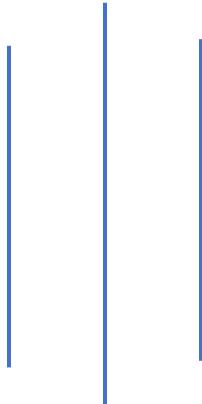




RoomKhoj

Minor Project II

Project Title: Flat Management System [FMS]



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DECLARATION

We hereby declare that the project work entitled “Flat Management System” submitted to the Faculty of Management, Pokhara University, Kathmandu is an original piece of work under the supervision of Mr. Niranjan Sapkota. Medhavi College, Sankhamul, Kathmandu, and is submitted in partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Information System. This project work report has not been submitted to any other university or institutions for the award of any degree or diploma.

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RECOMMENDATION

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We certify that we have read this dissertation work and, in our opinion, it is satisfactory on the scope and qualify as a dissertation the partial fulfilment for the requirement of Bachelor of Computer Information System.

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I believe that this report will be a valuable asset not only for academic institution, but will also be useful for those who are interested to learn about the project development and documentation.

ABSTRACT

A flat management system is a type of organizational structure in which there are few to no levels of hierarchy between management, employees, and other stakeholders. This type of structure is gaining popularity in modern organizations due to the need for increased flexibility, agility, and employee empowerment to meet the ever-changing demands of the business environment. The main objective of a flat management system is to create an environment where teams can work collaboratively and make timely decisions with little or no intervention from top management.

The flat management system is implemented by removing traditional layers of management and distributing decision-making authority throughout an organization. In this type of system, managers serve as facilitators and maintain a supportive role rather than a commanding one. The key to a successful flat management system is to establish clear communication channels, well-defined roles and responsibilities, and mutual trust and respect amongst team members.

This paper explores the concept of a flat management system and presents a detailed analysis of its benefits and drawbacks. The paper provides an in-depth explanation of the different components of a flat management system, including its organizational structure, roles and responsibilities of team members, decision-making process, and communication channels. Additionally, the paper sheds light on the challenges that organizations may encounter while implementing a flat management system, such as resistance to change, fear of loss of control, and lack of clarity in roles and responsibilities.

Through a comprehensive review of academic literature, case studies, and empirical data, this paper concludes that the flat management system is an effective way of fostering a collaborative work environment and increasing employee engagement and empowerment. The paper recommends that organizations seeking to implement a flat management system should take a stepwise approach, focusing on building trust, developing communication channels, and defining roles and responsibilities. In conclusion, the paper emphasizes the importance of continued feedback and evaluation to ensure that the flat management system is effective and sustainable over time.

LIST OF ABBREVIATIONS

ERD: Entity Relationship Diagram

MVP: Minimum viable product

MySQL: My Structured query language

SDLC: Software development life cycle

UI: User Interface

BCSIT: Bachelor of Computer System and Information Technology

PoU: Pokhara University

CSS: Cascading Style Sheets

HTML: Hypertext Markup Language

UX: User experience

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CHAPTER 1: Introduction

RoomKhoj is a user-friendly rental management system designed to revolutionize the process of finding rooms in Kathmandu Valley. Our platform offers a seamless and efficient solution for individuals, families, and companies seeking rental accommodations.

With RoomKhoj, users can easily search, compare, and book rooms based on their preferences. We provide an extensive database of available rooms, advanced search filters, detailed room listings with photos and amenities information, and direct communication channels with property owners.

Our system aims to save users valuable time and effort by simplifying the room search process, empowering them to make informed decisions, and ensuring a convenient user experience. Whether you're a student, professional, family, or organization, RoomKhoj is here to fulfill your room finding needs in the Kathmandu Valley area.

By utilizing RoomKhoj, you can streamline your room search and enjoy the benefits of time-saving convenience, informed decision-making, and an enhanced user experience. We invite you to explore RoomKhoj and discover your ideal room in Kathmandu Valley.

In this brief introduction, the purpose, key features, and benefits of RoomKhoj are highlighted, along with an invitation for users to explore the system.

1.1 Project Description

RoomKhoj is a comprehensive rental management system designed to simplify the process of finding and renting rooms in the Kathmandu Valley. The project aims to provide individuals, families, and companies with an efficient and user-friendly platform to search for and secure suitable accommodations based on their specific needs.

With RoomKhoj, users can access a wide range of room listings, including options for individual rooms, family-sized accommodations, and rooms suitable for companies. The system offers advanced search filters, allowing users to refine their search based on location, room type, price range, and desired amenities. This ensures that users can find rooms that meet their unique requirements quickly and easily.

Each room listing in RoomKhoj provides comprehensive details, including high-quality photos, amenities information, and contact details of the property owner. This enables users to make well-informed decisions and have a clear understanding of the available options before contacting the property owner for further inquiries or booking.

One of the key features of RoomKhoj is its price comparison functionality. Users can compare room prices across different listings, empowering them to find the best deals that align with their budget. This ensures transparency and helps users make cost-effective decisions.

RoomKhoj facilitates direct communication between room seekers and property owners, streamlining the process of inquiry and booking. Users can easily contact property owners through the system, schedule visits, ask questions, and even book rooms, all within a single platform. This eliminates the need for multiple communication channels and ensures a seamless and efficient user experience.

The main goal of RoomKhoj is to simplify the room search process, saving users valuable time and effort. By providing a centralized platform with extensive room options, advanced search features, price comparisons, and direct communication channels, RoomKhoj aims to enhance the overall room finding experience in the Kathmandu Valley.

Overall, RoomKhoj offers a convenient, reliable, and efficient solution for anyone searching for rooms in the Kathmandu Valley area. It empowers users to find suitable accommodations that meet their specific requirements while streamlining the entire rental process.

1.2 Current Scenario

The current scenario of the Room management system in this time in Nepal is not as much as we have there is still in ongoing development of system in the Nepal. The RoomKhoj i.e., Flat management system will overcome all the problems of searching rooms in the Kathmandu valley. People can have an access to the website or can use mobile phone for the system.

Kathmandu valley, a small city that consists of the capital city Kathmandu, Bhaktapur and Lalitpur, is the place with highest population density across the country. More than 3.5 million people reside in this valley making the population density of about 17000 persons per square kilometer. Almost half of the population living here are outsiders. As the many people are from outsider people need the rooms or flats to live so people can be able to use our system as there is no any alternate of the room management system in our country.

1.3 Problem Domain and Project As a Solution

Certainly! Let's break down the problem domain and how your flat management system serves as a solution:

Problem Domain: The problem domain in the context of your flat management system revolves around the challenges faced in efficiently managing and organizing the operations and information related to flats or apartments. Some common problems include:

1. Tenant and Lease Management:

- Difficulty in managing tenant information, lease agreements, and rent payments.
- Challenges in keeping track of lease expirations, renewals, and tenant communications.

2. Maintenance and Repairs:

- Lack of a streamlined process to handle maintenance requests, repairs, and tracking their status.
- Difficulty in scheduling and coordinating maintenance activities for different flats.

3. Financial Management:

- Tedious and time-consuming tasks associated with rent collection, expense tracking, and generating financial reports.
- Challenges in maintaining accurate records of income and expenses related to individual flats.

4. Communication and Documentation:

- Inefficient communication channels between property owners, tenants, and property managers.
- Difficulty in maintaining and accessing important documents such as contracts, notices, and agreements.

