

Smart Accommodation Finder for Student

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ABSTRACT

Smart Accommodation is a web-based intelligent housing recommendation system designed to assist students in finding suitable rental accommodations efficiently. The system addresses common challenges such as unorganized listings, lack of transparency, and difficulty in comparing options by providing a centralized platform with smart filtering and recommendations. It integrates real-time accommodation data, geospatial analysis, and a recommendation algorithm to suggest personalized housing options based on user preferences like budget, distance from university, safety, and amenities. The system is developed using modern web technologies with a scalable backend and database support. The experimental results show improved recommendation accuracy, fast response time, and high user satisfaction. The platform significantly reduces the time required for manual searching and enhances decision-making for students. Overall, the system provides a reliable, efficient, and user-friendly solution for student accommodation, making the search process smarter and more effective.

1. INTRODUCTION

Finding suitable accommodation is one of the major challenges faced by students, especially those studying in new cities or away from home. Students often struggle with scattered rental listings, unreliable information, high prices, and difficulty in comparing multiple options. Traditional methods of searching for housing are time-consuming and inefficient. To overcome these issues, this project introduces “Smart Accommodation”, a smart housing recommendation system designed specifically for students. The platform provides a centralized solution where users can easily search, filter, and compare accommodation options based on their preferences such as budget, location, safety, and facilities. The system uses real-time data integration, geospatial analysis, and a recommendation algorithm to deliver personalized suggestions. It helps students find accommodations closer to their universities and within their budget, improving convenience and decision-making. By combining modern web technologies with intelligent recommendation techniques, Smart .

2.METHODOLOGY

2.1. System Design and Architecture

The system is designed using a three-tier architecture to ensure modularity and scalability:

Frontend Layer (Presentation Layer):

Developed using React JS, this layer provides an interactive and user-friendly interface for students, property owners, and admin.

Backend Layer (Application Layer):

Built using Java Spring Boot, it handles business logic, API management, authentication, and communication between frontend and database.

Database Layer:

Managed using PostgreSQL, it stores user data, property listings, booking details, and feedback.

Key Design Considerations:

- Scalability for future expansion
- Secure data handling and authentication
- Easy navigation and responsive UI
- Separation of concerns for maintainability

2.2. Software Selection

The technologies were selected based on performance, scalability, and ease of development:

- React JS: For building a dynamic and responsive user interface
- Java Spring Boot: For robust backend development and REST API creation
- PostgreSQL: For reliable and structured data storage
- Cloudinary: For storing and managing property images and media files
- Python (AI Integration): For implementing intelligent features like face recognition and future recommendation systems

Reason for Selection:

- Open-source and widely supported
- High performance and scalability
- Strong community support
- Easy integration between components

2.3. System Integration

All system components are integrated to work seamlessly:

- Frontend-Backend Integration:
- REST APIs are used to connect React frontend with Spring Boot backend.
- Backend-Database Integration:
- Spring Boot interacts with PostgreSQL using ORM (Hibernate/JPA).
- Media Integration:
- Cloudinary is integrated to upload, store, and retrieve images efficiently.
- AI Integration:
- Python modules are connected with backend APIs for processing face recognition data.

Outcome:

Smooth data flow between all modules

Real-time updates and efficient processing

2.4 Testing and Deployment

- Conducted unit testing and integration testing to ensure all features work properly.
- Performed user testing with students and landlords to collect feedback and improve the system.
- Planned deployment of the Smart Accommodation application for wider use after final optimization.

