



# NEHEMA RENTAL HOUSE MANAGEMENT SYSTEM DOCUMENTATION

## ABSTRACT

The Nehema Rental House Management System is a web-based application developed to address the challenges faced by property managers and landlords in housing management, particularly in Nairobi and other urban areas. The primary objective of this research was to design and implement an efficient and comprehensive system to streamline rental property management processes. The system offers various features, such as tenant and property data management, automated rent collection, payment tracking, and reporting. It includes a user-friendly interface to simplify data entry and updates, ensuring efficient record-keeping. The implementation of a centralized database enhances data accessibility and reduces the risk of data loss.

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## CHAPTER ONE

### 1.1 INTRODUCTION

House Rental Management System is an administration framework, which is a mainstream technique for leasing houses and its rooms by utilizing on the web security to ensure their protection and budgetary data, this venture is planned to be utilized by House Rental Company that represent considerable authority in leasing houses to clients. It is an online framework through which clients can see accessible houses, enlist, see profile and book houses. This project is created by utilizing PHP as the programming dialect and MySQL as the database. To build up the genuine framework, plans are to be made that cover the framework engineering, UIs, and database structure. (Abdi, 2018) This framework will help the house Online Company in dealing with the House rental administration System. This online system permits administrators to include another House, erase a house or book a house for the client. A client can get a house on lease online by online instalment. It will encourage the individual in their much bustling life. This framework will likewise exceptionally be supportive to the clients of Rental Associations. As each association needs to fulfill their clients, so the framework will give a criticism zone to get inputs from the clients. The principal motivation behind a House Rental System to be actualized is to oversee data about houses, customers and the system clients identified with the organization.

## 1.2 BACKGROUND OF THE STUDY

Housing has a central importance to quality of life with considerable economic, social, cultural and personal significance. Though a country's national prosperity is usually measured in economic terms, increasing wealth is of diminished value unless all can share its benefits and if the growing wealth is not used to redress growing social deficiencies, one of which is housing (Erguden, 2001). Housing plays a huge role in revitalizing economic growth in any country, with shelter being among key indicators of development.

The universal declaration of human rights gives one of the basic human rights as the right to a decent standard of living, central to which is the access to adequate housing (United Nations, The Human Rights-article 25, 1948).

Housing as a basic human right demands that urban dwellers should have access to a decent housing, defined as one that provides a foundation for rather than being a barrier to good physical and mental health, personal development and fulfillment of life objectives (Seedhouse, 1986).

The focus of this research project is basically managing housing for low income, medium and high incomes households or what is commonly known as affordable housing. „Affordable“ is a term used to describe individuals' capability to pay for certain products or services because their income is enough to do so. Although the term „affordable housing“ is often applied to rental housing; that is within the financial means of those in the lower income ranges of a geographical area, the concept is applicable to both middle- and high-income individuals.

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 (<http://www.ehow.com>). Housing is a major problem in Kenya especially in Nairobi city. Millions of people are living in sprawling slums and also in other informal settlement around Nairobi (UN-Habitat, 2008).

This explains why many people have shifted their focus to developing rental houses in Nairobi and other parts of the country. The demand for rental houses is extremely high and more rental houses need to be put in place.

Developing rental houses comes with many advantages especially to the Landlords who are able to increase their profits through rent paid by the tenants.

Increased number of tenants and Landlords makes management difficult especially for the landlords who are losing huge sum of money through tenants who evade rent.

The above statement gives a clear declaration as to why rental house management system need to be developed.

dates, maintenance schedules, or general information, keeping tenants informed and engaged.

By implementing the Nehema House Rental Management System, property managers can streamline their operations, improve efficiency, and enhance tenant satisfaction. The centralized nature of the system ensures data integrity, simplifies data management, and provides valuable insights through comprehensive reporting and analytics.

### 1.3 PROBLEM STATEMENT

The universal declaration of human rights gives one of the basic human rights as the right to a decent standard of living, central to which is the access to adequate housing (United Nations, The Human Rights-article 25, 1948).

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Increased number of tenants and Landlords makes management difficult especially for the landlords who are losing huge sum of money through tenants who evade rent.

Over the years, landlords/property managers have had a problem in maintaining and managing their customers and their own records. Management has become difficult because of issues that include: (Henry Peter Gommans \*, 2014)

- i) Data growth Data increase day to day. Storing and maintaining all data manually is very difficult
- ii) Lack of computerized system Currently most landlords/property managers use the manual system in recording and maintaining their property and customers data
- iii) Data security is not assured in a manual way; data is recorded on books/papers which may easily get damaged leading to loss of data.
- iv) There is no database to store information Potential of data loss or damage is very high because data is stored on tangible files. Lack of these crucial requirements makes management of the tenants and houses very difficult as some tenants may end up not paying rent.

### 1.4 RESEARCH OBJECTIVES

1. To identify previous challenges in housing management faced by property managers
2. To analyze the current system and review existing systems related to House rental management systems.
3. To design, develop, and implement the system that will help landlords to keep data for their tenants.
4. To validate the developed solution by assessing its effectiveness and impact on housing management.

## 1.5 RESEARCH QUESTIONS

1. What are the common challenges faced by property managers in housing management.
2. What are the existing tools, software solutions, and management systems used in housing management, and what are their strengths, weaknesses, and limitations?
3. How can the Nehema Housing Management System be designed, developed, and tested to effectively address the identified challenges and improve operational efficiency in housing management?
4. What is the impact and effectiveness of the Nehema Rental House Management System in improving housing management processes.

## 1.6 SCOPE OF THE STUDY

The project scope defines the description of the work that is required in delivering the Nehema Rental House Management system. The Nehema Rental House Management System is a PHP/MySQL project that helps manages the records and payments of certain house rental businesses. The system stores the list of house categories/types, houses, tenants, and monthly payments. The house type and house information will be used in identifying the tenant's rented house and monthly payable rate. The project is manageable only by the business management which is the system admin. Using the house rental management system, the management can easily retrieve the payment records of a certain tenant and contains important information such as the outstanding balance of the tenant. The outstanding balance will serve as the expected next payment amount of the tenant and this field may also display a negative result which means that the tenant has an advance amount paid which will be automatically credited for the next month payment but if the advance payment still greater than the monthly rental amount, the amount will only deduct the monthly rental rate tenant will still have an advance payment for the next month. The system generates also a printable report for the monthly payment report and tenant's rental balances report.

