SOUTH EAST ASIAN INSTITUTE OF TECHNOLOGY
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RENTAL SYSTEM
Residential Estate Navigation Tracking and Leasing System

A Project Study

Presented to

The faculty of

South East Asian Institute of Technology

College of Information and Communication Technology

In Partial Fulfillment

of the Requirement for the Subject

IT 411: Capstone Project and Research 1

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October 2024

CHAPTER I

INTRODUCTION

RATIONALE OF THE STUDY

Housing plays a huge role in revitalizing economic growth in any country, with shelter being among the key indicators of development. Most families choose to rent houses based on their income and family situations. Unfortunately, there may not be enough good quality rental housing for these families. The demand for rental houses is extremely high and more rental houses need to be put in place. Developing rental houses has numerous advantages, particularly for landlords, who can increase their profits through the rent paid by tenants. The increased number of tenants and landlords complicates rentals, especially for landlords who lose large sums of money to tenants who do not pay their rent (Voumick et al., 2021).

The rental property market is continuously expanding. With urbanization and population growth, many individuals prefer renting homes rather than buying, especially in large cities where property prices are high. According to a report over 55% of the world's population resides in urban areas, and this figure is expected to rise to 68% by 2050. In Polomolok, a municipality in South Cotabato, the trend is similar. As the local population grows and more people move into the area, the demand for rental homes increases. Currently, rental property in Polomolok primarily relies on traditional methods such as manual record-keeping and face-to-

face interactions. This approach involves several time-consuming and error-prone practices (Kilroy, A., 2024).

These are the following problems that the RENTAL System in Poblacion, Polomolok currently experiencing. (1) Property owners and managers struggle to manage multiple properties, leading to lost income, delayed announcements, and decreased profitability. (2) Manually managing tenant's information can lead to lost or misplaced confidential information, putting tenant privacy at risk and causing compliance issues for property owners and managers. (3) Prospective tenants get lost or have trouble finding the property due to inadequate signage, unclear directions, leading to bad reputation for the company. (4) Manual lease processes lead to delayed rent payments, disputes with tenants, and a lack of visibility into lease terms and conditions. (5) Tenants concerns and issues go unresolved due to a lack of effective feedback mechanisms, leading to decreased tenant satisfaction and increased turnover rates.

The RENTAL System is designed to improve how residential estates are managed by offering a centralized, automated platform that helps property owners and managers handle multiple properties more efficiently. This system reduces common problems, such as lost income and inefficiencies, by organizing tasks like tracking properties and managing tenant information. By automating reminders, notifications, and calendar events, the system keeps property owners and managers organized and ensures timely responses to tenant inquiries. Additionally, it allows administrators to easily back up all property and tenant data, providing a

secure way to store important information. The system also offers real-time navigation using Google Maps, making it easy for tenants to find rental properties. It reduces errors and misunderstandings by automating lease agreements, ensuring that both tenants and property owners are clear on terms. Furthermore, it simplifies financial transactions by automating rent payments, providing a secure and convenient process for both parties. Lastly, the system improves tenant satisfaction by enabling smoother communication through a chatbot feature, which provides quick access to property information and ensures fast responses to tenant concerns. This makes managing properties easier and more efficient for both tenants and property managers.

In conclusion, the RENTAL System benefits tenants and property managers, particularly landlords in Polomolok. Organizing the rental process, from managing tenant information to handling multiple properties. The system allows property managers to organize tasks like processing lease agreements, handling payments, and tracking tenant concerns on one centralized platform. It also helps tenants by providing easy access to property information and real-time navigation, ensuring a smoother experience. The system replaces manual processes, reducing errors and delays that often occur with traditional methods. This automation not only saves time but also increases efficiency, making rental management more convenient and reliable for everyone involved.

OBJECTIVES OF THE STUDY

General Objectives

To design and develop an effective and secure RENTAL System that enhances tenant satisfaction, reduces revenue loss, and improves payment transactions.

Specific Objectives

The choice of this study is driven by the following objectives:

- To develop a system that optimizes property information and speeding up rental processes through automated services such as automated lease agreement, and automated notifications.
- To develop a system that securely manages tenant information, protecting sensitive data and ensuring compliance with privacy regulations.
- To develop a system that helps tenants navigate properties using real-time Open Street Map, increasing visibility.
- To develop automated lease agreements and payment transactions by uploading a screenshot of proof of payment (GCash, PayMaya, Debit Card), ensuring timely rent collection.
- To create an AI chatbot system that responds to tenant inquiries instantly, enhancing tenant satisfaction and reducing turnover rates.

SCOPE AND LIMITATIONS OF THE STUDY

Scope of the Study

This system automates notifications and calendar activities to improve communication and organization. It sends automatic reminders and updates to tenants, ensuring they receive appropriate updates. By doing so, it enables smooth coordination and facilitates effective communication.

Exportable excel data backup allows users to securely export their data in Excel format, providing a reliable backup. This feature enables users to save their data in a compatible format, making it easy to access and manage their information. As a result, users can rest assured that their data is safe and easily accessible whenever they need it.

Open Street Map is an alternative to Google Maps, allowing users to navigate and display locations in real-time. It also enables users to optimize routes, reducing travel time and increasing efficiency. By using Open Street Map, it can improve customer service by providing accurate and up-to-date location information.

By automatically generating and managing digital lease agreements, the system eliminates manual errors and paperwork. It also automates payment transactions, ensuring timely and accurate payments. This results in a smooth experience for users, who can rely on efficient and error-free lease management and payment processing.

The chatbot feature provides a convenient and efficient customer support experience by offering instant answers to tenant queries 24/7. This AI-powered chatbot can be integrated into a company's website or application, allowing customers to quickly find solutions to their problems. Reduces the need for human intervention, making it a valuable tool for property managers and tenants alike.

Limitations of the Study

This proposed Residential Estate Navigation Tracking and Leasing System has several limitations. It relies on internet connectivity to provide real-time visibility using Open Street Map, and therefore, may not function optimally in areas with poor internet connectivity. The systems automated lease agreements and payment transactions through uploading a screenshot of proof of payment, and may not accommodate customized leasing arrangements. Additionally, the system cannot monitor real-time maintenance of the residential units if the tenants do not inform the property owners or managers.

SIGNIFICANCE OF THE STUDY

The Residential Estate Navigation and Leasing System plays a vital role in building a well-organized residential estate. It enables the property managers/owners to manage all the information and also allows them to interact with tenants, and connect them. Therefore, this study is deemed significant to the following people:

Property Owners

This study is important for owners as it will help them manage their residential properties efficiently, reduce human errors, and keep track of tenant's information, leases, and payment transactions.

Administrators

This study will be useful to administrators because it will offer a method of minimizing paperwork and accommodating all administrative tasks concerning residential estates in the most efficient and systematic way possible.

Tenants

This study helps tenants by offering a user-friendly and structured way to access lease details, monitor payments, and communicate effectively with administrators.

Researchers

This study is important to the researchers because it will provide them with a system to study the Residential Estate Navigation Tracking and Leasing System in the residential estate industry.

Future Researchers

This study is significant to future researchers in improving their knowledge and giving ideas about where and how to plan and start the research to explore new ideas relevant to the topic that can be very beneficial.

FLOW OF THE STUDY

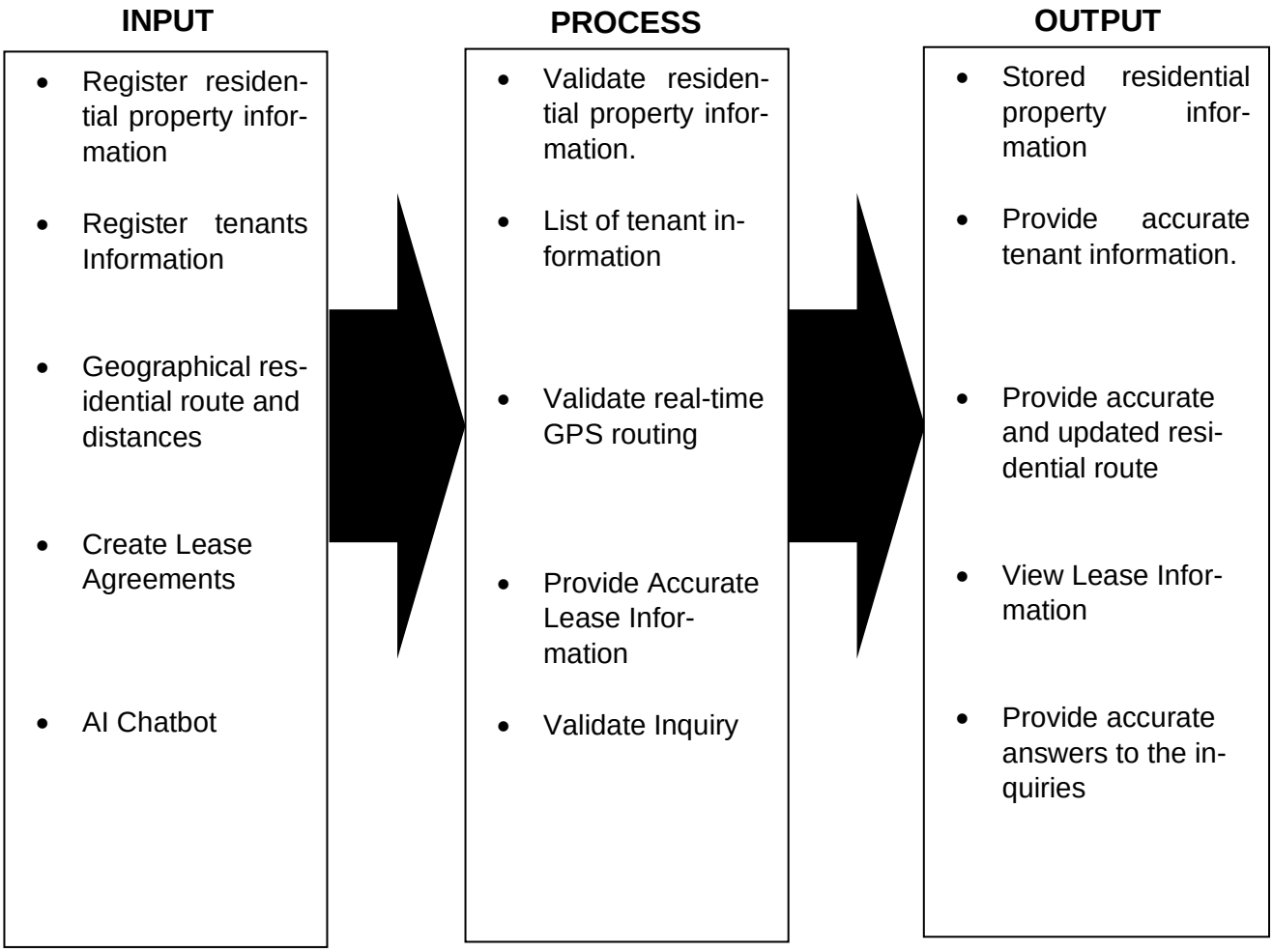


Figure 1.1 Flow of the Study of Residential Estate Navigation Tracking and Leasing System

DEFINITION OF TERMS

AI Chatbot — a piece of software that interacts with a human through written language.