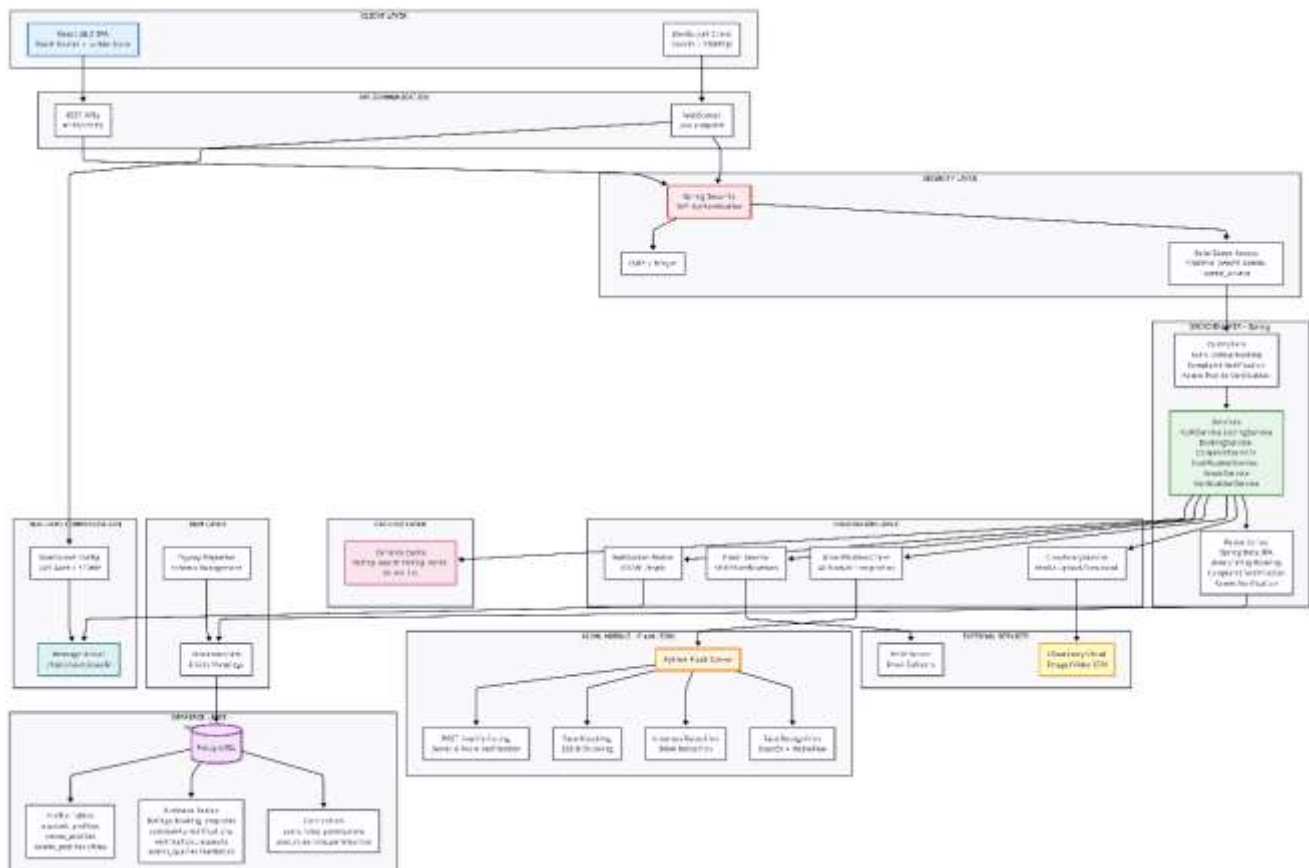


Fig.System design

3.RESULTS AND DISCUSSION

3.1. Reduction in Time for Finding Accommodation

Observation: Students were able to find suitable accommodation much faster compared to traditional methods.

Result:

The use of filters (location, budget, amenities) significantly reduced search time.

Students could shortlist properties within minutes instead of spending days through brokers or manual search.

3.2. Improved User Experience

Observation: The interface developed using React JS was simple, responsive, and easy to navigate.

Result:

Users (students and owners) could perform actions like searching, listing, and updating information without confusion.

Minimal training or guidance was required to use the system.

3.3. Accurate and Organized Data Management

Observation: PostgreSQL database efficiently handled user data, property details, and feedback.

Result:

Data retrieval was fast and reliable.

No major issues like data loss or inconsistency were observed during testing.

3.4. Effective Property Listing and Management

Observation: Property owners were able to easily add, update, and manage their listings.

Result:

Increased visibility of properties.

Owners could update availability in real-time, reducing confusion for students.

3.5. Transparency through Feedback System

Observation: The feedback and rating feature allowed students to share their experiences.