## 1.7 SIGNIFICANCE OF THE RESEARCH

### 1.7.1 Target Customers

The project seeks to help both the landlords who want to manage their client's information and tenants who will be searching new houses to rent.

### 1.7.2 Value proposition

The project aims at providing the best way of managing house rentals. It will eliminate the manual ways of handling data for rentals that is done using paper work. It will be economical since it will be modified to estimate the possible costs that may be incurred.

### 1.7.3 Innovation

The house owner can set their house specialty to attract student to find it. This mobile application can help owner to manage and find house to rent or for rent. While the manual system involves

admission of a New Customer, assigning a house, and finally compute the bill posting transactions which human handles.

#### 1.7.4 Impact

The project will extend knowledge of the available house rental services to the community because most of the people always have limited information on how easily they can manage their house rentals which results into exploitation of client's information.

#### 1.7.5 Business component

Collaborating with different House Rental Associations in the different parts of the country will be profitable according to the number of Landlords that will use systems platform to manage their clients which can be achieved by advertising and using recommendation features.

### 1.8 CONCLUSION

In conclusion, the Nehema Rental House Management System represents a significant advancement in the field of housing management. The background of the study highlighted the challenges faced by property managers, including manual processes, disparate systems, inefficient tenant management, rent collection issues, maintenance management gaps, and limited communication channels. These challenges underscored the need for a comprehensive solution that could streamline operations, enhance data accuracy, improve tenant satisfaction, and optimize overall efficiency.

The significance of the research lies in the potential of the Nehema Rental House Management System to address these challenges effectively. By designing, developing, and testing this web-based application solution, the research aims to provide property managers with a comprehensive tool to manage property listings, tenant information, rent collection, maintenance requests, and communication in a streamlined and efficient manner. The system's features, such as centralized data management, automation of tasks, improved communication channels, and convenient rent payment options, have the potential to significantly improve operational efficiency and tenant satisfaction.

The research holds implications for the housing management industry as a whole. Successful implementation of the Nehema Rental House Management System can lead to improved industry practices, cost savings, enhanced decision-making through data analytics, and better resource allocation. It can also contribute to the advancement of the real estate market, promote economic growth, and foster long-term tenant relationships.

In conclusion, the research on the Nehema Rental House Management System not only addresses the identified challenges in housing management but also offers a promising solution that can revolutionize the way property managers operate. By improving efficiency, enhancing tenant satisfaction, and promoting industry advancement, this research brings about positive implications for the housing management industry and the stakeholders involved.

## CHAPTER TWO: LITERATURE REVIEW

### 2.1 INTRODUCTION

A literature review is a critical and systematic evaluation of published research and scholarly articles relevant to a particular topic. It involves searching and analyzing existing literature to understand the current state of knowledge, identify gaps or controversies, and synthesize the findings to provide a comprehensive overview. A literature review serves as the foundation for further research by establishing the context, justifying the research objectives, and highlighting the significance of the study. It helps researchers identify key theories, concepts, methodologies, and findings related to the research topic and provides a framework for understanding the research landscape. (Abdi, 2018)

Some of the dominant strategies for housing and service provision for the Kenya's urban poor include slum upgrading and site and service schemes. However, the efficiency of these strategies has been limited by ambivalent government attitude to irregular settlement. These strategies have failed because of a reliance on inappropriate building by-laws and infrastructural standards and modern designs, construction technology and conventional building materials that all make housing unaffordable to the poor, even after subsidies.

Thus, government initiatives in assisting house owners in management have proven to be pathetically slow with many of the houses provided being economically and socially irrelevant, this further prompting the rise of informal settlement (Macoloo, 1994).

Private sector housing management is defined as any process which is not connected at all with the actions of the state neither directly constructed by state nor financially sponsored by the state where production is not expected to have a social element (Golland, 1996). (Ambrose and Barlow, 1987) have argued that three factors are important in influencing the level of new house building. These are direct capital investment by the state for public housing, state support for production and consumption and changes in the profitability of house builders in the private sector. The private sector can play an important role in housing provision provided that the state offers sufficient and appropriate incentives to the sector (Mitullar, 2003). The clear motivation that underlies the private sector is profit (or potential profitability) with profit maximizing options being in the context of housing, producing and selling more of the product; reducing the cost of production through lower raw material and wage costs and finally increasing the price of the product or service (Hancock, 1998).\ Profitability in housing is advocated to be based on three variables; House prices, land prices and building costs, where:

**Profit=House prices- {Land prices + Building costs} (Golland, 1996).**

As per money saving advantage examination, this proposed system tends to be said the underlying venture is somewhat higher. Be that as it may, it is a onetime expense for executing and running the framework except if that gear's are harmed or lost. From the above expense and advantage examination, we can see that quite a long time, the proposed framework diminishes their yearly costing. Along these lines, in the wake of sending the framework by and large it decreases an immense measure of their month to month spending when compared with existing manual systems of managing data for the house rentals.

## 2.2 REVIEW OF LITERATURE RELATED TO OBJECTIVE 2

### ***Existing systems***

Currently the most property managers manage property and tenants' details on papers. Once customers find a vacant house, they can call or email manager of the houses indicating the size of the house they would like rented to them. The property manager can email them back giving them all the details about the house they are requesting. The details include; Rent per month, Deposit paid, Terms and conditions to follow acceptance. (Gommans, November 2014; Henry Peter Gommans \*, 2014).

The table below shows the costs of the existing manual systems

Name	Number	Cost
Staff	3	Monthly
Utility cost		
Blank Paper	Reams	300,000(monthly)
Other Utilities	.....	200,000(monthly)
Total		500,000(monthly)

### ***Problem's of the existing systems***

With the current system recording the details of various activities of user is completely manual and entails a lot of paper work. Since the system is implemented manually, the response is very slow. Each house has a file that contains the house: number, size, rent per month, expected deposit, occupant and status. Rent payment table contains tenants: first name, last name, Phone number, date of payment, amount and balance if any.

The transactions are not secure as papers may get lost or damaged. Hence, there is need of reformation of the system with more advantages and flexibility. The system eliminates most of the limitations of the existing system. (Henry Peter Gommans \*, 2014)

As per money saving advantage examination, it tends to be said the underlying venture is somewhat higher. Be that as it may, it is a onetime expense for executing and running the framework except if that gears are harmed or lost. From the above expense and advantage examination, we can see that quite a long time, the proposed framework diminishes their yearly costing. Along these lines, in the wake of sending the framework by and large it decreases an immense measure of their month-to-month spending when compared with existing manual systems of managing data for the house rentals.



