ARDHI UNIVERSITY

SCHOOL OF EARTH SCIENCE, REAL ESTATE, BUSINESS AND INFORMATICS (SERBI)

DEPARTMENT OF COMPUTER SYSTEM AND MATHEMATICS (CSM)

BSC. INFORMATION SYSTEMS MANAGEMENT (BSC.ISM)

COURSE CODE: IS394

COURSE NAME: DISSERTATION

YEARS:3 2023/2024

TITLE: FARM RENTAL SYSTEM

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REGISTRATION NUMBER: 26996/T.2021

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1. Statement Of the problem

For beginning farmers, renting farmland is a common method of establishing a farm business. Compared to purchasing farmland, renting is often much more affordable and is a good fit for farmers with limited startup funds. In Tanzania, mostly of farmers struggle for the inefficiency and lack of a streamlined process in the current farm renting practices which is manually based. This includes challenges in connecting farmers with available resources especially land at the right time and place. The knowledge void lies in the scarcity of digital solutions that specifically address the unique needs of Tanzanian farmers in the real time of farm renting.

2. Requirement Analysis

Requirement analysis for a Farm rental system involves understanding the needs and expectations of stakeholders to ensure that the system meets their requirements. The requirement analysis document collects, organizes, and tracks the project requirements from key stakeholders. It guides project planning and ensures you complete project aligned with stakeholder and business goals. The questionnaire methodology was used to acquire all the requirements that make the system to perform the functions intended for with the aid of google form tool for requirements collection.

3. Hardware Requirement

In the context of a Farm Rental System, hardware requirements play a crucial role in ensuring seamless functionality and accessibility across various devices. Client devices, including mobile phones and computers, form the primary interface through which users interact with the system.

Personal Computer

1. Processor (CPU)

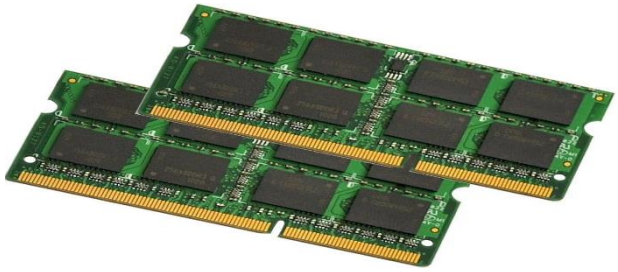
   Minimum Requirement: Quad-core Intel Core i5 or AMD Ryzen 5 processor.

   Recommended: Hexa-core Intel Core i7 or AMD Ryzen 7 processor for enhanced performance.

2. Memory (RAM)

   Minimum Requirement: 4GB DDR4 RAM.

   Recommended: 8GB DDR4 RAM for smoother multitasking and better overall performance.



3. Storage (Hard Drive)

   Minimum Requirement: 128GB Solid State Drive (SSD) for faster boot times and application loading.

   Recommended: 256GB SSD or higher for increased storage capacity and faster data access.

Mobile Phone

Mobile phones play a pivotal role in farm rental system by providing a portable interface for users to access and interact with the platform.

1. Processor (CPU)

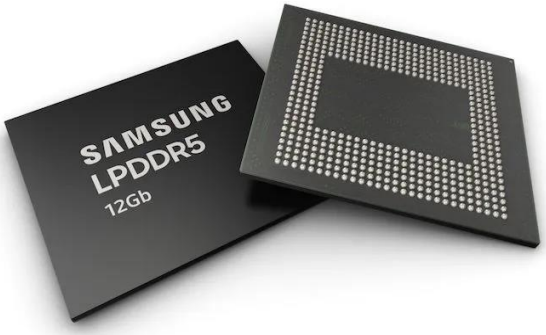
   Minimum Requirement: Octa-core processor with clock speed of at least 2.0 GHz.

   Recommended: Octa-core processor with clock speed of 2.5 GHz or higher for smoother performance and multitasking.

2. Memory (RAM)

   Minimum Requirement: 4-6GB RAM for decent multitasking capabilities.

   Recommended: 8-12GB RAM or higher for smoother multitasking, app switching, and better overall performance.



3. Storage (Internal Memory)

   Minimum Requirement: 32GB internal storage for storing apps, media, and files.

