MP Project Report on

ELITE ESTATE

at

U.V. Patel College of Engineering

Project Guide:
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U.V. PATEL COLLEGE OF ENGINEERING

06/03/25

C E R T I F I C A T E

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Ms. Sathwara Priyanshi** student of **B.Tech. Semester VII (Computer Engineering)** has completed her full semester Minor Project titled "**Elite Estate**" satisfactorily in partial fulfillment of the requirement of Bachelor of Technology degree of Computer Engineering at Ganpat University, Ganpat Vidyanagar, Mehsana in the year 2025.

Project Guide

Sign
Prof. Megha Patel

Dr. Paresh M.Solanki
Head, Computer Engineering

U.V. PATEL COLLEGE OF ENGINEERING

06/03/25

C E R T I F I C A T E

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This is to certify that **Ms. Mausam M Patel** student of **B.Tech. Semester VII (Computer Engineering)** has completed her full semester Minor Project titled "**Elite Estate**" satisfactorily in partial fulfillment of the requirement of Bachelor of Technology degree of Computer Engineering at Ganpat University, Ganpat Vidyanagar, Mehsana in the year 2025.

Project Guide

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Prof. Megha Patel

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U.V. PATEL COLLEGE OF ENGINEERING

06/03/25

C E R T I F I C A T E

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Ms. Krisha D Patel** student of **B.Tech. Semester VII (Computer Engineering)** has completed her full semester Minor Project titled "**Elite Estate**" satisfactorily in partial fulfillment of the requirement of Bachelor of Technology degree of Computer Engineering at Ganpat University, Ganpat Vidyanagar, Mehsana in the year -2025.

Project Guide

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Prof. Megha Patel

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Abstract

Vacation Rental is a peer-to-peer online marketplace that allows individuals to rent out their homes or apartments to travellers. It offers a wide range of accommodation options, from entire homes to private rooms. Guests can search for properties based on location, price, amenities, and reviews. Once they find a suitable property, they can book it directly through the platform and communicate with the host. Hosts can list their properties, set their own prices, and manage their bookings. Vacation Rental also provides tools for hosts to manage their listings, communicate with guests, and handle payments. The platform facilitates secure payments and offers a dispute resolution process. Additionally, Vacation Rental offers Experiences, which are activities and tours hosted by locals.

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1. INTRODUCTION

1.1 Project Overview

Elite Estate is a comprehensive Real Estate Property Management System developed using the MERN stack. The platform is designed to revolutionize the real estate experience by creating a single, transparent, and efficient hub for buyers, sellers, and agents. It integrates core functionalities such as property listings and search with unique features like a real-time buyer-seller chat, a transparent offer-and-counter-offer system, and community-driven neighborhood reviews. The system's primary goal is to address the inefficiencies of the current real estate market by providing a modern, user-friendly, and data-backed solution for all stakeholders involved in property transactions

1.2 Project Background

The motivation for Elite Estate stems from the widespread issues in the traditional real estate landscape, which is often characterized by inefficiency, a lack of transparency, and reliance on fragmented information. Existing market players, such as MagicBricks and 99acres, offer property listings but fall short in providing real-time communication, a structured negotiation process, and community insights. This project was initiated to create a platform that not only manages property transactions but also builds a foundation of trust and efficiency through innovative, user-centric features, thereby filling the void left by existing solutions.

1.3 Purpose

The purpose of this Software Requirements Specification (SRS) document is to provide a comprehensive and detailed outline of the functional and non-functional requirements for the Elite Estate project. This document will serve as a foundational reference for all project stakeholders, including developers, testers, project managers, and designers. It aims to eliminate ambiguity, ensure a shared understanding of project scope and goals, and guide the entire software development lifecycle, from design and implementation to testing and deployment, ensuring the final product meets the defined specifications.

1.4 Problem Statement

The current process of buying and selling real estate is often inefficient and opaque. Buyers struggle to find accurate, centralized information and must often navigate multiple platforms and brokers, leading to increased costs and frustration. Sellers face similar challenges in managing inquiries, reaching genuine buyers, and tracking the status of their listings. Existing real estate platforms lack critical features like real-time communication, transparent negotiation tools, and community-based feedback, which are essential for building trust and streamlining the process in a single, modern application.

1.5 Tools And Technologies

Elite Estate is built on the MERN stack, which stands for MongoDB, Express.js, React.js, and Node.js. MongoDB serves as the NoSQL database for flexible data storage, while Express.js and Node.js form the robust backend server environment. The frontend user interface is developed using React.js, which ensures a dynamic and responsive user experience. Additionally, the platform leverages WebSockets for real-time communication features, allowing for instant buyer-seller chat. The use of these modern, open-source technologies provides a scalable and efficient architecture to support the application's unique functionalities.

1.6 Literature Survey

Website	Core Features	Unique Features (Present)	Missing Features (vs. Elite Estate)
MagicBricks	Property listings (sale/rent), advanced search filters, photo galleries, agent contact details, new projects, commercial listings.	Rental Yield Calculator, Property Price Trends & Insights, Home Loans, e-Registration.	Direct in-platform Offer & Counter-Offer system, Integrated Real-time Buyer-Seller Chat, Community-driven Neighborhood Reviews & Ratings, Visual Property Status Tracking.
99acre	Property listings (sale/rent), verified listings, detailed property information, owner/agent contact, home loan assistance, news & blogs.	Interactive Map Search, Locality/Building Reviews, Rental Yield Calculator, Home Loan eligibility check, project overview videos.	Direct in-platform Offer & Counter-Offer system, Integrated Real-time Buyer-Seller Chat.
Housing.com	Property listings (sale/rent), advanced search, photos & videos, home services, property valuation, rent agreements.	**(Has some overlap)** Community Reviews, House price trends, EMI calculator, interactive maps.	Direct in-platform Offer & Counter-Offer system, Real-time Buyer-Seller Chat, Visual Property Status Tracking, Saved Search and Alerts.
NoBroker	Verified property listings from owners, direct contact with owners, home services	Brokerage-free transactions, Real-time Chat with Owners, Online	Direct in-platform Offer & Counter-Offer system, Community-driven Neighborhood

	(packers & movers, cleaning).	Rental Agreements, Home Services.	Reviews & Ratings (focused more on owners/tenants), Visual Property Status Tracking.
Makaan.com	Property listings (sale/rent), property search, home loan eligibility, home interior services.	Property Price Trends, Locality Guides.	Real-time Buyer-Seller Chat, Offer & Counter-Offer system, Rental Yield Calculator, Neighborhood Reviews & Ratings, Visual Property Status Tracking.
Zillow	Property listings, home valuation ("Zestimate"), mortgage calculators, interactive maps, foreclosure listings.	**(Has some overlap)** "Make Me Move" for off-market listings, Zillow Offers (direct home buying), 3D Home Tours.	Integrated Real-time Chat (though they have a message system), Community-driven Neighborhood Reviews & Ratings.
Trulia	Property listings, neighborhood insights, interactive maps, school ratings, local crime rates.	**(Has some overlap)** Detailed Neighborhood Information (including local businesses, schools), interactive crime maps.	Direct in-platform Offer & Counter-Offer system, Real-time Buyer-Seller Chat, Visual Property Status Tracking, Rental Yield Calculator.

Table 1.6.1 Literature Survey

2. PROJECT SCOPE

2.1 Objective

The primary objective of the Elite Estate project is to develop a comprehensive, MERN stack-based Real Estate Property Management System that streamlines property transactions for buyers, sellers, and agents. The platform aims to reduce market inefficiencies and enhance user trust by providing a secure, transparent, and user-friendly environment. Key goals include facilitating real-time communication between users, enabling a structured negotiation process, and offering data-driven insights through community reviews and financial calculators. The system is designed to provide a competitive edge by consolidating all essential real estate tools into a single, cohesive platform

2.2 Features and Functionality

Elite Estate will encompass a wide range of features tailored to its key user roles.

Buyer Features:

- **Property Search & Filter:** Search for properties based on location, type, price range, and other criteria.
- **Real-Time Chat:** Instantly communicate with sellers to ask questions and schedule viewings.
- **Offer & Counter-Offer:** Submit formal offers on properties and track the status of negotiations.
- **Neighborhood Reviews:** View and contribute to community ratings and reviews of localities.
- **Property Status Tracking:** Monitor the progress of a property transaction (e.g., Available, Negotiation, Sold).

Seller Features:

- **Property Listing Management:** List, update, and track properties with detailed information and photos.
- **Real-Time Inquiry Management:** Receive instant messages from potential buyers.
- **Negotiation System:** Accept, reject, or counter offers directly from the platform.
- **Property Status Updates:** Visually track and update the status of listed properties.

Admin Features:

- **User Management:** Manage and Moderate user profiles and roles(e.g., buyer, seller, agent)
- **Content moderation:** Oversee and moderate neighbourhood reviews and property listings to ensure quality and authenticity.
- **System Analytics:** Access dashboards for insights into user activity and platform performance.

2.3 Security and Compliance

2.3.1 Security Measures

Security is a fundamental component of Elite Estate, ensuring the protection of all user and transaction data.

- Data Encryption: All sensitive data, including communication and financial information, will be encrypted both in transit (using SSL/TLS) and at rest
- User Authentication and Authorization: The system will use secure authentication protocols to verify user identities. A role-based access control (RBAC) model will be implemented to ensure users only access features relevant to their assigned roles (buyer, seller, or admin).
- Vulnerability Management: Regular security audits and penetration testing will be conducted to identify and patch vulnerabilities proactively. Secure coding practices will be followed to prevent common web attacks like SQL injection.
- Data Backup and Recovery: A robust data backup and recovery plan will be in place to ensure business continuity and data integrity in the event of a system failure or data loss.

2.3.2 Compliance

Compliance with data protection and privacy regulations is essential for maintaining trust and fulfilling legal obligations.

- Data Protection**:** The platform will comply with relevant data protection laws (e.g., GDPR, CCPA) to safeguard personal user information.
- Privacy Policy: A clear and accessible privacy policy will detail how user data is collected, used, and protected, and will require explicit user consent.

By adhering to these security measures and compliance standards, elite estates ensures a safe, trustworthy, and legally compliant environment for users.

2.4 Scalability and Performance

Elite Estate is engineered for high performance and scalability to handle a growing user base and increasing transaction volume without compromising efficiency.

2.4.1 Scalability

- **Microservices Architecture:** The application is built on a modular architecture, with services for chat, listings, and negotiations, allowing for independent scaling of each component to handle specific high-traffic areas.

- **Cloud Infrastructure:** The system will be deployed on a cloud platform (e.g., AWS, GCP) to leverage dynamic resource allocation and horizontal scaling, ensuring smooth operation during peak usage periods.
- **Database Optimization:** MongoDB is used for its horizontal scalability and flexibility. Sharding strategies will be employed to distribute data across multiple servers as the database grows, ensuring fast query performance.

2.4.2 Performance

- **Real-Time Optimization:** The real-time chat feature uses WebSockets for minimal latency. Asynchronous processing will be used for computationally intensive tasks like image uploads.
- **Caching:** Caching mechanisms will be implemented for frequently accessed data, such as popular property listings, to reduce database load and improve response times.
- **Performance Monitoring:** Continuous monitoring tools will track system metrics to identify bottlenecks and allow for timely performance tuning, ensuring a seamless user experience.

By focusing on both scalability and performance, elite estates is designed to ensure high availability, smooth real-time communication, and an optimal user experience, even as the system grows and becomes more complex.

2.5 Testing and Quality Assurance

A rigorous testing and quality assurance process will be followed to ensure the delivery of a reliable and high-quality product.

2.5.1 Testing

- Functional Testing**:** This will verify that all features, including the search, chat, and offer systems, work as specified in the requirements.
- Integration Testing: This will confirm that different modules, such as the frontend and backend, and third-party integrations (e.g., for mapping), work together seamlessly.
- Performance Testing: Load and stress tests will be conducted to ensure the application can handle a large number of concurrent users and transactions without performance degradation.
- Security Testing: Penetration testing and vulnerability scans will be performed to identify and mitigate potential security weaknesses.
- Usability Testing: The user interface and user experience will be tested with target users to ensure the platform is intuitive and easy to navigate.

2.5.2 Quality Assurance

Quality assurance focuses on ensuring that the software development process and deliverables meet predefined quality standards. Key components include:

- **Test Plan:** A comprehensive test plan will outline the testing scope, strategy, and resources to ensure thorough coverage.
- **Test Automation:** Automated test scripts will be developed for key functionalities to support continuous integration and regression testing, improving the efficiency of the QA process.
- **Defect Management:** A structured defect management process will be used to log, track, and prioritize bugs, ensuring they are resolved in a timely manner before product release.

By rigorously adhering to these testing and quality assurance practices, Elite estates aims to deliver a robust, reliable, and high-quality software solution that meets user expectations and business requirements.

