UNITED REPUBLIC OF TANZANIA

MINISTRY OF AGRICULTURE

TANZANIA COOPERATIVE DEVELOPMENT COMMISSION (TCDC)

SOFTWARE REQUIREMENT SPECIFICATION DOCUMENT FOR NON FINANCIAL COOPERATIVES

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Document Control

Approval

S/N	Full Name	Designation	Signature	Date
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Amendment History

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List of Acronyms

Acronym	Full Form
AR	Assistant Register
AMCOS	Agricultural Marketing Cooperative Society
API	Application Programming Interface
CO	Cooperative Officer
HR	Human resource
MUVU	Mfumo wa Usimamizi wa Vyama vya Ushirika
TCDC	Tanzania Cooperative Development Commission
TMX	Tanzania Mercantile Exchange
UI	User interface

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FOREWORD

A Software Requirements Specification (SRS) is a document that describes what the software will do and how it will be expected to perform. It also describes the functionality the product needs to fulfil all stakeholders (Business users) needs.

Tanzania Cooperative Development Commission through its Inspection and Supervision section has developed this Minimum Software Requirement Specifications (SRS) to be able to obtain a framework that every Non-financial Cooperative Society that provide guidance to the Non-financial Cooperative Societies (AMCOS, Unions and Other Cooperative Societies excluding SACCOS) during development and operationalization of Core ICT System, furthermore it will provide the guidance to vendor during preparations and development stage of the systems. This SRS basically highlights the mandatory and desired requirements for users (Non- financial Cooperative Societies) and vendors, it will include both definitions of system function requirements and non-system function requirements.

Therefore, Tanzania Cooperative Development Commission is devoted and committed to keep Non-financial Cooperative Societies functioning and we will keep on doing so by making the environment smooth for their operations.

This document will be shared freely without any costs.

Dr. Benson O. Ndiege

Registrar of Cooperatives Societies

1 INTRODUCTION

1.1 Background

Non-financial cooperatives, including AMCOS and UNION cooperatives, are established under Section 33 of the Cooperative Societies Act No. 6 of 2013, which regulates cooperative operations in Tanzania. These cooperatives allow farmers, regardless of scale, to collaboratively manage, market, and sell their agricultural produce. They play a vital role in maximizing member benefits by aggregating crops, streamlining input distribution, and securing fair market prices through collective bargaining.

To effectively manage these functions and respond to the increasing complexities of agricultural markets, non-financial cooperatives require robust software solutions tailored to support their core activities. Such solutions enable cooperatives to streamline operations, enhance member services, and facilitate efficient resource management. By implementing specialized software, non-financial cooperatives can also improve operational transparency, enhance data accuracy, and foster more informed decision- making, ultimately benefiting both members and the organization.

The SRS framework outlines essential criteria and functional requirements to guide non-financial cooperatives in selecting software that aligns with their operational goals, regulatory standards, and sustainability objectives. This framework empowers cooperatives to adopt solutions that not only increase efficiency but also support their mission to advance the interests of their farmer members.

1.2 Purpose

The purpose of this Software Requirements Specification (SRS) is to provide a standardized, comprehensive guide documents that facilitate the acquisition or development of software solutions for non-cooperative societies. This SRS outlines the essential sections, components, and minimum requirements that should be adhered to ensure that the resulting software meets the Cooperative societies' operational needs, regulatory requirements, and long-term sustainability objectives.

1.3 Objective

The primary objectives of this Software Requirements Specification (SRS) are to provide a structured approach for defining and documenting software requirements, thereby enabling informed decision-making and ensuring alignment with both operational goals and regulatory standards. This framework serves as a foundational tool to help non-financial cooperative societies streamline the software selection and development processes.

1.3.1 Specific Objectives

i. Establish a consistent format and structure for documenting software requirements across all non-financial cooperative societies' projects, ensuring clarity and completeness in each SRS.
ii. Support non-financial cooperative societies in adhering to the Tanzania Cooperative Development Commission (TCDC) regulations and industry standards, thereby reducing regulatory risks associated with software implementation.
iii. Provide a clear and comprehensive document that enables effective communication of non-financial cooperative societies' requirements to software vendors, developers, and stakeholders, ensuring mutual understanding and minimizing scope misalignment.
iv. Guide non-financial cooperative societies in identifying software requirements that improve process efficiency, transparency, and data accuracy, ultimately supporting enhanced service delivery to cooperative members.
v. Help non-financial cooperative societies anticipate and mitigate potential risks by clearly defining functional and non-functional requirements upfront, leading to a smoother development process and a more reliable final product.
vi. Enable non-financial cooperative societies to specify requirements for software solutions that can grow and adapt to their evolving needs, supporting long-term sustainability and resilience in agricultural operations.

1.4 Scope

The scope of this System Requirements Specification (SRS) is to develop a comprehensive system tailored to meet the specific operational needs of non-financial cooperative societies in Tanzania.

1.5 Product perspective

The Software Requirements Specification (SRS) for non-financial cooperative societies is designed to facilitate the development or acquisition of software solutions that support the core functions of these cooperatives. This section outlines the context in which the software will operate, its intended use, and how it integrates with existing systems and processes. Below is a figure representing product perspective.

Figure 1: Product Perspective

1.5.1 System Environment

The software solutions will operate within a cooperative framework where non-financial cooperative societies manage agricultural marketing activities for their members. The system will interact with various stakeholders, including farmers, input suppliers, financial institutions, and regulatory bodies such as the Tanzania Cooperative Development Commission (TCDC). The software should be adaptable to diverse agricultural contexts, accounting for variations in crop types, market dynamics, and cooperative sizes.

1.5.2 Operating Environment

The software will operate in various environments, including:

i. Web-Based Platform
   Accessible via internet browsers for both mobile and desktop users.
ii. Mobile Application
   A dedicated mobile app for on-the-go access by farmers and field staff.
iii. Cloud-Based Infrastructure
   Ensuring scalability and reliability, allowing for data backup and recovery.

1.5.3 User Classes and Characteristics

The software will be designed for multiple user classes, each with distinct roles and needs:

i. Non-financial cooperative societies Management

Responsible for overseeing cooperative operations, monitoring performance, and making strategic decisions.

ii. Farmers/Members

Users who will access the system for services such as registration, market information, and input requests.

iii. Administrative Staff

Users tasked with managing day-to-day operations, including data entry, financial management, and reporting.

iv. Regulatory Authorities

Entities that will require access to specific compliance and reporting features to ensure non-financial cooperative societies operations align with TCDC regulations.

1.5.4 Product Functions

The system shall cover the following functions:

1. **Membership Management**: Streamlining registration, issuance of membership numbers, recording of farm details, management of shares, and documentation of economic activities for non-financial cooperative societies.
2. **User management:** Manages user accounts authorization & authentication management, user roles & permissions, separates internal and external user portals.
3. **Cooperative Profile:** Manages cooperative profiles including cooperative name, contact information, members information, assets and investments, cooperative total shares, accounting and budgeting information.
4. **Accounts and Budget Management**: Capturing and reporting all revenue sources and expenditures, ensuring transparency and accountability, provides a platform for keeping records eg. revenues, expenses, Debtors, Creditors, and supporting accurate and timely financial reporting, tracking non-financial cooperative societies' assets, managing investment portfolios, and monitoring asset depreciation and appreciation. This will include the following submodules.

    i. **Funds Management**: Manages funds and budgets for Cooperative Society (for Estimate of Income and Expenditure)

    ii. **Accounts payable**: Manages vendor Transactions, including invoices, (ISCF Fees), payments, and reports

    iii. **Accounts receivable**: Manages customer transactions, including invoices, credit memos, and customer reports

iv. **Asset accounting**: Manages fixed assets, including land, equipment, property, and Investments submodule

v. **General ledger**: Acts as the central component for financial reporting, integrating accounting transactions from other submodules

vi. **Bank ledger**: Reconciles transactions in the bank statement with transactions in other submodules

vii. **Final Accounts Reports**: include Financial Position, Financial Performance, Cashflow, Changes in Equity and Comparison of Budget and Actual amount

5. **Agricultural Input Management**: Overseeing the allocation, inventory, and tracking of essential farming supplies such as seeds and fertilizers.
6. **Marketing Management**: Facilitating the efficient planning, coordination, and sale of agricultural produce through sales, invoicing, billing, and transport logistics.
7. **Procurement Management**: Streamlining the procurement of goods and services, ensuring compliance with established policies, and tracking purchase orders and vendor performance.
8. **Administration and HR Management**: Supporting administrative tasks such as document management, meeting schedules, and human resource functions, including staff records, payroll, performance tracking, Employees Self Service Portal, Time and attendance management, Employee benefits management, Recruitment and hiring, Learning and Development as well as Analysis and reporting.
9. **Asset and Investment Management:** manage assets records, track registered assets, register investments, track revenues from investments and track registered investments.
10. **Loan Management**: Handling member loan applications, approval workflows, disbursement, repayment, and tracking overdue loans.

1.5.5 Constraints

The software will need to address several constraints, including:

i. Regulatory Compliance
Adherence to the policies and requirements set forth by TCDC and other relevant authorities.

ii. Scalability

Ability to accommodate growth in membership and operational complexity over time.

iii. Integration with Existing Systems

Compatibility with any current software solutions including MUVU from TCDC to ensure smooth data migration and interoperability.

1.6 Intended Audience and Document Overview

The intended audience for this document includes non-financial cooperative organizations wishing to acquire or develop an application for managing their operations, TCDC representatives responsible for overseeing regulatory compliance and data reporting, and external stakeholders such as agricultural input suppliers, financial institutions, and transport service providers who will be integrated into the system. This document aims to provide a comprehensive overview of the non-financial cooperative system, ensuring that all relevant parties understand its features, benefits, and compliance requirements, ultimately facilitating improved operational effectiveness and collaboration within the agricultural cooperative sector in Tanzania.

2 OVERALL DESCRIPTION

2.1 System Architecture

The system architecture section of the Software Requirements Specification (SRS) for the non-financial cooperatives provides a comprehensive overview of how the system is structured and the interactions between its various components. This architecture is essential for understanding the technical framework that supports the functionalities of the non-financial cooperative system, ensuring that it meets the requirements of users, facilitates efficient data management, and allows for seamless integration with external systems. The figure below shows the non-financial cooperative society system architecture.