Feedback — is a response or reaction to something, such as a comment, opinion, or evaluation, that helps to improve it.

Lease Agreement— a contract where one party grants a right to use a property or land to another party in return for consideration and for a specific period of time.

Navigation — the process or activity of accurately ascertaining one's position and planning and following a route.

Open Street Map — is a digital map service that helps users navigate and find locations, providing directions and information about places**.**

Payment — the action or process of paying someone or something or of being paid.

Residential Estate — refers to something related to a person's home or place of residence, where they live, rest, and spend their daily life.

Residential Estate Navigation Tracking and Leasing System — is a platform that helps rent, manage and track residential properties, including navigation, tracking, and leasing processes.

Rental — allowing someone to use a property (like a house) in exchange for payment.

Tracking — a tool used to monitor and manage payments within an organization.

CHAPTER 2

REVIEW OF RELATED LITERATURE AND STUDIES

The following review will aim at the available literature that has been published in this particular category. It will synthesize the findings of other researchers and present them thus categorizing studies about the topic under its different known categories. This will also serve to establish the place of the current study in the existing literature and what it could contribute to the same.

Local Studies

Design and Evaluation of an Online Beach House Rental System: Streamlining Accommodation Management and Enhancing User Experience

The study aimed to simplify rental management and improve user experience, particularly for beach house rentals. It showed that users found the system easy to use for searching properties and making inquiries. Key features, like property management tools and automatic notifications, helped make the process smoother. The system also emphasized security, which gave users confidence in the safety of their data and transactions. However, some improvements, like making the system faster during busy times and better for use on different devices, were noted.

The system proved to be effective, offering an easy-to-use interface, enhanced security, and features that help owners and renters manage listings, communicate, and complete bookings more efficiently. The system also prioritized secure payments and communication, building trust among users. The findings

provide useful feedback for future improvements, ensuring the system continues to meet the needs of users in the beach house rental (J. Gallera, 2023).

Apartment Rental Management System for Real-Time Transaction and Task Organization

The implementation of the Apartment Rental Management System for Real-Time Transaction and Task Organization has the potential to significantly enhance property management and tenant experiences in Celso's apartment complexes. The system offers centralized management, a comprehensive platform for handling various aspects of rental properties, and automation of key processes, which collectively improve efficiency, reduce manual workload, and streamline data handling. For lessors, this means easier management of multiple properties and improved decision-making. Tenants benefit from a more straightforward rental process and better communication with property managers. Additionally, the system's integration into modern rental practices, such as online transactions, ensures it meets current market demands. The main advantage of this system is its ability to address common issues found in traditional rental management approaches, such as poor data handling and slow processing. By providing a more efficient, transparent, and user-friendly solution, this project aims to improve overall property management and user satisfaction in the rental market (Magno et al., 2024).

A Web-Based Rental House Smart Finder

The Web-Based Rental House Smart Finder has the potential to significantly improve the rental process for clients in Bansud and Bongabong, Oriental Mindoro. The system offers several benefits, including the ability to easily locate and compare budget-friendly rental options such as boarding houses and dormitories. It provides detailed information on properties and displays nearby rentals based on distance, helping clients find affordable housing more conveniently. The Smart Finder also allows clients to make reservation requests directly through the platform. This system addresses gaps in current rental technologies by focusing on less commonly advertised rental options and offering a user-friendly interface that simplifies the search and booking process. By leveraging modern technology, the Web-Based Rental House Smart Finder aims to enhance both the efficiency and accessibility of rental housing, making it easier for clients to find suitable accommodations (Monteverde et al., 2023).

Foreign Studies

Design and Implementation of a House Rental Management System: A Comprehensive Approach

The adoption of the House Rental Management System (HRMS) has the potential to transform and enhance the rental experience for both property owners and tenants. It provides benefits such as centralized property management, a single control panel, and automated processes, which improve decision-making,

reduce workload, and give property owners greater control. For tenants, the HRMS simplifies the property search and facilitates easier communication with property managers. Additionally, the system adapts to modern rental practices, such as short-term leasing and online transactions, ensuring tenants can respond to evolving market trends.

The key advantage of HRMS lies in redesigning the rental process to be more efficient, transparent, and user-friendly. The research addresses the gap found in most existing rental management systems, which are inefficient, difficult to use, and lack transparency. By developing a more intuitive system with modern ICT technologies, this study aims to improve both the management and user experience, providing clarity and efficiency in the housing rental market (Francis & Frimpong, 2023).

RENTL: A Cloud-based System Providing a Simple Solution to the Complexity of Managing Rental Properties

The RENTTL project proposes a cloud-based property management system designed to address the inefficiencies of traditional pen-and-paper methods used by landlords to manage their properties. This digital solution aims to provide a secure and efficient way for landlords to manage their properties, replacing conventional paper-based document-intensive processes. The system offers a single-window interface with features such as electronic drafting of legal contracts, secure signature protection, collection and management of receivables, maintenance management, and automated financial report generation. This comprehensive

solution is expected to improve the overall experience of managing rental properties, addressing the research gap in developing a technological solution that incorporates encryption and benefits both landlords and tenants.

The RENTTL system is being developed using a collaborative approach, involving undergraduate students and faculty mentorship. The front-end GUI is built using AngularJS, HTML5, and CSS, while the back-end DBMS is built using NodeJS and MongoDB. The project's objectives include developing a cloud-based property management system that automates the process of managing rental properties, providing a secure and efficient solution for landlords and tenants, and improving the overall experience of managing rental properties. By addressing the research gap in developing a comprehensive solution, RENTTL is expected to improve cooperation between landlords and tenants, providing a convenient and efficient solution for all parties involved. (B. Henderson, 2019).

The Rental Zone (House Renting Website)

The proposed online house-renting website is a digital solution designed to address the growing demand for housing rentals, particularly in urban areas. The website enables tenants to rent properties and landlords to upload their property details, facilitating a convenient and efficient rental process. The system addresses the challenges faced by tenants in finding suitable rentals, eliminating the need for intermediaries and reducing the time and effort required to search for properties. The website provides a user-friendly interface, allowing users to easily interact and

find rentals that meet their needs. Additionally, the system offers packaging and shifting services, ensuring a safe and convenient relocation process.

The proposed system is designed to provide a maximum user-friendly interface, utilizing HTML, CSS, JavaScript, Bootstrap, PHP, and MySQL database servers to create interactive and responsive web pages. The goal of the project is to create a better relationship and easy interaction between tenants and landlords, making the renting process easy and effective for all parties involved. The online house-renting website is designed to improve the housing rental experience, providing a convenient, efficient, and user-friendly solution for tenants and landlords alike (Paul, 2022).

Local Literature

Design and Implementation of House Rental Management System: A Case Study of Metropolitan

The proposed House Rental Management System (HRMS) seeks to address the need for an efficient and flexible house rental system by offering active mobile phone services for tenants searching for vacant houses. The system's key features include a constraint satisfaction problem-based search option, an active chat server for real-time interaction between administrators and tenants, and a user-friendly interface with command buttons for easy database management.

The system provides benefits such as easy database management, adding and viewing data, and deleting data, which is particularly useful for managers

experiencing management challenges in the house rental business. However, the research lacks technical details on implementing the constraint satisfaction problem and security measures to protect user data and prevent unauthorized access. Additionally, the research does not discuss the system's scalability and performance in handling a large number of users and a large database of houses. The HRMS has the potential to improve the rental experience for both property owners and tenants by providing a more efficient, transparent, and user-friendly system. However, further research is needed to address the technical gaps and ensure the system's security, scalability, and performance (M. Kalbalde, 2023).

LeKeDe: Online Rental System

The proposed LeKeDe system is a web-based rental management information system that aims to bridge the gap between users and owners of rental products. The system's key features include an easy renting process, easy procurement of essential documentation, a central place for document storage, and an effective way to manage costs for an eco-friendly way of renting services for customers.

The system is designed to provide a customer-oriented approach, focusing on the four factors of "Reliability", "Responsiveness", "Tangibles", and "Quality" to improve its services for users and achieve a competitive advantage in contrast to existing rental systems. The system addresses the need for an efficient and effective platform that connects users and owners of rental products for communication and purchasing, particularly for daily-use items. The research highlights the lack

of a complete online rental system, especially for daily-use items, and the need for an easy-to-use, open-source, and free application that facilitates renting instead of selling and disposal of products. Overall, LeKeDe has the potential to improve the rental experience for both users and owners by providing a more efficient, customer-oriented, and environmentally friendly system (Mehta et al., 2019).

House Rental Management System

The proposed application for Congo landlords aims to address the inefficiencies and risks associated with paper-based record-keeping systems in the property rental business. The system's key features include a digital space for landlords to manage their properties, minimize data loss, and market their properties effectively. The system will have three types of users: device administrators, landlords, and tenants, and will include multiple functions such as user registration, login, password set/reset, payment, online contract signing, and texting.