3. FEASIBILITY ANALYSIS

3.1 Technical Feasibility

1. Technology Stack Availability:
   a. Frontend: React, Vue.js, Angular (for responsive UI development).
   b. Backend: Node.js, Django, Ruby on Rails (for scalable server-side logic).
   c. Database: PostgreSQL, MySQL, or MongoDB (for managing user and booking data).
   d. Cloud Infrastructure: AWS, Azure, or Google Cloud (for hosting and scalability).

2. Skills And Expertise:
   a. Development team needs expertise in web development, cloud services, and API integration.
   b. DevOps knowledge for deployment and CI/CD setup.

3. Integration Requirements:
   a. Payment gateways (Stripe, PayPal) for secure transactions.
   b. Third-party APIs for maps (Google Maps), SMS notifications, and user verification.

3.2 Economic Feasibility

Objective: Assess the financial viability of the project.

1. Cost Estimation:
   a. Development Costs: $150,000–$500,000 (based on complexity, team size, and timeline).
   b. Infrastructure Costs: $2,000–$5,000/month (cloud services, APIs, hosting).
   c. Marketing Costs: $10,000–$50,000 for launch and ongoing promotion.
   d. Operational Costs: Salaries, maintenance, customer support.
2. Revenue Potential:
   a. Service Fees: Percentage of booking amount (e.g., 10–15%).
   b. Premium Listings: Hosts pay for enhanced visibility.
   c. Advertising Revenue: From travel services, local experiences.
3. Break-Even Analysis:
   a. Revenue depends on active user base and average booking value.
   b. Estimated break-even in 12–18 months with a strong marketing strategy.

3.3 Operational Feasibility

Objective: Determines if the project can be operationalised.

1. User management:
   a. Efficient registration, authentication, and role management (Hosts/Guests).
   b. Customer support mechanisms for dispute resolution.

2. Platform Maintenance:
   a. Regular updates to fix bugs, add features, and ensure scalability.
   b. Monitoring tools for performance and security.
3. Customer Experience;
   a. User-friendly interface for seamless booking and hosting experiences.
   b. n-app communication for guest-host interaction.

3.4 Legal Feasibility

Objective: Ensure Compliance with legal requirements and regulations.

1. Local Regulations:
   a. Compliance with short-term rental laws (varies by country/city).
   b. Tax regulations (collecting and remitting occupancy taxes).
2. User Data protection:
   a. GDPR (Europe) and CCPA (California) compliance for data privacy.
   b. Secure storage and processing of user data (encrypted databases).
3. Payment Compliance:
   a. Adherence to PCI-DSS standards for secure payment processing.

3.5 Schedule Feasibility

Estimated Timeline: 5.5 to 7 months (22-29 weeks)

- Project Initialization: 1 week
- Requirements Gathering : 2-3 weeks
- System Design: 3-4 weeks
- Development: 10-12 weeks
- Testing: 3-4 weeks
- Deployment: 2-3 weeks

4. Functional and Non-Functional Requirements

4.1 Functional Requirements:

1. User Management:

- Users can register and log in as Hosts or Guests.
- Implement multi-factor authentication (MFA) for secure logins.
- Profile management for updating personal details, preferences, and payment methods.

2. Property Listing:

- Hosts can create, edit, and delete property listings.
- Upload photos, add descriptions, set pricing, and availability.
- Option to mark properties as "Featured" or "Discounted."

3. Search and Filtering:

- Guests can search for properties based on location, price, amenities, and availability.
- Map-based search integration (Google Maps).
- Sorting options: Price (low to high), Ratings, Popularity.

4. Booking System:

- Guests can book properties with specified check-in and check-out dates.
- Hosts receive booking requests and can accept or decline.
- Instant booking option for verified users.

5. Payment Processing:

- Secure payment transactions via Stripe, PayPal, or Credit/Debit Cards.
- Automatic currency conversion for international users.
- Refund and cancellation policies integrated.

6. Reviews And Ratings:

- Guests can rate and review properties after a stay.
- Hosts can respond to reviews.
- Star rating system (1 to 5 stars).

7. Messaging System:

- In-app messaging for communication between Guests and Hosts.

- Notification system (email, SMS, push notifications).

8. Security And Compliance:

- User verification via government-issued ID and email verification.
- Secure handling of sensitive information (GDPR, CCPA compliance).
- Fraud detection mechanisms.

9. Customer Support:

- Live chat and ticket-based support system.
- FAQ and Help Center with common queries.

10. Property Status Tracking:

- Monitor the progress of property transaction
- Eg., Available, Sold, Negotiation etc

11. Offer & Counter Offer:

- Submit formal offer on properties and track status of negotiation.

4.2 Non-functional Requirements:

These define system quality attributes such as performance, security, and usability.

1. Performance Requirements

- System should handle 100,000+ concurrent users.
- Page load time should be <3 seconds for optimal user experience
- Database queries should execute in < 500ms.

2. Scalability

- Cloud-based infrastructure (AWS, Azure, or GCP) for Scalability.
- Load balancing to handle high traffic.

3. Security

- Data encryption for user information and transactions.
- Role-based access control (RBAC) to limit administrative actions.
- Regular security audits and penetration testing.

4. Usability

- Intuitive and responsive UI for seamless experience across desktop and mobile.
- Support for multiple languages and currencies.
- Accessibility compliance (WCAG 2.1).

5. Availability and Reliability

- 99.9% uptime guarantee with automated failover mechanisms.
- Real-time backup and disaster recovery plan.

6. Compliance and Legal Requirements

- GDPR & CCPA compliance for data protection.
- PCI-DSS compliance for secure payment transactions.

7. Maintainability and Updates

- Modular architecture to allow easy feature updates.

5. Software And Hardware Requirements

1. Minimum Hardware Requirements

To ensure optimal performance and reliability of a booking system for villas and hotels, specific hardware requirements need to be met. Here's a detailed overview of the minimum hardware requirements:

1. Server Hardware

Processor(CPU):

- Requirement: At least a quad-core processor (e.g., Intel Xeon or AMD Ryzen) with a clock speed of 2.0 GHz or higher.
- Purpose: Handles multiple simultaneous transactions and processing tasks efficiently.

Memory (RAM):

- Requirement: Minimum of 8 GB of RAM, with 16 GB recommended for higher traffic or more extensive systems.
- Purpose: Ensures smooth operation of the booking system and handling of multiple users and transactions.

Storage:

- Requirement: Minimum of 250 GB SSD for operating system and application files. Additional storage may be required for databases and backups.
- Purpose: Provides fast data access and sufficient space for booking data, user information, and logs.

Network Interface:

- Requirement: Gigabit Ethernet (1 Gbps) or faster network interface.
- Purpose: Ensures reliable and fast network connectivity for handling high volumes of data traffic.

2. Workstation Hardware

Processor (CPU):

- Requirement: At least a dual-core processor (e.g., Intel Core i5 or AMD Ryzen 5) with a clock speed of 2.5 GHz or higher.

- Purpose: Ensures smooth operation of the booking system software on user workstations.

Memory (RAM):

- Requirement: Minimum of 4 GB of RAM, with 8 GB recommended for better performance.
- Purpose: Supports multitasking and smooth performance of the booking interface.

Storage:

- Requirement: Minimum of 100 GB SSD or HDD.
- Purpose: Sufficient space for storing local application data and files.

Display:

- Requirement: Minimum resolution of 1920x1080 (Full HD) for clear visibility of booking interfaces.
- Purpose: Ensures that the booking system interface is easily readable and usable.
- Input Devices:
- Requirement: Standard keyboard and mouse.
- Purpose: Essential for interacting with the booking system software.

3. Network And Connectivity

Internet Connection:

- Requirement: Stable high-speed broadband connection (minimum 10 Mbps download and 5 Mbps upload).
- Purpose: Supports online transactions, real-time updates, and remote access if applicable.

Firewall and Security:

- Requirement: Hardware or software firewall for network security.
- Purpose: Protects the system from unauthorised access and cyber threats.

4. Backup and Recovery

Backup Storage:

- Requirement: External storage or cloud-based backup solutions with sufficient capacity to store backup data.
- Purpose: Ensures data protection and recovery in case of hardware failure or data loss.

Backup Frequency:

- Requirement: Regular automated backups (daily or weekly) depending on the volume of transactions.
- Purpose: Minimizes data loss and facilitates quick recovery.

5. Additional Considerations:

UPS (Uninterruptible Power Supply):

- Requirement: UPS with sufficient capacity to keep the server running during power outages.
- Purpose: Prevents data loss and system downtime during power interruptions.

Printer:

- Requirement: Standard or thermal printer for generating booking confirmations and receipts.
- Purpose: Provides physical documentation as needed.

By meeting these minimum hardware requirements, you ensure that the booking system operates efficiently, handles the volume of transactions smoothly, and maintains high levels of reliability and performance.

2. Minimum Software Requirements (Tools & Technology)

1. Operating System

- Server OS: Windows Server 2019 or later, or a recent Linux version (e.g., Ubuntu Server 20.04).
- Client OS: Windows 10 or later, macOS Catalina or later, or a recent Linux version.

2. Database Management System (DBMS)

- Requirement: SQL Server 2019 or later, MySQL 8.0 or later, or PostgreSQL 13 or later.

3. Web Browser

- Requirement: Google Chrome, Mozilla Firefox, Microsoft Edge, or Safari (latest versions).

4. Web Server

- Requirement: Apache HTTP Server 2.4 or later, Nginx 1.18 or later, or Microsoft IIS

5. Application Software

- Requirement: Booking system application with modules for reservations, payment processing, and reporting.

6. Payment processing Integration

- Requirement: Integration with payment gateways like Stripe, PayPal, or Authorize.Net.

7. Security Software

- Antivirus/Antimalware: Up-to-date software (e.g., Bitdefender, Norton).
- Firewall: Network and/or software firewall for security.

8. Backup and Recovery Software

- Requirement: Solutions like Veeam, Acronis, or OS-specific backup tools.

9. Email Client

- Requirement: Microsoft Outlook, Mozilla Thunderbird, or a web-based client.

10. Document Management

- Requirement: PDF reader (e.g., Adobe Acrobat Reader) and document editing tools (e.g., Microsoft Office).

11. Analytics and Reporting Tools

- Requirement: Business intelligence tools like Microsoft Power BI, Tableau, or built-in system features.

6. Process Model

The Elite Estate project can benefit from a structured Software Development Life Cycle (SDLC) model to ensure systematic and efficient development. Given the project's scope, requirements, and potential for changes during development, the Agile Process Model is the most suitable. Below is the detailed explanation:

6.1 Agile Process Model

Why it's suitable:

- Elite Estates frequently updates its platform to improve user experience and introduce new features.
- Agile supports continuous iterations, making it ideal for adapting to user feedback and market trends.

Key Features:

- Iterative development in sprints (2–4 weeks).
- Continuous integration, testing, and deployment.
- Frequent collaboration with stakeholders (hosts, guests, internal teams).

Example Use:

- New feature development (e.g., improved search filters) is rolled out in increments, with user feedback guiding adjustments.

6.2 Lean Startup Model

Why it's suitable:

- Elite Estates started as a lean startup, focusing on rapid experimentation and learning.
- This model prioritizes building a Minimum Viable Product (MVP) and refining it based on user feedback

Key Features:

- Build-Measure-Learn feedback loop.
- Emphasis on validating assumptions with real users.

Example Use:

- Launching a new market feature (like Experiences or Airbnb Plus) in a limited region to test viability before scaling.

6.3 Microservices Architecture (For technical development)

Why it's suitable:

- Elite Estate's platform requires scalability, reliability, and flexibility to handle millions of users.
- Microservices allow independent development and deployment of individual components.

Key Features:

- Services like booking, payment, search, and messaging run independently.
- Facilitates faster updates and better fault isolation.

Example Use:

- Separate services for handling bookings, payments, and messaging allow updates without affecting the entire platform

7. Project Plan

1. Project Initialization

(1 week) Activities:

1. Define project objectives, scope, and deliverables.
2. Identify and engage stakeholders (project sponsors, users, developers).
3. Assign roles and responsibilities to the project team (e.g., PM, developers, designers).

Estimated Duration: 1 week

2. Requirements gathering & Analysis

(2-3 weeks) Activities:

1. Collect functional requirements (user registration, booking, payment processing).
2. Collect non-functional requirements (performance, security, scalability).
3. Analyse any existing systems (if applicable) to gather insights.
4. Document and finalize key system features and modules (search, messaging, review).