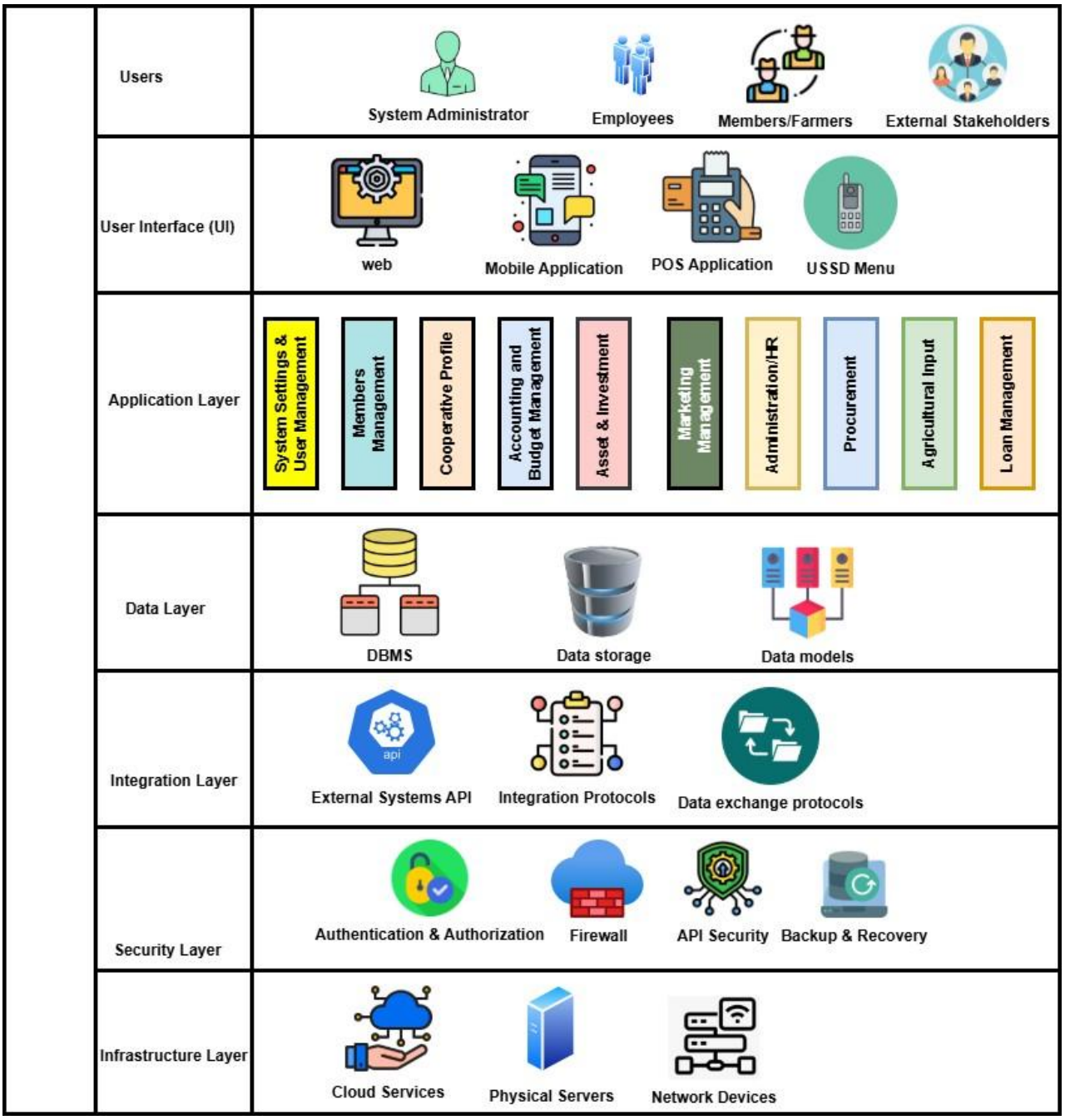

Figure 2: Non-financial cooperative society System Architecture

2.1.1 Components

i. Users

The non-financial cooperative society system includes various user roles with defined responsibilities and permissions: Members/Farmers can manage their profiles and make purchases; Managers oversee member registrations, stock, and transactions; Administrators have full system access to manage users and settings; and optional External Stakeholders can view relevant data under restricted permissions.

ii. User Interface (UI)

The non-financial cooperative society system offers multiple user interfaces: a responsive web application for farmers, managers, and administrators to handle registration, stock management, invoicing, and payments; a mobile application for farmers to manage accounts and make transactions on-the-go; a USSD menu and push SMS for simplified mobile access; and a POS application for in-person transactions, along with an admin dashboard for administrators to oversee system operations and generate reports.

iii. Application Layer

The non-financial cooperative society system architecture encompasses essential modules for managing user registration, system settings, member records, financial performance, stock levels, asset tracking, income and expenditure estimates, and marketing activities. Additionally, an admin dashboard allows administrators to oversee operations, configure system settings, and generate detailed reports, supporting comprehensive and informed decision-making across these areas.

iv. Data layer

The data layer of the non-financial cooperative society system includes a Database Management System (DBMS) for efficient data handling, data storage components for secure and structured storage of all system data, and data models that define the structure and relationships of key entities such as user profiles, financial records, stock information, and transaction history.

v. Integration Layer

The integration layer of the non-financial cooperative society system facilitates seamless interactions with external systems through APIs, utilizing integration protocols to connect with third-party services, and data exchange protocols to ensure secure, standardized data transfer across platforms, such as with payment gateways, government databases, and agricultural data sources

vi. Security layer

The security layer of the non-financial cooperative society system includes API security measures to protect data exchanges, robust authentication and authorization controls to manage user access, firewalls to prevent unauthorized network access, and backup and recovery processes to ensure data integrity and availability in case of data loss or system failure.

vii. Infrastructure layer

The infrastructure layer of the non-financial cooperative society system includes cloud services for scalable and flexible resource management, physical servers to support on-premises requirements, and network devices that ensure reliable connectivity and communication between system components.

2.2 Assumptions and Dependencies

2.2.1 Assumptions

i. Users possess basic computer literacy.
ii. Accurate data will be provided by non-financial cooperative society members and stakeholders.
iii. The system will comply with TCDC regulations and requirements.
iv. The non-financial cooperative society system will integrate with existing systems used by TCDC and other stakeholders.
v. Adequate IT infrastructure, including internet connectivity and hardware, will be available for all users.

2.2.2 Dependencies

i. Collaboration with TCDC for regulatory compliance and integration with the MUVU system.
ii. Reliance on third-party services for payment processing, logistics, and agricultural input supply.
iii. Comprehensive training programs for users to facilitate a smooth transition.
iv. Ongoing technical support and maintenance for the system post-deployment.
v. Sufficient financial resources for system development, implementation, and sustainability.

3 SPECIFIC REQUIREMENTS

3.1 External Interface Requirements

3.1.1 User Interface

The User Interface (UI) is a critical component of the system, as it directly impacts user interaction and overall experience. The following characteristics are essential for creating an effective and user-friendly UI for the non-financial cooperative society System

Attribute	Description
Usability	The UI should be intuitive and easy to navigate, allowing users to perform tasks efficiently without extensive training or documentation.
Accessibility	The system design should be inclusive, accommodating users with diverse abilities to ensure all members can access and utilize the system without barriers. It must adhere to accessibility standards and support multi-language functionality, offering both Kiswahili and English to cater to a broad range of users.
Responsiveness	The UI must be responsive, providing a seamless experience across various devices and screen sizes, including desktops, tablets, and mobile phones.
Consistency	Consistent design elements, such as colours, fonts, and layout, should be applied throughout the system to promote familiarity and reduce cognitive load for users.
Feedback	The UI should provide immediate and clear feedback for user actions, such as confirmation messages after submitting

	forms or alerts for errors, keeping users informed.
Visual Hierarchy	A clear visual hierarchy should guide users' attention to the most important elements on the screen, making it easier to understand the structure and navigate through content.
Aesthetics	The UI should have an appealing design that reflects 's brand identity while maintaining professionalism, enhancing user engagement and satisfaction.
Customization	Users should have options to customize their interface experience (e.g., themes, layout preferences) to suit their individual needs and preferences, enhancing comfort and usability.
Error Prevention and Recovery	The UI should be designed to minimize user errors by providing guidance and preventing common mistakes. When errors occur, clear instructions for recovery should be provided.

3.1.2 Hardware Interfaces

The non-financial cooperative society system will require specific hardware interfaces to ensure seamless operation, user accessibility, and efficient performance. The following hardware interfaces are essential:

Hardware Interfaces	Description
User Workstations	Desktops or laptops with internet connectivity for staff and members to access the system. Minimum hardware specifications should include sufficient RAM, processor speed, and storage to run the application smoothly.

Point of Sale (POS) Terminals	POS systems for sales transactions, invoicing, and payment processing.
Mobile Devices	Smartphones and tablets for field agents and members to access the system remotely. Mobile application compatibility to allow for transactions, member engagement, and input distribution tracking.
Barcode Scanners	Devices for scanning product barcodes during inventory management and sales processes. Integration with the system for efficient tracking and management of agricultural inputs and products.
Printers	Receipt and invoice printers for generating physical copies of transactions. Label printers for creating product labels and inventory tags.
Networking Equipment	Routers and switches to provide reliable internet connectivity within the offices and remote locations. Wireless access points for mobile device connectivity in various operational areas.
Server Infrastructure	Centralized servers to host the system and manage data storage, processing, and security. Backup systems to ensure data integrity and disaster recovery capabilities.
Application Programming Interface	Interfaces that allow different software systems to communicate and exchange data. API integration with the MUVU system and third-party services to enable seamless data sharing and functionality expansion.

3.2 Functional Requirements

Functional requirements define the intended behaviour of the system, detailing the specific services, tasks, and functions it must perform to meet user needs. This section follows the general functional requirements outlined in section 2.1 and enumerates the various product functions designed to enhance the efficiency and effectiveness of agricultural marketing cooperative societies. By clarifying these functional requirements, we establish a comprehensive understanding of the system's capabilities and how it will support non-financial cooperative society in achieving its operational goals.

3.2.1 Cooperative Profile

This Cooperative Profile provides essential information about cooperatives, detailing their core attributes and operational scope. It includes the cooperative's official name, registration number, economic activities, and category, highlighting the sector they serve and their unique common bond. The profile outlines the cooperative's structural aspects, such as membership size, financial year, and society operation category, offering insight into its organizational setup. Contact details, including phone number, email, and postal address, ensure accessibility,

Cooperative Name	Name of the cooperative
Registration Number	Official registration number of the cooperative from TCDC
Category	Category of the cooperative
Economic Activity	Primary economic activity (e.g., farming, fishing, etc.).
Financial Year	Financial year for reporting.
Common Bond	The common bond linking cooperative members
Sector	Industry or sector the cooperative operates in (e.g., agriculture).
Total Number of Members	The total count of registered members.
Society Operation Category	Type of society operation (e.g., primary, secondary).
Contact Information	General contact information section.
Cooperative Phone Number	Official phone number of the cooperative.
Cooperative Postal Address	Postal address for correspondence.
Cooperative Email Address	Official email address of the cooperative.
Headquarter Region/District	Location of the cooperative headquarters.
Registered Location	Official registered location (Region, District, Council).

