

## BAIE Final Project

Shivani Datar (002772160)  
Swarag Sanjay Gutte (002728422)

Kumar Mehul (002761391)  
Satadru Debnath (002787943)

Anshul Singh (002747160)  
Ragamalika Karumuri (002915012)

### Problem Statement



In today's fast-paced, technology-driven society, finding suitable rental accommodation presents considerable challenges, especially for university students, families relocating to new cities, and working professionals. The process of renting is often complex and lacks transparency, contributing to frustration and dissatisfaction. This complexity is amplified by several prevalent issues in the rental market:

1. **Redundant Listings:** Renters frequently encounter multiple brokers posting the same apartment listing, leading to confusion and a waste of time. Moreover, these listings often remain active even after the apartments are no longer available, misleading potential tenants and cluttering their search results.
2. **Unresponsiveness:** There is a significant problem with unresponsiveness from the contacts listed on rental websites. Potential renters find it difficult to obtain timely responses, if any at all, which delays the renting process and increases the difficulty of securing an apartment.
3. **Unverified Visual Content:** Many listings lack verified photos and videos, making it hard for renters to get an accurate sense of the property. This lack of reliable visual information forces tenants to visit more properties in person, which is time-consuming and inefficient.
4. **Scams and Unverified Listings:** The presence of unverified listings can lead to scams, where renters are deceived by fraudulent postings. This not only leads to financial losses but also undermines trust in the rental market.

## **Objectives of the Housing Rental Application**

The primary objective of our application is to transform the rental search process into a seamless, transparent, and user-focused experience. By leveraging advanced technology and a user-friendly design, the app aims to simplify the complexities of renting, provide a diverse array of housing options tailored to specific user needs, and clarify rental terms and conditions.

### **For University Students:**

Students typically seek affordable housing options near their educational institutions with flexible lease terms that accommodate their academic commitments. Recognizing these needs, our application offers features that allow for searches based on proximity to universities. This is particularly beneficial for students who may need to move frequently or avoid long-term commitments due to their transient lifestyle.

### **For Families:**

Families relocating to new areas generally look for rentals in safe, family-friendly neighborhoods that are close to essential amenities such as schools, parks, and healthcare facilities. Our application aids these users by integrating detailed insights about neighborhoods, including safety ratings, school district reviews, and proximity to recreational areas. This ensures that families can find homes in environments that support their needs and lifestyles, making transitions smoother and more secure.

### **For Working Professionals:**

Working professionals often prioritize convenience and proximity to their places of employment or urban centers with robust public transportation. To address these preferences, our application includes targeted search features that highlight properties near business districts and areas well-served by public transport.

### **Enhancing the Rental Experience:**

Across all user segments, our application focuses on enhancing the rental experience by ensuring simplicity and transparency in the leasing process. It provides robust customer support to assist users in navigating lease agreements, understanding rental policies, and resolving any issues that arise during their tenancy. This support is crucial for making the rental process as straightforward and stress-free as possible, which is particularly important for those who are renting for the first time or moving to an unfamiliar area.

In conclusion, our housing rental application caters to the specific needs of university students, families, and working professionals by providing tailored solutions that simplify the rental process, enhance transparency, and improve the overall experience of finding a new home. This innovative approach aims to empower renters, giving them the tools they need to navigate the rental market confidently and successfully.

## **Information Gathering**

Information gathering is a critical phase in this project for developing a housing rental application where understanding user needs and market dynamics is essential. We implemented following :

**Surveys and Questionnaires:** Develop and distribute online surveys targeting specific user demographics to understand their preferences regarding rental properties, features they value most in a rental application, and their technology usage patterns.

**Going through government's public document :** We went through Boston's housing department analysis document of year 2022 and some upcoming projected plans for year 2030.

**Sentiment Analysis :** We did some web scrapping from reddit targeting Boston's channels including conversations related to house hunting to determine views and sentiments of Bostonians regarding renting house apartment. Then summarized it by creating word clouds for good/bad words associated to positive and negative sentiments.

