

**SCHOOL OF PURE AND APPLIED SCIENCE**

**BACHELOR OF SCIENCE IN INFORMATION AND TECHNOLOGY**

**DESIGN AND IMPLEMENTATION OF A RENTAL FINDER APPLICATION**

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This research project was presented in partial fulfillment of Kirinyaga University's requirements for the award of the degree of Bachelor of Science in Information and Technology.

**24TH NOVEMBER, 2023**

# DECLARATION

I declare that this proposal was my original work and had not been presented for a degree or any other award in any other university.

**NAME: JOE WAMBUGU NGURE**

**SIGN: …………………. ……………. DATE: ………………………**

I confirm the project reported was carried out by the candidate under my supervision

**Name: …………………………………**

**Sign: ……………………………… Date: …………………………….**

# DEDICATION

Throughout the duration of this project, my parents and fellow course mates have served as a constant source of inspiration, fortitude, and motivation, propelling me towards the achievements I have attained. I would want to express my dedication of this artwork to the individuals in question. I express gratitude to them for their words of support.

# ACKNOWLEDGMENTS

I express gratitude to God for the opportunity to engage in the aforementioned academic pursuit while in good health, as well as to my parents and family for their unwavering support throughout the entirety of my educational journey. I would like to express my sincere gratitude to my supervisor for his unwavering dedication and continuous assistance throughout the duration of the study project. I would like to express my gratitude to the University for its provision of ample resources, such as knowledgeable lecturers, comprehensive information, and well-equipped computer facilities, along with reliable internet connectivity on campus, which greatly facilitated my research endeavors. It is imperative to express gratitude towards my peers and mentors for their invaluable contributions and assistance throughout the course of my education.

# ABSTRACT

The objective of this project is to create a Rental Finder App with the purpose of optimizing the administration of rental properties. The RFA is a smartphone application that serves as a centralized platform facilitating efficient interaction among property owners, tenants, and property managers. The documentation explains more about how there is a need for a localized rental finder app that focuses on all types of rentals and not limited to accommodations, hotels or motels. The introductory part focuses on the proposed system its purpose. Chapter two then reviewed the existing system and identified the gaps within these systems and tried to solve some of them, and also came up with the context diagram of the proposed system. The methodology employed for this project encompasses the utilization of agile software development practices, with an emphasis on iterative design and implementation. The system has been constructed utilizing the Python Django framework for back-end development which uses the Rest framework to serve the API, and Kotlin for the application that consumes the API. The management of the database is conducted via SQL. Chapter four contains the design of the system, chapter five contains the implementation and maintenance of the system, and chapter six contains the conclusion, recommendation, and future work of the system. In conclusion, the Rental Finder App functions as a useful asset in property management, providing a comprehensive solution that effectively caters to the requirements of property owners, tenants, and managers.

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# CHAPTER ONE: INTRODUCTION

# 1.0 Introduction

The study was used to create a rental management system that is useful for both landlords and renters. It makes the work of posting and finding rentals easily. This chapter aims to provide an overview of the study by first discussing the background and context, followed by the research problem, the research aims, objectives and questions, the significance and finally, the limitations.

# 1.1 Background of the Study

Looking for a hostel can be quite a task requiring both time and resources. With the increasing number of people using mobile devices it becomes crucial to have a rental finder app that simplifies the whole process. The application will make it easier for users to find hostels that match their preferences and needs by providing information like location, pricing and amenities. The developers aim in developing this application was to enhance the efficiency and convenience of finding hostels for users.

# **1.2Current/Existing System**

The modern way to find hostels is to look through a bunch of different websites and classified advertisements. Users may feel overwhelmed and take a lot of time because they have to look through a lot of listings to find hostels that meet their needs. Also, the information in these listings isn't always full or correct, which makes it hard for people to make smart choices. In order to solve these problems, the suggested rental finder application will give users a simple and useful way to discover rental homes matching their specific needs and interests. The application will save people time and effort by making it easier to find places to rent.