Manager Information	Details of the cooperative manager, including:
- Name	Name of the manager.
- Contact Information	Contact details (phone and/or email).

3.2.2 Members Management

Requirement Number	REQ-001
Actor(s)	Non-financial cooperative society staff
Pre-condition	i. Non-financial cooperative society staff is logged into the system and has permission to register new members. ii. Member registration completed.
Inputs	**Members categories:** i. Individual ii. Group *(For individual member)* **Personal Information:** i. First Name: _____ ii. Other Name: _____ iii. Surname: _____ iv. Date of Birth: _____ v. Photo: _____ (Attach Photo) vi. Signature: _____ (Sign Here) vii. Phone Number: _____ viii. Email: _____ ix. Identification Type: (National ID, Voter's ID) _____ x. Identification Number: _____ xi. Gender: (Male, Female) _____ xii. Education Level: _____ xiii. Farmer Assets: _____ xiv. Number of Shares _____ **Cooperative information:** i. Number of shares ii. Registration number (*from TCDC)* iii. Economic activity **Physical Location:** i. Region: _____ ii. District: _____ iii. Ward: _____ iv. Village: _____ v. Postal Address: _____ vi. Physical Address: _____ **Bank Information:** i. Bank Name: _____ ii. Account Number: _____

	Farm Profile: i. Farming/Agricultural Information ii. Region: _____ iii. District: _____ iv. Ward: _____ v. Village: _____ vi. GIS Point Latitude: _____ vii. GIS Point Longitude: _____ viii. Farm Size (Acres): _____ ix. Cultivated Size (Acres): _____ x. Ownership: (Sole Ownership, Lease Ownership) _____ *(For a group)* i. Group name ii. Economic activity **Cooperative information:** i. Number of shares ii. Registration number (*from TCDC)* iii. Economic activity **Physical Location:** i. Region: _____ ii. District: _____ iii. Ward: _____ iv. Village: _____ v. Postal Address: _____ vi. Physical Address: _____ **Bank Information:** i. Bank Name: _____ ii. Account Number: _____ **Farm Profile:** i. Farming/Agricultural Information ii. Region: _____ iii. District: _____ iv. Ward: _____ v. Village : _____ vi. GIS Point Latitude : _____ vii. GIS Point Longitude : _____ viii. Farm Size (Acres): _____ ix. Cultivated Size (Acres): _____ x. Ownership: (Sole Ownership, Lease Ownership) _____ xi.
Normal Flow	i. Non-financial cooperative society staff initiates the registration process.

	ii. The system prompts for member information. iii. Non-financial cooperative society staff enters and submits details. iv. System generates a unique registration number for the new member. v. System prompts for successor details. vi. Staff enters information for each successor.
Outputs	i. Confirmation of successful registration ii. Unique registration number generated iii. Successor information saved
Post-condition	i. Member is successfully registered in the system with a unique registration number. ii. System stores the generated registration number with the member's profile. iii. Successors are registered and associated with the primary member in the system.
Message	i. "Member successfully registered" displayed upon completion. ii. "Registration number generated: [Unique ID]" displayed for non-financial cooperative society staff confirmation. iii. "Successor information saved successfully" upon each successor's registration.
Business Logic	i. A unique registration number must be generated for each member. ii. Registration number format must follow the non-financial cooperative society standard ID format for consistency. iii. Each member can have multiple successors associated, recorded in the successor field of their profile.
Constraint	i. Only non-financial cooperative society staff with appropriate permissions can access the member registration function. ii. Duplicate registration numbers are not allowed in the system. iii. Successor details cannot be registered without a primary member profile being created first.

Below is a figure representing the sequence diagram for members management process flow.

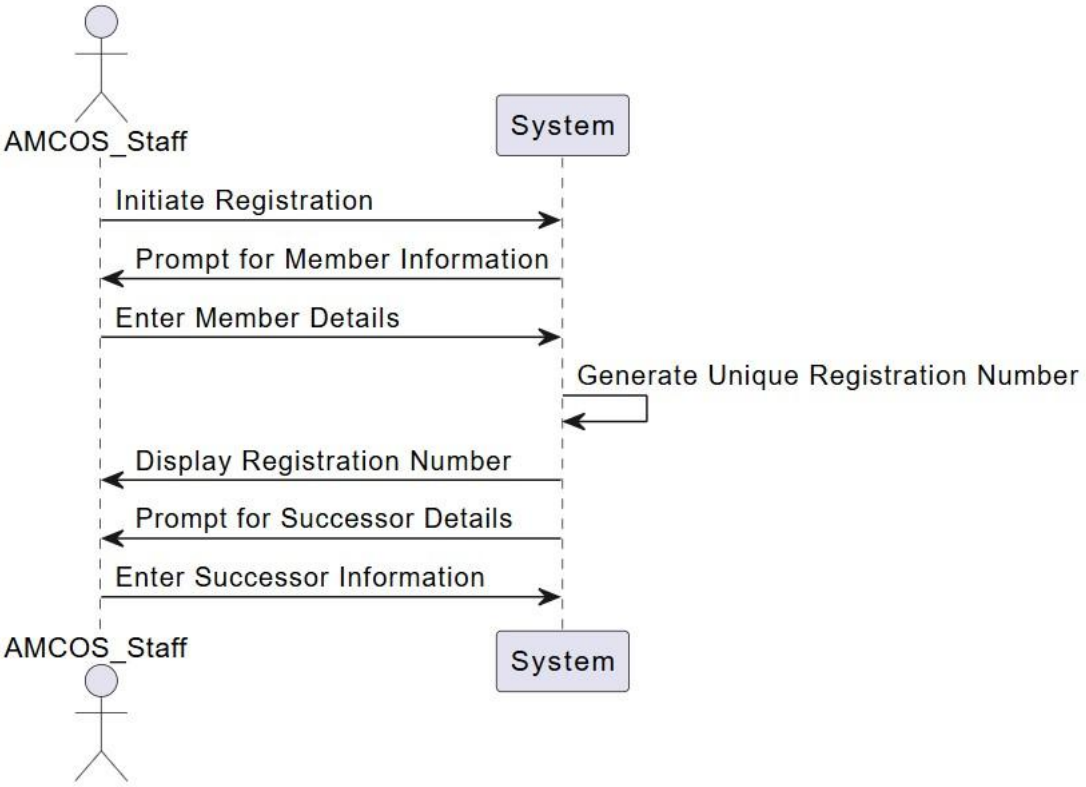

Figure 3: Non-financial cooperative society Members Management Sequence Diagram

3.2.3 Financial Performance

Requirement Number	Req-002
Actor(s)	Non-financial cooperative society Staff
Pre-condition	Non-financial cooperative society staff is logged into the system and has permission to manage financial performance.
Inputs	i. Financial performance forms which include but not limited to: ii. a statement of financial position (balance sheet) at the end of the period iii. a statement of profit or loss and other comprehensive income for the period (presented as a single statement, or by presenting the profit or loss section in a separate statement of profit or loss, immediately followed by a statement presenting comprehensive income beginning with profit or loss) iv. a statement of changes in equity for the period v. a statement of cash flows for the period vi. notes, comprising a summary of significant accounting policies and other explanatory notes
Normal Flow	1. Non-financial cooperative society staff fills out the financial performance forms, entering relevant revenue and expense data.

	2. The system validates the entered data for completeness and accuracy. 3. Upon successful validation, the system tracks revenue and expenses in real-time. 4. The system generates financial performance reports and dashboards based on the entered data. 5. Alerts are triggered for any budget deviations or financial thresholds that are exceeded.
Outputs	i. Real-time financial tracking. ii. Budget management tools. iii. Financial reports and dashboards. iv. Alerts for budget deviations. v. API to submit financial performances to TCDC via MUVU
Post-condition	i. Financial performance data is accurately tracked, and reports are generated reflecting the latest data entries, with alerts for any deviations from budgetary expectations. ii. The system must have API to submit financial performances to regulatory system (MUVU) from TCDC
Message	i. "Financial performance form submitted successfully." ii. "Revenue and expenses tracked successfully." iii. "Financial performance report generated." iv. "Alert: Budget deviation detected."
Business Logic	i. The system must ensure all financial data is updated in real-time. ii. Reports should be generated based on predefined performance criteria. iii. The system must monitor and alert on any budget deviations according to set thresholds.
Constraint	i. Must comply with regulatory financial reporting standards. ii. Only authorized non-financial cooperative society staff can access financial performance functionalities.

Below is a figure representing the sequence diagram for financial performance process flow.

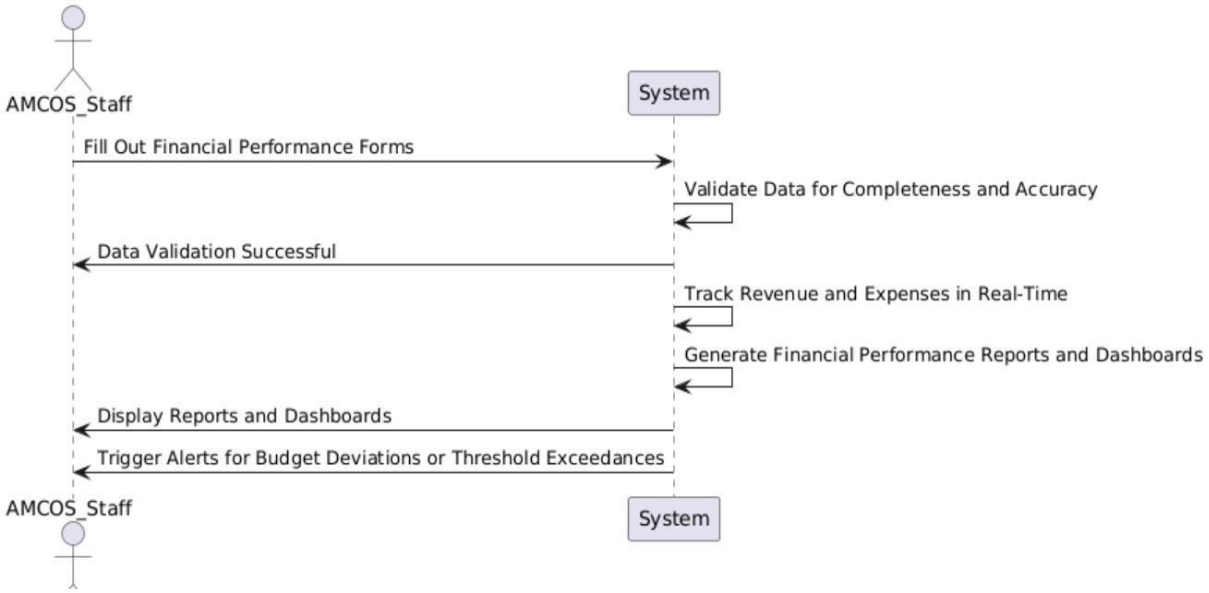

Figure 4: Financial Performance Sequence diagram

3.2.4 Accounting and Budgeting Management

Requirement Number	REQ-003
Actor(s)	Accountant, Financial Officer, Manager, System Auditor
Pre-condition	User is logged in with the necessary permissions (financial recording, reporting, auditing)
Inputs	Budget forms with the following details: i. Basic Information • Budget Title/Name • Budget Period (Start Date - End Date) • Department/Unit Name • Prepared By • Date of Preparation • Approval Status ii. Income/Revenue Estimates • Revenue Source • Expected Amount • Description • Frequency (Monthly, Quarterly, Annually) iii. Expense Estimates • Expense Category • Description • Quantity • Unit Cost • Total Cost • Justification • Payment Schedule