Estimated Duration: 2-3 weeks

3. System Design

(3-4 Weeks) Activities

1. **System Architecture Design:**
   - Create high-level architecture for the website, including frontend-backend interaction.
2. **Database Schema Design:**
   - Define tables for users, properties, bookings, payments, and reviews.
3. **UI/UX Design:**
   - Develop wireframes and UI mockups for main pages (home, listing, booking).
4. **Security Protocols:**
   - Define access control, data encryption, and user authentication mechanisms

Estimated Duration: 3-4 weeks

4. Technology Stack & Development Environment Setup

(1-2 Weeks) Activities:

1. Choose Technology Stack
   - **Frontend**: React, Vue, or Angular.
   - **Backend:** Node.js, Django (Python), or Ruby on Rails.
   - **Database:** MySQL.
2. Set up Development Environment
   - Configure servers, IDEs (VS Code, IntelliJ), and version control (Git, GitHub).
3. Install and configure databases and dependencies

Estimated Duration: 1-2 Weeks

5. Module Development

(10-12 Weeks) Activities:

1. Develop individual modules:
   - **User Module:** Registration, authentication, and profile management.
   - **Listing Module:** Property listing creation and management.

    - **Search Module:** Advanced search functionality with filters.
    - **Booking Module:** Booking, cancellation, and calendar management.
    - **Payment Module:** Integration with Stripe or PayPal.
2. Implement REST APIs for communication between frontend and backend
3. Develop front-end interfaces and back-end logic simultaneously using Agile sprints

Estimated Duration: 10-12 Weeks

6. Testing

(3-4 Weeks) Activities:

1. **Unit Testing:** Ensure each module functions correctly in isolation.
2. **System Testing:** Verify that all modules interact correctly and the website operates as intended.
3. **User Acceptance Testing (UAT):** Engage beta users to test core functionalities and gather feedback.
4. Fix bugs and iterate based on test results.

Estimated Duration: 3-4 Weeks

7. Integration & Deployment

(2-3 Weeks) Activities:

1. Integrate all modules into the final system, ensuring smooth data flow.
2. Configure the website on cloud platforms like AWS, Azure, or on-premise servers.
3. Deploy the system with production settings (domain setup, SSL certification).
4. Provide detailed system documentation and user guides for future reference.

Estimated Duration: 2-3 Weeks

8. System Design

8.1 Use Case Diagram

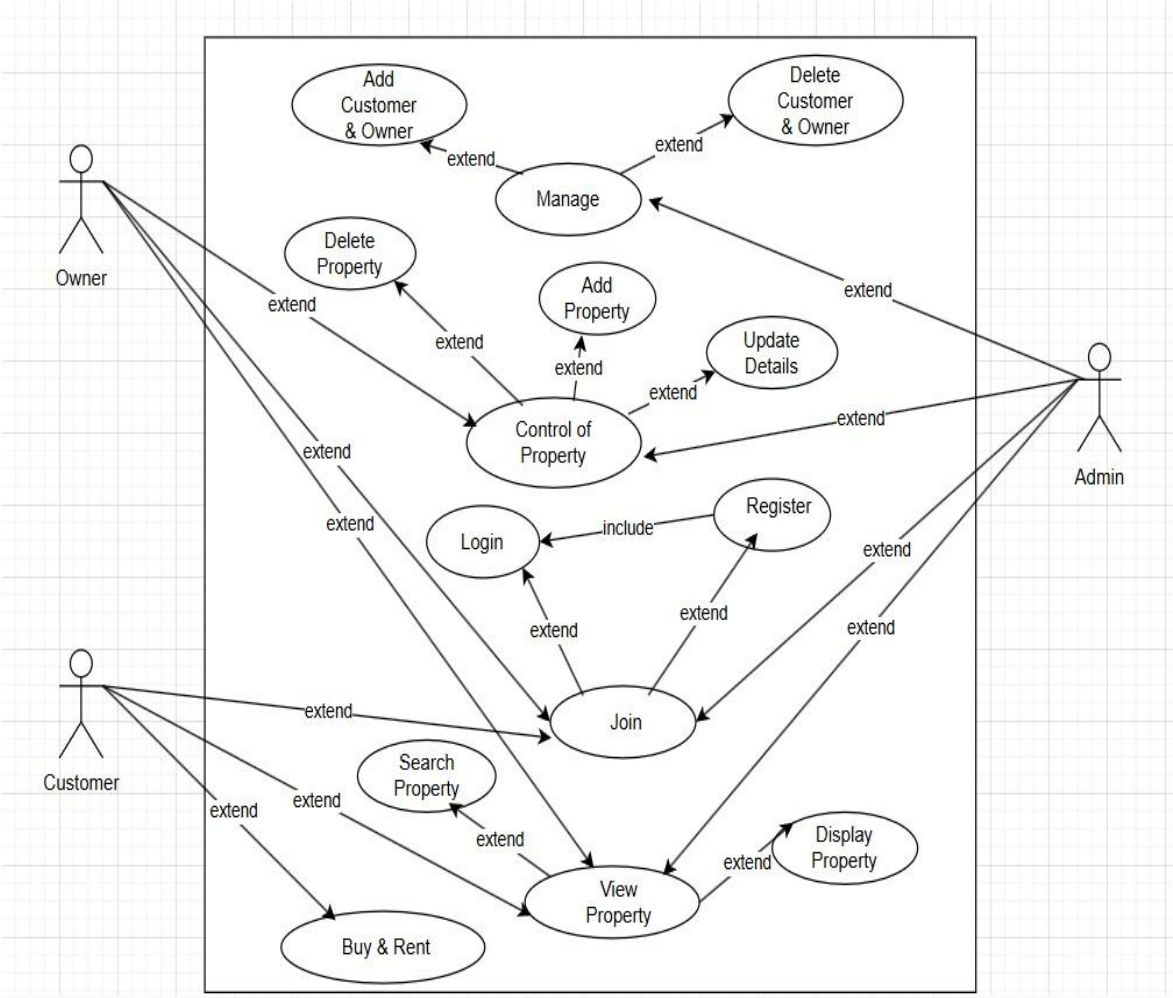
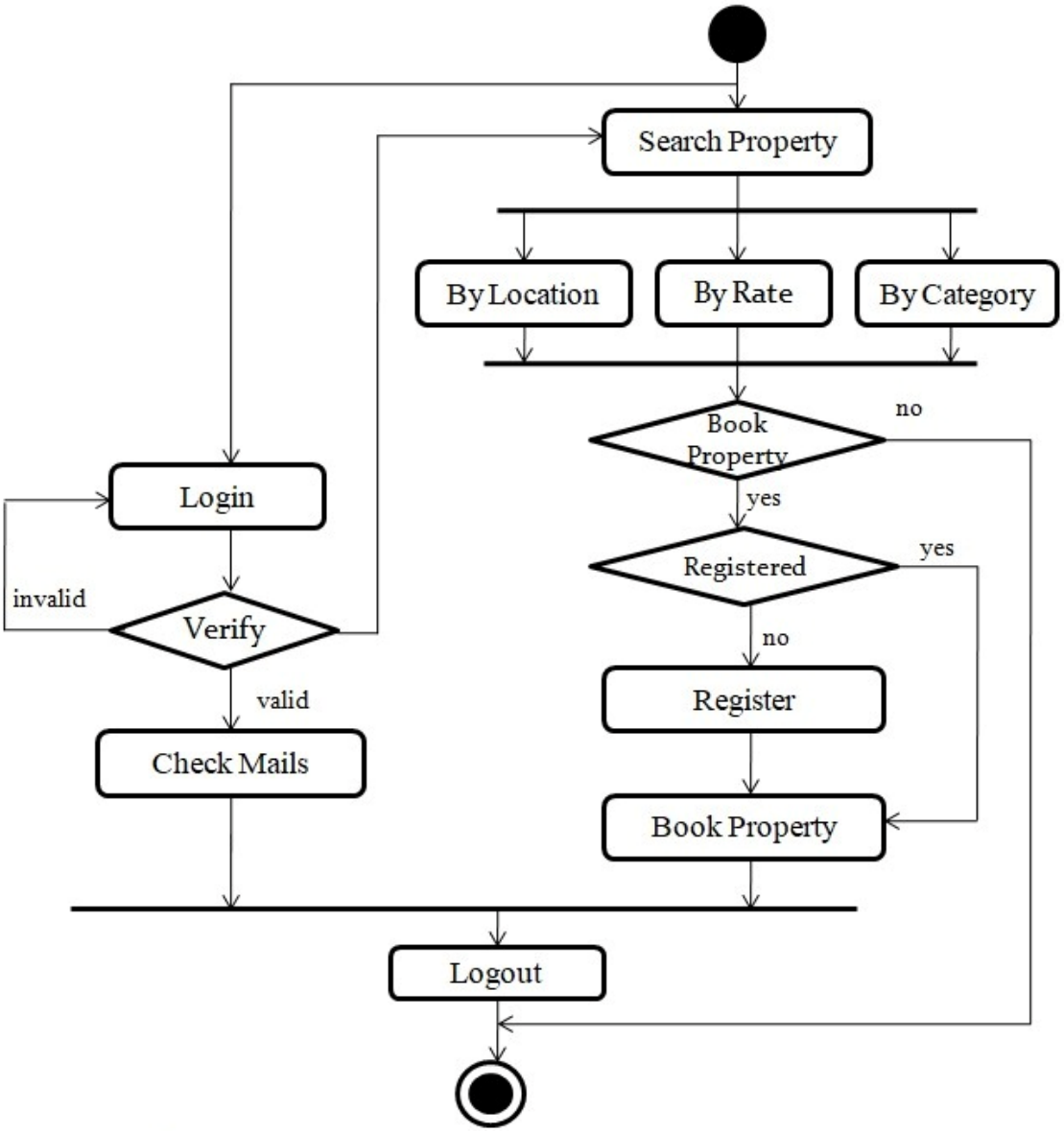


Figure 8.1 Use Case

- A Use Case Diagram for Elite Estate represents the interactions between owner (actors), customer(actor) and the admin(actor). This use case diagram helps visualise how various actors (owner, customers, and admins) interact with elite estate system to accomplish their goals like booking stays, managing accommodations, or overseeing the platform

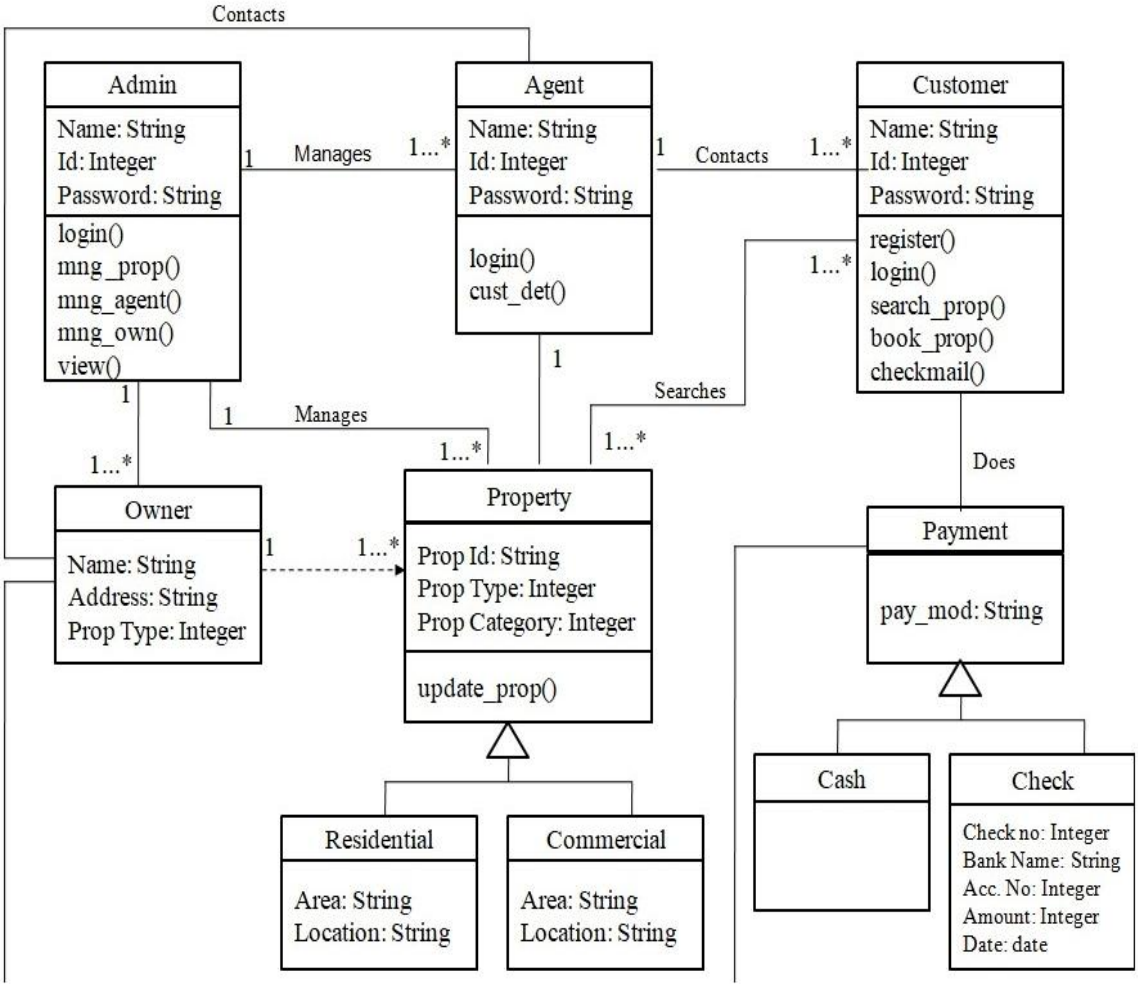
8.2 Activity Diagram



8.2 Activity Diagram

- The Activity Diagram for Elite Estate focuses on the core processes of booking a stay and listing an accommodation. It demonstrates how Guests search for listings, select and book properties, register, and complete their bookings. It also shows how Hosts list their properties, manage bookings, and receive payments.