We can also implement following information gathering methods for more insights:

**Stakeholder Interviews:** Conduct structured interviews with a diverse set of stakeholders including potential renters (students, families, working professionals), property managers, real estate agents, and technical staff. Focus on their pain points, needs, and expectations from the rental application.

**Market Research:** Review existing rental applications and their offerings. Study market reports and statistics on housing trends, technology adoption in real estate, and customer satisfaction levels with existing solutions.

**Focus Groups:** Organize focus group discussions with representative users to generate detailed feedback on conceptual prototypes, design mockups, and potential functionalities of the application.

**Field Observation:** Conduct field visits where team members observe interactions between property managers and renters, understand the typical workflow, and note the challenges faced during the rental process.

**Technical Feasibility Studies:** Perform feasibility studies regarding the application architecture, data storage solutions, security requirements, and integration capabilities with other platforms like payment gateways or CRM systems.

**Legal and Compliance Checks:** Consult with legal experts to review the proposed features and data handling practices. Ensure compliance with regulations like GDPR for European users or local housing laws that affect rental agreements and transactions.

## Business Model Canvas

# BUSINESS MODEL CANVAS

### Housing Rental Application



The housing rental application's strategic plan is delineated in this Business Model Canvas. Important Partners are companies that provide payment gateways, apartment buildings, and landowners. These companies are essential to what the app offers. Key Activities place a strong emphasis on the creation and upkeep of the app as well as the significance of marketing and customer service. An experienced development team, marketing resources, and technology infrastructure have been identified as the Key Resources.

The Value Propositions of the app center on making the apartment search process easier, providing a wide array of options, guaranteeing transparency in the rental terms, and increasing the effectiveness of finding housing. Personalized recommendations take into account user preferences, and online support and feedback tools are used to maintain Customer Relationships. Targeted customer segments include working professionals looking for rental housing, families in transition, international students, and university students.

Social media, smartphone platforms, and collaborations with apartment buildings and universities are all ways to reach consumers. The app's creation and upkeep, marketing, customer service, and partnership fees are all included in the cost structure. Finally, it is anticipated that the revenue stream will originate from commission on rental transactions, premium features for users, subscriptions for real estate agencies and property owners, and local shop advertisements. This canvas offers a thorough strategy for securing a position in the rental market by catering to the unique requirements of its diverse clientele.

## **Proposed Solution**

### **Key Features:**

**Personalized Search Filters:** Users can search for properties based on criteria like location, price, size, and specific amenities.

**Interactive User Interface:** A user-friendly interface accessible on both mobile and desktop platforms ensures a smooth user experience.

**Digital Lease Management:** Enables digital signing and secure storage of lease agreements.

**Real-Time Updates:** Provides notifications about new listings and updates on existing ones.

**Customer Support Portal:** Offers comprehensive support through chat, email, and a resourceful FAQ section.

**Community Engagement Tools:** Allows tenants to share experiences and advice through forums and rating systems.

**Implementation Strategy:** The project will be rolled out in six phases: initiation and planning, requirements gathering and design, development and testing, implementation and deployment, monitoring and optimization, and project closure and evaluation. This structured approach ensures thorough preparation, efficient execution, and continuous improvement based on user feedback.

**Value Proposition:** For renters, the application simplifies finding and securing accommodation through customized search options and transparent processes. Property managers receive a dependable platform to reach potential tenants, with tools that streamline property listings and reduce vacancy rates.

