

Roomzy: An Affordable Accommodation Platform for Students

HARSH YADAV¹, FARDEEN SALMANI², ABHISHEK CHAKRAWAL³, PRINCE⁴, UMASHANKER SHARMA⁵

^{1,2,3,4,5}Department of Computer Science and Engineering, KCC Institute of Technology and Management, Greater Noida, India

Abstract- More students are shifting their base from rural to urban areas or cities, which is increasing the need for affordable, safe and accessible accommodation. However, housing industry continues to remain fragmented, with most people dependent on local real estate agents, unverified ads and multiple websites for accommodation. The fragmented housing market not only makes it susceptible to fraud, but also less transparent and increases the search time for students. Roomzy is an online portal that seeks to make the task of searching for accommodations easy and fast for the students. Roomzy was developed using MERN stack technologies (MongoDB, Express.js, React.js and Node.js). Some of the unique aspects of Roomzy include location-based search, budget filter, verified property listings and direct communication between students and the owner of the property. With the elimination of the role of real estate agents altogether, it eliminates dependence on real estate brokers completely. The use of 3-tier architecture and modularity in Roomzy enables effective usage of information/data and communication between users and the platform. The experimental evidence shows that Roomzy offers an effective way to reduce the period of time starting from searching until a student takes possession of the property, while at the same time offering greater transparency and access for both the students and property owners. In other words, Roomzy can be considered an innovative, convenient, and practical tool for addressing students' accommodation issues.

Index Terms—Student Accommodation, Affordable Housing, MERN Stack, Web-Based Platform, Room Sharing, Verified Listings, Location-Based Search, Scalable Architecture, Rental Platforms, User-Centric Design.

I. INTRODUCTION

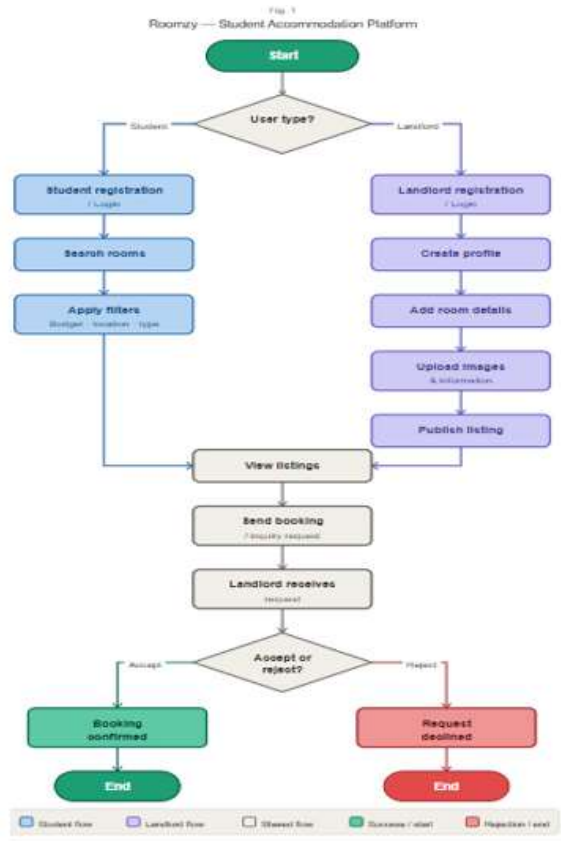
The fast-growing number of students pursuing higher education coupled with the increasing trend of students choosing urban or semi-urban locations creates a growing requirement for affordable housing

facilities. The influx of thousands of students and test-takers from all over the country every year creates immense strain on the existing housing structure in cities such as Delhi-NCR, Kota, and Noida. In spite of this, the student accommodation industry remains largely informal.

Students primarily resort to traditional methods such as finding brokers, joining social media groups, or depending on recommendations through word of mouth. Traditional methods may lead to issues such as misrepresentation, increased costs, hidden charges, and other related issues. Additionally, students already suffer from budget-related limitations owing to high commission costs charged by brokers, creating an added burden on their finances. Although there are various online rental service providers, these tend to cater to the larger real estate market rather than the needs of the students.