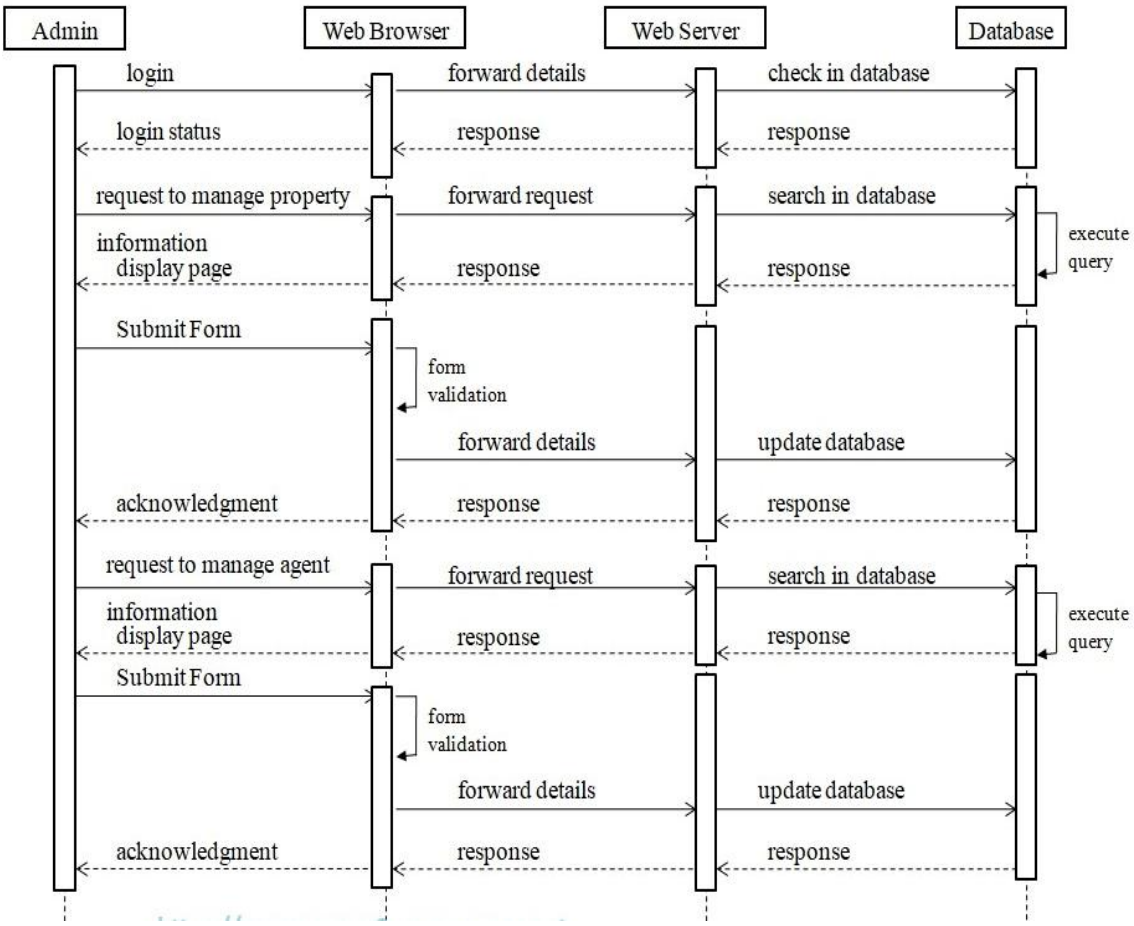
8.3 Class Diagram



8.3 Class Diagram

- A Class Diagram for the Elite Estate project provides a structural overview of the system by defining its classes, attributes, relationships, and operations. It shows the key entities in the Elite Estate platform, such as Guests, Hosts, Listings, and Bookings, and how they interact.

8.4 Sequence Diagram



8.4 Sequence Diagram

- A Sequence Diagram for the Elite Estate project shows the flow of interactions between different objects or actors (such as Guests, Hosts, the Elite Estates, and Payment Gateway) over time to accomplish specific tasks, like booking an accommodation. It visually represents the sequence of messages passed between these entities to complete a process.

8.5 DFD Diagram

A Data Flow Diagram (DFD) for the Elite Estate project illustrates how data moves through the system, highlighting key processes, data stores, and external entities involved in managing bookings, listings, and payments. It provides a visual representation of how data is processed, stored, and transferred between users (Guests, Hosts, Admins), the Elite Estate system, and external services (e.g., Payment Gateway).

8.5.1. Level 0 Diagram

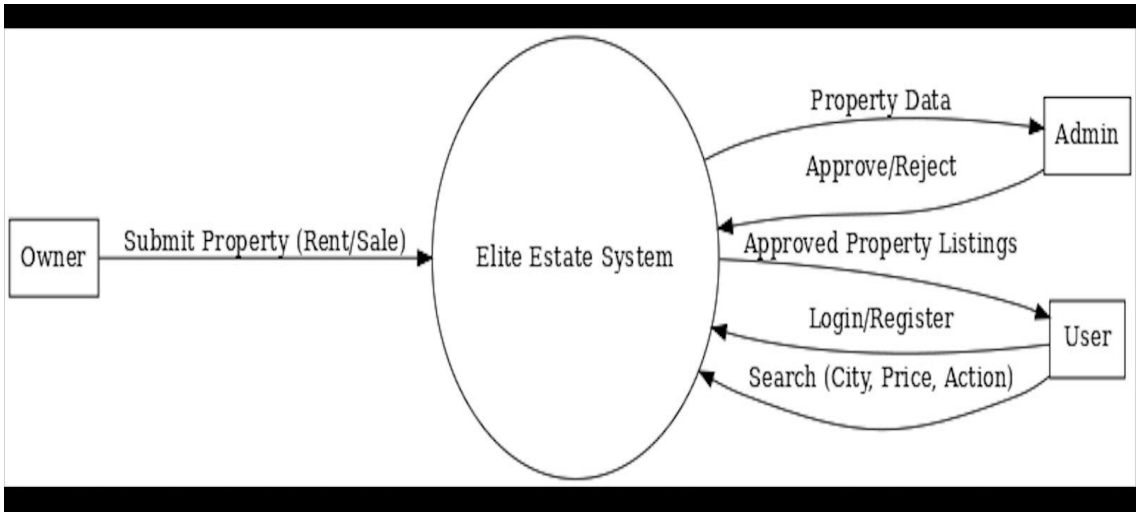


Figure 8.5.1 DFD Level 0

- The Level 0 DFD gives an overview of the entire Vacation Rental system as a single process, showing the main external entities and data flow.

8.5.2 Level 1 DFD

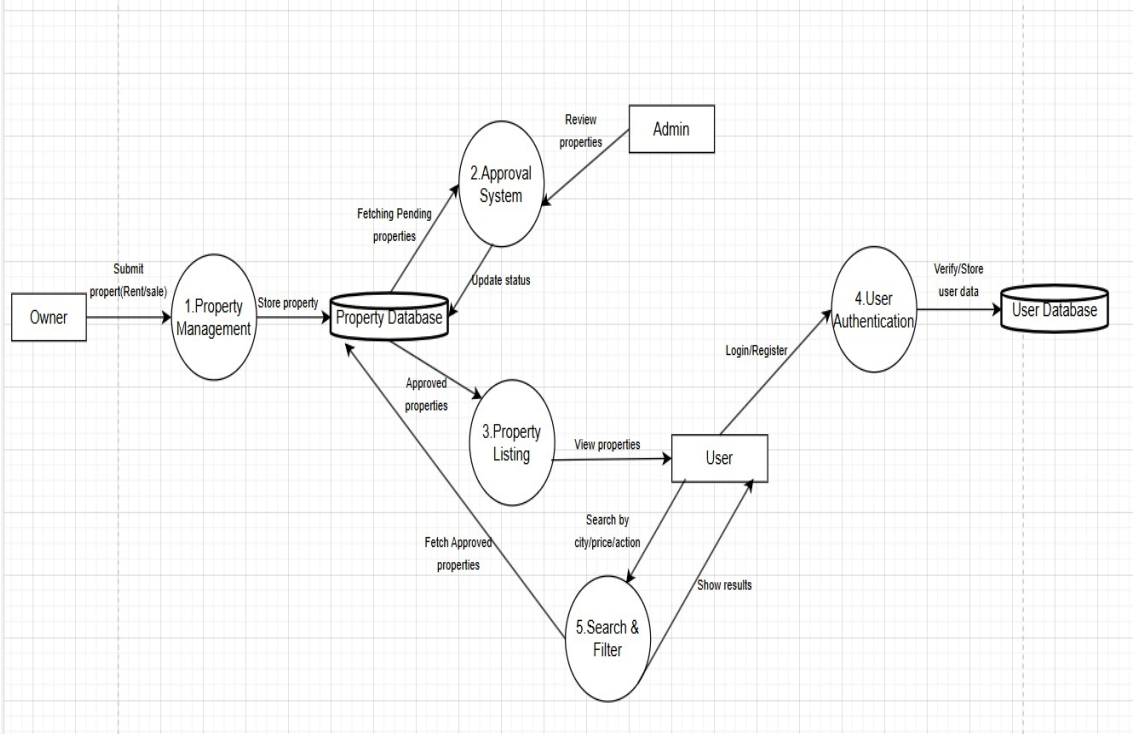


Figure 8.5.2 DFD Level 1

- The Level 1 DFD breaks down the single process from the Level 0 DFD into smaller subprocesses, focusing on how different components within Elite Estate interact and exchange data.