# **1.3 Problem Statement**

When new students enroll, there was a significant need for accommodations, particularly hostels. The most efficient and effective method to promote rental properties or hostels was to distribute a substantial quantity of brochures and booklets within the school premises, ensuring visibility to both students and parents. This process entails a significant amount of printing, resulting in challenges for tenants in locating their preferred rental properties, often leading to compromises in their original preferences. Additionally, this causes congestion within educational institutions as they contend with restricted capacity. Additionally, the use of paper materials in this context may contribute to the issue of littering, as the practicality of carrying large quantities of paper is sub-optimal. Furthermore, distributing pamphlets to individuals who are not genuinely interested in the information being presented might result in the unnecessary consumption of resources. There exists a necessity to develop a software program that facilitates landlords in entering pertinent information on their unoccupied rooms or properties, while simultaneously providing tenants with the ability to search for suitable accommodations within their preferred locality.

# **1.4 Proposed System**

The proposed system was a mobile application that aims to help tenants and landlords find each other with ease. The current system has no such platform, which makes it difficult for both parties to connect. Tenants have to manually search for hostels, which was a tedious and time-consuming process. Landlords, on the other hand, have to spend money on advertising their hostels and printing brochures.

The proposed system uses a mobile application that sends requests to a server that processes the requests and returns information relevant to the user. The server will use an API to send and receive requests and a Database Management System to store all the data needed by the users. A database is simply an organized collection of related data, typically stored on disk, and accessible by possibly many concurrent users. This will serve the application with the needed data.

In this system, landlords would post information about their rentals and hostels, and tenants can access the information from anywhere at any time and make informed decisions. The mobile application will allow tenants to search for hostels based on their preferences, such as location, price range, and amenities. Landlords will be able to post information about their rentals easily and quickly.

The proposed system will be efficient and cost-effective for both tenants and landlords. Tenants will be able to find hostels without having to physically visit them, saving them time and money. Landlords will be able to advertise their hostels without having to spend money on printing brochures.

# **1.5Purpose of the study**

The purpose of this study was to develop a rental finder application that simplifies the process of finding rental properties. The study aims to evaluate the effectiveness of the application in terms of user satisfaction and efficiency.

# **1.6Objectives of the Study**

# **1.6.1General Objective**

The general objective of this study was to develop a rental finder application that hosts information about hostels where users can easily find them.

# **1.6.2 Specific Objectives**

1. To develop a rental house management system that can simplify work for rental managers such as inputting information about their hostels.

2. To design a user-friendly interface for both landlords and tenants that helps them navigate through the application faster and effectively.

3. To provide a secure and reliable system that can store rental house data safely without interference from third parties and avoid loss of data.

4. To develop a system that can display vacant rooms for tenants in the surrounding area effectively simplifying the process of finding rooms that align with the users needs.

# **1.7Justification**

The rental market can be overwhelming and time-consuming to navigate. The proposed rental finder application aims to address this need by providing users with a convenient and easy-to-use platform for finding hostels based on their preferences and requirements. Additionally, the application provided valuable data on user preferences and requirements, which can be used to improve the rental market as a whole.

# **1.8Scope of the Study**

The scope of this study was limited to the development of a rental finder application that simplifies the process of finding hostels. The application was designed to help users search for hostels based on their preferences and requirements. The study was focusing on evaluating the effectiveness of the application in terms of user satisfaction and efficiency. The study did not cover the development of any additional features or functionality beyond those required to meet the stated objectives. Additionally, the study did not cover any marketing or promotional activities related to the application.

# **1.9Limitations**

There are certain limitations, such as potential fraud, where hackers could impersonate renters and potentially scam renters into giving them money. There was a risk of technical problems with the cloud, hence unavailability of the system. Inaccurate data where landlords could enter wrong or outdated information which confused renters. The study was also limited by time and resource constraints, which may affect the scope and depth of the research. Finally, the study was limited to a specific geographic area and may not be generalizable to other regions.

