

Smart Urban Resource Sharing Platform Using AI

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Abstract: SpaceHive is a digital marketplace for booking temporarily available rooms, conventional halls, and vacant plots. The proposed platform connects Customers seeking short-term spaces with Owners listing their properties, while an Admin reviews listings, manages pricing rules and commission, and monitors platform revenue. Customers can search by title, address, and type, use distance-aware discovery, view available spaces, and obtain an itemized rule-based price before booking. Owners can submit listings with supporting documents, track approval status and bookings, and view expected payouts. The system emphasizes role-based authentication, identity verification, transparent pricing, secure payment verification, and preservation of historical booking records. The project report also discusses AI-driven demand prediction, personalized recommendations, and conversational assistance as proposed enhancements; however, its current pricing design is rule-based, with machine-learning pricing identified as future work. SpaceHive aims to improve the organization, transparency, and utilization of underused urban spaces.

Key Word: SpaceHive; Smart Urban Resource Sharing; Space Booking; Role-Based Access; Dynamic Pricing; Smart Cities; Digital Marketplace.

I. INTRODUCTION

Rapid urban development increases the need for flexible access to land and built spaces. At the same time, many privately owned rooms, community halls, and open plots are available only intermittently. A room may be vacant between occupants, a hall may be unused on weekdays, and an open plot may be suitable for a short-duration event, parking arrangement, or temporary activity. The lack of a unified discovery and reservation mechanism makes it difficult to match this temporary supply with demand. Conventional arrangements frequently depend on telephone calls, local advertisements, personal contacts, and separate websites. Such methods make it difficult for customers to compare availability, distance, capacity, prices, and conditions consistently. Owners may struggle to communicate updates or keep a reliable record of requests. Platform administrators need an auditable way to verify listings and manage booking-related financial activity. SpaceHive proposes a single digital marketplace that combines resource discovery with administrative control. The system organizes participation around Customers, Owners, and Admins. A Customer searches and books an appropriate resource; an Owner publishes information about available spaces and monitors incoming bookings; an Admin reviews listings, supervises marketplace rules, and monitors financial information. This separation is essential because a trustworthy marketplace requires more than simply displaying properties. The project gives special attention to differences among resource categories. Rooms may be charged hourly or daily, halls generally use daily pricing and guest-capacity details, and plots require area and purpose-of-use information. Instead of forcing every resource into an identical form, SpaceHive uses common marketplace processes alongside category-specific details. The platform also emphasizes transparent charges, status visibility, and controlled listing publication.

II. SCOPE OF THE PROJECT

The project covers registration and login for Customer, Owner, and Admin roles; property listing and document upload; administrative approval; search and filtering; booking dates and durations; rule-based price calculation; payment workflow; commission and Owner payout records; booking history; overstay fines; and revenue reporting. Rooms can support hourly or daily pricing, halls have capacity-based details and daily booking, and plots include area and intended use. Real payment gateway integration, production identity verification, and predictive machine-learning pricing require additional deployment and development work.

III. EXISTING SYSTEM AND PROPOSED SYSTEM

Existing System: Conventional short-term space rental is fragmented across local advertisements, telephone calls, messaging platforms and unrelated booking services. Availability and documentation may be communicated manually,

while prices and additional charges are not always explained consistently. Owners can struggle to maintain reliable booking and earnings records. Customers may have difficulty locating suitable rooms, halls or plots and comparing their conditions. Without a common approval process, platform-wide commission records and overstay handling, administrative control also becomes challenging

Proposed System: SpaceHive introduces a centralized three-role marketplace. Owners register, upload required documents and submit space listings, which remain pending until Admin verification. Approved listings become available to Customers through title, address and category searches. When location permission is granted, results can be arranged by distance; a fallback location is used when permission is denied. Category-specific booking forms capture timing, duration, capacity or purpose. A rule-based engine displays the price breakdown before payment. Booking records preserve the charged amount, commission and Owner payout, while the Admin can monitor revenue, review overstays and issue reasoned fines. The platform is designed for secure authentication, protected documents and gateway-verified payment confirmation.