8.5.3 Level 2 DFD

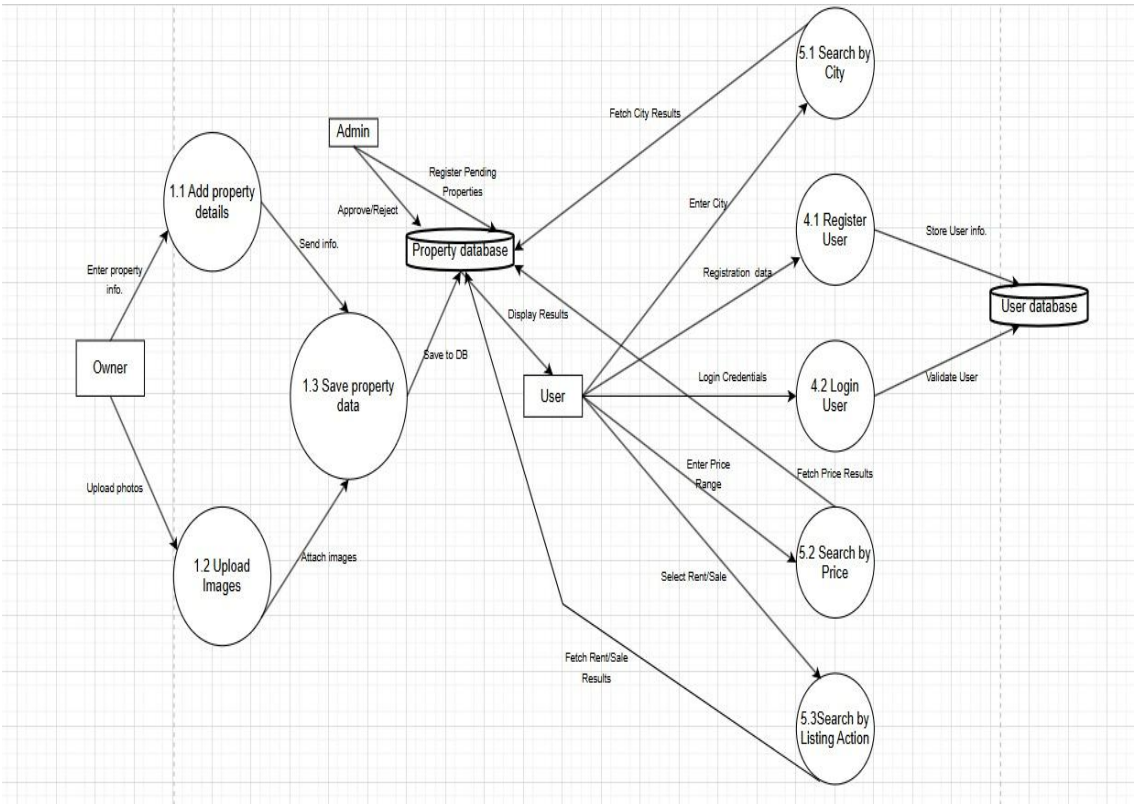
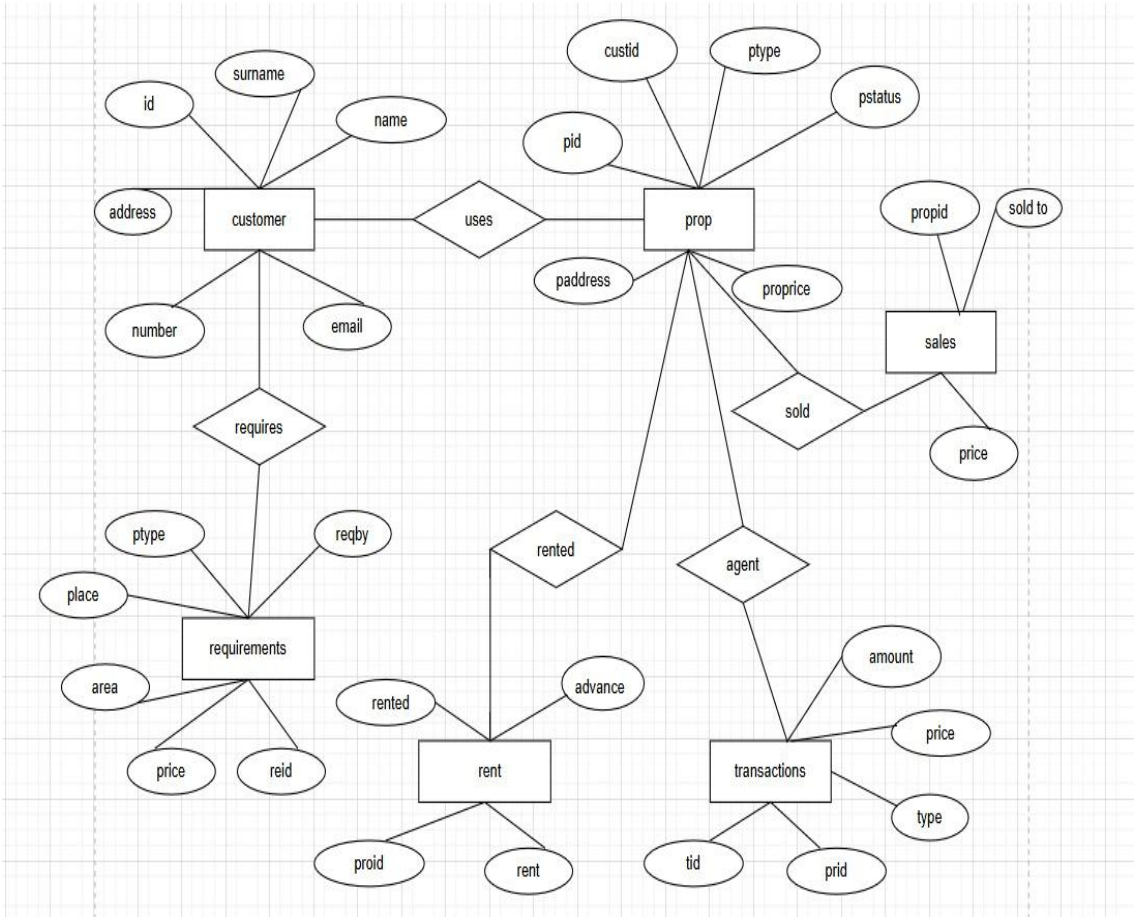


Figure 8.5.3 DFD Level 2

- The Level 2 DFD for Elite Estate breaks down key processes like Add property, save property, upload image, register user, and login user, etc. This allows for a more granular view of how data flows through each step in these processes and how it interacts with the data stores and external entities.

8.6 E-R Diagram



8.6 E-R Diagram

- The ER Diagram for Elite estate models the main entities and their relationships in the system. These entities represent the objects within Elite Estate such as customers, rent, properties, sales, and transaction, and it captures the data they manage and how they interact with each other

9. List of Tables, Table Design, Data Dictionary

9.1 List of Tables:

1. Bookings

2. Places

3. Register

9.2 Table Design & Data Dictionary:

1. Bookings

Column Name	Data Type	Description
id	Int (11)	A Unique identifier for each booking
place_id	Int(11)	Links to the property being booked
user_name	Varchar(255)	The name of the user making the booking
user_email	varchar(255)	The email of user who initiated the booking
user_phone	varchar(255)	The user's optional phone number
booking_date	timestamp	The timestamp when the booking was created
status	enum('Pending','confirmed', 'cancelled')	The current status of the booking
transaction_type	enum('online','cash')	The method of payment
action_type	enum('Rent','Buy')	Specifies if the action is a rental or a purchase
start_date	date	The start date for the booking action(for rentals)
end_date	date	The end date for the booking action(for rentals0029

Table 9.1

2. Places

Column Name	Data Type	Description
id	int (11)	A unique identifier for each property. This is the primary key.
is_approved	tinyint(1)	A flag (0 or 1) indicating if the property listing has been approved by an administrator
place_name	varchar(255)	A unique ID for the property, potentially from a different system or used for external reference.
location	text	The detailed location of the property.
price	decimal(10,2)	The price of the property, stored with two decimal places.
city	varchar(255)	The city where the property is located.

owner_name	varchar(255)	The name of the property owner or seller.
image	varchar(255)	The URL or file path for the property's main image.
description	text	A detailed description of the property's features.
property_type	enum	The type of property, such as 'Apartment', 'Villa', 'House', 'Plot', etc.
bedrooms	int(11)	The number of bedrooms in the property
bathrooms	int(11)	The number of bathrooms in the property.
area_sqft	int(11)	The total area of the property in square feet.
amenities	json	A JSON object or array storing a list of amenities available at the property.
contact_number	varchar(20)	The contact number for the property owner.
listing_type	enum('buy','sell','rent')	The purpose of the listing.
created_at	timestamp	The timestamp when the listing was created
updated_at	timestamp	The timestamp when the listing was last updated.

Table 9.2

3. Register

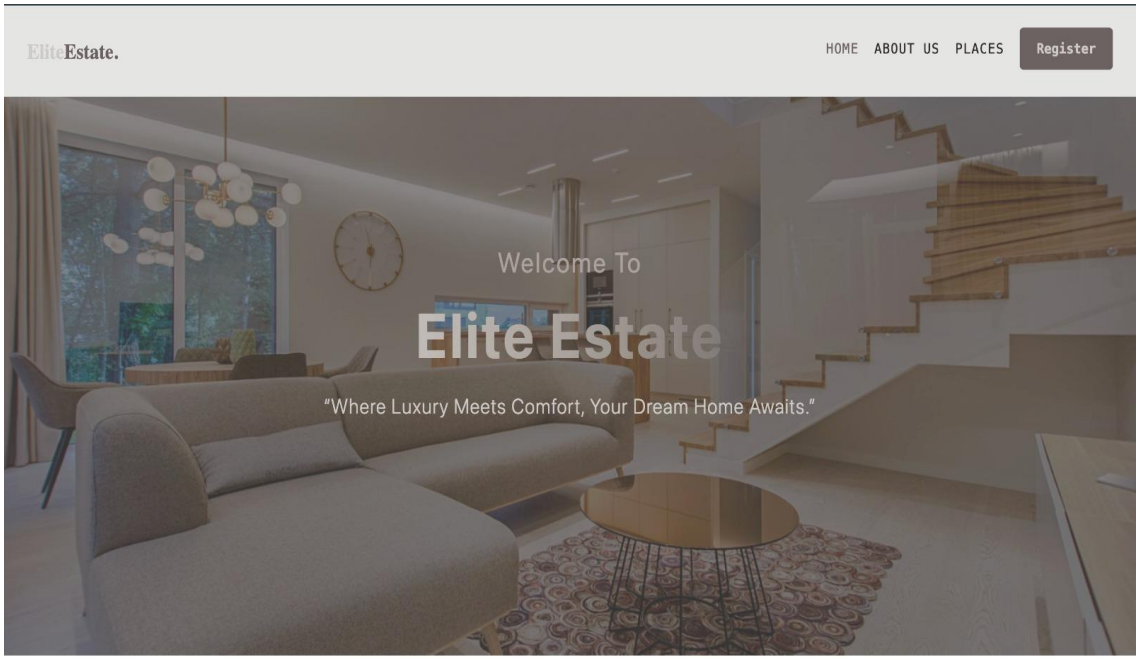
Column Name	**Data Type**	**Description**
name	varchar(255)	The user's full name.
email	varchar(255)	The user's unique email address, used for login and communication.
password	varchar(255)	The hashed and salted password for the user's account.
otp	varchar(255)	A one-time password for verification purposes.
otp_expire	timestamp	The timestamp indicating when the OTP will expire.
role	varchar(255)	The user's role on the platform, such as 'user' or 'owner'.

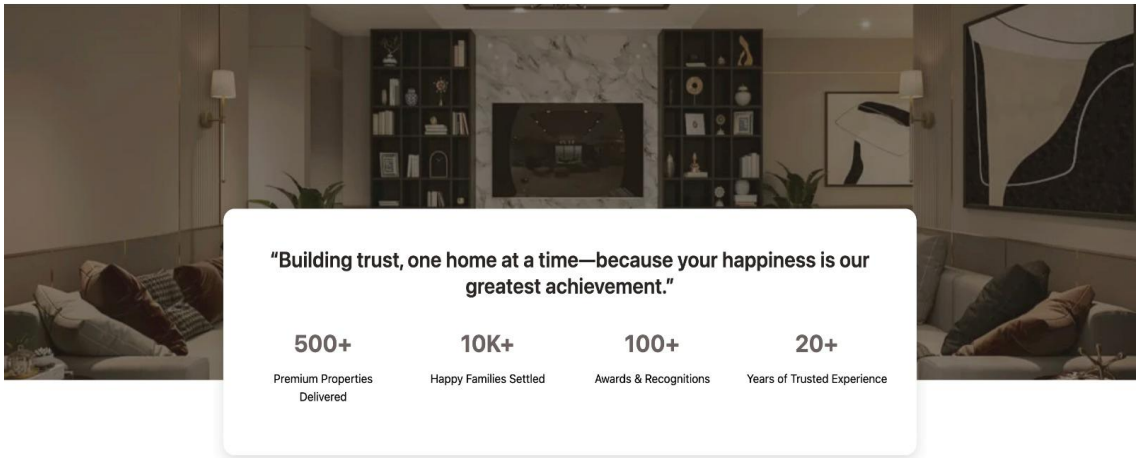
Table 9.3

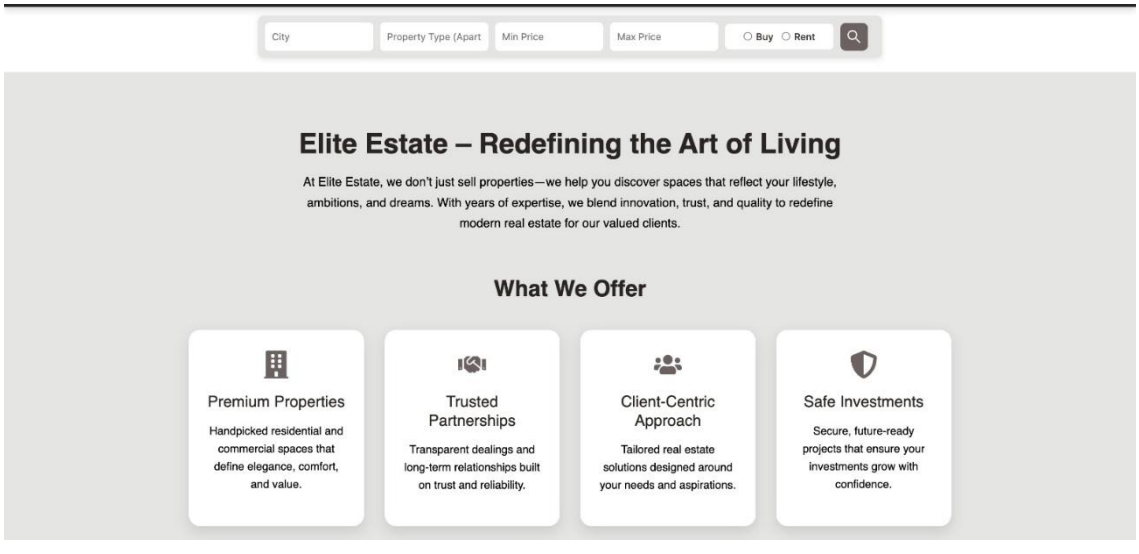
9.3 Relationships

- User & Properties: One-to-many (A user can list multiple properties)
- User & Bookings: One-to-many (A user can make multiple bookings)
- Properties & Bookings: One-to-many (A property can have multiple bookings)
- Properties & Reviews: One-to-many (A single property can have multiple reviews)
- Properties & Photos: One-to-many (A single property can have multiple photosw)

