investors will look into the posts to find out required property which will be suitable for them to invest in it. Investors can contact with real estate agents for farther detail of the property. Multiple investors can invest in a single property.

- Buyers:

  Buyers can look for properties available in their required region by applying filter on posts and contact with real estate agent of that property. Buyers can also do estimation to construct a new house or building. Estimation of material will only be provided on the grey structure.

1.12. Risk List

- **Customer disputes:**

Main risk is of customer understanding. If the customer didn’t understand the system properly, he/she will not be agreed to invest in it.

- **Adaption of new technology:**

Bringing real estate agents on online portals is our first priority. If the agents denied to join our system we could not grow our business and it will become useless. This is all because of trust worthy.

- **Unauthorized access:**

This also a risk that unauthorized users will also try to access seller end. However, we will manage it by placing a highly secure Registration and login module by giving only 3 attempts to login after registration and passing through captcha.

- **SEO:**

Google or other platforms could do a complete makeover of their algorithm at any time and make your website traffic drop significantly overnight. For this we will be careful about our content and its effective usage.

- **System reliability:**

Internet service provider (ISP) server could crash and data of customers may be lost that what they were doing. For this we will try to use a good quality server so that system will be available to users 24/7 and without any data loss.

1.13. Product Features/ Product Decomposition

Responsive Website Design.

In this day and age, consumers are using their mobile phones more and more to do sale and purchase online. In just a few scrolls and clicks, consumers can sale or purchase products right from the comfort of their screen – which is why it’s super important to ensure our website is mobile friendly and responsive for all devices.

Our target is also mostly going to use cell phone so responsiveness of our website will matter a lot.

User-Friendly Navigation.
Our main focus will be to develop a user-friendly navigation which is the most important thing for our website to work and grow easily. We will design our website keeping buyers in mind mainly that how they will be able to understand what to do and how to do on website easily with the help of pictography and icons.

Multiple Security Features:
Security is the most important one. For agents, security is the most prioritize thing specially access to their accounts. For this we will use captcha and will allow only 3 attempts to login with correct credentials.

- **Real estate agent:**

Agent can make a post of properties by providing required information which is necessary for an investor or buyers to understand the value of the property. Agent can set minimum investment required for posted properties according to the value or rate of the property. He can update the status of the post and can decide how many people can invest in single property.

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Buyers can look for properties available in their required region by applying filter on posts and contact with real estate agent of that property. Buyers can also do estimation to construct a new house or building. Estimation of material will only be provided on the grey structure.

Chapter 2: Software Requirement Specification and Design Document (For structured Approach)

2.1 Software requirements and specifications

2.1.1 User Requirements

2.1.1.1 User Roles

The following user roles will be supported by the platform:

- Investors: Users who want to invest in real estate properties.
- Real Estate agents: Users who want to list their properties for investment.
- Admins: Users who will manage the platform, approve listings, and manage user accounts.

2.1.1.2 User Stories

The following user stories outline the key functionality required for the platform:

- As an investor, I want to be able to search for properties based on specific criteria such as location, property type, and investment amount.
- As a real estate agent, I want to be able to list my property for investment and receive real-time updates on the status of my listings.
- As an investor, I want to be able to view detailed information about a property, including photos, descriptions, and investment terms.
- As an investor, I want to be able to invest in a property with just a few clicks, and track the status of my investment in real-time.
- As an admin, I want to be able to approve property listings and manage user accounts.

2.1.2 System Requirements

2.1.2.1 Technical Requirements

- The platform will be developed as a web-based application using a modern web development framework such as Node-js or PHP .
- The platform will be responsive and accessible on all modern devices, including desktop computers, laptops, and mobile devices.
- The platform will use secure user authentication and authorization to ensure the privacy and security of user data.
- The platform will use a modern database management system such as Firebase or MySQL to store user data and property listings.
- The platform will use real-time updates to provide investors with up-to-date information on their investments.

2.1.2.2 Functional Requirements

- The platform will allow investors to search for properties based on specific criteria such as location, property type, and investment amount.
- The platform will allow property owners to list their properties for investment and receive real-time updates on the status of their listings.
- The platform will provide detailed information about properties, including photos, descriptions, and investment terms.

- The platform will allow investors to invest in properties with just a few clicks and track the status of their investments in real-time.
- The platform will provide an admin dashboard for managing property listings and user accounts.

Conclusion

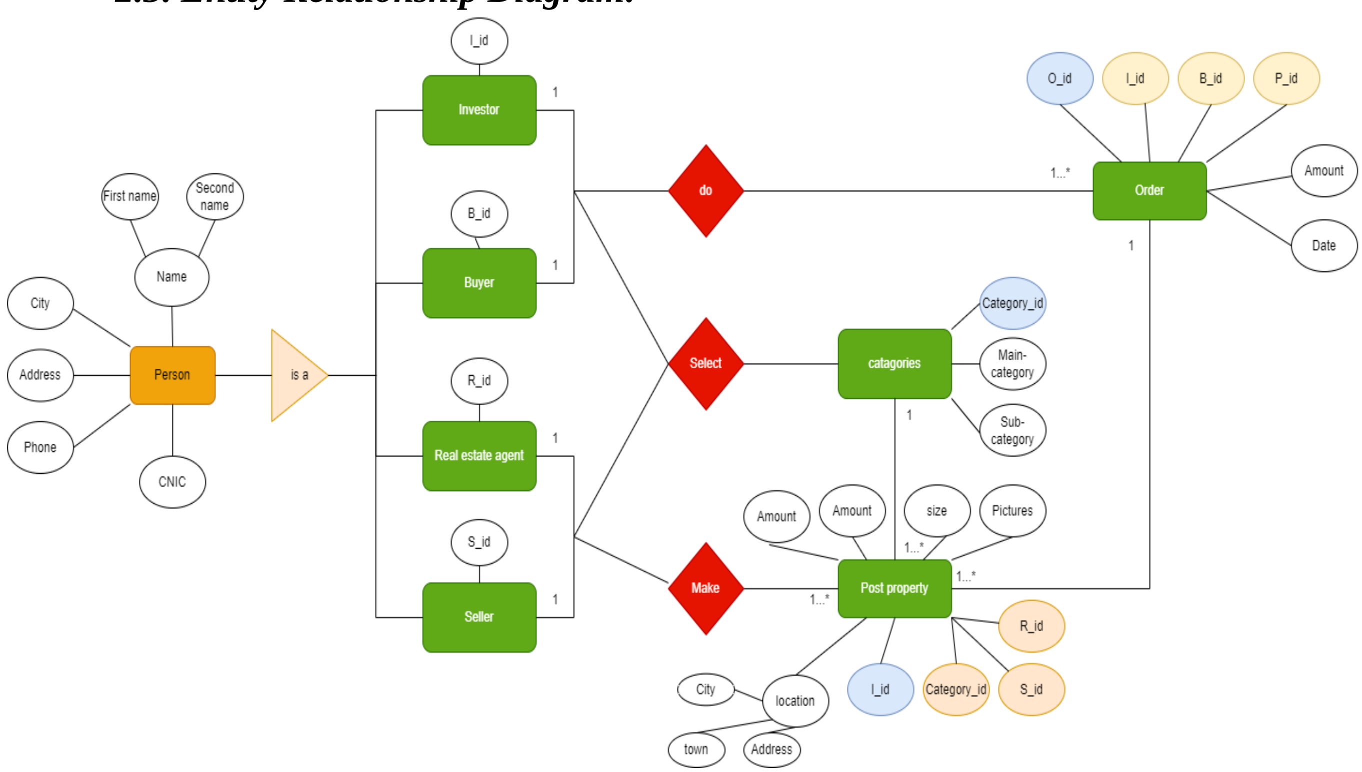
This SRS outlines the software requirements for a real estate investment web project that will simplify the process of investing in real estate and provide investors with a convenient and efficient platform for finding and investing in properties. The platform will be accessible on all modern devices and provide real-time updates on the status of investments and returns.

2.2. Introduction:

Analysis & Design Model for structured approach must contain following artifacts:

1. Entity Relationship Diagram
2. Data Flow Diagram (Functional Model)
3. State Transition Diagram (Behavioral Model)
4. Architecture Design
5. Component Level Design

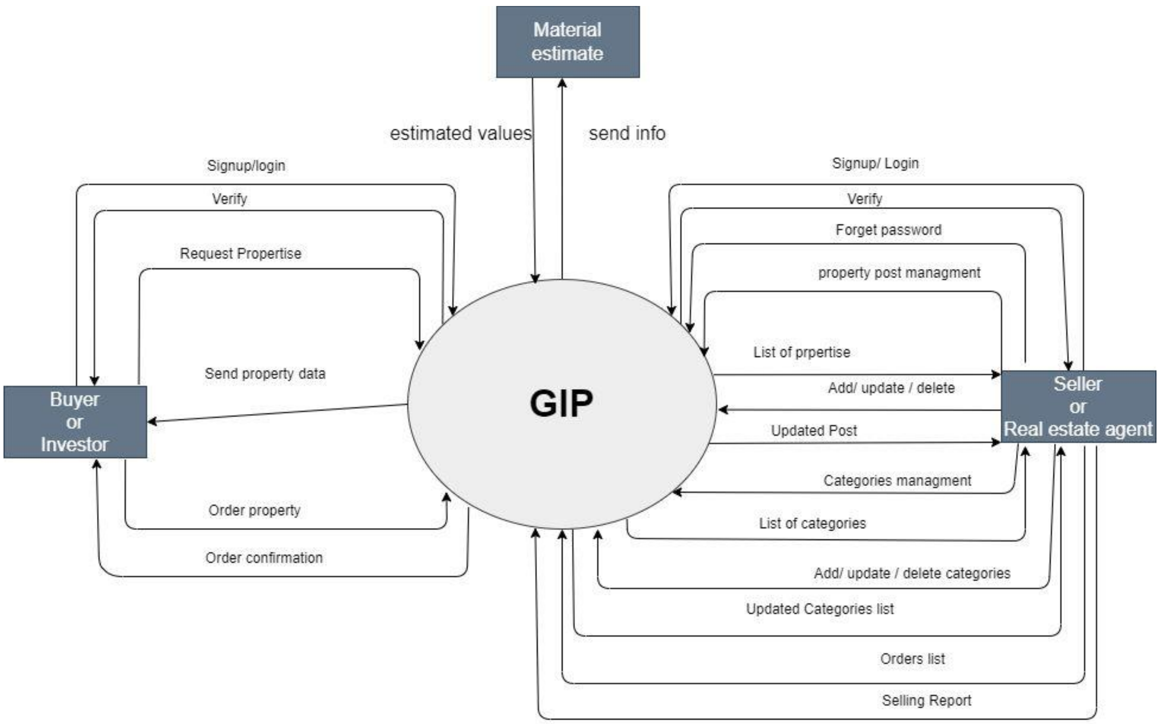
2.3. Entity Relationship Diagram:



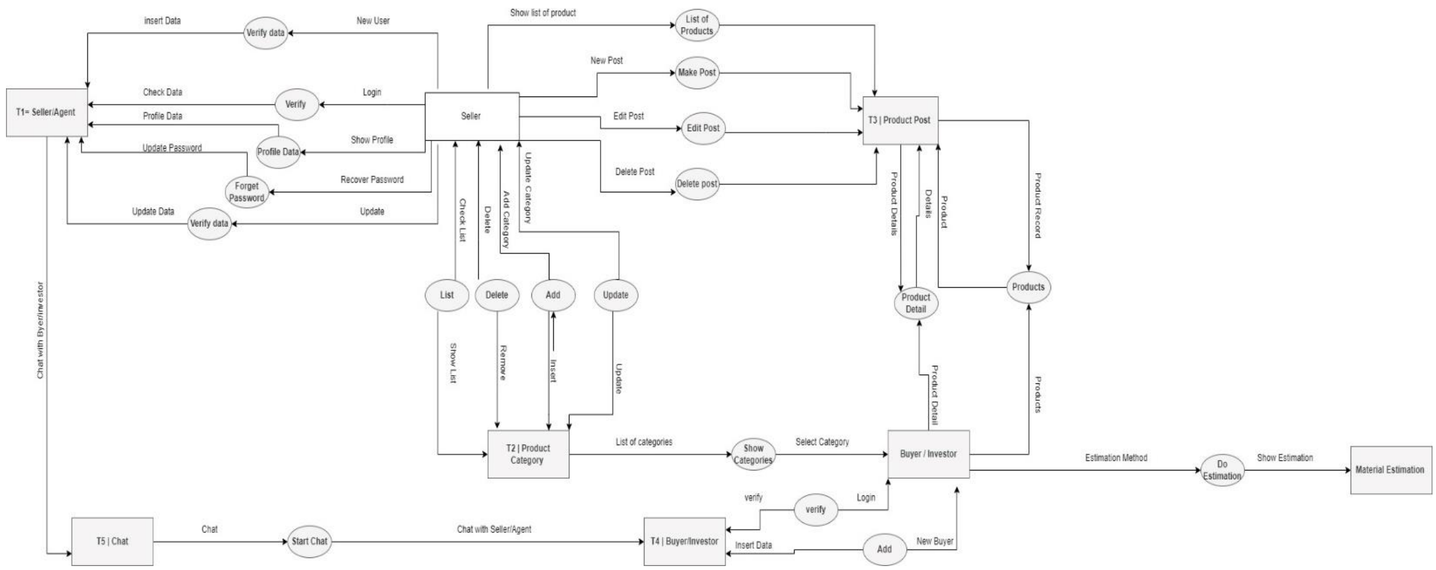
2.3. Entity Relationship Diagram

2.4. Data flow diagram (Functional Model)

Context level data flow
Level 1 data flow

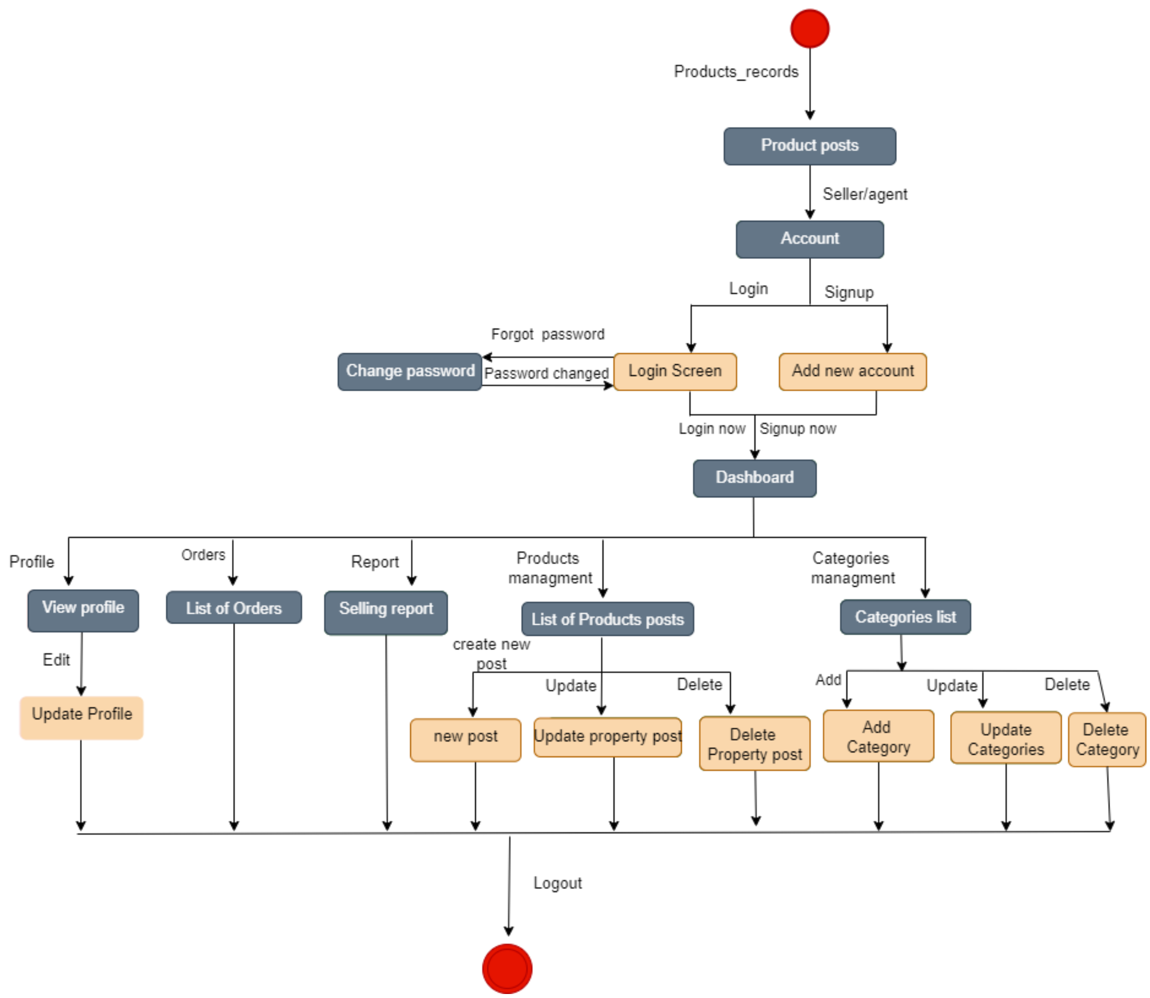


Context level data flow

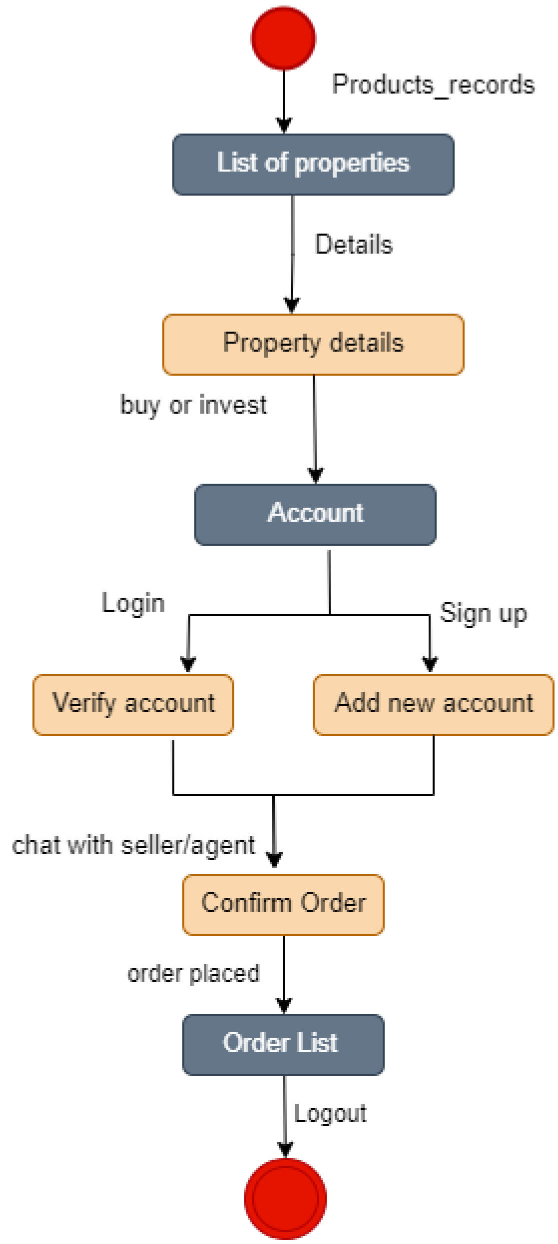


Level 1 data flow

2.4. State Transition Diagram

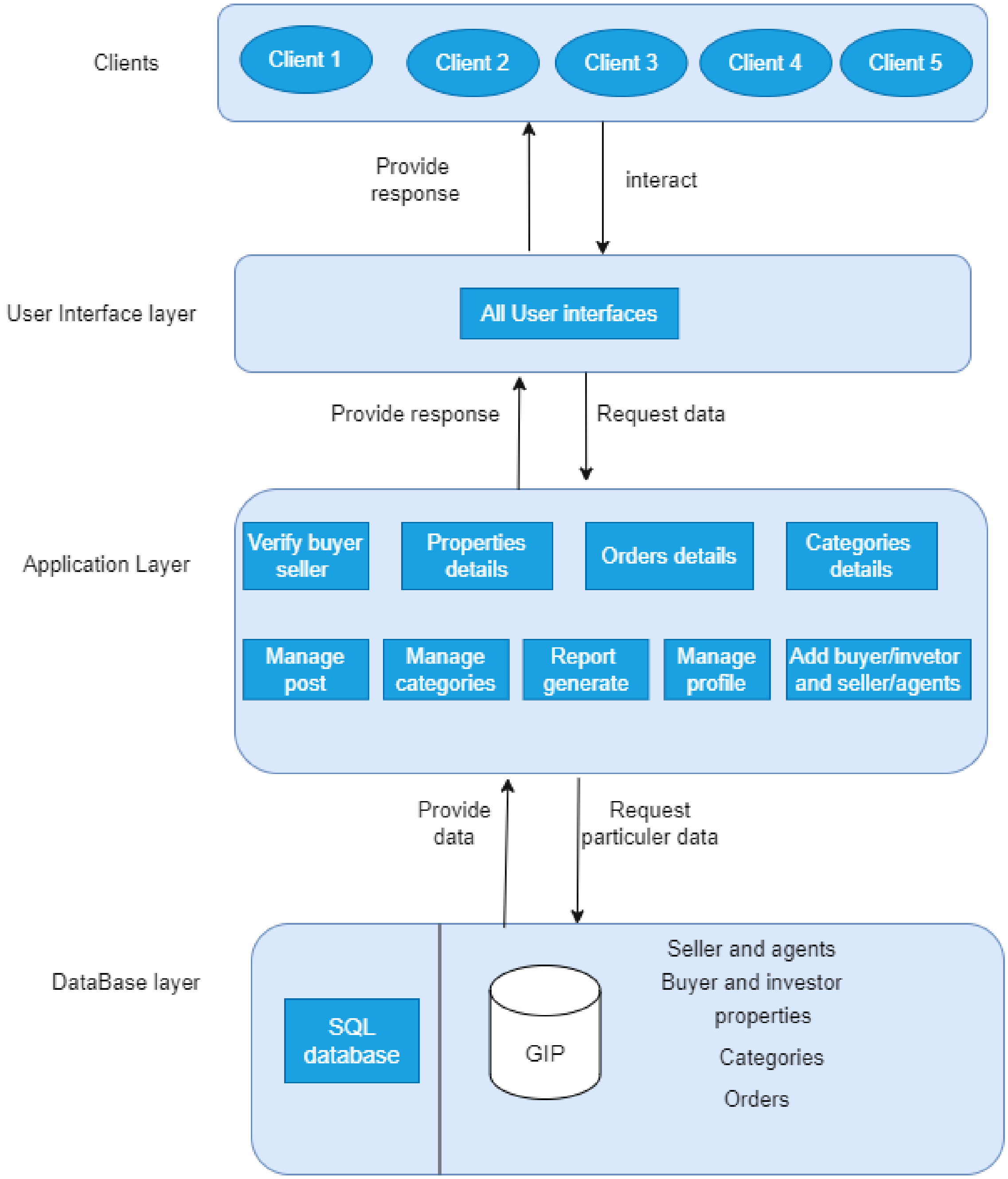


2.4. State Transition Diagram



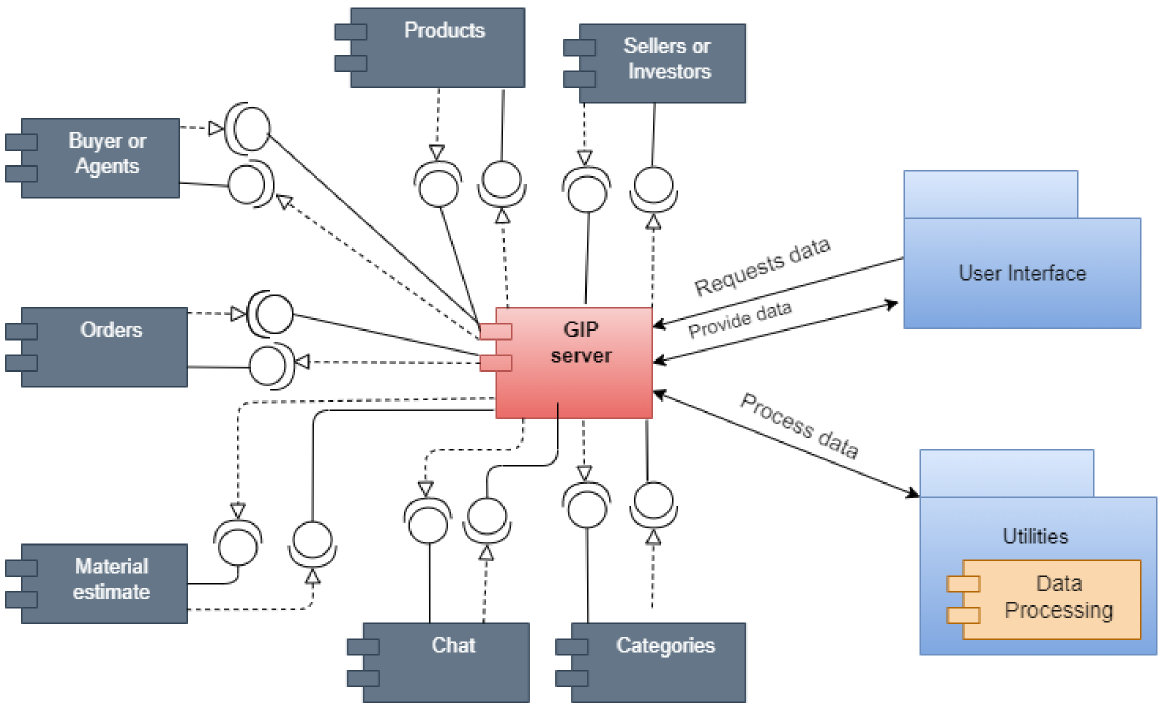
2.4. State Transition Diagram

2.5. Architecture diagram



2.5. Architecture diagram

2.6. Component Level Design



2.6. Component Level Design

Chapter 4: User Interface Design (For structured Approach)

4.1 Introduction

A user interface design consists of three main parts:

Page elements should be visualized on paper before building them in the computer. Just as you draw a site map to plan the site, use cartoons and storyboards to begin blocking out the site's appearance and navigational scheme.

