Design and Development of RentEase: A Smart Web-Based Property Rental Management System

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***Abstract*—** The rapid growth of digital technology has transformed traditional property rental services by providing convenient and efficient online platforms. However, conventional rental processes often involve challenges such as fake property listings, insufficient user verification, broker dependency, time-consuming paperwork, and difficulties in finding compatible roommates. This paper presents RentEase, a smart and secure web-based rental service platform designed to connect property owners and tenants through a centralized, admin-controlled system. The proposed platform provides separate modules for tenants, property owners, and administrators to ensure efficient property management and secure interactions. It offers property searching with multiple filters based on location, budget, profession, and educational background. A dedicated field-grouping feature helps users identify suitable roommates with similar professional or academic interests. Additionally, the system supports user verification, property listing approval, booking requests, and digital rent agreement generation. The platform follows a structured development approach using modern web technologies, including React.js, Next.js, and database integration for managing user and property information. By reducing manual processes and dependence on intermediaries, RentEase aims to improve transparency, accessibility, security, and convenience in property rental management. The proposed system provides a centralized digital solution for simplifying rental activities and enhancing the overall experience of tenants and property owners.

Keywords— RentEase, Online Rental Platform, Property Management, User Verification, Roommate Matching etc.

I. INTRODUCTION

The real estate rental sector is increasingly adopting digital technologies to simplify property discovery, tenant communication and rental management. Traditional rental procedures often involve manual property searches, broker dependency, lengthy documentation and difficulties in verifying property owners and prospective tenants. These challenges can increase the time, cost and uncertainty associated with renting accommodation. Digital property platforms provide opportunities to improve accessibility, transparency and communication between different stakeholders [1]–[4].

The proposed RentEase platform is a web-based rental service designed to establish a centralized connection between tenants and property owners through an administrator-controlled verification mechanism. The system provides three primary user roles: Tenant, Owner and Admin. Tenants can search for properties using filters such as location, budget and professional or educational background. Property owners can upload property details, images, rental prices and locations, while administrators verify users, approve listings and remove invalid entries.

A significant feature of RentEase is its field-based grouping facility, which allows users to identify potential roommates belonging to similar educational or professional backgrounds, such as Engineering, MBBS, Law and Management. The platform also incorporates booking requests and digital rent agreement generation. The proposed system aims to reduce broker dependency, simplify rental procedures and improve the overall reliability of online property transactions [5], [6].

II. PROBLEM STATEMENT

Existing property rental procedures frequently involve difficulties in identifying genuine property listings, verifying tenants and owners, managing booking requests and completing rental documentation. Dependence on brokers can increase rental expenses, while scattered communication and manual record management can create inconvenience for both parties. Furthermore, conventional property platforms may not provide sufficient facilities for finding roommates based on educational or professional compatibility.

Therefore, RentEase proposes a centralized web-based rental management platform with role-based access, administrator-controlled verification, property filtering, digital agreement generation and field-based roommate grouping. The system is intended to provide a more organized, accessible and transparent rental experience.

III. LITERATURE REVIEW AND RESEARCH BACKGROUND

Digital transformation in real estate has introduced new methods of property discovery, rental management and stakeholder interaction. Naeem et al. [1] examined the technologies transforming the real estate sector and highlighted the growing importance of digital platforms. Wainwright [2] discussed the changing relationship between landlords and tenants through rental technology platforms.

These developments provide a foundation for centralized property search and management systems.

Research on digital housing searches also highlights the importance of online interfaces and the organization of property information. Studies of rental technology have examined how digital platforms influence housing accessibility, tenant applications and interactions between property owners and renters [3]–[6]. These findings support the development of user-friendly search filters and centralized listing management in RentEase.

Trust and verification are important considerations in online rental transactions. Research on digital platforms identifies the importance of reputation, user information and trust-building mechanisms [7]–[11]. Accordingly, RentEase incorporates administrator-controlled verification to reduce the possibility of invalid user accounts and misleading property listings.