### **Revenue Streams:**

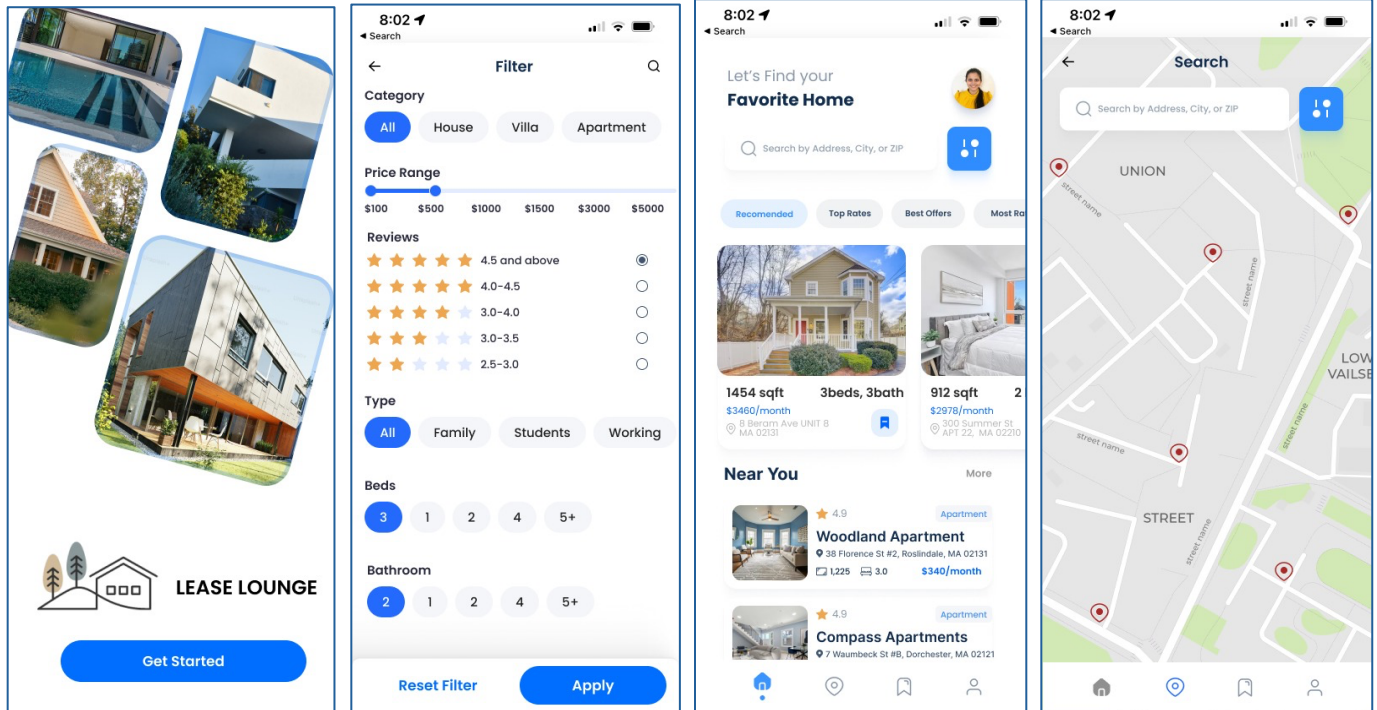
**Subscription Fees:** For property owners wanting enhanced listing features.

**Commission Fees:** On successful rental agreements facilitated by the app.

**Advertising Revenue:** From local businesses targeting the rental community.

**Cost Structure:** Involves development, operational costs, marketing expenses, and partnership fees. This model supports sustainable growth and ensures continuous improvement and adaptation to market needs. This solution promises to modernize the rental market, making renting an easier and more enjoyable experience for all parties involved.

## Project Prototype



This prototype has the potential to improve users' property-searching experiences. It demonstrates a multifaceted strategy to expedite the process of finding a new home by combining an advanced, customizable filtering system with map-based property discovery.

Preference for a location is often at the heart of the search for a new home. The core functionality of the prototype is this feature, which enables users to explore options based on desired locations by giving property listings a geographical context. It places a strong emphasis on user convenience by providing an interactive and visual approach to house hunting that is effective and easy to use.