These factors make these sites less useful for student users. In order to solve these problems, Roomzy, an internet site specialized in student accommodation, is proposed in this paper. It incorporates such crucial features as search by location, budget options, verifiable listings, and communication among students and the owners. By eliminating intermediaries and combining information about accommodations into one website, Roomzy intends to provide an effective solution for students.

This system is based on advanced web technologies providing a highly flexible interface that allows students to find a place to live more effectively. The primary objective is not just to save their time on the search process but also to make the whole procedure safer, easier, and more enjoyable.



Roomzy- Student Accommodation Platform Figure 1.

II. LITERATURE REVIEW

The topic of accommodation for the students is well debated in the context of the growth of cities and mobility among the students. The traditional accommodation system is based mostly on manual procedures, which leads to inefficiencies, high costs, and lack of transparency [2].

In the recent period, with the development of the web technologies and databases, there appeared many digital services helping people to find an appropriate accommodation. With the development of modern techniques in database management, one can achieve great efficiency in searching, managing and retrieving a lot of information about properties, thus ensuring better performance of the system [1]. Nevertheless, these systems do not fit the needs of the students.

Taking into account the principles of usability, we should pay much attention to user-friendly interfaces.

Research in Human Computer Interaction reveals the significance of good usability when designing systems [3], [7]. Existing websites usually provide general-purpose functionality but not specifically to the needs of the student audience.

Another critical issue related to online rental platforms is security and trust. Examples of the need to apply secure web practices include issues like fake postings, false information, and security threats to sensitive data. The OWASP Foundation defines several security vulnerabilities and risks that should be taken into consideration when creating safe web applications [4]. Although some systems use verification and reviewing methods, their implementation can vary and make them less effective.

Modern technologies also allow developing highly-performing and scalable web applications that are able to work with large numbers of users and data in real-time mode [6]. Technologies used for building a system include MongoDB, Node.js, and React which provide scalable, flexible, and highly-efficient system architecture [8], [9], [10]. Finally, there is evidence that specialized solutions are more effective compared to general solutions [5].

In light of the above researches, it can be concluded that digital renting services plays an increasing role in simplifying accommodations management and making the system accessible for users. Kotkar et al [11] design a renting system using MERN stack technology focusing on student's accommodation. Student's secure authentication, location-based searching of apartments, verified listing and communication system between students and owners were designed. Results show that it simplifies searching and make accommodation process clear. Bhakare et al [12] proposed a campus centric accommodation service in his research CampusNest, where search for location and filtering by budget as well as trust forming was emphasized for students new to the city.

Khan et al. [13] have built RENTEASE, a MERN stack web application for digitizing renting process through property listing, tenant finding, lease management and rent payment tracking. Another

house renting application for property listing and ease of searching was developed by Santhosh Kumar et al. [14]. Both of the works agree on that MERN stack technology is a scalable and secure application and it lowers down the intermediaries.

Voumick et al [15] created a smart house renting web application as a response to unorganized rental information, central access and poor communication between owners and tenants and demonstrate that web based systems provide better search capabilities and support owner decision making. In summary, all these investigations form an important background for Roomzy application that is being designed but they also illustrate that there is a demand for an application aimed solely for students which should take into account the affordability aspect, verified rental information, owner's direct contact and lack of any broker intervention.

Many web-based rental and accommodation management systems have been developed but many of them are a general rental property management, a hostel management, or a real estate convenience platform. Roomzy has been proposed keeping in mind student, exam aspirant who is looking for budget, secure and location specific accommodation. As an approach, Roomzy will focus on students with its emphasis on verifying student friendly, filtered budget based booking, no broker and communication directly with owner, as compared to other rental systems. Students generally waste a lot of time in finding accommodation; a lot of broker commission and lack of transparency. Thus the study contributes a dedicated, user friendly, practical approach to the student accommodation booking.