1. Site maps
2. Storyboards
3. Navigational maps
4. Traceability Matrix

4.2 Site Maps

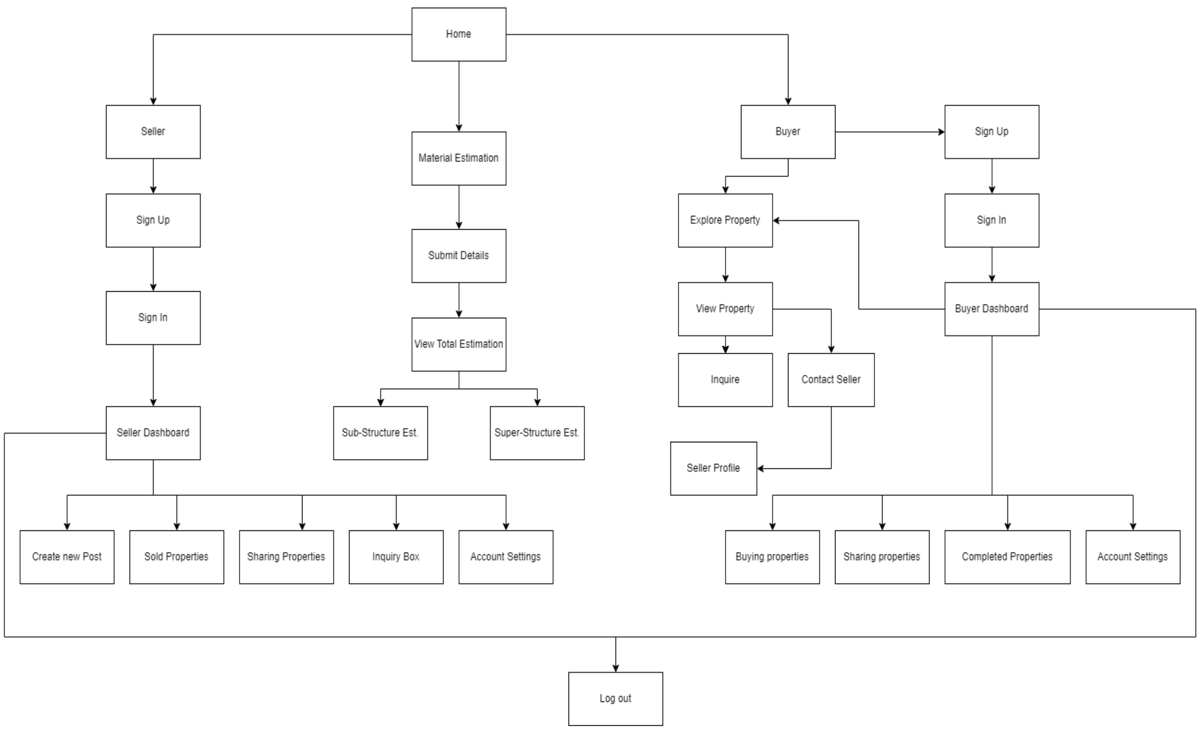


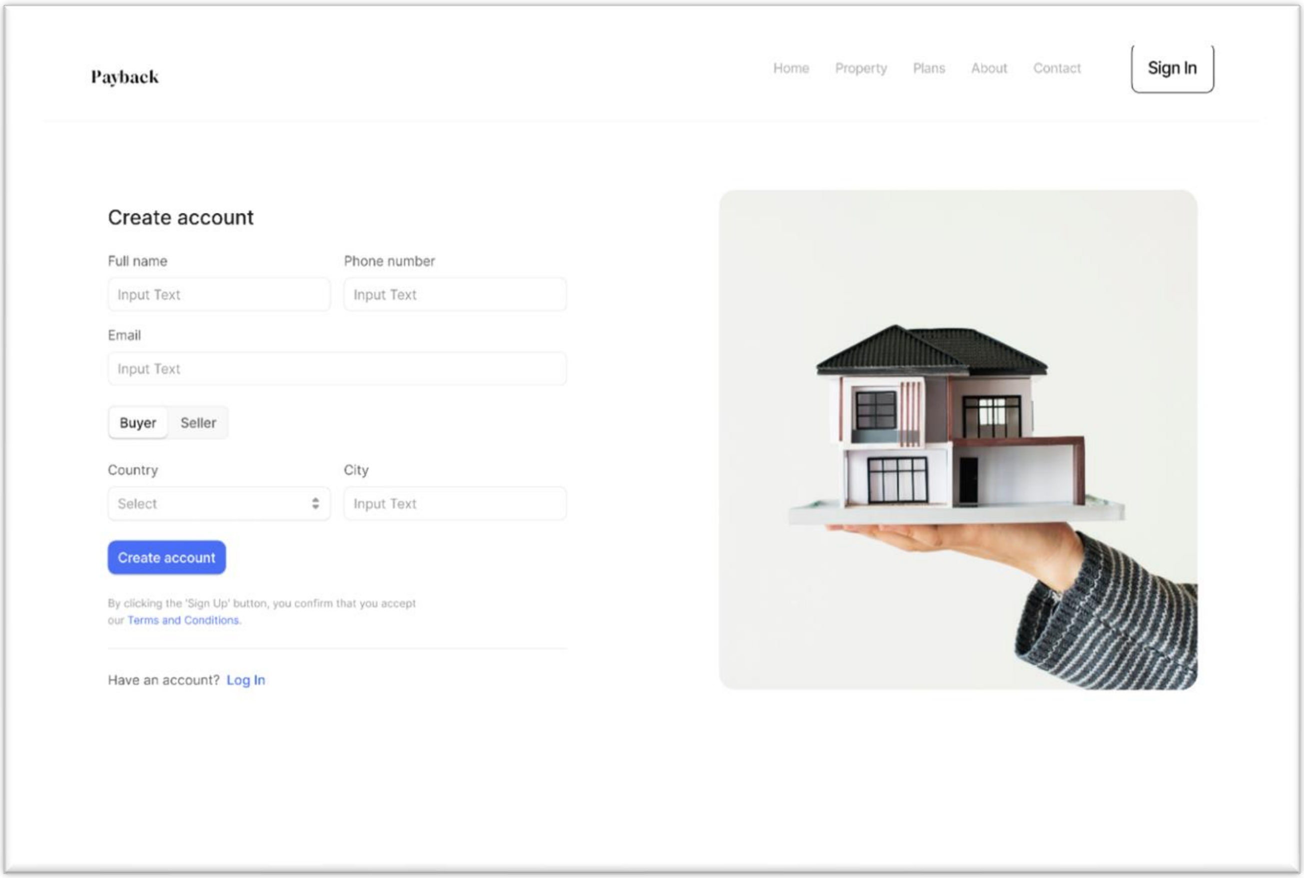
Figure 4.2 Site Map

4.3 Story Boards

Seller Side:

Table4.3.1: UI_SIGNUP

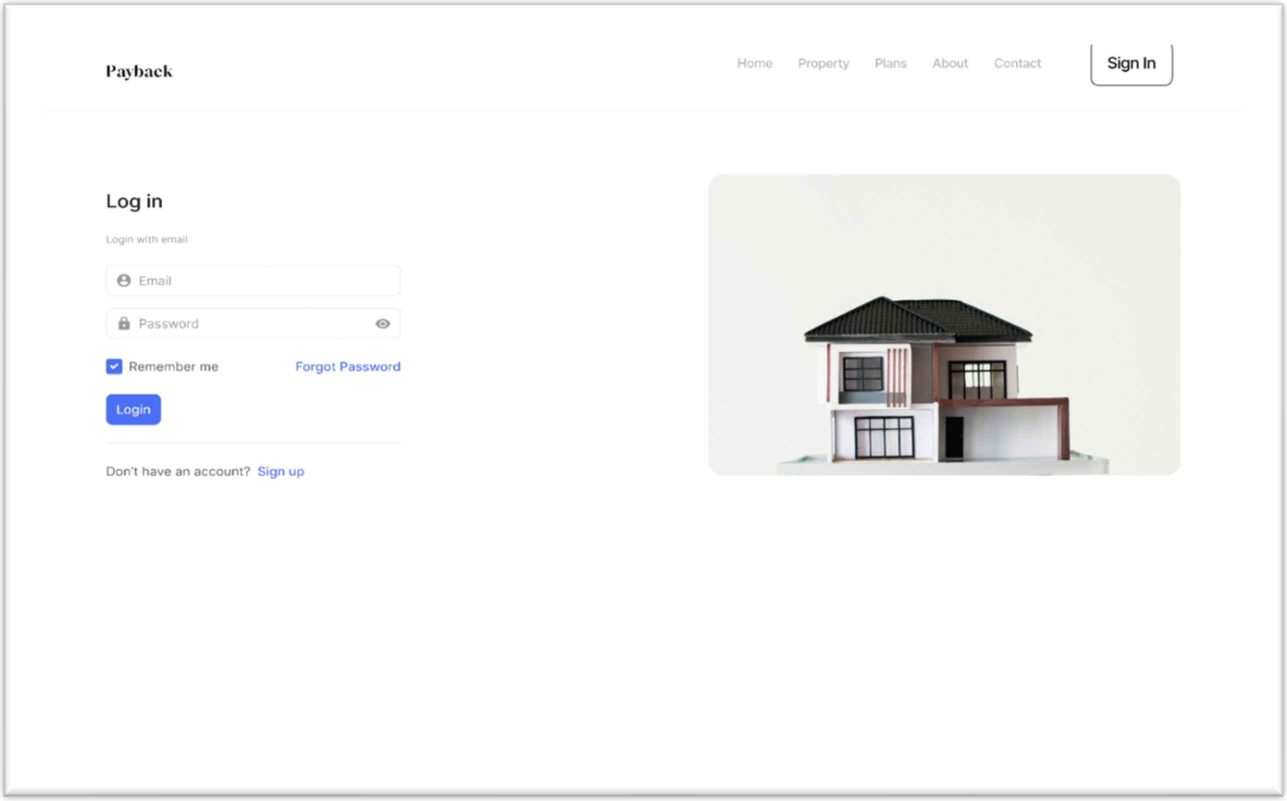
UI ID	UI-Signup



Visual cues	User sees a registration form with fields for full name, number, address, e-mail, choose buyer/seller, country and city.
Tactile cues	User uses the keyboard to fill the required fields like name, number, address, e-mail and city.
User input	Enter full name, number, address, e-mail, choose buyer/seller, country and city.
Machine output	System will create user account.
User's emotions	User may feel satisfaction upon successful registration.
Quality of experience	Users benefit from a streamlined registration

Table4.3.2: UI_Login

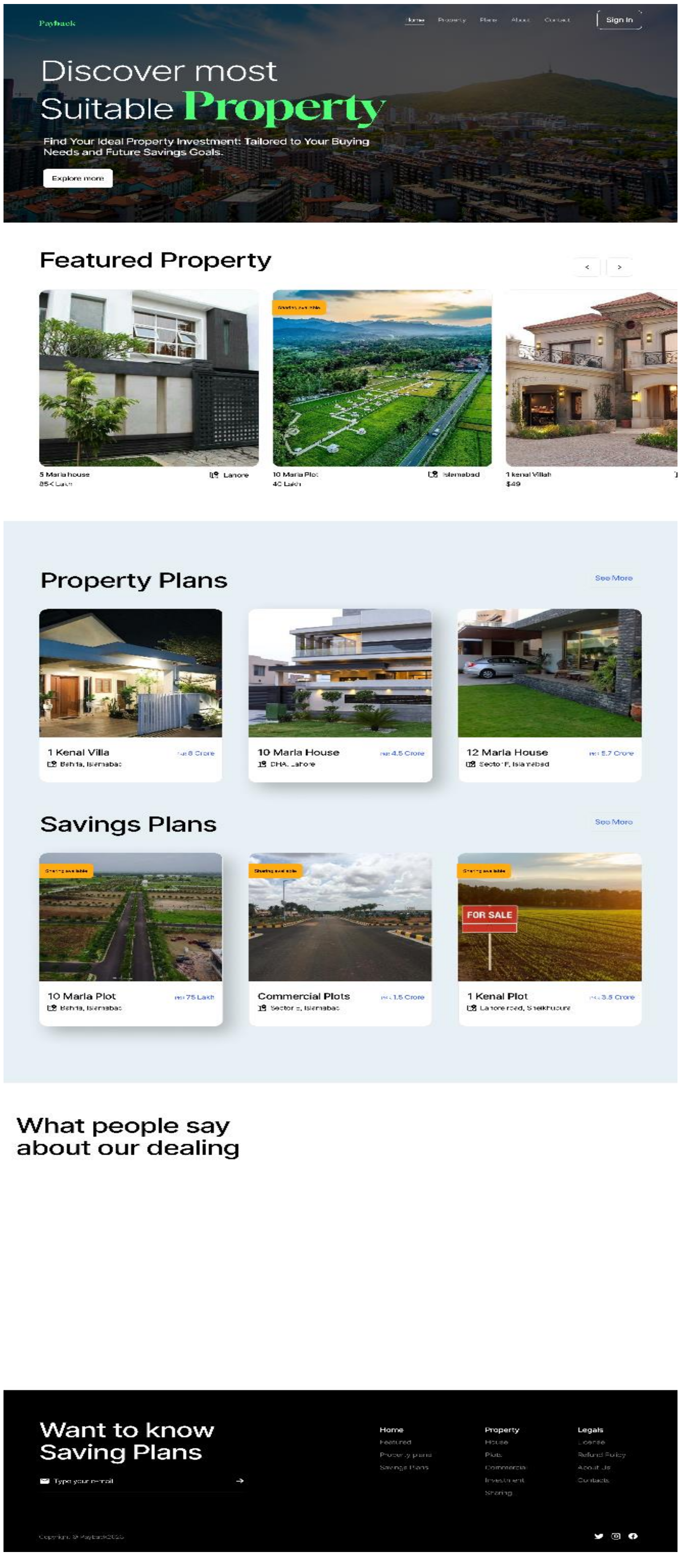
UI ID	UI-SellerLogin



Visual cues	User sees a login form with fields for email and password.
Tactile cues	User uses the keyboard to fill the required fields like mail and password
User input	User enter e mail and password to login into the system.
Machine output	System displays a message for successful Login and an error message in case of wrong mail or password.
User's emotions	User may feel frustration or disappointment upon encountering login errors.
Quality of experience	Users benefit from a streamlined login process.

Table4.3.3: UI_HomePage

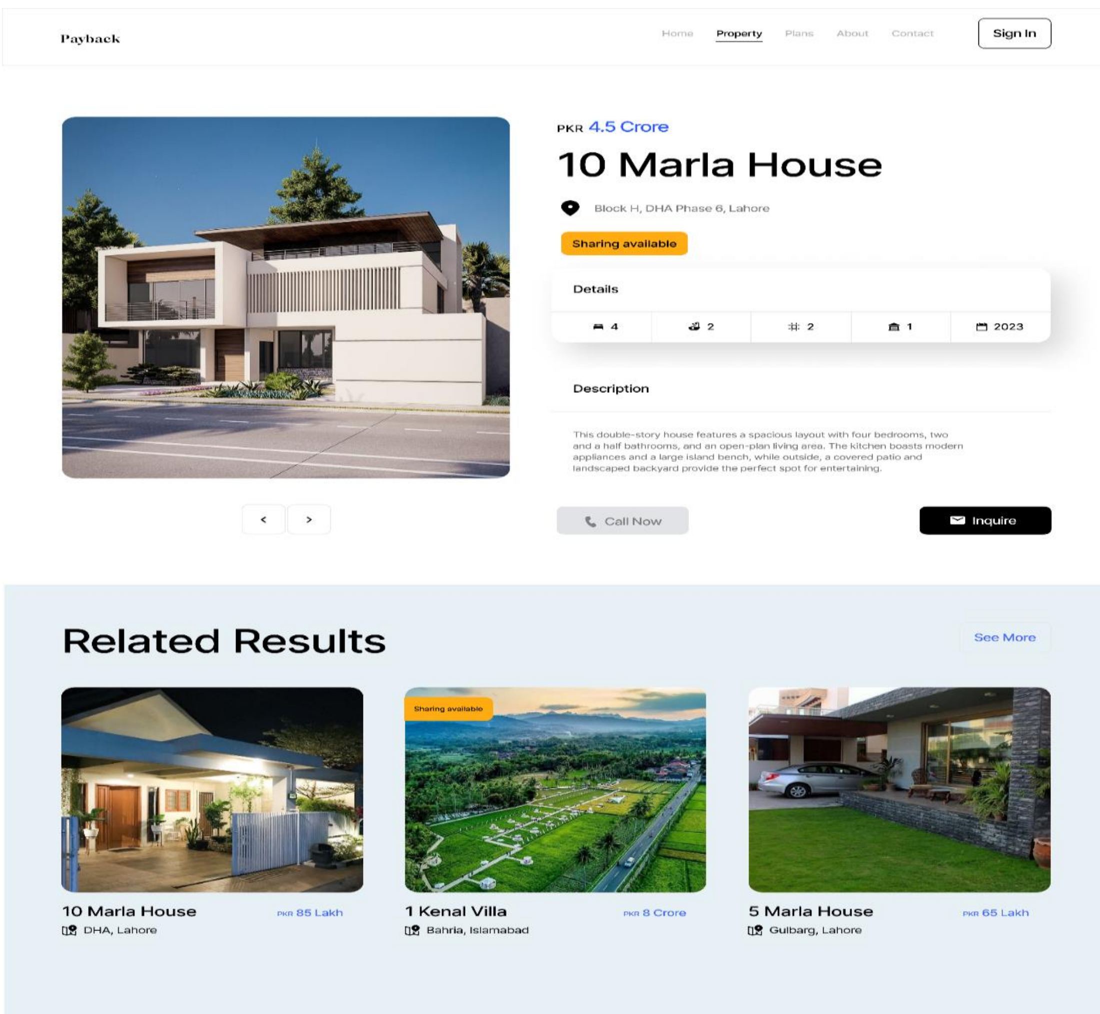
UI ID	UI-Homepage



Visual cues	User can see the featured property and property plans available.
Tactile cues	User can see available properties by a single click.
User input	User
Machine output	System will show available property and plans.
User's emotions	User will be happy with the friendly display of the property.
Quality of experience	Users benefit from a streamlined login process.

Table4.3.4: UI_Search

UI ID	UI-Search

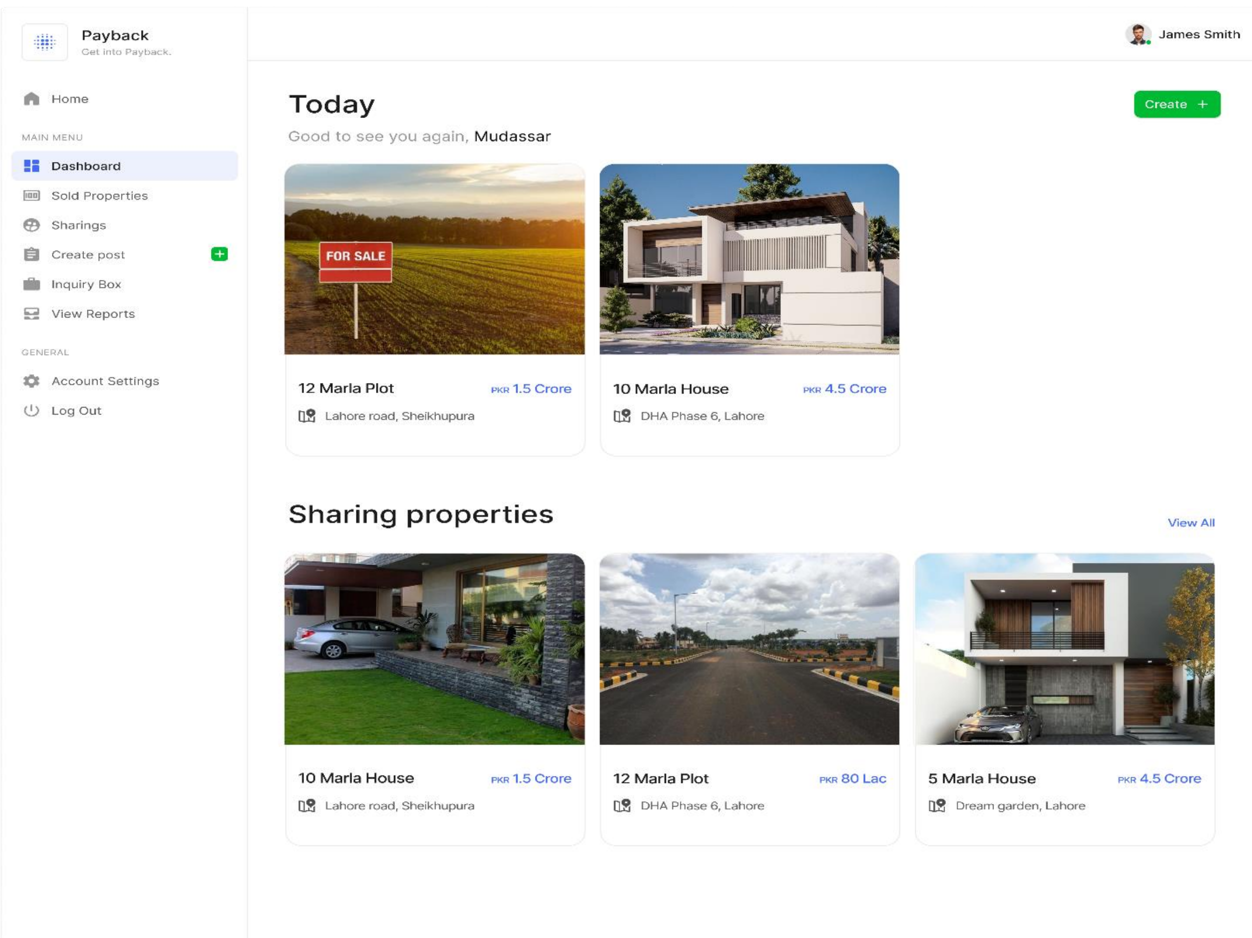


Visual cues	User sees a login form with fields for email and password.
Tactile cues	User uses the keyboard to fill the required fields like mail and password
User input	User enter e mail and password to login into the system.
Machine output	System displays a message for successful Login and an error message in case of wrong mail or password.
User's emotions	User may feel frustration or disappointment upon encountering login errors.
Quality of experience	Users benefit from a streamlined login process.