The minimalist and welcoming home screen of the application acts as the entry point for the property search process. The "Get Started" button is positioned to draw users in and encourage instant interaction, emphasizing the importance of an easy-to-use interface for users to enter the app.

One example of the app's extensive functionality is the property listings view, which can be seen in the image. The prototype shows how the application can be tailored to meet a variety of user needs by displaying a search interface with adjustable filters that represent the user's preferences for property type, price range, and ratings. This reflects the intention to provide a tailored, responsive property search engine that honors the user's time and preferences.

The detailed filters screen is another feature that improves the user experience. Users can adjust search parameters here to precisely match their needs, including the number of bedrooms and bathrooms as well as particular property types. This degree of customization detail highlights the prototype's dedication to offering a thorough and complex search experience, laying the foundation for a strong and user-friendly application.

The prototype's design is in line with contemporary UI/UX principles, featuring a simple, user-friendly interface and a clean aesthetic. The choice of icons, the organization of the content, and the harmony of the text and imagery all demonstrate careful attention to detail and work together to create a simple and enjoyable navigation experience.

## **Process of Renting through our Application**

The process of renting a house through our application is designed to be streamlined, transparent, and user-friendly, ensuring that finding and securing rental accommodation is as seamless and efficient as possible for our users. Here is a detailed outline of the steps involved in our rental process:

### **User Registration**

Step 1: Users create an account on our application by providing basic information such as name, contact details, and preferences.

Step 2: For added security and personalization, users can further enhance their profiles by including additional preferences related to location, budget, and type of accommodation.

### **Searching for Properties**

Step 3: Users access our search platform, which features advanced filtering options to select properties based on specific criteria such as location, price range, number of bedrooms, and amenities.

Step 4: Each listing includes comprehensive details, photos, and possibly virtual tours to help users make informed decisions without needing to visit the properties initially.

### **Shortlisting and Comparisons**

Step 5: Users can shortlist favorites and compare different properties to evaluate which ones best meet their specific needs and preferences.

Step 6: The application also provides personalized recommendations based on the user's search history and profile preferences to assist in narrowing down choices.

### **Scheduling Visits**

Step 7: Once a user has identified potential homes, they can schedule in-person visits or request live virtual tours directly through the app.

Step 8: This scheduling feature integrates with both the user's and the property manager's calendar to find convenient viewing times.

### **Application for Rental**

Step 9: After selecting a property, users can fill out and submit rental applications directly through our app. This includes uploading necessary documentation and completing a rental application form.

Step 10: The application provides guidelines and checklists to ensure all pertinent information is provided, which helps streamline the approval process.

## **Securing the Property**

Step 11: Once the application is approved, users can review and sign the lease agreement digitally via our secure platform.

Step 12: The app facilitates secure payment of deposits or first month's rent and provides a digital receipt.

## **Post-Rental Support**

Step 13 Our application continues to support tenants after they move in, offering a portal for them to manage lease documents, make service requests, and communicate with property managers.

Step 14: Regular updates and notifications about lease renewals, maintenance schedules, and community events are also provided.

By integrating these steps into our housing rental application, we aim to cater comprehensively to the rental needs of various user segments, reducing the traditional complexities associated with renting a home and enhancing the overall rental experience. This process not only saves time but also adds value by making rental transactions transparent, reliable, and convenient for everyone involved.

## **SWOT Analysis**

### **Strengths**

User-Friendly Interface: Easy-to-use digital platforms enhance user experience and engagement.

Wide Range of Options: Offers a diverse array of rental properties to suit different needs and preferences.

Advanced Search Features: Enables tailored searches with filters that match specific user requirements, such as location, budget, and amenities.

Digital Leasing Processes: Streamlines the rental application, agreement signing, and payment processes, making everything more efficient and less time-consuming.

Strong Customer Support: Provides comprehensive support and guidance throughout the rental process, improving customer satisfaction and retention.

