THE STATE UNIVERSITY OF ZANZIBAR

SCHOOL OF SOCIAL AND NATURAL

SCIENCE DEPARTMENT OF SOCIAL

SCIENCE TUNGUU CAMPUS.

PROJECT TITLE: **AGRICULTURE MANAGEMENT SYSTEM**

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REG NO. **BITAM/9/21/026/TZ**

SUPERVISOR **DR HUSSEIN SHAABAN**

SIGNATURE **…….**

This project report is submitted in partial fulfillment of the requirements for the award of a Bachelor Degree in Information Technology Application and Management(BITAM)

DECLARATION (plagiarism)

I, DAIFAT MUSSA OTHMAN, hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text

Name……..

Date……/……/……..

Signature……

ABSTRACT

The Agriculture Management System is a robust and innovative platform designed to empower farmers by providing them with essential tools and information for effective crop management. This system is tailored to address the specific needs of farmers by enabling them to input and track critical post-harvest data, manage and monitor their farming expenses, and gain access to detailed and localized information about stores offering seeds, fertilizers, and other necessary agricultural tools and supplies.

In addition to serving as a comprehensive resource for farmers, the system also facilitates the involvement of registered contributors who are experts in the field of agriculture. These contributors provide valuable insights and guidelines on optimal farming practices, offering advice on the best times to plant and harvest crops to ensure maximum yield and profit. By integrating expert knowledge with real-time data, the system supports farmers in making informed decisions, enhancing the efficiency and effectiveness of their farming operations.

The Agriculture Management System is designed not only to streamline farming processes but also to contribute significantly to improving overall agricultural productivity. By bridging gaps in information, providing crucial resources, and fostering collaboration between farmers and agricultural experts, this system represents a significant step forward in the modernization and sustainability of farming practices. Ultimately, it aims to empower farmers, boost agricultural output, and contribute to food security and economic development in farming communities.

DEDICATIONS

This project is dedicated to all the hardworking farmers who strive daily to cultivate the land and feed our communities. Your relentless efforts inspire innovation and progress in agricultural technology.

I also dedicate this work to my beloved family, whose unwavering support, belief in my abilities, and constant encouragement have been the bedrock of my academic journey. Your faith in me has been my guiding light, providing the strength I needed to overcome obstacles and persevere.

Finally, I wish to dedicate this project to the STATE UNIVERSITY OF ZANZIBAR. The knowledge, wisdom, and encouragement imparted to me by this university have been invaluable in shaping my academic and professional growth. The university has not only provided me with the tools to succeed but also instilled in me a sense of purpose and the confidence to conduct and complete this project.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to my project supervisor, Dr. Hussein Shaaban, for his exceptional guidance, unwavering support, and insightful feedback throughout the course of this project. His profound expertise, patience, and dedication have been instrumental in navigating the complexities of this research and ensuring its successful completion.

Dr. Shaaban's mentorship has been a source of inspiration and a key factor in the development of this work.

I extend my sincere thanks to the State University of Zanzibar(SUZA) for providing the invaluable resources, academic environment, and knowledge base that empowered me to undertake and complete this project. The institution's support and commitment to fostering academic growth have been crucial in my educational journey and the successful execution of this project.

I am profoundly grateful to my family for their unconditional love, unwavering support, and constant encouragement. Their belief in me has been the cornerstone of my academic achievements and personal growth, providing me with the strength and motivation to persevere through challenges and achieve my goals.

I would also like to acknowledge my colleagues and friends, whose assistance, encouragement, and constructive feedback have greatly contributed to the research and development phases of this project. Their collaborative spirit and valuable insights have enriched the project and helped refine its outcomes.

Special thanks are due to the farmers and agricultural experts who generously shared their experiences and practical insights. Their contributions have been crucial in shaping the project, ensuring its relevance and effectiveness in addressing real-world agricultural challenges. Their expertise and willingness to engage in this process have added immense value to the work.

Thank you all for your unwavering support and contributions, which have been vital in bringing this project to fruition.

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CHAPTER 1: Introduction

1.1. INTRODUCTION

Agriculture management system aims to provide farmers with valuable data and analysis to enhance decision-making in crop management.
The system helps optimize resource allocation, improve yield predictions, and implement precision farming techniques, ultimately promoting more efficient and sustainable agricultural practice

1.2. PROJECT BACKGROUND AND MOTIVATION

Currently, the farmers observe their fellow farmers in their community and imitate their techniques without having the knowledge about that certain crop, also the farmers don’t know how much they exactly used when they finish farming the thing which lead the farmers to get the loss instead of profit.
So the system will include information on crop cultivation, and will provide budget template for crop cultivation to assist farmers in managing their expenses effectively.

1.3. PROBLEM STATEMENT

The existing agriculture management system primarily focuses on the needs of mainland Tanzania, leaving significant gaps in its applicability to Zanzibar. This lack of localized information limits Zanzibar farmers' ability to optimize their crop yields and make informed decisions. Additionally, the system fails to offer a comprehensive budgeting tool, making it difficult for farmers to manage their expenses effectively, which could lead to financial mismanagement.

Finally, the system lacks a feature for post-harvest data input, preventing farmers from tracking critical metrics like yields and profits. This omission hinders farmers from assessing their performance and making data-driven decisions for future farming activities. If these issues are not addressed, the system will continue to fall short in supporting the agricultural needs of Zanzibar, potentially leading to reduced productivity and financial losses for farmers.

1.4. PROBLEMS SOLUTION AND SCOPE

PROBLEM SOLUTION

- To include information on crop cultivation in Zanzibar like the location of shop for farming resources.
- Development of a detailed budget template for crop cultivation to assist farmers in managing their expenses effectively.
- Inclusion of crop-specific information and resources.
- Integration of a feature for farmers to input post-harvest data, such as yields and profits.

SCOPE

1. **Geographical Scope:**
    - The system will cover Zanzibar, providing information and support tailored to the specific agricultural practices and needs of farmers in the regions.
2. **Crop Cultivation:**
    - The system will extensively focus on crop cultivation, offering guidance on various crops, cultivation techniques, and best practices.
3. **Budgeting and Financial Management:**
    - A comprehensive budgeting tool will be included to assist farmers in planning, tracking, and managing their expenses related to crop cultivation.
4. **Post-Harvest Data Input:**
    - A feature will be integrated to allow farmers to input information post-harvest, such as yields and profits, enabling them to analyze the success of their cultivation efforts and make informed decisions for future seasons.
5. **User-Friendly Interface:**
    - The system will have an intuitive and user-friendly interface, making it accessible to farmers with varying levels of technological expertise.

6. **Education and Resources:**

    - In addition to cultivation and budgeting tools, the system will provide educational resources, and guidelines to empower farmers with knowledge and skills for sustainable and successful crop cultivation.

7. **Collaboration with Local Stores:**

    - Information on reputable local stores for obtaining fertilizers and pesticides will be included.

1.5 OBJECTIVES

MAIN OBJECTIVE

The main objective of this project is to develop and enhance an agriculture management system that provides comprehensive, and accessible support for farmers, enabling them to effectively manage crop cultivation, expenses, and post-harvest data.

SPECIFIC OBJECTIVES

- ❖ To develop a feature that allows farmers to input and track post-harvest data, including yields and profits, to facilitate better decision-making and performance evaluation.
- ❖ To predict and optimize crop yield by analyzing historical data, to identify the best practices for maximizing productivity.
- ❖ Provide educational resources and within the system to help farmers improve their knowledge of modern agricultural techniques and sustainable farming practices.
- ❖ Develop a feedback mechanism that allows farmers to report issues, suggest improvements, and provide insights on the system's usability, ensuring continuous improvement based on user input.