# **1.10Significance Of The Study**

By developing this application, the developer hopes to make the process of finding rental properties easier and more efficient for users. Additionally, the application will provide valuable data on user preferences and requirements, which can be used to improve the rental market as a whole. By simplifying the process of finding rental properties, the developer hopes to encourage more people to rent properties, which will help address the housing shortage in many areas.

# **1.11Operational Definition of Terms**

* **User**: An individual who uses the rental finder application to search for rental properties.
* **Search criteria**: The preferences and requirements that a user enters into the rental finder application to search for rental properties.
* **Location**: The geographic area where a hostel is located.
* **Price**: The amount of money that a user is willing to pay for a hostel.
* **User satisfaction**: The degree to which a user is satisfied with the rental finder application and its features.
* **Efficiency**: The speed and ease with which a user can find a hostel using the application.

# CHAPTER TWO: LITERATURE REVIEW

# **2.0Introduction**

The rental market can be a daunting place, with so many options and variables to consider. This chapter discusses the literature review and provided examples of related existing rental management systems. It also discusses the benefits and drawbacks of each. Finally, it provides an overview of key search findings and trends in the rental applications.

# 2.1 Related Literature Review

1. **Accurate Search Results:**

According to **Investopedia.com. (2023, November 15)** and JustCoded. (2023, August 22), Accurate search results are crucial in rental finder apps to ensure users find what they're looking for. A study on rental search app development suggests that the application should cater to industry standards and user demands. This implies the need for accurate search results based on user's criteria.

2.**Detailed Property Information:**

According to U.S. News & World Report. (2023, November 14) and JustCoded. (2023, August 22), Providing detailed property information is another essential feature of rental finder apps. A study on rental house management systems emphasizes the need for such systems to simplify work for rental managers and make their work efficient and effective. This includes providing comprehensive information about each property.

3. **User-friendly Interface:**

According to Harrison, R., Flood, D. & Duce, D. Usability of mobile applications: literature review and rationale for a new usability model. J Interact Sci 1, 1 (2013). https://doi.org/10.1186/2194-0827-1-1 and JustCoded. (2023, August 22), A user-friendly interface is vital for any app, including rental finder apps. A study on rental house management systems highlights the importance of developing a system that provides a maximum user-friendly interface. Another study discusses the usability of mobile applications and introduces a new usability model, PACMAD (People At the Center of Mobile Application Development), which addresses the limitations of existing usability models when applied to mobile devices.

4. **Virtual Tours:**

According to Emerald Insight. (n.d.). Virtual reality and modern tourism and JustCoded. (2023, August 22), Virtual tours have become increasingly popular in the tourism industry and are now being adopted in the real estate industry as well. A study on virtual reality and augmented reality in tourism research discusses how these technologies have emerged in various sectors. Another study discusses virtual tours' role in tourism recovery post COVID-19, suggesting that virtual tours can keep attractions firmly in the minds of potential visitors.

5. **Online Payment Options:**

According to **Al-Debei, M. M., & Al-Henzawi, W. (2022). Digital Payments Adoption: An Analysis of Literature. In Lecture Notes on Data Engineering and Communications Technologies (pp. 169-178). Springer, Singapore** and JustCoded. (2023, August 22), Online payment options are becoming increasingly important in today's digital world. A literature review on the adoption of digital payment systems discusses the progress made in terms of adopting digital payment systems and factors impacting consumers' attitudes towards adopting such systems. Another review discusses various methods of digital payments and why they are being adopted.

In conclusion, rental finder applications are becoming increasingly popular as more people opt to rent rather than buy property. To create a successful rental finder application, it is essential to include key features such as accurate search results, detailed property information, user-friendly interfaces, virtual tours, and online payment options. By incorporating these features into their applications, developers can create a product that meets the needs of both landlords and tenants.