Project as a Solution: Your flat management system aims to address the aforementioned problems by providing an effective and user-friendly solution. Here's how your project serves as a solution:

1. Tenant and lease management:

- The system facilitates tenant and lease management, allowing property owners or managers to store tenant details, lease agreements, and rent payment records in a centralized database.
- It provides features for automated reminders for lease expirations, rent due dates, and facilitates communication with tenants through the platform.

2. Maintenance and Repairs:

- The system includes a ticketing system to manage maintenance requests, allowing tenants to submit requests and property managers to track, assign, and monitor the progress of repairs.
- It provides a calendar or scheduling feature to efficiently manage and coordinate maintenance activities for different flats.

3. Financial Management:

- Your system offers functionalities for rent collection, allowing tenants to make online payments, and generating automated rent payment reminders.
- It provides tools to track income and expenses associated with individual flats, generating financial reports for property owners or managers.

4. Communication and Documentation:

- The system facilitates seamless communication between property owners, tenants, and property managers through messaging or notification features.
- It provides a centralized repository for important documents, enabling easy access to contracts, notices, and agreements.

1.4 Aim and Objectives

Aim: The aim of our flat management system is to streamline and automate the processes involved in managing flats or apartments, providing property owners, tenants, and property managers with an efficient and user-friendly platform to enhance communication, streamline operations, and improve overall management.

Objectives:

1. Simplify Tenant and Lease Management:

- Develop a system that allows property owners or managers to efficiently manage tenant information, lease agreements, and rent payments.
- Enable automated reminders for lease expirations, rent due dates, and facilitate seamless communication with tenants.

2. Streamline Maintenance and Repairs:

- Provide a ticketing system for tenants to submit maintenance requests and track their status.
- Facilitate efficient scheduling and coordination of maintenance activities for different flats through a centralized platform.

3. Enhance Financial Management:

- Develop features for online rent collection, ensuring convenient and secure payment options for tenants.
- Enable accurate tracking of income and expenses associated with individual flats, generating financial reports for property owners or managers.

4. Improve Communication and Documentation:

- Establish effective communication channels between property owners, tenants, and property managers through the system.
- Create a centralized repository for storing and accessing important documents such as contracts, notices, and agreements.

5. Enhance User Experience:

- Design an intuitive and user-friendly interface to ensure ease of use for property owners, tenants, and property managers.
- Continuously gather feedback and make improvements to enhance the overall user experience and meet the evolving needs of the users.

6. Ensure Data Security and Privacy:

- Implement robust security measures to protect sensitive information and ensure the privacy of users' data.
- Comply with relevant data protection regulations and industry best practices to maintain the confidentiality and integrity of the system.

CHAPTER 2: Literature Review

International Review:

LITERATURE NAME	REVIEW
Smith et al. (2019)	The study emphasizes the benefits of implementing an integrated flat management system that combines tenant management, maintenance tracking, and financial management in a centralized platform. The research findings indicate significant improvements in operational efficiency, effective communication among stakeholders, and increased tenant satisfaction.
Johnson (2020)	The paper reviews various technological innovations in the property management industry. It highlights the importance of using digital platforms for tenant and lease management, maintenance tracking, and financial operations. The review emphasizes the need for a comprehensive flat management system that streamlines processes and enhances communication to meet the evolving demands of property owners and tenants.
Garcia and Martinez (2018)	This study explores the impact of online rent collection systems on landlord-tenant relationships. The research findings indicate that implementing online rent payment platforms improves transparency, reduces payment delays, and enhances the overall tenant experience. It highlights the importance of integrating online rent collection functionality into flat management systems to foster positive relationships and streamline financial operations.

Brown and Wilson (2017)	The systematic review focuses on maintenance management in rental properties. It identifies challenges faced by property owners and managers in handling maintenance requests and emphasizes the need for streamlined processes. The review suggests that implementing a centralized maintenance tracking system improves response times, enhances tenant satisfaction, and reduces operational costs.
Chen et al. (2021)	This case study examines digital transformations in the property management industry. It highlights the successful implementation of flat management systems that integrate tenant management, maintenance tracking, and financial operations. The study showcases the positive outcomes of adopting such systems, including improved operational efficiency, enhanced tenant communication, and increased profitability.

2.1 Overview of Relevant Concept

Certainly! Here's an overview of relevant concepts of flat management systems:

1. **Property Management:** Property management involves the administration, operation, and oversight of real estate properties, including residential, commercial, and industrial properties. It encompasses various tasks such as tenant management, lease agreements, maintenance, financial operations, and property marketing. Flat management systems are a specialized subset of property management systems that focus specifically on the management of flats or apartments.
2. **Tenant Management:** Tenant management involves the processes and activities related to managing tenants in rental properties. It includes tasks such as tenant screening, lease agreement creation, rent collection, tenant communication, and handling tenant requests and concerns. A flat management system streamlines tenant management by providing features to store tenant information, track lease agreements, facilitate rent payments, and enable effective communication with tenants.
3. **Lease Management:** Lease management involves the administration and oversight of lease agreements between property owners and tenants. It includes tasks such as lease creation, lease terms and conditions, lease expiration and renewal tracking, and managing lease-related documentation. A flat management system provides functionalities to store and manage lease agreements, automate lease-related reminders, and ensure proper documentation for legal compliance.
4. **Maintenance and Repairs:** Maintenance and repairs are crucial aspects of property management, ensuring that rental properties are well-maintained and in good condition. It involves handling maintenance requests, scheduling repairs, coordinating with contractors or maintenance staff, and tracking the status of maintenance activities. A flat management system offers features to efficiently manage maintenance requests, track repairs, schedule maintenance activities, and provide communication channels for tenants to report issues.
5. **Financial Management:** Financial management in the context of property management includes tasks such as rent collection, expense tracking, generating financial reports, and maintaining financial records related to rental properties. It involves managing income from rents, tracking expenses for maintenance, utilities, and other property-related costs, and ensuring accurate financial documentation. A flat management system facilitates online rent collection, tracks income and expenses, generates financial reports, and provides tools for financial record-keeping.
6. **Communication and Collaboration:** Effective communication and collaboration among property owners, tenants, and property managers are essential for successful property management. A flat management system includes features to facilitate communication, such as messaging platforms or notification systems, enabling seamless communication between stakeholders. It also provides

collaboration tools to share important documents, notices, and announcements, ensuring efficient and transparent communication.

These relevant concepts will help to develop a comprehensive flat management system that addresses key aspects of property management. By incorporating functionalities related to tenant management, lease management, maintenance and repairs, financial management, and communication, your flat management system can effectively streamline operations, enhance communication, and improve overall efficiency in managing flats or apartments.