Result:

Built trust among users.

Helped new users make better decisions based on reviews.

Reduced chances of selecting unsuitable or fraudulent properties.

3.6. Efficient Media Handling using Cloudinary

Observation: Images of properties were uploaded and retrieved using Cloudinary.

Result:

Faster image loading with good quality.

Reduced load on the main server.

Improved visual representation of listings.

3.7. Secure User Authentication

Observation: Login and registration system ensured only authorized users accessed the platform.

Result:

Reduced fake accounts.

Improved system security and reliability.

3.8. Face Recognition for Enhanced Security

Observation: AI-based face recognition (Python) was tested for user verification.

Result:

Added an extra layer of security.

Helped in verifying genuine users (in applicable scenarios).

Demonstrated the potential for advanced AI integration.

3.9. Smooth System Integration

Observation: Frontend, backend, database, cloud storage, and AI modules worked together effectively.

Result:

Seamless data flow between components.

No major integration errors during testing.

3.10. System Performance and Stability

Observation: The system was tested under different conditions and user loads.

Result:

Application performed efficiently with minimal delays.

No crashes or major failures observed during testing phase.

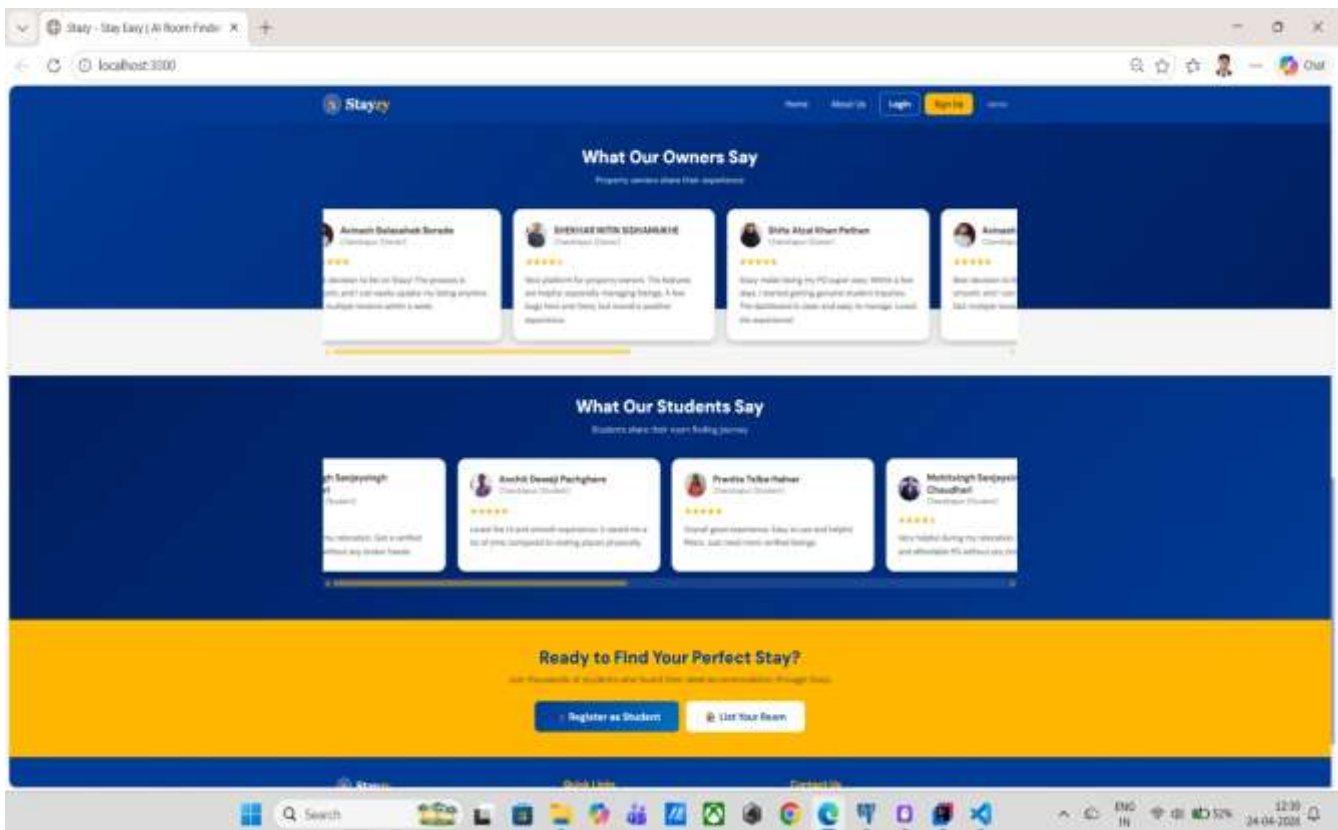
3.11. Accessibility and Remote Usage

Observation: The web-based system could be accessed from any device with internet connectivity.

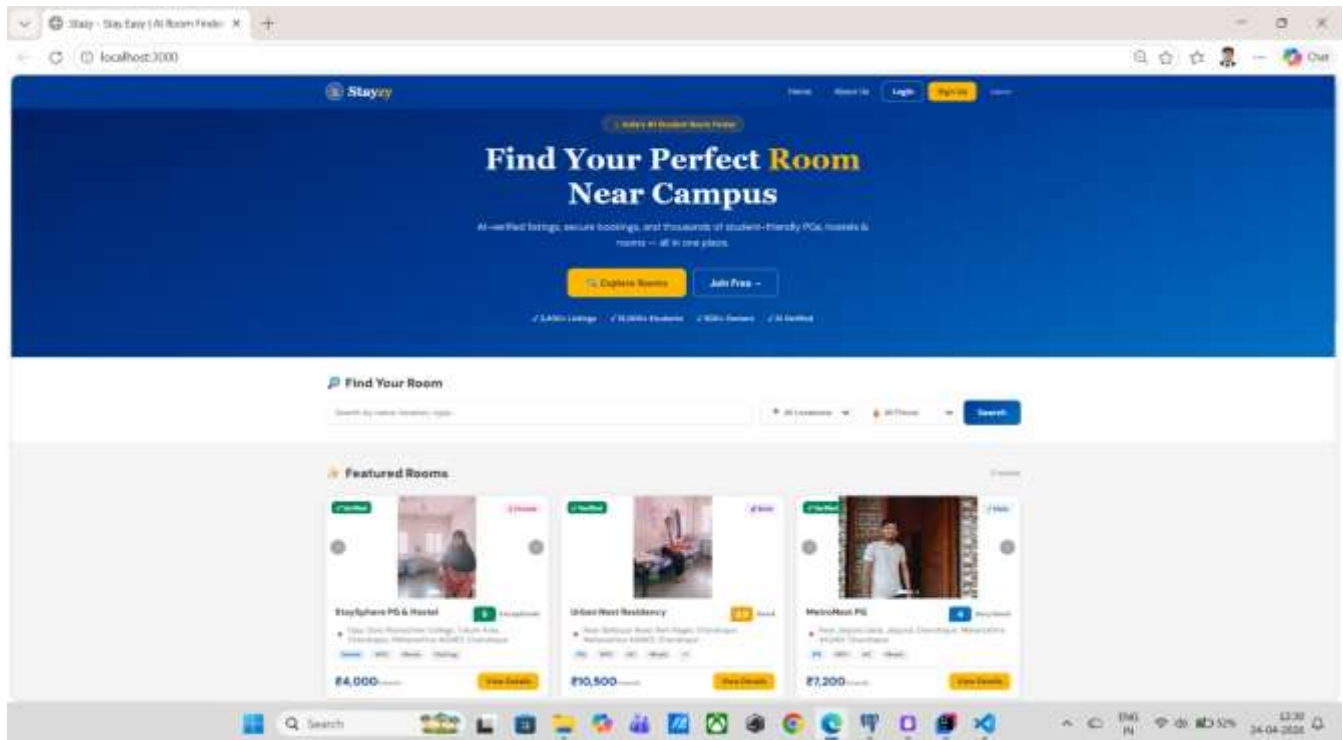
Result:

Users could search or manage accommodations anytime and anywhere.