Normal Flow	1. User records budget information with details such as revenue sources, expenditure type, date, and amount. 2. User attaches supporting documents and submits the entry. 3. User selects the option to generate reports and applies filters for categorization. 4. System generates categorized reports based on filters. 5. For consolidated reporting, user selects report type and date range; system pulls relevant data, consolidates it, and prepares the report. 6. For audit trails, user selects a transaction entry to view its audit history; system displays modifications, timestamps, and user IDs for review.
Outputs	i. Saved budget entries ii. categorized financial report iii. consolidated report (PDF, Excel) iv. audit trail details for transactions v. API for the submission of Income and Expenditure to TCDC via MUVU
Post-condition	i. Transactions recorded and categorized ii. Reports generated and available for review iii. Audit trails accessible for authorized users iv. The system must have API to submit income and expenditure to regulatory system (MUVU)
Message	i. "Transaction recorded successfully," ii. "Report generated successfully," "Consolidated report generated successfully," "Audit trail retrieved successfully"
Business Logic	i. The system must support comprehensive entry of income/expenditure with details, automatic categorization for analysis, ii. consolidated financial performance tracking, and audit trails for all transactions. iii. The system must prevent duplicate entries, allow only authorized access to reports and audit trails, and maintain data integrity across all financial records.
Constraint	i. All required fields must be completed before submission.

	ii. Only users with report access permissions can generate reports. iii. Consolidated reports may require higher access permissions. iv. Audit trails are accessible only to users with auditor roles.

Below is a figure representing the sequence diagram for income and expenditure process flow.

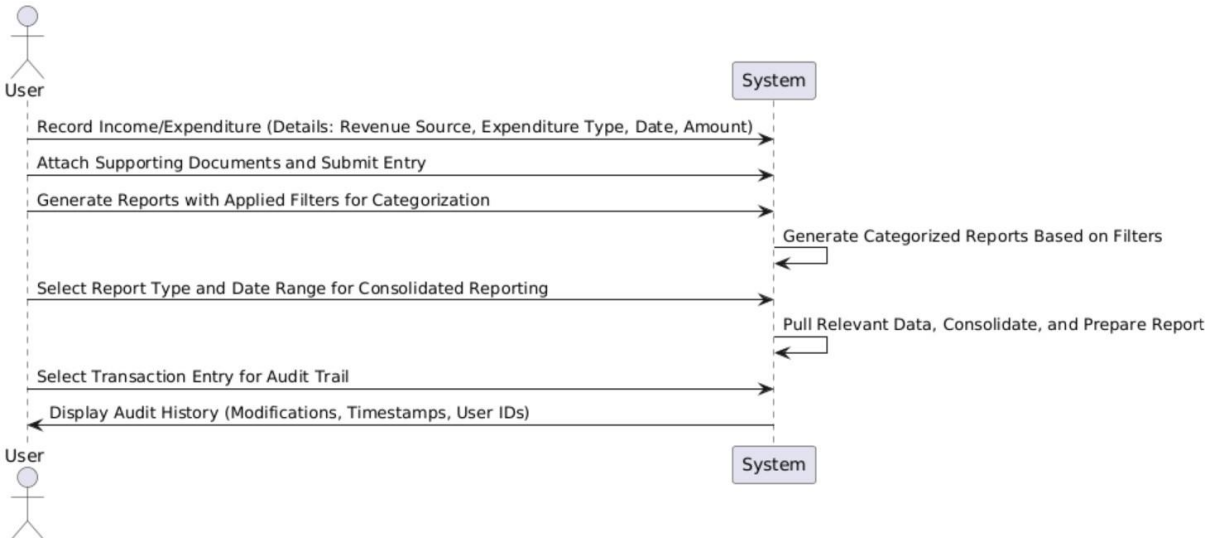

Figure 5: Income and Expenditure Sequence Diagram

3.2.5 Assets and Investment

Requirement Number	REQ-004
Requirement	Inventory management for all non-financial cooperative society assets and investments
Actor(s)	Financial Officer, Investment Analyst
Pre-condition	User is logged in with the necessary permissions (asset management, financial reporting)
Inputs	i. Asset details (type, value, location, condition), ii. investment portfolio data (investment type, amount, performance metrics),

	iii. maintenance schedule, depreciation method
Normal Flow	1. User enters asset details into the inventory management system. 2. System tracks investment portfolios and their performance metrics. 3. User performs depreciation calculations based on the selected method and inputs. 4. System generates reports for asset value and depreciation. 5. User sets maintenance alerts for assets and investment milestones.
Outputs	i. Updated asset inventory, ii. investment performance reports, iii. depreciation reports, iv. maintenance and investment milestone alerts
Post-condition	Assets and investments tracked and managed effectively, with alerts set for necessary actions
Message	i. "Asset recorded successfully," ii. "Investment performance updated," iii. "Depreciation report generated," iv. "Alert set for maintenance/investment milestone"
Business Logic	i. The system must allow users to manage assets and investments comprehensively, ii. Perform depreciation calculations accurately, and set alerts for maintenance and milestones. iii. The system must maintain data integrity and allow only authorized access to sensitive financial information.

Below is a figure representing assets and investment process flow.

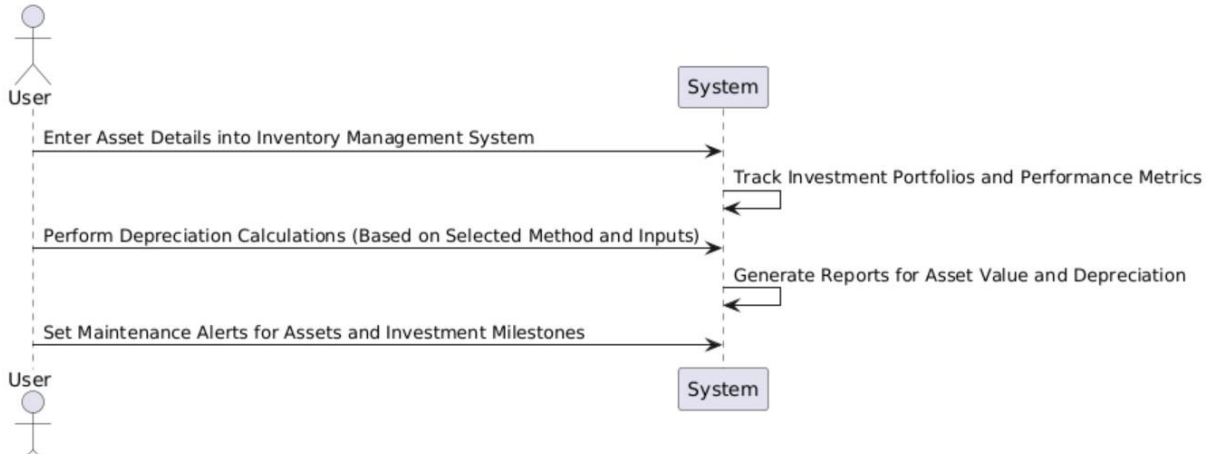

Figure 6: Asset and Investment Sequence Diagram

3.2.6 Marketing Management

3.2.6.1 Products Collection, Warehouse management & transportation

Requirement Number	REQ-005
Requirement	Products Collection, Warehouse management & transportation
Actor(s)	Cooperative Members, Collection Officer, Warehouse Manager, Inventory Officer, Transport Coordinator, Delivery Driver, System Administrator
Pre-condition	i. Products ready for collection from cooperative members or suppliers. ii. System access granted to authorized collection officers. iii. Products are collected and ready for storage. iv. Warehouse capacity and space are available for storing incoming products. v. Products are ready to be transported to buyers or other locations. vi. Delivery vehicles are available and properly maintained.
Inputs	i. Product details (name, quantity, quality, source) ii. Collection location and date iii. Cooperative member or supplier ID iv. Product details (type, quantity, storage conditions) v. Warehouse location and product storage slots vi. Expiry date (for perishable items) vii. Transportation document (indicating vehicle, driver, route, and destination).
Normal Flow	**Products Collection, Warehouse management & transportation:**

	1. The collection officer verifies products from cooperative members or suppliers. 2. The system records the collection and generates receipts. 3. The warehouse manager assigns products to storage slots, ensuring proper conditions are met. 4. Inventory is updated after storage. 5. The transport coordinator schedules the delivery, assigns a vehicle and driver, and prepares a transportation document. 6. The delivery driver uses the transportation document for guidance and delivers the products.
Outputs	i. Collection receipt ii. Product collection record iii. Inventory update notification iv. Storage conditions alert v. Transportation document vi. Delivery status update
Post-condition	i. Product collection recorded in the system. ii. Collection receipts generated. iii. Inventory updated with new stock entries. iv. Storage conditions monitored for compliance. v. Products transported to the intended destination. vi. Transportation record updated.
Message	i. Product Collection Confirmation ii. Collection Receipt iii. Inventory Update iv. Storage Conditions Alert v. Transportation Document Issued vi. Delivery Status Update
Business Logic	- Products are matched with cooperative members or suppliers' details.

	- Collection receipts are auto-generated based on product quantity and quality. - Products are assigned to appropriate storage slots based on type and quantity. - Alerts for storage conditions are triggered for perishable items or other critical storage needs. - Barcode/QR code scanning is used for tracking inventory updates. - Transportation is scheduled based on route and vehicle availability. - Transportation document includes all details for efficient product delivery. - Delivery status is updated in the system upon completion.

