SECJ3204: Software Engineering

System Documentation (SD)

KADA SYSTEM

Version 1.1

Date: 15/12/2024

Faculty of Computing

Prepared by: <TechMedico>

Revision Page

a. **Overview**

The current version of system documentation introduces the basis of KADA system. The introduction and specific requirements are included. The objective, scope, definitions, acronyms and abbreviations, references, and overview are all included in the introduction. To give a thorough grasp of the project, this portion of the system requirement specification also explains the persona, system characteristics such as the use case diagram, class diagram, state diagram, user stories, non-functional requirements and design constraints.

b. **Target Audience**

As the ones who would utilize the system, system developers who oversee creating and implementing the KADA system, as well as project stakeholders like KADA cooperative members, are the target audience for this SD because they are more knowledgeable about the system and may have more precise requirements.

c. **Project Team Members**

The System Documentation is designed for system developers, administrators and technical support teams that are responsible for implementing, maintaining and troubleshooting the KADA system. It is also created for board members and other stakeholders who require a high-level understanding of the system's operations and procedures for management and decision-making.

Member Name	Role	Task	Status
Elijah She Yu Sheng	Project manager	Specify design constraints. Define performance and other requirements. Draw state diagram	Complete
Choh Jing Yi	System analyst	Create user story for KKK admin Draw sequence diagram Draw activity diagram	Complete
Lee Yin Shen	System designer	Create user story for apply membership Draw sequence diagram Draw activity diagram Draw domain model	Complete
Joanne Ching Yin Xuan	Process analyst	Document launch phase Draw sequence diagram	Complete

		Draw activity diagram Draw use case diagram	
Lim Yu Han	Quality analyst	Create user story for apply loan Draw sequence diagram Draw activity diagram	Complete

d. **Version Control History**

Version	Primary Author(s)	Description of Version	Date Completed
1.0	ELIJAH SHE YU SHENG LEE YIN SHEN CHOH JING YI JOANNE CHING YU XUAN LIM YU HAN	Completed all sections in the system documentation	15/12/2024
1.1	ELIJAH SHE YU SHENG LEE YIN SHEN CHOH JING YI JOANNE CHING YU XUAN LIM YU HAN	Edited user diagram and class diagram	23/12/2024

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1. Introduction

1.1 **Purpose**

This SD serves as a structured document to guide the analysis, design, development, and deployment of the KADA system, which is intended to digitize the cooperative's operations. This SD comprises the project's requirements, architecture, and functionality; by referring to this document, project stakeholders will gain a clear knowledge of what the project is doing. For example, SD can serve as an SRS since it clearly lists the functional and non-functional, user and system requirements of the KADA system. It can also serve as a reminder to developers to always deliver output that meets stakeholder expectations. Additionally, the project management can make sure that every step is carried out in the proper and logical order, and the development team may utilize this SD as a blueprint to build the system effectively. For the quality analyst team to evaluate and enhance the system in accordance with the requirements, this SD also contains predicted performance. As specified in this SD, both developers and stakeholders make sure that things like the deadline and deliverables move smoothly.

1.2 **Scope**

We want to replace the current manual Kada website with our software solution, the KADA online system. By using a digital solution, our KADA online system will increase operational effectiveness, accessibility, and usability. With certain essential features, the KADA online system offers a unified platform for administrators, which is cooperative executives, members, and regular users.

1. New Member Registration
By completing the member application form found on the website, users can register as members online. Both members and administrators will greatly benefit from this, as members can monitor their membership status and administrators may approve applications by just clicking on the website rather than having to review numerous documents.

2. Loan management
Members can browse the list of available loan types, use the loan calculator in our system to determine the interest rate, and then only apply for the loan type they want. If they receive a loan offer, members can also monitor their loan status and repayment plans.

3. Saving account
Members can obtain and repay loans by managing their savings accounts, which are integrated into the system.

4. Financial reporting

Both members and administrators can retrieve monthly and annual reports from the system, which will enable members to monitor their financial performance and administrators to learn about the cooperative's performance. The purpose of this report is to increase financial transparency.

5. Program application

Members are permitted to apply for KADA programs, with streamlined tracking and email or SMS notifications upon approval.

1.3 Definitions, Acronyms and Abbreviation

This subsection should provide the definitions of all terms, acronyms, and abbreviations used in the SD.