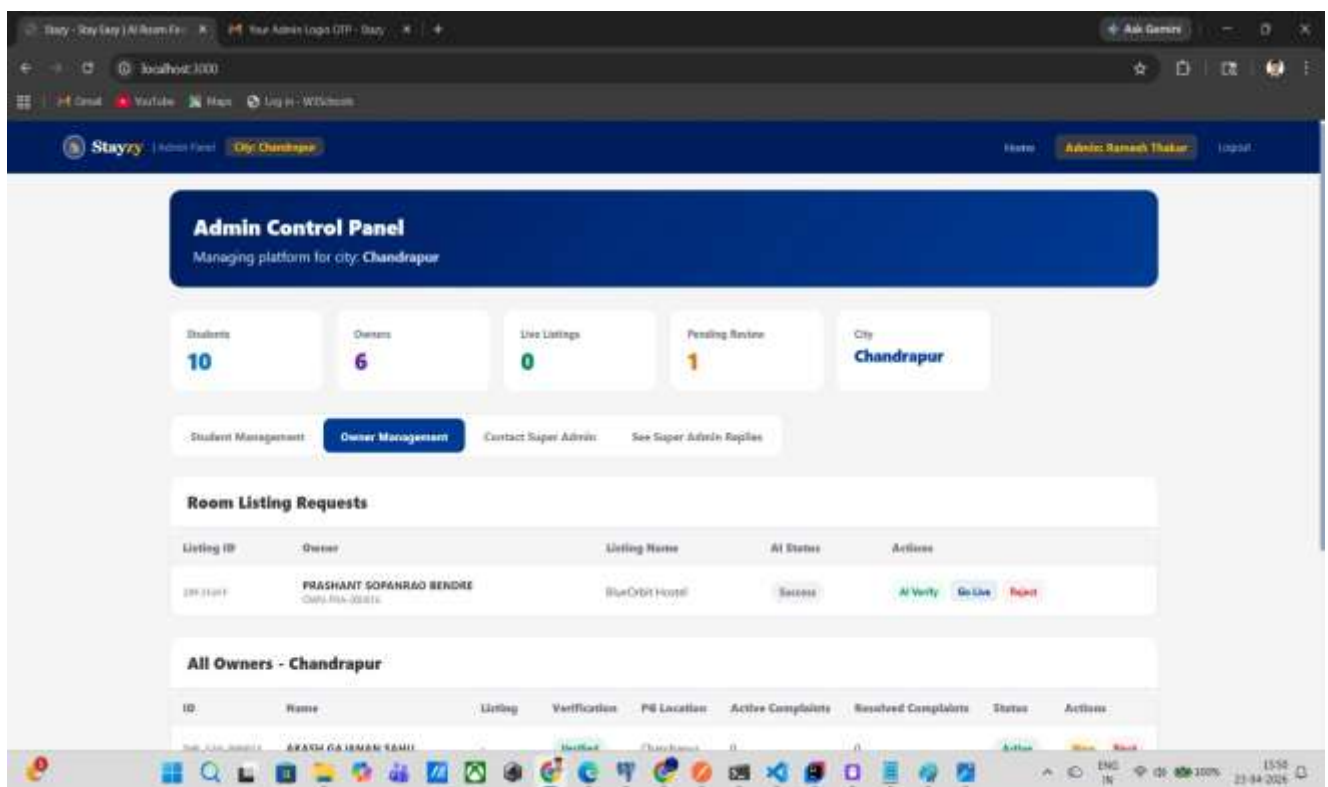
Increased convenience and usability.