   Recommended: 64GB or higher internal storage for ample space and flexibility.

4. Software Requirement

In the development of a Farm Rental System, a suite of software components forms the foundation for its functionality and accessibility. The following software requirements will be required for the development and implementation of Farm rental system.

Hypertext Preprocessor (PHP).

In the context of a farm rental system, PHP plays a crucial role in developing and maintaining the online platform. Its versatility allows for the creation of dynamic web pages. PHP's integration with web servers ensures smooth operation, facilitating seamless communication between users and the system. Additionally, its database interaction capabilities enable efficient management of rental inventory and customer data, ensuring accurate tracking and timely updates.

HTML, CSS and JavaScript

HTML, CSS and JavaScript are going to be used in designing and develop the user interface of the web-based part of the system where by HTML is used for the structure of the web pages, CSS for the presentation and JavaScript for the behaviour of the web pages.

FLUTTER

Flutter, as a cross-platform UI toolkit, is going to be used in developing farm rental systems, offering multi-platform compatibility for Android smartphones, ensuring widespread accessibility. Its rich set of customizable widgets facilitates the creation of visually appealing interfaces, enhancing user experience. Flutter seamlessly integrates with backend services, allowing for efficient management of inventory, rental requests, and user authentication.

DART

Dart, as the primary programming language for Flutter development, empowers the creation of farm rental app by defining UI components, implementing business logic, and facilitating seamless integration with backend services. With its support for navigation, state management, and asynchronous programming,

Database management systems (DBMS)

To store and retrieve the data required for the proposed system, a reliable and efficient database management system is necessary. MYSQL is going to be used as preferred DBMS. MySQL integrated with platforms XAMPP for local development environments, serve as repositories for storing and managing application data. XAMPP, comprising Apache, MySQL and PHP, provides a convenient solution for setting up a local server environment.

Integrated Development Environment (IDE)

An integrated Development Environment (IDE) will be required for the development of the system. Visual studio Code (VS Code) will be used as the primary IDE for the system development as well as Android Studio.

Star UML and Draw.io

Star UML and Draw.io are going to be used as essential software tools for system design. These tools allow to create and manipulate various types of diagrams such as use case diagram and class diagram which are all necessary for the proper analysis and design of complex system.

5. User Requirements

User requirements, often regarded as the cornerstone of any system development endeavor, encapsulate the needs, preferences, and expectations of the end-users. In the context of a Farm Rental System, understanding the user requirements is paramount to crafting a solution that resonates with the agricultural community, facilitating seamless interaction and satisfaction.

This system consists of four users (Admin, farmer, extension officer and renter).

Functional requirement

i. The system shall allow users to register and log in.
ii. The system shall allow admin to manage all users.
iii. The system shall allow land owner(farmer)to post farm's photo and description and legal documents about farm to Extension officer.
iv. The system shall allow Extension officer to approval farms posted by farmer
v. The system shall allow land owner(farmer) to see the all-listed farms ready for rent
vi. The system shall allow Renter to view all listed farms for rent

vii. The system shall allow Renter to rent farm
viii. The system shall allow land owner(farmer) to confirm the rented farm
ix. The system shall allow users to log out

Non functional Requirement

i. Performance: The system should be responsive and scalable to handle a large number of users and listings.
ii. Security: Implementation of secure authentication, essential data encryption, and protection against common web vulnerabilities.
iii. Reliability: The system should be available and reliable, minimizing downtime and ensuring data integrity.
iv. Usability: The user interface should be intuitive and easy to navigate for both farmers and renters.
v. Compatibility: The system should be compatible with different devices and browsers.

Assumptions

The proposed system shall adhere to the following assumptions

i. Users have basic computer skills and can access the internet
ii. Users have access to the necessary hardware required to access the system
iii. Users have reliable internet connectivity.

SPECIFIC OBTECTIVE 02.

1.Introduction

The purpose of the System Design Document (SDD) for the farm rental system is to streamline and modernize the rental process, providing a comprehensive framework for managing farm rentals efficiently. By documenting the system's requirements, architecture, and functionalities, the SDD aims to facilitate the development of a user-friendly digital platform tailored to the needs of both land owner and renter. Key objectives include enhancing accessibility to farm rental opportunities, improving transparency in rental negotiations, and promoting sustainable rental management practices.