1. KADA   Lembaga Kemajuan Pertanian Kemubu
2. SD   System Documentation
3. SRS   System Requirement Specification
4. SDD   System Design Document
5. STD   System Test Document
6. UX   User Experience
7. MTBF   Mean Time Between Failures
8. API   Application Programming Interface
9. MCC   Malaysian Cooperative Commission
10. RAM   Random Access Memory
11. SSD   Solid State Drive
12. TLS   Transport Layer Security
13. RBAC   Role-Based Access Control

1.4   **References**

[1]   A. Athuraliya, "The Easy Guide to UML Activity Diagrams | Creately," creately.com, Jun. 20, 2022. https://creately.com/guides/activity-diagram-tutorial/

[2]   "How to Draw a Sequence Diagram in UML," Lucidchart, 2019. https://www.lucidchart.com/pages/how-to-draw-a-sequence-diagram-in-UML

[3] "Domain Modeling: What you need to know before coding," Thoughtworks. https://www.thoughtworks.com/insights/blog/agile-project-management/domain-modeling-what-you-need-to-know-before-coding

1.5   **Overview**

This System Documentation includes special requirements for program development. We added five personas, each with their own user needs and tales. We will use them throughout this section to ensure that our development team has a clear understanding of the system requirements. The system features will then be explained in more depth using a use case diagram, as well as a brief description of each use case using a table, class diagram, and state machine diagram. Next, we'll use a sequence diagram and an activity diagram to represent each user story, allowing designers and developers to fully exploit this SD to help their work. Finally, we will conclude this document on the basis of system performance, needs, and design constraints.

2.   Specific Requirements

This section outlines the software requirements in detail to guide the process of design, development, and testing. By describing all required inputs, outputs, and functionality specifically, it ensures that the system satisfies the needs of users and stakeholders.

2.1   Persona

The Persona section defines the target users of the system, detailing their characteristics and user stories when using the system, to ensure that the system is designed to meet their specific needs. Understanding the personas helps ensure that the system is appropriate for its target users.

2.1.1 Persona 1: KADA employee (New User)

User Need

A KADA employee needs to register as a new KADA member to enjoy benefits.

User Stories

1. As a KADA employee, I want to register myself as a new member of the cooperative, so that I can access the benefits provided by the corporation.
2. As a KADA member, I want to log in to the system using my unique username and password, so that I can access my respective dashboard

2.1.2 Persona 2: KADA member (Existing member)

User Need

A KADA member needs a way to apply loans easily to purchase equipment, machinery, or infrastructure required.

User Stories

1. As a KADA member, I want the system to check the approval status of my loan application, so that I can know if my loan request has been approved and understand any next steps or additional requirements to secure funding.
2. As a KADA member, I want to apply for a loan online through the system, so that I can complete the application process conveniently and quickly without needing to visit a physical office.

3. As a KADA member, I want to apply for a training program online, so that I can complete my application quickly and conveniently without needing to visit a physical office.
4. As a KADA member, I want to manage my saving account through the system, so that I can deposit money, pay for loans, apply for programs, and view my account information conveniently.
5. As a KADA member, I want to generate reports through the system, so that I can make informed decisions based on my financial situation.
6. As a KADA member, I want to view and verify financial information through the system, so that I can stay updated on my current financial status and ensure accuracy.

2.1.3 Persona 3: KADA admin

User Need

A KADA admin needs a way to efficiently manage member applications, loan requests, program participation, and system policies to ensure smooth operations.

User Stories

1. As a KADA admin, I want to view applicant lists for new members, loans, and program applications, so that I can review their details and proceed with the approval process in an orderly manner.
2. As a KADA admin, I want to approve new members, so that I can ensure applicants meet the necessary requirements and maintain the integrity of the KADA membership.
3. As a KADA admin, I want to approve new loans, so that I can verify members' eligibility and ensure compliance with the loan policies.
4. As a KADA admin, I want to approve new programs, so that I can confirm applicants meet the criteria and maintain the quality and fairness of program participation.
5. As a KADA admin, I want to update policies, so that I can ensure the system complies the latest organizational guidelines and modify the website design to keep it user-friendly and aligned with updates.

2.2 System Features

KADA System is a web-based software. The system provided a means for the members and admin to better manage the member application and loan application. It also has other features such as managing saving account, view financial status, generate finance report, and manage website.