# 2.2 Gaps/Lacuna's

* Lack of transparency: Some rental finder applications do not provide accurate or up-to-date information about the properties listed on their platform. This can lead to tenants wasting time and money on properties that are no longer available or do not meet their requirements.
* Limited search filters: Many rental finder applications have limited search filters, which can make it difficult for tenants to find properties that meet their specific needs. For example, some applications may not allow users to filter by pet-friendliness or accessibility features.
* Poor user experience: Some rental finder applications have a poor user experience, with clunky interfaces and slow loading times. This can discourage tenants from using the application and lead to frustration.
* Lack of virtual tours: Virtual tours are becoming increasingly popular among tenants, as they allow them to get a better sense of the property before scheduling an in-person viewing. However, not all rental finder applications offer virtual tours

# 2.3 Chapter Conclusion

In this chapter, the researcher has examined the existing research on rental finder applications and identified several key features that are essential for a successful application. The researcher has also identified several gaps that could be addressed in rental finder applications.

To address these gaps and create a successful rental finder application, it is essential to incorporate the key features identified in this chapter. By doing so, developers can create an application that meets the needs of both landlords and tenants and provides a seamless rental experience.

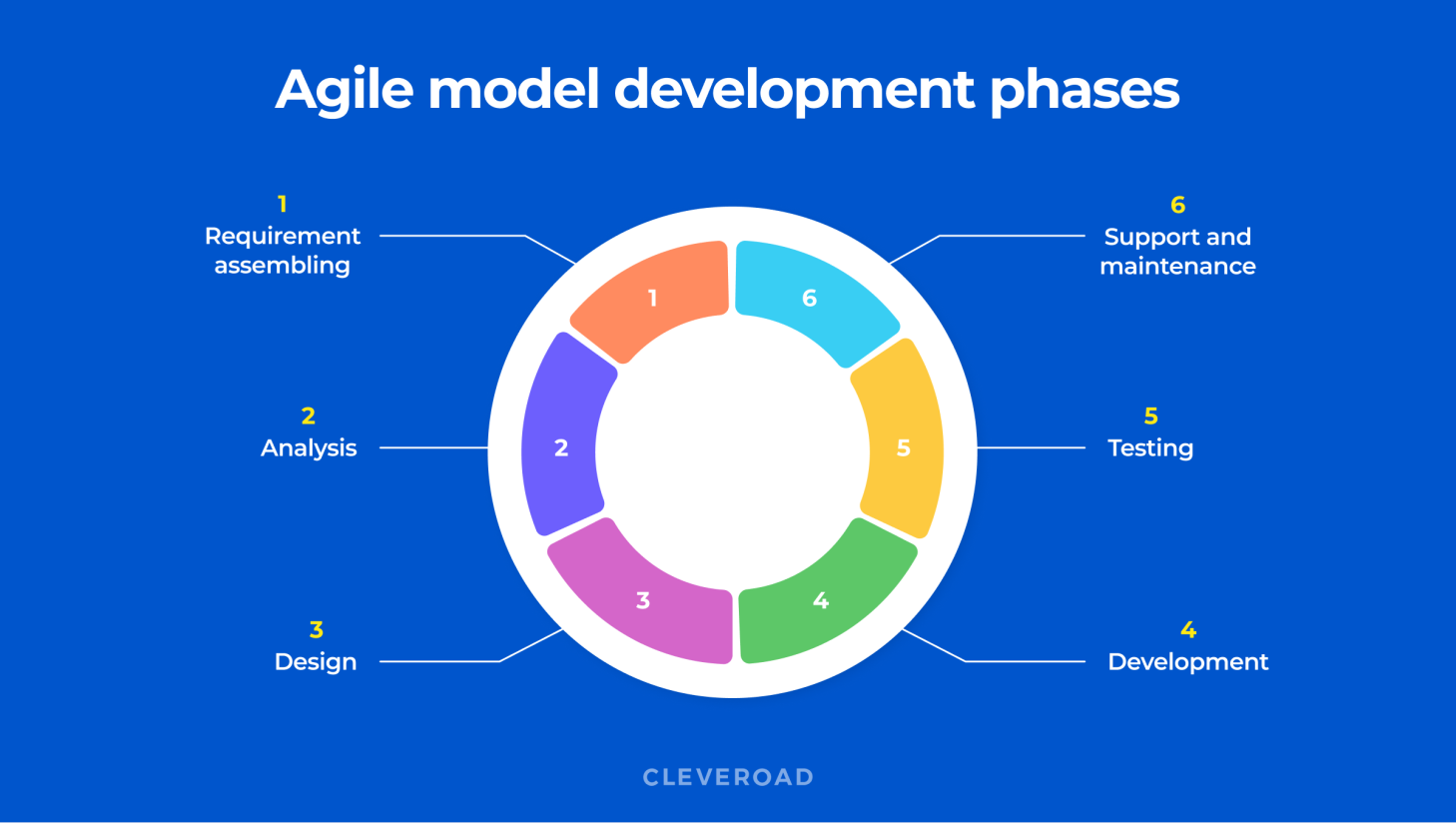
# CHAPTER THREE: RESEARCH METHODOLOGY

# 3.0 Introduction

In this chapter, the researcher will describe the methodology they will use to develop the rental finder application. This chapter will provide a detailed overview of the development methodology, data collection, and data analysis techniques that we will use to create the rental finder application. the researcher will also explain why they have chosen this methodology and how it aligns with their research questions.

# 3.1 Development Methodology

The rental finder application was developed using the **Agile methodology**. This methodology is ideal for software development projects that require flexibility and adaptability. It involves breaking down the development process into small, manageable chunks called **sprints**. Each sprint is typically two to four weeks long and focuses on delivering a specific set of features.



The Agile methodology emphasizes collaboration, communication, and customer feedback. It allows the developers to quickly respond to changing requirements and make adjustments to the project as needed. The developer used the following steps to develop the rental finder application:

1. **Planning**: In this phase, the researcher defined the scope of the project, identified the features they want to include, and created a project timeline.
2. **Design**: In this phase, the researcher created wire frames and prototypes of the rental finder application. The researcher also designed the user interface and user experience.
3. **Development**: In this phase, the researcher developed the rental finder application using the Agile methodology. They broke down the development process into sprints and focused on delivering specific features in each sprint.
4. **Testing**: In this phase, the researcher tested the rental finder application to ensure that it is functioning correctly. They used automated testing tools to speed up the testing process.
5. **Deployment**: In this phase, the researcher deployed the rental finder application to production servers. They also provided training and support to users.
6. **Maintenance**: In this phase, the researcher maintained and updated the rental finder application as needed. They also collected feedback from users and made improvements to the application based on their feedback.

# 3.2 Justification of Methodology

The researcher chose the Agile methodology for developing the rental finder application because it was ideal for software development projects that require flexibility and adaptability. The Agile methodology emphasized collaboration, communication, and customer feedback. It allowed the developers to quickly respond to changing requirements and make adjustments to the project as needed.

The Agile methodology was particularly suited to the project because it involved breaking down the development process into small, manageable chunks called sprints. This approach enabled the developer to deliver specific features in each sprint and ensure that the developers are meeting their project goals.

Another advantage of the Agile methodology was that it allowed us to involve stakeholders in the development process. This means that the developer can get feedback from users and other stakeholders throughout the development process, which helped the developer to create a rental finder application that met their needs.

Overall, the researcher believed that the Agile methodology was the best approach for developing their rental finder application. It allowed the developer to be flexible and adaptable, involve stakeholders in the development process, and deliver a high-quality product that met their project goals.

# 3.3 Data Collection and Analysis

For the rental finder application, the researcher uses observation, surveys and secondary research. This helped the researcher obtain data analysis on hostels occupancy rates, pricing and investment research and more.