The scope of the SDD encompasses various aspects of the farm rental process, including but not limited. It involves defining user roles and permissions, designing interfaces and implementing robust data management protocols. Additionally, the SDD outlines strategies for stakeholder engagement, training, and support to facilitate the adoption and utilization of the digital platform. Ultimately, the goal is to create a cohesive and efficient ecosystem that fosters mutually beneficial relationships between landowners and renter while promoting the sustainable use of agricultural land resources.

2. System architecture

The system architecture for the farm rental platform integrates a robust blend of hardware and software components to enable seamless and efficient management of farm rental activities. The farm rental platform uses computers and software to make it easy for people to rent and manage farmland. It uses special technology to handle lots of users and keep the system running smoothly. Different parts of the system work independently but can still talk to each other, making it flexible and easy to update. It also keeps all the information about land and rentals organized and secure.

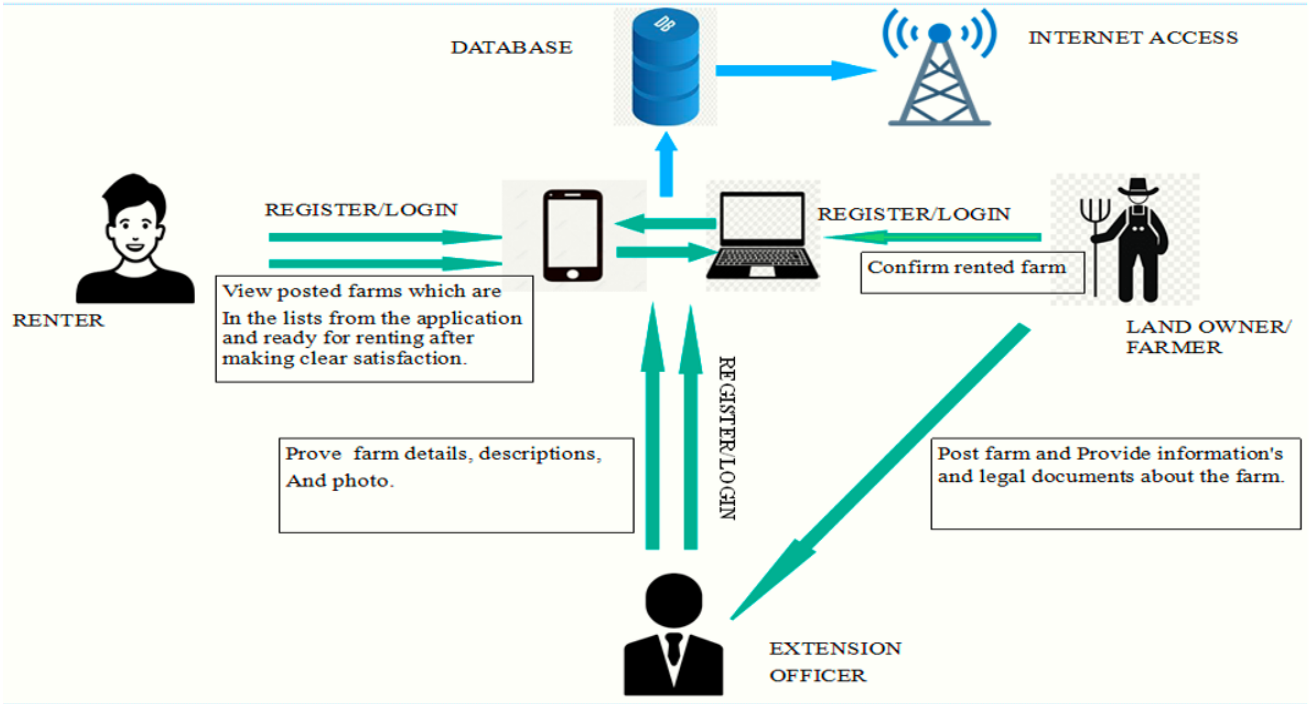


Fig 2.1 Showing the system architecture for farm rental system.