Digital documentation and blockchain-based property management have also attracted research attention. Blockchain applications in real estate have been investigated for improving transparency, record management and transaction reliability [12]–[15]. These developments provide background for the digital rent agreement and centralized property record facilities proposed in RentEase.

Roommate allocation and accommodation matching have been examined through mathematical optimization, preference-based allocation and stable matching approaches [16]–[19]. These studies provide a conceptual foundation for RentEase's field-based grouping facility, which aims to help users find accommodation communities based on educational and professional backgrounds.

Finally, recent research on tenant-data collection emphasizes the importance of responsible information management and privacy protection [20]. This is relevant to RentEase because the platform manages personal details of tenants, property owners and property listings.

IV. PROPOSED SYSTEM

The proposed RentEase system is a centralized web-based application that provides rental services through three major user modules and one specialized grouping module. It is designed to simplify the interaction between property owners and tenants while maintaining administrative control over user accounts and property listings.



Figure 1: The proposed RentEase system Flow Diagram

The system consists of the following modules:

A. Tenant Module

- Provides registration and login facilities for tenants.
- Allows users to search available properties.
- Supports filtering based on location, rental budget and professional or educational background.
- Displays property information, including images, location and rental price.
- Allows tenants to submit property booking requests.
- Supports digital rent agreement generation and downloading.

B. Property Owner Module

- Allows property owners to register and access their accounts.
- Provides facilities to add, update and manage property listings.
- Supports uploading property images, rental prices and location details.
- Enables owners to view tenant booking requests.
- Allows owners to approve or reject rental requests.

C. Admin Module

- Provides centralized management of the complete platform.
- Verifies tenant and owner accounts.
- Reviews and approves property listings.
- Identifies and removes fake or invalid property entries.
- Monitors platform activities and manages system information.

D. Field-Based Grouping Module

- Categorizes users according to profession and educational background.
- Provides groups such as Engineering, MBBS, Law, MBA, Arts, Commerce and Science.
- Helps users discover potential roommates with similar backgrounds.
- Supports community-based accommodation discovery.

V. PROPOSED SYSTEM ARCHITECTURE

The RentEase architecture follows a client-server-based approach in which the user interacts with the frontend interface, while the backend manages requests, authentication and database operations.



Figure 2. Proposed architecture of the RentEase web-based rental service platform.

The working architecture consists of five major components:
1. User Interface: Provides separate interfaces for tenants, owners and administrators.
2. Frontend: Uses React.js and related web technologies to display property information and user options.
3. Backend Server: Processes user requests, authentication, property management and booking operations.
4. Database: Stores user profiles, property information, booking details and verification records.
5. Output Interface: Displays approved property listings, search results, booking information and generated agreements.

VI. PROPOSED METHODOLOGY

The major development stages are:
1. Requirement Analysis: Identify the needs of tenants, owners and administrators, including property searching, verification and rental management.
2. System Design: Prepare the user interface, module structure, database design and application architecture.

3. Development: Develop the frontend using HTML, CSS, JavaScript, React.js and TypeScript, with suitable backend technologies.
4. Database Integration: Store and manage user information, property listings, booking requests and agreement records.
5. Testing: Check registration, login, property listing, search filters, booking requests and administrative functions.
6. Deployment: Deploy the completed application to make rental services accessible through a web browser.

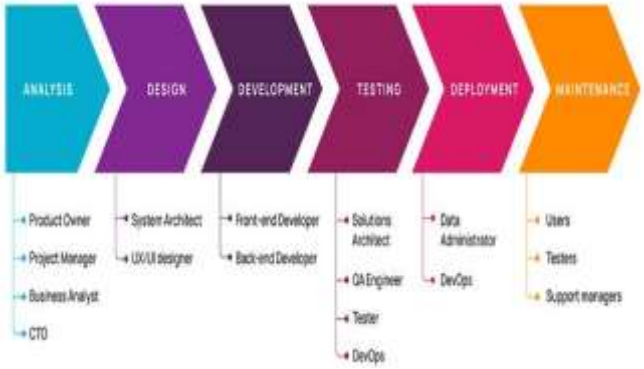


Figure 3. Structured development methodology adopted for RentEase.