The system addresses the research gap of inefficient and risky paper-based record-keeping systems, which lead to problems in record-keeping, tenant details, and property marketing. The lack of a digital solution worsens the issue, resulting in data loss during disasters and huge losses for landlords. The proposed application has the potential to improve the rental housing market and enable landlords in DR Congo to offer quality services, sustain their competitiveness, and maintain their position in the market. The application is designed to provide a digital solution for landlords to effectively manage their properties, reduce data loss, and improve the rental experience for both landlords and tenants (E. Cariño, 2019).

Foreign Literature

A Web-based Rental Property Management System for Oreteti Apartment

The proposed rental property management system is a web-based application designed to automate and streamline the management of rental properties, reducing the workload for users. The system's key features include a centralized property management system, easy rent collection, and a unified dashboard, making it user-friendly, efficient, and easy to maintain.

The system addresses the research gap of inefficient management in the rental property industry, which is characterized by paperwork, poor management, and a lack of transparency. The current system involves many challenges, including juggling multiple rented houses, collecting rent, and searching for good tenants. The proposed system has the potential to revolutionize the rental experience, enabling property owners to make informed decisions with ease and control their properties effectively, while tenants can easily rent properties of their choice and communicate directly with property managers or owners (M. Ungayi, 2019).

Auto Generated Agreement Based House Rental System

The proposed Home Rental System is a digital solution designed to address the challenges faced by the housing rental market, including false rental information, difficulties in government monitoring and regulation, and disputes related to housing leases. The system utilizes smart contracts to automate rent payments and collections and incorporates certification department nodes and record management nodes to verify property listings and personal identity information.

The system addresses the research gap of inefficient and unreliable housing rental systems, which are characterized by a lack of transparency, accountability, and tamper-proof solutions. The current system's reliance on intermediaries and manual processes results in increased costs, disputes, and difficulties in resolving issues related to housing leases. The proposed system has the potential to provide a secure, efficient, and transparent housing rental experience, benefiting both property owners and tenants, and enabling the government to effectively monitor and regulate the rental situation (Amina & S.R, 2024).

Review Paper on Rental System

The Online Rental System is a web-based platform that enables users to easily find and rent houses online, overcoming the time-consuming process of manual searching. The system allows users to search for rental homes by location, view nearby utilities, and get driving directions using Open Street Map. It also enables landlords to upload room details and photos, and renters to search for available rooms. The platform provides a reliable communication channel between users and vendors, reducing personal errors and issues related to data.

The existing manual process of finding rental homes is time-consuming and inefficient, leading to a significant need for a web-based rental system that can reduce the time required to find rooms on rent in nearby locations. The current system lacks a reliable platform for users and vendors to communicate and access information, resulting in personal errors and issues related to data, highlighting the

need for a more efficient and technology-driven solution like the proposed Online Rental System (Hatwar et al., 2022).

CHAPTER III

RESEARCH METHODOLOGY

ENVIRONMENT

The setting of the study is situated at Poblacion, Polomolok, South Cotabato.

SOFTWARE ENGINEERING TECHNOLOGY

The agile model is a set of software development approaches based on iterative development. It was chosen as the initial methodology for the “RENTAL System” and its stages are indeed an iterative necessity for its development and fit in project management. Throughout the development process, which involves planning, designing, building, testing, and reviewing the system, Agile maximizes value.

Figure 3.1: Agile Software Development Methodology Model of Residential Estate Navigation Tracking and Leasing System

The researchers aim to find the core problems and constraints that occur in the running system and came up with a project title, as well as objectives, scope, and timelessness.

Sprint 1: (Allows admin to manage property information)

Managing property information would include handling the property's details such as location, and description. The admin will be able to validate information about the properties. The researchers developed a plan and created a system that might be used in the rental system.

The development tools such as PHP, Visual Code Studio, and MySQL Xampp Server, the researchers came up with the system's design output. It contains a feature that allows admin to manage property information after the system has been planned and designed using PHP, Visual Code Studio, and MySQL.

The researchers must test the system to see if there are any bugs or faults in the programming. This test ensures that the system is free of bugs. It was tested for accuracy and usefulness.

Sprint 2: (Allows admin to manage tenant's information)

Managing tenant information would include handling the tenant's personal and rental details. The admin will be able to manage information about the tenants. The researchers developed a plan and created a system that might be used in the rental system.

The development tools such as PHP, Visual Code Studio, and MySQL Xampp Server, the researchers came up with the system's design output. It contains a feature that allows property owners to manage tenant information after the

system has been planned and designed using PHP, Visual Code Studio, and MySQL.

The researchers must test the system to see if there are any bugs or faults in the programming. This test ensures that the system is free of bugs. It was tested for accuracy and usefulness.

Sprint 3: (Allows the tenants to navigate properties)

Managing property navigation would include providing a platform for tenants to search and view available properties. The system allows tenants to navigate through properties and view their details. The researchers developed a plan and created a system that might be used in the rental system.

The development tools such as PHP, Visual Code Studio, and MySQL Xampp Server, the researchers came up with the system's design output. It contains a feature that allows tenants to navigate properties after the system has been planned and designed using PHP, Visual Code Studio, and MySQL.

The researchers must test the system to see if there are any bugs or faults in the programming. This test ensures that the system is free of bugs. It was tested for accuracy and usefulness.

Sprint 4: (Allows property owners and admin to manage lease agreements and payments)

Managing Lease Agreements and Payments would enable residential property owners to oversee and regulate lease agreements and payment transactions. The system allows property owners to review and manage lease agreements and payments. The researchers developed a plan and created a system that might be used in the rental system.

The development tools such as PHP, Visual Code Studio, and MySQL Xampp Server, the researchers came up with the system's design output. It contains a feature that allows property owners to manage lease agreements and payments after the system has been planned and designed using PHP, Visual Code Studio, and MySQL.

The researchers must test the system to see if there are any bugs or faults in the programming. This test ensures that the system is free of bugs. It was tested for accuracy and usefulness.

Sprint 5: (Allows tenants to interact with an AI Chatbot for inquiries and concerns)

Managing inquiries and concerns of tenants would include providing a platform for tenants to ask questions, report issues, and seek assistance. The AI Chatbot will be able to provide immediate responses to common queries, freeing up

property owners and admins to focus on more complex issues. The researchers developed a plan and created a system that might be used in the rental system.

The development tools such as PHP, Visual Code Studio, and MySQL Xampp Server, the researchers came up with the system's design output. It contains a feature that allows tenants to interact with an AI Chatbot for inquiries and concerns after the system has been planned and designed using PHP, Visual Code Studio, and MySQL.

The researchers must test the system to see if there are any bugs or faults in the programming. This test ensures that the system is free of bugs. It was tested for accuracy and usefulness.

PLANNING/CONCEPTION–INITIATION PHASE

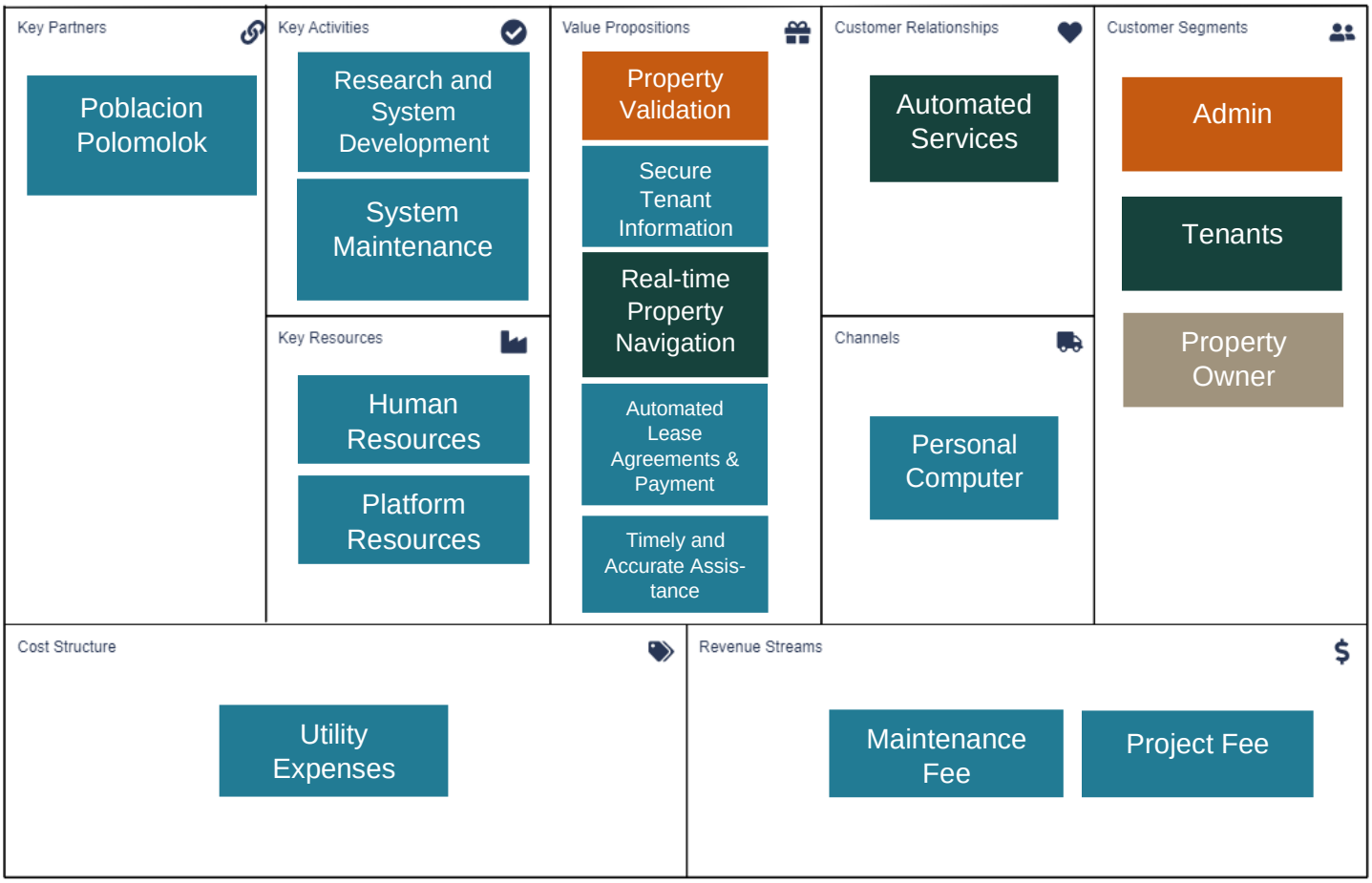


Figure 3.2 Business Model Canvas

GANTT CHART

Months	August					September					October					November				
Weeks	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Sprint 1	Allows admin to manage property information																			
Planning																				
Designing																				
Building																				
Testing																				
Reviewing																				
Sprint 2	Allows admin to manage tenant's information																			
Planning																				
Designing																				
Building																				
Testing																				
Reviewing																				
Sprint 3	Allows the tenant to navigate properties																			
Planning																				
Designing																				
Building																				
Testing																				
Reviewing																				
Sprint 4	Allows property owners and admin to manage lease agreements and pay-ments																			
Planning																				
Designing																				
Building																				
Testing																				
Reviewing																				
Sprint 5	Allows tenants to interact with an AI Chatbot for inquiries and concerns																			
Planning																				
Designing																				
Building																				
Testing																				
Reviewing																				

Legend	Color
Finished	
Ongoing	
Undone	

Table 3.1 Gantt Chart for Residential Estate Navigation Tracking and Leasing System

This table represent processes on developing the system.

