




# Okello Fredrick

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MAKERE UNVIVERSITY BUSINESS SCHOOL  
FACULTY OF COMPUTING AND INFORMATICS  
DEVELOPING A HOUSE RENT MANAGEMENT SYSTEM  
FOR AVANCE PROPERTIES

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A research proposal submitted to the faculty of Computing and Informatics of Makerere  
University School of Business in partial fulfilment of the bachelor's degree of Business  
Computing.

2024/2025



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## DECLARATION

We the undersigned, declare that to the best of our knowledge, this proposal is our original piece of work and has never been submitted for any award in any other University or Higher Institutions of learning.

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## APPROVAL

The research proposal has been submitted with my approval as supervisor and my signature  
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## CHAPTER ONE

### 1. INTRODUCTION

#### 1.1 Background of the study

The rental housing market is a crucial sector that demands efficient management for both landlords and tenants. Manual methods of rent collection, tenant tracking and lease agreements are often inefficient, prone to errors and time-consuming. With digital development and transformation, there is a need for a robust House Rent Management system to address the inefficiencies in the current manual process.

The real state sector has undergone significant transformation worldwide due to rapid urbanisation, population growth and advances in digital technology. Globally, the rental housing market continues to expand, driven by increasing urban populations. According to the United Nations (2018), about 55% of the global population lived in urban areas in 2018, and this figure is projected to rise to 68% by 2050 (Affairs, 2018 Revision of World Urbanization Prospects, 2018)

Regionally, developing nations particularly in Africa are experiencing similar urban growth but face greater challenges due to limited resources and low adoption levels of digital solutions. In Uganda, the rental housing sector has become increasingly important as urbanization continues especially in Kampala and surrounding districts. The National Housing Construction Company (2022) reports that demands for rental units has significantly increased due to the rural-urban migration and population growth. Despite this, most landlords still rely on manual methods such as physical record keeping and cash payments leading to inefficiencies including delayed payment, disputes and loss of records.

In Uganda, landlords and tenants in urban areas such as Kampala, Mukono and Wakiso face recurring challenges in rental management. Manual systems often result into poor record keeping, difficulties in tracking multiple tenants and disputes over tenancy agreements. Tenants particularly students and young professionals who constitute a large segment of the rental market, also encounter challenges with unclear payment processes and lack of transparency. These issues show the need for a digital House Rent Management System that addresses local challenges while drawing on global best practices. Such a system would

automate transactions, ensure secure data storage and improve communication between landlords and tenants.

The real estate industry has seen rapid digitalization in the recent years, yet many landlords and property managers still rely on manual methods for managing the rental properties. the absence of a system leads to delayed payments, miscommunication and lack of transparency. Existing systems lack scalability and automation making it difficult to manage multiple rental properties effectively. This research will investigate how automated system can improve rental management.

## 1.2 Problem statement

Ideally, rental house management should ensure timely rent collection, accurate tracking of transactions, transparent communication between landlords and tenants, fair allocation of rental units, accurate tracking of tenant records, proper handling of maintenance requests and effective lease agreement handling. A digitalised system would enable landlords and tenants communicate easily, keep accurate records and ensure that all financial and administrative processes are streamlined (Laudon & Laudon, 2020)

Currently in Uganda, most rental properties are still managed using physical notebooks, cash payments and verbal agreements. These traditional/ local approaches make it difficult for both landlords and tenants to track rental transactions, maintenance requests and lease agreements effectively. The reliance of manual methods results in inefficiencies, and the lack of a centralised system leads to mismanagement and financial losses. Landlords experience difficulties in monitoring tenant obligations while tenant face frustrations due to poor communication and lack of transparency.

This research seeks to design and develop a digital House Rent Management system (HRMS). The system will automate rental transactions, provide real-time updates and securely store records. It will also incorporate features to ensure efficiency, accountability and satisfaction for landlords and tenants.

## 1.3 Research goals and objectives

### 1.3.1 Research goal

The primary goal of this research is to design and develop a digital House Rent Management System that simplifies and automates rental transactions, enhance transparency and ensure secure data storage.

### 1.3.2 Research objectives

- To study and analyse the current rental property management systems.
- To review literature in relation to Digital rental management systems and identify the requirements for house rent management system.
- To design and develop a house rent management system.
- To test and implement the House Rent Management System.

### 1.3.3 Project Scope Summary

The house rent management system is a digital platform designed to automate and streamline the management of rental properties for landlords and tenants. The project focusses on eliminating manual errors, improving communication and enhancing transparency in rent payments, tenant management and property managing, supervising and monitoring. The scope of the system covers the design, development, testing and deployment of a web-based application that supports features such as user management, property and tenant management, rent payments and transactions, maintenance and service requests, system security and data protection.