## 2.3 REVIEW OF LITERATURE RELATED TO OBJECTIVE 3

Building a site to speak to the House rental administration framework where clients are allowed to see essential data, store and keep up all data and also allows changes and makes appealing structure for clients for example; renting and exercises on the site.

## 2.4 CONCLUSION

The literature review conducted on the challenges in housing management and existing tools and systems has provided valuable insights and findings for the research study. The key findings can be summarized as follows:

1. **Challenges in Housing Management:** The literature has identified various challenges faced by property managers, including tenant management, rent collection, maintenance tracking, and financial reporting. These challenges can impact operational efficiency and tenant satisfaction.
2. **Existing Tools and Systems:** The literature has discussed several existing software solutions and management systems commonly used in housing management. These tools offer functionalities such as property listing, tenant management, rent collection, and maintenance tracking. However, they may have limitations in terms of usability, customization, or integration capabilities.

The Nehema Rental House Management System emerges as a potential solution that addresses the identified challenges in housing management. It offers a comprehensive set of features, a user-friendly interface, customization options, and integration capabilities. By streamlining processes, automating tasks, and improving communication, it has the potential to enhance operational efficiency, tenant satisfaction, and financial management in housing management.

The literature review contributes to the overall research study by providing a solid foundation for further investigation. It establishes the context and importance of addressing the challenges in housing management and highlights the gaps and limitations in existing tools. By emphasizing the significance of the Nehema Rental House Management System as a potential solution, the literature review sets the stage for the research study to explore the design, development, and testing of the proposed system.

Furthermore, the literature review helps identify research gaps and areas where further investigation is needed. It provides insights into the effectiveness and usability of existing tools, which can inform the evaluation and comparison of the Nehema Housing Management System. The literature review serves as a reference point for the research study and provides a basis for the formulation of research questions and hypotheses.

Overall, the literature review is a crucial component of the research study, providing a comprehensive understanding of the challenges, existing tools, and the potential of the Nehema Rental House Management System. It sets the direction for the research, justifies the importance of the proposed solution, and guides further investigation into the development and validation of the system.

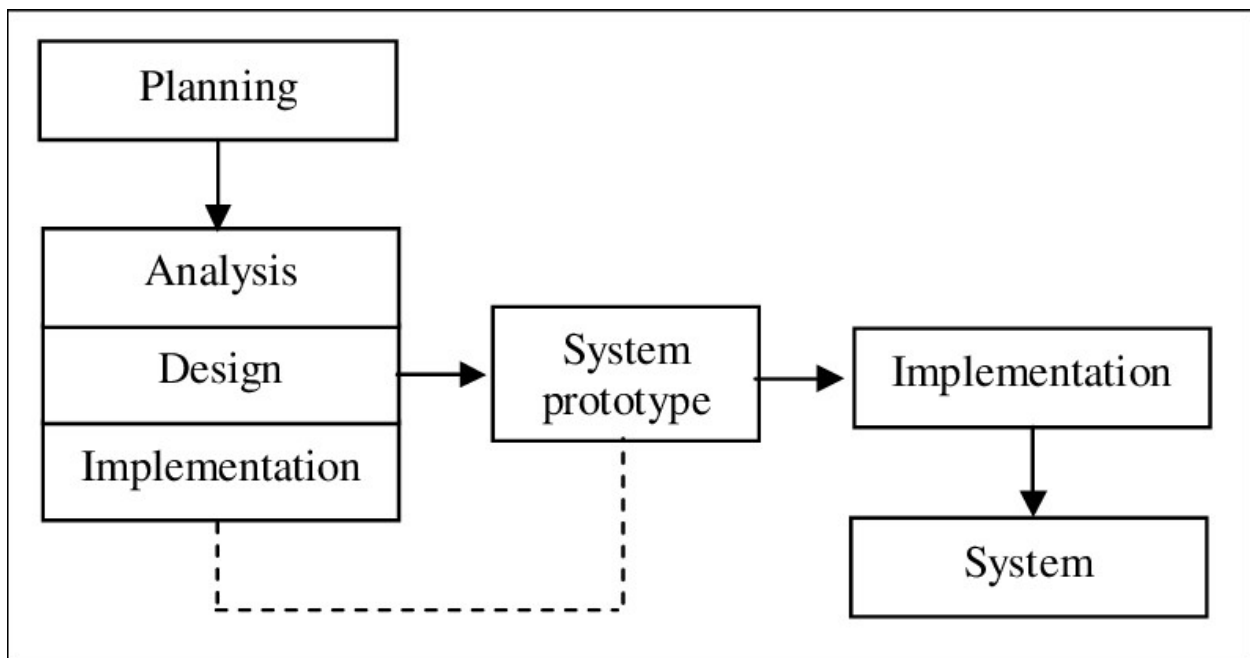
## CHAPTER 3: RESEARCH METHODOLOGY

### 3.1: INTRODUCTION

The term methodology means the technique and procedure adopted by conducting a research study. It outlines how data will be collected and the tools for collecting data, system methodology, the proposed system input and output, users and systems development tools.

System development methodology is a technique that is used to show how the proposed system will be developed. Babbie, E. (2013)

Prototyping will be used as the methodology for the system.



**Figure 3.2.1** Prototype Method

## 3.2: PROTOTYPING METHODOLOGY

Prototyping methodology is a software development process which allows software developers to create portions of the solution to demonstrate functionality and make needed refinements before developing the final system. A prototype is an early sample, model or release of a product built to test a concept or process or to act as a thing to be replicated or learned from. I will be able to come up with prototypes which will be used to evaluate and validate the system before developing the final system which will be achieved through different phases of prototyping methodology. It is used when the business process is likely to change as the project proceeds. The analysis, design and implementation phases are performed concurrently which results into a system prototype that is to be viewed by the project sponsor. The cycle is repeated until the prototype successfully meets the user's requirements and the final prototype is referred to as the system.

The key steps in the Prototype methodology are as follows:

### 3.2.2: Planning Phase

This phase focuses on the requirements the user needs in the system and it determines how the system will be built. It is the fundamental system for determining why the system should be built. We identified the key stakeholders involved, including tenants, and property managers.