Below is a sequence diagram representing Products Collection, Warehouse management & transportation process flow

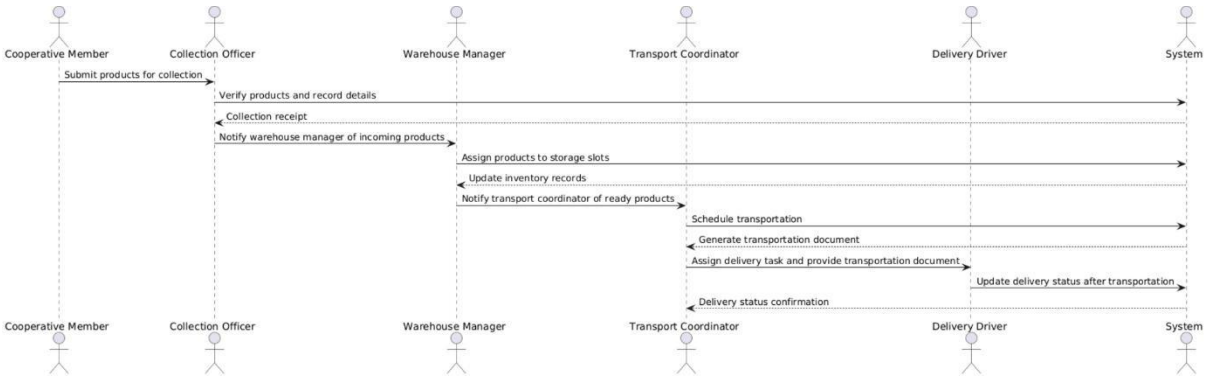

Figure 7: Products Collection, Warehouse management & transportation

3.2.6.2 Sales management

Requirement Number	REQ-006
Requirement	Sales Management: Auction Sales, Direct Sales, Contract Sales, and POS Integration
Actor(s)	Cooperative Member, Buyer, Auction Coordinator, Sales Manager, System Administrator
Pre-condition	i. Products are ready for sale and listed in the system. ii. System is configured for the selected sales type (auction, direct, or contract).

	iii. Cooperative members have a valid account linked to the system. iv. Buyer has completed registration in the system.
Inputs	*(This module shall depend on functions and nature of the non-financial cooperative society.)* i. Product details (type, quantity, price). ii. Auction bid details (bidders, bid amount, auction end date). iii. Contract terms (quantity, price, delivery date). iv. Buyer payment confirmation.
Normal Flow	**Sales Management:** **Auction Sales** 1. Auction Coordinator lists items for auction. 2. Buyers place bids; the system tracks bids and determines the highest bidder. 3. Winning bidder is notified; an invoice is generated and issued to the buyer. 4. Upon payment confirmation, a sales receipt is generated, and funds are disbursed to cooperative members. **Direct Sales** 1. Buyer selects items for direct purchase. 2. System generates an invoice immediately upon sale. 3. Payment is processed, a sales receipt is issued, and funds are disbursed to cooperative members. **Contract Sales** 1. Sales Manager uploads contract terms into the system. 2. System tracks contract terms and issues invoices based on agreed terms. 3. Payment is confirmed, sales receipts are issued, and funds are disbursed to cooperative members. **POS Integration** 1. The buyer completes a physical transaction using a POS device. 2. The system generates invoices, bills, and sales receipts.

	3. Payment is processed through the bank, and funds are disbursed to cooperative members.
Outputs	i. Auction bid tracking details. ii. Invoices, sales receipts, and bills. iii. Payment disbursement confirmation. iv. Contract term compliance reports.
Post-condition	i. Auction, direct, or contract sales recorded in the system. ii. Payment status updated and funds disbursed to cooperative members. iii. Sales reports generated for system administrators and cooperative managers.
Message	i. Auction Completion Notification ii. Payment Confirmation Notification iii. Sales Receipt Issued Notification iv. Payment Disbursement Notification
Business Logic	i. Auction bids must be automatically sorted, and the highest bidder selected at auction closure. ii. Direct sales and contract sales must generate invoices based on product and contract details. iii. Payments must be validated before generating sales receipts and disbursing funds to cooperative members. iv. POS and digital scale integration must support real-time transaction recording, invoicing, and payment disbursement through the bank integration.

Below is a sequence diagram representing sales management process flow

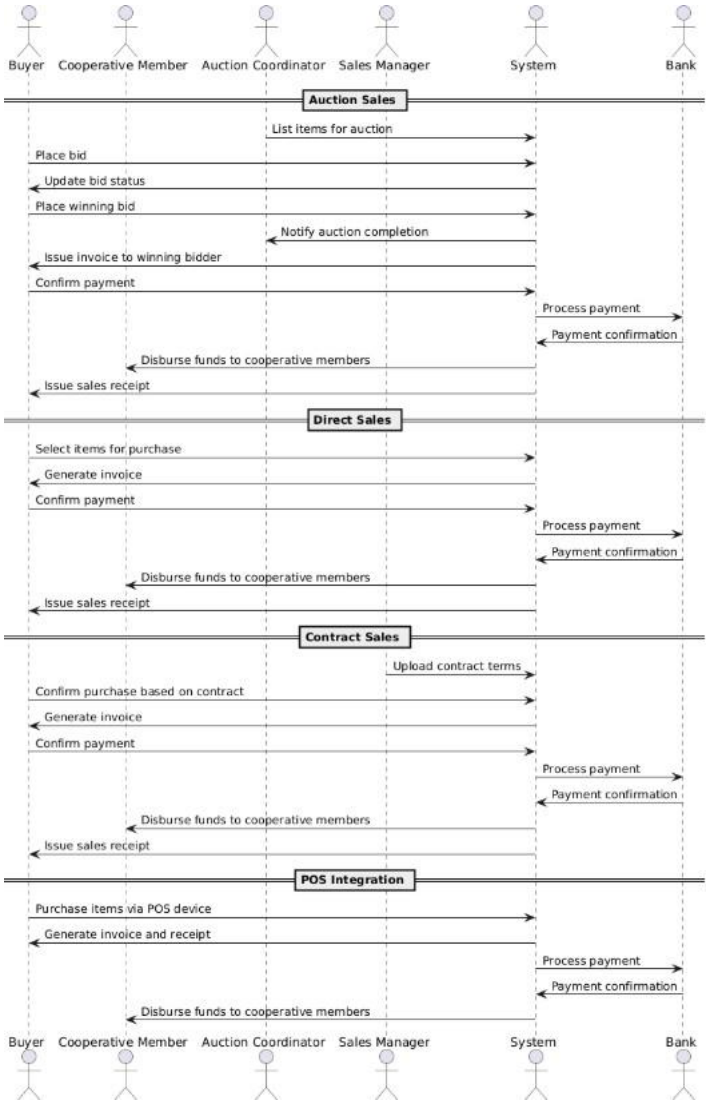

Figure 8: Sales Management

3.2.7 Administration/Human Resource Management

Requirement Number	REQ-007
Requirement	Administration/Human Resource Management
Actor(s)	HR Officer
Pre-condition	HR Officer is logged into the system. For contract and responsibilities management, the employee must be registered in the system.
Inputs	For Employee Registration: Employee name, date of birth, address, phone number, email, job role, department, designation, responsibilities, employment start date, salary, contract file. For Contract Management: Employee ID, contract terms (duration, salary, benefits), start and end dates, contract document (uploaded). For Responsibilities Management: Employee ID, designation, department, list of responsibilities.

Normal Flow	1. HR Officer selects "Register Employee," "Manage Contracts," or "Manage Responsibilities" based on the task. 2. System displays the corresponding form or list. 3. HR Officer fills fields and uploads relevant documents. 4. System validates inputs and saves the record. 5. For contracts, notifications for expiring contracts are sent. 6. For responsibilities, updated details are saved and linked to the employee.
Outputs	Confirmation messages: - For registration: Employee ID, contract, and responsibilities saved. - For contract management: Updated contract details and notifications for expiring contracts. - For responsibilities: Updated responsibilities and designation.
Post-condition	Employee details, contracts, responsibilities, and designations are accurately recorded and linked in the system.
Message	- "Employee registration successful. Employee ID: [ID]." - "Contract updated successfully for [Employee Name]." - "Responsibilities and designation updated successfully for [Employee Name]."
Business Logic	- System ensures unique Employee IDs and validates required fields. - Contract expiration triggers notifications to HR. - Responsibilities and designations are linked to roles for accurate reporting and evaluations.