III. METHODOLOGY

The Roomzy platform acts in an easy and systematic manner, facilitating the task of searching for an accommodation solution for a student. This makes the process quicker, increases relevancy, and helps in the effective communication between the students and property owners. The workflow of the system is described as follows:

A. User Registration and Input:

The registration process commences as the student registers himself/herself using the online portal. The details provided by the student comprise of his/her preference for location, budget, and housing types. This ensures that the portal is able to obtain valuable insights from the student. The owners of the rental property may register themselves using the online portal as well.

B. Data Retrieval and Processing

After the user has entered the requirements, the database will be searched by the system for matching listing information. All the information regarding the property is kept systematically, which helps in searching the data easily. The information received from the user is then processed and arranged in such a way that it becomes easy to compare the results with the available options.

C. Search and Filtering Mechanism

The next stage is filtering of the available options on the basis of the preferences of the user. Such preferences include location, price range, and type of rooms. In doing so, it is easier to avoid those options that are not required by the student. In such a way, the searching process becomes more efficient.

D. Listing Matching and Result Display

The filtered data is matched with available listings, and the best suited listings are shown to the user. The listings come with comprehensive details like images, prices, facilities offered, and location among others, thus enabling the user to make wise choices.

E. User–Owner Interaction

Through Roomzy, one is able to reach out to the owners of the properties directly via the website itself. The absence of the middleman eliminates any ambiguity from the process. It also makes the process of decision-making easier. It also avoids the additional costs incurred in using an agent.

F. Feedback and Continuous Update

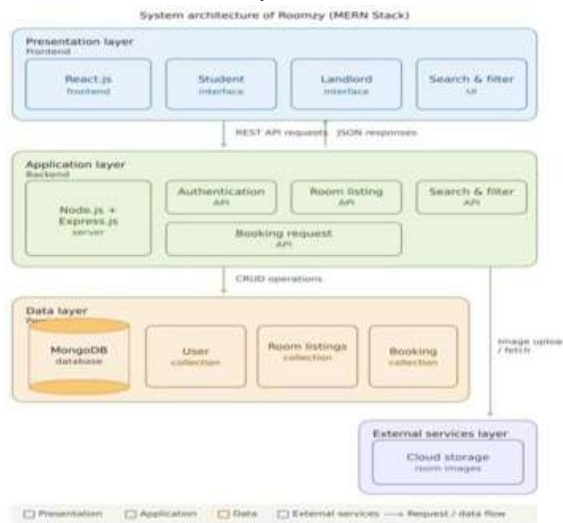
Once the platform is used by the students, then they will provide feedback regarding how well they enjoyed the experience with it. This way, other users can have a more informed choice and trust will be built for the platform. The property owner can update

their listing any time to make it more accurate and recent.

IV. SYSTEM ARCHITECTURE

Roomzy uses a client-server architecture consisting of three layers. The architecture guarantees scalability, flexibility, and efficiency of the system. As a result of dividing the software application into layers, it becomes easy to develop, maintain and facilitate information transfer between different parts. The architecture makes it possible for the system to process several user demands simultaneously.

Fig. 2 illustrates the overall architecture and workflow of the Roomzy.



System Architecture of Roomzy Figure 2

A. Architecture Overview

The system architecture comprises of four main layers: presentation layer, application layer, and data layer. These entire layers act together to facilitate user interaction, data processing, and recommendation generation and output respectively.

B. Presentation Layer

The presentation layer uses React.js as its core framework that ensures that the layer presents a very dynamic user interface for the users to interact through. Some of the functionalities of the presentation layer include: searching for accommodation, filtering based on budget or

location, browsing accommodation, and communicating with the property owners.

C. Application Layer

Application layer involves Node.js and Express.js that are responsible for server-side activities and processing of business logic. This particular layer deals with requests to APIs, processes users' inputs as well as interactions between front-end and back-end applications. The tasks of the application layer involve user authentication, listing management, etc., which enable users to have real-time experience.

D. Data Layer

Data layer uses MongoDB for storing and managing application data, including users' data, listings, availability information, user feedbacks, and so forth. MongoDB is a NoSQL database, which means it enables fast and convenient processing of big amount of data.

E. Workflow Explanation

As it was noted previously, these layers work efficiently together, thus ensuring users get their effective results while spending less time on searching. Due to the discussed architecture, Roomzy manages to offer its users effective platform for finding suitable accommodation.