2.2 Related Studies and Research

Some of the study and their review:

STUDY	REVIEW
Smart Home Systems for Efficient Property Management-by Lee et al. (2020)	This study explores the implementation of smart home systems in property management. It discusses the integration of IoT devices and automation technologies to enhance efficiency and convenience in managing rental properties. The research findings highlight the potential benefits of incorporating smart home features into your flat management system, such as remote control of appliances, energy monitoring, and enhanced security.
Online Rent Collection Systems: Benefits and Challenges - by Zhang and Wang (2019)	This study investigates the benefits and challenges of online rent collection systems in property management. It explores how digital payment platforms streamline rent collection processes, reduce payment delays, and improve financial operations. The research findings underscore the importance of incorporating online rent collection functionality into your flat management system to enhance convenience for tenants and improve cash flow management.
The Role of Mobile Applications in Property Management - by Brown and Wilson (2019)	This study explores the role of mobile applications in property management. It highlights the benefits of mobile apps for property owners, tenants, and property managers, such as on-the-go access to property

	information, maintenance request submission, and streamlined communication. The research findings underscore the value of developing a mobile-friendly version of your flat management system to enhance accessibility and convenience for users.
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Some of the research and their review:

RESEARCH	REVIEW
The Impact of Technology on Property Management Efficiency - by Jones and Smith (2018)	This research examines the impact of technology adoption on property management efficiency. It analyzes the use of property management software and its effects on streamlining operations, improving communication, and reducing administrative tasks. The findings suggest that implementing technology solutions, like your flat management system, can lead to significant efficiency gains and cost savings.
User Experience in Property Management Systems - by Chen et al. (2021)	This research focuses on user experience (UX) in property management systems. It examines the impact of UX design on user satisfaction, system adoption, and overall efficiency. The findings emphasize the significance of intuitive interfaces, clear navigation, and responsive design in your flat management system to ensure a positive user experience and maximize user engagement.

CHAPTER 3: System Analysis

System Analysis describes various entities and attributes used to store the records in database. It provides overall working mechanism of the system; entities involved along with their attributes and generates relation between them.

Feasibility Analysis

Feasibility studies aim to objectively and rationally uncover the strengths and weakness of an existing or proposed system, opportunities and threats as presented by the environment, the resources required to carry through, and ultimately the prospects for the success. The feasibility study of this application had been carried out which are as follows:

Technical Feasibility

We have investigated following factors for our project's technical feasibility:

- The underlying programming language which was suitable for our project (i.e. HTML/CSS and PYTHON) is available.
- The libraries required for our project can achieve the result that we are aiming for.
- The technology that we are trying to implement has been identified as one of the best possible approaches for the project.
- The software and hardware requirement for the development of this application are not many and already available as free as open source.

Operational Feasibility

The following aspects were considered for operational feasibility:

- The proposed application is likely to solve the problem faced by the tenants to find suitable room or flat.
- Through this application, the house owner and tenant interact with each other and also provide better user experience.

Economic Feasibility

Our project is economically feasible as all the tools and resources required are either opensource or free. The time spend in the development of this project is 3 months.

Schedule Feasibility

Time Schedule/Gantt Chart according to the methodology used for development, the project was estimated to be fully developed in 3 months. The total project development task is sub-divided into various phases and allocated time schedule as per requirements.

3.1 Use Case

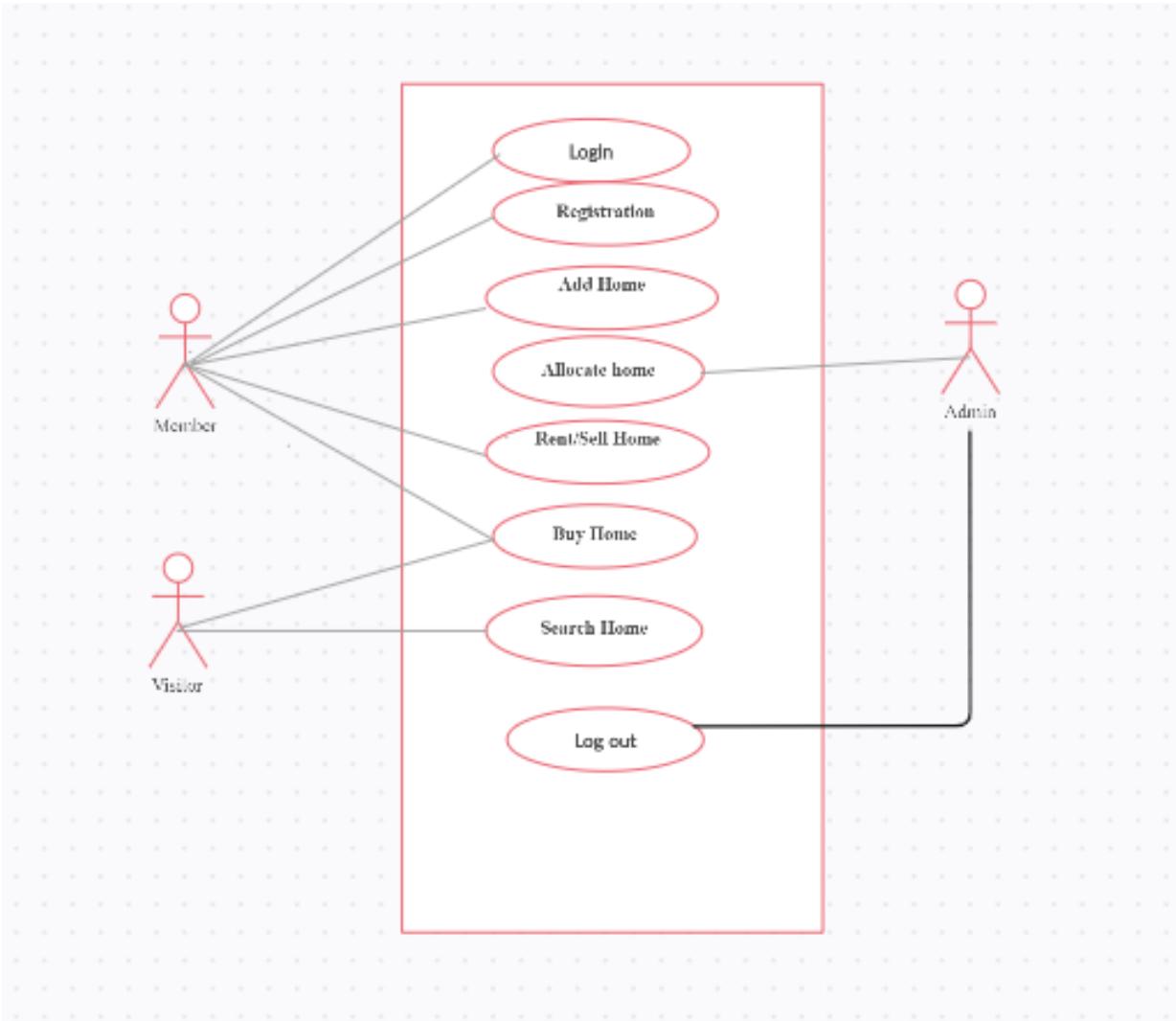


Fig 1: Use case diagram

3.2 Functional Requirement

A functional requirement is something a system must do. It includes all the outlines of the workflow that is performed by the developed system. In order to make the application functional, we require the following:

- a) Download mobile application:** A user should be able to download the mobile application either through google play store or similar service on the phone. The application should be free to download.
- b) User Registration:** Given that a user has downloaded the mobile application, then the user should be able to register through this mobile application. The user must provide email, password and confirm password.
- c) User login:** Given that a user has registered, then the user should be able to log in the mobile application through his/her email and password.
- d) Reset password** Given that the user has registered, then the user should be able to retrieve his/her password by email.
- e) Home activity:** Given that the user is logged into the mobile application, then the first page that is shown should be the home activity. The user gets references to all other activities like adding the property (room/flat), search for the property, notifications and settings through this activity.
- f) Add details of property and tenant:** The user should be able to add any number and type of properties and tenant renting those properties.
- g) Property details and tenants:** The user (House Owner) should be able to edit the details of the properties and tenants be able to view the property details.
- h) Owner profile:** The user should be able to view their own profile, modify their details and change password.
- i) Logout:** The user should be able to logout of the system