### 3.2.3: Analysis phase

At this stage, we gathered information about what the property managers needs' and defined the problems the system is expected to solve. We conducted a thorough analysis of their requirements, considering factors such as property listing management. We also gathered requirement such as software like the programming language to use, database model and hardware needed such as laptop, printers etc

### 3.2.4: Design phase

At this stage, the overall design of the system architecture and physical design which includes User Interface and Database design. It is at this stage where we identified any faults before moving onto the next stage. The output of this stage is the design specification which is used in the next stage of implementation.

### 3.2.5: Implementation

At this stage, we did coding as per the design specification(s). The output of this step is one or more product components built according to a pre-defined coding standard and debugged, tested and integrated to satisfy the system architecture requirement. At the end of this phase, we expected to have a working prototype of the intended system that is responsive and user-friendly.

### 3.2.6: System

At this stage was the Overall system, the Nehema Rental House Management System, developed using the prototyping methodology, offers an efficient and user-friendly solution for managing rental house records and payments. It meets the specific needs outlined in the project scope, enabling the business management to streamline rental operations and make informed decisions based on accurate data and reports.

## CHAPTER 4: PLANNING AND ANALYSIS

### 4.1 INTRODUCTION

Analysis is the process of identifying, gathering, and documenting the needs, expectations, and constraints of stakeholders in order to define the functional and non-functional requirements of a software system. It involves various techniques, such as questionnaires and interviews, to elicit and validate requirements. [Boehm, B. W., & Ross, R. (1988).

Here's a breakdown of these techniques in requirement analysis:

### 4.2 QUESTIONNAIRES'

Questionnaires are structured sets of questions designed to gather specific information from stakeholders.

- a. How do you currently handle tenant onboarding and registration processes?
- b. How do you currently manage rent payments and financial records?

We distributed questionnaire to stakeholders, such as property managers, residents, and maintenance staff, to collect their responses.

#### 4.2.1 QUESTIONNAIRES' RESPONSES

When analyzing the responses to the question "How do you currently handle tenant onboarding and registration processes?",

- Some respondents mentioned using paper-based forms or manual documentation for tenant onboarding and registration.
- Others indicated using digital forms or online platforms for tenant registration.
- A few respondents highlighted the need for a streamlined and efficient onboarding process to reduce paperwork and save time.

When analyzing the responses to the question "How do you currently handle maintenance requests from tenants?",

- Several respondents mentioned using a manual process where tenants submit maintenance requests through phone calls, emails, or in-person communication.
- Some respondents mentioned using a paper-based maintenance request form that tenants fill out and submit.
- Others mentioned using digital platforms or dedicated software systems to manage maintenance requests.
- Many respondents expressed the need for a streamlined and efficient process to track, prioritize, and resolve maintenance requests promptly.

### 4.3 INTERVIEWS

This involves conducting intensive individual interviews with a small number of qualified respondents to explore their perspectives on a particular idea about the system. This will be used to obtain facts, goals and informal procedures. A physical conversation with the current system users will be used to obtain firsthand information about the system and a proposed system.

When conducting interviews with stakeholders, specifically regarding the handling of maintenance requests from tenants, I used the following question to gather more in-depth information;

In your opinion, what improvements or enhancements could be made to the current maintenance request handling process?

- A respondent mentioned there's need to improve communication channels between the tenants and the maintenance team. Provide a dedicated email address, phone number, or online portal where tenants can easily submit their maintenance requests and receive updates on their status.
- Others mentioned there's need to implement an online portal or mobile application specifically for submitting maintenance requests. This would provide convenience for tenants and ensure that requests are recorded accurately and in a timely manner.

### 4.4 CONCLUSIONS

In conclusion, the analysis of the questionnaire responses and information gathered from interviews regarding the Nehema Housing Management System's revealed several key observations and potential areas for improvement. These insights and suggestions provide valuable input for enhancing the efficiency, communication, and overall effectiveness of the process.

By implementing digital self-service portals, improving communication channels, and providing real-time updates to tenants, the management can streamline the maintenance request submission and tracking process. Clear response time expectations and a well-defined emergency maintenance protocol can help tenants understand the timeline and urgency of their requests.

Transparency, accountability, and proactive maintenance are crucial aspects that can be addressed by providing documentation of work done, gathering feedback from tenants, and implementing regular inspections to prevent issues. The use of data analytics and feedback mechanisms can provide valuable insights for continuous improvement.

Overall, taking into account the perspectives and suggestions of both stakeholders and tenants is vital in shaping an efficient and tenant-centric maintenance request handling process. By incorporating these enhancements, the Nehema Rental House Management System can strive to deliver a seamless, responsive, and satisfactory experience for all tenants.

## **CHAPTER 5: SYSTEM DESIGN AND ARCHITECTURE**

### **5.1 INTRODUCTION**

The system design phase involves creating detailed representations of the application's functionalities and interactions. We use various design techniques, such as UML diagrams and flowcharts, to articulate the system design effectively.

### **5.2 SYSTEM ARCHITECTURE**

The term “architecture” origins from “architect”, the role that realizes the architecture of something. The process of architecting leads from requirements to one or more designs that satisfy the requirements. The design of a system comprises system elements. The term “architecture” is frequently related to high-level design, typically involving multiple disciplines to realize the system elements. The definitions of “system” and “system architecture” have a tight relationship. Therefore, they should be modeled together. The system architecture may depend on a number of principles regarding its organization, the design and the system's evolution. The interactions within the system (system element interaction) and with its context (context interaction) form parts of the architecture. System elements need to interact to create the emergence of the system.

{John Wiley & Sons,2015}

### **5.3 SYSTEM DESIGN**

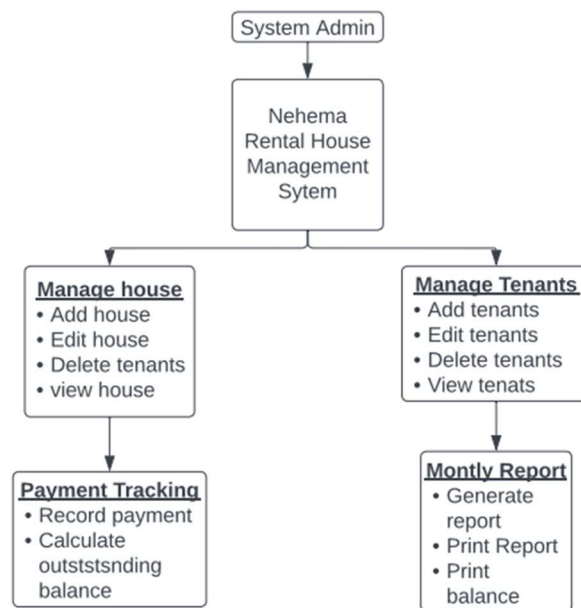
The users requirements document was analyzed for better understanding of what was required of the system. Ways of implementing these requirements were analyzed. Physical modules of the system were designed and identifying of the operating environment in which they were to work on. The system is a web application. The database is updated each time the administrator; add, deletes or deletes data on the system. Its only the administrator who has access to the system to view or make changes when necessary. The system is designed to allow the administrator to view, edit, delete and add data to the database Each time a customer comes, he/she is registered in the tenant registration table of the database with other relevant details about the tenant. System design involves transforming the software requirements into an architecture that described its top-level structure and identified the software components and developed a detailed design for each software components. For each requirement, a set of one or more design elements was produced