SELLER:

Table4.3.5: UI_SellerDashboard

UI ID	UI-SellerDashboard

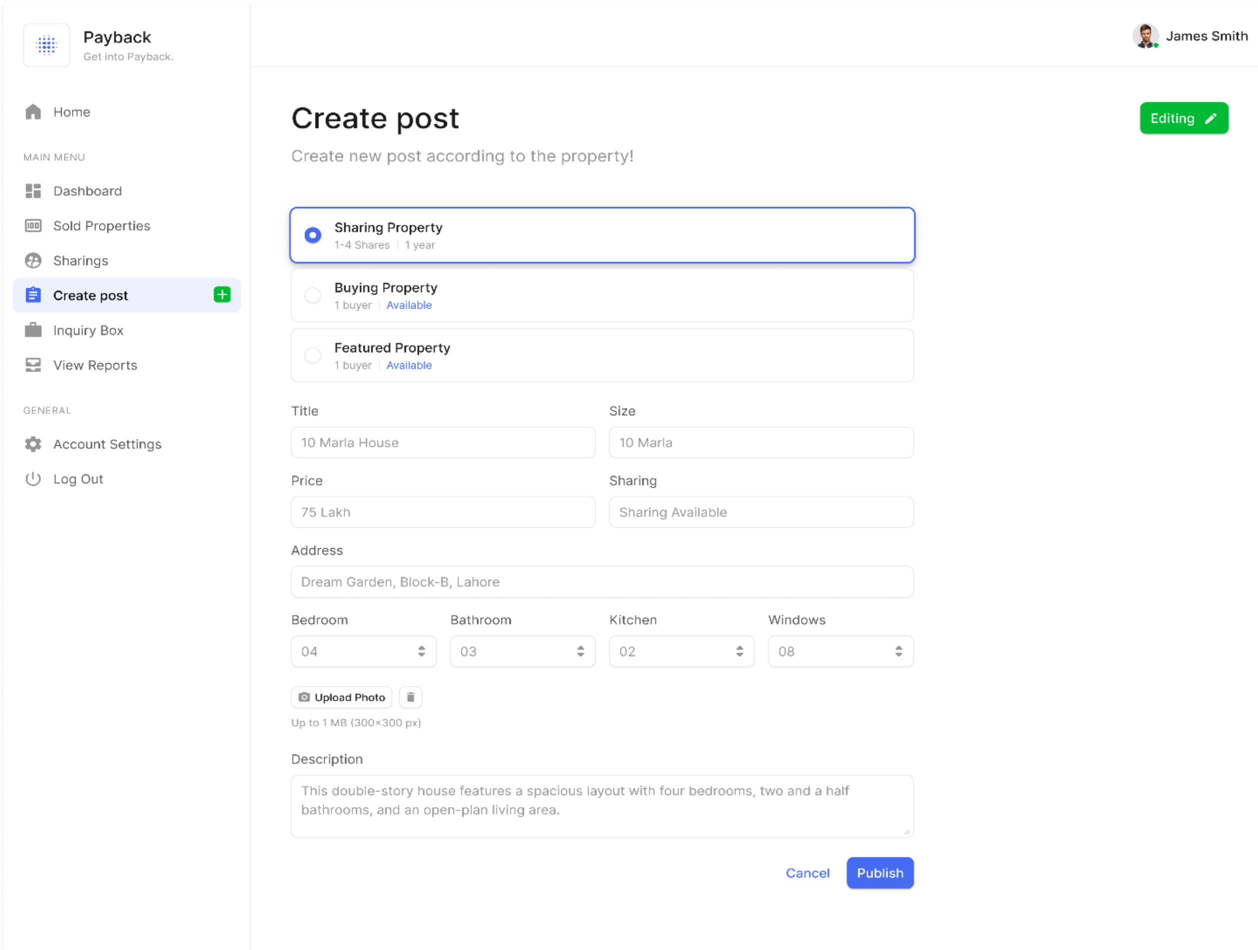


Visual cues	User sees plots and houses available for sale.
Tactile cues	User can easily access to available plots & houses for sale.
User input	User will click on dashboard button to see.
Machine output	System displays plots and houses available for sale.

User's emotions	User will be happy with the good interface.
Quality of experience	Users benefit from a streamlined login process.

Table4.3.5: UI_CreatePost

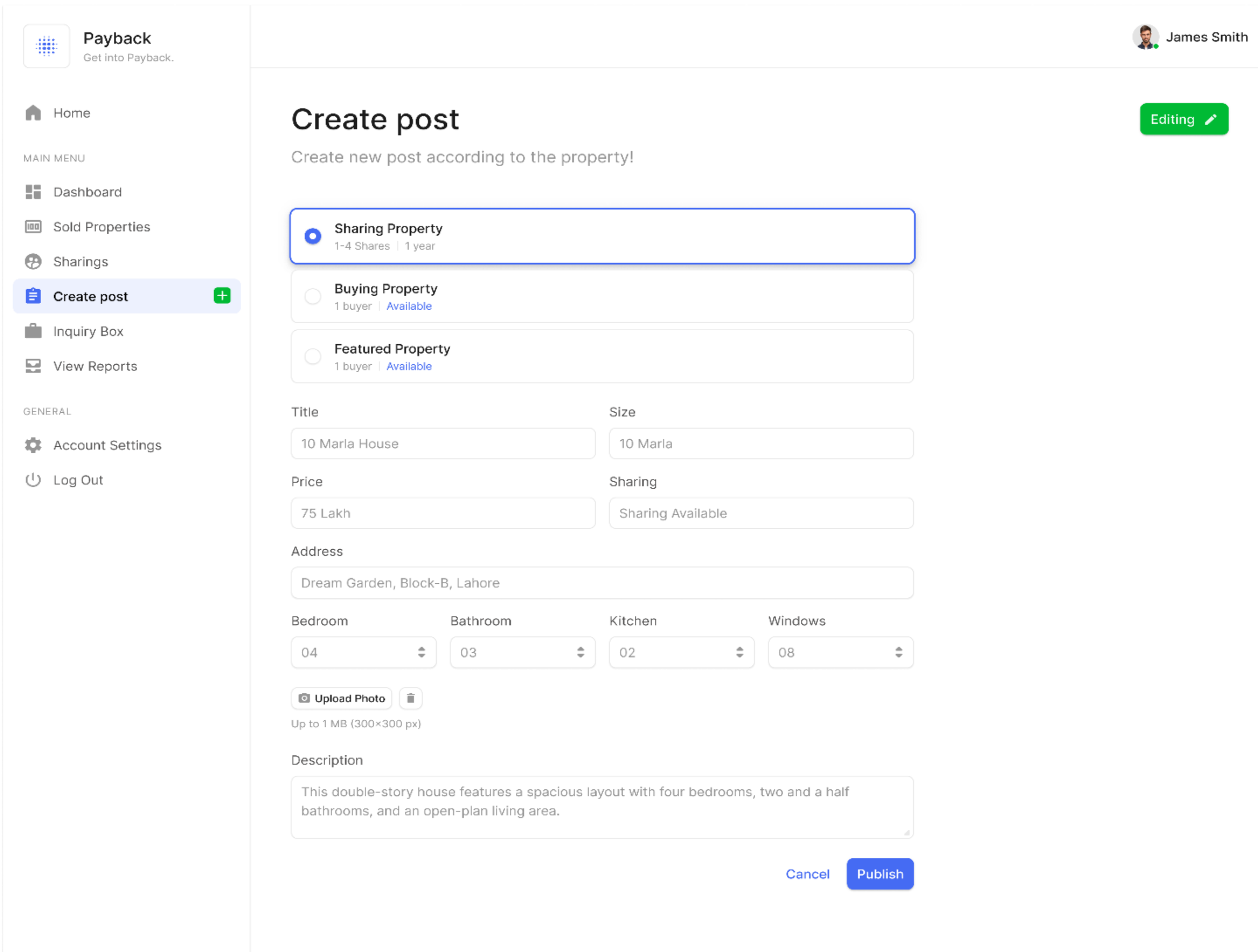
UI ID	UI-CreatePost



Visual cues	User will enter details regarding to their need like (sharing ,buying ,featured) property.
Tactile cues	User uses the keyboard to fill the required fields like title ,size ,price etc.
User input	User enter required fields like title, size, price etc. To make a post.
Machine output	System displays a message for successfully post created.
User's emotions	User will feel happy by the easy steps to make a post.

Table4.3.6: UI_EditPost

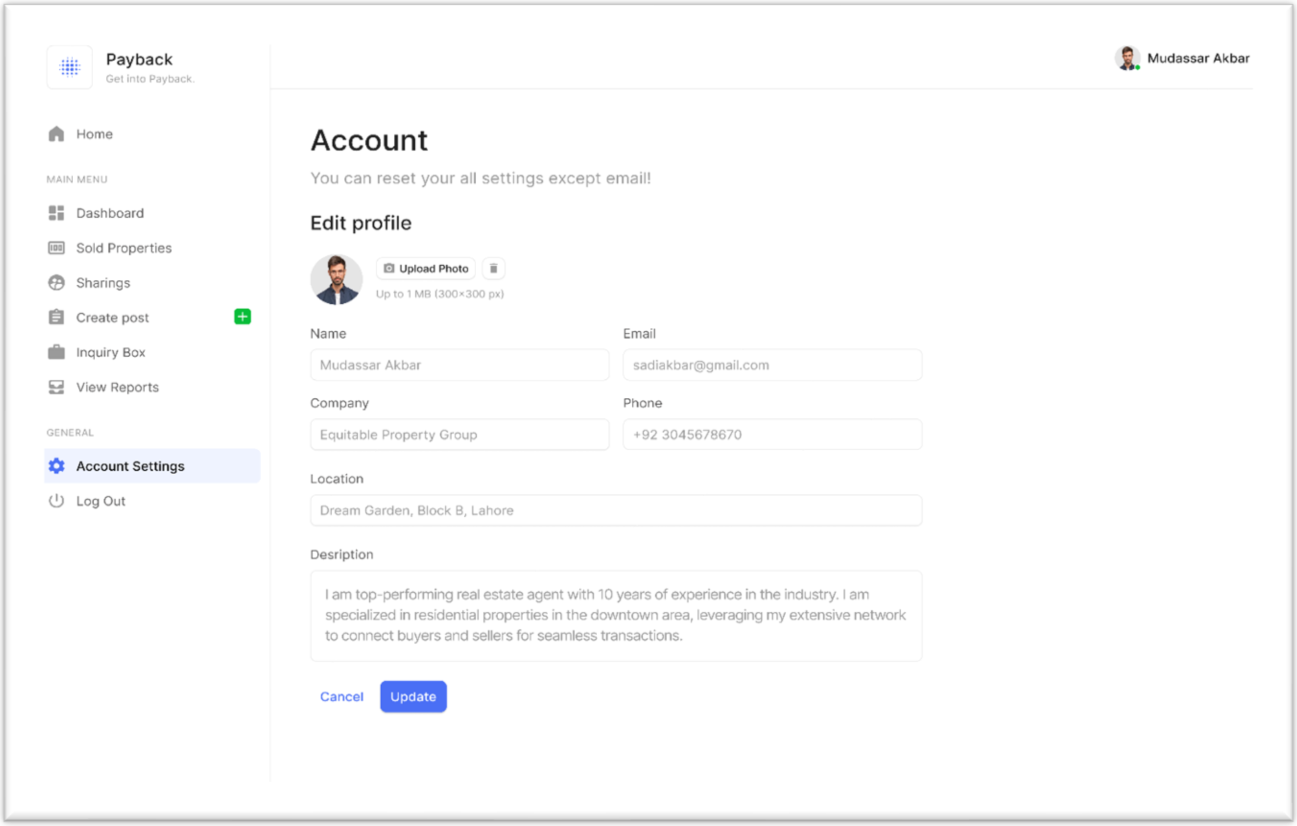
UI_ID	UI-EditPost



Visual cues	User will edit details regarding to their need like (sharing ,buying ,featured) property.
Tactile cues	User uses the keyboard to fill/edit the required fields like (title ,size ,price etc.).
User input	User edit required fields like title, size, price etc. To edit a post.
Machine output	System displays a message for successfully post created.

Table4.3.7: UI_Update

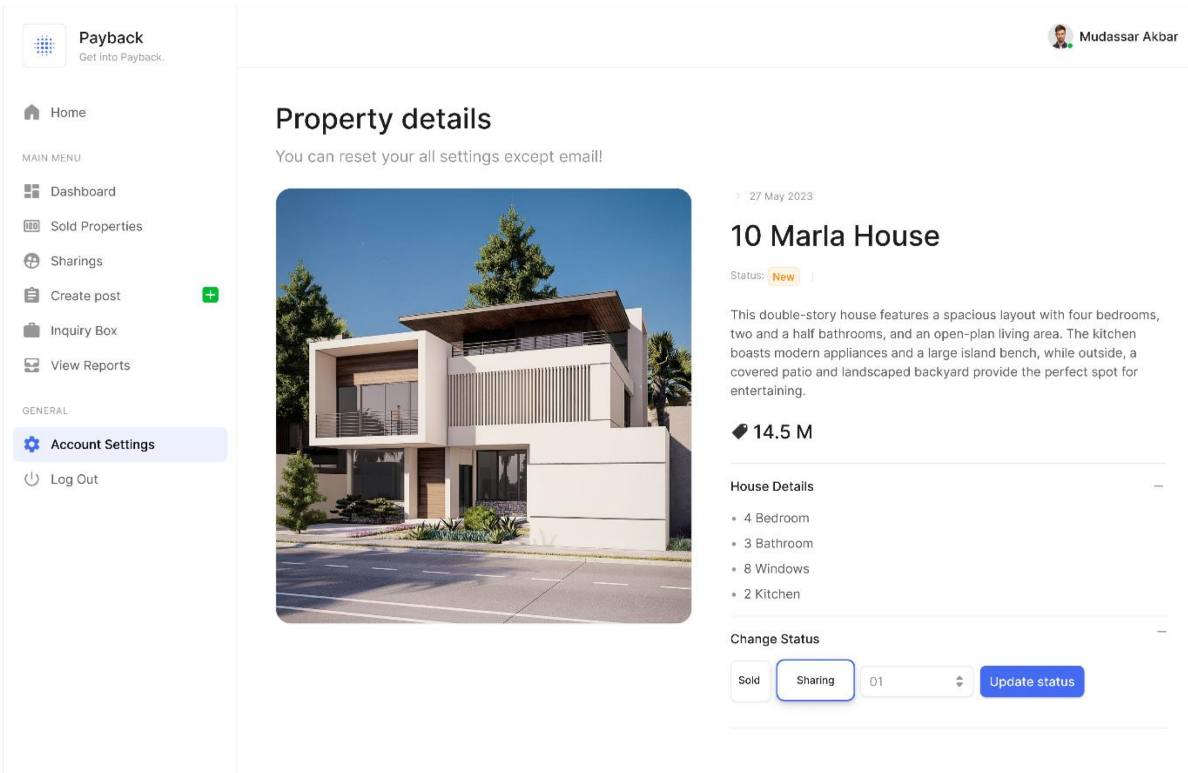
UI_ID	UI-Update



Visual cues	User will update details regarding to their need like (sharing ,buying ,featured) property.
Tactile cues	User uses the keyboard to fill/update the required fields like title ,size ,price etc.
User input	User edit required fields like title, size, price etc. To update a post.
Machine output	System displays a message for successfully post updated.

Table4.3.8: UI_CompletedProperties

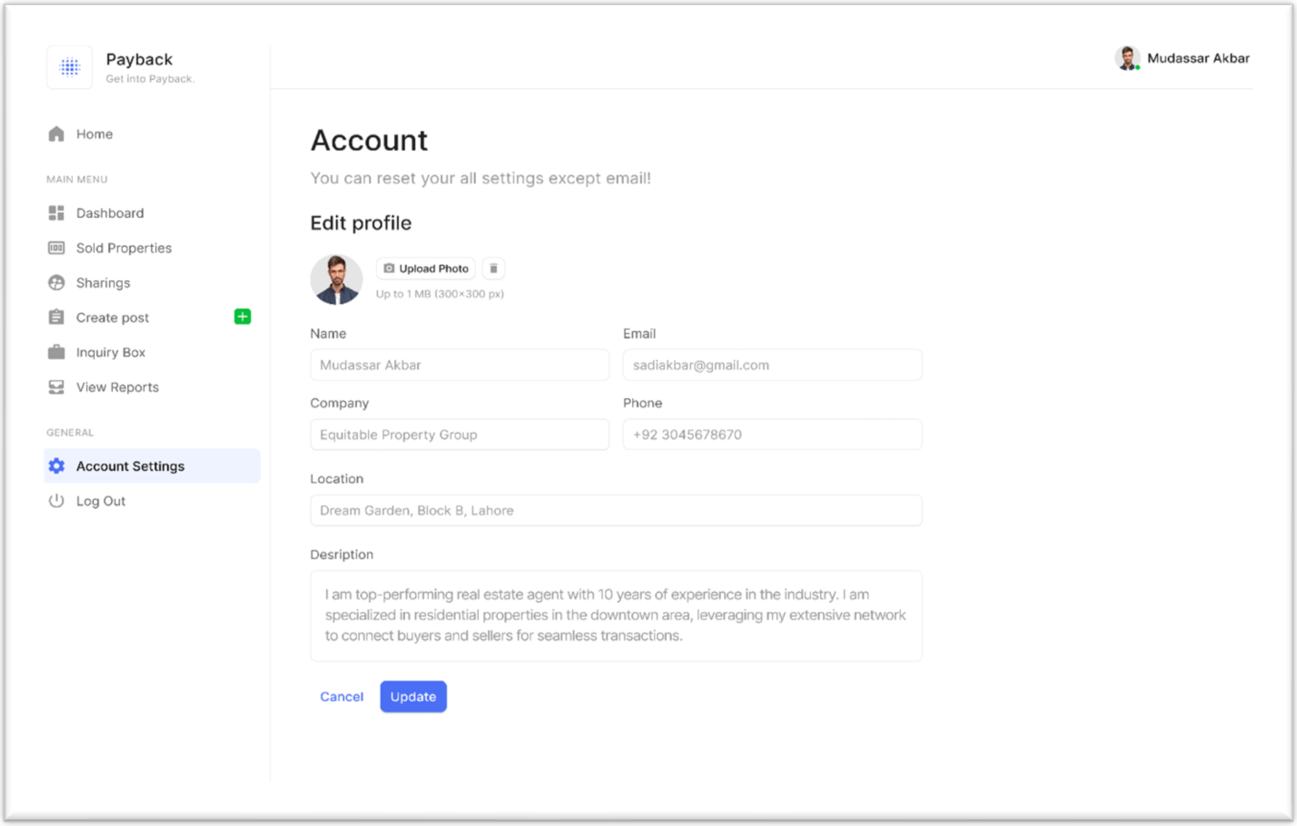
UI ID	UI-CompletedProperties



Visual cues	User sees details regarding to selected property.
Tactile cues	User uses the cursor to select
User input	User select the setting.
Machine output	System displays that the property is still available or sold.

Table4.3.9: UI_AccountSetting

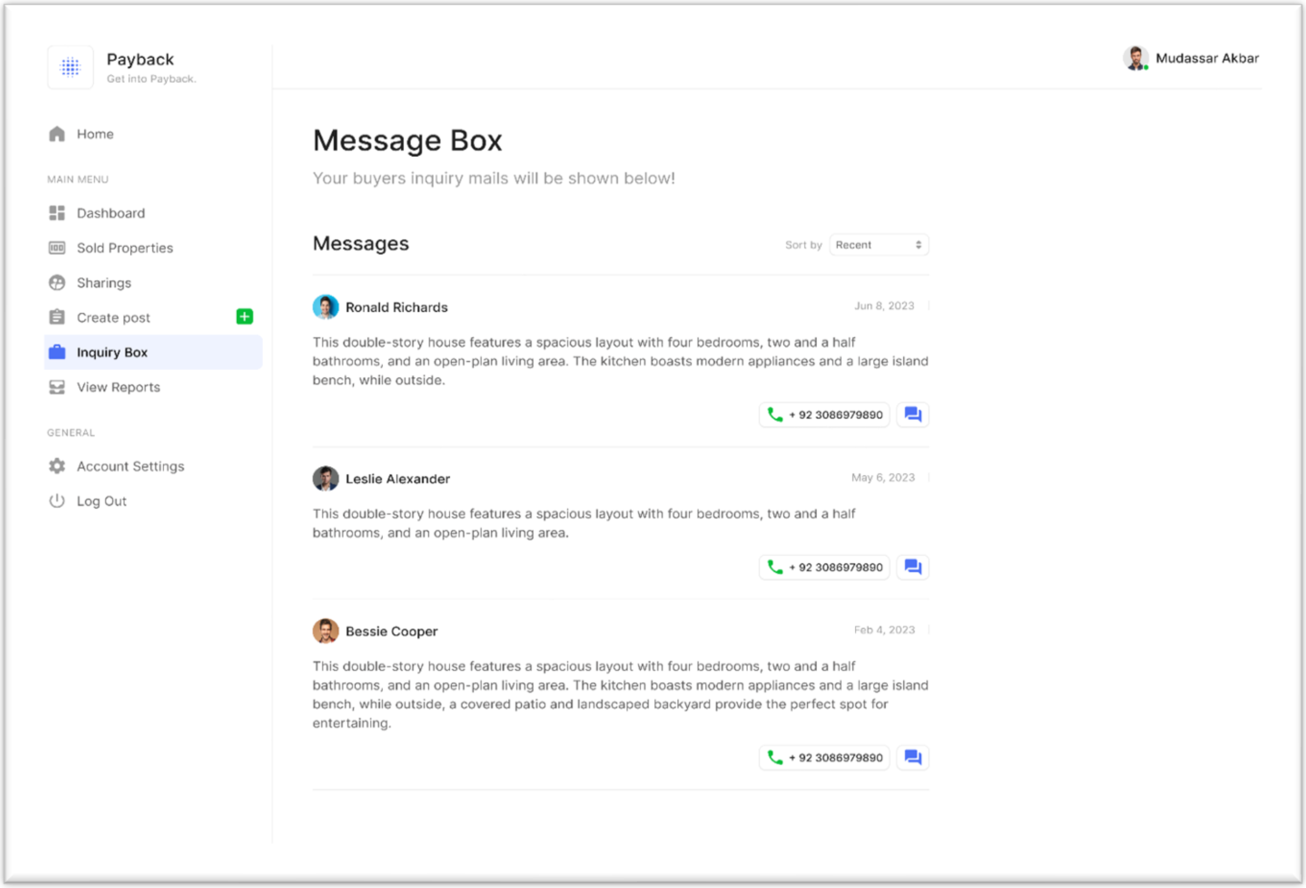
UI ID	UI-AccountSetting



Visual cues	User sees details like (name, email, phone etc.)
Tactile cues	User uses the keyboard to fill the required fields like (name, email, phone etc.)
User input	User enter e mail and password to login into the system.
Machine output	System displays a message for successful Login and an error message in case of wrong mail or password.
User's emotions	User may feel frustration or disappointment upon encountering login errors.

Table4.3.10: UI_ InquiryForm

UI ID	UI-InquiryForm

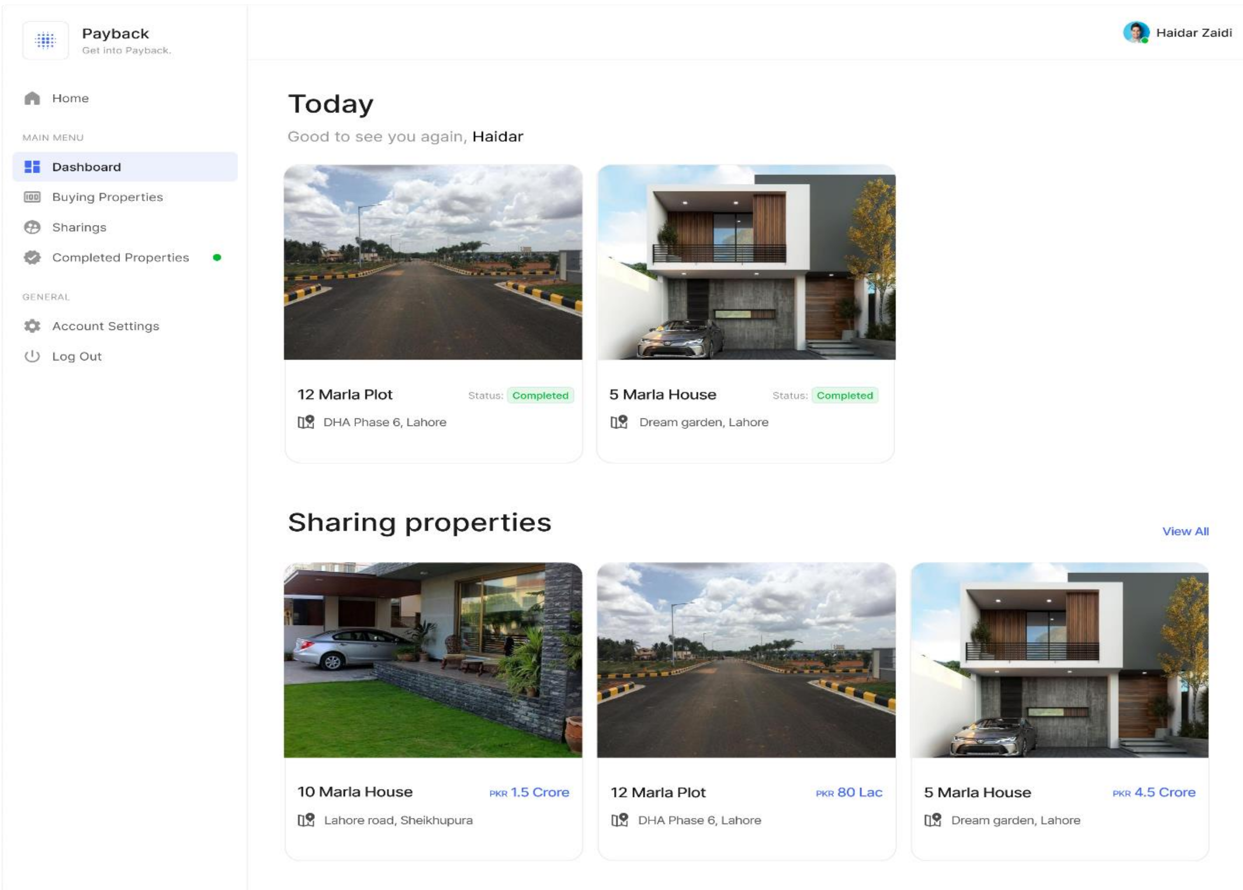


Visual cues	Buyer inquiry mail will be shown.
User input	User will click on the inquiry box.
Machine output	System displays the inquiry mails from the buyer.
User's emotions	User may feel stratify after getting information from the seller.