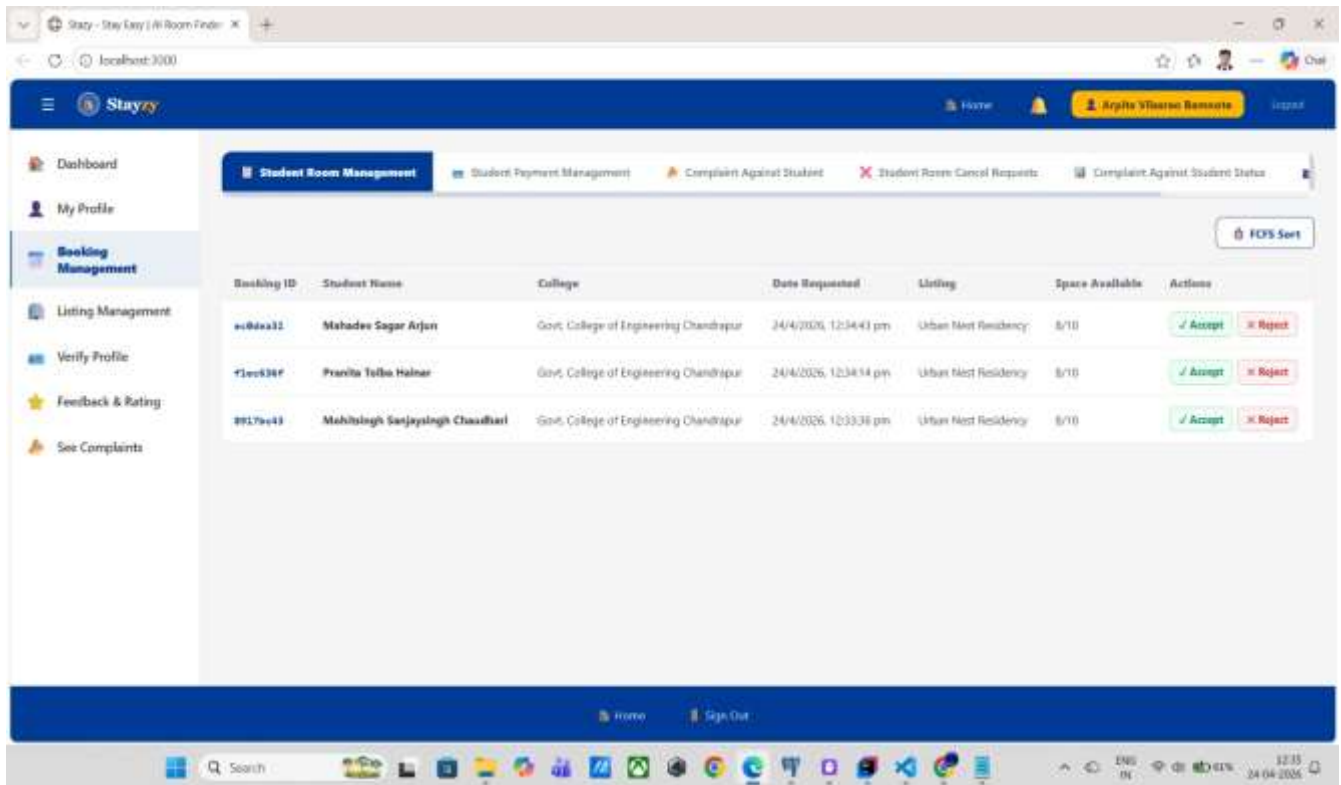
Home page



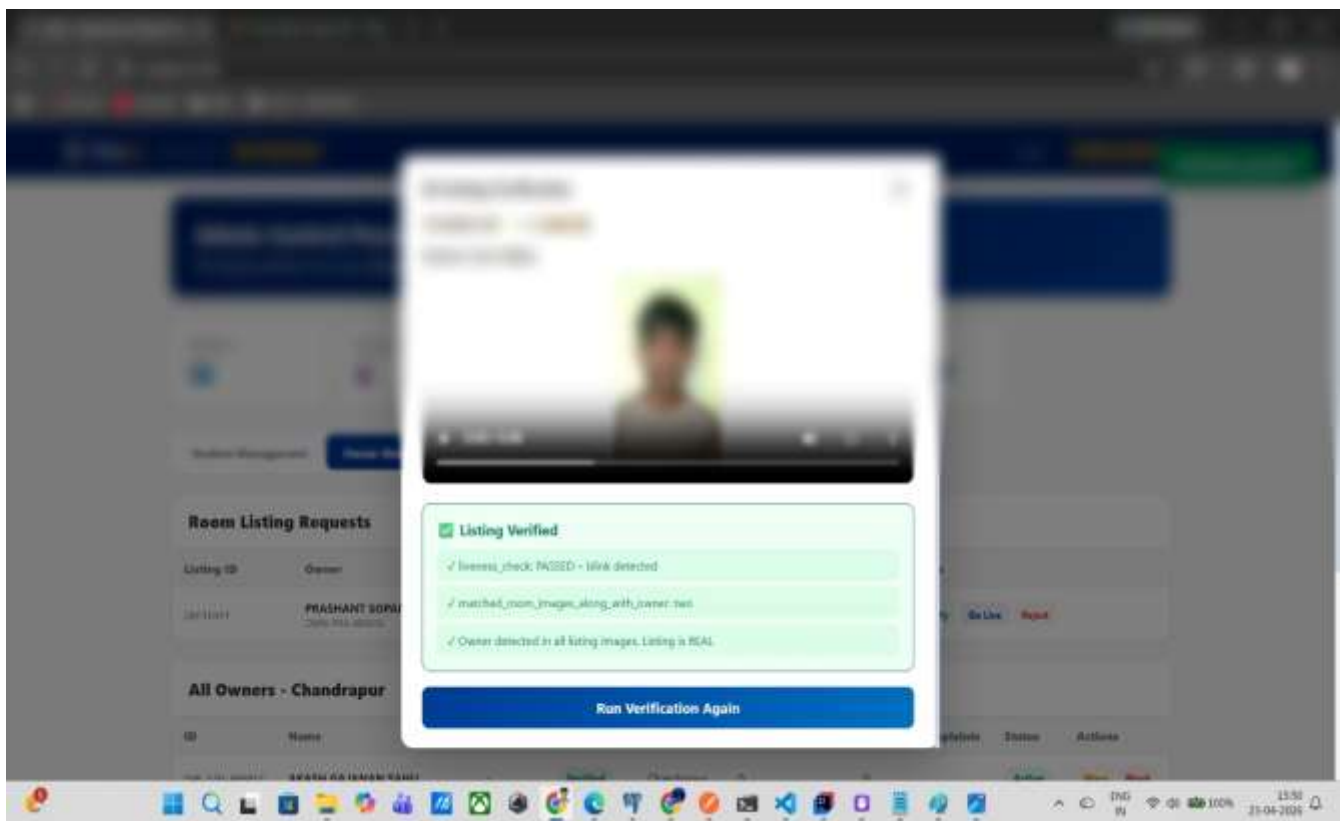
Room listing



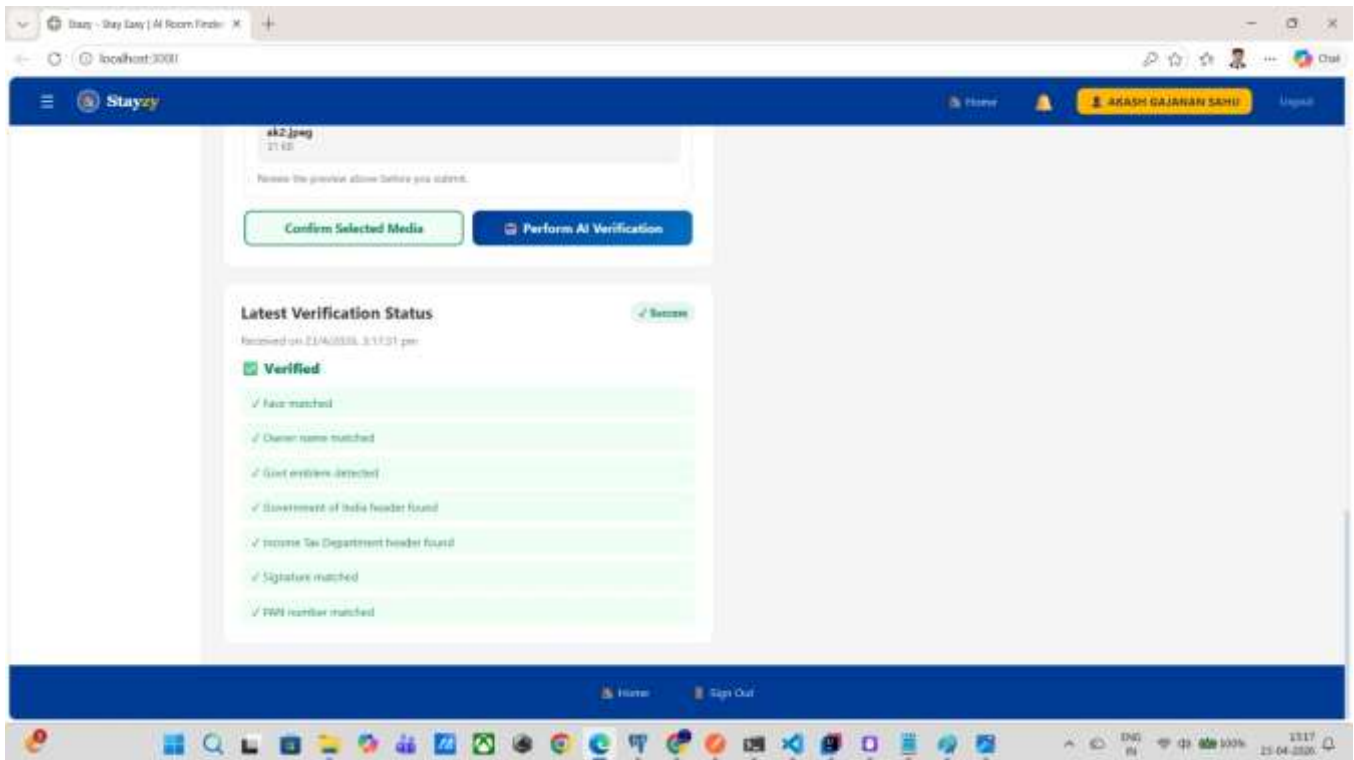
Admin panel



Owner panel



Id verification using our identity verification model



Id verification

4.CONCLUSION

The project “Smart Accommodation for Students” successfully addresses one of the most common and challenging problems faced by students—finding suitable accommodation in a new city. With the rapid growth of student migration for education, especially in non-metro cities, traditional methods such as brokers, word-of-mouth references, and manual searching have proven to be inefficient, time-consuming, and often unreliable. This project provides a modern, **technology-driven** solution that simplifies and enhances the entire accommodation search process.

The system introduces a centralized digital platform where students can easily search, filter, and explore accommodation options based on their preferences such as location, budget, and available amenities. By leveraging technologies like **React JS** for frontend, **Java Spring Boot** for backend, and **PostgreSQL** for database management, the