FUNCTIONAL DECOMPOSITION DIAGRAM

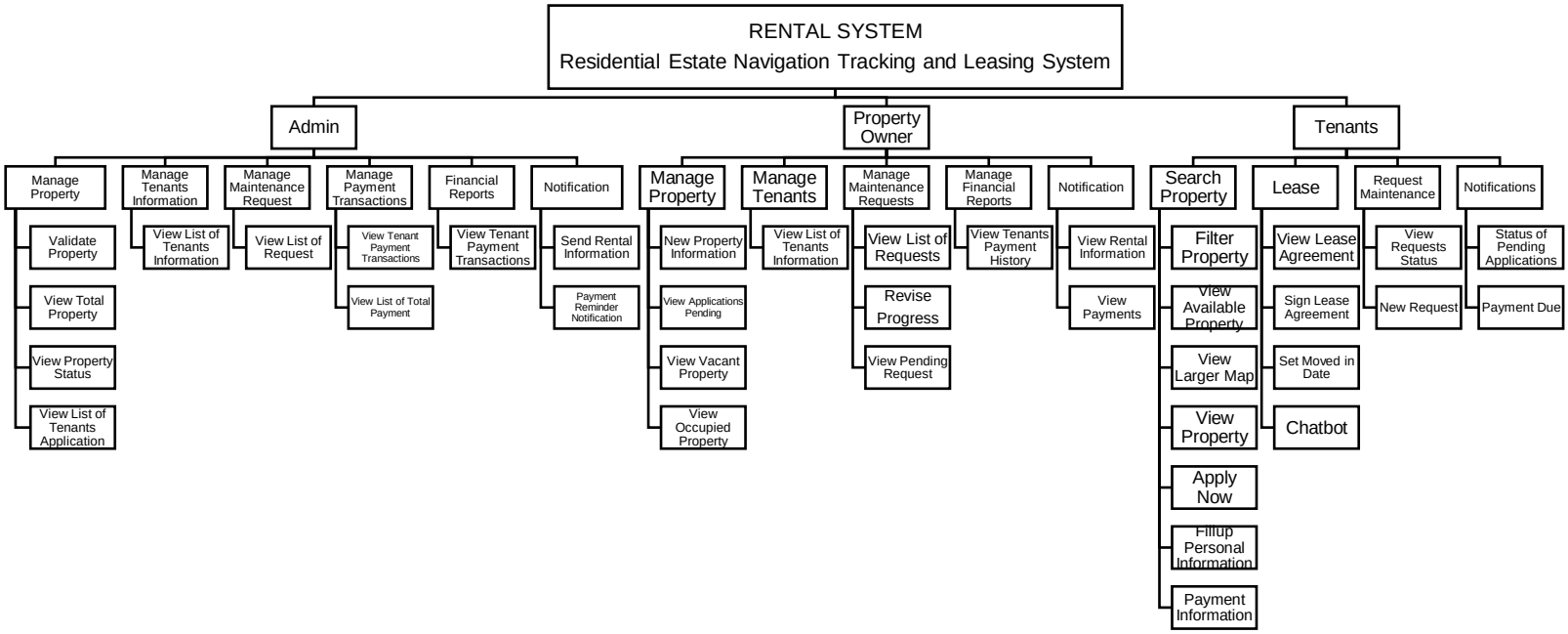


Figure 3.3 Functional Decomposition Diagram for Residential Estate Navigation Tracking and Leasing System

ANALYSIS–DESIGN PHASE

Use–Case Diagrams

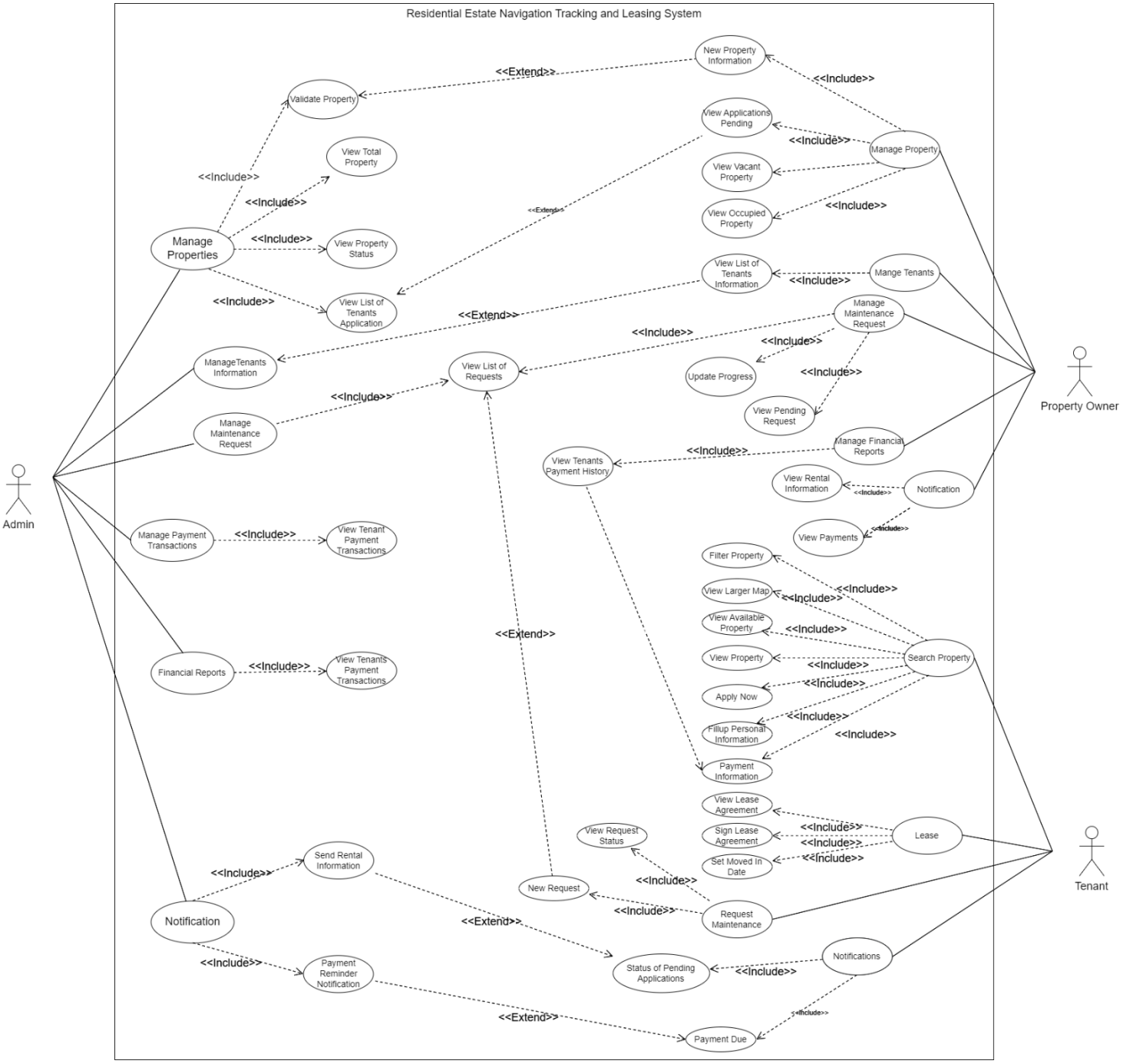


Figure 3.4 Use Case Diagram of Residential Estate Navigation Tracking and Leasing System

Use–Case Matrix

Use Case	Registration
Author	Jirmy S. Nacario, Cristy Mae S. Balaba, Rosemarie T. Gepolani
Primary Actor	Admin
Trigger	When Admin Validate the Property Information add by the Property Owner
Basic Flow	1. Admin opens Rental Web Application
	2. Admin Login
	3. Admin enters account access
	4. Admin validates property information
Post Condition	Admin must validate the documents to prove legitimacy.
Secondary Actor	Property Owner
Trigger	When Property Owner Adds Property Information.
Basic Flow	1. Owner opens Rental Web Application 2. Owner Login 3. Owner enters account access 4. Owner fill ups property information 5. Owner set up property locations 6. Owner waits for admin to validate property
Post Condition	Owner must have documents to prove ownership.

Table 3.2 Use–Case Matrix of Residential Estate Navigation Tracking and Leasing System

Use–Case Matrix

Use Case	Registration
Author	Jirmy S. Nacario, Cristy Mae S. Balaba, Rosemarie T. Gepolani
Secondary Actor	Tenants
Trigger	When Tenants Apply for Rent
Basic Flow	1. Tenants opens Rental Web Application
	2. Tenants Login
	3. Tenants enters account access
	4. Tenants fill ups personal information
	5. Tenants waits for admin to confirm the application.
Post Condition	Tenants must provide the required Information.