### 1.4 Significance of the study

Landlords will be able to manage their properties more efficiently by automating rent collection and tenant communication which will reduce the risks of financial losses, mismanagement and disputes that often arise with manual method. Landlords will also gain access to accurate reports and analytics that support better decision-making in property management.

This will benefit tenants from improved transparency and convenience in managing their rental obligations. This system will provide timely notifications for rent payments, allow digital submission of maintenance requests. This increases tenant satisfaction and strengthen trust between landlords and tenants.

For policymakers, the system can serve as model for modernising the housing sector and addressing urban housing challenges. It will provide data-driven insights into rental patterns,

tenant demographics and housing demand which can inform the formation of housing policies, rent regulations and strategies to address housing shortages.

The development and implementation of the House Rent Management System contribute to the advancement of Information and Communication Technology (ICT) solutions in real estate. It provides an opportunity for ICT practitioners to design, test, and deploy innovative applications that solve real-world problems. It also encourages the integration of ICT in property management, contributing to the digital transformation of the housing sector.

### 1.5 Project assumptions.

The team assumes that technologies such as MySQL, HTML, CSS and JavaScript, internet access and a stable hosting environment for the project development will be accessible and functional for the duration of the project.

The users and stakeholders that is the landlord and tenants will provide correct and truthful information during registration and system use. They will have to access the internet and basic computer or smart phone usage skills.

The project scope, goals and objectives will remain consistent and major changes will not be introduced after the initial approval.

The project will not be affected by resource shortages or delays. All the required software and hardware will be available throughout development. Stakeholders will collaborate and provide timely feedback during testing. System requirements will remain relatively stable during the development cycle.

Users will maintain secure passwords and backup procedures will run regularly to prevent data loss. The database server will remain protected from unauthorised access.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2. SECTION INTRODUCTION

This section reviews existing research and systems related to real rental and property management. It discusses global and local adoption of digital housing systems, challenges of traditional processes and innovations in financial technology for real estate management. The review draws from journal articles, technical reports and online publications. Challenges that justify the need for a house rent management system for Avance Properties.

##### 2.1 Global perspectives and house rent management systems.

Globally, the real estate industry has embraced digital transformation through the adoption of property management technologies commonly referred to as Prop Tech. These technologies integrate software applications to automate rent collection, lease tracking and maintenance management. Digital rental management systems improve efficiency, accuracy and transparency by enabling real-time monitoring of transactions and automated communication between landlords and tenants.

In developed economies such as the United States, United Kingdom and Singapore, web-based and mobile applications like Buidium, AppFolio and Rentec Direct are widely used to streamline property management. These systems provide automated invoicing, cloud-based data storage, and mobile access for both landlords and tenants. Studies by Ahmad and Alammary (2022) highlight that automation in rent management reduces operational costs, minimizes human error and promotes accountability (Ahmad, 2022).

Furthermore, the integration of financial technology (Fin Tech) into property management has enabled online rent payment through secure digital gateways, reducing reliance on manual cash transactions. This integration aligns with the growing trend of cashless economies and digital service delivery across various sectors (the national construction company, 2022).

##### 2.2 Regional and local perspective

Across Africa, the adoption of digital rental systems is still emerging but steadily gaining attention. Many landlords and property managers in developing countries rely on traditional

management approaches such as manual bookkeeping and physical cash handling. This reliance has led to inefficiencies, data loss and financial mismanagement

In Uganda, the demand for rental housing continues to grow due to urbanisation and population increase. The National Housing Construction Company (2022) reports a consistent rise in rental housing demand in Kampala and neighbouring districts. Despite this growth, the sector remains largely unautomated. Most landlords use paper records and manual receipts to track rent payments and tenant information, leading to issues of delayed payments, poor accountability and tenant disputes.

These challenges have emphasized the need for user-friendly, low-cost and locally adaptable systems that address the specific realities of Uganda property owners and tenants. Therefore, the development of a customized digital house rent management system is both timely and necessary efficiency and transparency in property management.

### 2.3 Existing house rent management systems

Several researchers and developers have designed and implemented rental management system to improve efficiency and communication between landlords and tenants. Rastogi and Singh (2023) proposed a web-based rental management system that automates tenant registration, rent calculation and payment tracking using modern technologies such as PHP and MySQL. Their system demonstrated improved accuracy and reduced administrative workload but lacked integration with mobile devices limiting accessibility for users (Rohit Rastogi., 2023).