Use Case Diagram

The Use Case Diagram visually illustrates the interactions between users (actors) and the farm rental system, depicting various functionalities which facilitate the whole system activities. Through this diagram, stakeholders gain a comprehensive understanding of the system's capabilities and user interactions, facilitating effective communication and requirements analysis during the design and development process.

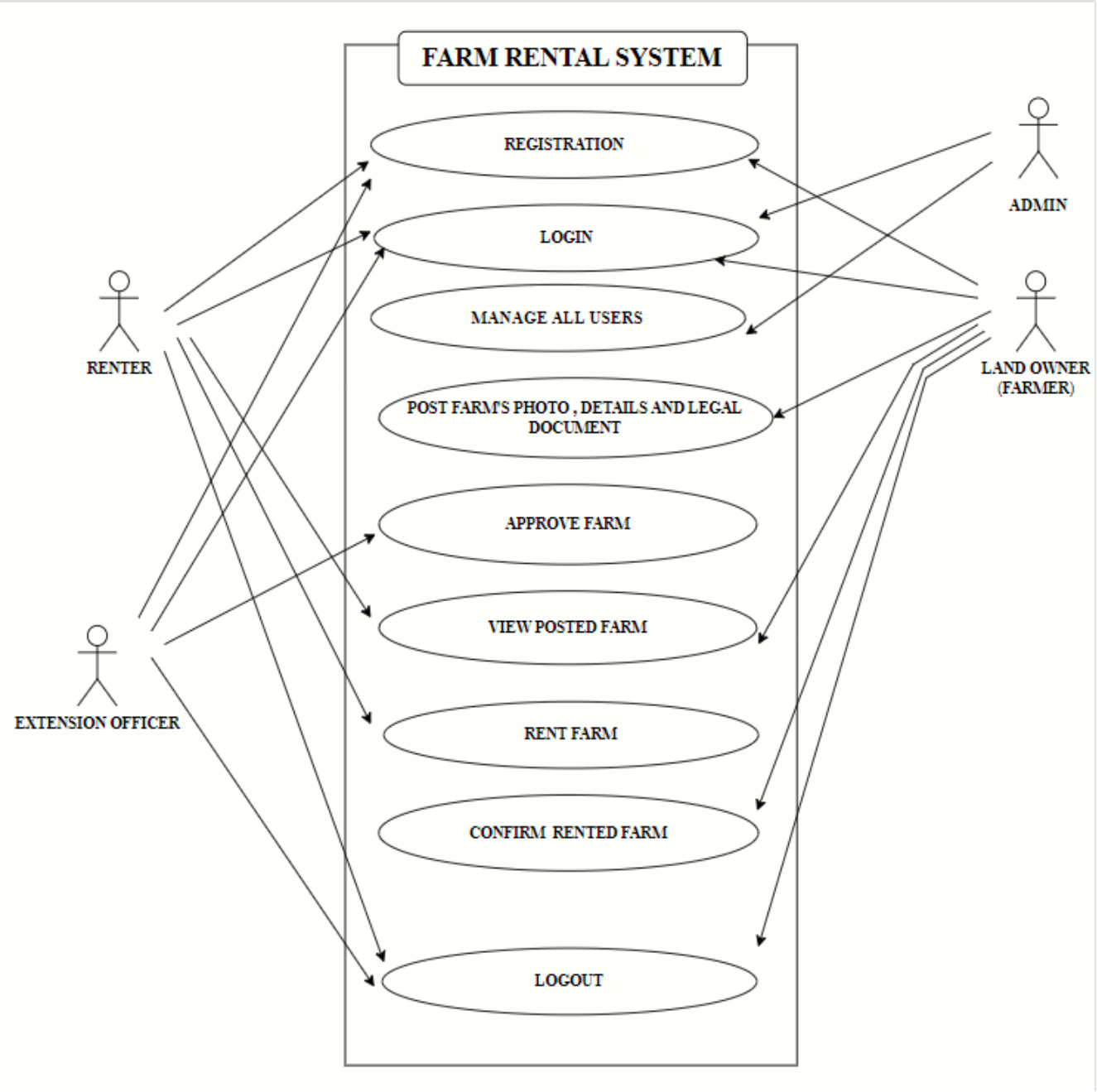


Fig 2.2 Showing use case for farm rental system.