Work flow explanation might be the following:

User request → Searching and Filtering Application → Data Retrieval from Database → Matching Listings → Displaying Results → Interaction between User and Owner → Feedback Rating → Listing Update

V. RESULTS AND ANALYSIS

Sourcing of accommodations using the Roomzy system is assessed with respect to its capability to simplify the sourcing procedure, promote transparency, remove middlemen, and many more. The analysis will focus on system outputs, performance evaluation, comparison between the system and the previous approach, and consequences caused by the system.

TABLE I.
 RESULT ANALYSIS OF ROOMZY SYSTEM

Parameter	Result Observed
Search Time Reduction	Reduced from manual long process to few minutes
Broker Dependency	Completely eliminated
Listing Transparency	Improved through verified listings
Search Accuracy	High due to location and budget filters
Accessibility	24/7 web-based access
User Decision Making	Faster due to filtered and comparable options
Trust & Reliability	Increased through feedback and ratings
User Communication	Direct interaction with owners enabled

A. System Output

This system is able to analyze information provided by the user and generate appropriate suggestions with respect to the source of accommodations. The output from this system includes cost, facilities, and availability of accommodations. Moreover, the system helps users interact with owners or tenants of the property. Lastly, rating and feedback ensure reliability of the system.

B. Performance Evaluation

Performance of the system has been evaluated in terms of effectiveness, efficiency, and speed. The efficiency of the system depends on the time required for the system to answer users. Data processing and retrieving is faster due to effective indexing technique used in the system. Filters used in the system ensure that information provided to users is accurate. The efficiency of the system is higher than that of the previous system.

TABLE II: PERFORMANCE EVALUATION METRICS

Features	Traditional Methods	Roomzy Platform
Search Process	Manual and time-consuming	Fast and automated
Transparency	Limited and unclear	High and clearly defined
Broker Dependency	High dependency on agents	Completely eliminated
Listing Verification	Unreliable or unverified listings	Verified and trustworthy listings
User Interaction	Indirect communication	Direct student-owner interaction
Accessibility	Limited and location-dependent	Web-based and easily accessible

According to the results, the Roomzy system can provide accurate room suggestions to the users since it can properly match users' preferences like budget, area and room type with available rooms.

C. Comparative Analysis

Below is the comparative analysis of the traditional accommodation approaches and the recommended Roomzy approach presented in Table I.

D. Discussion

It is clear from the results that Roomzy can resolve many of the problems that affect students looking for accommodation. Since there is now centralization of all the advertisements, and no middle men involved in this process, the amount of time spent on searching for an accommodation at a fair price has reduced considerably. In addition, there are filters present on this website that help the students make decisions on choosing the right accommodation. Moreover, since there is provision for feedback in Roomzy, there is more accountability involved. On the other hand, traditional methods of obtaining information about accommodations are disorganized.

VI. CONCLUSION

Roomzy has come up with a single, easy place and method of problem-solving that student accommodation issues present, and a straightforward

and practical approach to making student accommodation search a simpler task than it is presently.

Roomzy platform successfully eliminating intermediaries, brokers in student accommodation searching, therefore making the search affordable for student, and making the bond between student and landlord stronger.

Location-based search, budget filter, and validated posts help in providing the best of accommodation searching experience. This whole system represents the proper implementation of the technologies of modern web development to meet real world problems efficiently and at a large scale and by only providing what students demand, Roomzy have succeeded to create a system where demand is directly connected to the supply.

VII. FUTURE SCOPE

There are many scenarios in which the existing system could be enhanced. For example a mobile phone application would enhance accessibility to the site but still providing increased interaction between the end-user and the site itself. An embedded online payment facility will help the user to make bookings without fuss.

Advanced verification methods for identities can be implemented to ensure security and a sense of trust in the system. A user will be able to access available rooms near colleges and universities with an embedded geographic location and map facility.

User preference based and behavior based smart recommendations will support the extensibility of the system in future and making Roomzy efficient and adjustable to a number of users.

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