10. User Interface Design







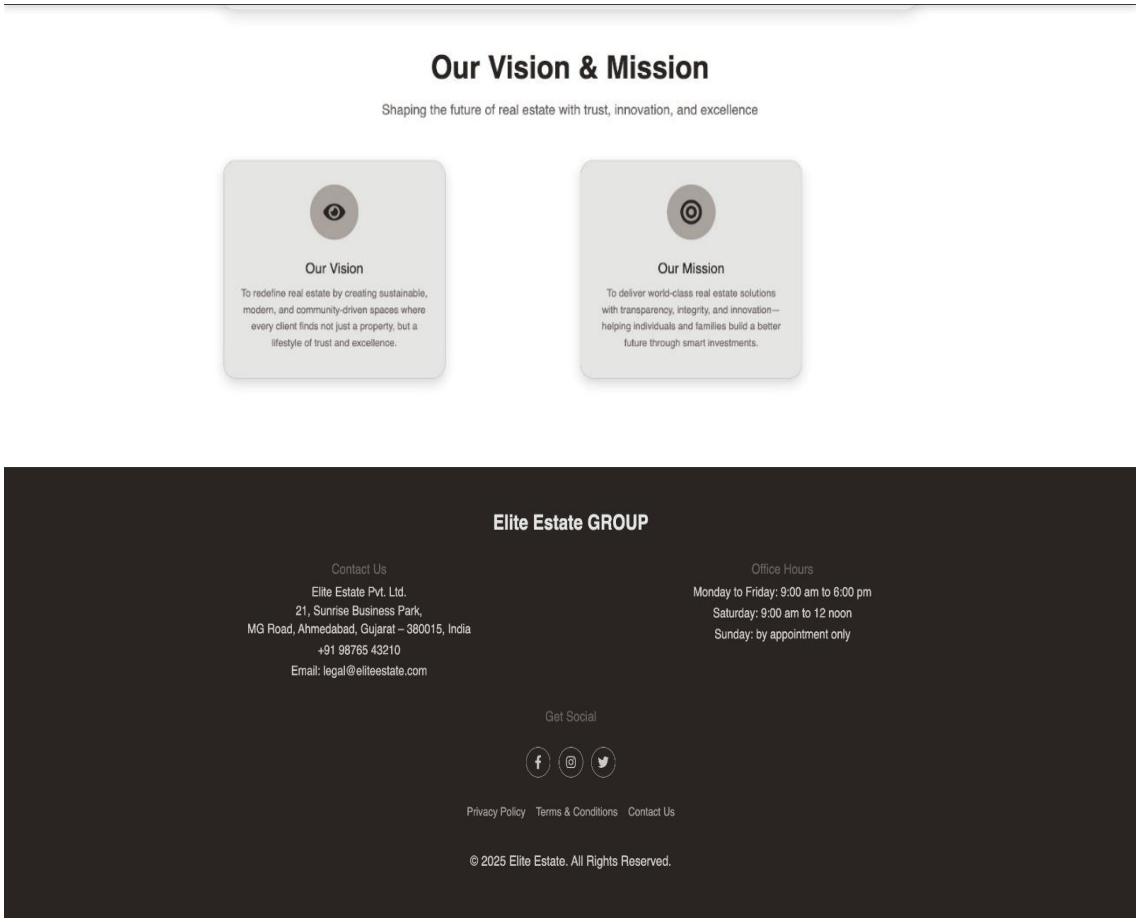
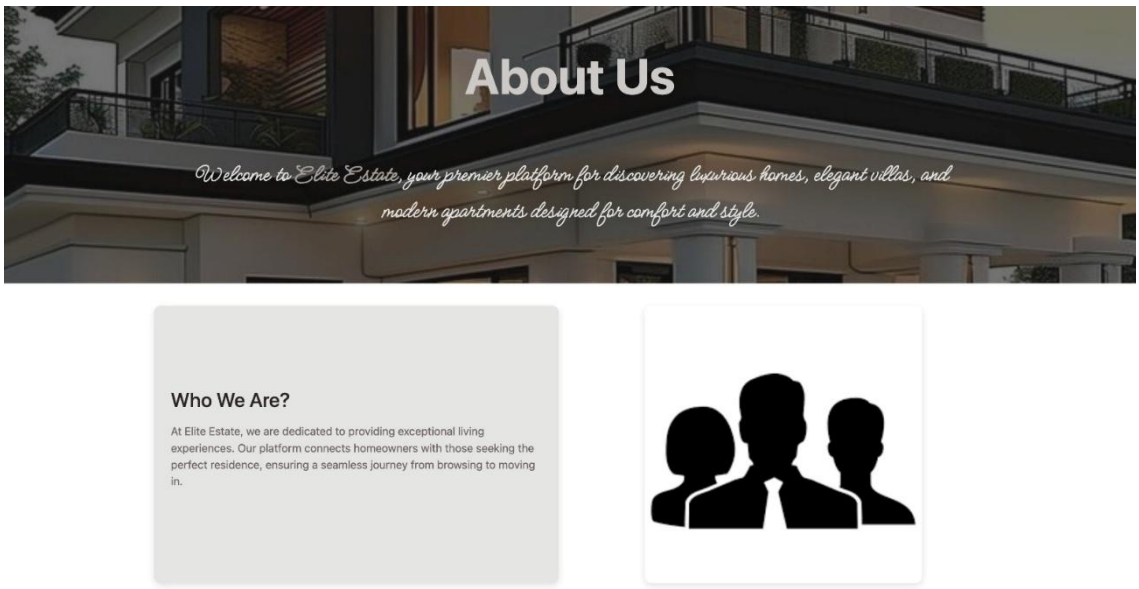


Figure 10.1 Home Page



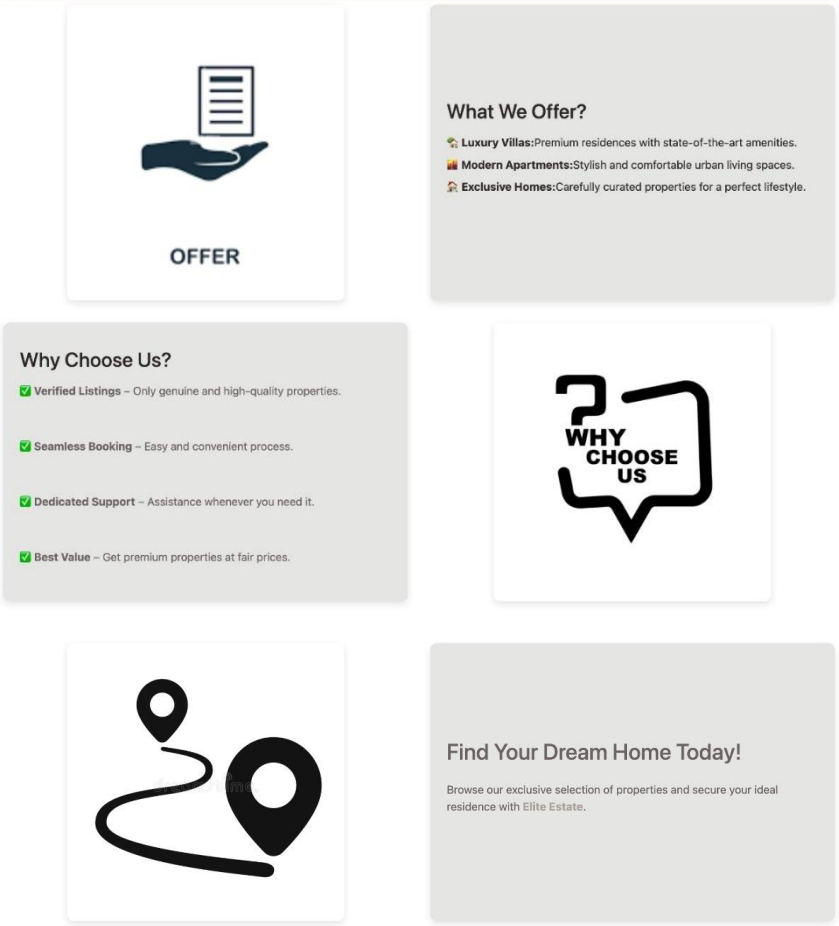
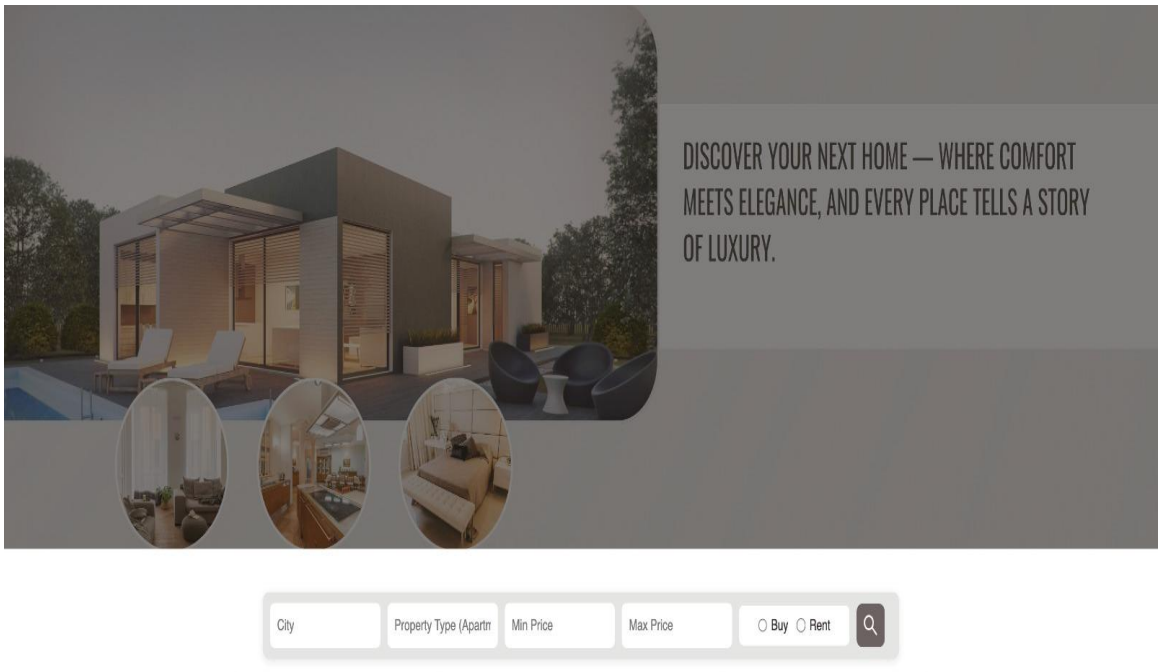