Class Diagram

Illustrates the static structure of the Farm rental system by showing classes, their attributes, methods, and relationships.

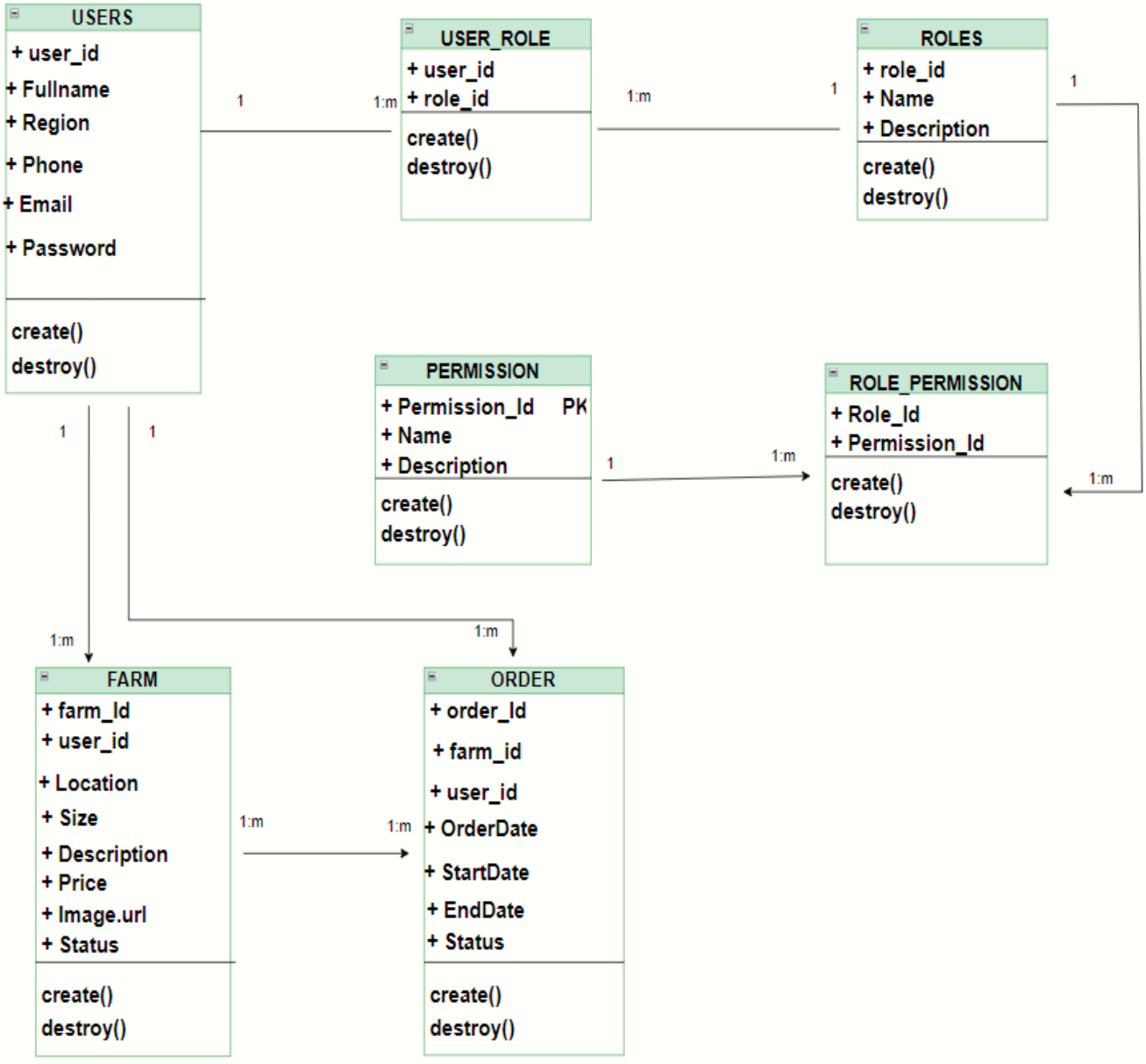


Fig 2.2 Showing class diagram for farm rental system