1.6 FEASIBILITY STUDY REPORT

- ✓ Technically, the project can be performed as there is availability of hardware and software needed, and the one to implement the system is also available with required skills.
- ✓ Economically, the system doesn't need huge amount of money, and it will help to reduce the loss which most of the farmers face due to lack of tracking expenses tools and due to farming in wrong seasons because of lack of information.
- ✓ Legally, the system doesn't have any conflict with legal issues and it is legally acceptable by laws.

1.7 ORGANIZATION OF THE PROJECT

- ➢ Chapter One is the introductory part of the project showing why the project is undertaken. It also presents the problems, the purpose of the study, the scope and limitations.
- ➢ Chapter Two is the review of literature.
- ➢ Chapter three is Research Methodology. This chapter discusses the methodology of the research the source of data and the procedure for collecting the data, analysis of the data and the system and fixing the requirements specification.
- ➢ Chapter Four is System design and so on.

CHAPTER 2: Literature review

2.1) INTRODUCTION

Agricultural management systems play a pivotal role in enhancing the productivity and sustainability of farming practices. These systems are designed to assist farmers in various aspects of crop management, resource allocation, and decision-making processes. However, existing systems often fall. This chapter provides a review of the existing agricultural management systems, identifies gaps in their functionality, and outlines the necessary enhancements to meet the specific needs of farming community.

2.2) RELATED WORK

BareFoot International Limited is an agribusiness company registered in Tanzania for the purpose of importation and supply of quality agricultural inputs including fertilizers, seeds, agrochemicals, farm equipment, farm structure materials, greenhouse supplies and installation, and accessories for irrigation (Registration 128811, 2016).

https://bfi.co.tz/

2.3) PREVIOUS SYSTEMS (OR SIMILAR APPLICATIONS)

- http://www.mkulima.sua.ac.tz/handle/123/753

Figure 1:screen shot of existing system from sua

- The system runs on any platform that supports a web browser like desktop, mobile devices, tablets.

2.4) lessons learnt from the review

The review of existing agricultural management systems highlights several critical lessons. Firstly, there is a clear need for systems that provide education on how to farm certain crops not just see the importance of the crops.

Secondly, the lack of a detailed budgeting tool in the existing systems underscores the need for more robust financial management features that can help farmers track their expenses

2.5) a critique of the review

While the existing literature and systems provide a solid foundation for agricultural management, they are not without their shortcomings.

One of the most significant gap is the absence of a comprehensive budgeting tool limits farmers' ability to manage their finances effectively and the lack of post-harvest management features is a significant oversight, as this is a crucial aspect of farming that directly impacts profitability and sustainability.

2.6) conclusion of the chapter

This chapter has provided a comprehensive review of existing agricultural management systems, identifying both their strengths and limitations. The analysis has revealed several critical gaps. These gaps include the inadequate financial management tools, location of local stores and products provided. The review underscores the need for an enhanced agricultural management system that provide detailed budgeting tools, and features for managing post-harvest data. By addressing these gaps, the new system can significantly improve the productivity and sustainability of farming practices.

CHAPTER 3: Project Methodology

3.1. INTRODUCTION

The methodology chapter outlines the processes and approaches utilized to develop the Agriculture Management System. This chapter provides a comprehensive overview of the software development approach, the chosen Software Development Life Cycle (SDLC) model, and the tools and techniques employed throughout the project. The selected methodologies are aligned with the project's objectives, ensuring that the system is robust, flexible, and user-centric. This chapter will also explain the rationale behind choosing an Object-Oriented Approach and the Agile methodology, highlighting their benefits in addressing the complexities and dynamic nature of agricultural management.

3.2. SOFTWARE DEVELOPMENT APPROACH (OBJECT ORIENTED OR STRUCTURED)

In developing the Agriculture Management System, an Object-Oriented Approach was adopted. This approach is well-suited as it emphasizes modularity, reusability, and scalability.

The Object-Oriented Approach organizes software design around data, or objects, rather than functions and logic. Each object represents a real-world entity, such as a farmer, crop, or store, encapsulating data and behavior that are relevant to that entity.

3.3. SOFTWARE DEVELOPMENT LIFE CYCLE MODEL (SDLC)

I used Agile, because agile breaks down larger projects into small, manageable chunks called iterations, also changes can take place at any phase and the highest priority is to satisfy customer.

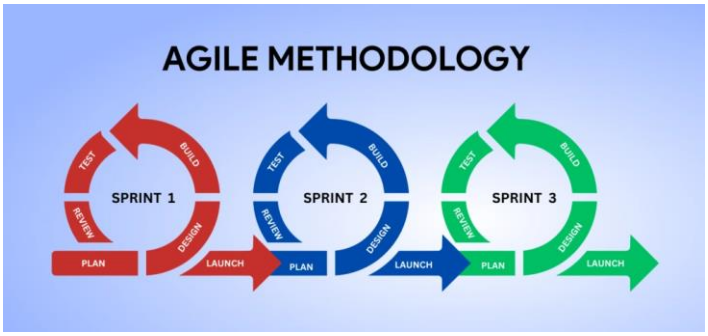

Figure 2:Agile methodology

3.4. SOFTWARE DEVELOPMENT TOOLS

i. For designing: draw.io, ER-Plus
ii. System development platform:
    a) DBMS: PostgreSQL
    b) Front-end tools: react
    c) Back-end tools: spring boot
    d) Testing tool: Swagger.

3.5. INFORMATION GATHERING AND ANALYSIS

- ✓ Interview: Conducted oral interviews with farmers and agricultural educators to gain firsthand insights into the farming process. These interviews provided valuable information on the day-to-day challenges farmers face, including resource acquisition, crop management, and the impact of environmental factors on farming practices.
- ✓ Literature Review: Carried out extensive research on existing agricultural management systems to identify their strengths and weaknesses. This analysis highlighted critical gaps in current systems, particularly in areas such as expenses tools.