Figure 10.2 About Page



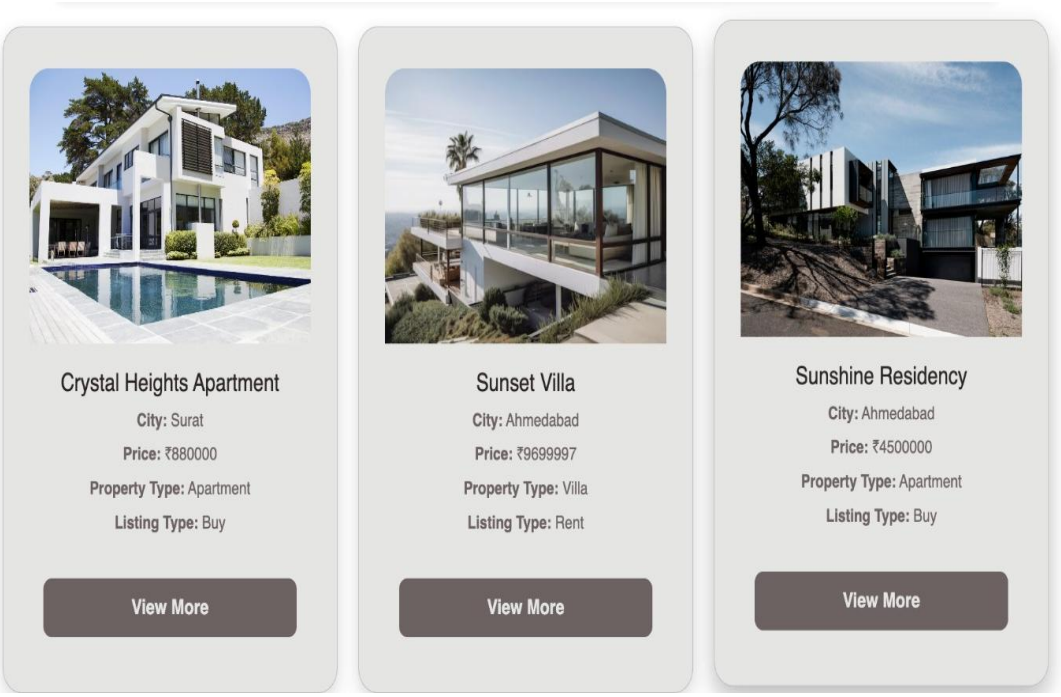


Figure 10.3 Places

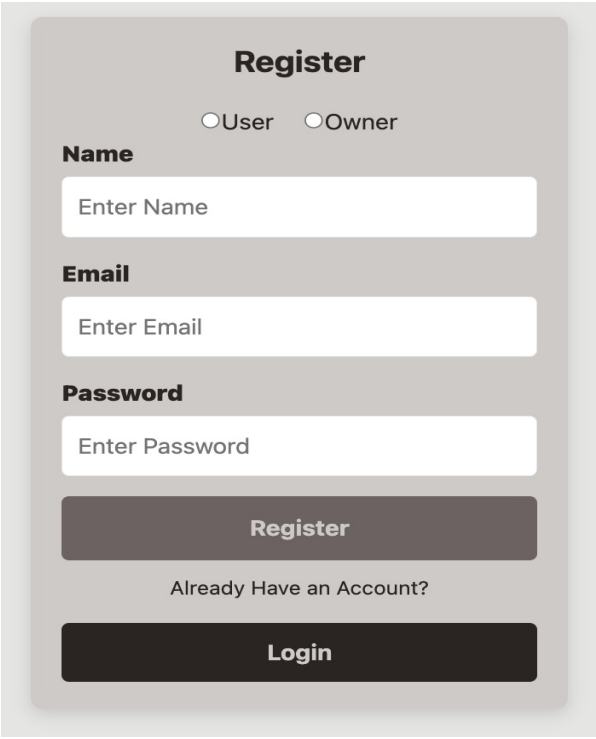


Figure 10.4 Register Page

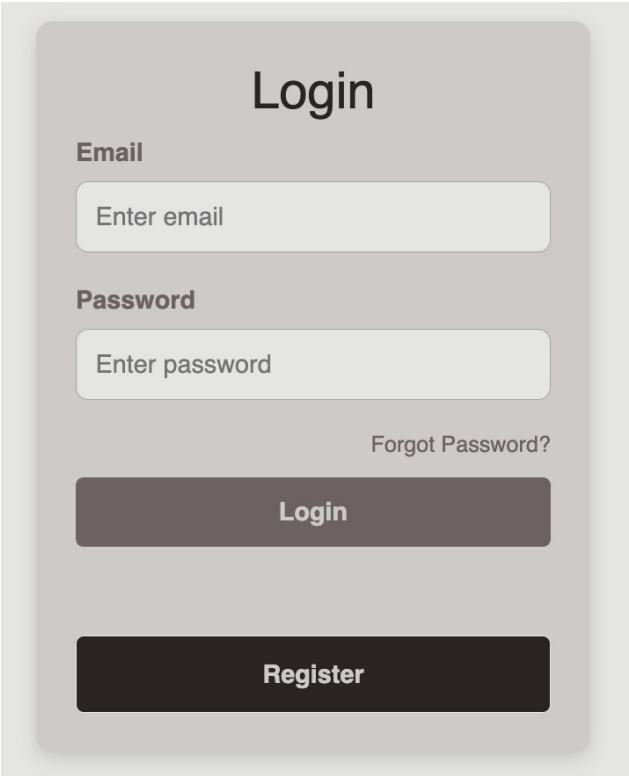


Figure 10.5 Login Page

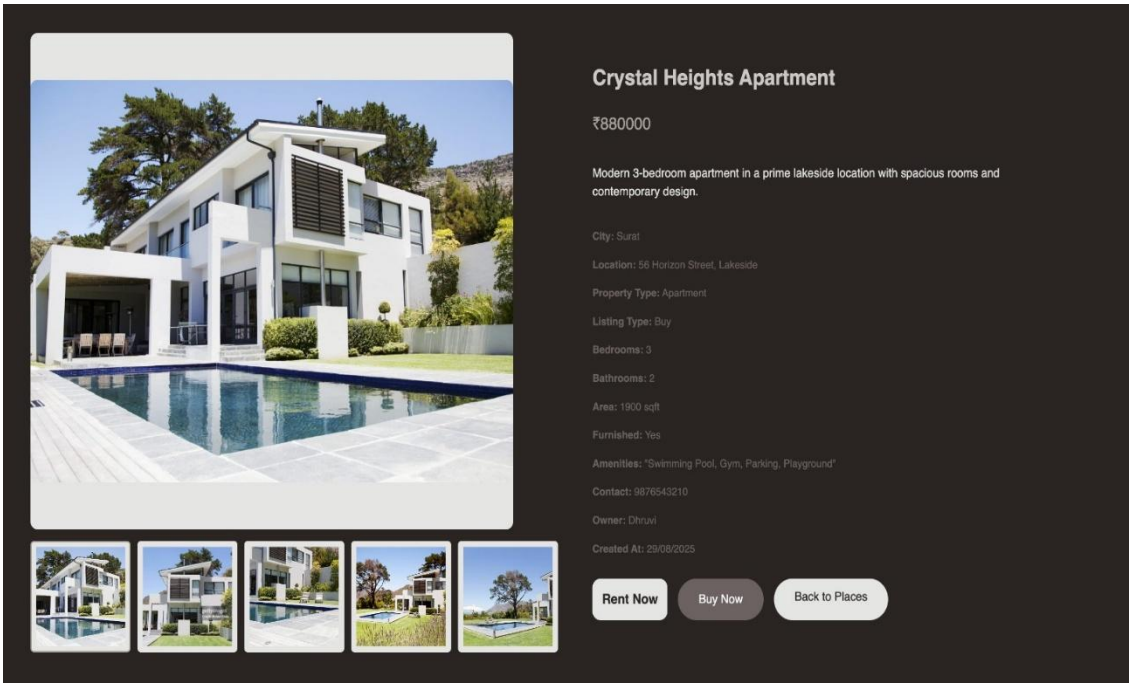


Figure 10.6 Place Detail

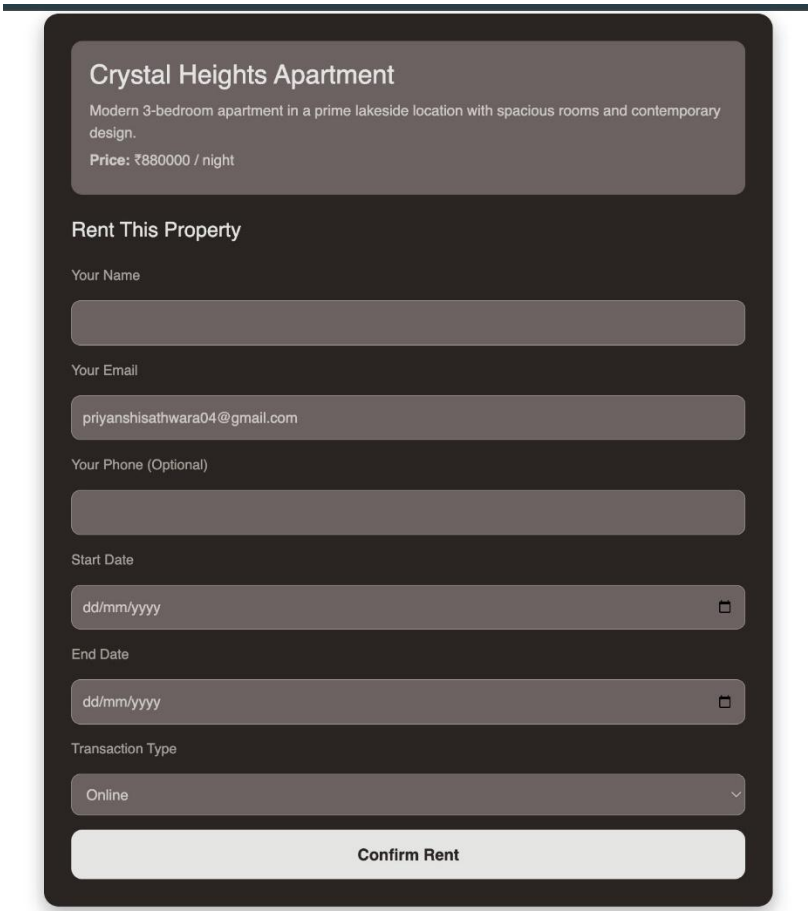


Figure 10.7 Rent Now page

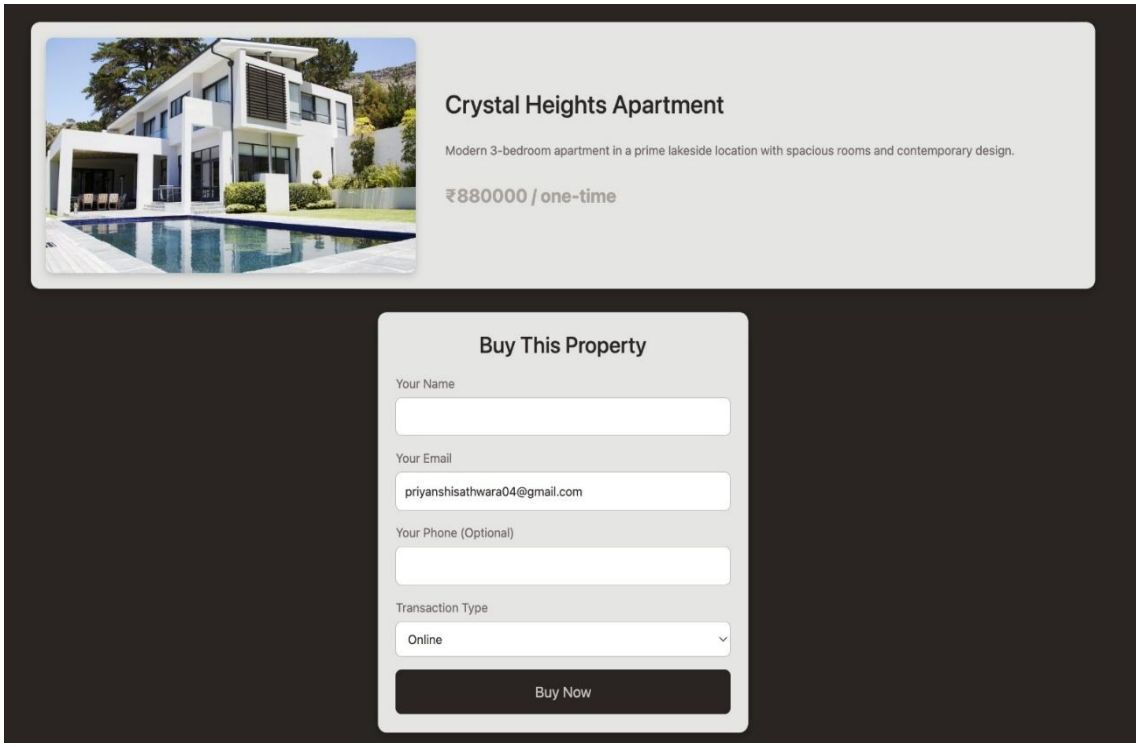


Figure 10.8 Buy Now

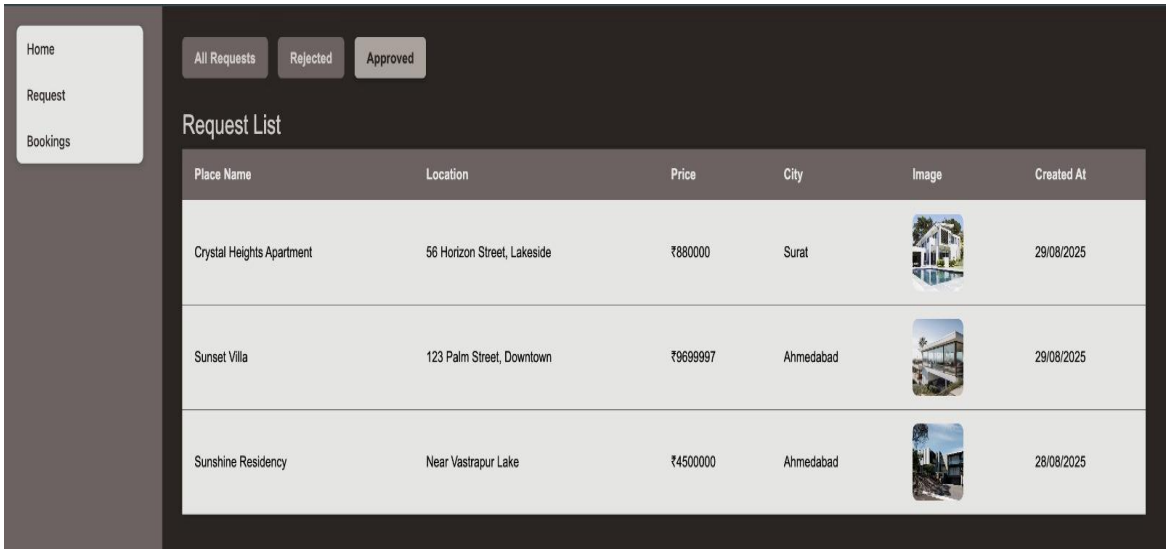


Figure 10.9 Admin

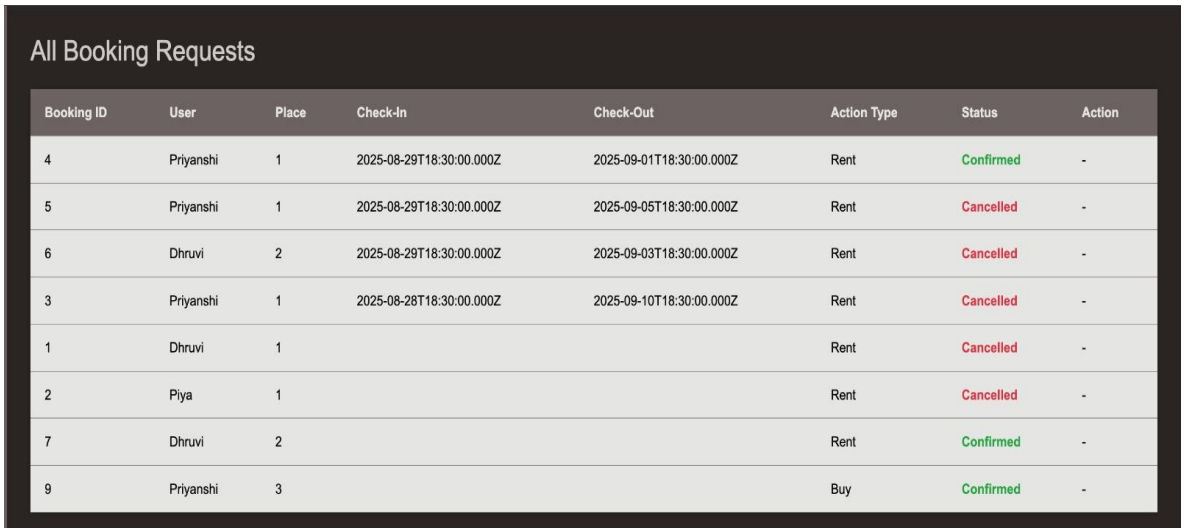


Figure 10.10 All Bookings Requests

11. Conclusion & Future Work

11.1 Conclusion

The development of Elite Estate successfully addresses the significant inefficiencies and lack of transparency present in the current real estate market. By integrating key features such as a real-time buyer-seller chat, a transparent offer and counter-offer system, community-driven reviews, and visual property status tracking, the platform provides a comprehensive and trustworthy solution. The MERN stack architecture ensures a modern, user-friendly, and responsive design that is scalable and secure. The system's focus on consolidating essential functionalities, as identified in the market analysis, provides a significant competitive advantage over existing platforms. Ultimately, Elite Estate is positioned to create a more streamlined, efficient, and reliable real estate experience for all users.

11.2 Future Work

Future development of the Elite Estate project will focus on enhancing user experience and leveraging data to provide more personalized insights. The primary area for future work is the implementation of a **Personalized Recommendation System**.

1. System Overview The recommendation system will analyze user behavior and property data to suggest relevant listings to buyers. This feature will save users time and increase the likelihood of conversions by presenting properties that align with their specific needs and preferences.

2. Technical Implementation

- **Data Collection and Analysis:** The system will gather and analyze data from the places and bookings tables, along with user search and viewing history. This includes property-specific details (property_type, location, price, amenities) and user preferences.
- **Recommendation Algorithm:** A machine learning algorithm, such as collaborative filtering or content-based filtering, will be developed to identify patterns and generate recommendations. The algorithm will consider a user's past interactions and the attributes of properties they have shown interest in.
- **User Interface Integration:** The recommendations will be integrated into the user interface, likely on the homepage or a dedicated 'Recommended' section. This will provide users with a dynamic, curated list of properties based on their activity.
- **Real-time Updates:** The system will be designed to process data in real time, ensuring that recommendations are always up-to-date with the latest property listings and price changes.

11.3 Benefits

- **Enhanced User Experience:** Provides users with a tailored experience by presenting them with listings that are most relevant to their interests.
- **Increased Engagement and Conversions:** By offering relevant recommendations, the platform can increase user engagement and encourage more property inquiries and bookings.
- **Data-Driven Decisions:** The recommendation system's insights will enable the platform to make more informed decisions about marketing and content strategy.

11.4 Potential Challenges

- **Data Quality and Privacy:** Ensuring the accuracy of property data and protecting user privacy while collecting and analyzing behavioral information will be a key challenge.
- **Algorithm Performance:** Optimizing the recommendation algorithm to provide highly accurate and relevant suggestions without slowing down the application will require continuous effort.
- **Scalability:** As the user base and data volume grow, the recommendation system must be able to scale efficiently to maintain performance.

By addressing potential challenges and leveraging data-driven approaches, the platform can deliver valuable recommendations that meet the specific needs and preferences of its users.

12. Annexure

12.1 Glossary of Terms & Abbreviations

Here’s a Glossary of Terms and Abbreviations for Elite Estate project:

Glossary of Terms:

-Buyer:

A user who is searching for a property to rent or purchase.

-Seller/Owner:

A user who has listed a property for sale or rent on the platform.

-Property:

A residential or commercial listing available for sale or rent.

-Booking:

A record of an inquiry or an accepted offer for a specific property.

-Listing:

A property entry on the Elite Estate platform, containing details, photos, and contact information.

-Real-time Communication:

Instant, two-way messaging between users without any significant delay.

-Offer & Counter-Offer:

A structured negotiation process where a buyer proposes a price and the seller can accept, reject, or propose a new price.

-Neighborhood Reviews:

Community-submitted ratings and comments about a specific locality or area.

-Rental Yield:

A financial metric used by investors to calculate the return on investment from a rental property.

-Property Status Tracking:

A visual representation of a property's transaction stage (e.g., Available, Negotiation, Sold).

Abbreviations:

SRS:	Software Requirements Specification
MERN Stack:	MongoDB, Express.js, React, Node.js (The technology stack used for the project)
API:	Application Programming Interface
UI:	User Interface
UX:	User Experience
DB:	Database
SQL:	Structured Query Language
JSON:	JavaScript Object Notation
GDPR:	General Data Protection Regulation
CCPA:	California Consumer Privacy Act
SaaS:	Software as a Service
ID:	Identifier

HTTP:	Hypertext Transfer Protocol
SSL/TLS:	Secure Sockets Layer / Transport Layer Security (used for data encryption)
VCS:	Version Control System
QA:	Quality Assurance

12.2 References:

- **99acres:** https://www.99acres.com/
- **MagicBricks:** https://www.magicbricks.com/
- **Housing.com:** https://housing.com/
- **NoBroker:** https://www.nobroker.in/
- **Makaan.com**: https://www.makaan.com/
- **Zillow**: https://www.zillow.com/
- **Trulia:** https://www.trulia.com/