BUYER:

Table4.3.11: UI_ Buyer Dashboard

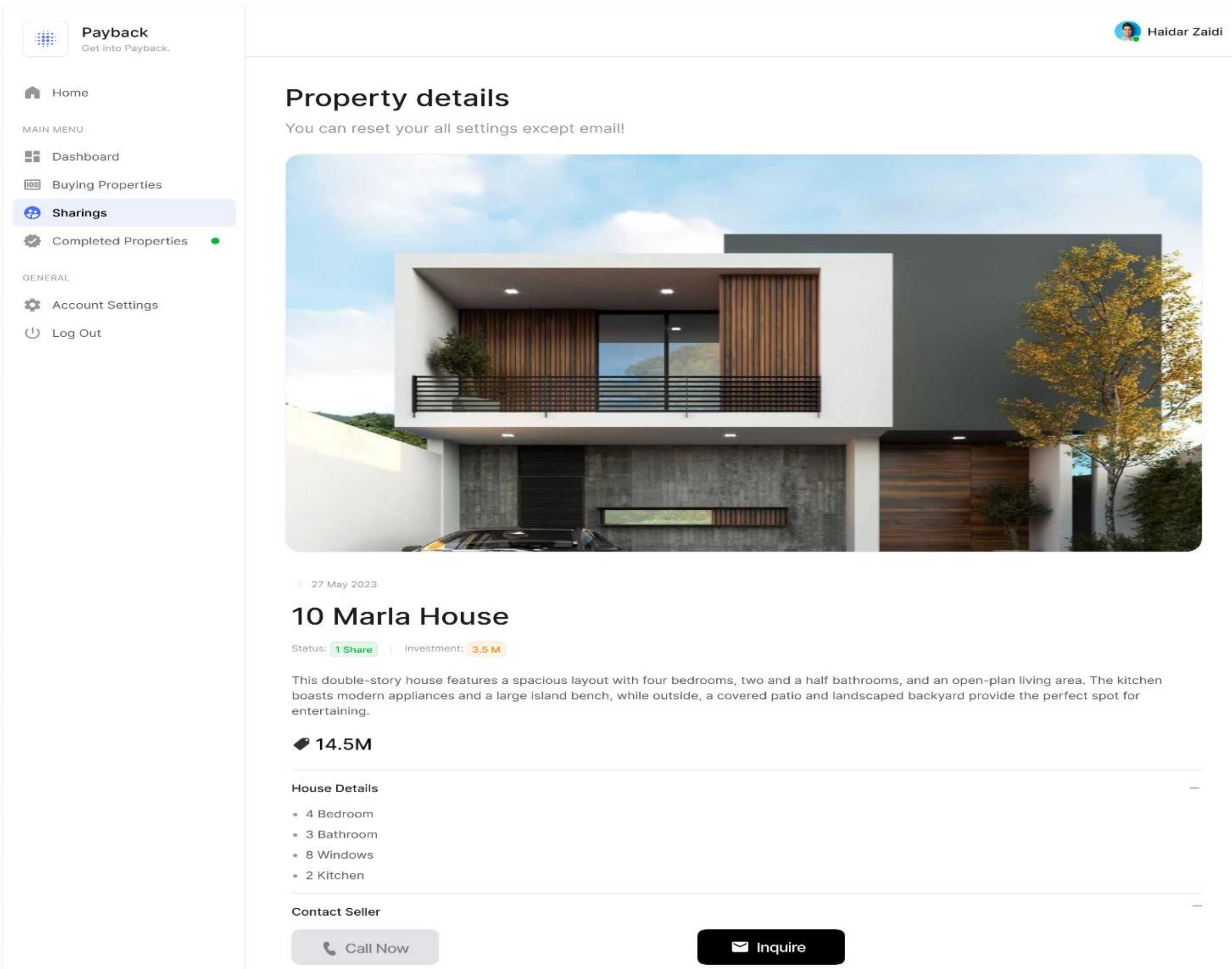
UI ID	UI-Dashboard



Visual cues	User can see the plots and sharing property plans available.
Tactile cues	User can see available properties and sharing properties by a single click.
User input	User will click on dashboard.
Machine output	System will show available property and sharing property plans.
User's emotions	User will be happy with the friendly display of the property.

Table4.3.12: UI_ PropertyDetails

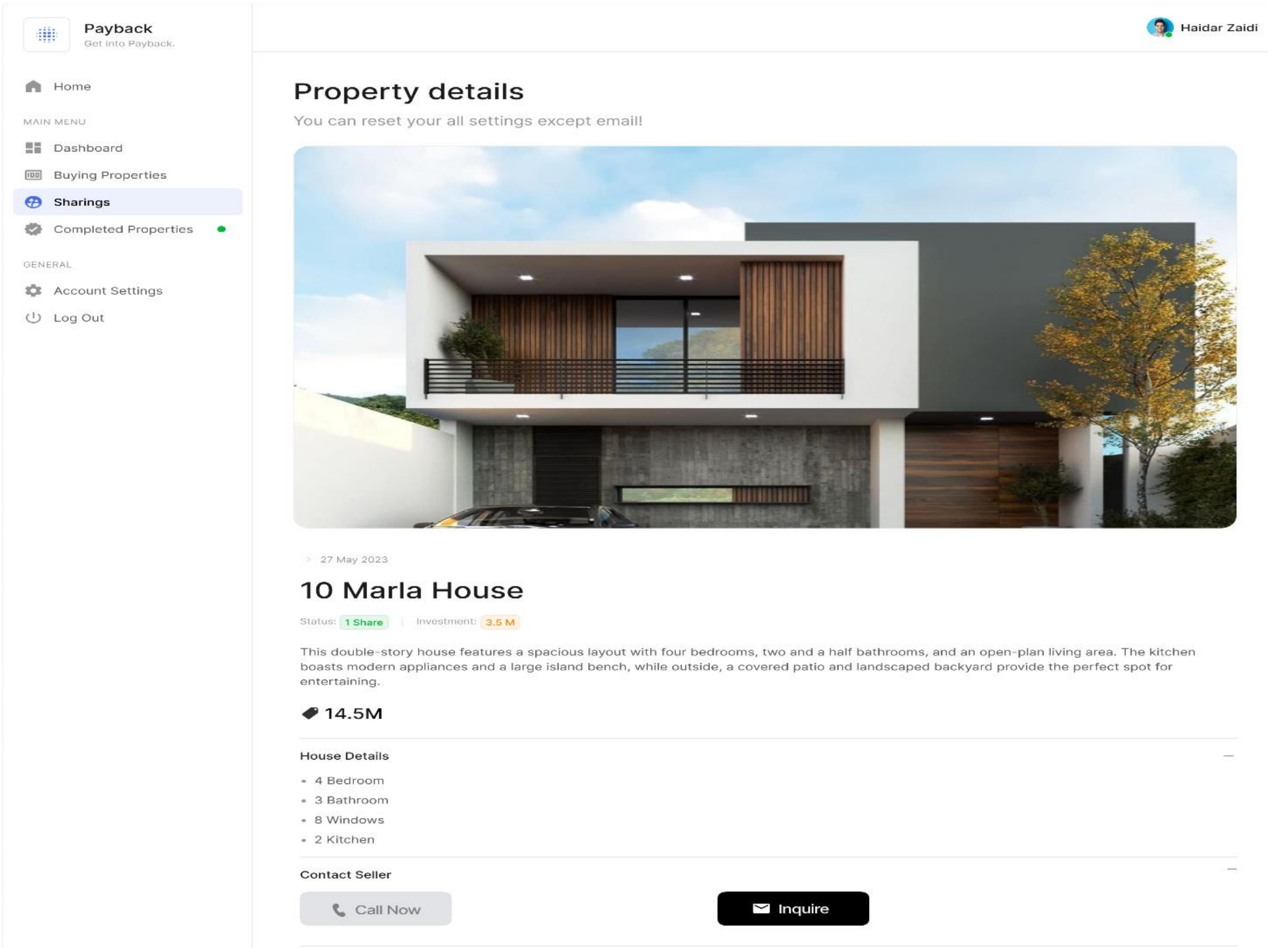
UI ID	UI-PropertyDetails



Visual cues	User can see the details related to property (house/plot).
User input	User will click on sharing property.
Machine output	System displays property (house/plot) details.

Table4.3.13: UI_ Inquiry

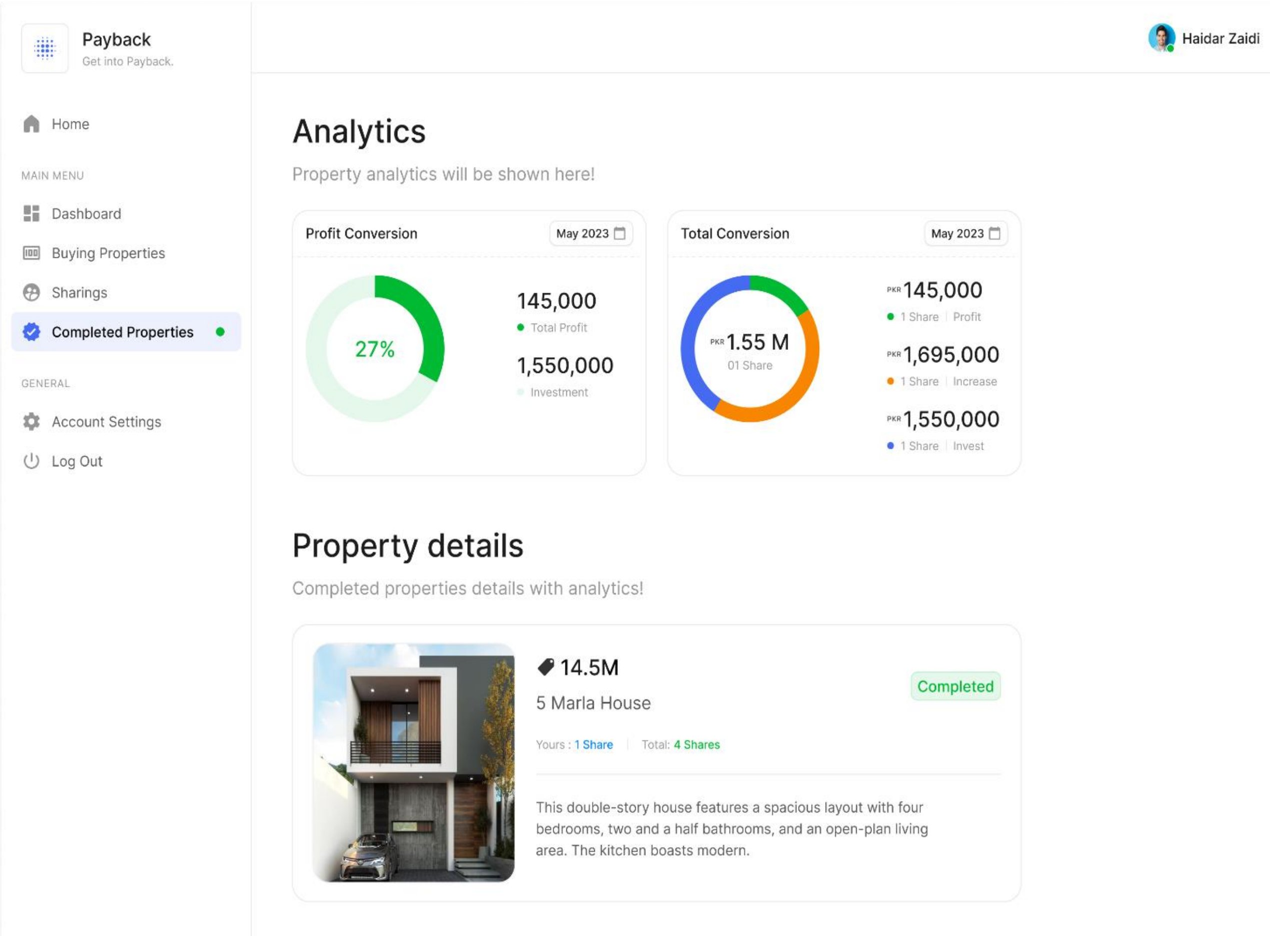
UI ID	UI-Inquiry



Visual cues	Buyer inquiry mail will be shown.
User input	User will click on the inquiry box.
Machine output	System displays the inquiry mails from the buyer.
User’s emotions	User may feel stratify after getting information from the seller.

Table4.3.14: UI_ Analytics

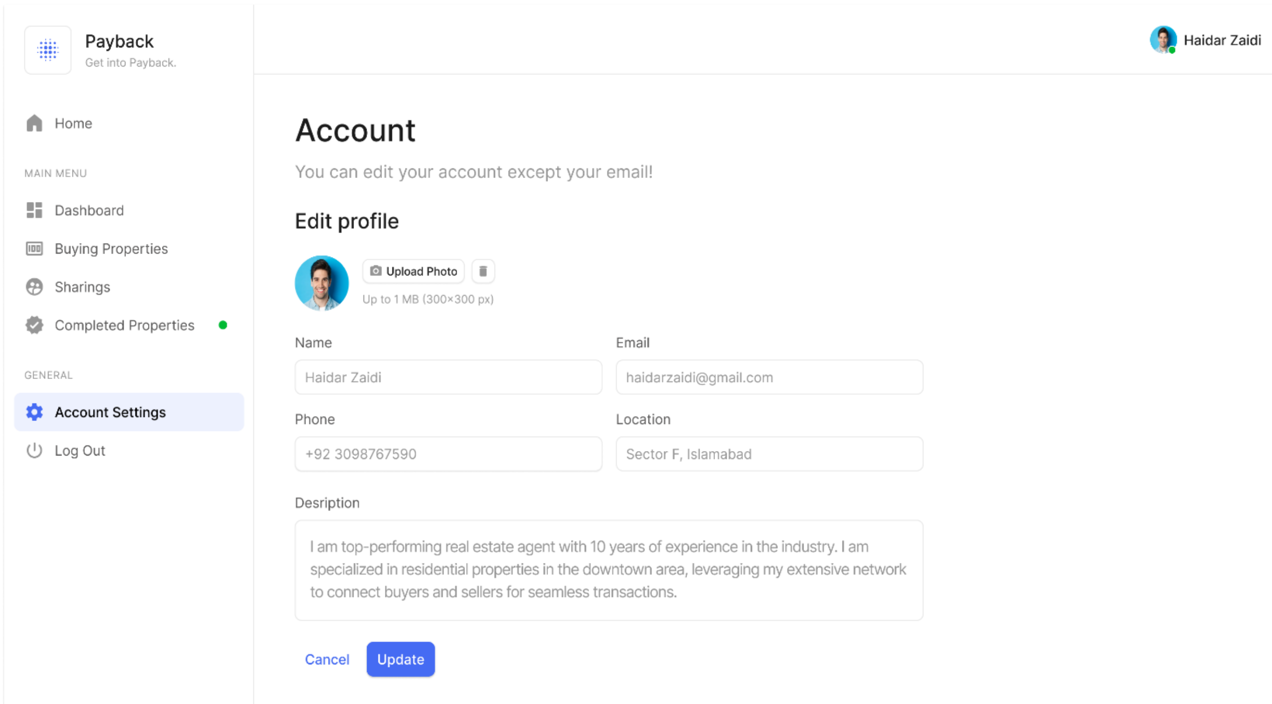
UI ID	UI-Analytics



Visual cues	In this section details related to profit and total conversation will be shown.
User input	User click on the completed properties.
Machine output	System displays details about the sold properties and total profit.

Table4.3.15: UI_ AccountSetting

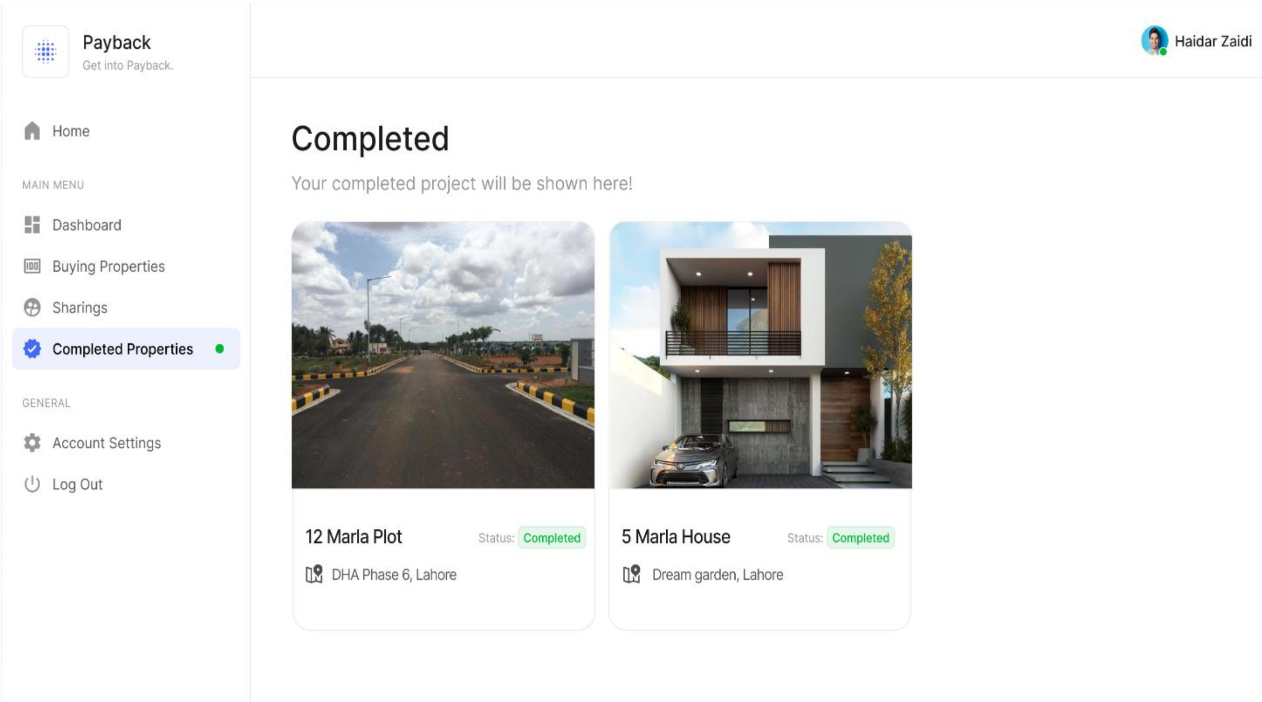
UI ID	UI-AccountSetting



Visual cues	User sees details like (name, email, phone etc.)
Tactile cues	User uses the keyboard to fill the required fields like (name, email, phone etc.)
User input	User click on the account setting and edit profile.
Machine output	System displays a message for successful updated.

*Table4.3.16: UI_* CompletedProjects

UI _ID	UI_CompletedProjects

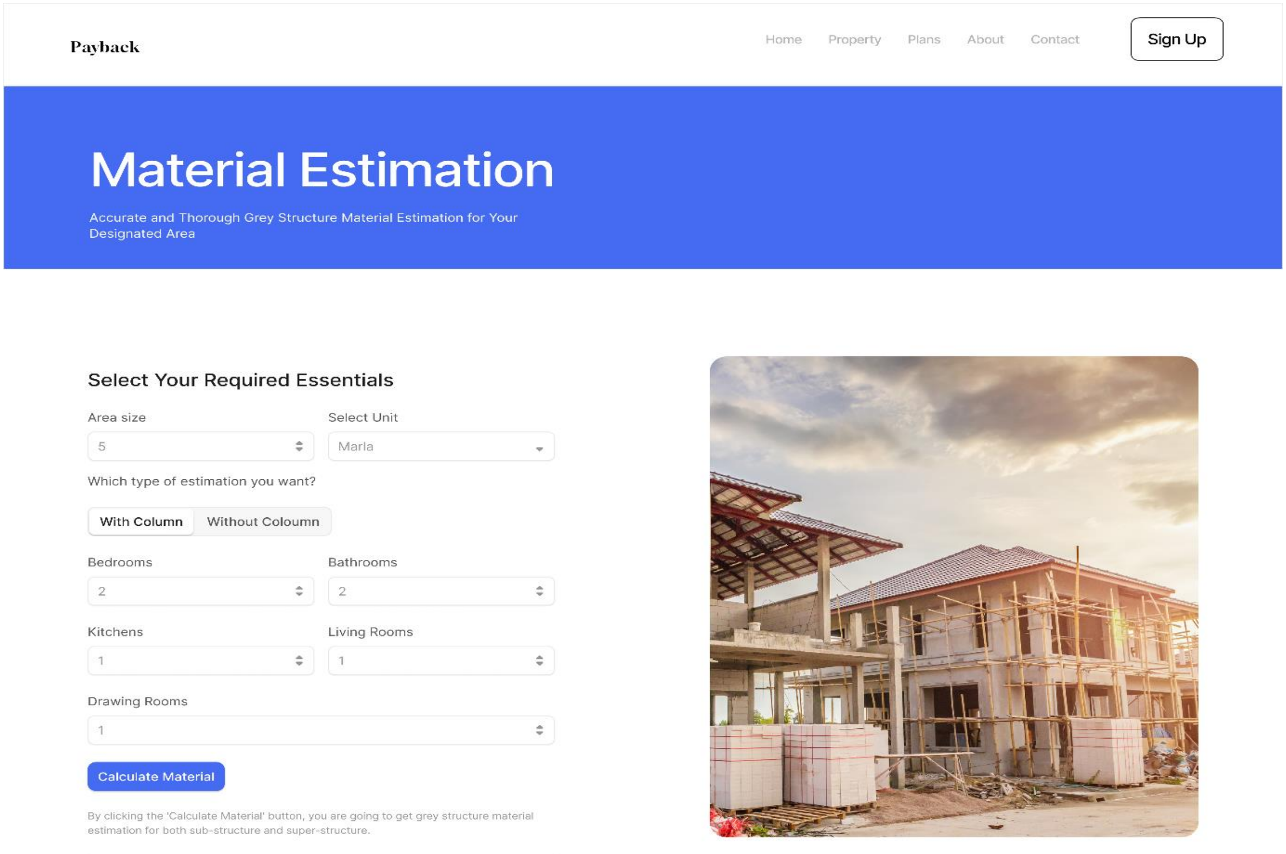


Visual cues	User can see that how much projects are completed.
User input	User will click on the completed properties.
Machine output	System will show the completed projects or sold properties.

Material Estimation:

Table4.3.16: UI_ MaterialEstimation

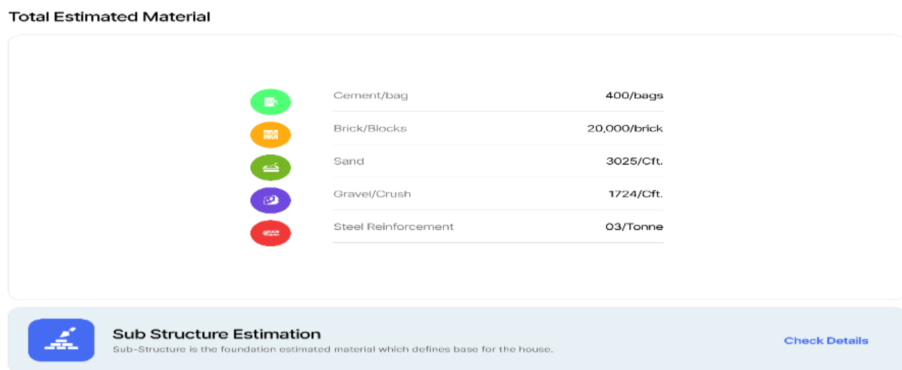
UI _ID	UI_MaterialEstimation



Visual cues	User sees select your required essentials like (Area size, select unit, bedrooms, Kitchen etc.)
Tactile cues	User uses the mouse to choose options.
User input	User enter details like (Area size, select unit, bedrooms, Kitchen etc.)
Machine output	System will show estimated material.