Similarly, Arunachaleshwara Barman and Rathi (2018) developed a fair rent division algorithm that ensures equitable rent allocation among tenants. This innovation enhances fairness but focusses mainly on shared rentals rather than complete property management. Other systems such as the model proposed by Maulana et al (2021), applied Software Development Life Cycle (SDLC) waterfall model to create a property management system that stores tenant records and automates billing (Maulana, 2021). However, their study identified scalability and security limitations which the current research seeks to improve.

These existing systems provide valuable insights but reveal a consistent gap in designing solutions that are both affordable and tailored to local conditions such as those in Uganda. Hence, this project aims to bridge this gap by developing a secure user-friendly and scalable house rent management system specifically for Avance Properties.

## 2.4 Technologies used in rental management systems

Modern rental management systems typically employ web-based technologies such as PHP, MySQL, JavaScript and HTML/CSS for development due to their flexibility and opensource nature. According to Dennis, Wixom and Roth (2020), these technologies allow core functionalities including database management, user authentication and data visualization. Cloud computing and mobile technologies also play a vital role in facilitating accessibility and scalability. Systems developed using cloud infrastructure enable real-time updates, secure data backup and multi-user access (Dennis, wixon, & Roth). Moreover, integrating payment gateways such as Pay stack or Futter wave allows tenants to make rent payments electronically, aligning with global digital finance trends (world bank group, n.d.)

The Design Science Research (DSR) approach as proposed by Hervner el at (2004), provides a structured framework for developing and evaluating such systems (Hervner, 2004). This approach ensures that the resulting artifact not only functions effectively but also address real organisational needs, making it suitable for the development of the House Rent Management System for Avance Properties.

## 2.5 Challenges in implementing digital rental systems

Despite the benefits of digital transformation, several challenges hinder the adoption of rental management system in developing countries. These include high cost of implementation, limited access to stable internet and insufficient ICT knowledge among landlords and tenants (Hughes, 2019)Resistance to change is another barrier where users prefer traditional methods due to familiarity and perceived complexity of digital system.

Additionally, concerns about data privacy and system security discourage many landlords from adopting online systems (Kaynak, 2007)To overcome these challenges, developers must design lightweight, secure and easy-to-use systems that address the specific socio-economic conditions of the target users.

## 2.6 Overcoming the challenges

Although the adoption of digital rent management systems faces several problems, various strategies and technological innovations have been proposed to address them. First, capacity building and digital literacy training for landlords and tenants can significantly increases acceptance and effective use of new systems. According to Hughes, providing user training

sessions during system development reduces resistance and promotes confidence in technology (Hughes, 2019).

Second, cost-effective development tools such as open-source technologies (e.g., PHP, MySQL, and Laravel) lower implementation expenses for small-scale property owners. This makes it possible to deploy functional systems without large financial investments (Dennis, Wixon, & Roth)

Third, cloud-based and mobile platforms can mitigate infrastructure limitations offering flexible access and reducing the need for high-end hardware (Ahmad, 2022). These platforms also ensure data backup and continuity even in the event of power or hardware failure.

Fourth, to address security and privacy concerns, researchers recommend incorporating data encryption, role-based access control and secure authentication mechanism (Kaynak, 2007). Regular security and compliance with privacy standards such as the General Data Protection Regulation (GDPR) further enhance user trust.

Lastly, stakeholders' collaboration between developers, landlords, tenants and policymakers ensures that digital solutions align with actual user needs and local regulations. Establishing supportive governance policies and incentives for ICT adoption can accelerate digital transformation in Uganda's real estate sector (World Bank Group, n.d.)

By adopting these strategies, developers and property managers can overcome most implementation challenges and therefore promote the sustainable use of digital house rent management systems.

## 2.7 Conclusion

In conclusion, literature shows significant progress in digital property managements globally, with proven benefits such as automation, transparency and improved communication. However, in Uganda still most landlords and property managers still rely on manual methods due to lack of affordable, localised solutions. Existing systems reviewed tend to focus on large-scale property markets. Therefore, a gap exists in developing a cost-effective, secure and scalable digital house rent management system that fits the local Ugandan context. The proposed system for Avance Properties aims to bridge the gap by automating rental transactions, improving communication and ensuring accountability through a robust platform.





## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.PROJECT METHODS

This section presents the methodology adopted in developing the system, including the research approach, system design, data collection and evaluation

##### 3.1 Research Design / Research Approach

The study adopts the Design Science Research (DSR) approach, focussing on problem identification, objective definition, design and development, demonstration, evaluation and communication. In this approach, the team will develop an information system artifact through identifying business requirement and thereby defining a practicable solution to the existing problem (Hervner, 2004) in the organisation. The approach follows an interactive process of problem identification, solution design, system development and evaluation.