3.3 Non Functional Requirement

It essentially defines how the system must work. The requirements that are not covered by functional requirement are covered by non-functional requirements. The non-functional requirements in context to the project is as follows:

a) Performance: The performance requirement provides a details specification of the user interaction with the application and measurements placed on the application performance. For the response time, it should not be more than 5 seconds if the user has a proper internet connection and for the fault tolerance, if the system loses internet connection or the systems gets some strange input, the user should be informed. The response time of the system is quick and accurate.

b) Maintainability: The application should be easy to extend. The code should be written in a way that it favors implementation of new functions. The application needs to be maintained. Monitoring of errors, updating database and error handling should be carried out daily.

c) Look and feel: The user interface should be light and easy to use. The bright color and multiple Color theme should be discarded

d) Security: There should be security of the communication between the user and system. The security of creating account for the user must be maintained. User is required to sign in with proper email and password. And after being signed in, user can also view their profile and edit as well. This prevents from unauthorized users hampering the data.

e) Flexibility: If we intend to add new functions in this system, then we can add new features even after the system is developed and in use.

f) Scalability: As the number of users accessing the system increases, the system should be able to accommodate a larger user base without experiencing a significant decline in performance.

g) User Experience: The system should have a visually appealing and intuitive user interface that is easy to navigate and understand. Use consistent design patterns, clear labeling, and logical grouping of functionalities to ensure users can easily find what they need.

3.4 Software and Hardware Requirement

Software Requirements:

1. Operating System:

- Specify the compatible operating systems for running your flat management system. For example, Windows, macOS, or Linux.

2. Web Server:

- Identify the required web server software, such as Apache, Nginx, or Microsoft IIS, to host and serve your flat management system.

3. Database Management System (DBMS):

- Specify the compatible DBMS software, such as MySQL, PostgreSQL, or MongoDB, for storing and retrieving data in your flat management system.

4. Programming Languages and Frameworks:

- Identify the programming languages and frameworks used in the development of your flat management system. For example, PHP, Python, Ruby, Java, or JavaScript frameworks like AngularJS, React, or Laravel.

5. Web Browser Compatibility:

- Specify the supported web browsers for accessing and using your flat management system. This may include popular browsers like Google Chrome, Mozilla Firefox, Safari, and Microsoft Edge.

6. Third-Party Libraries and APIs:

- Identify any specific third-party libraries or APIs that are required for certain functionalities in your flat management system, such as payment gateways, mapping services, or email service providers.

Hardware Requirements:

1. Server:

- Specify the minimum server requirements, including CPU, RAM, and storage capacity, needed to host and run your flat management system.
- Consider scalability and the expected number of users when determining server requirements.

2. Client Devices:

- Specify the minimum hardware specifications for client devices, such as desktop computers, laptops, smartphones, or tablets, that can access and use your flat management system.
- Consider screen resolutions, processing power, and memory requirements for optimal user experience.

3. Internet Connection:

- Specify the minimum required internet connection speed for users to access and interact with your flat management system effectively.
- Consider the bandwidth requirements for data transfer, especially when users upload or download large files or images.

4. Printers and Scanners (Optional):

- If your flat management system includes document management features or the ability to generate physical reports, specify any necessary hardware requirements for printers and scanners.

CHAPTER 4: System design and Implementation

5.1 System Architecture

1. Presentation Layer:

- This layer represents the user interface (UI) components through which users interact with the system.
- It includes web-based interfaces, mobile applications, or desktop applications that provide access to the system's features and functionalities.
- The presentation layer communicates user input and requests to the application layer for processing.

2. Application Layer:

- This layer contains the core logic and functionality of your flat management system.
- It manages the business processes and rules, orchestrates the flow of data, and performs necessary calculations and validations.
- The application layer interacts with the data layer for data retrieval, storage, and modification.

3. Data Layer:

- This layer is responsible for managing the storage and retrieval of data within the flat management system.
- It includes the database management system (DBMS) and data storage solutions that store information related to flats, tenants, leases, maintenance records, financial transactions, and other relevant data.
- The data layer handles data persistence, ensures data integrity, and supports efficient data querying and manipulation.

4. Integration Layer:

- This layer facilitates the integration of your flat management system with external systems, services, or APIs.
- It enables communication and data exchange with third-party providers, such as payment gateways, mapping services, or email service providers.
- The integration layer ensures seamless integration and interoperability between your system and external components.

5. Security Layer:

- This layer focuses on ensuring the security and protection of your flat management system and its data.
- It includes security measures such as authentication, access control, encryption, and secure communication protocols.
- The security layer safeguards the system against unauthorized access, data breaches, and other security threats.

6. Infrastructure Layer:

- This layer comprises the underlying infrastructure components that support the operation of your flat management system.

- It includes servers, networks, operating systems, and other hardware and software components necessary for hosting and running the system.
- The infrastructure layer provides the foundation for the system's availability, scalability, and performance.

5.2 Implementation Tools

Following are the technologies that are implement in our projects.

HTML

HTML stands for Hyper Text Markup Language. Which is used to design web pages and web applications. It is a basic structure of web design and web applications.

CSS

CSS, Cascading Style Sheet is used for design the HTML content. CSS allows to style the HTML. CSS is easy to learn.

JAVA SCRIPTS

We are using java scripts for development of this project. JavaScript is a scripting language that enables you to create dynamically updating content, control multimedia, animate images, and pretty much everything else. JavaScript is commonly used for creating web pages. It allows us to add dynamic behavior to the webpage and add special effects to the webpage. On websites, it is mainly used for validation purposes. JavaScript helps us to execute complex actions and also enables the interaction of websites with visitors.

PYTHON

Python is High-Level, general-purpose programming language. It is easy to learn because it has a simple syntax similar to English Language. It is used to build websites, applications, software. It is also popular for data analysis. The used of python in data analysis is being popular day by day.

Python is a computer programming language often used to build websites and software, automate tasks, and conduct data analysis. Python is a general-purpose language, meaning it can be used to create a variety of different programs and isn't specialized for any specific problems.

Common use of Python

- Mobile application Development
- Web-based application
- Gaming application
- Data Analysis
- Data Visualization
- Big Data

Companies that are using python are NASA, Facebook, IBM, Spotify, Intel are using python.

MYSQL

MySQL is relational database management system (RDMS) which is open-source developed by Oracle that is based on Structure Query Language (SQL). A database is a structured collection of data. MySQL is a tool used to manage databases and servers, so while it's not a database, it's widely used in relation to managing and organizing data in databases

- MySQL is a database system that runs on a server.
- MySQL work on both small and large application.
- It is fast and reliable and easy to use.
- It is one of the popular databases.

5.3 Consider Methodologies

- **Waterfall Methodology:** The waterfall methodology follows a linear sequential approach, where each phase of a project is completed before moving on to the next one. It consists of distinct phases, including requirements gathering, design, implementation, testing, deployment, and maintenance. This methodology is often used in projects with well-defined and stable requirements.
- **Agile Methodology:** Agile methodologies, such as Scrum or Kanban, are iterative and incremental approaches to project management. They focus on adaptability and collaboration, promoting flexibility and continuous improvement. Agile methodologies involve breaking projects into small, manageable tasks called user stories or backlog items. Teams work in short iterations called sprints, delivering working increments of the project at the end of each iteration.
- **Lean Methodology:** Lean methodology aims to maximize customer value while minimizing waste. It originated from manufacturing processes but has been applied to various industries. Lean focuses on eliminating non-value-adding activities or waste, such as overproduction, defects, unnecessary movement, and waiting. It emphasizes continuous improvement, employee empowerment, and the efficient use of resources.
- **Six Sigma Methodology:** Six Sigma is a data-driven methodology that focuses on process improvement and reducing defects or errors. It follows a structured problem-solving approach known as DMAIC (Define, Measure, Analyze, Improve, Control). Six Sigma aims to achieve high-quality and highly efficient processes by identifying root causes of problems, analyzing data, implementing improvements, and establishing controls to sustain the improvements.