Table4.3.17: UI_ Substructure

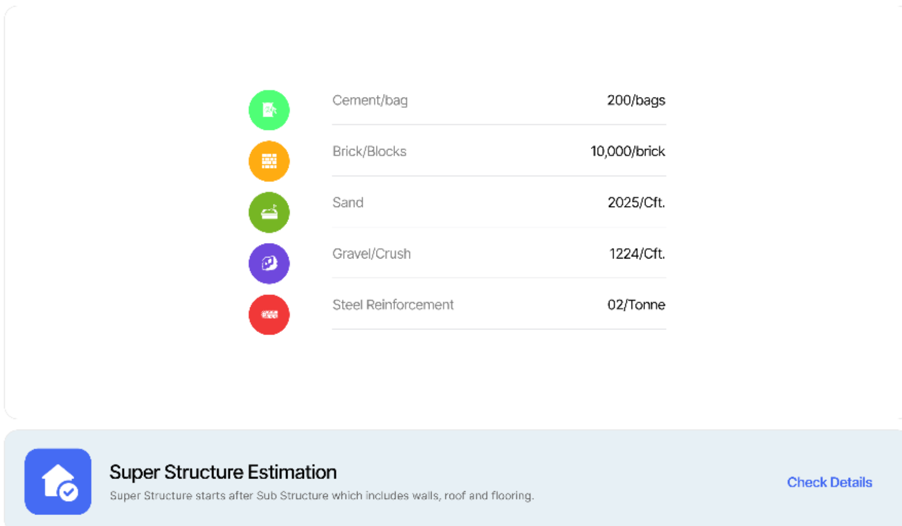
UI _ID	UI_SubStructure



Visual cues	Estimated material required ()
User input	User enter details like (Area size, select unit, bedrooms, Kitchen etc.)
Machine output	System will show sub structure estimated material.

Table4.3.18: UI_ Substructure

UI _ID	UI_SuperStructure



Visual cues	Estimated material required ()
User input	User enter details like (Area size, select unit, bedrooms, Kitchen etc.)
Machine output	System will show super structure estimated material.

4.5 Trace-ability Matrix

Traceability Matrix 4.5.1

Feature	**Sign Up**
Use Case ID	UC_1
UI ID	UI-Signup
Priority	High
Use Case Cross Ref	UC_SignUp
Elaborated Use-case ID	User can sign up to the system by entering the correct information.

Traceability Matrix 4.5.2

Feature	**Seller Side Login**
Use Case ID	UC_2
UI ID	UI_SellerLogin
Priority	High
Use Case Cross Ref	UC_ SellerLogin
DB Table ID	Seller Login
Elaborated Use-case ID	User can login to the system by entering the Email and password
Dependent Classes	Null

Traceability Matrix 4.5.3

Feature	**Home Page**
Use Case ID	UC_3
UI ID	UI_HomePage
Priority	High
Use Case Cross Ref	UC_ Homepage
DB Table ID	Seller Homepage
Elaborated Use-case ID	After login successfully user will be on home page.
Dependent Classes	Login/SignUp

Traceability Matrix 4.5.4

Feature	**Search**
Use Case ID	UC_4
UI ID	UI_Search
Priority	High

Use Case Cross Ref	UC_ Search
DB Table ID	Seller Search
Elaborated Use-case ID	By using search option user can find properties available for sharing / sale.
Dependent Classes	Null

Traceability Matrix 4.5.5

Feature	**Dashboard**
Use Case ID	UC_5
UI ID	UI_Dashboard
Priority	High
Use Case Cross Ref	UC_ Dashboard
DB Table ID	Seller Dashboard
Elaborated Use-case ID	Seller Dashboard will show the properties available for sale/rent/sharing.
Dependent Classes	Home Page

Traceability Matrix 4.5.6

Feature	**Create Post**
Use Case ID	UC_6
UI ID	UI_CreatePost
Priority	High
Use Case Cross Ref	UC_ CreatePost
DB Table ID	Seller Create Post
Elaborated Use-case ID	After enter required material for post, System displays a message for successfully post created.
Dependent Classes	Home Page

Traceability Matrix 4.5.7

Feature	**Edit Post**
Use Case ID	UC_7
UI ID	UI_EditPost
Priority	High
Use Case Cross Ref	UC_ EditPost
DB Table ID	Seller Edit Post
Elaborated Use-case ID	After enter required material for post, System displays a message for successfully post created.
Dependent Classes	Home Page ,Create post

Traceability Matrix 4.5.8

Feature	Update Post
Use Case ID	UC_8
UI ID	UI_UpdatePost
Priority	High
Use Case Cross Ref	UC_ UpdatePost
DB Table ID	Seller Update Post
Elaborated Use-case ID	After enter required material for post, System displays a message for successfully post updated.
Dependent Classes	Home Page, Create Post

Traceability Matrix 4.5.9

Feature	Completed Property
Use Case ID	UC_9
UI ID	UI_CompletedProperty
Priority	High
Use Case Cross Ref	UC_ CompletedProperty
DB Table ID	Seller Completed Property
Elaborated Use-case ID	It will show that the property is sold out or available.
Dependent Classes	Account Setting

Traceability Matrix 4.5.10

Feature	Account Setting
Use Case ID	UC_10
UI ID	UI_AccountSetting
Priority	High
Use Case Cross Ref	UC_ AccountSetting
DB Table ID	Seller AccountSetting
Elaborated Use-case ID	System will show available property and sharing property plans.
Dependent Classes	Home Page

Traceability Matrix 4.5.11

Feature	Inquiry Form
Use Case ID	UC_11
UI ID	UI_InquiryForm
Priority	High
Use Case Cross Ref	UC_ InquiryForm
DB Table ID	Seller InquiryForm

Elaborated Use-case ID	System displays the inquiry mails from the buyer.
Dependent Classes	Home Page

Traceability Matrix 4.5.12

Feature	**Buyer Dashboard**
Use Case ID	UC_12
UI ID	UI-Dashboard
Priority	High
Use Case Cross Ref	UC_Dashboard
DB Table ID	Buyer Dashboard
Elaborated Use-case ID	Buyer can login to the system by entering his/her name, address, phone no and password.
Dependent Classes	Null
Feature	**Update**

Traceability Matrix 4.5.13

Feature	**Property Details**
Use Case ID	UC_13
UI ID	UI-PropertyDetails
Priority	High
Use Case Cross Ref	UC_PropertyDetails
DB Table ID	Buyer PropertyDetails
Elaborated Use-case ID	System displays property (house/plot) details.
Dependent Classes	Dashboard

Chapter 5: Software Testing (For structured Approach)

5.1 Introduction:

This deliverable is based on the IEEE standard of software testing i.e., IEEE SOFTWARE TEST DOCUMENTATION Std 829-1998. This standard describes a set of basic test documents that are associated with the dynamic aspects of software testing (i.e., the execution of procedures and code). The standard defines the purpose, outline, and content of each basic document. While the documents described in the standard focus on dynamic testing, several of them may be applicable to other testing activities (e.g., the test plan and test incident report may be used for design and code reviews). This standard may be applied to commercial, scientific, or military software that runs on any digital computer.

Following are standard artifacts, which must be included in this deliverable:

1. Test Plan
2. Test Design Specification
3. Test Case Specification
4. Test Procedure Specification
5. Test Item Transmittal Report
6. Test Log
7. Test Incident Report
8. Test Summary Report

5.2. Test plan

7.2.1. Purpose

To prescribe the scope, approach, resources, and schedule of the testing activities. To identify the items being tested, the features to be tested, the testing tasks to be performed, the personnel responsible for each task, and the risks associated with this plan.

7.2.2. Outline

A test plan shall have the following structure:

a. Test plan identifier
b. Introduction
c. Test items
d. Features to be tested
e. Features not to be tested
f. Approach
g. Item pass/fail criteria
h. Suspension criteria and resumption requirements
i. Test deliverables
j. Testing tasks
k. Environmental needs
l. Responsibilities
m. Staffing and training needs
n. Schedule
o. Risks and contingencies
p. Approvals

5.2.2.1. Test plan identifier

Test plan identifier is SMS-TP-001.

5.2.2.2. Introduction

This test plan is a blueprint that aims at conducting the testing activities for the system "Payback Management System". The motivation behind this test plan is to make sure all required features are taken to test out their working. The purpose of test plan is making sure that features this system provides are compatible with each other and how the system will react to the inputs provided by the user. The testing will also check whether expected and actual outcomes are being met. If any case fails then it will be reviewed and required changes will be made to it.

5.2.2.3. Test items

There are following items which will be tested.

- As a Seller and buyer, registering and logging into the system.
- As a user, navigating the application.
- As a registered seller, updating profile.
- As a seller replying queries.
- As a seller, viewing selling properties.
- As a seller add, update or delete properties.
- As a buyer updating profile.
- As a buyer searching product.
- As a buyer making queries.
- As a buyer view product detail.
- As a buyer checking Analytics.
- As a buyer doing Material Estimation.

5.2.2.4. Features to be tested

- Seller and buyer Registration/Signup
- Seller and buyer Login
- Homepage
- Seller Profile
- Searching product
- Order Management
- Product Management (Add, Update and Delete)
- Category Management (Add, Update and Delete)
- Query
- Buyer profile
- View product details
- Material estimation

5.2.2.5. Features not to be tested

- How does system performance vary during high loads? This feature cannot be tested as we cannot simulate an actual server crash and try and recover it.
- Home Page: This is the home page of the application, there is no need to test it as it only displays the relevant information about the system.

5.2.2.6. Approach

We have used the proactive approach to testing, therefore, any issue or error that may occur is considered beforehand and the development is done accordingly. Everything related to testing a feature is recorded, like expected or actual outputs and the test data that is used for testing a particular feature. The intention is to check whether the system is working according to the specified requirements. After the completion of tests, the supervisor is asked to review the test report.

5.2.2.7. Item pass/fail criteria

We have used the proactive approach to testing, therefore, any issue or error that may occur is considered beforehand and the development is done accordingly. Everything related to testing a feature is recorded, like expected or actual outputs and the test data that is used for testing a particular feature. The intention is to check whether the system is working according to the specified requirements. After the completion of tests, the supervisor is asked to review the test report.

5.2.2.8. Suspension criteria and resumption requirements

The testing will be suspended when network issue occurs or 30% of the tests have failed. Once the above issues are resolved the testing will be resumed. If system experiences login issues, registering issues and failure in any basic operation then testing will be paused immediately to resolve issues.

5.2.2.9. Test deliverables

The following are deliverables are required to perform testing and to know what the tests have result in:

- Test plan;
- Test design specifications;
- Test case specifications;
- Test procedure specifications;
- Test item transmittal reports;
- Test logs;
- Test incident reports;
- Test summary reports.

5.2.2.10. Testing tasks

Specify list of testing tasks we need to complete in the current project. The following activities must be completed.

- Test plan prepared
- Functional requirements written and delivered to the testing system.

- Setting up testing environment
- Performing the test
- Prepare test summary report

5.2.2.11. Environmental needs

The hardware and software specifications of Task Management System are as follows:

Hardware specs:

Laptop or Personal Computer with internet connection.

Software specs:

Following is the software that we will use for our project.

Any Browser:

- For testing the website
- Figma install
- Webflow subscription
- Visual studio Install
- Firebase access

5.2.2.12. Responsibilities

The execution of test should be carried out by tester (Group Member). The test manager is responsible for executing, managing, and resolving the issues of the project.

Each tester should understand about execution of testing.

5.2.2.13 Staffing and training needs

No special skills are required; however, tester must know how to use the system from start to end and how to carry out the designed tests.

5.2.2.14. Schedule

Activities	Member	Time Required
Test Planning and Specification	Ahsan Mehboob	5 days
Perform Testing	Ali Shan And Adnan	15 days
Test Report	Ali Shan And Adnan	7 days
Test Delivery	Ali Shan And Adnan	7 days

Table 5.2.2.14 - schedule

5.2.2.15. Risks and contingencies

- If the first component testing is not completed within a day, it could delay bug fixes and final testing.
- If the testers don't have the basic understanding of software development, testing could be delayed or not be conducted properly.
- Poor internet speed may cause the system to work improperly and delay the results.

- There is a possibility that internet access may be lost for a few days, this may lead to catching up, to follow the schedule and this results in hastiness, which consequently leads to creating errors.

5.2.2.16 Approvals

Name	Title	Date	Signature
Mr. Adeel Shahzad	Project Supervisor		

5.3. Test design specification

5.3.1. Purpose

The purpose of the test plan of 'PayBack Management System" is to generate a detailed document that describes the test strategy, objectives, schedule, estimation, deliverables and resources required for testing of application. This test plan serves as a blueprint to conduct software testing activities which will be controlled by test manager.

5.3.2. Outline

A test plan shall have the following structure:

a. Test plan identifier;
b. Introduction;
c. Test items;
d. Features to be tested;
e. Features not to be tested;
f. Approach;
g. Item pass/fail criteria;
h. Suspension criteria and resumption requirements;
i. Test deliverables;
j. Testing tasks;
k. Environmental needs;
l. Responsibilities;
m. Staffing and training needs;
n. Schedule;
o. Risks and contingencies;
p. Approvals.

All of the points in the outline have already been discussed in the previous section of Test Plan.

5.3.2.1 Seller Signup Test-Case

Table 5.3.2.1: Seller Signup

Test Case ID: TC-001			**Made By: PB Crew**		
Test Case Name: Seller Signup Test-Case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**
TS-01	Verify a red steric appear on the top of the text field if it left empty.	Enter the Name, password and email left the contact number field empty.	The validations on the input fields should work properly and the error message should display until all the fields are correctly filled.	Error message display until all the fields are correctly filled.	Pass
TS-01	Verify that the email is not already registered in the database.	Enter the email that is already registered in the database.	A red label should appear with error message.	Red label appear	Pass
TS-01	Verify the email msg to verify provided email successfully sent	Enter the correct name, phone number, email, address and password, hit the enter key	An email verification should send to the user's email	Email received	Pass

TS-01	Verify the user is redirected to the appropriate page after successful signup	Enter the correct name, phone number, email, address and password click on sign up button	The user should be redirected to the appropriate page after successful signup	The user is redirected to the appropriate page after successful signup	Pass

5.3.2.2 Seller Login Test-Case

Table 5.3.2.2: Seller Login

Test Case ID: TC-002			**Made By: PB Crew**		
Test Case Name: Seller Login Test-Case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**
TS-02	Verify that the account can't be logged in if the login page has an empty field	Enter the Gmail and left the password field empty.	Error message should display in the label.	Error message displays	Pass
TS-02	Verify that the account can only log in if both email and password are correct	Enter email and password	The account should only log in if both username and password are correct	The account login successfully	Pass

TS-02	Verify the user is redirected to the appropriate page after successfully login	Enter the correct email and password and click on login button	The user should be redirected to the appropriate page after successful signup	The user redirected to the appropriate page after successful login	Pass

5.3.2.3 Seller Dashboard Test-Case

Table 5.3.2.3: Seller Dashboard

Test Case ID: TC-003			**Made By: PB Crew**		
Test Case Name: Seller Dashboard Test-Case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**
TS-03	Verify that all the buttons on the seller dashboard are navigating to the correct form.	Click all the buttons one by one i.e. Create post, sharing, selling and account settings	The option should Redirects toward that specific page.	The option Redirects toward that specific page.	Pass
TS-03	Verify both selling and sharing properties are displaying in their own section.	Click seller dashboard button.	Both selling and sharing properties should displaying in their own section.	Both selling and sharing properties are displaying in their own section.	Pass

TS-04	Verify today posts are separated from old posts.	Click seller dashboard button.	Today or latest post should display on top.	Today or latest post are displaying on top.	Pass

5.3.2.4 Account Setting Test Case:

Table 5.3.2.4: Account setting Test Case

Test Case ID: TC-004			**Made By: PB Crew**		
Test Case Name: Update account info Test Case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**
TS-04	Verify that the seller's profile information is displayed correctly.	Click on the Dashboard button.	The system should navigate to the seller's profile page and display accurate information specific to that particular seller.	The system navigates to the seller's profile page and display accurate information specific to that particular seller.	Pass
TS-04	Verify that the field is updated correctly by clicking the save button	Select account setting and enter the information in the field you want to update and click on update button.	Success message should be displayed after correctly updating the information about the seller.	Success message displays after correctly updating the information about the seller.	Pass

5.3.2.5 Create Post Test Case:

Table 5.3.2.5: create post Test Case

Test Case ID: TC-005			**Made By: PB Crew**		
Test Case Name: Create post Test case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**
TS-05	Verify that the "Create post" Button works properly	Click the "Create Post" Button	The button should display "Create Post" form.	The button displays "Create Post" form.	Pass
TS-05	Verify error appear if any field left empty.	Enter the title of property and left the remaining fields empty.	Error message should appear that all fields are not filled.	Error message appears that all fields are not filled.	Pass
TS-05	Verify that the "Upload Photo" Button works properly	Click "Click Upload photo" button and upload an image.	The button should work properly	The "Upload Photo" button works properly	Pass
TS-05	Verify that the "Publish" button works properly	After adding all details properly click on Publish button.	The property should be saved in the record and should display in the chosen category.	The property saves in the record and display in the chosen category.	Pass

5.3.2.6 Delete Property Test Case:

Table 5.3.2.6: Delete Product Test Case

Test Case ID: TC-006			**Made By: PB Crew**		
Test Case Name: Delete Property Test Case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**
TS-06	Verify that the "Update" Button works properly	Click the "Update" Button	The button should navigate to the create post form.	The button display create post form.	Pass
TS-06	Verify that the "Delete" Button works properly	Click on the delete button.	The success message should display and the property should be removed from the specific category.	The success message displays and the product has removed from the specific category.	Pass

5.3.2.7 Update Property Test Case:

Table 5.3.2.7: Update Property Test Case

Test Case ID: TC-007			**Made By: PB Crew**		
Test Case Name: Update Property Test Case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**

TS-07	Verify that the "Update" Button works properly	Click the "Update" Button	The button should display "Create post" for with already filled fields.	The button displays "Create post" form.	**Pass**
TS-07	Verify that the "Publish" button works properly	After adding all details in the field, you want to update click on "Publish" button.	The product should be Updated in the record and should show updated record in the specific category.	The product updated in the record and shows in the chosen category.	Pass

5.3.2.8 Search Property Test Case:

Table 5.3.2.8: Search Property Test Case

Test Case ID: TC-008			**Made By: PB Crew**		
Test Case Name: Search Property Test Case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**
TS-08	Verify Search by Price	Insert price in the search bar and select search button.	The button should display all properties according to the price.	Properties displayed according to the price	Pass

TS-08	Verify Search by Place	Insert place in the search bar and select search button.	The button should display all properties according to the place.	Properties displayed according to the place.	Pass
TS-08	Verify the out put by inserting wrong input	Click on search button.	Nothing results found should appear.	Nothing found displayed.	Pass
TS-08	Verify predefined search buttons are working perfectly.	Click any of the predefined search button.	Result should appear according to search button	Result appeared according to the search button.	Pass

5.3.2.9 Queries form Test Case:

Table 5.3.2.9: Queries Form Test Case

Test Case ID: TC-009			**Made By: PB Crew**		
Test Case Name: Quires Form test case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**

TS-09	All the fields are working properly	Fill all the fields and click submit button.	All fields should work properly.	All the fields are working.	**Pass**
TS-09	Verify error appear if any field left empty.	Enter the title of property and left the remaining fields empty.	Error message should appear that all fields are not filled.	Error message appears that all fields are not filled.	Pass
TS-09	Verify that the "Upload Photo" Button works properly	Click "Click Upload photo" button and upload an image.	The button should work properly	The "Upload Photo" button works properly	Pass
TS-09	Verify submit button working properly	Fill all the fields and click submit button	All the info should be submitted	All the info submitted	Pass

5.3.2.10 Update sharing properties:

Table 5.3.2.10: sharing property Test Case

Test Case ID: TC-0010	**Made By: PB Crew**
Test Case Name: Update sharing properties Test case	**Tested By: PB Crew**

Test Scenario ID	Action	Inputs	Expected Results	Actual Results	Status
TS-010	Verify drop down buttons are working perfectly	Click the button and select the value	Value must be submitted successfully	Value submitted successfully	**Pass**
TS-010	Verify shares are added successfully	Enters share	Share must be added successfully.	Share added successfully.	Pass
TS-010	Verify completed status updated successfully	Select the completed button	Status must be updated	Status added successfully.	Pass

5.3.2.11 Property Profit Analytics Test Case:

Table 5.3.2.11: Provide Rating Test Case

Test Case ID: TC-0011			**Made By: PB Crew**		
Test Case Name: Property Profit Test Case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**

TS-011	Verify correct graph are displaying	Select sold property from the Buyer Dashboard	Correct graphs should be displayed	Correct shapes/graphs are displaying	**Pass**
TS-011	Verify correct profit and loss percentage	Select sold property from the Buyer Dashboard	The site must display correct percentage	Correct percentage has been displaying	Pass

5.3.2.12 Property Details Test Case:

Table 5.3.2.12: Property Details Test Case

Test Case ID: TC-0012			**Made By: PB Crew**		
Test Case Name: Property details Test case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**
TS-012	Verify that clicking on property will show property details.	Click on the property	The button should display product detail form	The button displays product detail form	Pass

TS-012	Verify that query button working properly	Click on the query button	It should display the query form	Query form displayed	Pass
TS-012	Verify that the contact button is working properly	Click on the contact button	The Sellers profile should display	Seller profile is visible to user	Pass
TS-012	Verify that all the related properties will be also displayed in property detail section	Click on the property from home page	All the related properties should be displayed under the property details section.	All related properties displayed.	Pass

5.3.2.13 Seller Query Form Test Case:

Table 5.3.2.13: Seller query form Cart Test Case

Test Case ID: TC-0013			**Made By: PB Crew**		
Test Case Name: Customer Signup			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**

TS-013	Verify all the queries are received	Login as a buyer and fill inquiry form.	Query should be received on sellers' queries form	Query received successfully	Pass
TS-013	Verify query reply sent successfully	Write reply against the query.	Reply should be received on seller side.	Reply received on seller side successfully.	Pass

5.3.2.14 Material Estimation Test Case:

Table 5.3.2.14: material Estimation Test Case

Test Case ID: TC-0014			**Made By: PB Crew**		
Test Case Name: Material Estimation Test case			**Tested By: PB Crew**		
Test Scenario ID	**Action**	**Inputs**	**Expected Results**	**Actual Results**	**Status**
TS-014	All the fields are working properly	Fill all the fields and click submit button.	All fields should work properly.	All the fields are working.	**Pass**

TS-014	Verify that correct total estimation is made	Fill the form and click on Calculate button	Correct Estimation should be display	Correct estimation displayed	Pass
TS-014	Verify Sub Structure Estimation drop down button is working correctly	After clicking Calculate button select sub structure dropdown button	Drop down button should work correctly and estimation displayed.	Sub structure estimation displayed.	Pass
TS-014	Verify Correct super structure estimation made	Click on super structure dropdown button	Correct estimation should be displayed	Correct estimation displayed	Pass

5.4. Test Case Specification

5.4.1. Purpose
To define a test case identified by a test design specification.

5.4.2. Outline
A test case specification shall have the following structure:

a. Test case specification identifier
b. Test items
c. Input specifications
d. Output specifications
e. Environmental needs
f. Special procedural requirements
g. Inter case dependencies

5.4.2.1. Test case specification identifier

Specify the unique identifier assigned to this test case specification.

5.4.2.2 Test items

Identify and briefly describe the items and features to be exercised by this test case.
For each item, consider supplying references to the following test item documentation:

a. Requirements specification
b. Design specification
c. Users guide
d. Operations guide
e. Installation guide

5.4.2.3. Input specifications

Specify each input required to execute the test case. Some of the inputs will be specified by value (with tolerances where appropriate), while others, such as constant tables or transaction files, will be specified by name. Identify all appropriate databases, files, terminal messages, memory resident areas, and values passed by the operating system.
Specify all required relationships between inputs (e.g., timing).

5.4.2.4. Output specifications

Specify all of the outputs and features (e.g., response time) required of the test items. Provide the exact value (with tolerances where appropriate) for each required output or feature.

5.4.2.5. Environmental needs

5.4.2.5.1. Hardware

Specify the characteristics and configurations of the hardware required to execute this test case (e.g., 132 character´ 24 line CRT).