These are some of the most popular and well-known House rental websites. They offer a wide range of properties, from apartments and flats for sale to PG and hostels for rent, in across various cities.

12.3 Tools & Technologies

✴ **Frontend**: These are the tools that make the website look and feel good. Think of them as the furniture and decorations in your house.

• React: A tool that helps us create the website's layout and make it interactive.

• HTML and CSS: These are like the blueprints and paint for the website. They tell the computer how to arrange things on the screen and what colours to use.

✴ **Backend:** These are the tools that work behind the scenes to make the website function. They're like the plumbing and wiring in your house.

• Node.js: A tool that helps us run JavaScript code on the server, which makes the website work.

• Express.js: A tool that helps us organise and manage the website's different parts.

• MongoDB: A tool that stores information about users, properties, and bookings

12.4 About College (UVPCE)

Ganpat University-U. V. Patel College of Engineering (GUNI-UVPCE) is situated in Ganpat Vidyanagar campus. It was established in September 1997 with the aim of providing educational opportunities to students from various strata of society. It is one of the constituent colleges of Ganpat University. It was armed with the vision of educating and training young talented students in the field of Engineering and Technology so that they could meet the demands of Industries in Gujarat and across the globe.

The College is named after Shri Ugarchandbhai Varanasibhai Patel, a leading industrialist of Gujarat, for his generous support. It is a self-financed institute approved by All India Council for Technical Education (AICTE), New Delhi and the Commissionerate of Technical Education, Government of Gujarat.

The College is spread over 25 acres of land and is a part of Ganpat Vidyanagar Campus. It has six ultra modern buildings of architectural splendor, class rooms, tutorial rooms, seminar halls, offices, drawing hall, workshop, library, well equipped departmental laboratories and several computer laboratories with internet connectivity through 1 Gbps Fibre link, satellite link education center with two-way audio and one way video link. The superior infrastructure of the Institute is conducive for learning, research, and training.

The Institute offers various undergraduate programs, postgraduate programs, and Ph.D. programs.

Placement plays a key role in shaping the future of the students, and keeping this in mind; the institute has endeavour healthy relations with the prominent industries. These tie-ups are mutually beneficial. The industries get a chance to employ the resources of the institute for their R & D. In turn they extend every possible help to the institute especially with regard to providing hands-on training to the students. As part of this initiative, Incubation Centre/Start-up activities have also been developed.

Awards & Acheivements :

1. Ganpat University, U. V. Patel College of Engineering is bestowed with Third rank in Utkrisht Sansthan Vishwakarma (USVA 2020) Award “INDIA FIGHTS CORONA” organized by AICTE for the significant contribution in the category - Support Provided (Visits to create awareness, services rendered, assistance extended to migrants, etc.) during pandemic times caused by COVID-19 across India.
2. Ganpat University - U. V. Patel College of Engineering ranked among Top 50 Private Engineering Institutes in INDIA in OUTLOOK - ICARE RANKINGS 2023 & 2022 for India’s top Professional Colleges.

3. Ganpat University - U. V. Patel College of Engineering ranked among Top 70 Private Engineering Institutes in INDIA in OUTLOOK - ICARE RANKINGS 2020 for India's top Professional Colleges.
4. Students participated in ROBOFEST-GUJARAT 2020 competition in the Robot Playing musical Instrument category organized by Gujarat Council on Science and Technology (GUJCOST), Gandhinagar. The Team received certificates and a special cash prize of Rs.5,00,000/- (Rupees Five Lakh).
5. U. V. Patel College of Engineering was awarded for Excellence in Research Activities for Betterment of Education, Society and Nation by Government of Gujarat at Grand Education Fair on 2nd February 2018.Bestowed a Diamond Award under the category 'Best Industry-Academia Initiative by Academic Institute' to eiTRA - Ganpat University in the 8th GESIA Annual Awards - 2015 held on 13th March 2015 at Ahmedabad as recognition of an active association of Ganpat University with eInfochips.
6. Students Participated in Smart India Hackathon 2018(World's largest Hackathon) and secured 2nd runners-up prize. They have been rewarded a cash prize of Rs. 50000/- and Medals in this 36 hours coding and app development.
7. Students Participated in Smart India Hackathon 2020 (Software Edition) and won Rs. 100000/- (1 Lakh).
8. One team of Students won a prize money of Rs. 9,00,000/- in Level I to III (Rs. 7,50,000 in Level III, Rs. 1,00,000/- in Level-II & Rs. 50,000 in Level-I) for the project "Smart Library Assistant Robot" in "Other Category" in the India's biggest Robotics Competition, ROBOFEST- GUJARAT 3.0 Competition organized by Gujarat Council on Science and Technology (GUJCOST), Gandhinagar.
9. One team of Students won a prize money of Rs. 7,50,000/- in Level I to III (Rs. 5,00,000/- in Level-III, Rs. 2,00,000/- in Level-II & Rs. 50,000 in Level I) in category "Two Wheeled Self Balancing Robot" in the India's biggest Robotics Competition, ROBOFEST- GUJARAT 3.0 Competition organized by Gujarat Council on Science and Technology (GUJCOST), Gandhinagar.
10. Achievements of TEAM GUNI-UVPCE ROBOCON

    • BEST ROOKIE AWARD IN ROBOCON-2013

    • BEST IDEA AWARD IN ROBOCON-2015 ORGANIZED BY MIT, PUNE

    • 1ST IN GUJARAT TECHNOLOGICAL UNIVERSITY TECH FEST 2016

    • MATHWORKS AWARD FOR ROBOCON-2018

11. Achievements of TEAM GUNI-SHATASHA EBAJA

    • Got 1st Prize in Cost Event at SAE INDIA BAJA-2013

    • Best E-BAJA TEAM Award-2015

• 1st in Maneuverability and 2nd in Acceleration and International Participation of M-BAJA TEAM at California-2016

• Got 2nd Prize in Sled Pull at SAE INDIA BAJA and also got 1st Prize in Sled Pull in ATV Championship 5.0 at GTU-2018