IV. SYSTEM DESIGN

System design: SpaceHive follows a three-layer architecture consisting of a user interface, an application logic layer and a SQLite database. Customers, Space Owners and the Super Admin interact with separate functions while the backend enforces listing, booking and financial rules

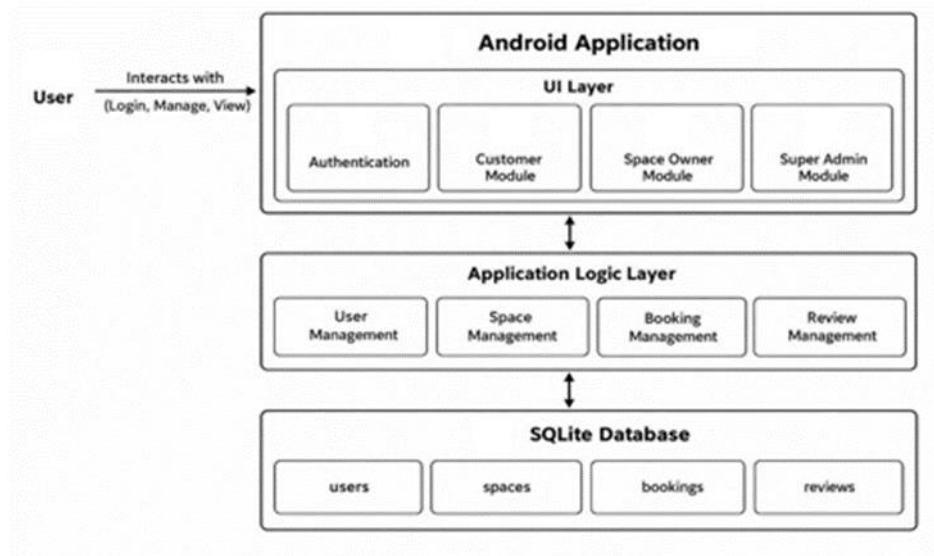


Figure no 1: System Design

1. User Interface Layer: The application presents authentication, Customer, Space Owner and Super Admin modules. Customers search and book spaces; Owners create listings and inspect booking requests; Admin manages approvals, users and reports.
2. Application Logic Layer: User management, space management, booking management and review management validate requests and coordinate operations. Important decisions, including listing visibility, pricing and authorization, are enforced by application logic rather than only by the interface.
3. Listing and Approval Module: Owners submit titles, addresses, pricing, availability, photographs and supporting documents. Each new listing is stored as Pending and becomes visible for booking only after Admin approval.
4. Database Layer: The SQLite database stores users, spaces, bookings and reviews. Related payment, commission and listing-status records support consistent retrieval, history and reporting across the platform.
5. Pricing and Payment Module: The system calculates charges using the resource category, booking duration and configured rules. The breakdown is shown before payment; final booking price, commission and Owner payout are retained as historical records.
6. Search and Booking Module: Customers filter rooms, halls and plots, review amenities and availability, and choose suitable dates or hours. Location-aware results improve discovery when permission is available.
7. Admin and Revenue Module: Admin reviews submitted properties, manages pricing adjustments and commission settings, checks overstay cases, applies fines with reasons and views financial summaries.
8. Workflow: An Owner registers and submits a property. Admin verifies the documents and approves the listing. A Customer discovers an approved space, reviews its details and price, makes a booking and completes the payment workflow. The Owner can then track bookings and expected earnings.
9. Security controls include role-based authorization, protected identity documents and server-side verification of payment status.

The report describes a UI layer, application logic layer and SQLite data storage. Its software requirements also identify Python, React.js, Node.js, Flask or FastAPI, and optional AI-related libraries as possible development technologies. Machine-learning pricing is a future direction rather than a validated component of the current rule-based design.

V. RESULT

The SpaceHive report presents a working demonstration through screenshots of the login page, space listings, space descriptions, dashboard, space history and hosting dashboard. These interfaces illustrate the intended customer and owner journeys within a shared booking platform. Users can navigate available resources, inspect details and access booking-related information through organized screens. The demonstration highlights the advantages of consolidating rooms, halls and vacant plots in one marketplace. Category-specific descriptions help users understand facilities and booking requirements, while the hosting interface supports property management. The project report also documents functional test cases covering key operations such as viewing space details, booking and payment. The documented results indicate successful behavior for the listed scenarios, although the report does not establish production-scale reliability, verified real-money settlement or predictive AI pricing accuracy. The screenshots and tests support evaluation of the prototype workflow and its usability, not claims about large-scale commercial deployment.