5.4.2.5.2. Software

Specify the system and application software required to execute this test case. This may include system software such as operating systems, compilers, simulators, and test tools. In addition, the test item may interact with application software.

5.4.2.5.3. Other

Specify any other requirements such as unique facility needs or specially trained personnel.

5.4.2.6. Special procedural requirements

Describe any special constraints on the test procedures that execute this test case. These constraints may involve special set up, operator intervention, output determination procedures, and special wrap up.

5.4.2.7. Inter case dependencies

List the identifiers of test cases that must be executed prior to this test case. Summarize the nature of the dependencies.

5.5. Test procedure specification

5.5.1. Purpose

The purpose of the following test procedure specification is to specify the steps the tester will follow for executing a set of test cases. This also involves analyzing the system to evaluate the set of features that needed to be considered for testing.

5.5.2 Outline

A test procedure specification shall have the following structure:

a. Test procedure specification identifier
b. Purpose
c. Special requirements
d. Procedure steps

Details on the content of each section are contained in the following sub clauses.

5.5.2.1. Test procedure specification identifier

The unique identifier specified for the test procedure specification is SMSTPS001.

5.5.2.2. Purpose

The purpose of this module is to describe how the testing of the system is carried out. The procedure is carried out to execute the following test cases: TC-001 up-to TC-013. All of the test cases are conducted manually within specified time constraint.

5.5.2.3. Special requirements

There are some special requirements in terms of skills; however, to carry out the testing, the following must be there:

- Knowledge of WebFlow, Node JS, JavaScript, MySQL Commands
- Access of internet
- WebFlow installed
- Visual Studio installed

- Node JS installed

5.5.2.4. Procedure steps

5.5.2.4.2. Set up

The following need to be considered before the testing can be carried out:

- Tester's system has access to a good internet speed
- Have WebFlow Subscription
- Have MySQL Access
- Visual Studio installed
- Install Node JS

5.5.2.4.3. Start

It is web base system and it has 2 users buyer and seller, The seller has to register and login to the system to perform further activities but buyer can use the system without log in he just need to login when he/she want to place an order.

5.5.2.4.4. Proceed

Execute the tests in chronological order as specified from TC-001 that lead up-to TC-010

5.5.2.4.5. Measure

The tests are conducted manually. Therefore, the actual output will be measured based on the expected output and of course on human observation.

5.5.2.4.6. Shut down

Once all of the test cases have been conducted, the user can log out of the system and disconnect the server.

5.5.2.4.7. Restart

Connect to the internet then login in case of Seller and Buyer again to start testing again or using the system.

5.5.2.4.8. Stop

Once all tests are carried out logout of the system to stop its working.

5.5.2.4.9. Wrap up

Make sure output of each test case is recorded in the test log.

5.6. Test item transmittal report

5.6.1. Purpose

The purpose of this report is to determine all the parts and items which need to be tested. And the system has been shared with the relevant person who is responsible for conducting the testing in a thorough and efficient manner. Each team member has been assigned specific areas of responsibility to ensure comprehensive testing coverage.

5.6.2. Outline

A test item transmittal report shall have the following structure:

a. Transmittal report identifier
b. Transmitted items
c. Location
d. Status
e. Approvals

5.6.2.1. Transmittal report identifier

The unique identifier for this test item transmittal report is SMSTR-1.

5.6.2.2. Transmitted items

System is transmitted to the responsible person i.e. tester for testing.

5.6.2.3. Location

Our system is a web app, to use it tester must go to it and login only in case of Seller Dashboard and in case of buyer Dashboard tester just go the web app.

5.6.2.4. Status

The status of all test items transmitted is pass and all item are functioning properly as the actual output match the expected out meaning that the test plan has worked successfully.

5.6.2.5. Approvals

Table 5.6.2.5 - Test Item Transmittal Report Approvals

Name	Title	Signature
Mr. Adeel Shahzad	Project Supervisor	

5.7. Test log

5.7.1. Purpose

The purpose of test log is to record all relevant details about the test cases executed

including the output received against each test case. The log represents the observed results of the system for the tests conducted.

5.7.2. Outline

A test log shall have the following structure:

a. Test log identifier;
b. Description;
c. Activity and event entries.

5.7.2.1. Test log identifier
Identifier for test log is SMSTL-001.

5.7.2.2. Description
The items testes are already identified in the above section 5.2.2.3 Test Items. However, the testing is done manually and therefore the results are recorded manually by the tester. All of the environmental needs that helped in carrying out the test successfully are listed under the section 5.2.2.11 Environmental Needs.

5.7.2.3. Activity and event entries
Everything is already briefly elaborated under the section 5.4.2.1 **Test Case Specification.**

5.8. Test incident report

5.8.1. Purpose
The purpose of this incident report is to record whether an unexpected incident occurred. If it did, then all necessary details about it are to be recorded.

5.8.2. Outline
A test incident report shall have the following structure:

a. Test incident report identifier
b. Summary
c. Incident description
d. Impact

Details on the content of each section are contained in the following sub clauses.

5.8.2.1. Test incident report identifier
The unique identifier for Test incident report is SMSTIR – 001
5.8.2.2. Summary
No expected incident occurred as the errors are proactively handled beforehand through error messages.

5.8.2.3. Incident description
No incidents occurred.

5.9. Test summary report

5.9.1. Purpose
The purpose of this test summary report is to summarize everything about the testing performed on system features. It wraps up everything regarding the results achieved against the features tested and describes various activities performed as part of testing.

5.9.2. Outline

A test summary report shall have the following structure:

a. Test summary report identifier
b. Summary
c. Variances
d. Comprehensive assessment
e. Summary of results
f. Evaluation
g. Summary of activities
h. Approvals

Details on the content of each section are contained in the following sub clauses.

5.9.2.1. Test summary report identifier

Test summary report identifier is SMSTSR-001.

5.9.2.2. Summary

- Test items identified against the features stated under 5.2.2.4. Features to be tested. Environment needed to carry out tests successfully is stated under 5.2.2.11 Environmental Needs.
- Sections 5.2, 5.3, 5.4, 5.5, 5.6 & 5.8 can be referred to for checking Test Plan, Test Design specification, Test Case Specification, Test Procedure Specification, Test Transmittal Report and Test logs.

5.9.2.3. Variances

No Variance

5.9.2.4. Comprehensiveness assessment

The tests were carried out just as they were described in the test plan. All features the tests are conducted against are also described under the test plan.

5.9.2.5. Summary of results

Ten test cases were designed to carry out during testing. All of them carried out successfully and the actual result received matched with the expected result, therefore, all of them declared as pass.

5.9.2.6. Evaluation

The process to carry out the testing was simple and we received the results as we expected them to be like. The thing we have concluded from testing of our system is that if the user follows the user manual provided, then they can work through the system without having to deal with issues.

5.9.2.7. Summary of activities

The items listed under 5.2.2.3 Test Items tested against the features listed under 5.2.2.4. Features to be tested. The duration spent on the testing activities are given below.

Table 5.9.2.7- Table of summary activities

Activities	Member	Time Required
Test Planning and Specification	Ahsan Mehboob	5 days
Perform Testing	Ali Shan And Adnan	15 days
Test Report	Ali Shan And Adnan	7 days
Test Delivery	Ali Shan And Adnan	7 days

5.9.2.8. Approvals

Table 5.9.2.8 – Test summary Report Approvals

Name	Title	Signature
Mr. Adeel Shahzad	Project Supervisor	

Chapter 6: USER TECHNICAL MANUAL (For structured Approach)

A. GENERAL INFORMATION

6.1 System Overview

This project is a web-based application that has been successfully built to facilitate property investment for both low and high-budget investors. The application offers a user-friendly interface and a range of features aimed at providing a seamless experience for users. The objective of this project was to develop a platform that empowers investors by offering them the opportunity to invest their money in various types of properties, including lands, buildings, and houses.

- Empowers investors to invest in lands, buildings, and houses
- Real estate agents post saleable properties on the platform
- Comprehensive database of available land options
- Informed decision-making based on preferences and needs
- Displays houses available for rent
- Provides transparency and property information
- Assess current and future property values
- Flexibility to fully or partially invest for fixed duration
- Collaboration with real estate agents for diverse property selection
- Material estimation module for accurate calculations
- Estimates materials for construction or renovation
- Helps in planning, budgeting, and project management
- Simplifies property investment process
- Transparent information and investment opportunities
- Empowers investors and facilitates buyer-seller interactions

- System name or title: Pay Back
- System code: SM
- System category:
  - Major Application: performs the clearly defined functions which satisfies the needs and requirements along security.
  - General Support System: Provide a general ADP or network support for variety of users.
- Operational status:
  - Partially Operational
  - Under Development

B. SYSTEM SUMMARY

The web-based property investment application is designed to simplify and streamline the property investment process for both low and high-budget investors. The system offers a user-friendly interface with various features to provide a seamless experience. Real estate agents play a vital role in posting saleable properties on the platform, which are then showcased to potential buyers and investors. The application allows buyers to register and access a comprehensive database of available land options. With the information provided by real estate agents, buyers can make well-informed decisions based on their preferences and needs. Additionally, the platform also displays houses available for rent, catering to those seeking temporary accommodation. Transparency is a key focus of the system, providing users with all the necessary information about each property. Investors and buyers can assess the current and future value of a property, enabling them to make informed investment choices. The system offers flexibility to investors, allowing them to fully or partially invest in properties for a fixed duration. The system collaborates with real estate agents to ensure a diverse selection of properties that cater to different investment strategies and budget requirements. It also includes a material estimation module, which accurately calculates the materials required for construction or renovation purposes. This module helps users plan and budget by estimating quantities of various materials such as cement, bricks, steel, wood, and paint.

Overall, the system aims to simplify property investment by providing a user-friendly platform that offers transparent information and investment opportunities. It empowers investors, facilitates interactions between buyers and sellers, and ensures a seamless experience for all users involved.

6.2 Getting Started

6.2.1 Registration and Login

You can login into our system through any Internet browser. You need to register an account. Simply click on the create account and provide the required information, such as your name, email address, and contact details. Don’t Forget to switch into correct user type (such as Seller/Buyer). Create a unique username and password for accessing the application. Once registered, a verification email will be sent to your provided email address. Once you verify it, you can log in using your credentials.

Note: Only email verified user can login to the site.

An email and password are required to login shown in figure 6.2. Follow these steps:

1. Open the website in any browser.
2. Enter the assigned email and password.
3. Click on Login Button.

We will describe the manual guide according to each user (admin, Faculty, Student). Let’s talk a look at admin panel first.

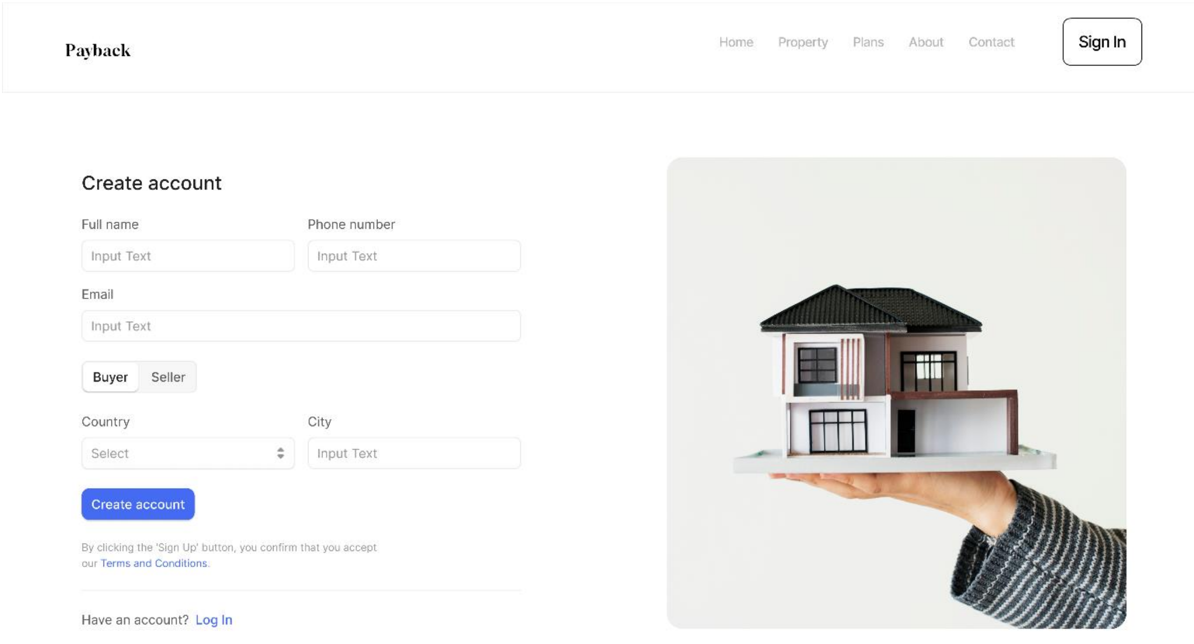

Payback
Home
Property
Plans
About
Contact
Sign In
Create account
Full name
Input Text
Phone number
Input Text
Email
Input Text
Buyer
Seller
Country
Select
City
Input Text
Create account
By clicking the 'Sign Up' button, you confirm that you accept our Terms and Conditions.
Have an account? Log In

Figure 6.1

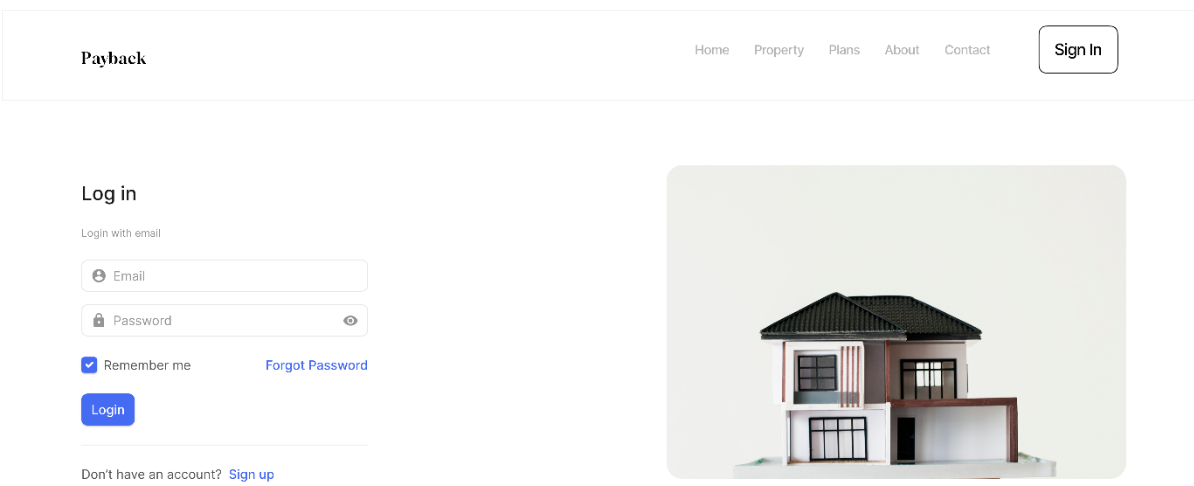

Payback
Home
Property
Plans
About
Contact
Sign In
Log in
Login with email
Email
Password
Remember me
Forgot Password
Login
Don't have an account? Sign up

Figure 6.2

6.2.2 Main Menu

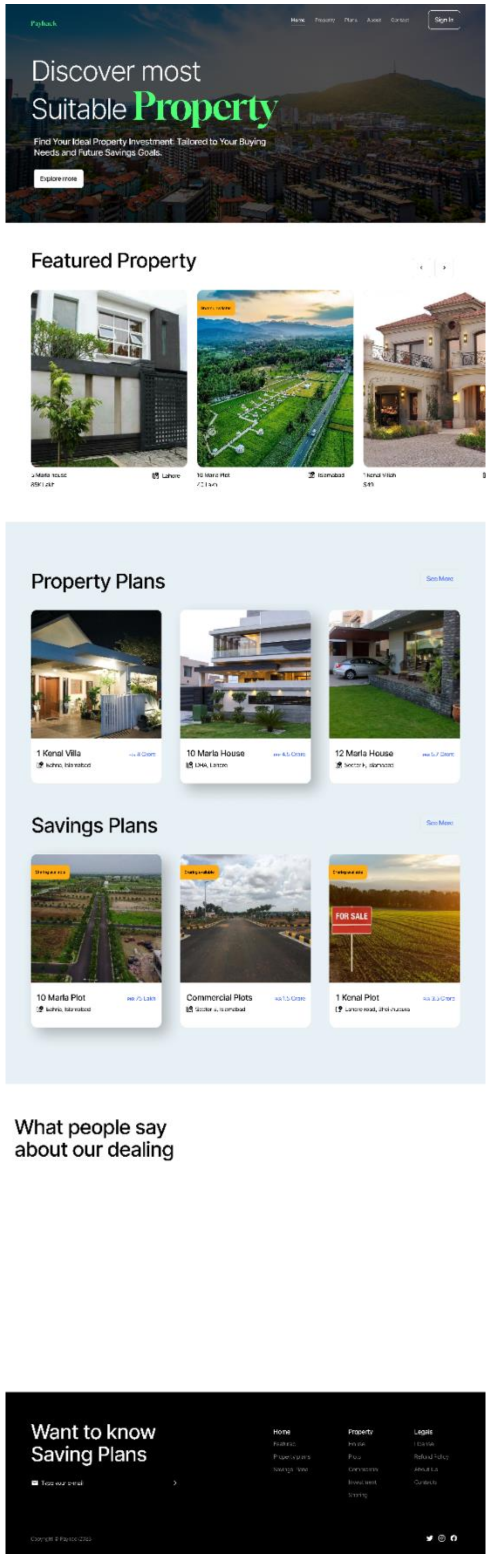


Figure 6.3

6.2.3 User Roles and Permissions

Seller

1. As Log into the system using your assigned email and password.
2. Access the navigation menu and select the "Dashboard" option.
   Menu ⟶ Dashboard

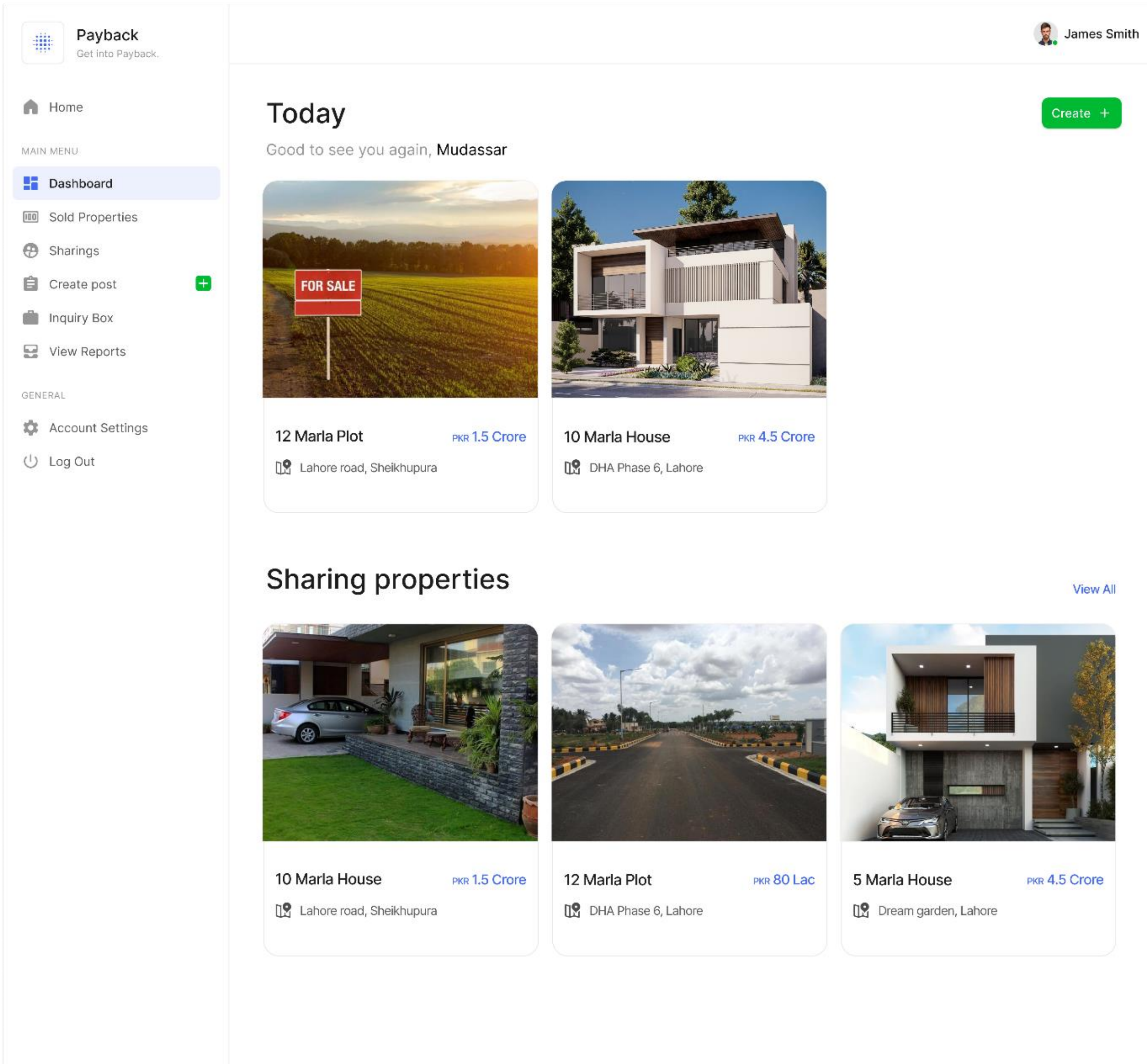


Figure 6.4

3. From the dashboard, click on the "Create Post" button to start listing a new property for sale.
   Dashboard ⟶ Create post

   ➢ Fill in all the required details for the property, such as location, size, amenities, and pricing information.

- ➢ Upload high-quality images of the property to attract potential buyers.
- ➢ Provide additional information about the property, including its current/future value and any special features or selling points.
- ➢ Review the listing details and make any necessary edits before submitting it.