Below is a sequence diagram showing administration and Human resource management

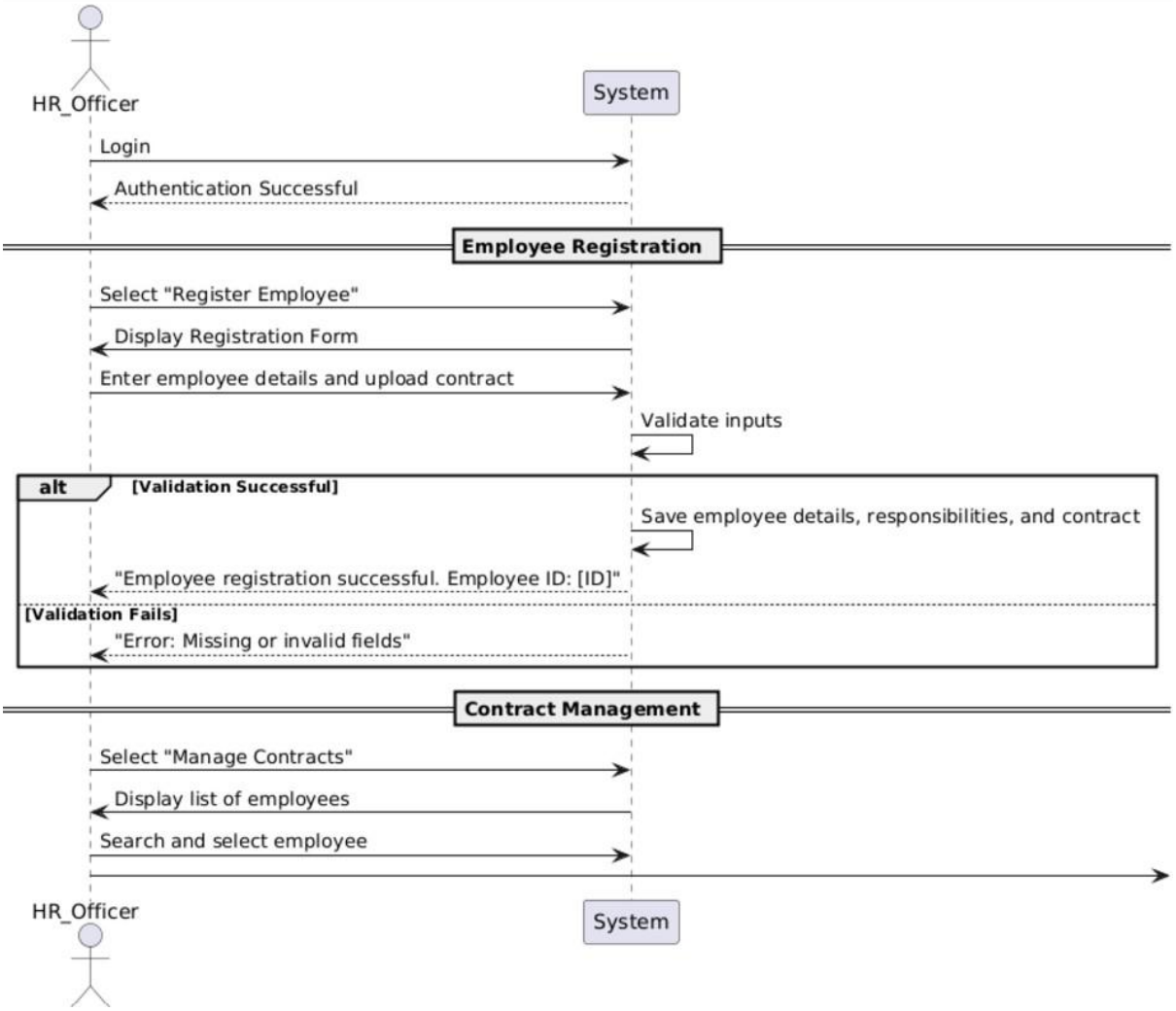

Figure 9: Administration & HR Management

3.2.8 Procurement

Requirement Number	REQ-008
Requirement	Procurement Plan for the year
Actor(s)	Procurement Procedures. Procurement Officer, Supplier, System
Pre-condition	Procurement Officer is logged into the system. The system must have a list of approved suppliers and tenders for routine activities.
Inputs	Purchase request (item, quantity, specifications), supplier details, price quotes, purchase order number, payment terms, delivery terms, invitation, opening report and evaluation report.
Normal Flow	1. Procurement Officer logs into the system. 2. Procurement Officer creates a purchase request or selects from pre-approved items. 3. System fetches list of approved suppliers/ bidders. 4. Procurement Officer issues Request for Quotion (RFQs) to suppliers and tender documents. 5. Suppliers respond with quotation and tender documents.

	6. Procurement Officer evaluates quotation and selects supplier. Evaluation team created for tender evaluations. 7. Procurement Officer generates a Purchase Order (PO), also issue notification letter for successful bidders and unsuccessful bidders with reasons of not being selected then the letter of acceptance should be prepared for successful bidder and Contract document should be created. 8. System sends the PO to the selected supplier and contract document to successful bidders. 9. Supplier and bidders confirm the order and delivers goods/services. 10. Procurement Officer verifies delivery against PO and contract.
Outputs	Purchase order, Contract, supplier's quotation, delivery receipt, and monthly and quarterly procurement report. All Contracts should be sent to legal officers for vetting before signing.
Post-condition	Supplier delivers goods or services with inspection reports, and payment is processed. The purchase order is completed and closed.
Message	"Purchase order created successfully for [item/quantity] with supplier [supplier/ bidder name]."
Business Logic	The system checks if the item is in stock or needs to be ordered. It verifies supplier eligibility based on prior contracts or approvals. PO/ Contract is generated only if the supplier/ bidders meets the requirements. Supplier must confirm delivery before the order is closed.
Disposal of Assets	Assets should be disposed after depression be zero value from Asset Register.
Asset register	The Procurement officer should maintain the Assets Register for all assets procured in the cooperative union.
Codification of Assets	All Assets should be coded properly and uploaded in the system
Disposal of Assets	The procurement officer should recognise the Assets to be disposed and report to the Manager, then the Manager should seek approval for disposal the the valuation process will follow and the valuation report will be generated.
Output	Assets should be disposed by three methods Auction, tender process and as gift to the institution, hospital or school.
Business logic	All the Assets disposed should be removed from the Assets register by a Procurement Officer by using its codification numbers.

Below is a diagram showing sequence diagram for procurement process flow

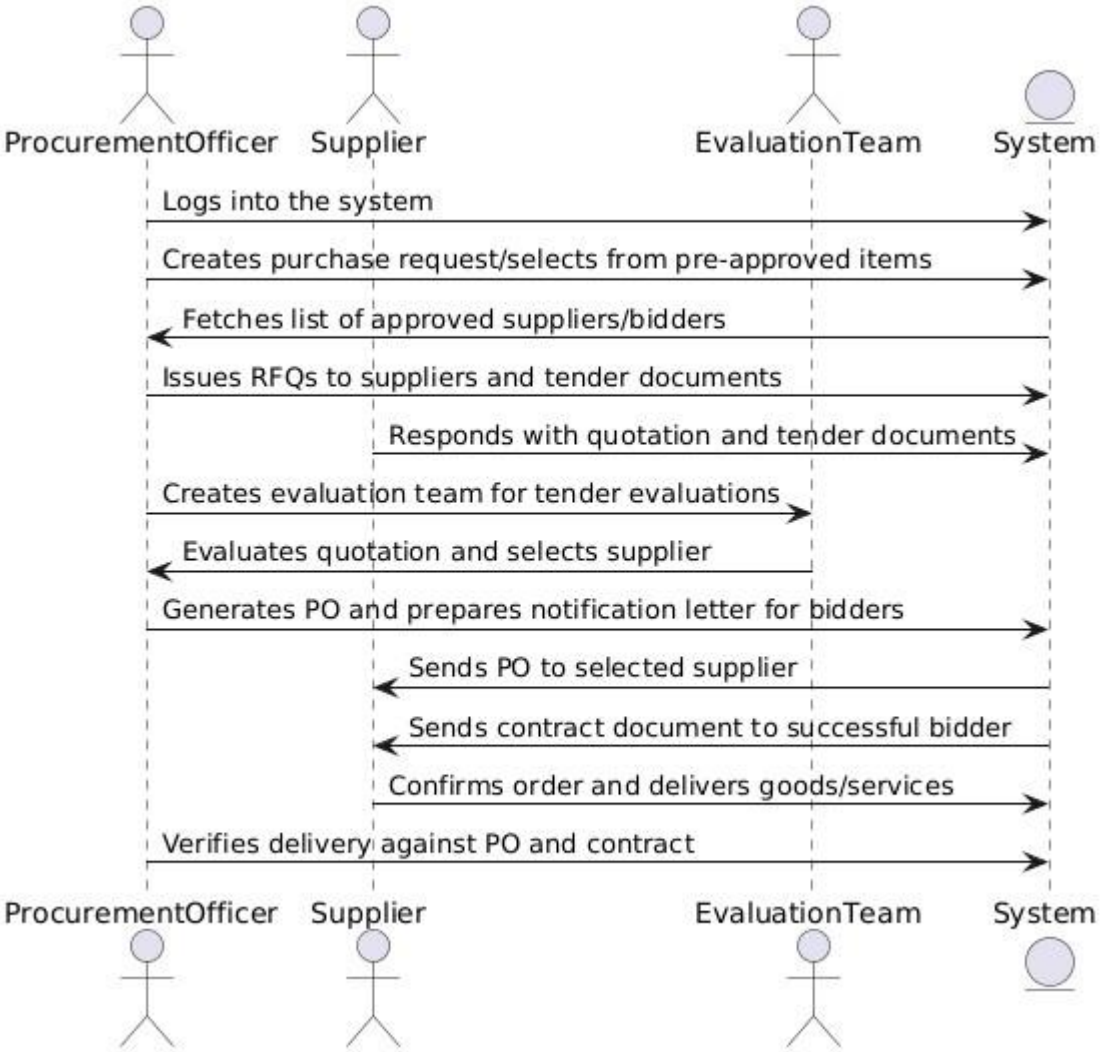

Figure 10: Procurement Management

3.2.9 Agricultural Input Management

Requirement Number	REQ-009
Requirement	Agricultural Input Management (Requesting, Allocation, Distribution with Verification during Disbursement)
Actor(s)	Member, Cooperative Officer, System, OTP/Biometric Service
Pre-condition	Member must be registered in the system. Cooperative Officer is logged in to the system. The system must have an inventory of available agricultural inputs (seeds, fertilizers, tools, etc.).
Inputs	Input request details (input type, quantity), member ID, OTP/Biometric data for verification, cooperative allocation criteria (e.g., crop type, farm size), input delivery details (e.g., delivery location).
Normal Flow	1. Member logs into the system or visits the cooperative. 2. Member submits a request for agricultural inputs (e.g., seeds, fertilizers) based on need.

	3. Cooperative Officer reviews and allocates the requested inputs based on availability and allocation rules. 4. System confirms input allocation and generates an order for distribution. 5. Member is notified about the allocated inputs and scheduled disbursement date. 6. At the time of disbursement, member verifies identity using OTP or biometric verification. 7. Once verified, the cooperative officer distributes the inputs to the member. 8. System updates inventory and confirms input delivery to the member.
Outputs	Allocation confirmation, OTP/biometric verification result, input delivery confirmation, updated inventory.
Post-condition	Inputs are allocated to the member and delivered as scheduled. The system updates the inventory, and the member's request is marked as completed
Message	"Input request successful. Input type: [input], Quantity: [quantity], Delivery: [date]." "OTP/biometric verification successful. Request allocated and ready for disbursement." "Disbursement successful for [input type] to [member name]."
Business Logic	- OTP/biometric verification ensures that the member is valid and authorized to receive inputs during the disbursement process. - Allocation follows cooperative rules such as crop types, member priority, and available stock. - Inputs are allocated and distributed based on availability and request validation. - Inventory is updated automatically upon allocation and distribution.