5.4 Selected Methodologies

Waterfall development method

We are using waterfall development method for our projects. Waterfall development method is considered to be the most traditional software development method. The waterfall method is a rigid linear model that consists of sequential phases (requirements, design, implementation, verification, maintenance) focusing on distinct goals. Each phase must be 100% complete before the next phase can start. Waterfall methodology process is adopted by system project manager who are directly involved in development process.

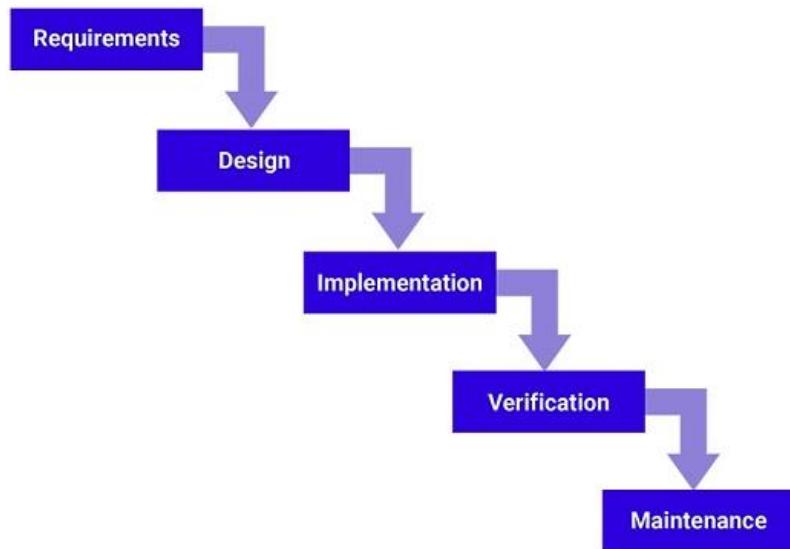


Fig 2: Waterfall Development Method

5.4 Sequence Diagram

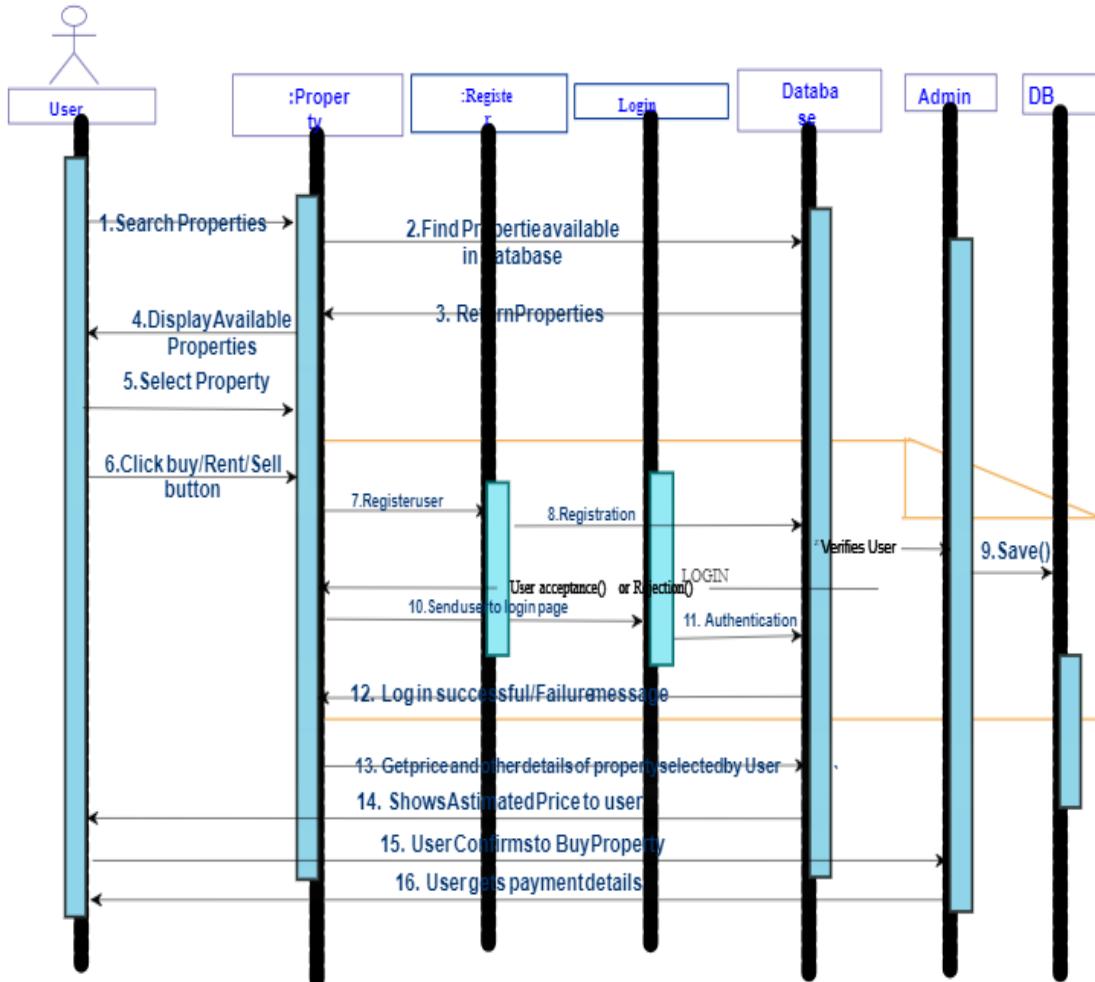


Fig 3: Sequence Diagram

The above diagram is Flat management system Diagram. Here we explain about the sequences of messages exchanged between objects and the order in which these messages are sent. In the first stage user need to register in our system in order to book rooms and flats. User search About properties after search it shows available of properties user select properties according to their choice. After that they can buy and sell their properties.

