
HumaraGhar - A Revolutionary real-estate application.

*A project report submitted in partial fulfillment of the requirements for the
award of the degree of*

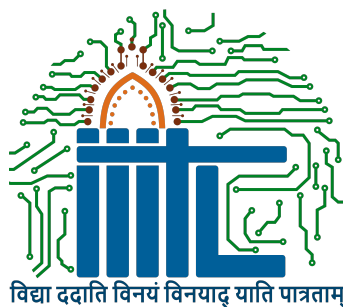
B.Tech. in Information Technology

by

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Declaration of Authorship

We, **Ayush Kumar and Akshay Bhatnagar**, declare that the work presented in “**HumaraGhar**” is our own. We confirm that:

- This work was completed entirely while in candidature for B.Tech. degree at Indian Institute of Information Technology, Lucknow.
- Where we have consulted the published work of others, it is always cited.
- Wherever we have cited the work of others, the source is always indicated. Except for the aforementioned quotations, this work is solely our work.
- We have acknowledged all major sources of information.

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CERTIFICATE

This is to certify that the work entitled “**HumaraGhar**” submitted by **Ayush Kumar and Akshay Bhatnagar** who got their name registered on **Jul 2020** for the award of B.Tech. degree at Indian Institute of Information Technology, Lucknow is absolutely based upon their own work under the supervision of **Dr. Mainak Adhikari**, Department of Computer Science, Indian Institute of Information Technology, Lucknow - 226 002, U.P., India and that neither this work nor any part of it has been submitted for any degree/diploma or any other academic award anywhere before.

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ABSTRACT

The modern dynamics of housing and shared living arrangements have evolved significantly, paving the way for innovative solutions to streamline the process of finding roommates and renting accommodations. This project introduces a comprehensive room renting application that revolutionizes the traditional approach to housing searches by integrating collaborative features and personalized matchmaking.

The core feature of this application is its versatility, offering users the flexibility to either form teams to explore rental options collectively or seek individual accommodations. The unique selling proposition (USP) lies in its capability to facilitate seamless roommate searches for those seeking cohabitation or simply looking to fill vacancies in existing spaces.

Key functionalities include a sophisticated matchmaking system leveraging user preferences and profiles to pair compatible roommates and predicting accurate renting price suggestions based on neighbourhood and amenities provided. The application utilizes Next.js for its frontend, harnessing its capabilities for dynamic and responsive web interfaces. Meanwhile, Supabase, a robust PostgreSQL-based backend, powers the application's database, ensuring efficient data management and scalability.

Through a user-centric design approach and a user-friendly interface, this application aims to redefine the room renting experience, fostering connections, and simplifying the often daunting task of finding suitable accommodations or roommates.

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Chapter 1

Introduction

1.1 Background and Context

In the evolving landscape of urban living, the challenges associated with securing suitable accommodations transcend the boundaries of traditional housing searches. Our endeavor to develop a room renting application stems from the personal experiences of our team members—recent bachelor graduates navigating their entry into professional realms in new, bustling cities. The initial hurdle of securing affordable living spaces without an established network of friends or acquaintances drove us to conceive a solution that redefines the norms of housing searches.

As young professionals transitioning from academic settings to bustling urban environments, the lack of a supportive network to share the costs and experiences of renting became a significant obstacle. This personal experience serves as the driving force behind our initiative, inspiring us to craft a comprehensive solution that addresses not only the financial burden but also the social and logistical challenges associated with finding suitable accommodations and compatible roommates.

1.2 Need

The contemporary housing market poses challenges for individuals transitioning from academia to professional spheres, particularly in unfamiliar urban landscapes. There exists a pressing need for an inclusive, efficient, and user-centric platform that accommodates both solo renters and those seeking collaborative living arrangements or compatible roommates. The absence of such a tool creates inefficiencies and hurdles in finding afford-

able, compatible, and convenient housing solutions.

1.3 Problem Statement

The challenge lies in bridging the gap between traditional housing approaches and the modern needs of individuals seeking varied accommodation options. The absence of a centralized platform that caters to both the individual renter and those interested in collaborative living leads to prolonged searches, incompatible living situations, and financial strains.

1.4 Objectives

1. **Comprehensive Housing Searches:** Develop a platform that accommodates both individuals seeking independent rentals and those forming teams for collective exploration of rental spaces, ensuring inclusivity and convenience.
2. **Efficient Roommate Matchmaking:** Create a robust matchmaking system that caters not only to those in search of compatible roommates but also to individuals seeking solo accommodations, ensuring tailored matches.
3. **AI-Driven Rent Price Suggestions:** Utilize machine learning models trained on diverse rent data to suggest optimal rent prices for listed properties, empowering users with informed pricing strategies.
4. **Owner Dashboard & Property Management:** Enable property owners to manage their listings through a dedicated dashboard, facilitating tasks like sending rent reminders, generating contract templates for rent agreements, and ensuring seamless property management.
5. **Controlled Chat Feature:** Implement a secure and controlled chat function, allowing users to interact and negotiate further deals only with authorized and interested parties, enhancing user security and convenience.
6. **User-Centric Design:** Prioritize user experience by delivering an intuitive interface that simplifies the search for accommodations or roommates, irrespective of the individual's preferences.

7. **Addressing Financial and Social Barriers:** Alleviate the challenges associated with securing affordable living arrangements and establishing connections in new cities, catering to diverse housing needs.

1.5 Scope

The project aims to develop a Next.js-based web application utilizing Supabase, a PostgreSQL-based backend, to create a scalable, dynamic, and responsive platform. The focus lies in providing a holistic solution catering to both individuals seeking independent rentals and those in search of compatible roommates, fostering a sense of community and ease in the process of finding suitable accommodations. Leveraging machine learning models, the platform will suggest rent prices for listed properties, while a controlled chat feature will enable secure interactions between authorized users, further enhancing the platform's utility and user experience.

Chapter 2

Literature Review

Summarizing and analyzing existing research, studies, and relevant publications that relate to our project.

2.1 Market Trends in India

2.1.1 Real Estate Market Trends

1. **Urbanization and Population Growth:** India's rapid urbanization continues to drive demand for housing. With a growing population and increasing urban migration, the need for affordable and accessible housing remains a significant trend. [4]
2. **Shift in Rental Preferences:** There has been a shift in preferences among the younger population towards rental accommodations due to mobility for jobs, lower commitment, and financial flexibility. This shift is particularly notable in metro cities and urban hubs.
3. **Co-living and Co-working Spaces:** Emerging trends show a rise in demand for co-living spaces and co-working environments, especially among millennials and young professionals. These spaces offer a sense of community, shared amenities, and cost-effectiveness.

The rise of co-living and co-working spaces is not just a trend; it's a significant shift in urban lifestyles. In densely populated cities like Mumbai, Delhi, and Bengaluru, these concepts are addressing the challenges of affordable housing and the need for flexible, productive workspaces. Moreover, co-living offers attractive returns—2-4 times higher than the traditional residential yield of 2-3

per cent—leading to higher investors’ interest in actively pursuing options in the market to create flexible co-living facilities. [5]

4. **Tech Integration in Real Estate:** Technology adoption in real estate has seen substantial growth. Digital platforms for property searches, virtual property tours, and online rent payment systems have gained popularity, enhancing convenience for both landlords and tenants.
5. **Government Initiatives:** Various government initiatives like the Pradhan Mantri Awas Yojana (PMAY) and Smart Cities Mission aim to provide affordable housing and improve infrastructure, influencing the real estate landscape and rental market dynamics.

2.1.2 Rental Market Trends

1. **Rise in Rental Yields:** Despite fluctuations, rental yields have been stable or rising in certain areas, attracting investors and encouraging property owners to engage in the rental market.
2. **Demand for Flexible Rentals:** There’s an increasing demand for flexible rental options, including short-term leases and furnished accommodations, particularly from young professionals and students.
3. **Emergence of PropTech Solutions:** Proptech startups are introducing innovative solutions for property management, tenant screening, and rent collection, streamlining processes for both landlords and tenants.
4. **Localized Rental Dynamics:** Rental markets vary significantly across different cities and regions in India. For instance, metropolitan areas like Mumbai and Delhi exhibit different rental patterns, pricing structures, and demand-supply dynamics compared to tier-II or tier-III cities.
5. **Rental Regulations and Policies:** Rental laws and regulations, such as the Rent Control Act and local tenancy laws, significantly impact the rental market. Understanding these regulations is crucial for both landlords and tenants. [1]

2.1.3 Recent Developments and Future Projections

1. **Post-Pandemic Impact:** The COVID-19 pandemic has influenced the rental market, causing temporary shifts like increased demand for spacious homes, a surge in remote work leading to altered location preferences, and a focus on hygiene and safety in rental spaces.
2. **Technology and Data Analytics:** Continued integration of technology, including AI-driven property searches, blockchain for secure transactions, and data analytics for market predictions, is expected to redefine the rental landscape, making it more efficient and transparent.
3. **Sustainability and Green Spaces:** Growing awareness of sustainability and environmental concerns is influencing rental choices, with preferences for eco-friendly properties and communities on the rise.
4. **Policy Changes:** Anticipated policy changes or amendments in rental laws, especially concerning tenancy agreements and rent control, could significantly impact the market dynamics in the coming years.

2.2 Why we chose the PropTech sector?

The story of proptech startups in India took shape in the mid-2000s after the entry of Info Edge-owned 99acres and Times Internet-owned Magicbricks, Quikr-owned CommonFloor and PropTiger (REA India)-owned Makaan.com. Following this, the story revolved around Housing.com, a once-celebrated startup which then faced a series of mishaps. In the past five years, the proptech segment has evolved manifold and has seen startups in brokerage tech led by Square Yards, construction tech led by Infra.Market, AI, AR, VR, IoT, SaaS, and other spaces.

The Indian real estate sector is predicted to reach \$1 trillion in market size by 2030, up from \$200 billion in 2021, and contribute to 13% of the country's GDP by 2025. And looks like tech companies in this space have a role to play as well. As per data compiled by Fintrackr, proptech startups have mopped up nearly \$2.4 billion between January 2021 and March 2023. This comprises 39 growth stage companies raising \$2.25 billion and 69 early stage startups raising \$145 million. If we take previous data, then proptech startups have managed to raise \$2.9 billion since January 2020.



Figure 2.1: Key Highlights

Funding in proptech startups peaked in 2018 with \$1.28 billion. Even as the trend continued in 2019, the impact of lockdown can be seen in 2020 when the fundraise plunged to less than \$500 million. This again saw a revival in 2021, only soon to get impacted by an overall slowdown in the funding environment in 2022 and 2023. While pre-Covid era was dominated by the likes of OYO, co-working space providers, the post-Covid period saw massive funding in construction and building material focused startup such as Infra.Market, real estate rental startup NoBroker, home decor and interior startups Livspace and HomeLane. [2]

In this section, we have highlighted top funded startups in proptech and their capital efficiency ratio based on their financial performance in FY22.

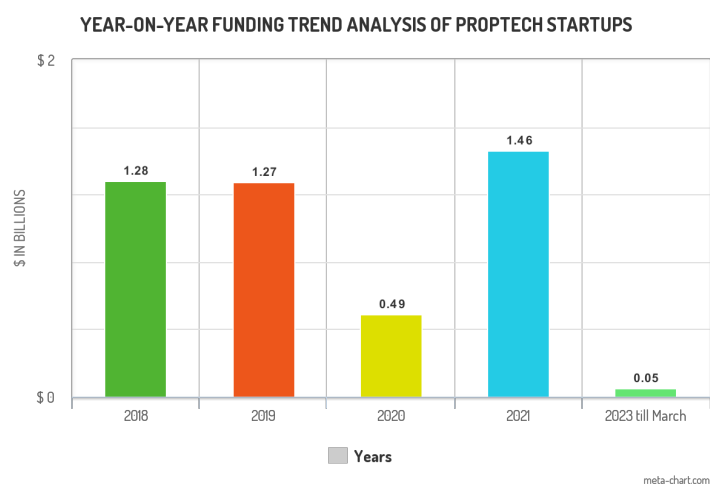


Figure 2.2: Funding trend analysis

Table 2.1: Capital Efficiency of top PropTech Startups

Name	Revenue(FY22)	Overall Funding	Capital Efficiency
IndiQube	₹6236 Cr	₹342 Cr	2.00
WeWork India	₹351.4 Cr	₹1300 Cr	1.03
Awfis	₹257 Cr	₹760 Cr	0.50
NestAway	₹57.8 Cr	₹828 Cr	0.07
Stanza Living	₹115 Cr	₹1672 Cr	0.07
NoBroker	₹116 Cr	₹2743 Cr	0.06

Table 2.2: Top Revenue Generating Real Estate Focused Companies

Name	Revenue(FY21)
Square Yards	₹245.7 Cr
Anarock	₹182 Cr
99acres	₹173.8 Cr
Housing.com	₹88 Cr
PropTiger	₹50.57 Cr
NoBroker	₹166.5 Cr
Quikr Homes	₹60.7 Cr
MagicBricks	₹166 Cr

2.3 Co-Living & Renting Together

We live in a globally connected world and this has led to the real estate sector experiencing disruption led by nomadic millennials, who are re-defining the meaning of 'living' and 'working'. The concept of 'shared economy' has just started to unfold in India and the days ahead look much more exciting. Unlike earlier when 'ownership' was fundamental to success in life, today 'sharing' has taken the centre stage.

2.3.1 Framework of Analysis

JLL Research conducted a comprehensive demand survey targeting millennials across the top seven cities of Mumbai, Delhi NCR, Bengaluru, Hyderabad, Chennai, Kolkata and Pune. The key objective of this assessment was to study their behavioural patterns for owning and renting houses.

The nomads of today are becoming a major force driving the Indian housing market—an estimated 42% constituted millennials¹ in 2018 across the top seven cities in India. It is relevant to note that millennials will continue to form a major proportion of the country's working population, growing to nearly 41% of the workforce in 2023. *Nearly 40% of India's millennial workforce are migrants*

Migrant millennial workforce prefers to rent

With millennials driving housing demand, there is a marked change in demand patterns. Gen Y has a different take on home ownership from their parents. Earlier generations moved to the peripheral locations to fulfil their dreams of owning a home, but millennials refuse to compromise.

While selecting an accommodation, connectivity to their workplace, convenience and security are the factors on top of their decision making tree and not ownership of the property. Moreover, a migrant workforce prefers rented apartments because of the uncertainty attached with the duration of their stay as well as cost savings in renting as against purchasing accommodation.

The outcome—an increased demand for rental housing.

Owning vs Renting a house

Home ownership has been long considered as a basis to measure financial and social security in India. However, there has been a discernible change in the mind-set and the behaviour of the recent generations. This is attributable to the following:

1. High cost of housing in most gateway cities and lower returns from buying a house (EMI to rent ratio is typically 2-3 times in most cities).
 2. Change in the nature of work - short term nature of assignments warranting higher mobility and flexibility.
 3. Delayed marriage and child rearing, less inclination to block funds and rather spend on travel, food and leisure (considered to be discretionary in the past).
- 93% of the migrant respondents who were single stayed in rented accommodation across the top 7 cities
 - 60% said that they didn't plan or were unsure about buying a house in the future
 - Budget constraints and limited flexibility were cited as the key reasons for not owning a house

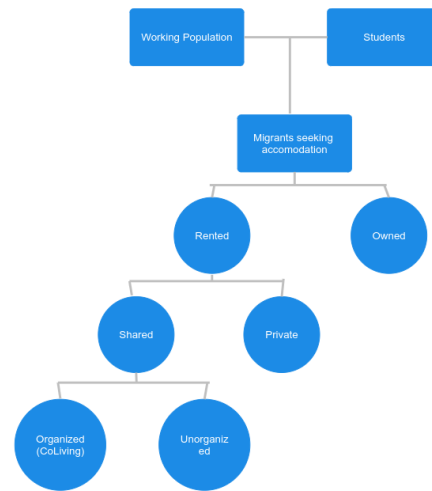


Figure 2.3: Framework Analysis

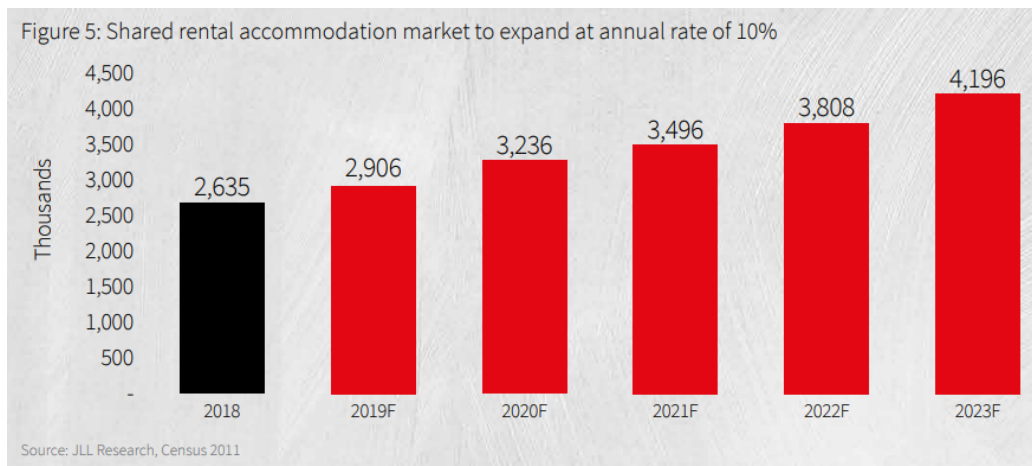


Figure 2.4: Funding trend analysis

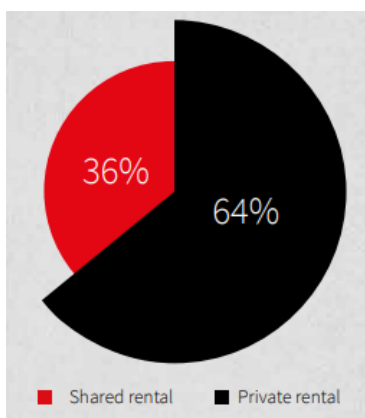


Figure 2.5: Living Preferences

Here's Why Millennials Find Shared Rental Apartments Most Viable:

- Cities like Delhi, Pune, Hyderabad, Bengaluru, Mumbai, Chennai and Kolkata attract millennials for education as well as employment
- Millennials consider proximity to workplace or education institute as most important while choosing accommodation
- Renting private apartment in commercial or educational hub beyond financial means of most millennials
- With housing rent typically accounting for 25-30% of average monthly income in urban India, rental costs get apportioned in case of shared accommodation [3]

Chapter 3

Methodology

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Chapter 4

Simulation and Results

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Chapter 5

Conclusion and Future Work

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Appendix Title Here

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