Below is a sequence diagram showing agricultural input management process flow

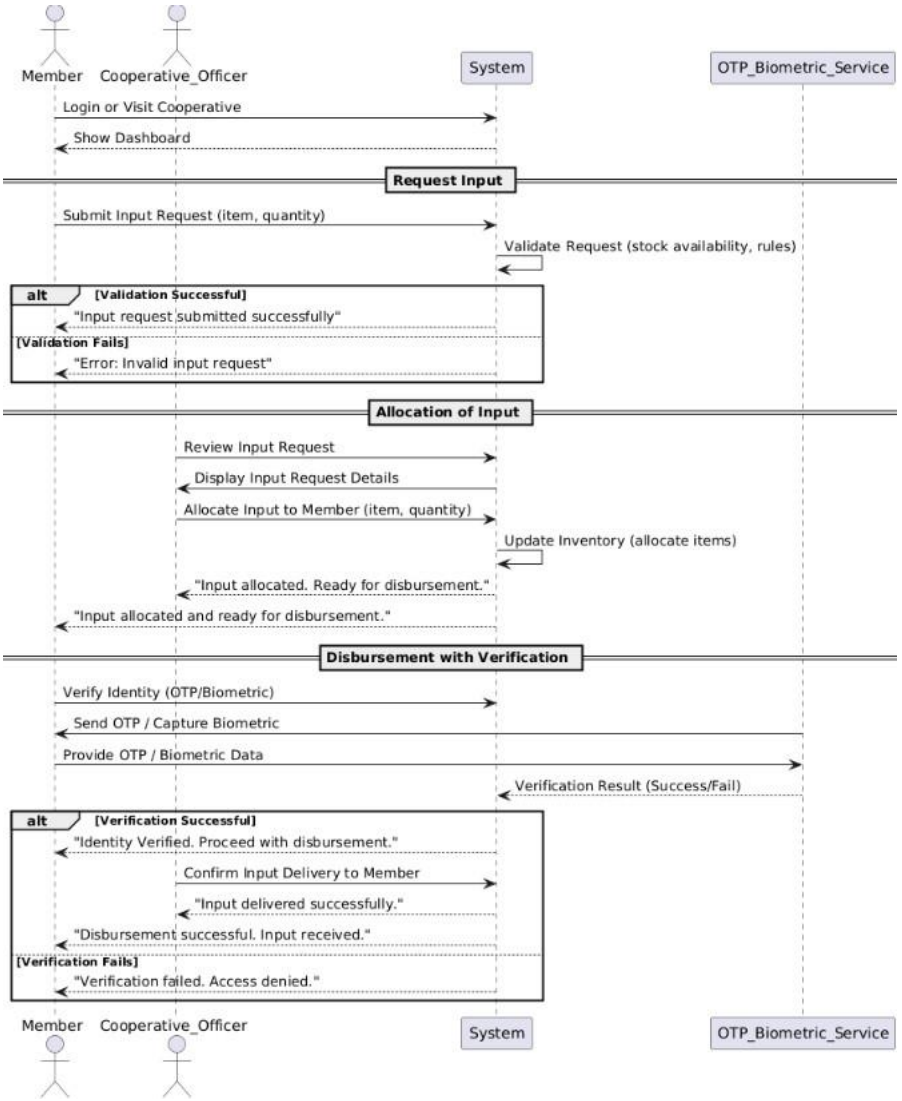

Figure 11: Agricultural Input Management

3.2.10 Loan Management

Requirement Number	REQ-010
Requirement	Loan Management (Request, Allocation, Monitoring Repayments)
Actor(s)	Member, Cooperative Officer, System, Bank (for loan disbursement)
Pre-condition	- Member is registered in the system and eligible for a loan. - The member has an active account with the cooperative. - The cooperative has predefined loan policies (interest rate, repayment period, etc.). - Cooperative Officer is logged into the system.
Inputs	Loan request details (loan amount, repayment terms), member's financial records, loan application data, member ID, loan terms and conditions.
Normal Flow	1. Member submits a loan application (amount, terms) through the system or to the Cooperative Officer. 2. System verifies member eligibility (loan balance, membership status, previous repayments).

	3. Cooperative Officer reviews loan application. 4. Cooperative Officer allocates loan based on predefined criteria. 5. System generates loan contract (amount, interest rate, repayment period). 6. Cooperative Officer and member sign the loan contract. 7. Loan is disbursed to the member. 8. System tracks loan repayment schedule. 9. Member makes regular repayments (via the system or cooperative). 10. System monitors repayments and sends reminders if any payment is overdue.
Outputs	Loan approval notification, loan disbursement confirmation, loan repayment reminders, loan balance updates, loan repayment receipts.
Post-condition	Loan is successfully allocated and disbursed to the member. Repayments are tracked, and loan status is updated in the system. The loan account is closed once fully repaid.
Message	"Loan request successful. Loan Amount: [amount], Repayment Period: [period]." "Loan allocation successful. Amount Disbursed: [amount]." "Repayment Reminder: [amount] due by [date]."
Business Logic	- Eligibility verification is based on membership status, loan balance, and repayment history. - Loan terms are generated based on predefined cooperative rules (interest rate, period). - Loan disbursement can be processed through the cooperative or external bank. - Repayment schedule is based on loan terms, and repayment amounts are automatically calculated. - The system sends reminders for overdue repayments. - The loan account is updated after each payment, and the loan is closed when fully paid.

Below is a sequence diagram for the loan management process flow

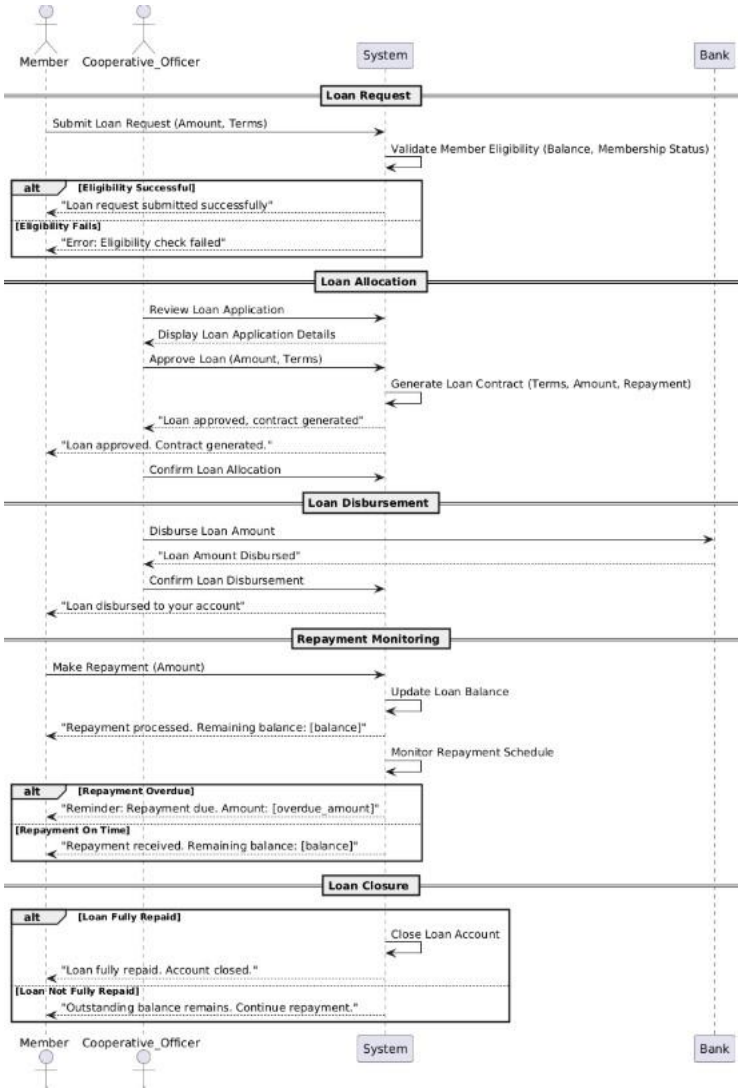

Figure 12: Loan Management

3.3 Use cases

3.3.1 Registration, Crop Collection, and Auction Process.

This use case covers the end-to-end registration, collection, aggregation, and auction process for agricultural produce managed by non-financial cooperative society and integrated systems. Here's a detailed overview:

i. Member Registration in non-financial cooperative society System

- Non-financial cooperative society managers log into the non-financial cooperative society system to register members, capturing essential member details.
- The non-financial cooperative society system integrates with MUVU, allowing the exchange of non-financial cooperative society registration information to ensure compliance and accurate record-keeping across systems.

ii. Crop Collection and Receipt Generation

- Non-financial cooperative society managers log into the system to manage crop collections from farmers, who may or may not be smallholders.
- The non-financial cooperative society system generates crop collection receipts as proof of transaction, detailing quantities and other specifics for each collection.

iii. Submission of Crop Collection Data to WRRB

- The collected crop data is submitted to the Warehouse Receipt Regulatory Board (WRRB) system through integration.
- The WRRB system aggregates these collections and compiles them into a Sales Catalogue. This catalogue includes batch information that is necessary for auction preparation.

iv. Sales Catalogue Submission to TMX Auction System

- The WRRB system then integrates with the Tanzania Mercantile Exchange (TMX), submitting the sales catalogue for auction purposes.
- A TMX officer reviews the catalogue and sets up an auction event for the listed crops, where authorized bidders can participate.

v. Auction and Payment Processing

- The auction process allows bidders to place bids on the crops listed in the TMX sales catalogue.
- Once an auction concludes, the highest bidder, now designated as the Buyer, is notified of their winning bid.
- The Buyer initiates payment through a financial service provider, typically a bank.

vi. Paylist Submission and Payment Processing

- The non-financial cooperative society manager prepares and submits a Paylist to the integrated bank system, detailing payment distributions for each member/farmer. The bank system processes these payments accordingly.

vii. Confirmation and Notification to non-financial cooperative society

- Upon completion, the bank system returns a notification to non-financial cooperative society, including a list of successfully paid members/farmers, confirming the transaction status for accurate record updates.

The diagram below describes the use case for registration, crop Collection, and auction process.

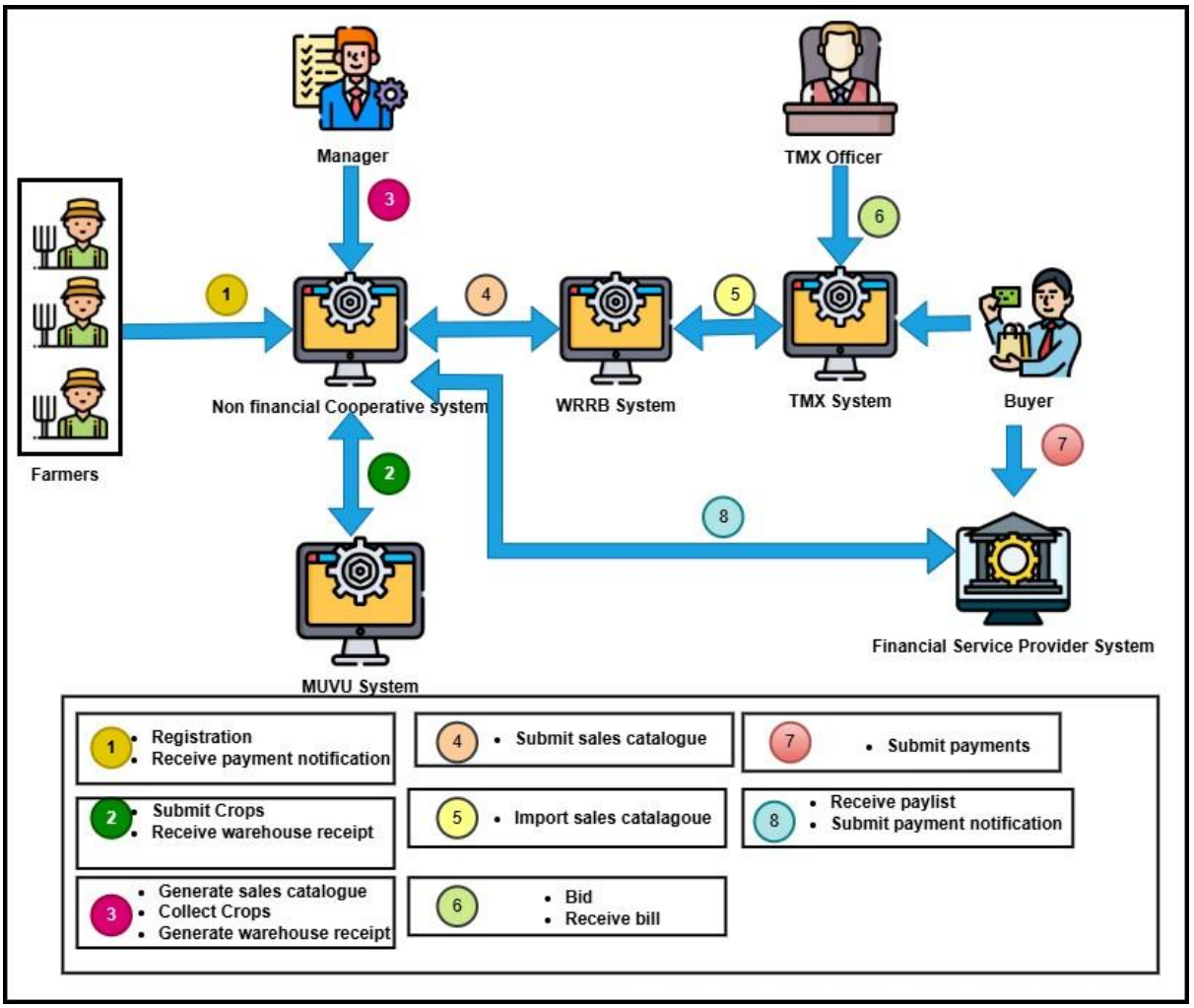

Figure 13:Use case for Registration, Crop Collection, and Auction Process in non-financial cooperative society System