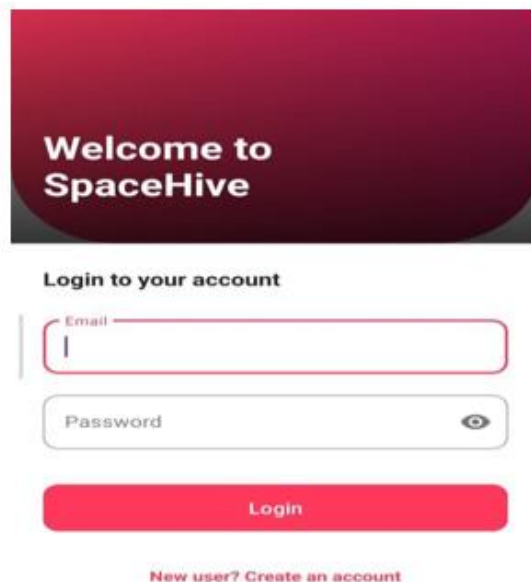


Figure no 1: login page

SpaceHive login page allows registered users and administrators to securely access the platform using their email and password. It provides registration options and demo credentials for testing the system.

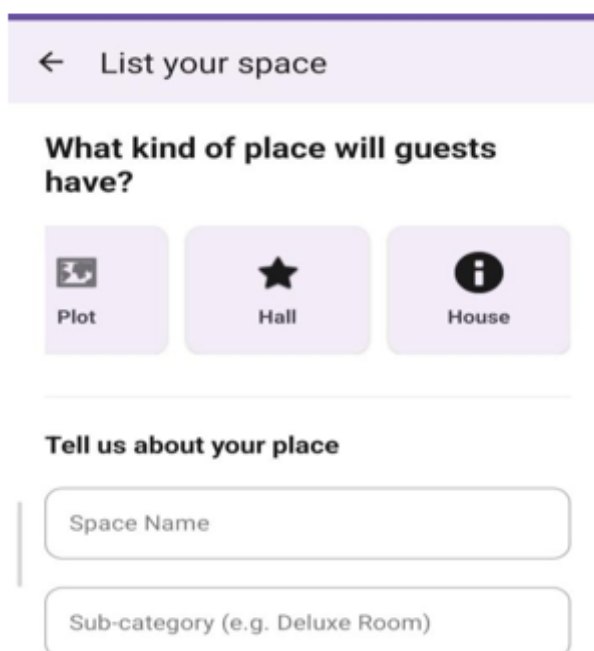
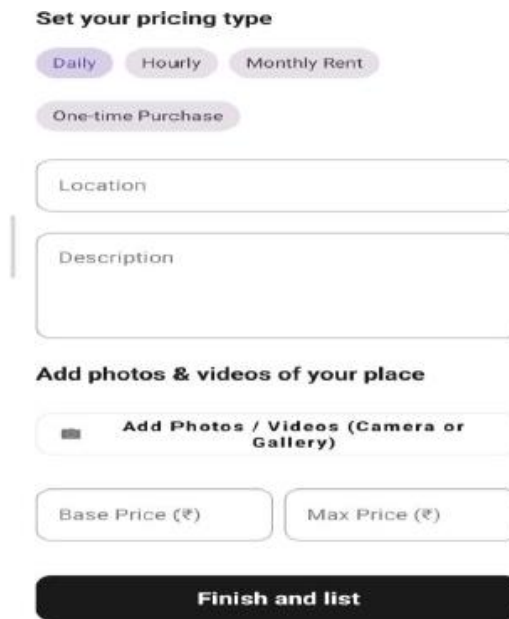


Figure no 2: Space Listing

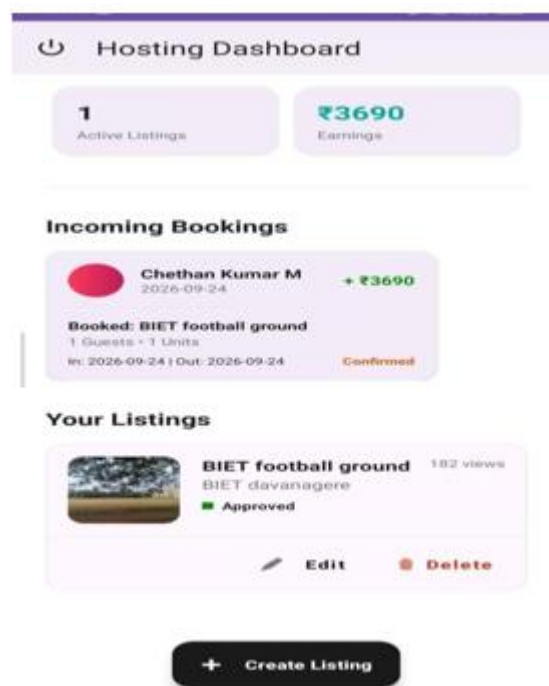
The listing interface presents available urban resources in a common marketplace, helping customers browse and identify rooms, halls or plots that meet their needs.



The form titled "Set your pricing type" includes four radio button options: "Daily", "Hourly", "Monthly Rent", and "One-time Purchase". Below these are two text input fields labeled "Location" and "Description". A section titled "Add photos & videos of your place" contains a button labeled "Add Photos / Videos (Camera or Gallery)". At the bottom are two input fields for "Base Price (₹)" and "Max Price (₹)", followed by a large black button labeled "Finish and list".

Figure no 3: Space Dimension

The space-description screen displays property-specific information needed before a booking, such as the resource details, availability and applicable booking conditions.



The "Hosting Dashboard" features a top bar with a power icon and the title. Below are two summary cards: "1 Active Listings" and "₹3690 Earnings". The "Incoming Bookings" section shows a booking for "Chethan Kumar M" on "2026-09-24" for "+ ₹3690", booked for "BIET football ground" with "1 Guests - 1 Units" from "2026-09-24" to "2026-09-24", marked as "Confirmed". The "Your Listings" section displays a listing for "BIET football ground" in "BIET davanagere", marked as "Approved" with "182 views", and includes "Edit" and "Delete" buttons. A large black button at the bottom is labeled "+ Create Listing".

Figure no 4: Hosting Dashboard

The hosting dashboard supports the Space Owner's view of listed properties and related activity, providing a central location to monitor resources and bookings

VI. DISCUSSION

SpaceHive brings together resource discovery, property listing, booking and administrative oversight that are otherwise handled through separate channels. The three-role structure clarifies responsibilities and creates a more organized marketplace for temporary urban spaces.

A key design decision is Admin verification before publication. Requiring document review and an explicit approval state prevents Owners from making unreviewed properties immediately available. Role-based access and identity checks are intended to strengthen accountability, though practical effectiveness depends on secure implementation and operational review.

Transparent rule-based pricing makes charges easier to understand and audit. Recording the final price, commission and Owner payout at booking time helps protect historical financial records from later configuration changes. Location-aware sorting also improves convenience without making GPS permission mandatory.

The project discusses AI-driven demand prediction, intelligent pricing and conversational assistance as broader goals. However, its detailed current specification describes rule-based pricing, and machine-learning optimization is reserved for future development after sufficient booking data becomes available. These capabilities should not be presented as experimentally validated results.

The prototype additionally depends on external infrastructure for production use. Live payment-gateway verification, reliable identity checks, protected cloud document storage, scalable deployment, monitoring and clear operational policies would need further development and testing before real-world rollout.

Limitations include the absence of demonstrated large-scale performance measurements, limited evidence of real-world booking demand and the need to validate payment, security and reliability under production conditions. Future work can extend the system with data-driven recommendations, demand forecasting and stronger marketplace analytics

VII. CONCLUSION

SpaceHive proposes a centralized Smart Urban Resource Sharing Platform for booking vacant rooms, conventional halls and plots. It connects Customers, Space Owners and Admin through controlled listing approval, searchable property information, category-specific bookings, transparent pricing and financial tracking. The system design uses a layered architecture and a SQLite-backed data model to organize user, space and booking operations. Reported interfaces and functional tests demonstrate the principal marketplace workflow. By improving the discoverability and management of underutilized spaces, SpaceHive provides a foundation for more efficient urban resource sharing. Future enhancements include secure production payment and identity services, scalable hosting, AI-assisted recommendations and data-driven pricing after adequate booking history has been collected.

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