Table 3.3 Use–Case Matrix of Residential Estate Navigation Tracking and Leasing System

STORYBOARD

Login Page

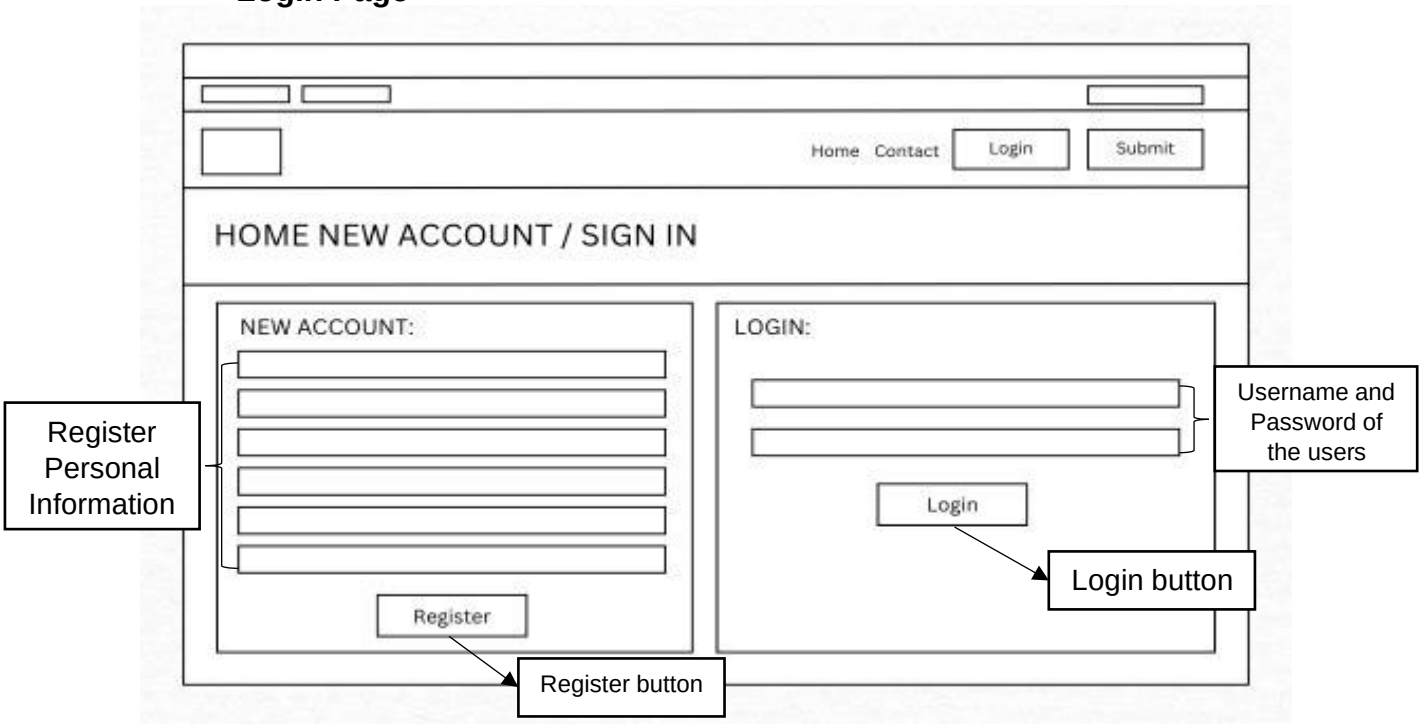


Figure 3.5 Storyboard of Register and Login Page of Residential Estate Navigation Tracking and Leasing System

Admin Page

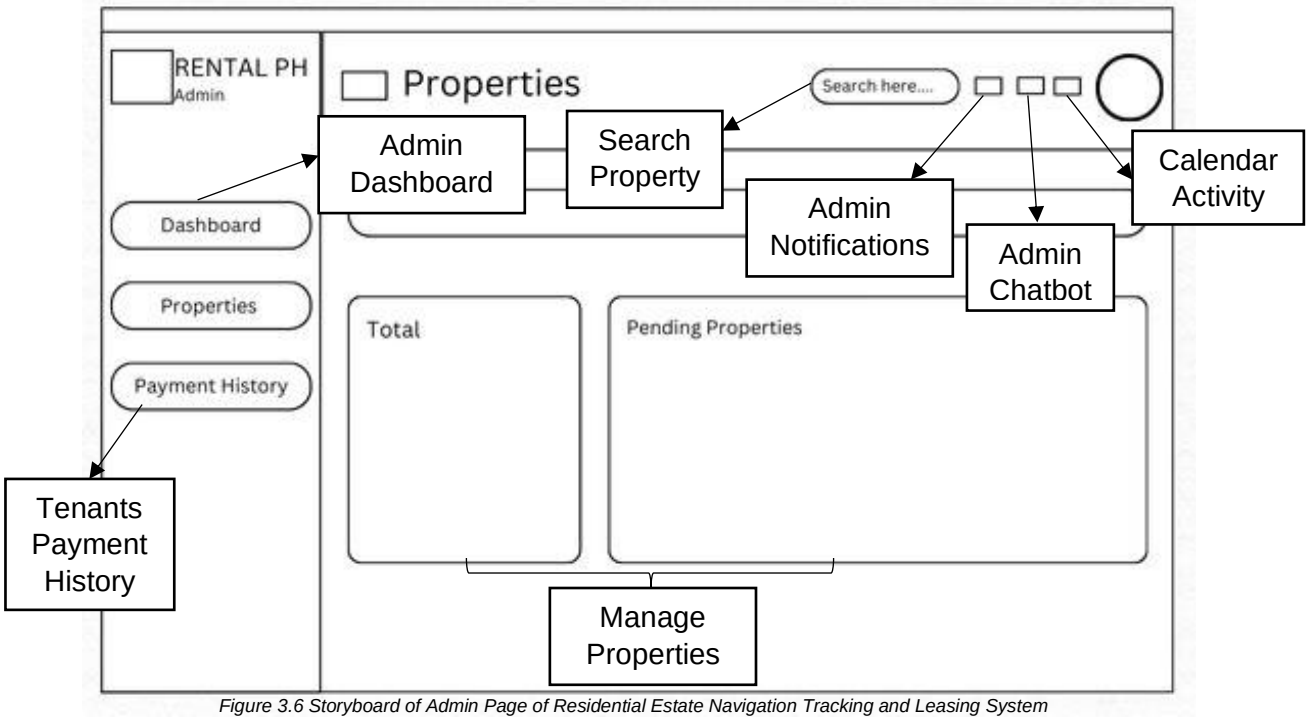


Figure 3.6 Storyboard of Admin Page of Residential Estate Navigation Tracking and Leasing System

STORYBOARD

Property Owner Page

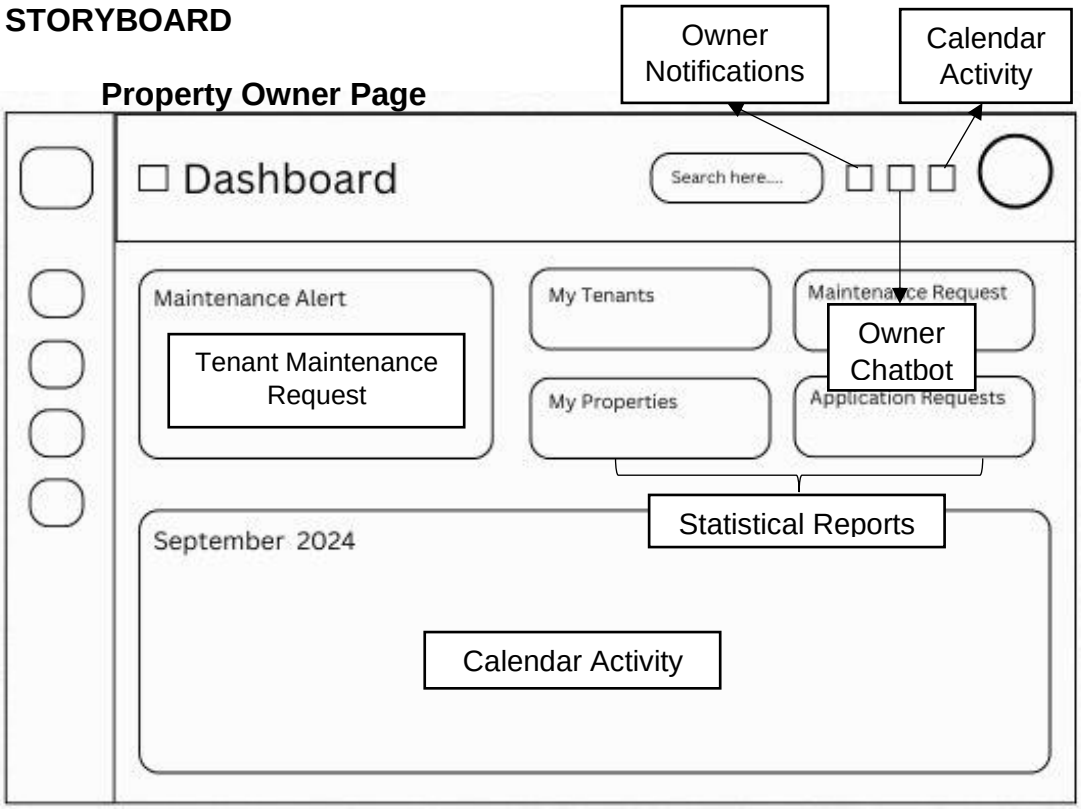


Figure 3.7 Storyboard of Property Owner Page of Residential Estate Navigation Tracking and Leasing System