### 5.3.1 DESIGN DIAGRAMS

#### 5.3.2 USE CASE DIAGRAM

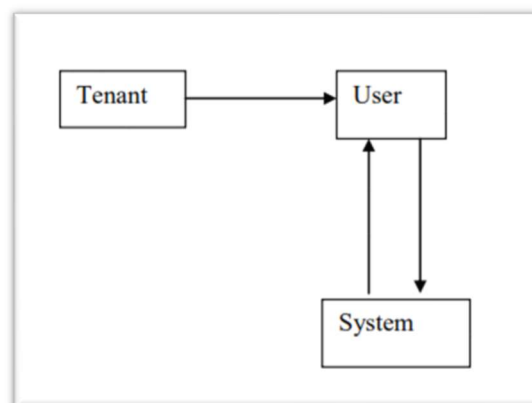
The use case diagram showcases the interactions between actors (users) and the system. It identifies the different use cases, representing the various functionalities and user interactions.

Figure 5.3.2.1: Use Case of system



#### 5.3.3 Conceptual Design

Conceptual design was the very first phase of design in which drawings or solid models were the dominant tools and products. The conceptual design phase provided a description of the proposed system in terms of a set of integrated ideas and concepts about what it was to do, behave and look like, that was understandable by the users in the manner intended.



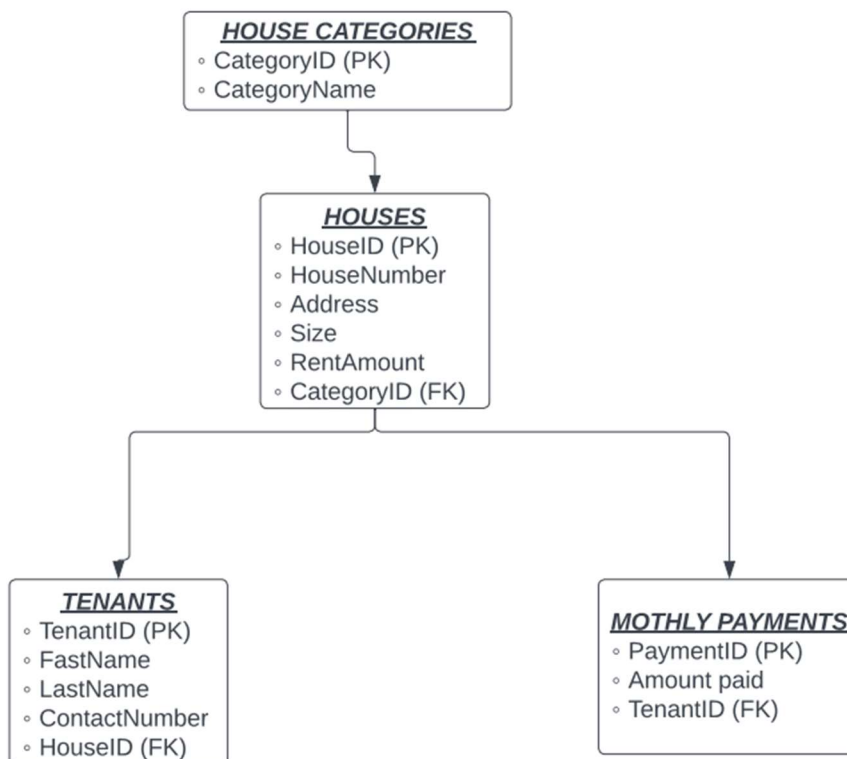
### 5.3.4 DATABASE DESIGN

The general theme behind a database is to handle information as an integrated whole. A database is a collection of interrelated data stored with minimum redundancy to serve the users quickly and effectively. After designing input and output, the analyst must concentrate on database design or how data should be organized around user requirement. The general objective is to make information access, easy, quick and flexible for other users.

#### 5.3.4.1 DATABASE DIAGRAM

This database diagram illustrates the relationships between the entities and the structure of the Nehema Rental House Management System's database, facilitating efficient data management and retrieval for the rental house management application.

Figure 5.3.4.1: Database diagram of the system





## TABLES USED

### 5.3.5 HOUSE TABLE

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	id	int(30)			No	None		AUTO_INCREMENT
2	house_no	varchar(50)	utf8mb4_general_ci		No	None		
3	category_id	int(30)			No	None		
4	description	text	utf8mb4_general_ci		No	None		
5	price	double			No	None		

### 5.3.6 TENANTS REGISTRATION TABLE

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	id	int(30)			No	None		AUTO_INCREMENT
2	firstname	varchar(100)	utf8mb4_general_ci		No	None		
3	middlename	varchar(100)	utf8mb4_general_ci		No	None		
4	lastname	varchar(100)	utf8mb4_general_ci		No	None		
5	email	varchar(100)	utf8mb4_general_ci		No	None		
6	contact	varchar(50)	utf8mb4_general_ci		No	None		
7	house_id	int(30)			No	None		
8	status	tinyint(1)			No	1	1 = active, 0= inactive	
9	date_in	date			No	None		

### 5.3.7 PAYMENTS TABLE

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	id	int(30)			No	None		AUTO_INCREMENT
2	tenant_id	int(30)			No	None		
3	amount	float			No	None		
4	invoice	varchar(50)	utf8mb4_general_ci		No	None		
5	date_created	datetime			No	current_timestamp()		

### 5.3.8 CATEGORIES TABLE

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	id	int(30)			No	None		AUTO_INCREMENT
2	name	varchar(200)	utf8mb4_general_ci		No	None		