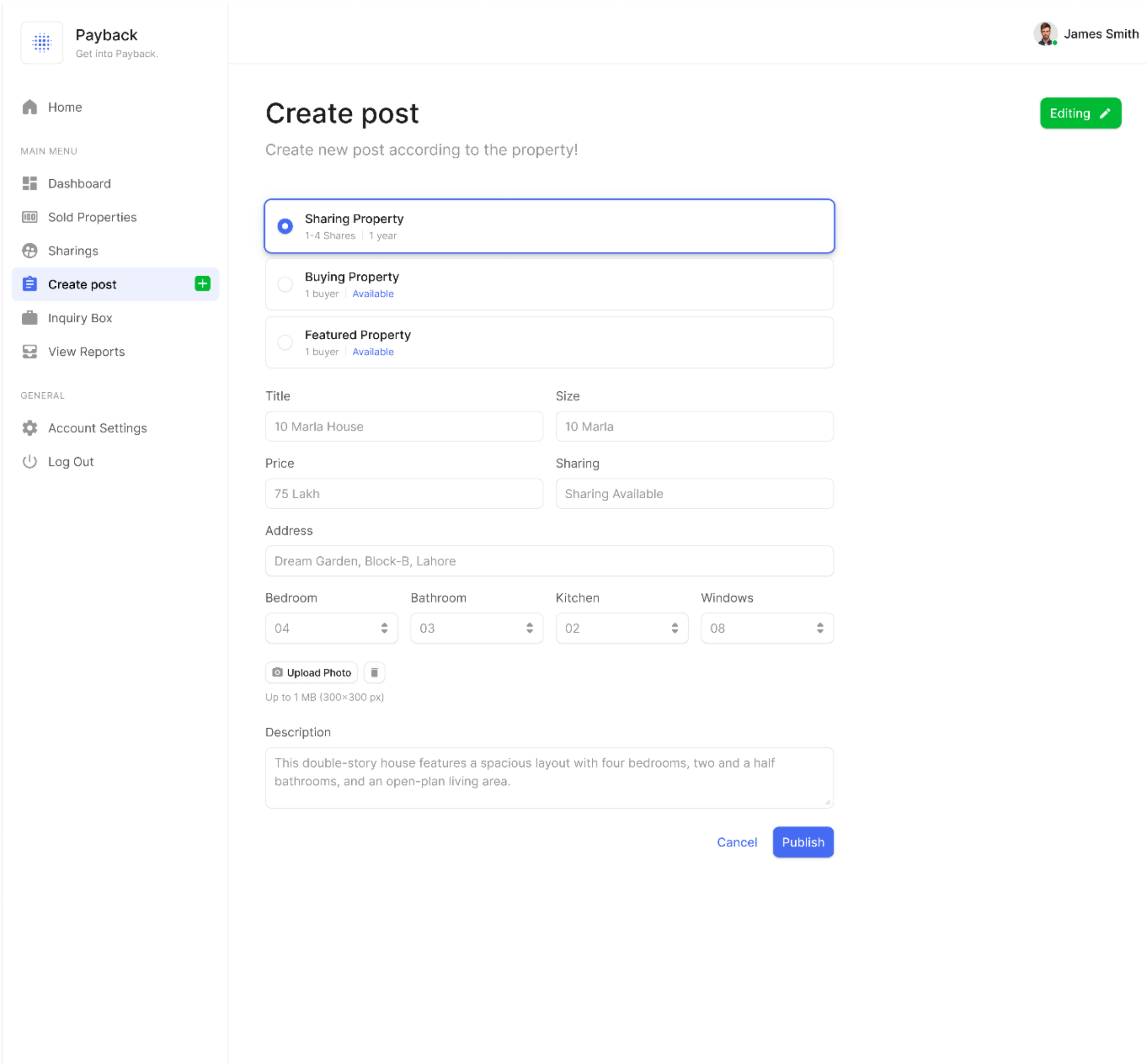


Figure 6.5

4. Once the property listing is submitted, it will go through a verification process by the platform administrators.

5. Respond to inquiries and messages from potential buyers or investors who express interest in the listed property.

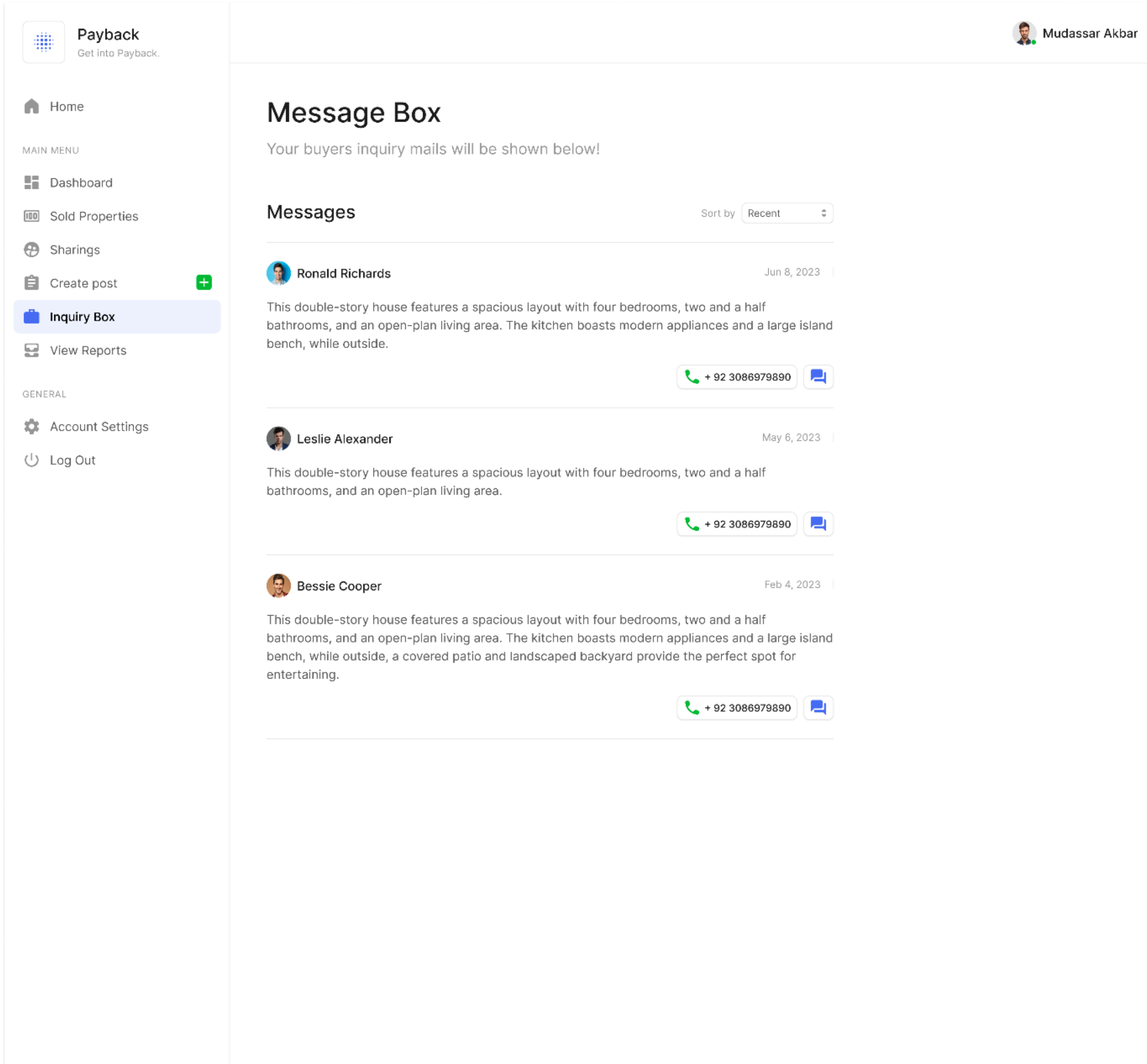


Figure 6.6

6. Keep the property listing up to date by editing with edit button it as needed, such as adjusting the pricing or adding more information.
    1. As the edit button clicked the seller will move to the edit post page where he can make changes according to his own interest.
    2. Click the submit button after complete the editing.
    3. User may delete the post from the edit section.

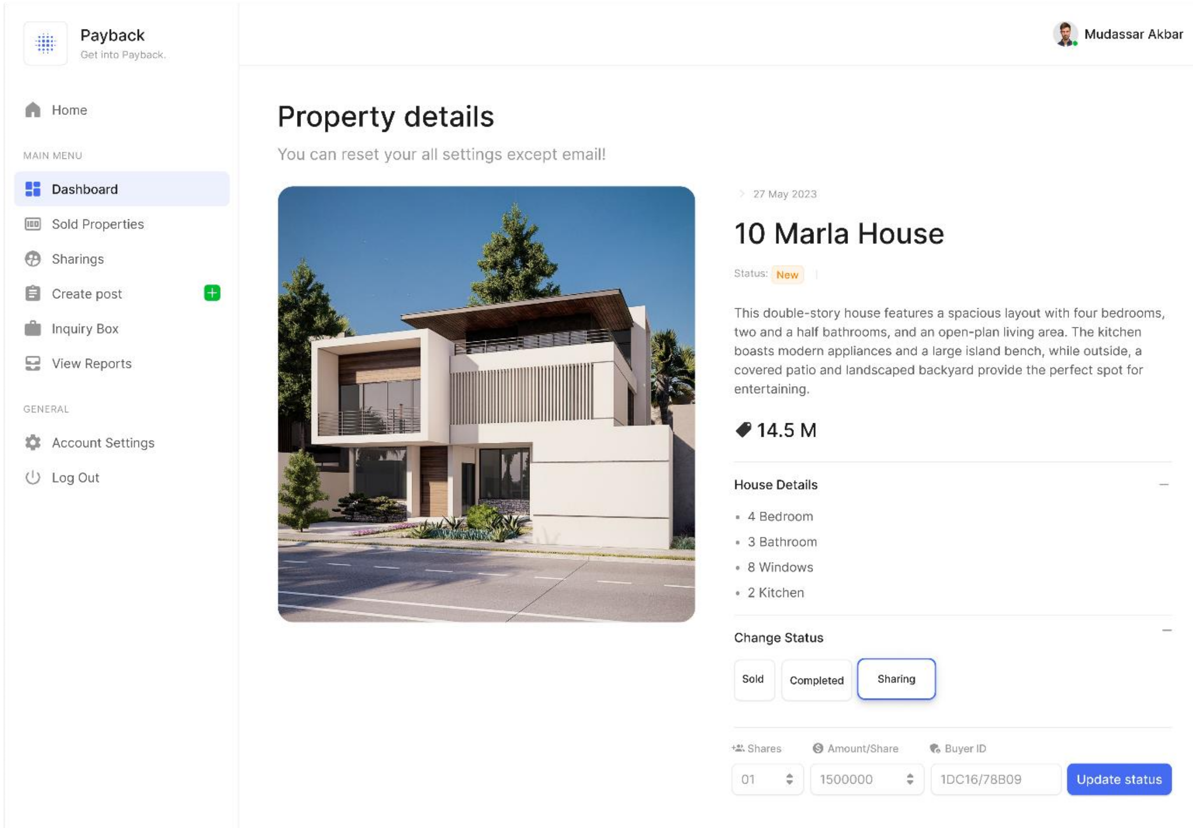
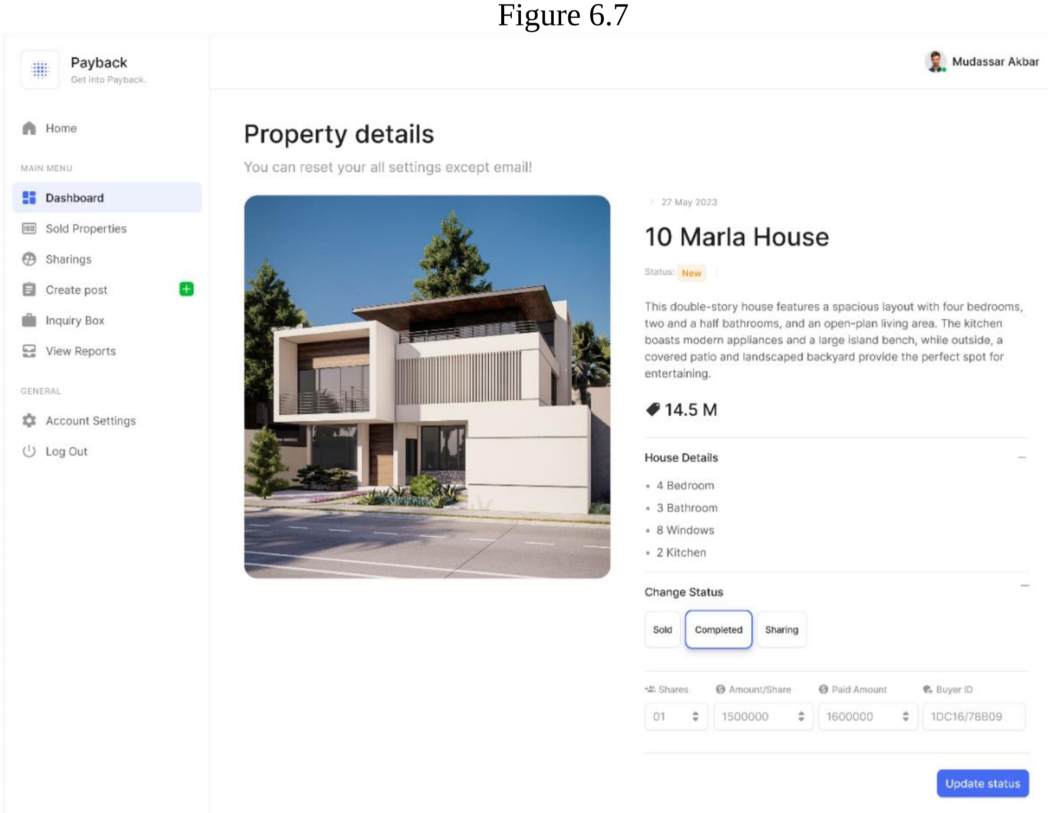

Payback
Get into Payback.
Mudassar Akbar
Home
MAIN MENU
Dashboard
Sold Properties
Sharings
Create post
Inquiry Box
View Reports
GENERAL
Account Settings
Log Out
Property details
You can reset your all settings except email!
27 May 2023
10 Marla House
Status: New
This double-story house features a spacious layout with four bedrooms, two and a half bathrooms, and an open-plan living area. The kitchen boasts modern appliances and a large island bench, while outside, a covered patio and landscaped backyard provide the perfect spot for entertaining.
14.5 M
House Details
4 Bedroom
3 Bathroom
8 Windows
2 Kitchen
Change Status
Sold
Completed
Sharing
Shares
Amount/Share
Buyer ID
01
1500000
1DC16/78B09
Update status

Figure 6.7


Payback
Get into Payback.
Mudassar Akbar
Home
MAIN MENU
Dashboard
Sold Properties
Sharings
Create post
Inquiry Box
View Reports
GENERAL
Account Settings
Log Out
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You can reset your all settings except email!
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3 Bathroom
8 Windows
2 Kitchen
Change Status
Sold
Completed
Sharing
Shares
Amount/Share
Paid Amount
Buyer ID
01
1500000
1600000
1DC16/78B09
Update status

Figure 6.8

7. Monitor the status and progress of property sales through the seller dashboard, which may include tracking offers, negotiations, and accepted deals.
8. Collaborate with the platform administrators or support team to resolve any technical or operational issues related to property listings or the seller account.
9. Adhere to the terms and conditions of the platform, ensuring professional conduct and transparency in all interactions with buyers and investors.
10. To edit seller own details, click on account settings.

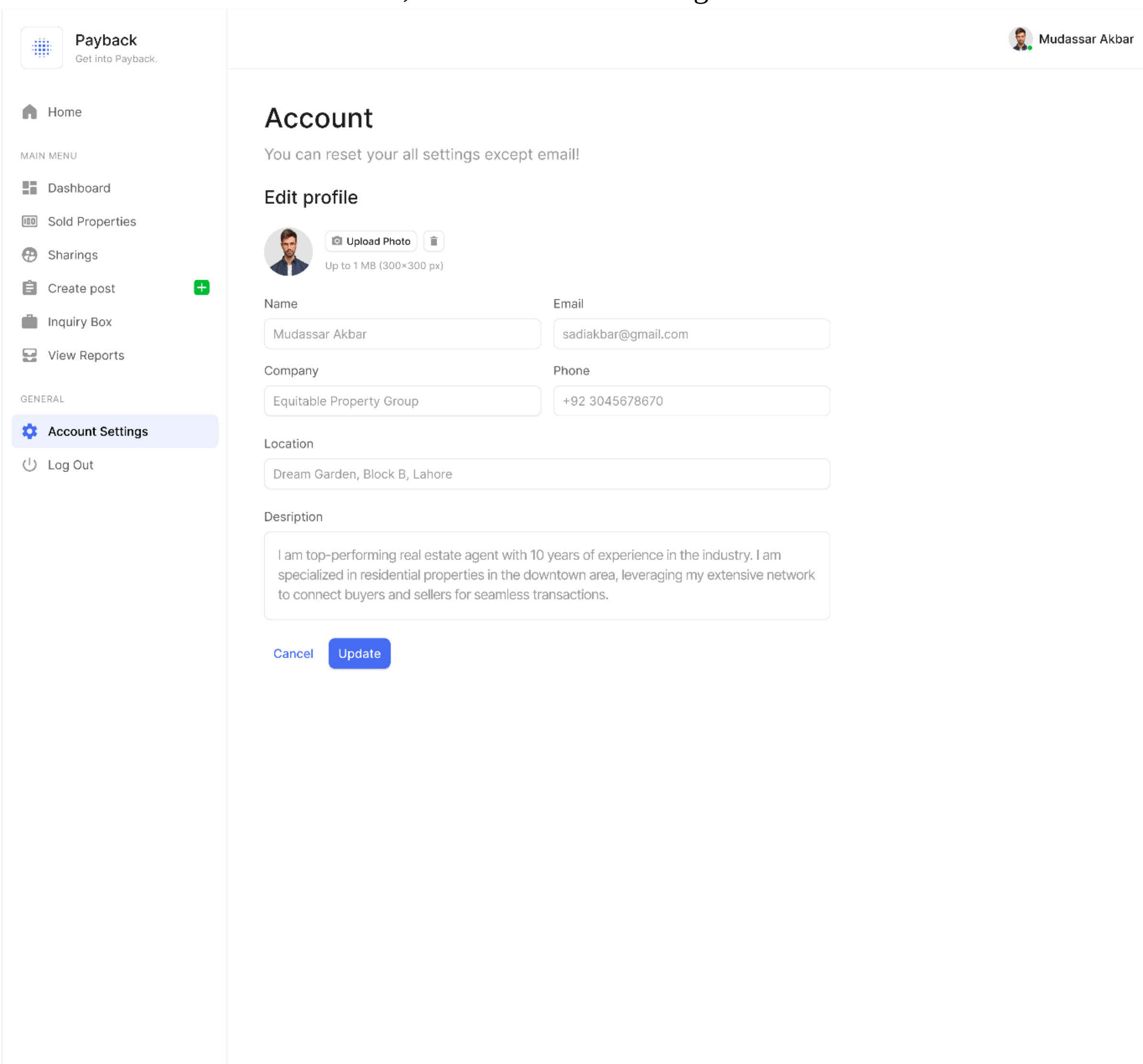

Figure 6.9

Buyer

1. Log into the system using your assigned email and password.
2. From the Home Page, buyer can explore the available properties listed for sale by real estate agents.

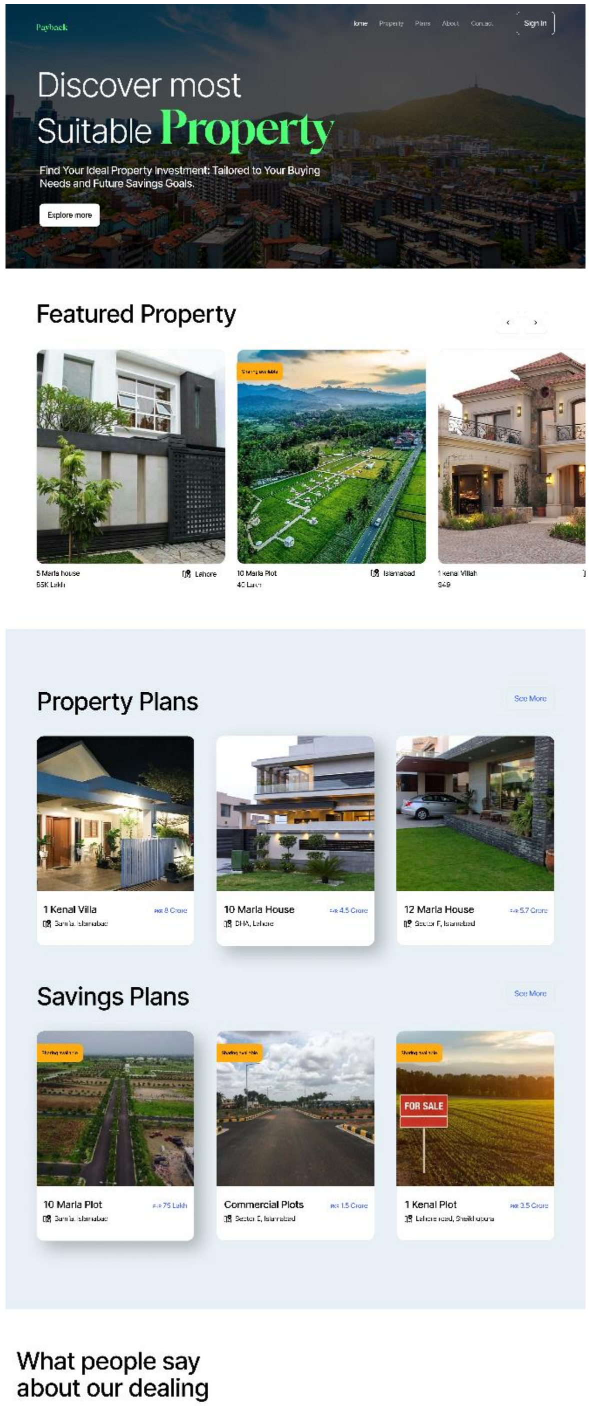

Figure 6.10

3. Utilize search filters and sorting options to narrow down your property search based on criteria such as location, and property type.

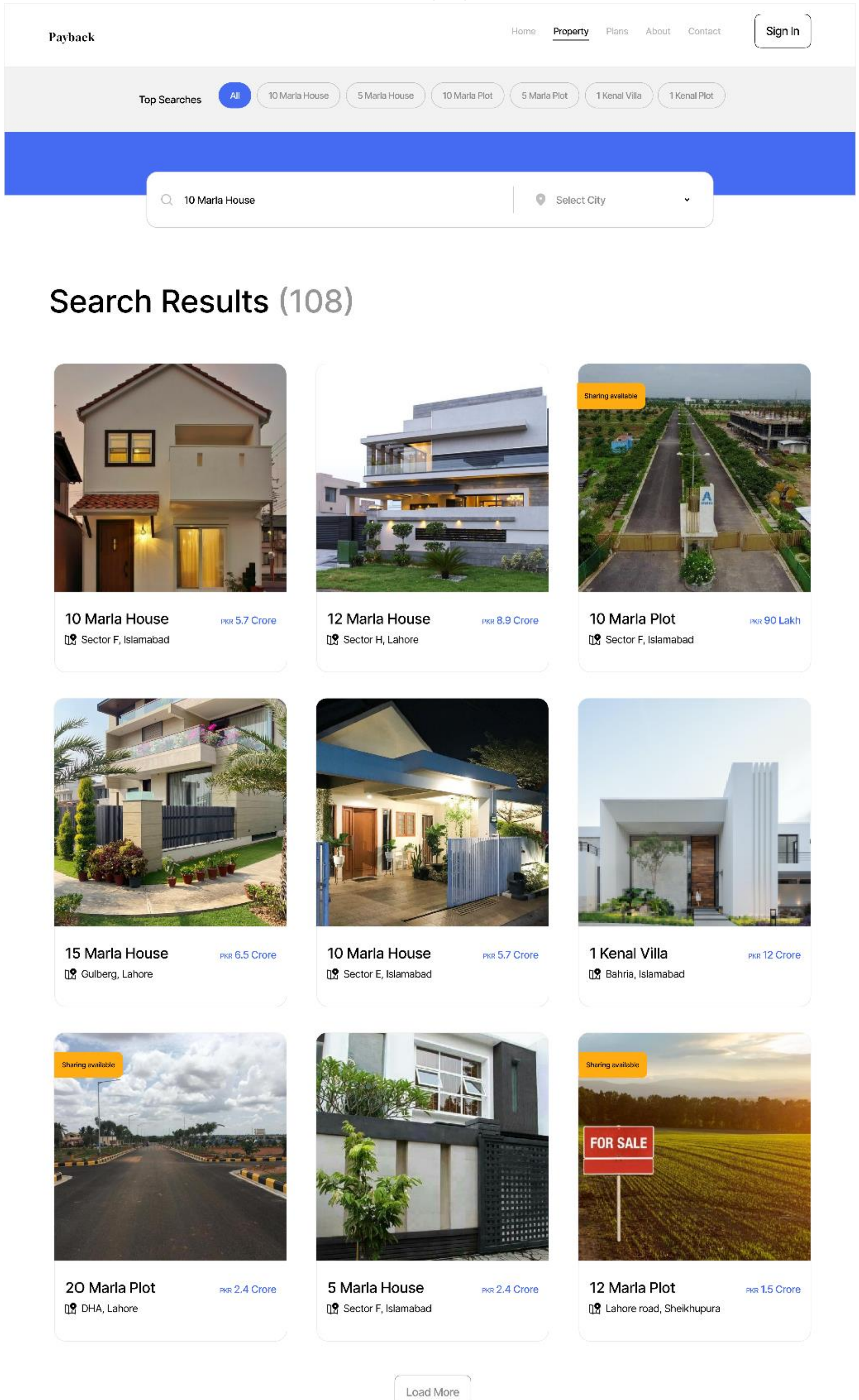

Figure 6.11

4. Click on a property of interest to view detailed information, including its location, size, amenities, and pricing.

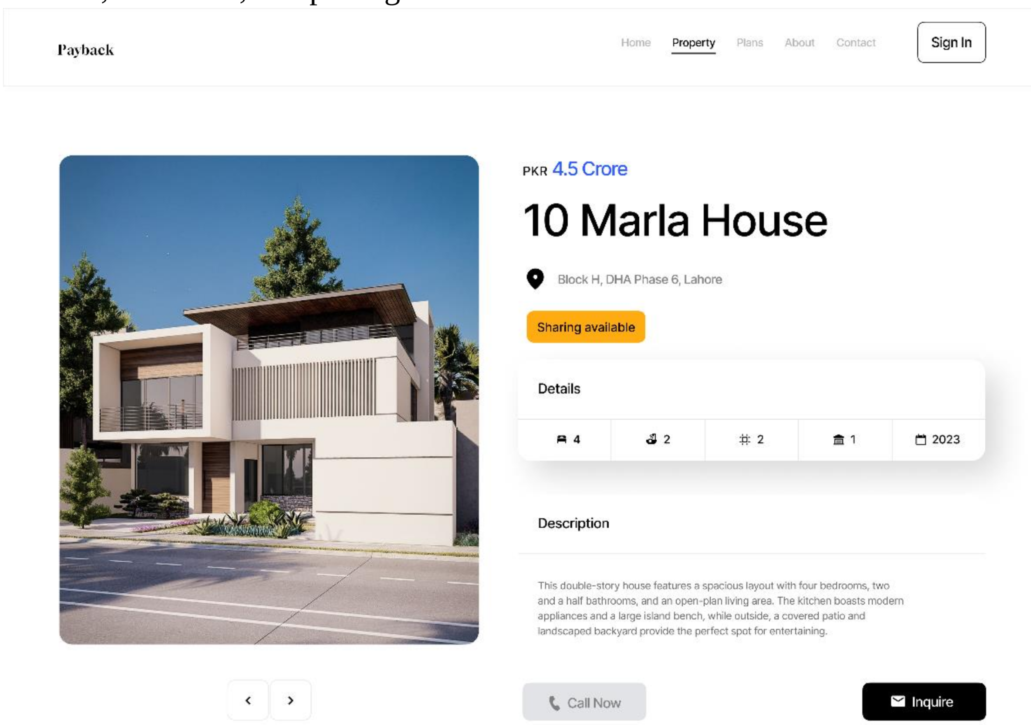

Figure 6.12

5. Examine any additional information provided by the seller, such as the property's current/future value and unique selling points.
6. If you have questions or need more details, use the platform's messaging or inquiry feature to communicate directly with the seller or real estate agent.