Tenant Page

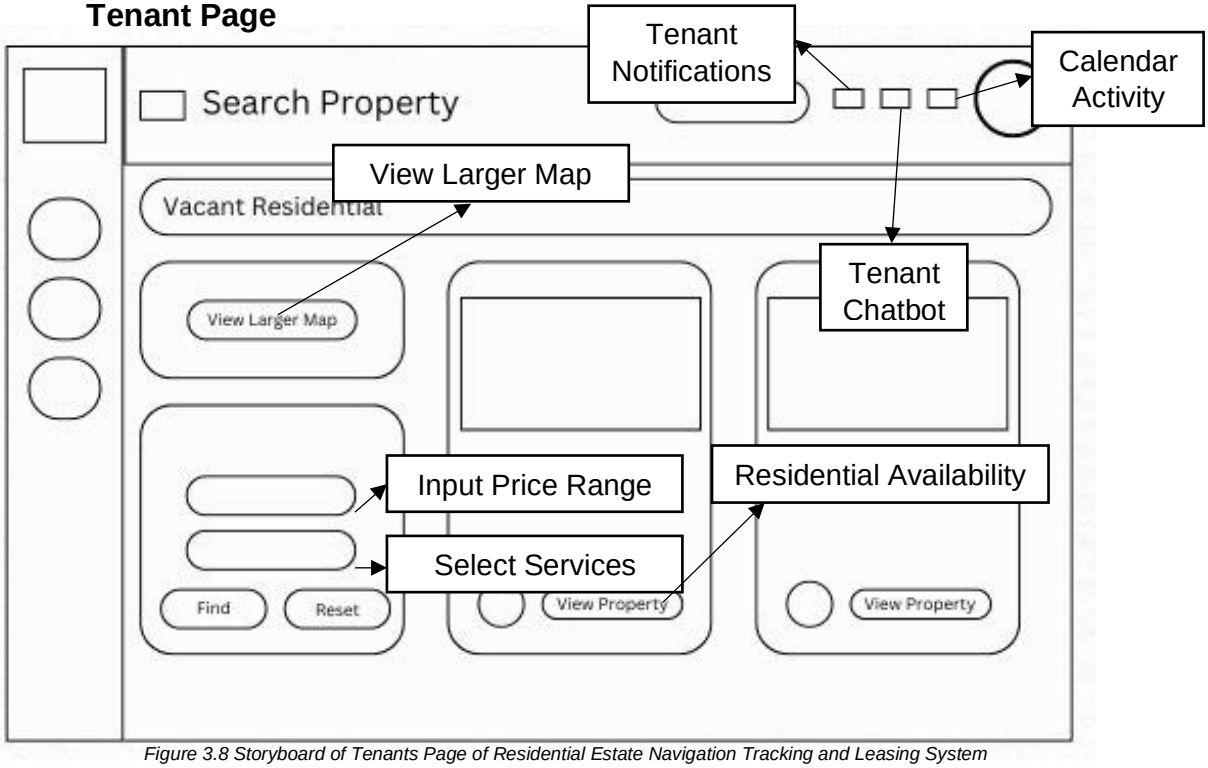


Figure 3.8 Storyboard of Tenants Page of Residential Estate Navigation Tracking and Leasing System

Application Form Page

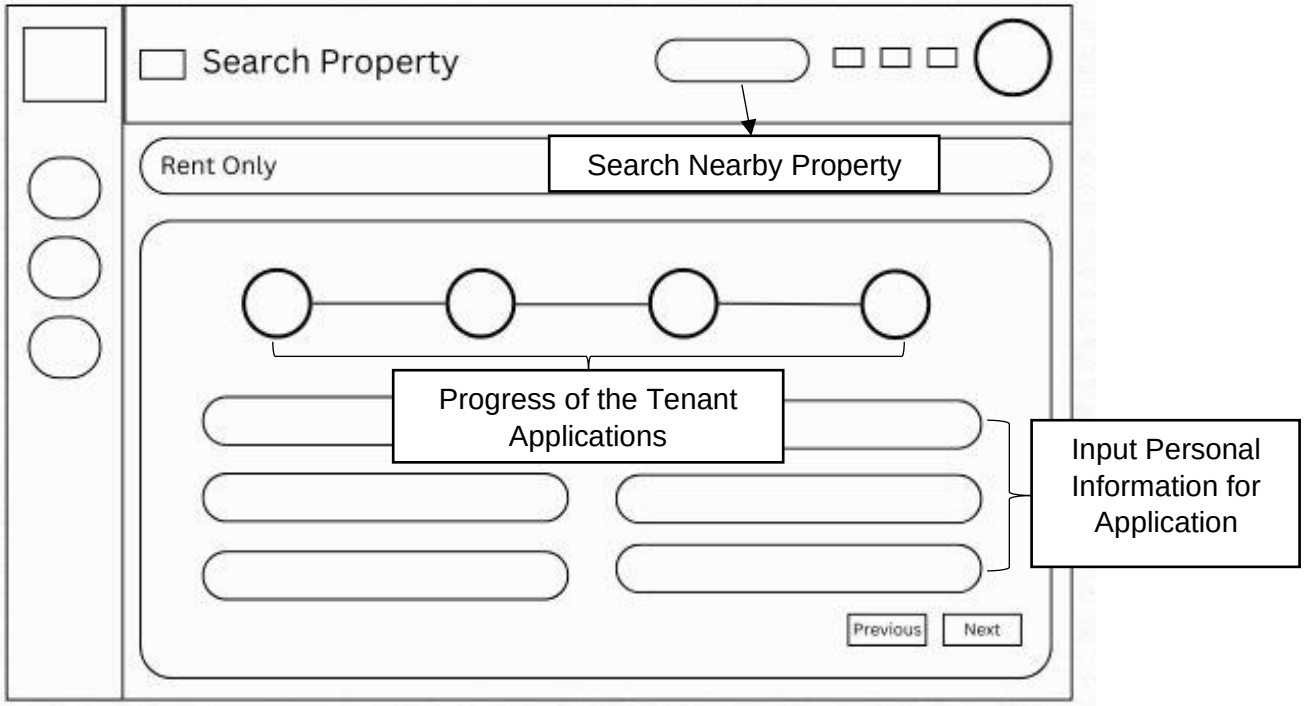


Figure 3.9 Storyboard of Application Form Page of Residential Estate Navigation Tracking and Leasing System

Payment Page

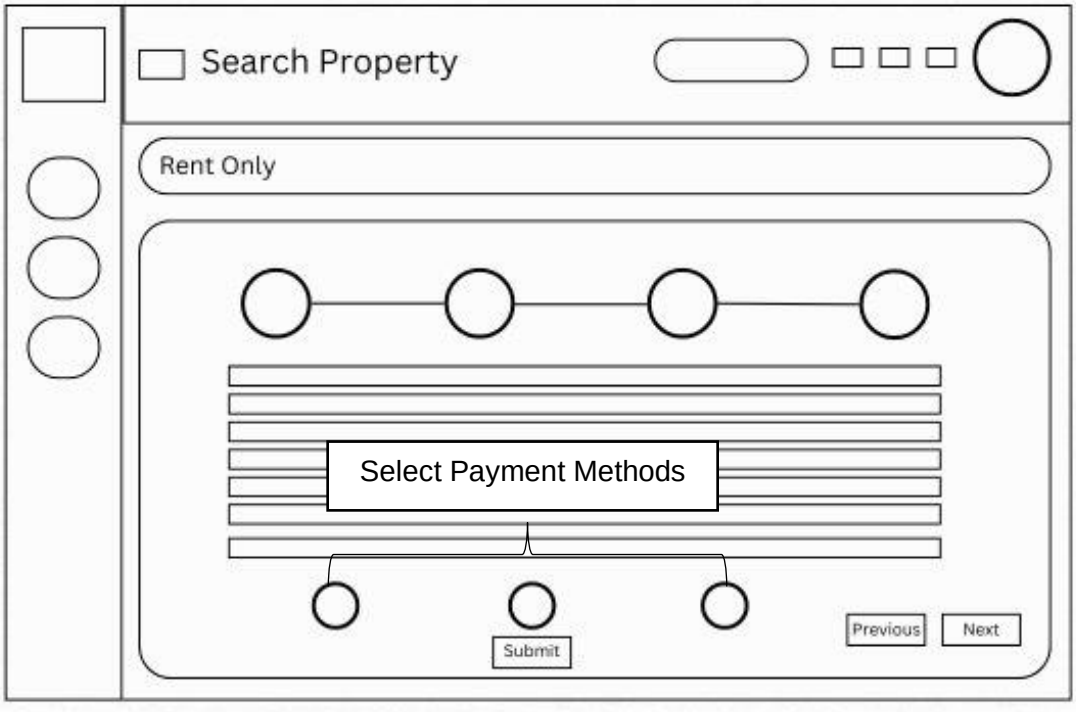


Figure 3.10 Storyboard of Payment Page of Residential Estate Navigation Tracking and Leasing System