2.2.1 Use Case Diagram

The system features are illustrated in Figure 1.1 below. The detail description of each module is tabulated in Table 1.1.
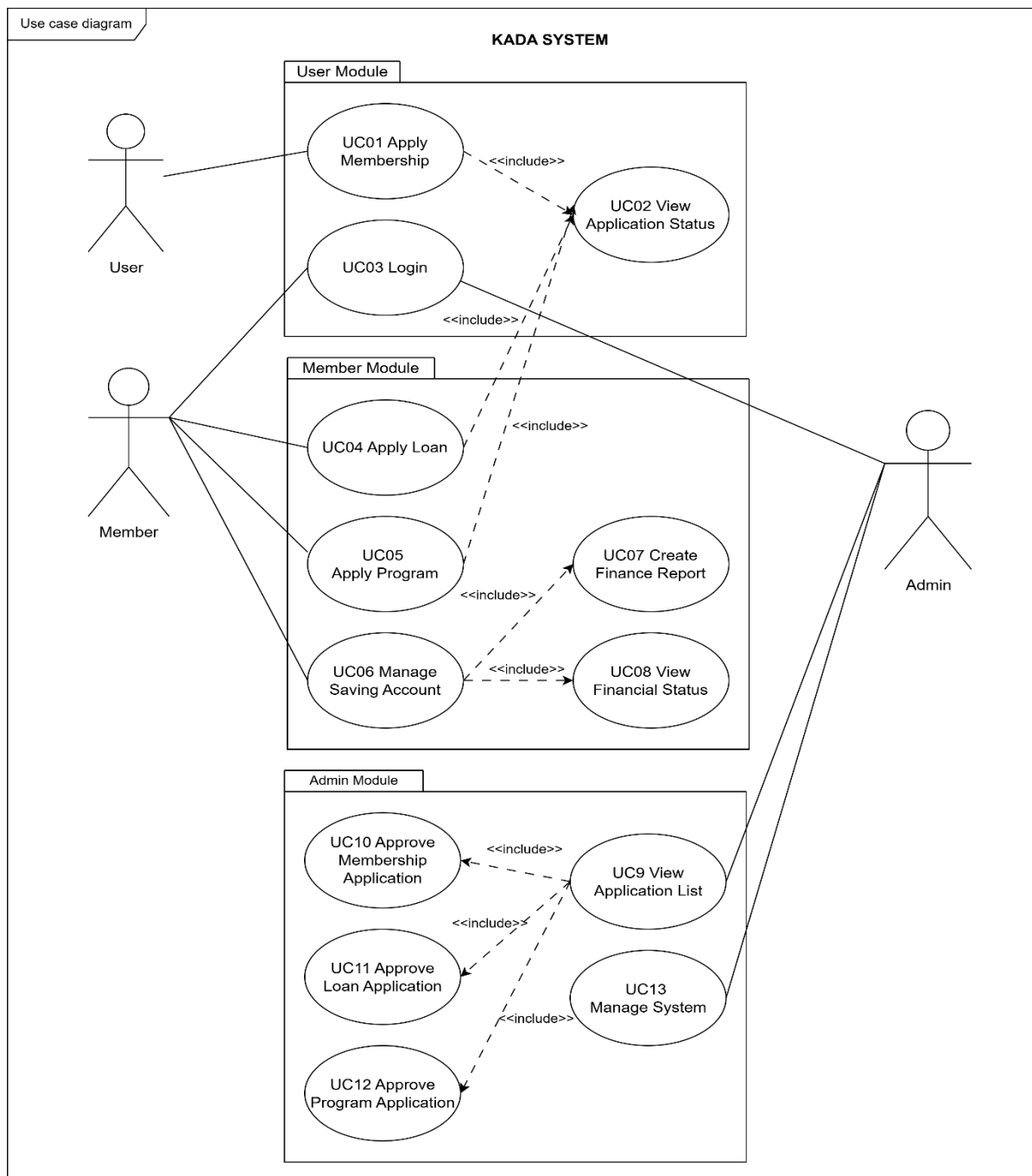