### **Weaknesses**

Market Saturation: High competition in the rental application market can make it difficult to stand out without significant unique offerings.

Dependence on Property Listings: The application's success is heavily reliant on the quality and quantity of listings it can secure from property owners.

Technology Dependence: Requires continuous investment in technology to keep the platform updated and secure, which can be costly.

Scalability Challenges: Expanding to new geographical areas might be limited by local market conditions and regulatory environments.



## Opportunities

**Expanding Market Demands:** Increasing mobility among the general population, such as remote workers and international students, provides a growing market for flexible rental solutions.

**Partnerships:** Collaborating with universities, corporations, and relocation services could provide a steady influx of users.

**Technological Advancements:** Implementing AI and machine learning for better personalized recommendations and automated management tasks can enhance user experiences.

**Regulatory Changes:** Adapting quickly to changes in housing laws and regulations can provide a competitive advantage and access to new markets.

## Threats

**Economic Downturns:** Economic instability can reduce people's ability to afford rentals, impacting the demand for housing.

**Regulatory Risks:** Changes in rental regulations or housing laws could impose additional constraints on what the application can offer or how it operates.

**Data Security:** As an online platform, there is a constant threat from cyber-attacks, which can compromise user data and trust.

**Market Entrants:** New competitors entering the market could innovate in ways that make existing services less appealing or outdated.

## Project Tools

**Asana:** Asana is a task management tool that is vital for keeping teams organized and focused. It provides an intuitive interface where tasks can be created, assigned, and scheduled. Progress on each task can be tracked, and deadlines are prominently displayed to ensure projects stay on track. Team members can comment on tasks, attach documents, and set priorities, making Asana an essential tool for maintaining oversight of various project components across teams.

**Confluence:** Confluence, developed by Atlassian, is an excellent tool for teams that need to collaborate on documentation. It serves as a single source of truth for project requirements, design documents, meeting notes, and more. Teams can create pages and spaces that are easily searchable, ensuring that everyone has access to the latest information. Confluence integrates with other Atlassian products like Jira, enabling a seamless flow between project tracking and documentation.

**Figma:** Figma is a cutting-edge design tool that allows UI/UX designers to create high-fidelity wireframes, mockups, and prototypes. It operates within a browser, enabling real-time collaboration among stakeholders. Designers can share their work with teammates and clients who can leave feedback directly on the designs. Figma's features facilitate a dynamic design process that's both iterative and inclusive of all project stakeholders.

**GitHub:** GitHub is a cornerstone in the world of code management and collaboration. It hosts source code repositories and supports Git for version control, enabling developers to track changes, branch off, and merge code. It fosters collaborative coding and features issue tracking, code review, and extensive integration capabilities with other tools, making it a must-have for development teams.



**TestRail:** TestRail is a test case management tool that helps quality assurance teams organize, manage, and track the testing process. With TestRail, teams can create detailed test cases, plan testing schedules, and run tests while capturing detailed reports of their findings. It integrates with issue trackers like Jira, making it simple to link test cases to reported issues and ensuring testing aligns closely with development.

**Jenkins:** Jenkins is an open-source automation server that is widely used for continuous integration and delivery (CI/CD). It helps developers to automate the stages of their development process, such as building code, running tests, and deploying to production. Jenkins can be extended with plugins to fit any CI/CD need and is a staple for teams practicing DevOps.

**Slack:** Slack is a powerful communication tool that streamlines interaction within teams. More than just a messaging app, Slack allows the creation of various channels for different topics, direct messaging, and integrates with a plethora of other tools. This integration capability allows for automation of notifications, such as alerts from version control systems or updates from project management tools, centralizing communication and keeping everyone in the loop.

**Google Drive:** Google Drive is a file storage and synchronization service provided by Google. It enables users to store files in the cloud, synchronize files across devices, and share files with ease. Google Drive includes the Google Docs suite, allowing for the creation and collaboration on documents, spreadsheets, and presentations in real time. Its integration with other Google services makes it a versatile platform for collaboration and resource sharing within teams.