Database Design

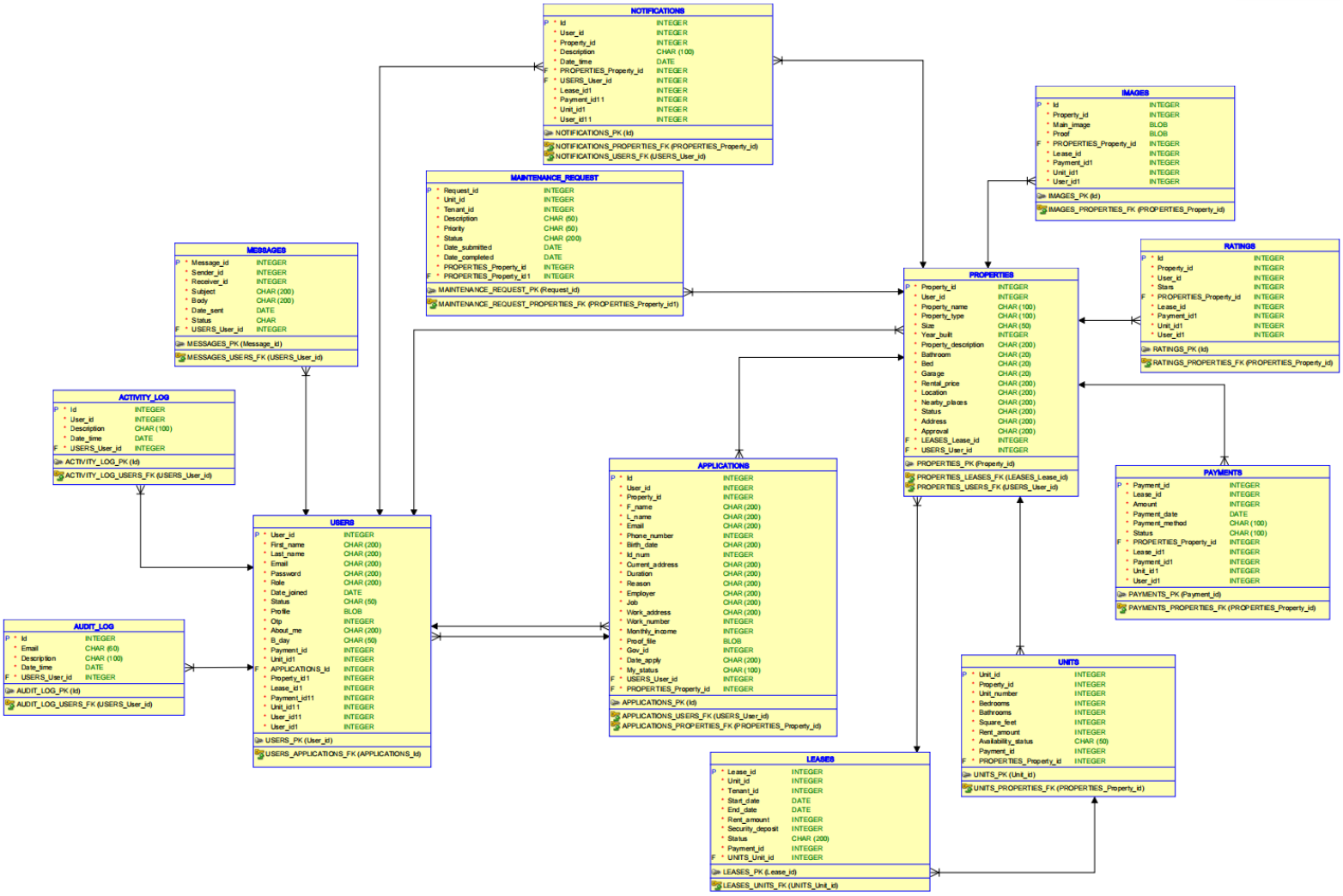


Figure 3.11 Database Design of Residential Estate Navigation Tracking and Leasing System

Entity Relationship Diagram

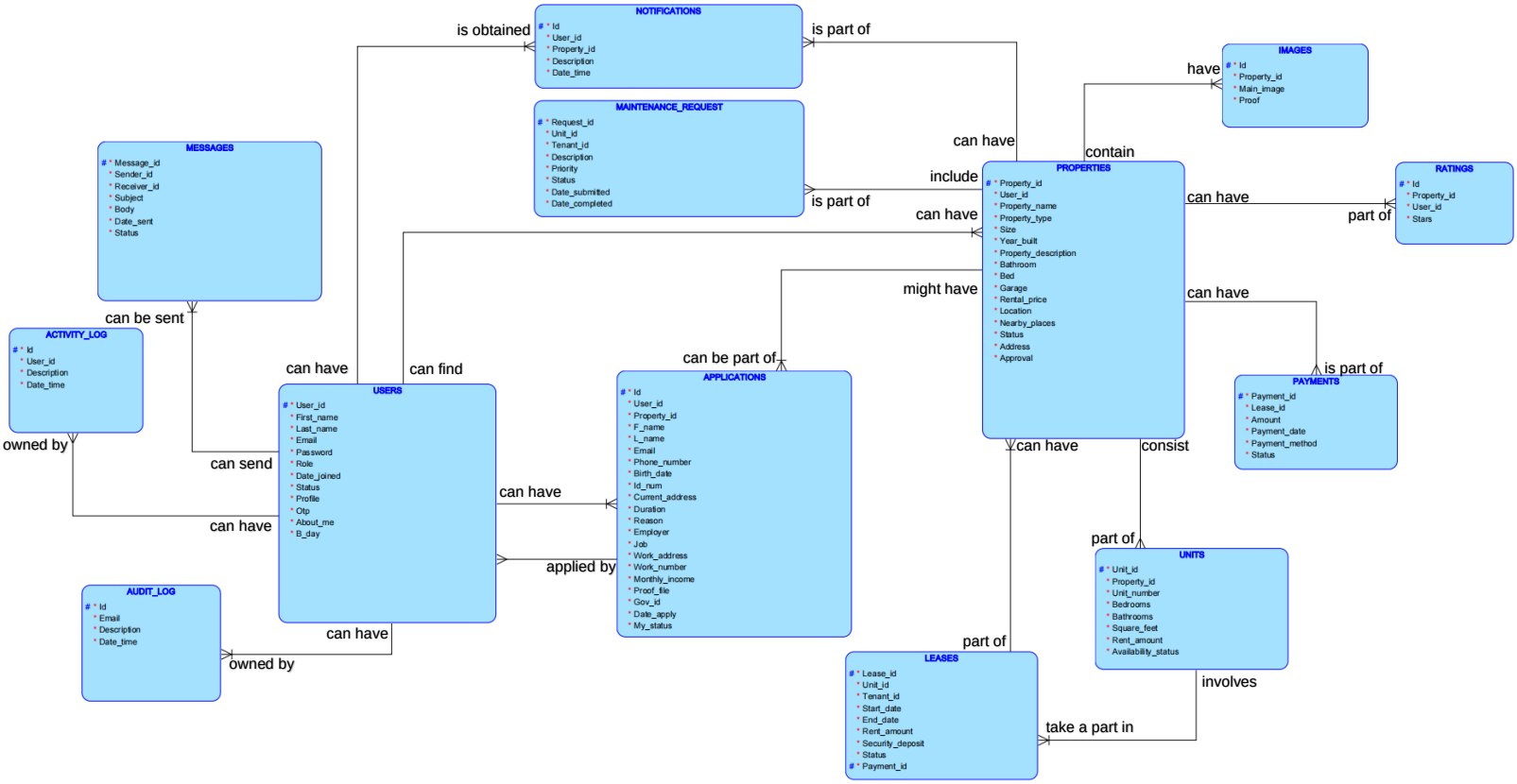


Figure 3.12 Entity Relationship Diagram of Residential Estate Navigation Tracking and Leasing System

Data Dictionary

Table name	activity_log		
Attributes	Type	Description	Constraints
id	integer (11)	Unique identifier for the activity log entry	PRIMARY KEY, AUTO_INCREMENT
user_id	integer (11)	Foreign key referencing the user who performed the activity	FOREIGN KEY (users.user_id)
description	varchar (100)	Description of the activity performed	
date_time	varchar (50)	Timestamp of when the activity was performed	

Table 3.7 Data Dictionary of Activity Log Table of Residential Estate Navigation Tracking and Leasing System

Table name	applications		
Attributes	Type	Description	Constraints
id	integer (11)	Unique identifier for the application	PRIMARY KEY, AUTO_INCREMENT
user_id	integer (11)	Foreign key referencing the user who submitted the application	FOREIGN KEY (properties.property_id)
property_id	integer (11)	ID of the property	FOREIGN KEY (property_id) REFERENCES properties (property_id)
f_name	varchar (200)	Indicates tenant's ID	
l_name	varchar (200)	Last name of the applicant	
email	varchar (200)	Email address of the applicant	
phone_number	integer (200)	Phone number of the applicant	
birth_date	varchar (200)	Birth date of the applicant	
id_num	varchar (200)	ID number of the applicant	
current_address	varchar (200)	Current address of the applicant	
duration	varchar (200)	Duration of the application	
reason	varchar (200)	Reason for the application	
employer	varchar (200)	Employer of the applicant	
job	varchar (200)	Job title of the applicant	
work_address	varchar (200)	Work address of the applicant	
work_number	varchar (200)	Work phone number of the applicant	
monthly_income	varchar (200)	Monthly income of the applicant	
proof_file	varchar (200)	Proof of income	
gov_id	varchar (200)	Government ID of the applicant	
date_apply	varchar (200)	Date the application was submitted	
my_status	varchar (100)	Status of the application	

Table 3.8 Data Dictionary of Applications Table of Residential Estate Navigation Tracking and Leasing System

Table name	audit_log		
Attributes	Type	Description	Constraints
id	integer (11)	Unique identifier for the audit log entry	PRIMARY KEY, AUTO_INCREMENT
User_id	integer (11)	Foreign key referencing the user who performed the audit	FOREIGN KEY (users.user_id)
email	varchar (60)	Email address of the user who performed the action	
description	varchar (100)	Description of the action performed	
date_time	varchar (50)	Timestamp of when the action was performed	

Table 3.9 Data Dictionary of Audit Log Table of Residential Estate Navigation Tracking and Leasing System

Table name	images		
Attributes	Type	Description	Constraints
id	integer (11)	Unique identifier for the images	PRIMARY KEY, AUTO_INCREMENT
property_id	integer (11)	Foreign key referencing the property associated with the image	FOREIGN KEY (properties.property_id)
main_image	varchar (200)	Main image of the property	
proof	varchar (200)	Proof of ownership or other relevant document	

Table 3.10 Data Dictionary of Images Table of Residential Estate Navigation Tracking and Leasing System

Table name	leases		
Attributes	Type	Description	Constraints
lease_id	integer (11)	Unique identifier for the lease	PRIMARY KEY, AUTO_INCREMENT
unit_id	integer (11)	Foreign key referencing the unit associated with the lease	FOREIGN KEY (units.unit_id)
tenant_id	integer (11)	Foreign key referencing the tenant associated with the lease	
start_date	DATE	Start date	
end_date	DATE	End date	
rent_amount	decimal (10,2)	Rent amount	
security_deposit	decimal (10,2)	Security deposit	
status	varchar (200)	Status of the lease	

Table 3.11 Data Dictionary of Leases Table of Residential Estate Navigation Tracking and Leasing System

Table name	messages		
Attributes	Type	Description	Constraints
message_id	integer (11)	Unique identifier for the lease	PRIMARY KEY
User_id	integer (11)	Foreign key referencing the user who sent the message	FOREIGN KEY (users.user_id)
sender_id	integer (11)	Senders ID	
receiver_id	integer (11)	Receivers ID	
subject	varchar (200)	Subject of the message	
body	varchar (200)	Body of the message	
date_sent	datetime	Timestamp of when the message was sent	
status	enum('sent','received','read')	Status of the message	

Table 3.12 Data Dictionary of Messages Table of Residential Estate Navigation Tracking and Leasing System