3.6. SYSTEM ANALYSIS

USE CASE DIAGRAM

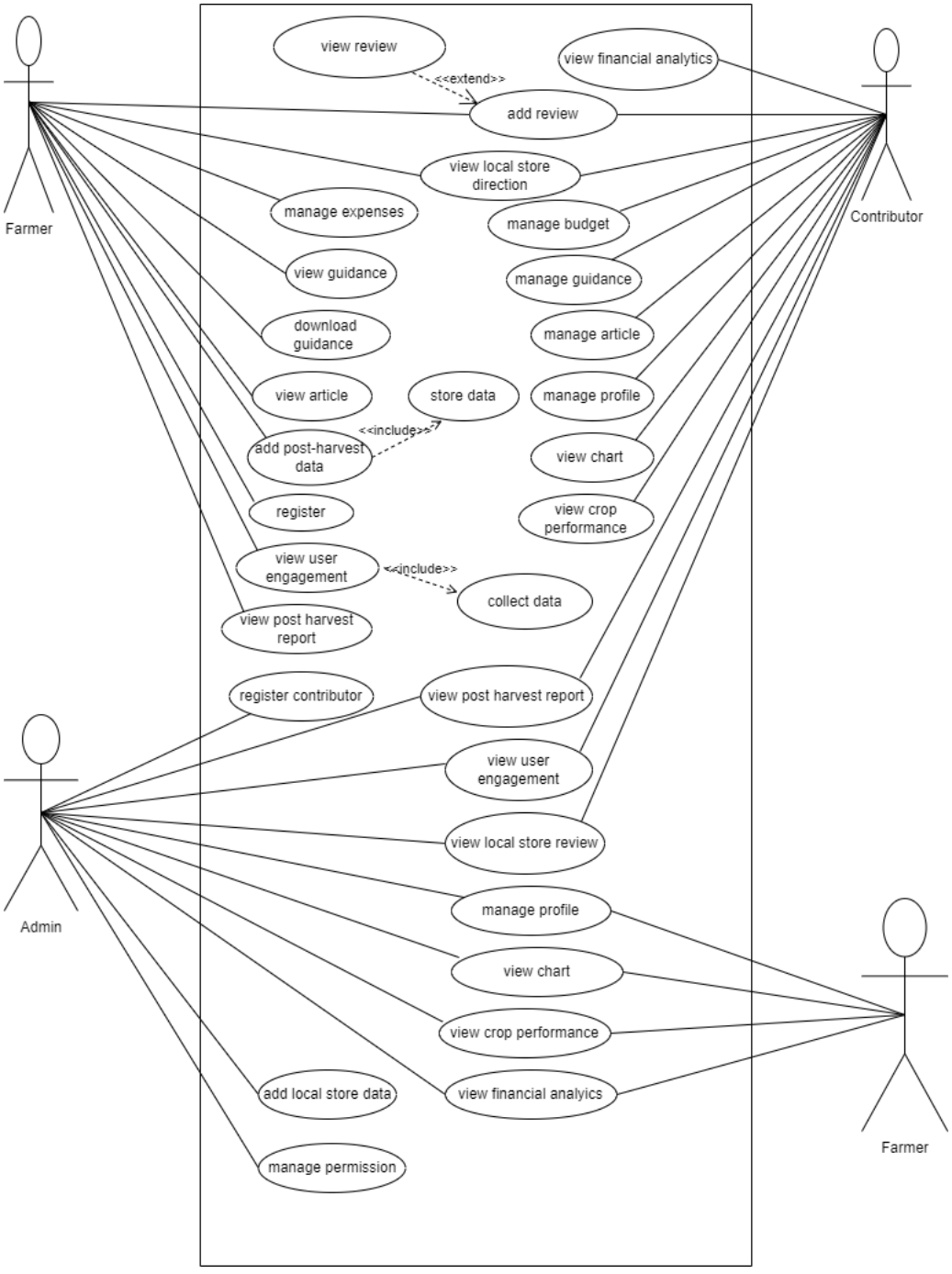

Figure 3:usecase diagram

SEQUENCE DIAGRAM

Farmer self registration UML Sequence diagram

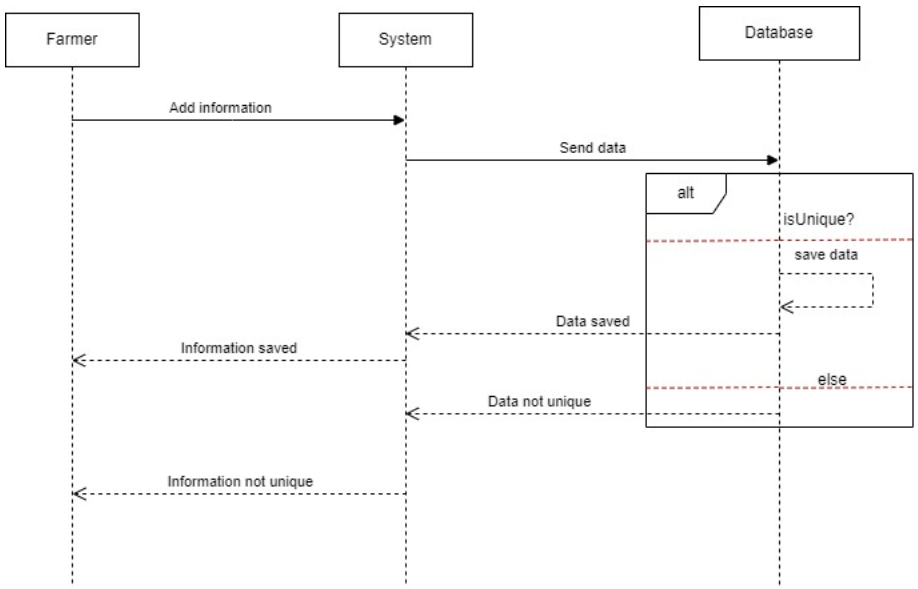

Figure 4:Farmer self registration sequence diagram

Login UML Sequence diagram

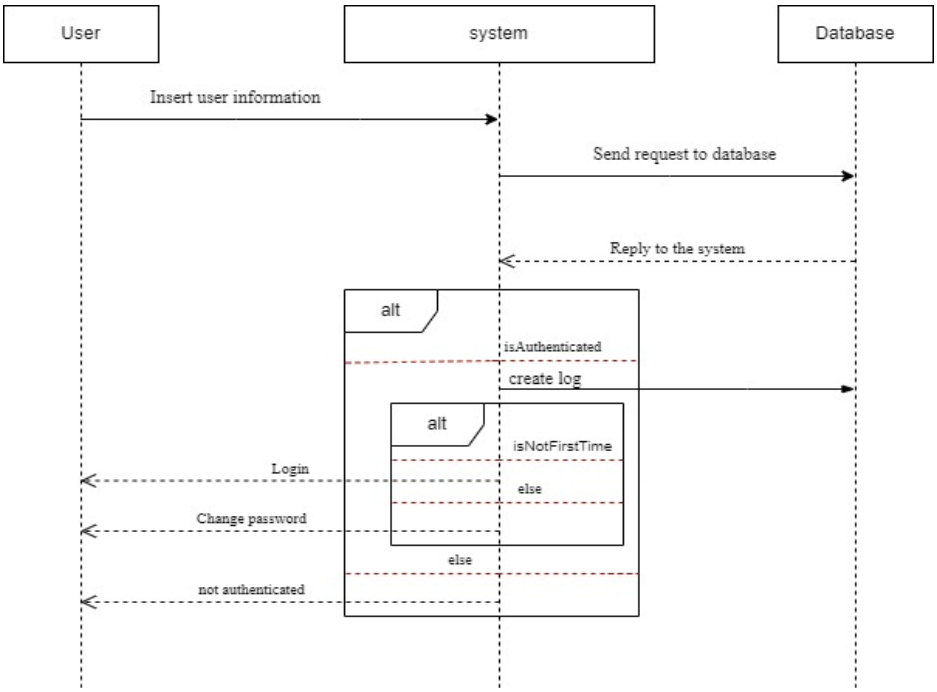

Figure 5:Login sequence diagram

Logout UML Sequence diagram

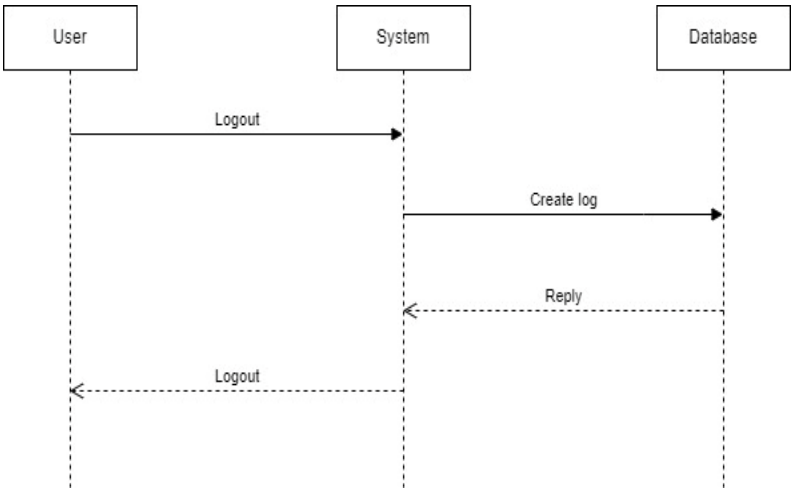

Figure 6:Logout sequence diagram

Manage Data UML Sequence diagram

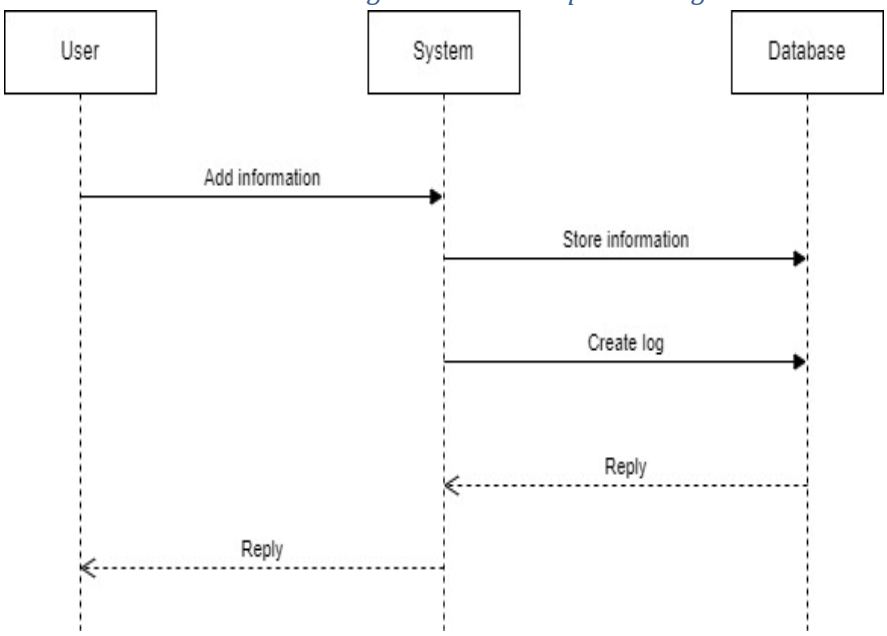

Figure 7:manage data sequence diagram

Download UML Sequence diagram