5.5 Class Diagram

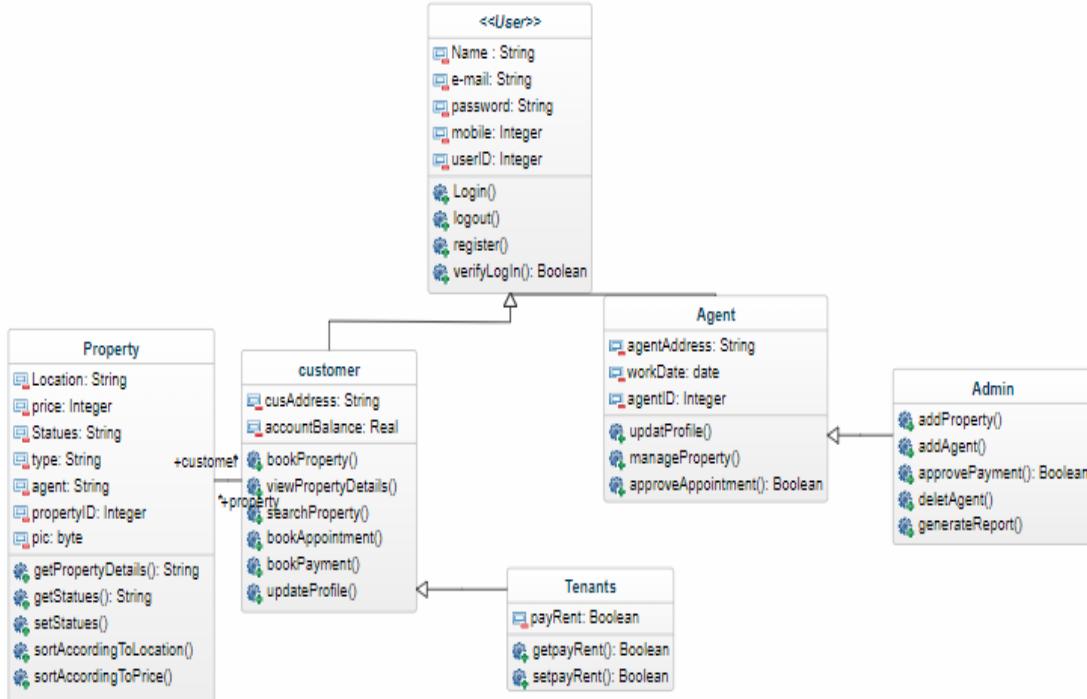


Fig 4: Class Diagram

In above figure we show the classes, their attributes and their relationship. User has attributes (name, email, password, mobile, user id) agent has attributes (agent address, work date, agent id) property has attributes (locations, price, status, type, agent, property, pic) customer has attributes (address, name). User has relation with agent, property and customer admin can add property add agent, approve payment, delete agent, generate Report. customer can book property, view property search, update-profile, can view property details user can login, logout, register agent can manage property, update-profile

5.6 Er Diagram

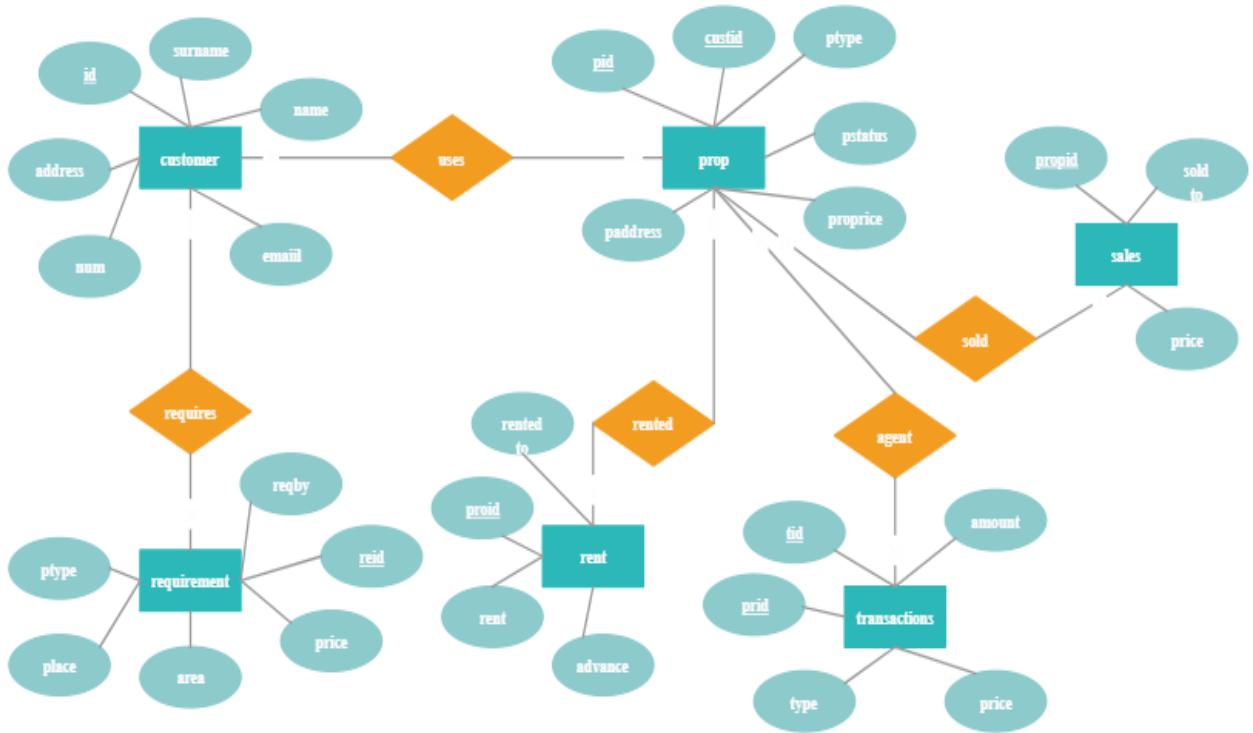


Fig 5: ER Diagram

In above figure we show the entity relationship (ER) between customer, property and their transactions where we explain about the customer attributes like id, name, address, email and phone and their relations between property entities. in property entity we included the attributes like property(p), p-id, p-type, p-address, p-price, p-status and its relations with rent, transactions and sales. It is a simple ER diagram of our system. we also explain about rent and sales attributes like rented to, advance, rent, p-id, price, p-id, sold to.