## **Project Plan**

### **Phase 1: Project Initiation and Planning**

Goal: Establish the project's foundation by defining its scope, objectives, and stakeholders.

Activities:

- Develop the project charter, which includes the purpose, objectives, and stakeholders of the project.
- Identify key project team members and define roles and responsibilities.
- Establish project governance structures to ensure clear decision-making processes.
- Create a detailed project plan outlining timelines, milestones, resource allocation, and budget.

Outcome: A well-defined project scope and a comprehensive project plan that guides all subsequent phases.

### **Phase 2: Requirements Gathering and Design**

Goal: Define detailed functional and technical requirements and design the application architecture and user interface.

Activities:

- Conduct meetings with stakeholders to gather detailed requirements, including user needs and system requirements.
- Perform market research to align the app's features with user expectations and competitive standards.
- Create wireframes and design prototypes for the application's user interface.
- Define system architecture and technology stack that will support the application functionalities.

Outcome: A complete set of requirements and a set of design documents ready for development.

### **Phase 3: Development and Testing**

Goal: Build and test the application to ensure it meets functional requirements and quality standards.

Activities:

- Develop the application according to the specifications outlined in the design documents.

- Conduct iterative testing phases, including unit testing, integration testing, and system testing.
- Perform user acceptance testing (UAT) with stakeholders to ensure the app meets their expectations.
- Fix any issues or bugs identified during testing.

Outcome: A fully functional and tested application ready for deployment.

#### **Phase 4: Implementation and Deployment**

Goal: Successfully deploy the application to the production environment and ensure operational stability.

Activities:

- Prepare the production environment and deploy the application.
- Conduct final pre-launch checks and ensure all elements are functioning as expected.
- Train users and stakeholders on how to use the application effectively.
- Officially launch the application to the public or intended users.

Outcome: Application is live and operational, with users beginning to interact with it.

#### **Phase 5: Monitoring and Optimization**

Goal: Continuously monitor the application's performance and user engagement to optimize and enhance functionality.

Activities:

- Implement monitoring tools to track performance issues, user behavior, and feedback.
- Regularly update the application based on user feedback and technological advancements.
- Optimize performance and usability through iterative improvements.
- Engage with users for feedback to ensure continuous alignment with user needs.

Outcome: An improved and optimized application that remains relevant and performs well.

#### **Phase 6: Project Closure and Evaluation**

Goal: Formally close the project and evaluate its success against initial goals and objectives.

Activities:

- Document all aspects of the project and archive important data and insights.
- Conduct a post-implementation review to evaluate what went well and what could be improved.
- Release project resources and provide final project deliverables.
- Celebrate successes and acknowledge the contributions of the team members.

Outcome: A complete project closure report detailing successes, challenges, and lessons learned, ensuring that knowledge is transferred, and the project's benefits continue.

### **References**

<https://www.zillow.com>

[https://www.reddit.com/r/boston/comments/vyx6j0/bidding\\_wars\\_on\\_rental\\_units/](https://www.reddit.com/r/boston/comments/vyx6j0/bidding_wars_on_rental_units/)

[https://www.reddit.com/r/boston/comments/1by4f4t/apartment\\_rental\\_options/](https://www.reddit.com/r/boston/comments/1by4f4t/apartment_rental_options/)

<https://www.rentecdirect.com/blog/state-rental-laws-resource-guides-state/#:~:text=Federal%20Landlord%2DTenant%20Laws,sex%20familial%20status%20or%20disability>

<https://www.nationwide.com/lc/resources/home/articles/renting-out-your-house-tips>

[https://www.boston.gov/sites/default/files/embed/h/housing\\_a\\_changing\\_city-boston\\_2030\\_full\\_plan.pdf](https://www.boston.gov/sites/default/files/embed/h/housing_a_changing_city-boston_2030_full_plan.pdf)