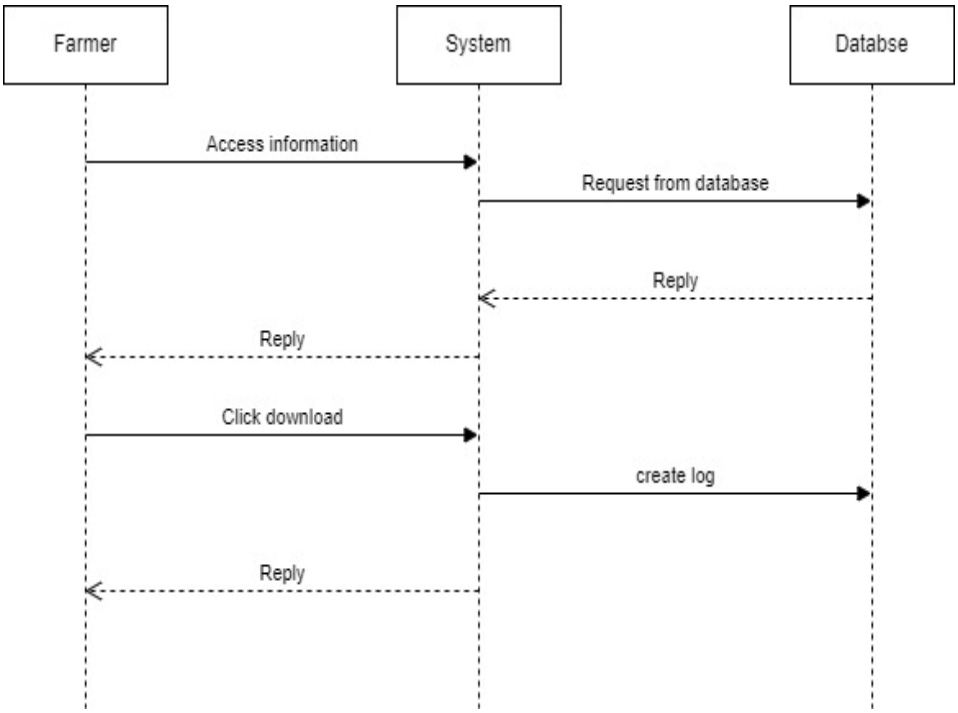

Figure 8:download sequence diagram

CLASS DIAGRAM

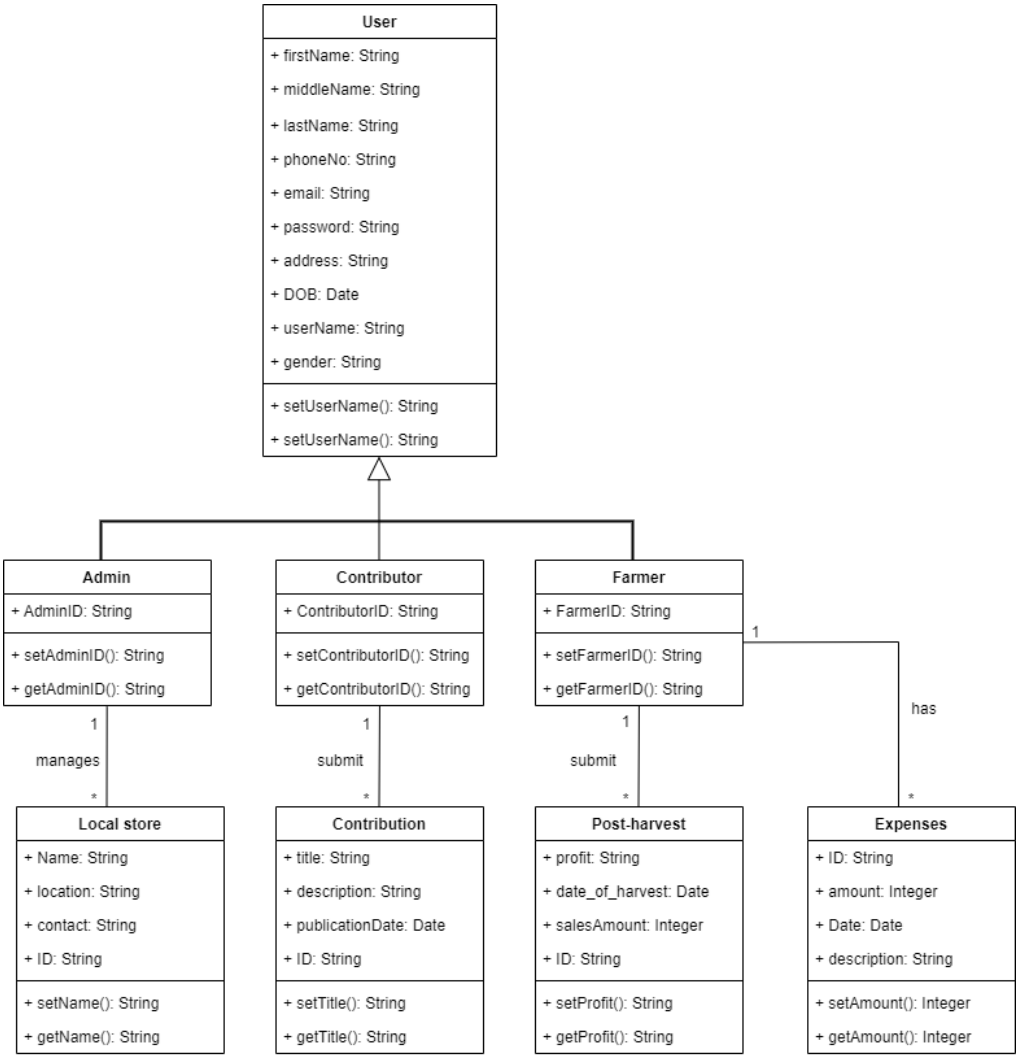

Figure 9:class diagram

CHAPTER 4: System Analysis

4.1. Existing System

4.1.1. Existing System Description

The current system utilized by the organization involves deploying agricultural experts to rural villages, where they conduct in-person training sessions for farmers. These sessions are designed to educate farmers on best practices in crop cultivation, pest management, and other essential farming techniques. While this approach allows for direct interaction and tailored guidance, it has significant drawbacks.