3.3.2 Use case for the Submission of Estimates of Income & Expenditures and Financial Performance

This use case describes the submission process for non-financial cooperative society to report their financial estimates and performance data to the MUVU system. After submission, the data undergoes review and approval by Cooperative Officers and the Assistant Registrar. If any fees are associated with the submission, the MUVU system generates a bill connected to the Government e-Payment Gateway (GePG), which non-financial cooperative society is required to pay.

i. Submission to MUVU System

The manager submits the income and expenditure estimates and financial performance data through the non-financial cooperative society system, which sends it directly to the MUVU system.

ii. Review and Approval Workflow

Once MUVU receives the financial data, a Cooperative Officer reviews it for accuracy and compliance. After review, the Assistant Registrar performs the final approval.

iii. Billing and Payment via GePG

If there are any fees associated with the submission, MUVU automatically generates a bill. The bill is connected to the Government e-Payment Gateway (GePG), where non-financial cooperative society can view and make payments as required. Non-financial cooperative society - must complete the payment through GePG to finalize the process.

The diagram below describes the use case.

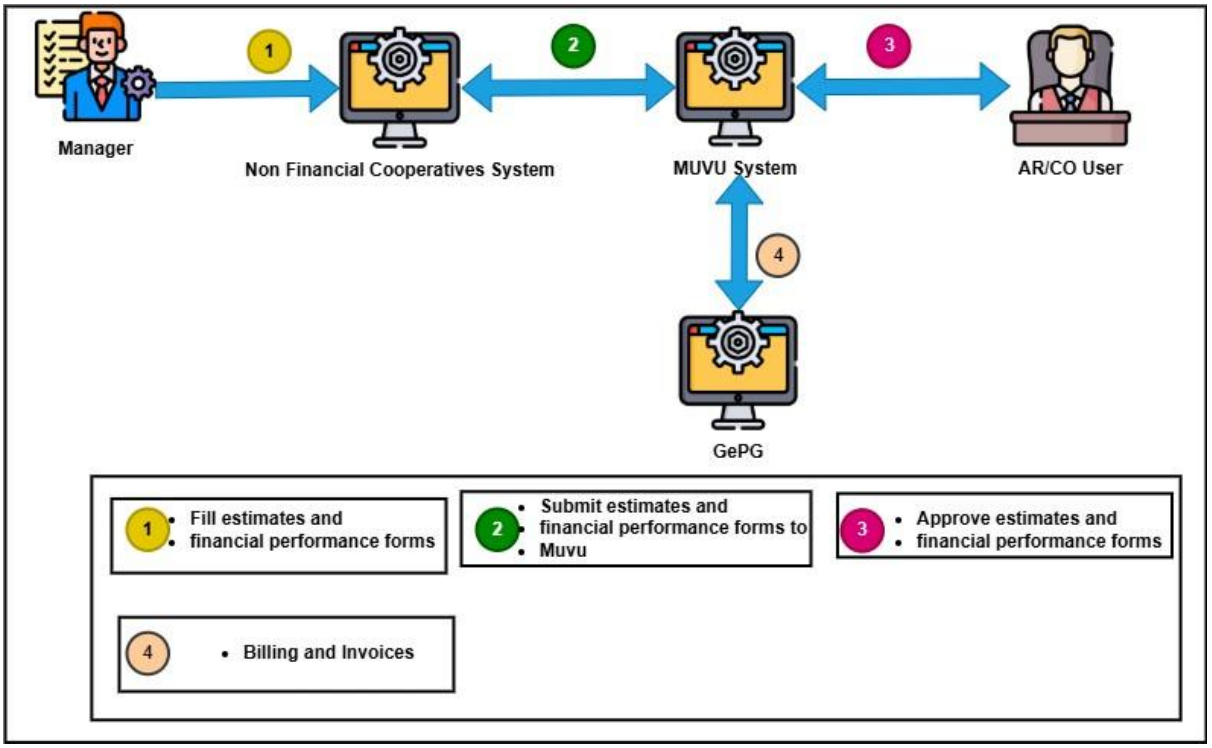

Figure 14: Use case for the Submission of Estimates of Income & Expenditures and Financial Performance

4 Other Non-functional Requirements

4.1 Performance

NFR1: The system shall respond to user inputs within 2 seconds under normal operational conditions.

NFR2: The system shall handle at least 500 transactions per minute during peak load times without performance degradation.

NFR3: The system shall load the main dashboard and critical features within 3 seconds.

NFR4: The system shall support concurrent access by at least 100 users without affecting performance.

4.2 Usability

NFR5: The system shall provide an intuitive user interface that requires no more than 1 hour of training for end users to become proficient.

NFR6: The system shall feature responsive design, ensuring compatibility and optimal user experience on desktops, tablets, and mobile devices.

NFR7: The system shall provide contextual help and tooltips accessible from any screen to assist users with feature usage.

NFR8: The system shall allow users to customize their dashboard layout and select frequently used features for quick access.

4.3 Reliability

NFR9: The system shall achieve 99.9% uptime, excluding scheduled maintenance, to ensure high availability.

NFR10: The system shall perform automatic data backups every 24 hours to safeguard against data loss.

NFR11: The system shall have error logging and handling mechanisms that do not disrupt the user experience and provide detailed error reports for troubleshooting.

NFR12: The system shall recover from unexpected failures within 5 minutes, ensuring minimal disruption to users.

4.4 Security

NFR13: The system shall encrypt sensitive data, including personal user information and financial details, both at rest and in transit using industry-standard encryption protocols.

NFR14: The system shall implement multi-factor authentication (MFA) for all user accounts to enhance security during login.

NFR15: The system shall maintain a comprehensive audit trail of user activities, including login attempts, changes to data, and report generation, accessible to authorized personnel only.

NFR16: The system shall conduct regular security assessments and vulnerability scans to identify and mitigate potential risks.

4.5 Scalability

NFR17: The system shall be designed to accommodate an increase in user load and data volume, supporting a growth of up to 200% in user base over the next three years without significant re-engineering.

NFR18: The system shall support modular architecture to enable easy addition of new features and functionalities without major redesign.

NFR19: The system shall dynamically allocate resources based on load, ensuring consistent performance during varying usage patterns.

4.6 Maintainability

NFR20: The system shall provide clear and comprehensive documentation for both users and developers, including setup instructions, troubleshooting guides, and system architecture.

NFR21: The system shall be built using industry-standard programming practices to facilitate easier updates and modifications.

NFR22: The system shall include automated testing frameworks to ensure that updates do not introduce new errors and that existing functionalities remain intact.

4.7 Compliance.

NFR23: The system shall undergo regular compliance audits to verify adherence to established regulations and standards.

4.8 Interoperability

NFR24: The system shall support integration with third-party applications via standard APIs (RESTful or SOAP) for data exchange.

NFR25: The system shall be compatible with widely used file formats (e.g., CSV, XML, JSON) for data import/export functionalities.

NFR26: The system shall enable seamless data synchronization with external databases and services to ensure up-to-date information.

4.9 Localization and Accessibility

NFR27: The system shall support multiple languages (Swahili and English), allowing users to select their preferred language for the user interface.

4.10 Logging and Monitoring

NFR28: The system shall maintain logs of all user actions and system events, providing a record for audits and troubleshooting.

NFR29: The system shall include monitoring tools to track performance metrics and alert administrators of any anomalies or potential issues.

5 System Documentation

The User Documentation and Training section ensures that both end-users and administrators have the necessary resources to effectively use the Non-Financial Cooperative System. It outlines requirements for user manuals, administrator guides, in-system help features, and training materials to support smooth system operation and user proficiency.

5.1 User Documentation and Training

i. End-User Manuals

Requirement 1: The system must provide step-by-step guides for users to navigate the system, complete tasks, and troubleshoot issues.

Requirement 2: The system must include a Frequently Asked Questions (FAQ) section for common user queries.

ii. Administrator Guide

Requirement 3: The system must provide an Administrator Guide for managing users, configuring system settings, and generating reports.

Requirement 4: The guide must cover role-based permissions and system maintenance procedures.

iii. Online Help and Tutorials

Requirement 5: The system must include tooltips and interactive tutorials to guide users through key tasks.

Requirement 6: The system must offer an easily accessible FAQ and help widgets for on-demand assistance.

iv. Training Materials

Requirement 7: The system must provide training modules to cover all aspects of the system.

Requirement 8: The system must offer videos, hands-on exercises, and evaluation quizzes to support training and assess user proficiency.

6 Appendix I: INTERNAL AUDIT UNIT

1	Required documents	
	Challenges	Requirements
1.1	List of registered cooperatives by region	Access-by region
1.2	List of audit and supervision reports of cooperatives done by the region- region wise	Access by region
	Failure to retrieve approved budget estimates by region	The approved budget estimates for revenue and expenditure- by the region
1.3	Failure to retrieve budget estimates in various stages (e.g., Forwarded, Approved, Rejected, Draft, Submitted)	Status reports – By region Despite general data being available, long data causing delays or errors, Data exceeds 10,000 records while pulling only 250 transactions at a time
1.4	Work plans for auditing cooperatives at the regional level	The Inspection work plans for cooperatives by region
1.5	System overload and frequent timeouts during data retrieval	