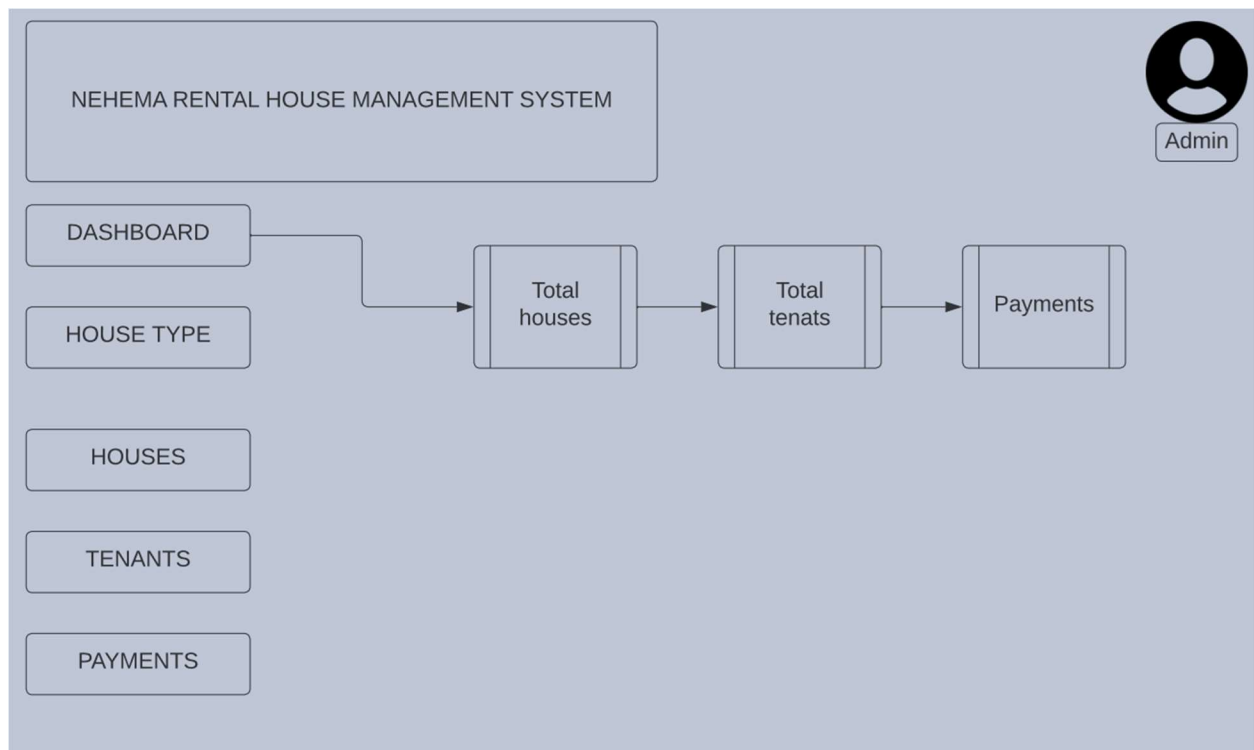
## 5.4 INTERFACE DESIGN

User interface design is crucial for a seamless user experience. We focus on creating an intuitive and efficient interface to enhance user interactions. The interface design includes the following components:

### 5.4.1 WIREFRAME

We present wireframes for key screens and interface elements, providing low-fidelity representations of the application's user interface. The wireframes illustrate the layout, navigation, and key UI elements.

Figure 5.5: Sample Wireframe - system



The wireframe represents the homepage of the web application.

The application name "Nehema Rental House Management System" is displayed at the top.

The main navigation menu contains the following options:

"Total Houses": This link leads to a page where the admin can view a list of houses and manage house information.

"Total Tenants": This link leads to a page where the admin can view a list of tenants and manage tenant information.

"Payments": This link leads to a page where the admin can track monthly payments, record payments, and manage tenant balances.

#### 5.4.2 CONCLUSION & SUMMARY

In conclusion, this chapter discussed the system architecture and design of our security management application. We presented the abstract representation of the system architecture, along with the proposed system architecture diagram. Furthermore, we detailed the design diagrams, activity diagrams, use case diagrams, database design, and interface design aspects of our application. The next chapter will focus on the implementation of the system, turning these designs into a fully functional .

## CHAPTER 6: SYSTEM IMPLEMENTATION AND TESTING

### 6.1 INTRODUCTION

“Implementation is the stage in the project where the theoretical design is turned into a working system. The implementation phase constructs, installs and operates the new system. The most crucial stage in achieving a new successful system is that it will work efficiently and effectively”.

Ambrose, P. and Barlow, J. (1987)

### 6.2 FRONT-END IMPLEMENTATION

The front-end implementation focuses on developing the user interface and user experience components of the Nehema Rental House Management system. This includes designing and coding the web application's front-end components to ensure a visually appealing and intuitive user interface.

### 6.3 DEVELOPMENT TOOLS

HTML: Used for creating the structure and layout of the web pages.

CSS: Used for styling and formatting the visual elements of the web pages.

JavaScript: Used for adding interactivity and dynamic functionality to the web application.

Bootstrap: A CSS framework that provides pre-designed components and responsive grid systems for efficient and consistent front-end development.

Ajax: Used for asynchronous communication between the web browser and the server, allowing real-time updates without page reloads.

### 6.4 APPLICATION COMPONENTS

User login and authentication pages.

Dashboard for admin and tenant users to access relevant information.

Forms for adding, editing, and deleting tenant details.

Payment management interfaces for tenants and admin.

Interfaces for monitoring house rentals, vacancy status, and lease agreements.

Reporting and data visualization components.

### 6.5 FRONT END WEB APPLICATION

The front-end web application of the Nehema Rental House Management system is developed using PHP, MySQL, JavaScript, Bootstrap, HTML, CSS, and Ajax. These technologies will work together to provide an interactive and responsive user interface.

### 6.6 DEVELOPMENT TOOLS

PHP: A server-side scripting language used for handling server-side processing and database interactions.

MySQL: A relational database management system used for storing and retrieving data related to tenants, payments, and house rentals.

## 6.7 APPLICATION COMPONENTS

The front-end web application components will interact with the back-end server to perform various tasks, such as retrieving and storing data, processing user inputs, and generating dynamic content.

## 6.8 CONCLUSIONS

The implementation phase of the Nehema Rental House Management system involves the front-end and back-end development of the web application. The front-end implementation focuses on creating an intuitive and visually appealing user interface using HTML, CSS, JavaScript, Bootstrap, and Ajax. The back-end implementation handles server-side processing and database interactions using PHP and MySQL. By combining these technologies and components, the system can efficiently manage tenant payments, monitor house rentals, and provide administrative control over tenant information.