First, the time and resources required to coordinate and carry out these visits are substantial. Experts must travel to remote areas, which can be logistically challenging and expensive, especially in regions with limited infrastructure. Additionally, the effectiveness of this method is limited by the availability of the experts, meaning that farmers may only receive sporadic support.

Second, this system is not scalable. As the demand for expert knowledge grows, the organization's ability to meet the needs of all farmers diminishes, leading to gaps in education and support. The reliance on periodic visits also means that farmers may not receive timely advice during critical phases of the farming cycle.

Overall, while the existing system provides valuable knowledge to farmers, its inefficiency in terms of time, cost, and scalability presents significant challenges that hinder its effectiveness in the long term.

4.1.2. Business Rules

- Face-to-Face Consultations.
- Manual Record-Keeping.
- Paper-Based Budgeting

4.2. Requirements Specification

4.2.1. Functional Requirements

- Farmers should be able to create accounts, log in securely, and manage their profiles.
- User roles should be defined, such as regular farmers, administrators, and contributors.
- farmers should be able to input expenses related to crop cultivation.
- Farmers should be able to input data post-harvest such as sales and profits.
- It should include directory of local stores.
- Farmers should be able to give comment related to local store.
- It should include information on crop varieties, cultivation techniques, pest management, and safety measures.

4.2.2. Non-functional requirements

- **Fault Tolerance:** Implement mechanisms to handle system failures gracefully, ensuring minimal disruption to users.
- **Response Time:** The system should provide quick responses to user interactions, with minimal latency.
- **Scalability:** The system should be scalable to handle an increasing number of users and data over time.
- **Throughput:** Ensure that the system can efficiently process a large number of simultaneous transactions.
- **Access Controls:** Define and enforce access controls to ensure that users can only access data and functionalities relevant to their roles.

4.2.3. Performance Requirements

- System Response Time: Page loading times should not exceed 5 seconds for any module or page within the application.
- Security: The system must protect sensitive user data by employing encryption protocols
- The system must ensure that all data entered by users is accurately stored and maintained, with no loss of information during processing or retrieval.

4.2.4. Software and Hardware Requirements

HARDWARE:

- ✓ A personal computer, which has 4-8 RAM, corei5.

SOFTWARE:

- ✓ **FRONT END TOOLS:**

  HTML, CSS, BOOTSRAP, REACT.

- ✓ **BACKEND TOOLS:**

  Java, spring boot.

DATABASE: PostgreSQL

IDE: Visual Studio Code.

OPERATING SYSTEM: Windows11.

BROWSER: Chrome.

4.2.5. Preliminary Product Description

4.2.5.1. System Functions and Operations

- **User Roles:**
    - **Farmers:** Input and manage their farming data, track expenses, and access local store information.
    - **Contributors:** Contribute knowledge and guidelines on best farming practices, including articles and guidance.
    - **Administrators:** Oversee the system's operation, manage user accounts, and ensure data integrity.
- **Core Functions:**
    - **Data Management:** Collection, storage, and retrieval of agricultural data, including post-harvest yields and expenses.
    - **Budgeting:** Tools for creating, managing, and tracking budgets, helping farmers allocate resources effectively.
    - **Resource Access:** Information on local stores, including the availability of seeds, fertilizers, and tools.
    - **Expert Contributions:** A platform for agricultural experts to share insights and best practices with the farming community.

CHAPTER 5: System Design

5.1. Architectural design

1. **Presentation Layer:**

- Web Application (React): A responsive web interface that allows users to interact with the system via a browser.
- System Interface (React): A separate system interface, offering specialized functionalities distinct from the web application.

2. **Application Layer:**

- Business Logic: Acts as a bridge between the presentation layer and the database. This layer handles the core logic of the application, managing requests, processing data, and implementing the business rules.

3. **Data Layer:**

- Database (PostgreSQL): Stores all the system's data, including user information, agricultural data, and other relevant records. This layer ensures data persistence and integrity.

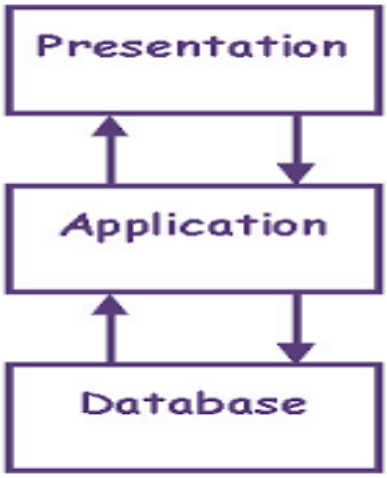

Figure 10:architecture

5.2. Database Design

5.2.1. Relational Model

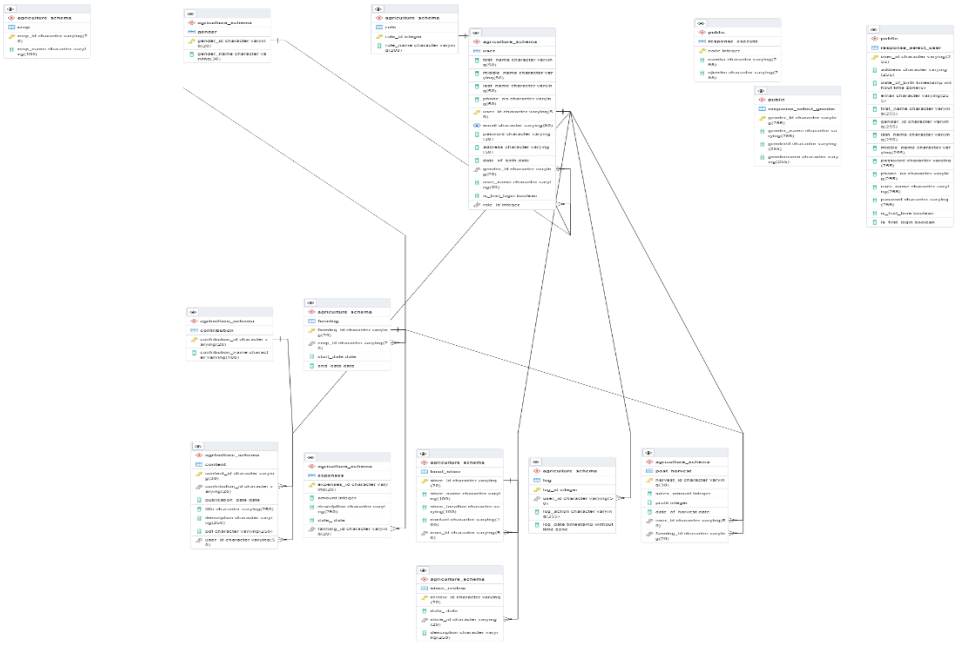

Figure 11:relational model

5.2.2. Data Description

Table: user

Description:

The user table is designed to store personal and authentication details for users within the agriculture management system. It includes essential information such as names, contact details, and login credentials. This table also tracks user roles, first login status, and gender information.

Columns:

- **first_name** (character varying(50)): The user's first name. This field stores up to 50 characters and is used to identify users in a personalized manner.
- **middle_name** (character varying(50)): The user's middle name, if applicable. It can also store up to 50 characters.
- **last_name** (character varying(50)): The user's last name. This field is also capped at 50 characters and is used for complete identification.
- **phone_no** (character varying(50)): The user's phone number. It accommodates up to 50 characters, providing contact information.