The researcher used these data collection methods to collect data on the following metrics:

* Occupancy rates: This metric measures the percentage of time that a rental property is occupied. The researcher used this metric to determine the demand for short-term rentals in their target market.
* Pricing: This metric measures the average daily rate for short-term rentals in our target market. The researcher used this metric to determine the average price that renters are willing to pay for short-term rentals.
* Investment research: This metric provides insights into the profitability of short-term rentals in our target market. The researcher used this metric to determine the potential return on investment for their rental finder application.

By analyzing this data, the researcher was able to identify trends and patterns in the short-term rental market in their target market. This information helped the researcher to create a rental finder application that met the needs of renters and landlords alike.

# 3.4 Conclusion

In this chapter, the researcher has outlined the methodology they used to develop their rental finder application. The researcher has described the development methodology, data collection, and data analysis techniques that they used to create their rental finder application.

The researcher chose the Agile methodology for developing their rental finder application because it was ideal for software development projects that require flexibility and adaptability.

The researcher used surveys and secondary research to collect and analyze data on short-term rentals in their target market. By analyzing this data, the researcher was able to identify trends and patterns in the short-term rental market in the target market. This information helped the researcher to create a rental finder application that met the needs of renters and landlords alike.

Overall, the researcher believed that their methodology was well-suited to their project goals. It allowed the researcher to be flexible and adaptable, involve stakeholders in the development process, and deliver a high-quality product that met their project goals.

# CHAPTER FOUR: SYSTEM DESIGN

# 4.0 Introduction

This chapter highlights the requirements used to come up with the entire system. It contains requirements, context level diagram, input design, output design, database design for customer and administration, and process design which contains diagrams such as flowcharts, sequence, activity, use case, and editing relation diagram.

# 4.1 Requirements

This relates to finding what the application needs to function. For this application to function it needed various components such as hardware and software that would help operate it at an optimal level. The following requirements are discussed below:

# 4.1.1 Hardware Requirements

The following were required for better functioning of the application: Laptop computer to be used for the design and development of the system. It should have had the following specifications:

* Processor Intel core I5 or better with 3.0 GHZ processing speed
* A memory of 8 GB RAM or more and 128 GB (or more) available solid state drive space
* Flash disk (8 GB)- used as a backup for the documentation of the project
* A monitor of high quality with a resolution of 1366 x768 or higher
* A virtual android device for testing the application

# 4.1.2 Software Requirements

For the application to be developed and be run smoothly it needed:

* Operating system – Windows 10 or higher
* SQL or SQL lite server – To act as the database for the application
* Programming Languages – Python, Kotlin, MYSQL database
* Git – To version the system

# 4.1.3 Functional Requirements

These were the main functions and capabilities of the system that must be performed successfully:

1. Register account – Anyone willing to join was required to create an account in the application by filling in the required account details which included their first name, last name, email, password, username, phone number and address. Later they can add their date of birth, gender ad profile picture.
2. Log in – To access the application, the users needed to be logged in using their email and password.
3. Add rentals – For the users that require services like adding their rentals for sale can do so in the application.
4. Retrieve rentals – For users looking for rentals, the application would have fetched the information needed from the database where they were stored.
5. Customize profile – Users were able to customize their profiles according to their liking.

# 4.1.4 Non Functional Requirements

These were the requirements that supplement the main function and capabilities of the system:

1. **Usability –** The system should have been user-friendly with interfaces that are easy to use.
2. **Security –** only authorized users should have been allowed access to the system.
3. **Reliability and availability –** the system should have been reliable and available to all customers at all times.
4. **The integrity –** the system should have ensured that the data is not corrupted.
5. **The performance –** the system should have had an acceptable response time when performing its functions.

# 4.2 Context Level Diagram

This diagram shows how the system works as it shows all the processes involved in the application to better understand it. The diagram is as follows:

# figure 4.0: context level diagram

# 4.3 Input Design

**Admin login**

The system's admins should have been able to log in using their username and password as shown in the figure 4.3.1 below:

USERNAME:

PASSWORD:

LOG IN

**Figure 4.3.1 Admin login page**

**Users login**

Users of the application were able to login using the email they had provided while signing up and a password that they chose.