Figure 2.2.1.1: Use Case Diagram for <KADA System>

Table 1.1: Description of Module and Functions for <KADA System>

Use case	Function	Description
UC01	Apply Membership	A user can apply to be a member in KADA cooperative by filling in the online form and uploading the required documents.
UC02	View Application Status	If a user applies for membership, or a member apply for loan or program, they would be able to view their application status whether approved or rejected and further instructions.
UC03	Log In	The member and admin can login to the system by using the unique login username and password. Members will turn to the member page while admin will turn to admin page.
UC04	Apply Loan	The members can apply for loans by filling in the online form and uploading any required documents.
UC05	Apply Program	The members can apply for the KADA program by filling in the online form and upload any required documents.
UC06	Manage Saving Account	The members can manage their saving accounts like depositing, paying for loans and program application and view account info.
UC07	Create Finance Report	Upon the management saving account operation, the members can create their monthly and annual finance report.
UC08	View Financial Status	Upon the saving account operation, the member can view their financial status, such as loan period, loan balance and loan amount.
UC09	Admin view Application List	The amin can view the list of membership and applications as well as the membership, and existing applications.
UC10	Approve Membership Application	The admin would be able to update the status of the membership application.
UC11	Approve Laon Application	The admin would be able to update the status of the loan application.
UC12	Approved Program Application	The admin would be able to update the status of the program application.

UC13	Manage Website	The admin can manage the website info like update the policies such as the requirement for loan application, loan interest rate, and membership rules.
		The admin can also modify the website design, such as the banner and latest news.

Functional Requirement of Each Use Case

UC01 Apply Membership

- Req-1: The system shall validate the user input, include verified email address, ID card number and phone number.
- Req-2: The system shall display error message for invalid input.
- Req-3: The system shall send an email notification to the user upon the submission of the membership application.
- Req-4: The system shall ensure that all application data is securely stored and complies with relevant data protection regulations.
- Req-5: The system shall display a confirmation message to the user after successfully updating the database.

UC02 View Application Status

- Req-1: The system shall allow users to access their application status securely.
- The system shall display detailed application status, like pending, approved, and rejected.
- The system shall notify the users of any updates of their application status.

UC03 Log In

- Req-1: The system shall validate the user credentials, include verified username and password.
- Req-2: The system shall display error message for invalid input and login attempts.
- Req-3: The system shall provide an option for password recovery.
- Req-4: The system shall log unsuccessful login attempts for security purpose.

UC04 Apply Loan

- Req-1: The system shall validate the user input, include loan type, amount, and period.
- Req-2: The system shall display error message for invalid input such as exceeding loa amount limit or missing document.

- Req-3: The system shall send a confirmation email to users if successful submit the form.
- Req-4: The system shall allow secure upload of required documents during the application process.

UC05 Apply Program

- Req-1: The system shall validate the program application details, like:
  - Program type
  - Required supporting information
- Req-2: The system shall display error message for incomplete application.
- Req-3: The system shall notify the user for successful submission with email.

UC06 Apply Program

- Req-1: The system shall allow users to view their saving account details, including:
  - Current balance
  - Recent transactions
  - Loan balance
- Req-2: The system shall enable users to make deposits or payments securely via supported methods like credit card and online banking.
- Req-3: The system shall show confirmation message for successful transactions and error message if transaction fail.
- Req-4: The system shall provide transaction history for each user.

UC07 Create Finance Report

- Req-1: The system shall allow users to generate detailed financial reports, including:
  - Loan balances
  - Payment histories
  - Total contributions to savings
- Req-2: The system shall enable users to download reports in standard formats like PDF and Excel.
- Req-3: The system shall ensure all reports are accurate and updated in real-time with latest data.

UC08 View Financial Status

- Req-1: The system shall display a detailed financial summary for users, including:
  - Contributions to savings
  - Outstanding loan balances
  - Payment due dates
- Req-2: The system shall ensure all financial data are accurate and updated in real-time with latest data.

UC09 View Application List

- Req-1: The system shall provide admins with a list of all membership, loan, and program applications.
- Req-2: The system shall allow admins to sort and filter application base on:
  - Application type
  - Application status
  - Submission date
- Req-3: The system shall enable admins to view detailed information for each application.

UC10 Approve Membership Application

- Req-1: The system shall enable admins to review the submitted membership application forms.
- Req-2: The system shall allow admins to approve or reject the application with reasons for rejection.
- Req-3: The system shall notify applications of the decision via email and update member details in the list.

UC11 Approve Loan Application

- Req-1: The system shall enable admins to review the submitted loan application forms.
- Req-2: The system shall allow admins to approve or reject the application with reasons for rejection.
- Req-3: The system shall notify applications of the decision via email and update member details in the list.

UC12 Approve Program Application

- Req-1: The system shall enable admins to review the submitted program application forms.

- