

Project Report: The Nest Community Application

Proposal

The Nest Community Application aims to streamline residential living by providing an integrated digital platform that connects prospective tenants, property managers, and administrators. The platform facilitates efficient property search, feedback collection, and property management while fostering an engaging community experience. With properties ranging from 1BHK to 3BHK, The Nest empowers users to explore modern living options equipped with advanced amenities and eco-friendly features.

Scope and Goals

The primary scope of the project is to develop a robust system for managing community properties and interactions. The application includes functionalities such as:

- Prospective tenant registration and feedback submission.
- Community and property search with filters for type, availability, furnishing, and rent range.
- Integrated community rating system from multiple sources (Google, social media, and internal metrics).
- Administrative features for property and community management.

Goals:

- Enhance user engagement and satisfaction through a seamless user interface.
- Streamline administrative operations for community management.
- Provide valuable insights through a comprehensive rating and feedback system.

Conceptual Design and Logical Design

Conceptual Design (E-R Diagram (Appendix))

The E-R diagram was designed to represent the relationships between different entities in The Nest Community Application. Key entities include:

- **Community:** Represents residential communities with attributes such as name, address, city, and number of units.
- **Property:** Captures property details like type, rent, availability, and furnishing status.
- **Prospective tenants:** Represents users of the application, storing their contact information.
- **Admins:** Facilitates administrative roles for managing properties and communities.
- **Rating:** Stores community ratings from multiple platforms for comparison.
- **Feedback:** Allows prospective tenants to provide feedback on communities or properties.
- **Map:** Provides geospatial information about community locations.

The E-R diagram reflects real-world relationships such as a community having multiple properties and prospective tenants being able to leave feedback for specific communities.

Each entity is connected through well-defined relationships, ensuring a clear and logical structure for data representation.

Logical Design (Transformation and Normalization)

The logical design involved transforming the conceptual E-R diagram into a relational database schema while ensuring normalization for efficiency and data integrity:

Transformation to Tables:

- Each entity in the E-R diagram was converted into a separate table with primary keys to uniquely identify records.
- Relationships were established through foreign keys (e.g., `c_id` in the Property table links to the Community table).

Normalization:

- **First Normal Form (1NF):** Ensured all attributes are atomic and each table has unique rows. For instance, property attributes like type, rent, and availability are stored in distinct columns.
- **Second Normal Form (2NF):** Eliminated partial dependencies by ensuring that non-primary key attributes are fully dependent on the primary key. For example, feedback is linked to both the prospective tenant and community tables using `u_email` and `c_name`.
- **Third Normal Form (3NF):** Removed transitive dependencies by separating attributes into related tables. For instance, community ratings from different sources (Google, social media) are stored in the Rating table, independent of other community attributes.

SQL Database Schema Implementation

The database was implemented using the following schema:

- **Community Table:** Stores community details with `c_id` as the primary key and attributes like name, address, city, and description. Communities are uniquely identified and linked to properties and ratings.
- **Property Table:** Captures property-specific data, with foreign keys `c_id` and `admin_id` referencing the Community and Admins tables, respectively. This ensures properties are correctly linked to their communities and managed by specific admins.
- **Admins Table:** Holds administrator details, ensuring secure and managed access for adding, updating, and deleting data.
- **Prospective tenants Table:** Contains prospective tenant information with unique emails for linking feedback entries.
- **Rating Table:** Aggregates community ratings from multiple platforms and links them to communities via `c_id`.
- **Map Table:** Stores geolocation data with latitude and longitude attributes, enabling the visualization of community locations.
- **Feedback Table:** Stores prospective tenant feedback linked to prospective tenant emails and community names, facilitating feedback management.

This schema ensures data integrity through primary and foreign key constraints, minimizes redundancy, and supports efficient queries for all application functionalities.

Shiny User Interface Design and Workflow

Layout Design

The Shiny user interface was designed with a tabbed structure to separate functionalities for ease of navigation. Each tab focuses on a specific feature, providing a clean and intuitive layout:

- **Home Tab:** A welcoming landing page with a registration form for new users and an introduction to The Nest platform.
- **Community Tab:** Offers search and filtering options for properties, with dropdown menus and sliders for parameters like property type, availability, furnishing status, and rent range.
- **Map Tab:** Features an interactive map displaying community and property locations with geotags.
- **Ranking Tab:** Displays a bar chart for community ratings comparison and a data table for detailed insights.
- **Feedback Tab:** Includes a simple form for prospective tenants to submit feedback linked to their registered email.
- **Admin Tab:** Provides tools for administrators to manage communities and properties, including options to add, update, or delete entries.
- **Ask AI Tab:** Leverages an advanced AI-powered assistant to retrieve data and provide instant answers to user queries about properties, communities, and more, directly from The Nest's database.

User Workflow

For Prospective tenants:

- Start at the **Home Tab** to register with basic details.
- Use the **Community Tab** to filter and search for properties.
- Explore the **Map Tab** to view property locations relative to community facilities.
- Visit the **Ranking Tab** to compare community ratings.
- Submit feedback through the **Feedback Tab** for continuous platform improvement.
- **Ask AI** chat for the queries related to our property and community.

For Admins:

- Navigate to the **Admin Tab** to add, update, or delete community and property details.
- Use insights from the **Feedback** and **Ranking Tabs** to improve management and decision-making.

Appendix

Relationships

1. A Community has many Property (1:M).
2. A Community receives multiple Ratings (1:M).
3. A Community can have multiple Feedback (1:M).
4. A Tenant (Prospective) provides multiple Feedback (1:M).
5. Admins manage multiple Property(1:M).
6. A Community is geolocated through a Map entry (1:1).

Data Dictionary

1. Tenants Table:

- **u_phone**: Contact phone number of the prospective tenant.
- **u_name**: Name of the prospective tenant.
- **u_email**: Email address of the prospective tenants.

2. Community Table:

- **c_id**: Unique identifier for each community.
- **c_name**: Name of the community.
- **c_address**: Address of the community.
- **c_zip**: ZIP code.
- **c_city**: City name.
- **c_description**: Brief description of the community.
- **c_units**: Number of units in the community.

3. Property Table:

- **p_id**: Unique identifier for the property.
- **p_type**: Type of property (e.g., 1BHK).
- **p_rent**: Monthly rent.
- **p_availability**: Availability status.
- **p_furnish_status**: Furnishing status.
- **p_description**: Description of the property.
- **c_id**: Foreign key linking to Community.
- **admin_id**: Foreign key linking to Admin.

4. Feedbacks Table:

- **f_message**: Feedback message.
- **u_email**: Tenant email (foreign key linking to Tenants).
- **C_name**: Community name (foreign key linking to Community).

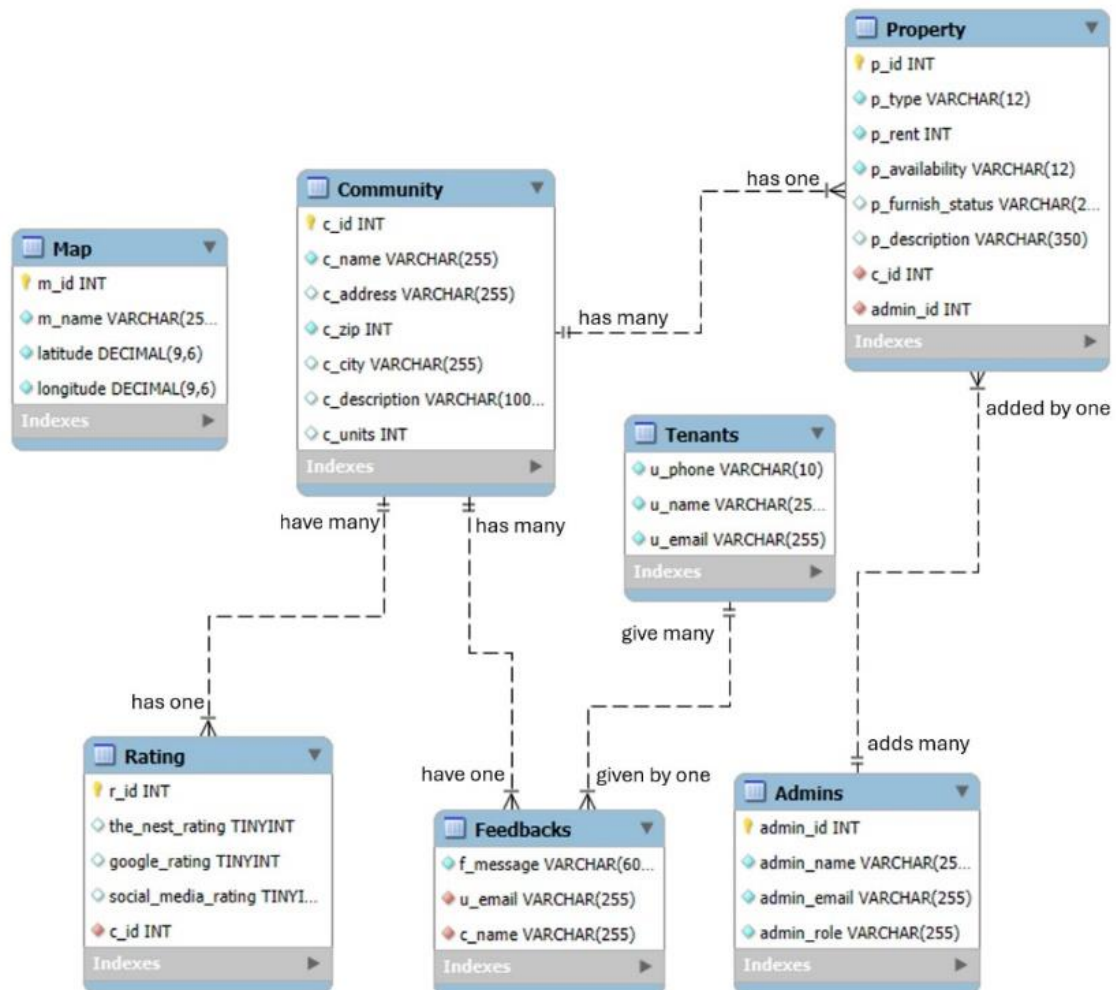
5. Ratings Table:

- **r_id**: Unique identifier for ratings.
- **the_nest_rating**: Rating given by the platform.
- **google_rating**: Rating from Google.
- **social_media_rating**: Rating from social media.
- **c_id**: Foreign key linking to Community.

- **admin_id**: Unique identifier for the admin.
- **admin_name**: Admin name.
- **admin_email**: Admin email address.
- **admin_role**: Role of the admin.

- **m_id**: Unique identifier for map data.
- **m_name**: Map name.
- **latitude**: Latitude of the location.
- **longitude**: Longitude of the location.

ERD- Entity Relationship Diagram

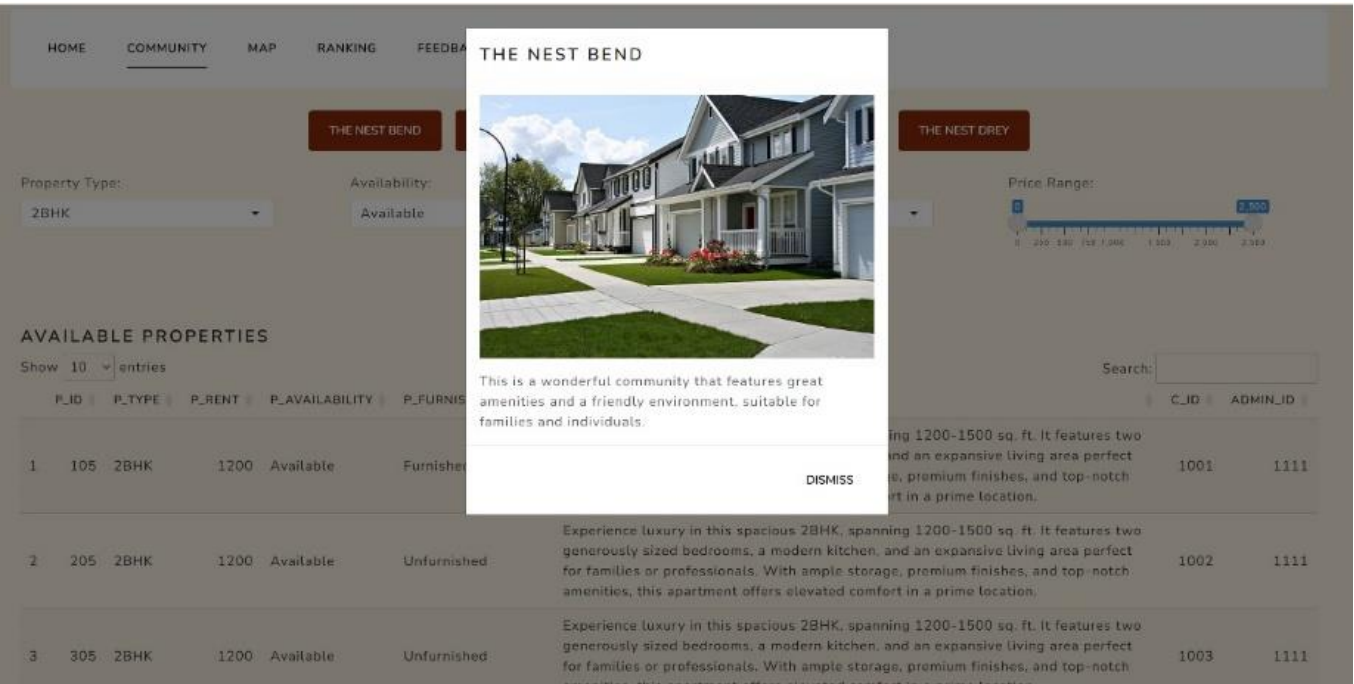


Pictures included to showcase functionalities:

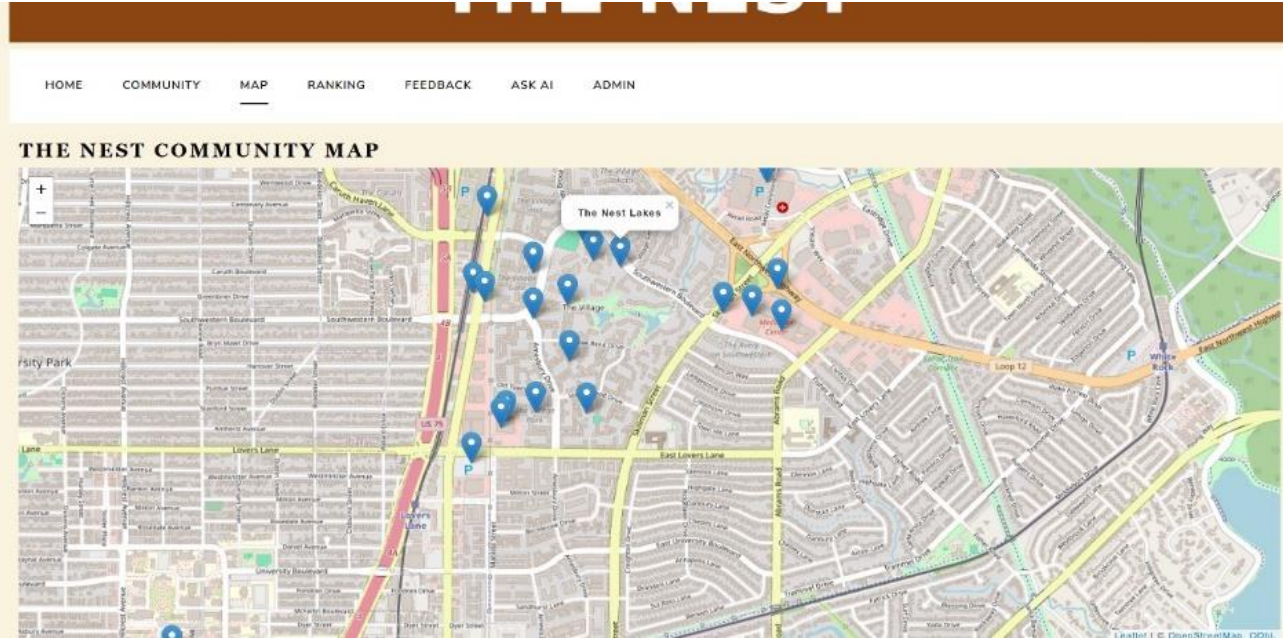
- 1. **Home Page:** Highlights The Nest’s mission, with a registration form for new prospective tenants.



- 2. **Community Page:** Features filters for advanced property searches.



3. **Map Page:** Displays an interactive map of community locations.



4. **Ranking Page:** Presents community ratings with a comparative bar chart and data table.



5. **Feedback Page:** Allows prospective prospective tenants to submit feedback and view submitted entries5.

HOME

COMMUNITY

MAP

RANKING

FEEDBACK

ASK AI

ADMIN

WE VALUE YOUR FEEDBACK!

Enter your registered email:

Your email address

Select Community:

The Nest Drey

Your Feedback

Enter your feedback here...

SUBMIT FEEDBACK

SUBMITTED FEEDBACK

Show 10 entries

Search:

	FEEDBACK	EMAIL	COMMUNITY
1	I love the community, and it has a lot to offer.	lubainaraja7@gmail.com	The Nest Gate
2	I love the community.	amith@gmail.com	The Nest Gate
3	The community is close to all activities. I love this community.	rahul@gmail.com	The Nest Park
4	I love the community.	rahul@gmail.com	The Nest Park

HOME

COMMUNITY

MAP

RANKING

FEEDBACK

ASK AI

ADMIN

WE VALUE YOUR FEEDBACK!

Enter your registered email:

Your email address

Select Community:

The Nest Drey

Your Feedback

Enter your feedback here...

SUBMIT FEEDBACK

SUBMITTED FEEDBACK

Show 10 entries

Search:

	FEEDBACK	EMAIL	COMMUNITY
1	I love the community, and it has a lot to offer.	lubainaraja7@gmail.com	The Nest Gate
2	I love the community.	amith@gmail.com	The Nest Gate

SUCCESS

Your feedback has been submitted successfully!

DISMISS

6. **Admin Page:** Enables administrators to add, update, or delete communities and properties.

SUCCESS

Community added successfully!

DISMISS

HOME

COMMUNITY

MAP

RANKING

FEEDBACK

Manage Communities

Manage Properties

Community ID

Community Name

Address

Zip Code

1000

The Nest Hill

6332 Shady Brook Ln

75206

City

Description

Units

Dallas

Close to target.

10

ADD COMMUNITY

UPDATE COMMUNITY

DELETE COMMUNITY

Show 10 entries

Search:

	C_ID	C_NAME	C_ADDRESS	C_ZIP	C_CITY	C_DESCRIPTION	C_UNITS
1	1000	The Nest Hill	6332 Shady Brook Ln	75206	Dallas	Close to target.	10
2	1001	The Nest Bend	The Nest Bend Dr	75206	Dallas	Close to hiking trail and dog park	5
3	1002	The Nest Park	Amesbury Dr	75206	Dallas	Eco-friendly community near parks	5
4	1003	The Nest Gate	Southwestern Blvd	75206	Dallas	Road front community close to recreational activities	5

SUCCESS

Community updated successfully!

DISMISS

HOME

COMMUNITY

MAP

RANKING

FEEDBACK

Manage Communities

Manage Properties

Community ID

Community Name

Address

Zip Code

1000

The Nest Hill

6332 Shady Brook Ln

75206

City

Description

Units

Dallas

Close to target and play area.

5

ADD COMMUNITY

UPDATE COMMUNITY

DELETE COMMUNITY

Show 10 entries

Search:

	C_ID	C_NAME	C_ADDRESS	C_ZIP	C_CITY	C_DESCRIPTION	C_UNITS
1	1000	The Nest Hill	6332 Shady Brook Ln	75206	Dallas	Close to target and play area.	5
2	1001	The Nest Bend	The Nest Bend Dr	75206	Dallas	Close to hiking trail and dog park	5
3	1002	The Nest Park	Amesbury Dr	75206	Dallas	Eco-friendly community near parks	5
4	1003	The Nest Gate	Southwestern Blvd	75206	Dallas	Road front community close to recreational activities	5

HOME

COMMUNITY

MAP

RANKING

FEEDBACK

ASK AI

ADMIN

Manage Communities

Manage Properties

Property ID

Type

Rent

Availability

Enter Property ID

1BHK/2BHK/3BHK

500

Occupied/Available

Furnish Status

Description

Community ID

Admin ID

Furnished/Unfurnished

Enter Property Description

Enter Community ID

Enter Admin ID

ADD PROPERTY

UPDATE PROPERTY

DELETE PROPERTY

Show 10 entries

Search:

P_ID	P_TYPE	P_RENT	P_AVAILABILITY	P_FURNISH_STATUS	P_DESCRIPTION	C_ID	ADMIN_ID	
1	101	2BHK	1500	Occupied	Furnished	This modern 2BHK offers 800-1200 sq. ft. of space, including two roomy bedrooms, a sleek kitchen, and a comfortable living area. Ideal for families or roommates, with premium features in a convenient location.	1001	1111
2	102	1BHK	1000	Available	Furnished	This stylish 1BHK spans 500-700 sq. ft., featuring a spacious bedroom, a modern kitchen, and a cozy living area. Perfect for comfortable living with great amenities in a prime location.	1001	2222
3	103	3BHK	2000	Available	Furnished	This luxurious 3BHK covers 1300-1800 sq. ft., with large bedrooms, a stylish kitchen, and a welcoming living area. Perfect for families seeking comfort, space, and premium amenities in a prime area.	1001	3333
4	104	Studio 1BHK	800	Available	Furnished	This compact yet stylish Studio 1BHK spans 300-500 sq. ft., featuring an open layout with a combined living, dining, and sleeping area, plus a modern kitchenette.	1001	4444

7. **Ask AI Page:** Your smart assistant for instant insights and tailored queries from The Nest's database.

THE NEST

HOME

COMMUNITY

MAP

RANKING

FEEDBACK

ASK AI

ADMIN

AI-POWERED SQL QUERY GENERATOR

AI-POWERED SQL QUERY GENERATOR

Enter your question:

How many Property are available?

GENERATE SQL AND RUN

GENERATED SQL QUERY

SELECT COUNT(*) AS available_properties_count
FROM Property
WHERE p_availability = 'available';

NATURAL LANGUAGE EXPLANATION

Generated SQL query and sentence response successfully.

QUERY RESULTS IN SENTENCE

"There are {available_properties_count} properties currently available."

QUERY RESULTS (TABLE)

Show 5 entries

Search:

AVAILABLE_PROPERTIES_COUNT
1

Showing 1 to 1 of 1 entries

Previous1Next

Conclusion

The Nest Community Application is designed to provide a seamless experience for prospective tenants and administrators alike. By integrating modern UI/UX principles with a well-structured database and Shiny framework, the application achieves its goals of enhancing community engagement and simplifying residential management processes.