VII. SYSTEM IMPLEMENTATION AND FUNCTIONAL FEATURES

The proposed platform uses a modular development approach to ensure that each user role can access only the facilities relevant to its responsibilities.

Table 1: System Implementation and Functional Features

Module	Main implemented/proposed functions	Expected output
Tenant	Registration, login, property search, booking	Property information and booking request
Owner	Property upload, listing management, request handling	Managed property listings
Admin	User verification, listing approval, monitoring	Approved accounts and properties
Field grouping	Profession and education categorization	Group-based property discovery
Agreement	Rent agreement generation and download	Digital agreement document

VIII. RESULTS AND DISCUSSION

A. *Results Obtained from the Developed RentEase Interface*

The results of the RentEase project are presented based on the interface screenshots provided on page 11 of the uploaded PowerPoint. The screenshots demonstrate the main user-facing facilities and the visual implementation of the proposed rental service platform.

Result 1: Home Page Interface



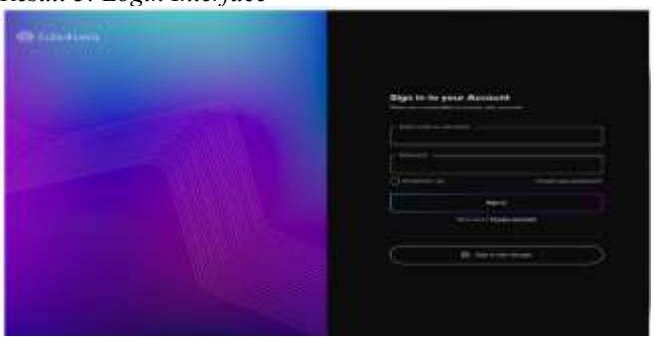
The home page provides the primary entry point for users. It introduces the RentEase rental service and provides property-search functionality. The interface emphasizes direct connections between tenants and property owners, with the objective of reducing broker dependency.

Result 2: User Registration Interface



The registration interface provides an account creation facility for new users. It collects the required information for account creation and supports separate user access for tenants and property owners. This facility establishes the initial user onboarding process.

Result 3: Login Interface



The login interface provides an entry facility for registered users. It allows users to access the platform using their login credentials and supports controlled access to the available rental services.

Result 4: Property Browsing Interface



The property browsing interface displays available rental properties through individual listing cards. Property information can be organized using location, price and other search criteria. The interface makes it easier for tenants to explore available accommodation.

Result 5: Community-Based Property Discovery



The community-based interface provides grouping according to educational and professional backgrounds. Categories such as Engineering, MBBS, Law, MBA, Arts, Commerce and Science help users identify suitable accommodation communities.

Result 6: Property and Community Overview



The overview interface combines property discovery and community-related information. It provides a centralized visual arrangement of rental listings and user-oriented facilities.

B. *Functional Results Summary*

The following table summarizes the functional outcomes represented in the project presentation.

Table 2: Functional Results Summary

Sr. No.	Feature	Result demonstrated
1	Home page	Rental service introduction and property search interface
2	Registration	New user account creation interface
3	Login	Registered-user login interface
4	Property browsing	Property cards and browsing interface
5	Community grouping	Profession- and education-based categories
6	Owner management	Property uploading and booking request handling specified
7	Admin management	User verification and listing approval specified
8	Digital agreement	Agreement generation and downloading specified

C. *Comparative Analysis of Existing and Proposed Systems*

The following comparison is based on the problems identified and the facilities proposed in RentEase. It is a feature-based comparison, not a measured experimental comparison.