*Figure 1 Research design*

DSR Stages	Research objectives to be addressed	Proposed Methods of research	Expected results
Problem statement /motivation	Understanding the inefficiencies in manual house rent management system	Interviews Surveys Literature review	Summary of the strength and weaknesses of the manual house rent management system
Definition of objectives	To study, analyse and develop a digital house rent management system.	Literature review	To implement and evaluate the effectiveness of the system  To ensure data security and accessibility for

			landlords and tenants.
Design and Development	To design a house rent management system	System analysis, prototyping	Working prototype and documentation
Demonstration	To test the house rent management system that is developed	Deploy the system among selected landlords and tenants.	Demonstrate the system in a real-world environment.
Evaluation	To ensure data security and accessibility to landlords and tenants.	Usability testing, performance testing and questionnaire reviews.	Measured improvements in efficiency, user satisfaction and security assessment.
Communication	Completion of the report, upload and presentation of the system.	Presentation of the project.	Final project report, academic dissemination, stakeholder handover

### 3.2 Project Organisation (Client)

The client organization is Avance Properties, a real estate company that manages multiple rental units across Kampala and nearby districts. The system will serve both landlords and tenants.

### 3.3 Sources of data

Primary data that is; surveys and interviews will be conducted with landlords and tenants to understand current rental management challenges.

Secondary data: literature review of existing documents, articles, reports and journals about property management systems.

#### 3.3.1 Data collection techniques.

Document review will be used by the team to analyse existing documents such as maintenance requests rent ledgers receipt books which will provide of what must be digitised

and how record keeping can be used in the new system. Interviews will be conducted with the property managers, tenants, landlords and service providers to gather detailed description of user needs and expectations for the system. Mind-mapping session will be conducted with Avance properties' staff to visually explore system functions, user roles, required modules and workflows so as to identify missing system components and confirm the relationships between different features of the system.

### 3.3.2 System analysis and design approach / Design techniques.

The agile development model will be used allowing interactive prototyping, testing and refinement based on user feedback system design will employ UML diagrams, ER diagrams and prototypes.

### 3.4 Anticipated Project constraints

- i. Limited access to up-to-date software and hardware resources. The team plans to use a text editor (visual studio) and xampp for developing the system.
- ii. Possible delays in stakeholder feedback. The team plans to use questionnaire to gather feedback from the users.
- iii. Internet and power interruptions affecting collaborations
- iv. Limited time for full system testing.

### 3.5 Project development process

The project follows interactive stages: requirement analysis, design, development, testing, deployment and evaluation.

### 3.6 Ethical considerations

All collected data will be confidential and used solely for academic purposes. Participants will give informed consent, and no personal identifiers will be disclosed.

### 3.8.2 Population target and sample

The target population includes landlords and tenants residing in urban residential areas where rental transactions are prevalent. A purposive sampling technique will be used to select participants who have experience with property rentals. The sample size will consist of 5 landlords and 10 tenants, providing a balanced perspective from both the user groups to inform system requirements and usability.

### 3.8.3 Evaluation strategy

Usability testing: a group of landlords and tenants will test the system, and their feedback will be collected through structured questionnaires.

Performance metrics: the system will be evaluated based on efficiency, user satisfaction and security features.

### 3.9 Timeline and Milestones

The development of a house rent management system will follow a structured project timeline to ensure that all deliverables are completed systematically and within the allocated semester period. The time highlights major phases of the project expected durations and key milestones.

Figure 2 Table showing 12 week schedule ( proposed time ).

Week	Activity	Milestone
Week1	Topic selection, problem identification	Project topic approval
Week 2	Requirement elicitation (interviews, mind-mapping)	Requirements gathered
Week 3	Analysis of requirements, drafting use cases, data models system scope	System analysis completed
Week 4	designing system architecture, UI sketches	System design approval
Week 5	Development of tenant module UI	Tenant module prototype
Week 6	Development of service provider module UI	Service provider module prototype
Week 7	Development of admin/ landlord module UI	Admin/Landlord module prototype
Week 8	Implementation of login simulation, notification system and chats.	Core features integrated

Week 9	Testing system functionality and debugging	Prototype working
Week 10	Evaluation with users, collecting feedback.	Evaluation conducted
Week 11	Refining system based on feedback, polishing UI	Final prototype refined
Week 12	Final documentation and submission.	Project submission

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