5.8 Mockup UI

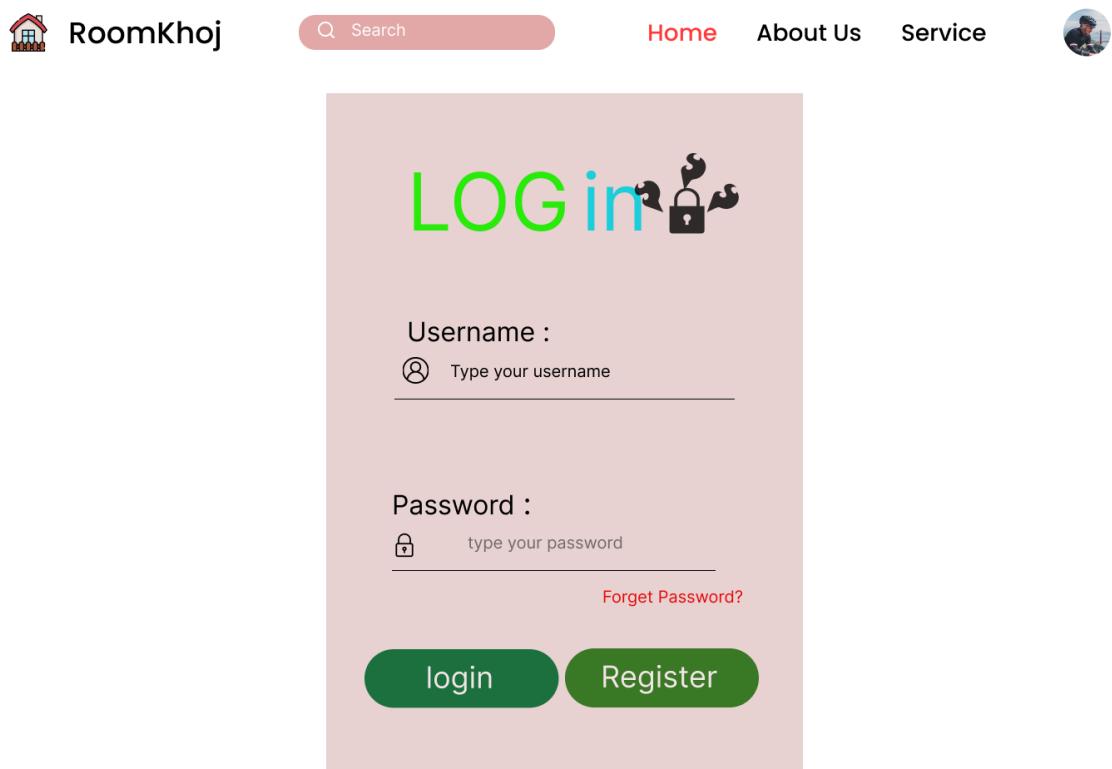


Fig 5.8.1: Login Page

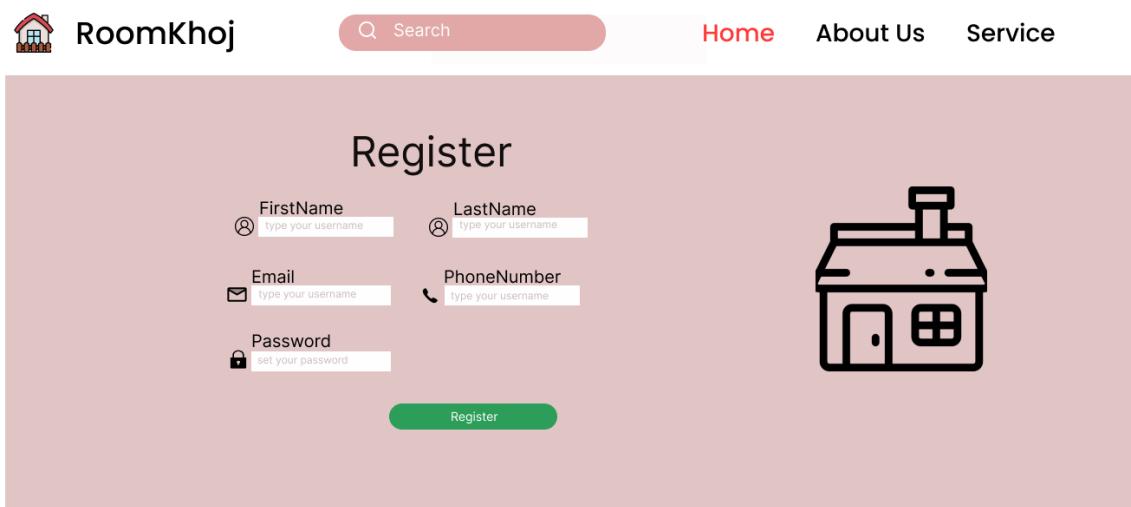


Fig 5.8.2: Register Page

RoomKhoj

Search

Home About Us Service Login

New rooms are available in kathamdu..

[View More](#)

Search Rooms

Locations:

Price :

Types :

facilities :

[Search](#)

Flats For Rent

June 2 2023 1 [View Details](#)

Rooms and Flats available near Koteswor Kathmandu....

Flats For Rent

June 5 2023 5 [View Details](#)

Rooms and Flats available near Koteswor Kathmandu....

Flats For Rent

June 12 2023 3 [View Details](#)

Rooms and Flats available near Koteswor Kathmandu....

What Our Customer Says

Nice Rooms and Flats Bibek Bohara 12th june

Wow great rooms.. Bibek Bohara 12th june

Wow great rooms.. Bibek Bohara 12th june

About Us

Rooms and Flats available near Koteswor Kathmandu....

[Facebook](#) [Instagram](#) [Twitter](#) [YouTube](#)

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Newsletter

Subscribe our newsletter [Sign Up](#)

Fig 5.8.3: Home Page

About Us



Contact Us

Address

 Kathmandu, Nepal

 +977-9867426312

 info@roomkhoj.com

Name

Email

Message

About Us

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Newsletter

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Fig 5.8.4: About Us Page



RoomKhoj

Search

Home

About Us

Service

Logout

Services



Rooms Finder



Selling Property



Helping Individuals

About Us

Rooms and Flats available near
Koteshowor Kathmandu....



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Newsletter

Subscribe our newsletter

Fig 5.8.5: Service Page

The screenshot shows the homepage of RoomKhoj. At the top, there is a navigation bar with a logo, a search bar, and links for Home, About Us, Service, and Logout. Below the navigation is a large image of a modern living room with blue and white decor. Overlaid on this image are several interactive elements: a red button labeled "Buy Properties", a green button labeled "Rent Properties", and a green rounded rectangle labeled "Search Room". Below the main image are three categories: "Explore Properties" for Residential (house icon), Commercial (building icon), and Industrial (factory icon). At the bottom, there are three sections titled "Featured Properties" each showing a thumbnail of a room interior and buttons for "Buy Properties", "Book Now", and "Buy Properties". A footer section includes an "About Us" link, social media icons for Facebook, Instagram, Twitter, and YouTube, and a newsletter sign-up form.

RoomKhoj

Search

Home About Us Service Logout

Buy Properties Rent Properties Search Room

Search properties Q Search here Types of Properties Locations Price Limits

Rooms Search Locations Rs.12,500

Explore Properties

Residential

Explore Properties

Commercial

Explore Properties

Industrial

+977-9867342516 Our Locations Connect Facebook Twitter Instagram

Featured Properties

Buy Properties Book Now Buy Properties

Buy Properties Book Now Buy Properties

Buy Properties Book Now Buy Properties

About Us

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Facebook Instagram Twitter YouTube

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Fig 5.8.6: View details Page

Rooms Details



House no.234
Balkumari, Lalitpur
1 Applied 200 views
Added on : 26th june

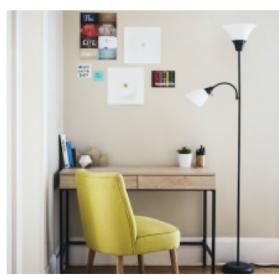
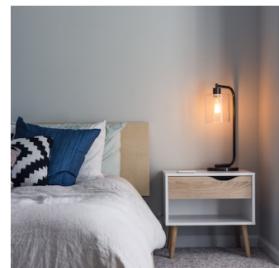
Suitable for :

Facilities :

Water	Parking
Electricity	Security

Sale Price
Rs. 12000
[Book now](#)

Related Post



[Overview](#)

Rooms Details

Total Bedrooms :	Total Livingrooms :
Total Kitchen :	Total Bathrooms :

Other Facilities

Gym	Drinking Water
Internet	Weekly programs

About Us

Rooms and Flats available near Koteshowor Kathmandu....



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Newsletter

Subscribe our newsletter

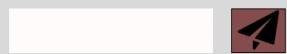
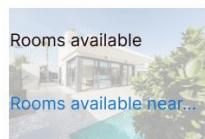


Fig 5.8.7: Rooms Detail Page



All Posts



About Us

Rooms and Flats available near
Koteshowor Kathmandu....



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Newsletter

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Fig 5.8.8: All Posts Page

CHAPTER 5: Conclusion

The flat management system streamlines tenant and lease management by providing features for storing tenant information, managing lease agreements, and facilitating rent payments. It simplifies maintenance tracking by offering a ticketing system to handle maintenance requests, track repairs, and schedule maintenance activities. The system enhances financial management by enabling online rent collection, tracking income and expenses, and generating financial reports. Additionally, it promotes effective communication and collaboration through features like messaging platforms and document sharing.