Table 3: Feature-based comparison between traditional rental procedures and the proposed RentEase system

Parameters	Traditional rental process	RentEase proposed system
Property search	Manual search and broker assistance	Online property browsing
User verification	May involve manual verification	Centralized admin verification
Property listing	Scattered advertisements	Centralized property listings
User access	Less organized	Tenant, Owner and Admin roles
Property filtering	Limited manual selection	Location, budget and field filters
Roommate selection	Personal contacts and manual search	Profession-based grouping
Booking	Direct communication	Online booking requests
Rent agreement	Conventional paperwork	Digital agreement generation
Management	Decentralized	Centralized platform

D. *Analysis of Major System Outcomes*

The developed interface and proposed functional modules demonstrate the following outcomes:

- Improved property accessibility: The property browsing interface provides a centralized facility for exploring rental accommodation.
- Organized user management: Separate tenant, owner and admin modules establish role-based system organization.
- Improved listing control: Administrator approval provides a mechanism for reviewing property listings before activation.
- Community-based accommodation: Field grouping introduces an additional facility for discovering potential roommates based on education and profession.
- Simplified rental activities: Booking requests and digital agreement facilities are intended to reduce conventional paperwork.
- Centralized management: The platform brings property information, user accounts and rental-related activities into one application.

E. *Research-Based Discussion*

The proposed outcomes of RentEase are consistent with important developments reported in digital real estate research. Naeem et al. [1] discussed the transformation of real estate through digital technologies and the importance of improving information accessibility and reducing procedural complexity. RentEase addresses these concerns through centralized property discovery and management.

Migozzi [7] and Przhedetsky [10] examined the role of rental platforms and digital tenancy application technologies in tenant screening and housing access. Their studies highlight the importance of transparency and responsible handling of applicant information. RentEase incorporates an administrator-controlled verification mechanism, although further privacy and security testing is necessary.

Saari et al. [14] examined real estate applications of blockchain and identified potential benefits related to transparency, verification and transaction management. Although RentEase currently proposes conventional centralized management, its digital agreement module could be extended through secure electronic records.

Perach and Anily [16] investigated stable matching of student groups to dormitories. Their research provides a relevant conceptual foundation for the field-based grouping feature of

RentEase, which focuses on organizing users according to academic and professional backgrounds.

Maalsen et al. [20] emphasized the implications of tenant-data collection through property technologies. This highlights the need for appropriate privacy policies, limited data collection and controlled access when implementing RentEase.

F. Limitations of the Current Results

The available demonstrates the system interfaces and proposed modules, but does not contain:
- Actual application response-time measurements.
- Number of registered tenants and property owners.
- Number of verified property listings.
- Accuracy of roommate matching.
- Security and authentication testing results.
- User feedback or satisfaction scores.

Therefore, the current results establish the functional design and interface-level outcomes rather than statistically validated system performance.

IX. FUTURE SCOPE

The RentEase platform can be enhanced through the following developments:
1. Online Payment Integration: Integrate secure payment gateways for rent payments, deposits and transaction records.
2. Mobile Application: Develop Android and iOS applications for convenient access.
3. AI-Based Recommendations: Suggest properties and roommates based on user preferences, budget and compatibility.
4. Location-Based Search: Integrate Google Maps or similar mapping services to display nearby rental properties.
5. Advanced Verification: Introduce identity-document verification and additional property ownership checks.
6. Chatbot Integration: Provide automated assistance for property searching, booking and rental-related queries.
7. Digital Signature: Enable electronic signing and secure storage of rental agreements.
8. Enhanced Security: Implement data encryption, access control, privacy policies and secure document management.

X. CONCLUSION

The proposed RentEase platform provides a centralized web-based solution for simplifying property rental activities and improving communication between tenants and property owners. The system incorporates separate modules for tenants, owners and administrators, enabling organized user management, property listing, verification and booking request handling. Its field-based grouping facility introduces an additional approach to accommodation discovery by categorizing users according to educational and professional backgrounds. The interface results presented in the project demonstrate the home page, registration, login, property browsing and community-based property discovery facilities. Digital rent agreement generation further aims to reduce conventional paperwork and simplify rental documentation. The administrator-controlled verification mechanism provides a structured approach to reviewing users and property listings. Overall, RentEase establishes a foundation for a more accessible, organized and technology-driven rental service. Further testing, payment integration, enhanced security and intelligent recommendation facilities can improve its functionality and practical application.

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