EMAIL

PASSWORD

LOG IN

**Figure 4.3.2 User login page**

# 4.4 Process Design

The researcher showed the use of process design tools such as a use case diagram that will be used to represent all the processes in the system. Shown below is such an example:

# 

# 4.5 Database Design

A database is an organized collection of structured data or information. The system was using a relational database which was designed to produce a detailed data model of a database, for us to come up with the best database model. Below are the entities used in the database to store the users information.

**User Table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **DATA** **TYPE** | **LENGTH** | **KEY** | **DEFAULT** **VALUE** |
| Id | Int | 10 | Primary key | Not null |
| First Name | Varchar | 50 | Foreign key | Not Null |
| Last Name | Varchar | 50 | Foreign key | Not Null |
| Email | Varchar | 50 | Foreign key | Not Null |
| Password | Varchar | 50 | Foreign key | Not Null |
| Username | Varchar | 50 | Foreign key | Not Null |
| Phone Number | Int | 20 | Foreign key | Not Null |
| Address | Varchar | 50 | Foreign key | Not Null |
| Date Of Birth | Varchar | 50 | Foreign key | Null |
| Gender | Varchar | 50 | Foreign key | Null |

**Rental Table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NAME** | **DATA** **TYPE** | **LENGTH** | **KEY** | **DEFAULT** **VALUE** |
| Id | Int | 10 | Primary key | Not null |
| Name | Varchar | 50 | Foreign key | Not Null |
| Image | Int | 10 | Foreign key | Null |
| Price | Int | 10 | Foreign key | Not Null |
| Description | Varchar | 255 | Foreign key | Not Null |
| Type | Varchar | 50 | Foreign key | Not Null |
| Location | Int | 20 | Foreign key | Not Null |
| Available | Bool | 20 | Foreign key | Not Null |
| Rating | Int | 50 | Foreign key | Null |
| Total Units | Int | 50 | Foreign key | Null |

# 4.6 Output Design

Output design is designing how the final output will be displayed to the users.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Id | Name | Image | Price | Description | Type | Location | Available | Rating | Total Units |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

**Figure 4.6: process design**

# ****4.7 Conclusion****

**This chapter went through the design of the rental finder application. It showed how the database looks like and it showed how the application database was used and all the different tables inside it. The chapter discusses on the different technologies used in the system and the requirements needed to complete the application. The various designs ranging from the input design to the output design ensure the timely completion of the implementation process.**

# ****CHAPTER FIVE: SYSTEM IMPLEMENTATION AND TESTING****

# ****5.0 Introduction****

This chapter expounds on the ways the application and the will be implemented, tried and tested. Here the developer will test the system's functionalities to make sure it has little to no errors and to make sure it runs optimally. Testing is a crucial part of development hence systems are tested in numerous ways to ensure the correctness of the system. After careful testing, the system will be deployed and made readily available for the intended audience users.

# 5.1 Unit Testing

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# ****Appendices****

## ****Appendix 1: Workplan****

Table 1: Gantt Chart

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Project Tasks/Weeks** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| **Idea & Title Proposal** |  |  |  |  |  |  |  |
| **Introduction** |  |  |  |  |  |  |  |
| **Aim & Objective** |  |  |  |  |  |  |  |
| **Literature Review** |  |  |  |  |  |  |  |
| **Methodology** |  |  |  |  |  |  |  |
| **Proposal Defense (Presentation)** |  |  |  |  |  |  |  |
| **Documentation** |  |  |  |  |  |  |  |

## Appendix 2: Budget

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| NO | ITEM | QUANTITY | UNIT PRICE | TOTAL COST |
| 1 | Laptop | 1 | 40,000 | 40,000 |
| 2 | Internet connection | 1 month | 2500 | 2500 |
| 3 | Flash drive | 1 (16GB) | 1000 | 1000 |
| 4 | Software | 2 | Free | Free |
| 5 | Printing and binding | 50 pages | 10 | 500 |
|  | TOTAL |  |  | 44000 |