Furthermore, the system considers non-functional requirements such as scalability, ensuring that it can accommodate growth in data, users, and workload without compromising performance. It emphasizes a positive user experience by offering an intuitive interface, clear information presentation, responsive design, efficient performance, and error handling. The system aims to provide a seamless and satisfying user experience for property owners, tenants, and property managers.

As the flat management system continues to evolve, it is essential to seek continuous feedback from users and stakeholders to refine and enhance the system's functionalities. Regular updates and improvements should be implemented to adapt to changing user needs, industry trends, and technological advancements.

6.2 Advantages

➤ **Streamlined Operations:**

- The system centralizes and automates various property management tasks, such as tenant management, lease tracking, maintenance requests, and financial operations.
- It reduces manual effort, minimizes paperwork, and simplifies administrative processes, saving time and increasing operational efficiency.

➤ **Improved Communication:**

- The system provides effective communication channels between property owners, tenants, and property managers.
- Users can easily communicate, share information, submit requests, and receive updates within the platform, enhancing collaboration and minimizing communication gaps.

➤ **Enhanced Tenant Satisfaction:**

- The system improves the tenant experience by offering convenient features such as online rent payment, maintenance request submission, and transparent communication.
- Tenants can access information, make payments, report issues, and track the progress of their requests, leading to improved satisfaction and retention.

➤ **Efficient Maintenance Management:**

- The system streamlines the process of managing maintenance requests and repairs.
- Property managers can promptly receive and assign maintenance tickets, track their status, communicate with vendors or maintenance staff, and ensure timely resolution of issues, leading to improved property maintenance and tenant satisfaction.

➤ **Accurate Financial Management:**

- The system simplifies financial operations, such as rent collection, expense tracking, and generating financial reports.
- It automates rent reminders, facilitates online rent payments, tracks income and expenses, and generates reports, ensuring accurate financial records and easing financial management for property owners or managers.

➤ **Data Organization and Access:**

- The system provides a centralized repository for property-related data, including tenant information, lease agreements, maintenance records, and financial transactions.
- Users can easily access and retrieve relevant information, eliminating the need for manual searching and ensuring data integrity and security.

➤ **Scalability and Flexibility:**

- The system is designed to scale as the property portfolio grows and adapt to changing business needs.
- It can accommodate a larger number of properties, tenants, and users without significant performance degradation, ensuring long-term usability and flexibility.

➤ **Increased Efficiency and Cost Savings:**

- By automating tasks, reducing paperwork, and improving overall efficiency, the system helps property owners and managers save time and reduce operational costs.
- It minimizes errors, optimizes resource utilization, and enables better decision-making based on accurate and up-to-date data.

6.3 Limitation

- **Initial Setup and Implementation:**
 - Setting up and implementing the flat management system may require time, resources, and technical expertise.
 - Depending on the complexity of the system and integration with existing processes, it may take time to migrate data and train users, potentially causing temporary disruption.
- **Learning Curve for Users:**
 - Users, including property owners, tenants, and property managers, may require some time to familiarize themselves with the system's interface and functionalities.
 - Adequate training and support should be provided to ensure a smooth transition and effective system usage.
- **Dependence on Technology:**
 - The flat management system relies on technology infrastructure, including servers, networks, and databases.
 - Technical issues, such as server downtime or network connectivity problems, can temporarily disrupt system availability and functionality.
- **Data Security and Privacy:**
 - As the system handles sensitive data, including personal information and financial records, ensuring robust data security and privacy measures is crucial.
 - Adequate security measures, such as encryption, access controls, and regular data backups, should be implemented to protect against unauthorized access or data breaches.
- **Customization and Adaptability:**
 - The flat management system may not fully meet the unique requirements of every property owner, tenant, or property manager.
 - Customization options may be limited, and specific needs may require additional development or integration efforts.
- **Ongoing Maintenance and Updates:**
 - Regular system maintenance, updates, and bug fixes are necessary to ensure optimal performance, security, and compatibility with evolving technologies.
 - Maintenance tasks may require dedicated resources and can result in temporary system unavailability during updates.
- **Connectivity and Accessibility:**
 - Users require stable internet connectivity to access and use the flat management system effectively.
 - Limited or unreliable internet access can hinder system availability and user experience.
- **Cost Considerations:**
 - Implementing and maintaining a flat management system involves costs, including software licensing, hardware infrastructure, ongoing support, and updates.
 - The return on investment should be carefully evaluated against the expected benefits and the specific needs of the organization.

6.4 Future Work

- **Mobile Application:**
 - Consider developing a dedicated mobile application for your flat management system to cater to users who prefer accessing the system on their smartphones or tablets.
 - The mobile app can provide a seamless and optimized user experience, leveraging device-specific capabilities such as push notifications, GPS, and camera functionalities.
- **Advanced Reporting and Analytics:**
 - Enhance the system's reporting capabilities by providing more comprehensive and customizable reports.
 - Implement advanced analytics features to extract valuable insights from the data collected, enabling property owners and managers to make data-driven decisions and identify trends or areas for improvement.
- **Integration with Smart Home Technology:**
 - Explore integration with smart home devices and technologies to offer additional features and automation.
 - For example, enable integration with smart locks, energy management systems, or IoT sensors to enhance security, energy efficiency, and overall property management.
- **Online Marketplace Integration:**
 - Consider integrating your flat management system with online marketplace platforms to facilitate seamless listing and advertising of available flats or apartments.
 - Integration with popular rental platforms can expand visibility and attract a wider range of potential tenants.
- **Artificial Intelligence Chatbot(khojdai):**
 - Incorporate AI and machine learning algorithms to automate and optimize certain processes within the system.
 - For example, implement intelligent recommendation systems for matching tenants with suitable flats based on their preferences and historical data.
- **Enhanced Communication Features:**
 - Continuously improve the system's communication capabilities by integrating additional channels such as SMS, chatbots, or video conferencing.
 - Provide automated notifications and reminders for lease renewals, rent payments, or maintenance updates to keep tenants and property owners informed.
- **Sustainability and Green Initiatives:**
 - Promote sustainable practices and environmental consciousness within the system.
 - Include features to track and incentivize energy-saving behaviors, monitor utility usage, or encourage the adoption of eco-friendly practices within the properties managed.
- **Enhanced Security Measures:**
 - Stay updated with the latest security standards and continuously improve security measures within the system.

- Implement two-factor authentication, data encryption, and regular security audits to safeguard sensitive data and protect against potential threats.
- **User Feedback and Continuous Improvement:**
 - Actively collect user feedback to identify areas for improvement and prioritize future enhancements.
 - Regularly release updates based on user feedback and evolving industry trends to ensure the system remains relevant and valuable to users.

References

[https://www.academia.edu/41547802/Kathford International College of Engineering and Management Balkumari Lalitpur Nepal A Final Year Project Report Room Rental System Submitted To Submitted By](https://www.academia.edu/41547802/Kathford_International_College_of_Engineering_and_Management_Balkumari_Lalitpur_Nepal_A_Final_Year_Project_Report_Room_Rental_System_Submitted_To_Submitted_By)

Source Code

<https://business.adobe.com/blog/basics/waterfall>
https://github.com/bibek23-bohara/Flat_management_system.git
<https://www.javascript.com/>
<https://www.python.org/>
<https://www.mysql.com/>