## 6.9 SYSTEM TESTING

System testing is a critical phase in the software development lifecycle where the developed system is thoroughly tested to ensure its functionality, performance, reliability, and compliance with the defined requirements. This phase aims to identify and rectify any defects or issues before the system is deployed to the end-users. System testing involves executing a series of test cases and scenarios to evaluate the system's behavior and measure its conformance to expected results.(Pressman, R. S. (2014).

### 6.10 Test schedule

Test Activity	Start Date	End Date	Responsible Person	Dependencies and prerequisites
Functional Testing	2023-08-01	2023-08-07	Quality Assurance Team	Completion of the system
Performance Testing	2023-08-08	2023-08-14	Performance Team	Availability of test data
Installation Testing	2023-08-25	2023-08-28	Quality Assurance (QA)	Completion of the system
Usability Testing	2023-08-15	2023-08-19	UX Team	Completion of UI development

## 6.11 TYPES OF SOFTWARE TESTING

**Functional Testing:** Verifies that the system functions correctly according to its specifications and requirements. (Pressman, R. S. (2014).

**Performance Testing:** Evaluates the system's performance under different load conditions to ensure it meets performance expectations. ( Kaner, C., Falk, J., & Nguyen, H. Q. (2019).

**Usability Testing:** Assesses the system's user-friendliness and ease of use for end-users. (Rubin, J. (1994).

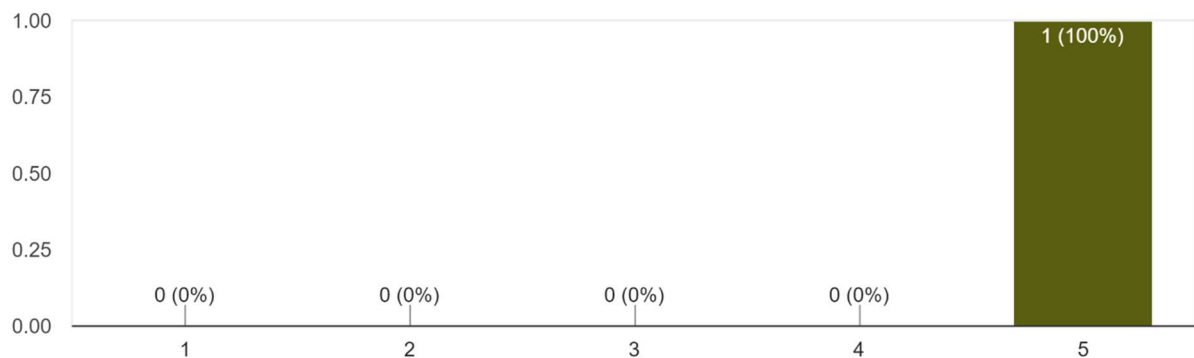
**Installation Testing:** This type of testing validates that all system components are correctly installed, configured, and ready to be used. ( Pressman, R. S. (2014).

### 6.11.1 PERFORMANCE TESTING

#### ONLINE QUESTIONNAIRE

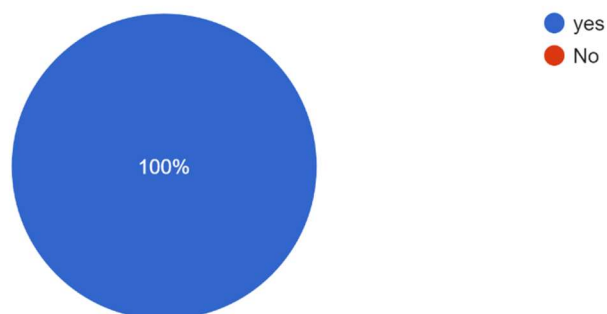
How would you rate the overall usability of the Nehema Rental House Management system?

1 response



Were you able to easily navigate through the different functionalities of the system?

1 response



Would you recommend the Nehema Rental House Management system to others? Why or why not?l response

Answer: Yes, I would recommend the Nehema Rental House Management system. It simplifies the management of rental properties and offers convenient features such as payment tracking and tenant information management. It has improved the efficiency of our rental management processes.

## 6.12 TESTING AND VALIDATION

Testing: Involves executing test cases and scenarios to identify defects or deviations from expected behavior. Testing aims to find errors and determine whether the system meets the specified requirements and functions as intended. It helps in identifying and fixing issues before deployment to ensure a high-quality system.

Validation: Focuses on evaluating the system against the user's needs and requirements. It ensures that the system satisfies the user's expectations and performs its intended functions accurately. Validation confirms that the system fulfills its intended purpose and provides value to its users.

Pressman, R. S. (2014). Software Engineering: A Practitioner's Approach. McGraw-Hill Education.

## 6.13 CONCLUSIONS

The system testing phase is a crucial step in the software development lifecycle. It involves thorough testing of the system to identify and resolve any defects before deployment. Various types of software testing techniques are employed, such as functional testing, performance testing, usability testing, and security testing. Testing and validation processes ensure that the system meets the specified requirements, functions as expected, and delivers value to its users. Pressman, R. S. (2014). Software Engineering: A Practitioner's Approach. McGraw-Hill Education.

## CHAPTER 7: SYSTEM

### 7.1 INTRODUCTION

The research aimed to address the challenges faced by property managers in housing management in Nairobi, Kenya. The development of the Nehema Rental House Management System was carried out using a prototype methodology, which allowed for iterative development and continuous feedback from potential users and stakeholders.

### 7.2 FINDINGS AND ACHIEVEMENTS

The literature review conducted during the research provided insights into the common challenges faced by property managers in housing management. These findings were instrumental in guiding the development of the Nehema Rental House Management System, ensuring that it effectively addressed the identified difficulties.

The findings collected from the research led to the development of;

- A system that allows property managers to record and manage tenant details, including names, contact information, identification documents, and rental agreements.
- A centralized database to store tenant information, enabling easy access and updates.
- A system that tracks rental payments from tenants and provided a record of payment history.
- A system that generates rent payment receipts for tenants, ensuring transparency in financial transactions.

### 7.3 REVIEW OF RESEARCH QUESTIONS AND OBJECTIVES

In this section, it aims in how the questions were achieved.

**Research Question 1:** What are the common challenges faced by property managers in housing management? Through interviews, surveys, and literature review, the study identified challenges such as insufficient availability of quality rental housing, manual record-keeping, data security risks, and the absence of a centralized database.