- **user_id** (character varying(50), **NOT NULL**): A unique identifier for each user. This column is the primary key of the table, ensuring that each user record is distinct and identifiable.
- **email** (character varying(50)): The user's email address. It is used for communication and authentication purposes, with a maximum length of 50 characters.
- **password** (text): The user's password. Note that passwords should be securely hashed before storage. This field allows for storing hashed password values.
- **address** (character varying(50)): The user's residential address, which can include up to 50 characters. This helps in identifying the user's location.
- **date_of_birth** (date): The user's date of birth. This field stores the birthdate in a date format, which is useful for age verification and demographic analysis.
- **gender_id** (character varying(20)): A foreign key referencing the gender table. This column associates users with gender records and is used for gender-related information and filtering.
- **user_name** (character varying(30)): A unique username chosen by the user for logging in to the system. This field is unique across the table, allowing users to have distinct login credentials.
- **is_first_login** (boolean, **DEFAULT true**): Indicates whether the user is logging in for the first time. This boolean field helps manage user onboarding processes.
- **role_** (character varying(200)): Describes the role(s) assigned to the user within the system. This field can accommodate up to 200 characters and helps in defining user permissions and responsibilities.

Constraints:

- **Primary Key (user_id)**: Enforces uniqueness and identifies each user uniquely within the table.
- **Unique (user_name)**: Ensures that each username is unique across the system, preventing duplicate usernames.
- **Foreign Key (gender_id)**: Maintains referential integrity by linking to the gender table. It ensures that the gender ID in the user table matches a valid entry in the gender table.

5.3. User Interface Design

5.3.1. Forms and Reports

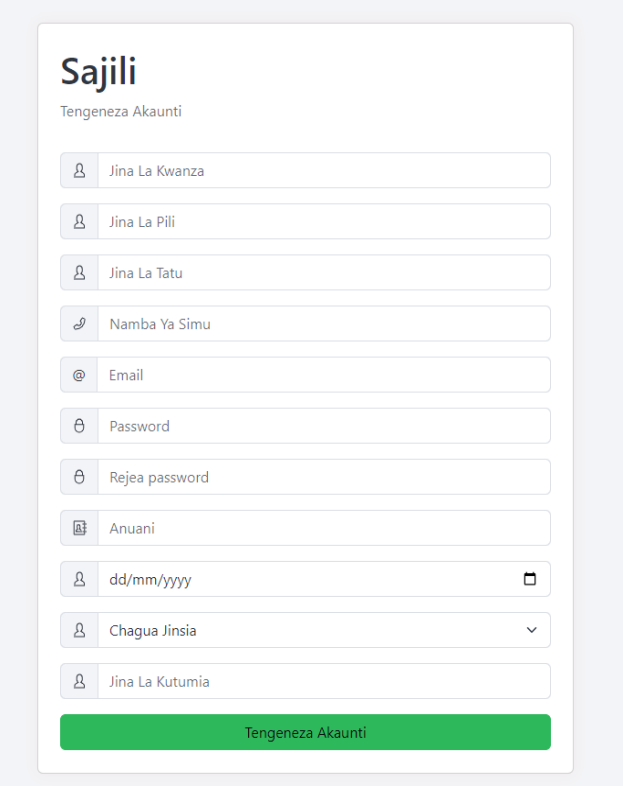

Figure 12:farmer registration form

Figure 13:report

5.4. Access control and security

- **Farmers:** Input and manage their farming data, track expenses, and access local store information.
- **Contributors:** Contribute knowledge and guidelines on best farming practices, including articles and guidance.
- **Administrators:** Oversee the system's operation, manage user accounts, and ensure data integrity.

CHAPTER 6: System implementation and testing

6.1. Technologies

- Java – Spring boot

```java
@PostMapping(path = "/select-postharvest", consumes = "application/json", produces = "application/json
public ResponseMain selectHarvest(@RequestBody RequestSelectPostharvest request) {
  ResponseMain responseMain = new ResponseMain();
  List<ResponseSelectPostharvest> listResponseSelectharvest = repositorySelectPostharvest.selectHarves
      request.getHarvestId(),
      request.getSalesAmount(),
      request.getProfit(),
      request.getDateOfHarvest(),
      request.getUserId(),
      request.getFarmingId());

  responseMain.setCode(i:200);
  responseMain.setData(listResponseSelectharvest);
  responseMain.setUjumbe(ujumbe:"Umefanikiwa");
  return responseMain;
}

@PostMapping(path = "/delete-postharvest", consumes = "application/json", produces = "application/json
```

Figure 14:Java codes

- React

```jsx
import React, { useState, useEffect } from 'react';
import DataGrid, {
  Column,
  Editing,
  Popup,
  Form,
  FormItem,
  SearchPanel,
  FilterRow,
  Scrolling,
  Paging,
  Lookup,
  Pager,
} from 'devextreme-react/data-grid';
import axios from 'axios';
import { ToastContainer, toast } from 'react-toastify';
import 'react-toastify/dist/ReactToastify.css';
import { useNavigate } from 'react-router-dom';

function Localstore() {
  const [data, setData] = useState([]);
  const [users, setUsers] = useState([]);
  const navigate = useNavigate();
```

Figure 15:react codes

6.2. Database implementation

6.2.1. Data Dictionary

Table: User

Description: stores user account information

Column Name	Data Type	Size	Constraints	Description
`first_name`	`character varying`	50	None	The first name of the user.
`middle_name`	`character varying`	50	None	The middle name of the user.
`last_name`	`character varying`	50	None	The last name of the user.
`phone_no`	`character varying`	50	None	The phone number of the user.
`user_id`	`character varying`	50	PRIMARY KEY, NOT NULL	A unique identifier for the user.
`email`	`character varying`	50	None	The email address of the user.
`password`	`text`		None	The password of the user.
`address`	`character varying`	50	None	The address of the user.
`date_of_birth`	`date`		None	The date of birth of the user.
`gender_id`	`character varying`	20	FOREIGN KEY	The gender ID, linked to the gender table's `gender_id`.
`user_name`	`character varying`	30	UNIQUE	The username of the user, must be unique.
`is_first_login`	`boolean`		Default: `true`	Indicates whether this is the user's first login.
`role_`	`character varying`	200	None	The role of the user in the system.

Table 1:Table that store user information

6.3. Testing

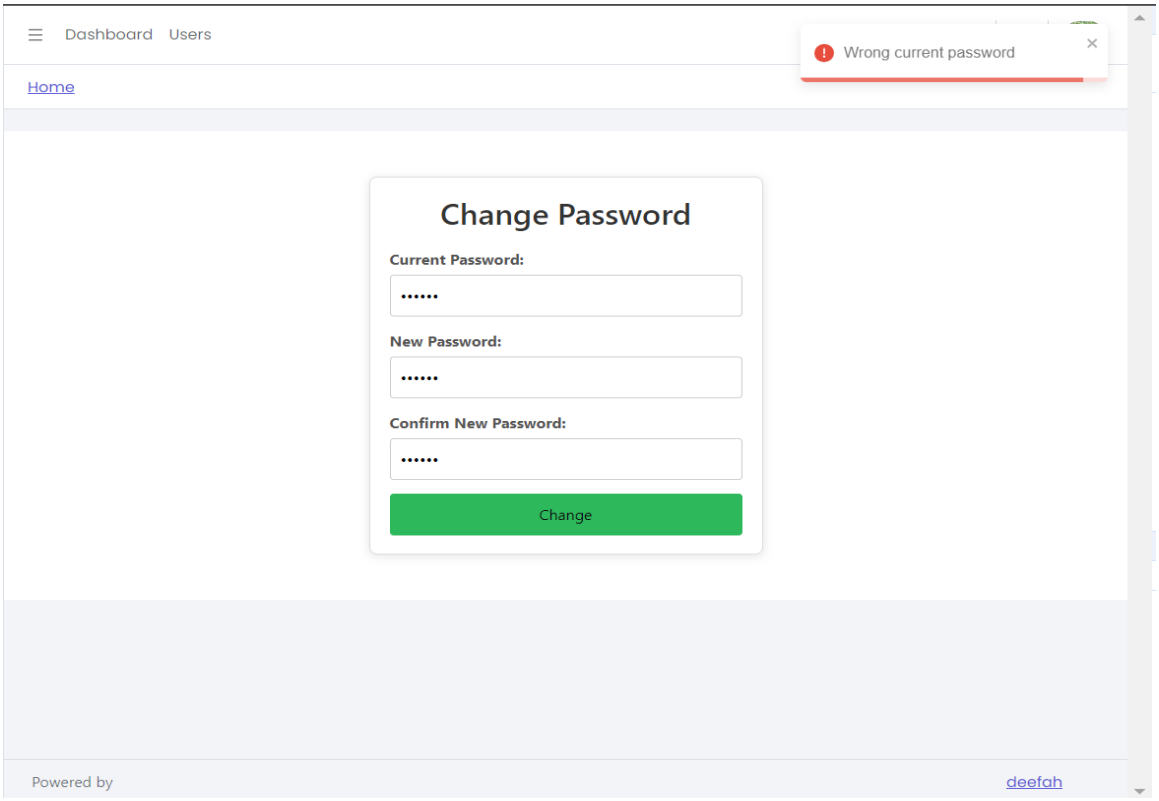

Figure 16: system respond with invalid data entry

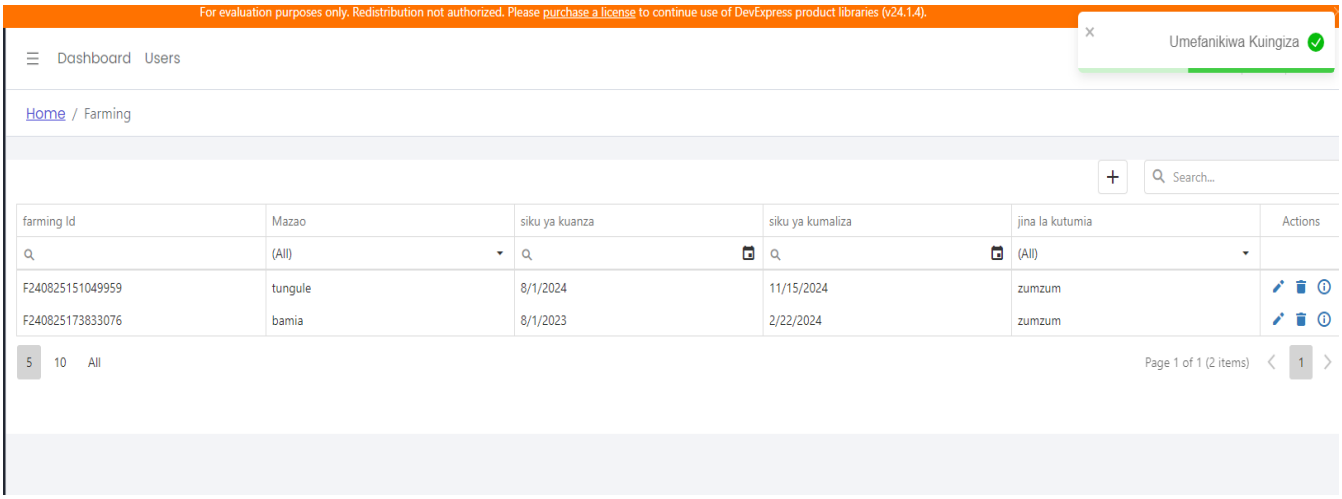

Figure 17:expected output

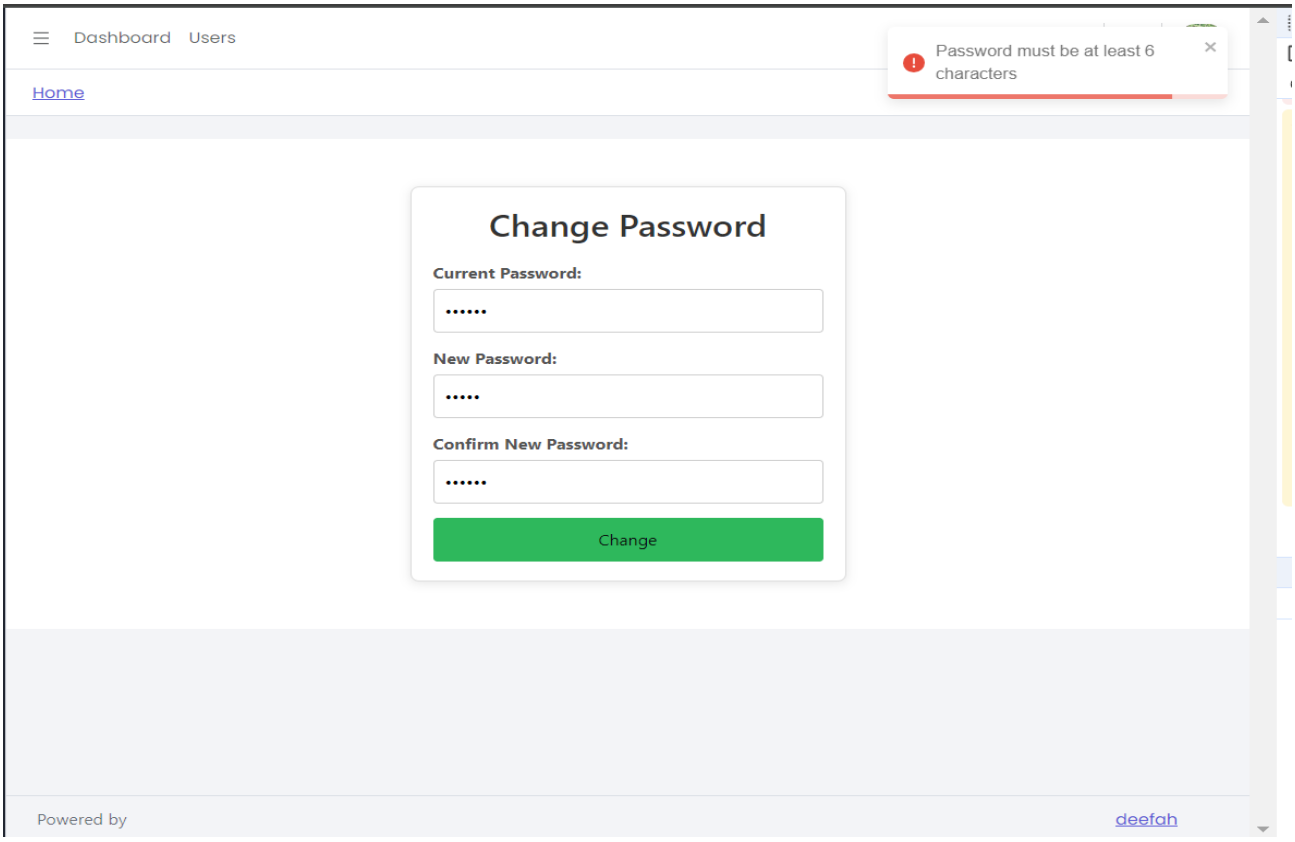

Figure 18:system respond with invalid data entry

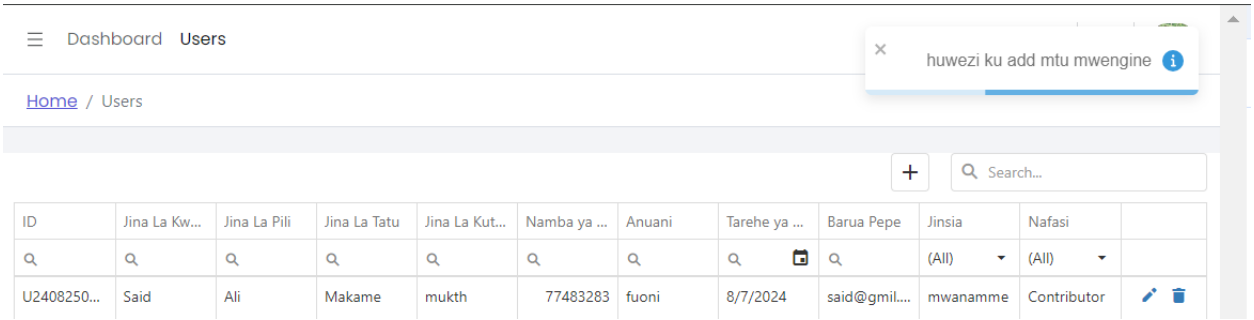

Figure 19:system restrict with user to perform non- privileged functionalities

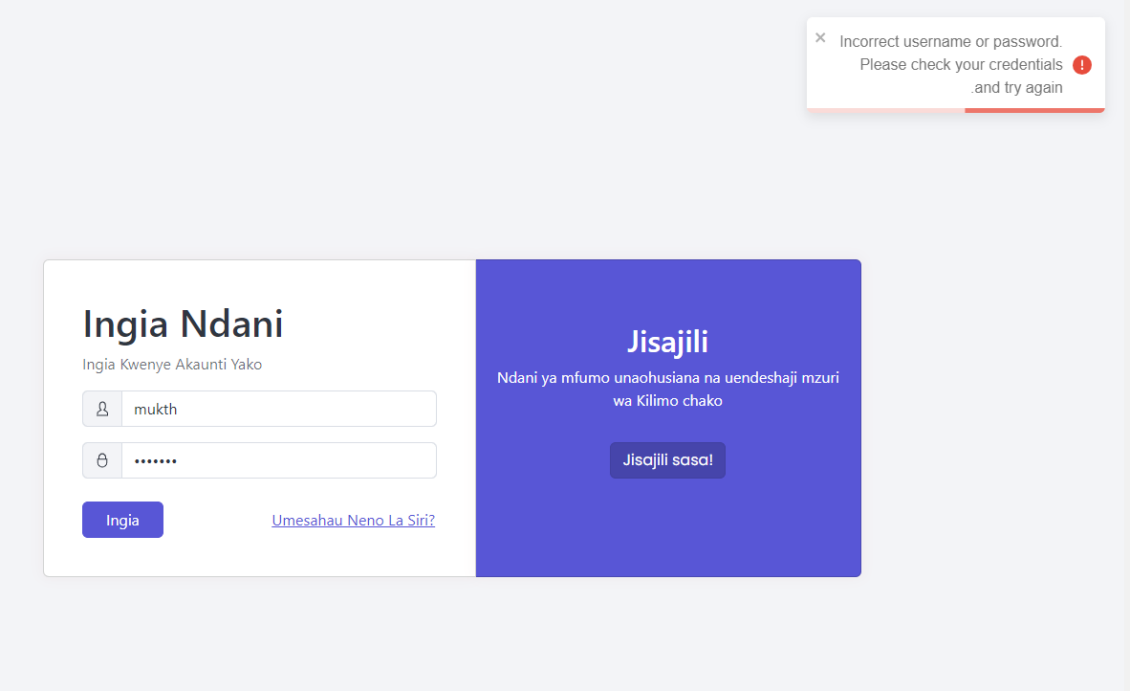

Figure 20:system respond with incorrect login credentials

6.4. User Interfaces

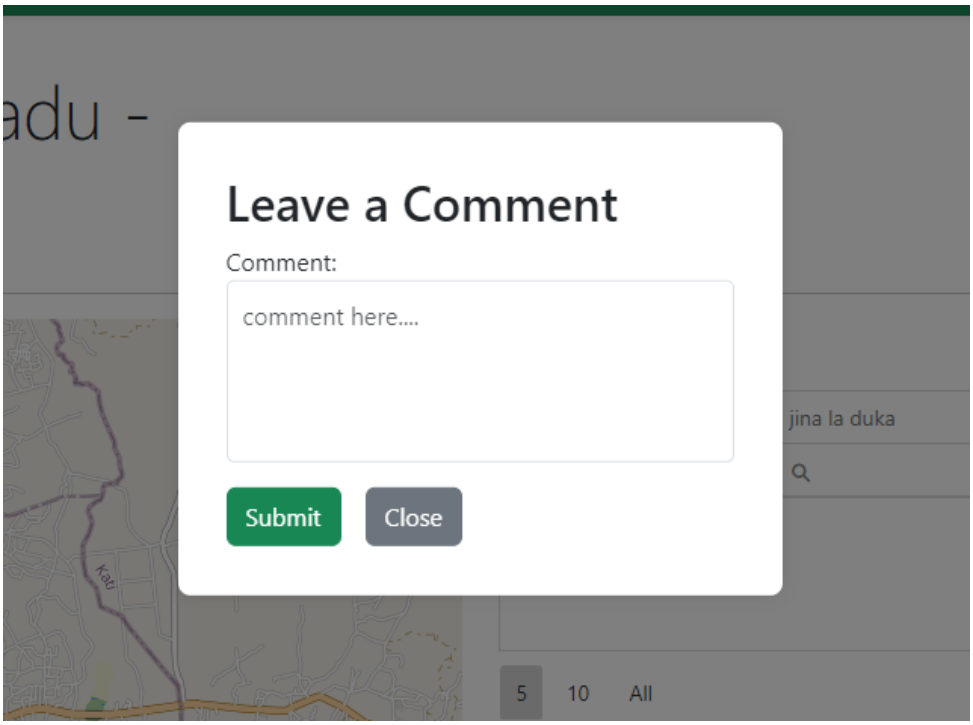

Figure 21:user interface for comment

Figure 22:web user interface

6.5. Strength and Limitation of the system

6.5.1. What is covered from requirements

In this project I covered most of the requirements.

6.5.2. What is not covered

Most of the requirements are covered

CHAPTER 7: Conclusion, Recommendations Challenges and References

CONCLUSION

The Agriculture Management System developed in this project addresses several critical gaps in the existing agricultural support systems, particularly for farmers in Zanzibar. By integrating features such as post-harvest data input, detailed budgeting tools, and location-specific crop cultivation information, the system offers a comprehensive solution that enhances the productivity and sustainability of farming practices. The system's user-friendly interface and educational resources empower farmers with the knowledge and tools they need to make informed decisions, ultimately improving their yields and profitability. The successful implementation of this system represents a significant step forward in supporting the agricultural community in Zanzibar.

RECOMMENDATIONS

- **Continuous Update and Expansion of Data:** Regular updates should be made to include new crop varieties, updated market prices, and more detailed geographical data specific to Zanzibar.
- **User Training Programs:** Implement training programs to educate farmers on how to effectively use the system, ensuring they can fully utilize its features.
- **Integration with Mobile Platforms:** Considering the widespread use of mobile phones among farmers, it is recommended to develop a mobile application version of the system to increase accessibility.
- **Collaborations with Local Experts:** Partner with local agricultural experts to keep the content and resources in the system relevant and up-to-date.
- **Feedback Mechanism:** Establish a robust feedback mechanism to gather user input for ongoing improvements and to ensure the system continues to meet the needs of its users.

CHALLENGES

- **Data Localization:** Gathering accurate and relevant data specific to Zanzibar's unique agricultural conditions was challenging, as most existing resources are tailored to mainland Tanzania.
- **User Adoption:** Encouraging farmers, particularly those with limited technological experience, to adopt and consistently use the system required significant effort and targeted outreach.
- **Infrastructure Limitations:** Some rural areas in Zanzibar lack the necessary infrastructure, such as stable internet connectivity, which could limit the system's effectiveness.

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