Table name	maintenance_requests		
Attributes	Type	Description	Constraints
request_id	integer (11)	Unique identifier for the maintenance request	PRIMARY KEY, AUTO_INCREMENT
unit_id	integer (11)	Foreign key referencing the unit associated with the request	FOREIGN KEY (units.unit_id)
tenant_id	integer (11)	Foreign key referencing the tenant associated with the request	
description	varchar (50)	Description of the maintenance request	
priority	varchar (50)	Priority of the maintenance request	
status	varchar (200)	Status of the maintenance request	
date_submitted	datetime	Timestamp of when the request was submitted	
date_completed	datetime	Timestamp of when the request was completed	

Table 3.13 Data Dictionary of Maintenance Requests Table of Residential Estate Navigation Tracking and Leasing System

Table name	notifications		
Attributes	Type	Description	Constraints
id	integer (11)	Unique identifier for the notification	PRIMARY KEY, AUTO_INCREMENT
user_id	integer (11)	Foreign key referencing the user who received the notification	FOREIGN KEY (users.user_id)
property_id	integer (11)	Foreign key referencing the property associated with the notification	FOREIGN KEY (properties.property_id)
description	varchar (100)	Description of the notification	
date_time	varchar (50)	Timestamp of when the notification was sent	

Table 3.14 Data Dictionary of Notifications Table of Residential Estate Navigation Tracking and Leasing System

Table name	payments		
Attributes	Type	Description	Constraints
payment_id	integer (11)	Unique identifier for the payment	PRIMARY KEY, AUTO_INCREMENT
property_id	integer (11)	Foreign key referencing the property associated with the payment	FOREIGN KEY (properties.property_id)
amount	decimal (10,2)	Amount of the payment	
payment_date	datetime	Timestamp of when the payment was made	
payment_method	varchar (100)	Method of payment	
status	varchar (100)	Status of the payment	

Table 3.15 Data Dictionary of Payments Table of Residential Estate Navigation Tracking and Leasing System

Table name	properties		
Attributes	Type	Description	Constraints
property_id	integer (11)	Unique identifier for the property	PRIMARY KEY
user_id	integer (11)	User ID of the user	FOREIGN KEY (users.user_id)
lease_id	integer (11)	Lease ID of the property	FOREIGN KEY (leases.lease_id)
property_name	varchar (100)	Name of the property	
property_type	varchar (100)	Type of property	
size	varchar (50)	Size of the property	
year_built	integer (50)	Year of the property was built	
property_description	varchar (200)	Description of the property	
bathroom	varchar (20)	Numbers of bathrooms in the property	
bed	varchar (20)	Numbers of bedrooms in the property	
garage	varchar (20)	Numbers of garage in the property	
rental_price	varchar (200)	Rental price of the property	
location	varchar (200)	Location of the property	
nearby_places	varchar (200)	Nearby places to the property	
status	varchar (200)	Status of the property	
address	varchar (200)	Address of the property	
approval	varchar (200)	Approval status of the property	

Table 3.16 Data Dictionary of Properties Table of Residential Estate Navigation Tracking and Leasing System

Table name	ratings		
Attributes	Type	Description	Constraints
id	integer (11)	Unique identifier for the rating	PRIMARY KEY, AUTO_INCREMENT
property_id	integer (11)	Foreign key referencing the property associated with the rating	FOREIGN KEY (properties.property_id)
user_id	integer (11)	User ID of the users	
stars	integer (50)	Number of stars given in the rating	

Table 3.17 Data Dictionary of Properties Table of Residential Estate Navigation Tracking and Leasing System

Table name	units		
Attributes	Type	Description	Constraints
unit_id	integer (11)	Unique identifier for the unit	PRIMARY KEY
property_id	integer (11)	Foreign key referencing the property associated with the unit	FOREIGN KEY (properties.property_id)
unit_number	varchar (50)	Number of the unit	
bedrooms	integer (11)	Number of bedrooms in the unit	
bathrooms	integer (11)	Number of bathrooms in the unit	
square_feet	integer (11)	Square footage of the unit	
rent_amount	decimal (10,2)	Square footage of the unit	
availability_status	varchar (50)	Availability status of the unit	

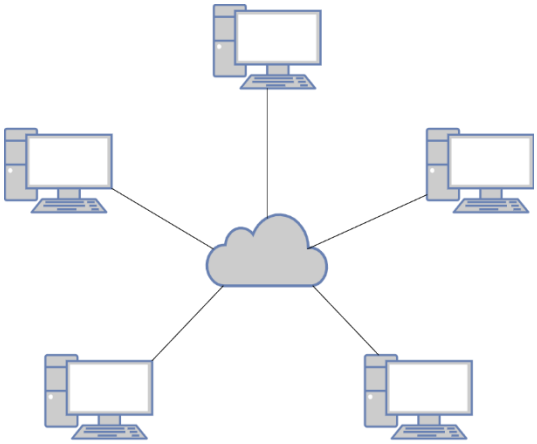
Table 3.18 Data Dictionary of Units Table of Residential Estate Navigation Tracking and Leasing System

Table name	users		
Attributes	Type	Description	Constraints
user_id	integer (11)	Unique identifier for the user	PRIMARY KEY
application_id	integer (11)	Foreign key referencing the application associated with the users	FOREIGN KEY (applications.applications_id)
first_name	varchar (200)	First name of the user	
last_name	varchar (200)	Last name of the user	
email	varchar (200)	Email address of the user	
password	varchar (200)	Hash password of the user	
role	varchar (200)	Role of the user	
date_joined	datetime	Timestamp of when user joined	
status	varchar (50)	Status of the user	
profile	varchar (200)	Profile picture of the user	
otp	integer (50)	One-time password of the user	
about_me	varchar (200)	About me section of the user	
b_day	varchar (50)	Birthday of the user	

Table 3.19 Data Dictionary of Users Table of Residential Estate Navigation Tracking and Leasing System

Network Design

Network design is the integration of different network devices to achieve end-to-end communication between network hosts, and to identify what type of topology is going to be used in Residential Estate Navigation Tracking and Leasing System.



Network Topology

The network topology that is suitable to the proposed system is star topology, which offers a centralized management point for easy maintenance and troubleshooting, a high degree of reliability, easy addition or removal of devices, and support for a large number of devices, making it ideal for a residential estate with multiple properties and users.

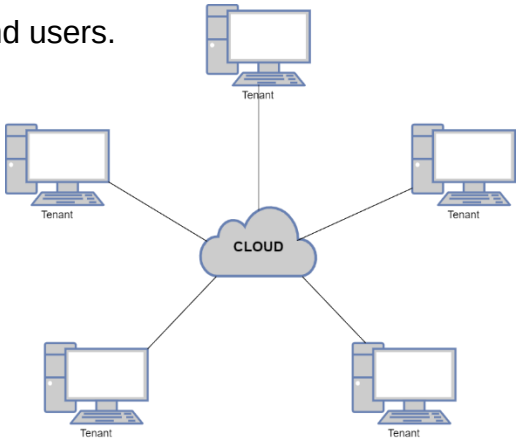


Figure 3.10 Network Topology of Residential Estate Navigation Tracking and Leasing System

2DEPLOYMENT/CONSTRUCTION/BUILD PHASE

Technology Stack Development

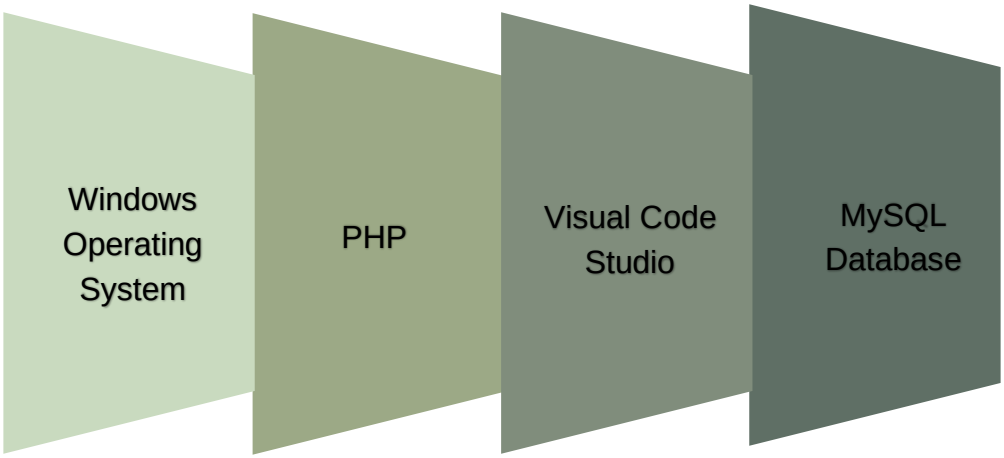


Figure 3.11 Technology Stack of Residential Estate Navigation Tracking and Leasing System

Software Specification

Language	: PHP
Technology	: PHP
Database	: MySQL XAMPP Server
IDE	: Visual Code Studio
Operating System	: Windows 10

Hardware Specification

Processor	: AMD Ryzen 7 5700G
Hard Disk	: 465GB
RAM	: 8.00 GB

Program Specification

Language:	: PHP
Database	: MySQL Database
IDE	: Visual Code Studio

LIST OF MODULES

Manage Property Module

This module allows property owners to manage their properties by viewing important details like location and rental rates. It shows how many properties are vacant and how many are occupied.

Manage Tenants Module

This module will display all tenant information. The admin can manage tenant profiles, track payment status, and update tenant records.

Manage Property Maintenance Module

This module will show all property maintenance information. The admin will manage property maintenance listings, and update property maintenance status.

Manage Rental Module

This module efficiently enables property owners to view available properties, access tenant information, and review a list of payment transactions, providing a centralized platform to manage their rental information effectively.

Register Module

This module allows new tenants to create an account by providing personal information, contact details, and preferences.

Lease Agreement Module

This module will display all lease agreements related to the tenant's rentals. Tenants can review the terms of their lease, view renewal dates, and access important lease documents.

Maintenance Request Module

This module will allow tenants to submit maintenance requests for any issues they encounter in their rental properties. Tenants can track the status of their requests and receive updates on maintenance progress.

Notification Module

This module enables users to receive real-time notifications regarding maintenance requests, payment reminders, upcoming move-in dates, and other relevant information, ensuring smooth communication and prompt action throughout the rental process.

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