In the Nehema Rental House Management System, the achievement of addressing the common challenges faced by property managers in housing management was accomplished through the following system features and functionalities:

Tenant and Property Data Management:

- The system offered a comprehensive module for recording and managing tenant details, including names, contact information, identification documents, and rental agreements.
- Property managers could easily update tenant information and track lease agreements, ensuring accurate and up-to-date records.

**Research Question 2:** What are the existing tools, software solutions, and management systems used in housing management, and what are their strengths, weaknesses, and limitations? Objective: To explore the landscape of existing housing management tools and systems, evaluating their merits, drawbacks, and limitations.

Achievement: The research assessed various housing management tools and systems available in the market, studying their features, strengths, and limitations. This analysis



informed the development of the Nehema Rental House Management System by incorporating the best practices and addressing the limitations of existing solutions.

**Research Question 3:** How can the Nehema Rental House Management System be designed, developed, and tested to effectively address the identified challenges and improve operational efficiency in housing management?

Objective: To focus on the design, development, and testing process of the Nehema Rental House Management System to ensure it effectively tackles the identified challenges.

Achievement: The development process involved iterative prototyping and rigorous testing to ensure the system's functionality, usability, and security. User feedback was actively sought and incorporated during the development phases to refine the system.

**Research Question 4:** What is the impact and effectiveness of the Nehema Rental House Management System in improving housing management processes?

Objective: To evaluate the actual impact and efficacy of the implemented Nehema Rental House Management System on housing management tasks and overall efficiency.

Achievement: The Nehema Rental House Management System was deployed in real-life scenarios, and its performance was assessed through various metrics, including time saved in record-keeping, rent collection efficiency, and data accuracy. Feedback from property managers and landlords provided valuable insights into the system's positive impact.

## 7.4 BENEFITS OF NEHEMA RENTAL HOUSE MANAGEMENT SYSTEM

- Streamlined tenant and property management processes.
- Improved rent collection and reduced rent evasion.
- Enhanced data security and data integrity.
- Centralized database for easy access and management.

## 7.5 LIMITATIONS OF THE SYSTEM

The system's performance and scalability may be limited by the technology stack used (PHP, MySQL, etc.). As the volume of data grows, the system might experience performance issues, especially with a large number of users and rental properties.

Despite efforts to provide a user-friendly interface and training support, some property managers and landlords with limited technical expertise may still face a learning curve while adapting to the system.

The system may have limitations in terms of customization to suit specific business processes and preferences of individual property managers. Customization options might be limited in the current version.

The system might not integrate seamlessly with other external systems, such as accounting software or property listing platforms, which could hinder overall workflow efficiency.

## 7.6 CONCLUSIONS

Overall, the Nehema Rental House Management System, developed using the prototyping methodology, offers an efficient and user-friendly solution for managing rental house records and payments. It meets the specific needs outlined in the project scope, enabling the business management to streamline rental operations and make informed decisions based on accurate data and reports.

## **CHAPTER 8: CONCLUSIONS, RECOMMENDATIONS AND FUTURE WORKS**

### **8.1 INTRODUCTION**

This chapter outlines the final conclusions drawn from the research and the development of the Nehema Rental House Management System. It also offers recommendations for stakeholders and suggestions for future research and enhancements to the system

### **8.2 CONCLUSIONS**

The Nehema Rental House Management System successfully addressed the common challenges identified in the research, such as insufficient availability of quality rental housing, manual record-keeping, data security risks, and the absence of a centralized database. By incorporating specific features and functionalities, the system directly tackled these challenges, streamlining rental property management processes.

The system's automated record-keeping, rent collection, and payment management features significantly improved operational efficiency for property managers and landlords. It reduced paperwork, minimized errors, and saved time on manual administrative tasks.

The implementation of a centralized database enhanced data management, ensuring easy access and updates to tenant and property information. Moreover, robust data security measures, such as encryption and access controls, safeguarded sensitive data, mitigating data security risks.

The system's tenant management module facilitated efficient tenant tracking and communication. Property managers/Administrator could easily record tenant details, manage rental agreements, and address tenant-related tasks more effectively.

The system's reporting and analytics features provided property managers with valuable insights into property income, expenses, occupancy rates, and tenant payment histories. These insights empowered property managers to make informed decisions and proactively address potential issues.

### **8.3 RECOMMENDATIONS**

The Nehema Rental House Management System has proven to be a valuable tool in addressing the challenges faced by property managers in housing management. Based on the successful implementation and positive impact of the system, the following recommendations are provided for various stakeholders:

We recommend property managers and landlords in Nairobi and other urban areas to adopt the Nehema Rental House Management System. By doing so, they can streamline their property management processes, improve efficiency, and enhance tenant satisfaction.

Property managers should consider providing training and support to their staff in using the system effectively. This will help overcome any potential learning curves and ensure the maximum utilization of its features.

Policymakers should consider promoting the use of modern property management systems, like the Nehema Rental House Management System, within the rental housing sector. Encouraging its adoption could lead to increased efficiency in housing management, better data tracking, and improved living conditions for tenants.

We recommend exploring possibilities for integrating the Nehema Rental House Management System with other existing government databases or financial systems. This integration would enable seamless data sharing and improve overall data accuracy.

## 8.4 SUGGESTIONS FOR FUTURE WORKS

The research identifies potential areas of improvement for the Nehema Rental House Management System. This section outlines future research directions;

Future work could involve integrating the Nehema Rental House Management System with property maintenance and repair systems. This integration would allow property managers to efficiently schedule and track maintenance tasks, ensuring that properties are well-maintained and in good condition.

The system's reporting and analytics features can be further enhanced to provide more comprehensive insights and data visualization. This could include advanced financial analysis, trend forecasting, and comparative market analysis, helping property managers make data-driven decisions.

Developing a mobile application for the Nehema Rental House Management System would enhance accessibility and convenience for property managers and landlords. Mobile apps would allow users to manage properties and tenant information on-the-go, providing real-time updates and notifications.

Future developments could include features to engage and communicate with tenants more effectively. This might involve implementing tenant portals for submitting maintenance requests, accessing rental agreements, or providing feedback.

By focusing on these suggestions for future works, the Nehema Rental House Management System can continue to evolve, remain relevant, and provide even greater value to property managers, landlords, and tenants. Collaboration with stakeholders and continuous research and development will play a pivotal role in shaping the system's growth and impact in the dynamic field of housing management.

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