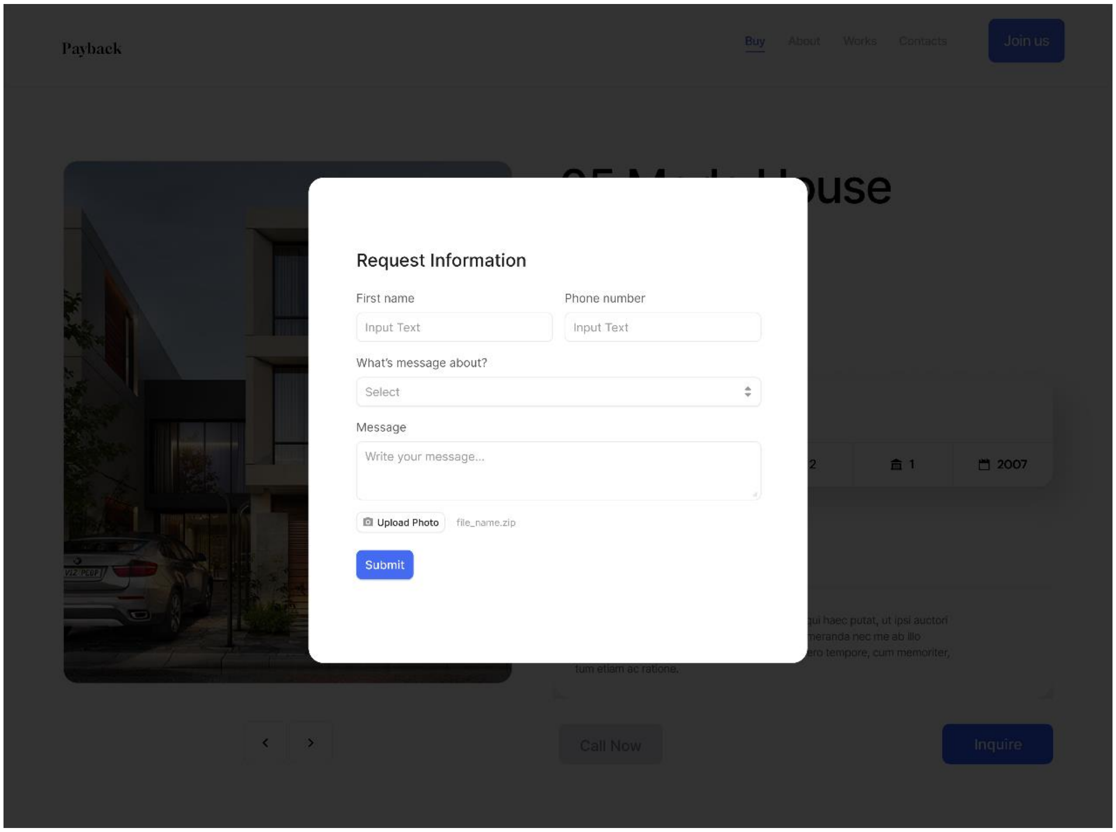

Figure 6.13

7. Compare multiple properties and make informed decisions based on your preferences, budget, and investment goals.
8. When ready to proceed with a purchase, submit an offer or negotiate with the seller through the platform's communication tools.
9. Monitor the status of your offers and negotiations through the buyer dashboard, keeping track of any updates or responses from the seller.

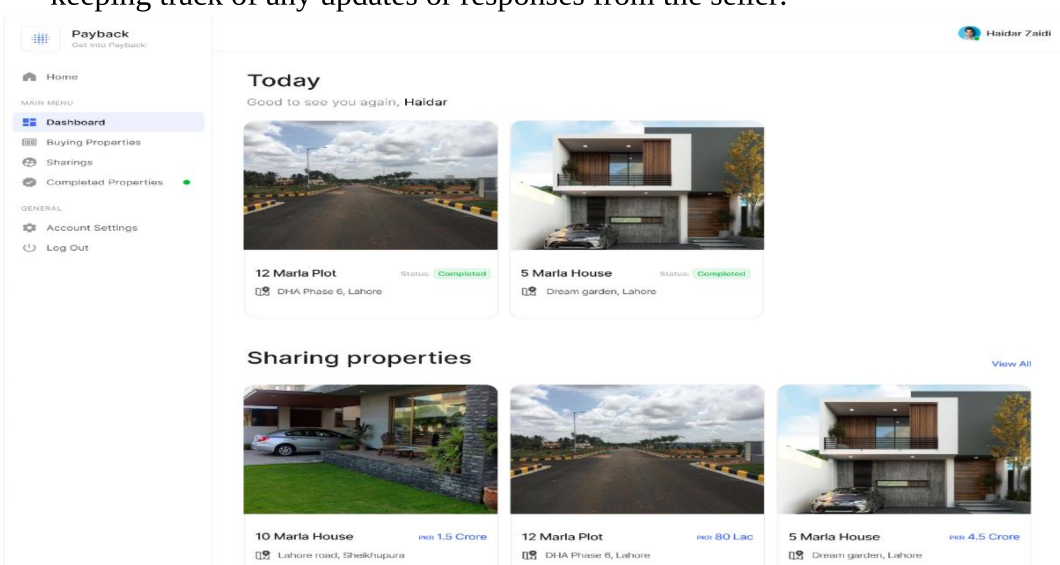

Figure 6.14

10. Finalize the purchase agreement and complete any necessary documentation or payment transactions as guided by the seller.
11. Stay informed about the progress of the purchase, including any inspections, legal procedures, or financing requirements.

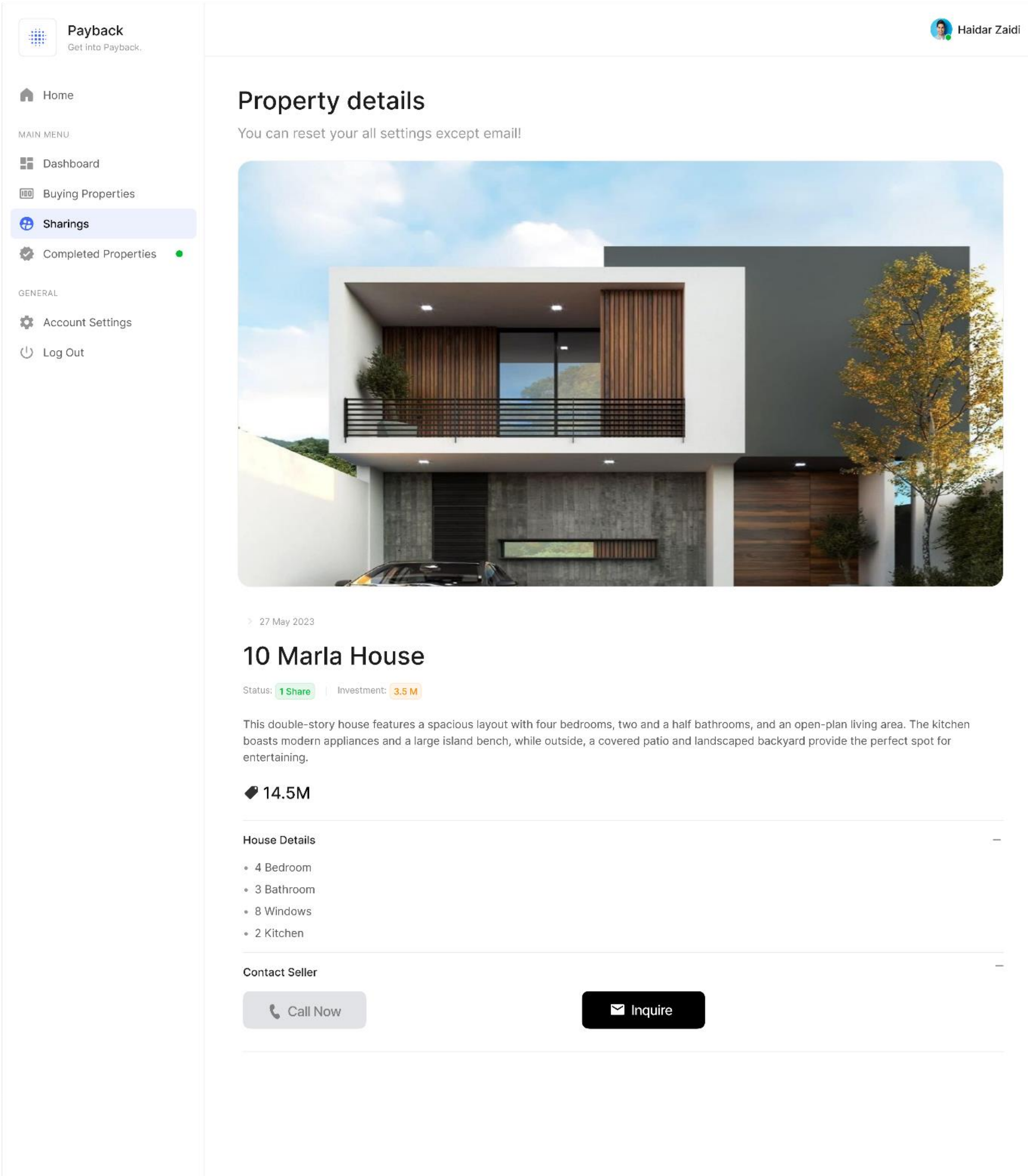

Figure 6.15

12. You can check the analytics of your investments in a specific property.

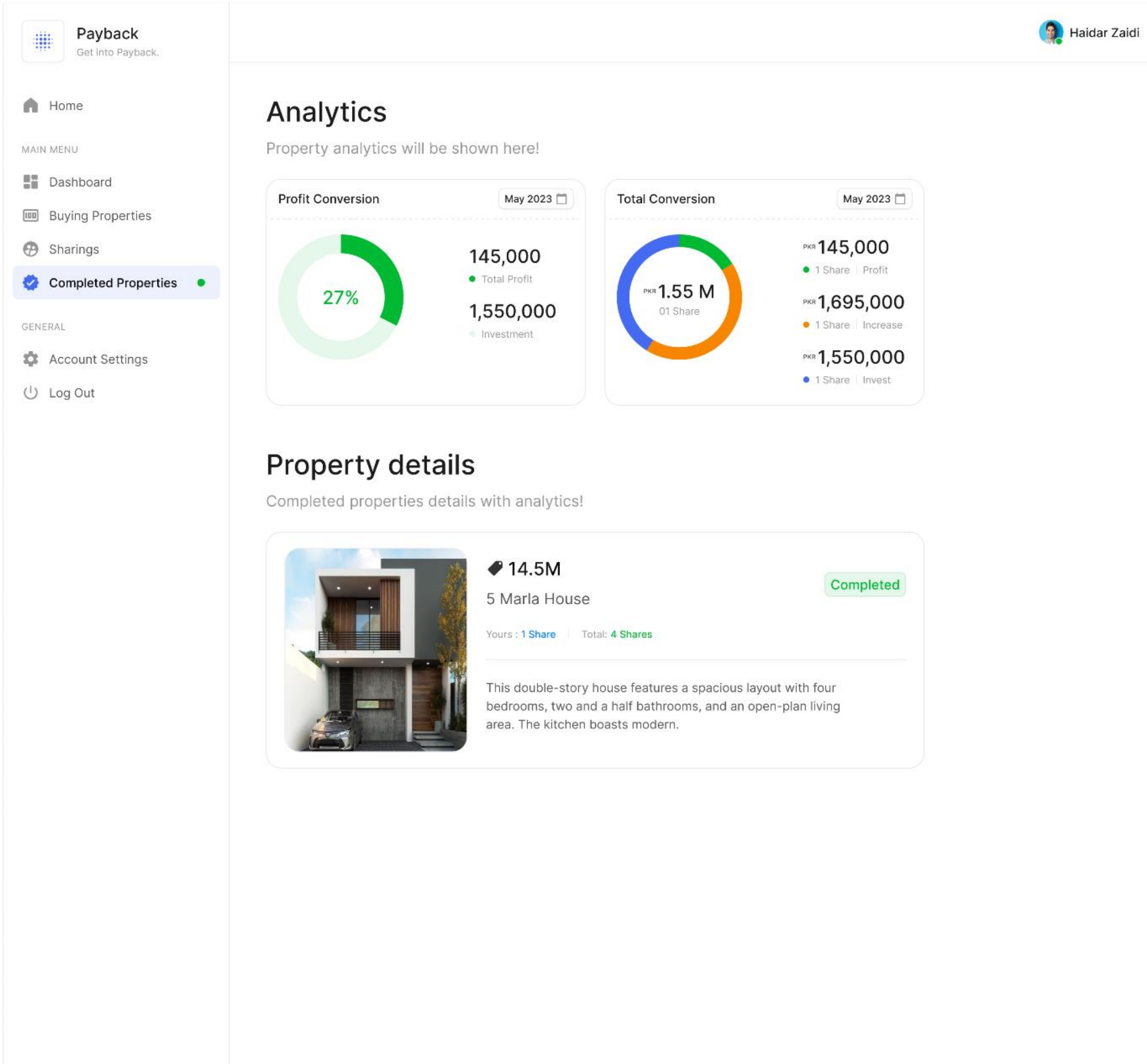

Figure 6.16

13. Seek assistance from the platform's customer service or support team if you have any technical issues or need guidance during the buying process.
14. Adhere to the terms and conditions of the platform, maintaining professional conduct and respectful communication with sellers and real estate agents.
15. Provide feedback and ratings for the sellers and properties you interact with, contributing to the platform's reputation and assisting future buyers in their decision-making process.
16. To update profile, click on Account Settings.

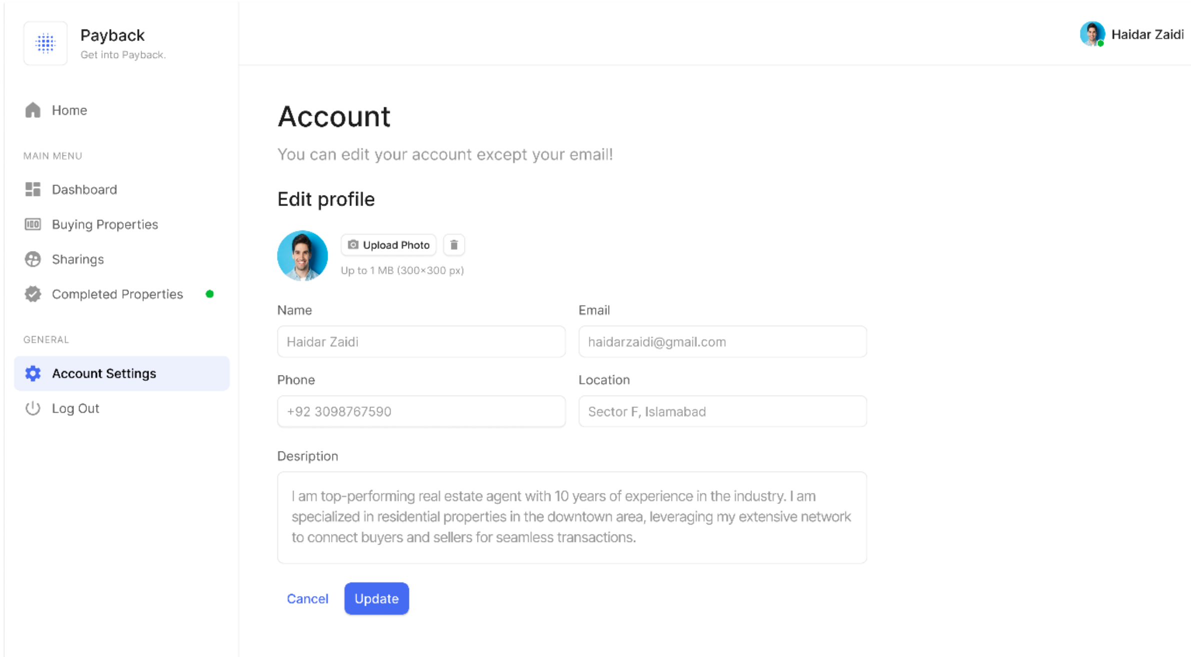

Figure 6.17

Buyer and Seller combine

1. To Calculate material press Material Calculator from the home page.
2. Insert all the inputs and press calculate.

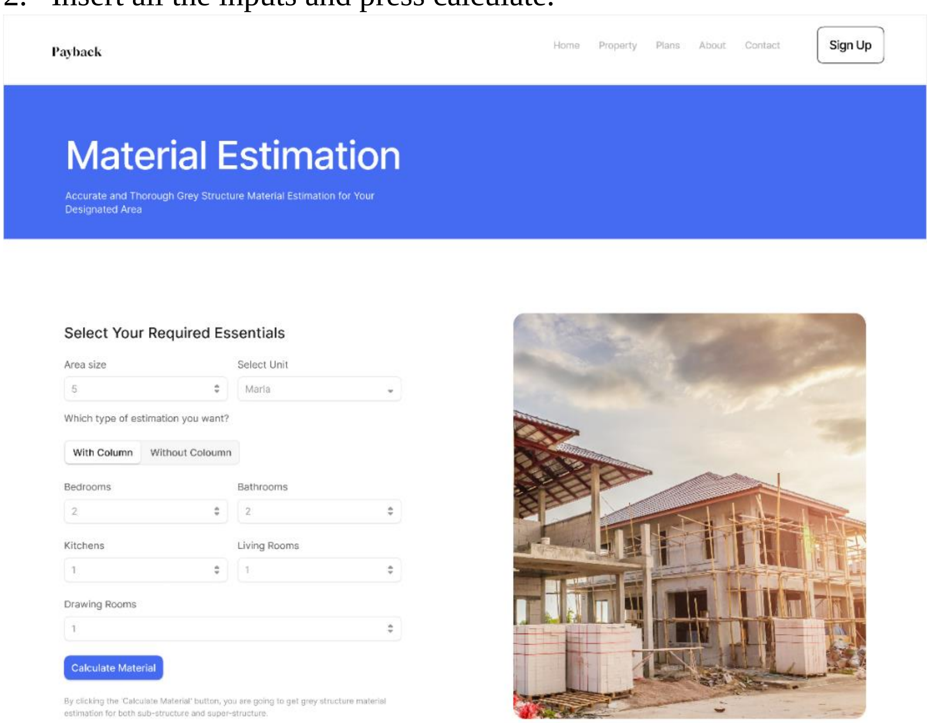

Figure 6.18

3. At first total calculation will be shown.

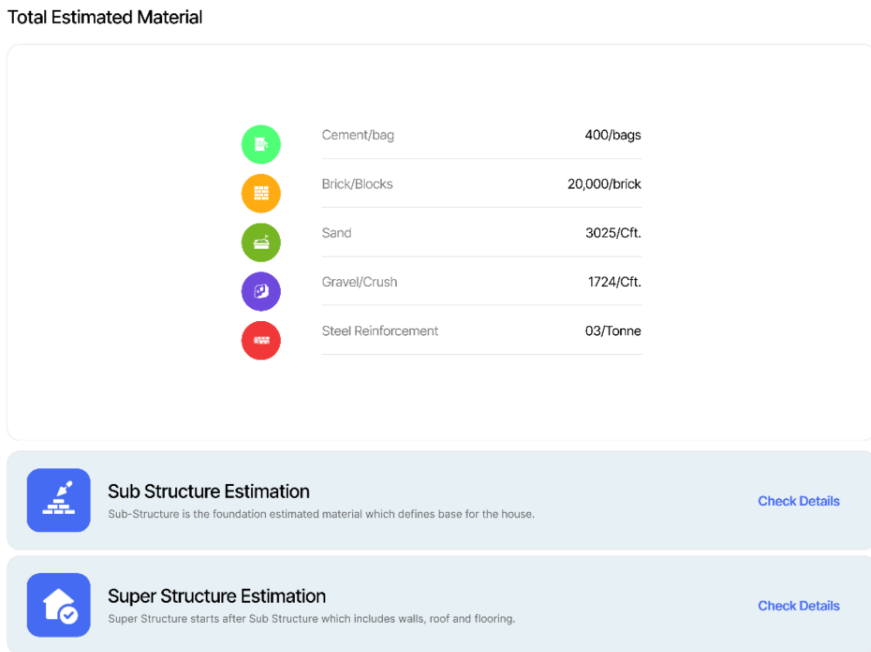

Figure 6.19

4. You can use drop down buttons to know sperate calculation of both Sub and Supper Structure.

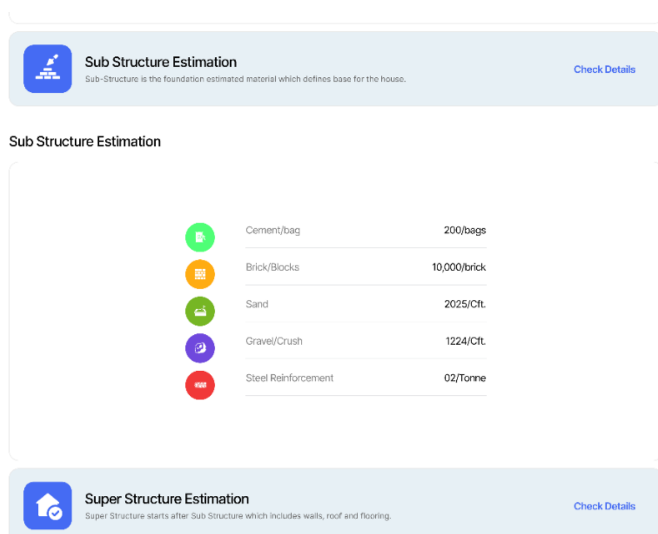

Figure 6.20

6.2.4 Logout

All the users will have same functionality to log out of the system. On top right corner, user can select logout option from the dropdown list to sign out of the system shown in figure.

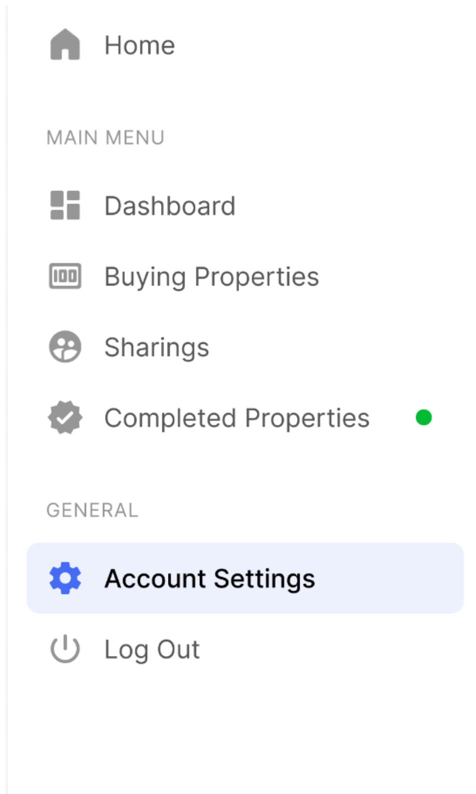

Figure 6.21

6.3 Special Instructions for Error Correction

The utilization of outdated browsers, webcams, and microphones may lead to issues, causing potential challenges. Similarly, the absence of these components can result in expected complications. Furthermore, the system's functionality relies on the availability of an internet connection, and its operation will be hindered in the absence of internet access.

6.4 Caveat and exceptions

This system is only used to facilitate all local Real Estate Agents and buyers. There is no any payment module, therefore no any payment can be made through this site. Although, it can be updated to accept payments through it.