platform ensures a smooth, responsive, and efficient user experience. The integration of Cloudinary for media storage further enhances the system by enabling fast and secure handling of property images, making listings more informative and visually appealing.

One of the key strengths of the system is its user-centric design, which focuses on simplicity, accessibility, and usability. The separation of modules into **Student**, **Owner**, and **Admin** ensures that each user type can interact with the system efficiently according to their needs. Students benefit from advanced search filters and transparent information, property owners gain better visibility and management tools for their listings, and administrators can monitor and maintain the overall system integrity.

The inclusion of a feedback and rating system plays a crucial role in improving transparency and building trust among users. It allows students to make informed decisions based on real experiences shared by others, thereby reducing the chances of fraud and dissatisfaction. Additionally, the integration of **AI-based** features such as face recognition using Python enhances the security of the platform by verifying user identities and minimizing fake registrations.

The system architecture, based on a three-tier design, ensures **scalability** and **flexibility**, allowing the platform to expand in the future to support more users and locations. Cloud integration enables remote access and efficient data handling, making the system available anytime and anywhere, which is essential for today’s digital environment.

Through proper testing and debugging, the application has been optimized to deliver stable performance with minimal errors. The deployment of the system ensures that it can be accessed through standard web browsers, making it convenient for users without requiring specialized software.

Overall, the system significantly reduces the time, effort, and complexity involved in finding student accommodation. It transforms a traditionally manual and uncertain process into a structured, transparent, and efficient digital experience. The project not only benefits students but also provides value to property owners by connecting them directly with potential tenants.

5.ACKNOWLEDGEMENTS

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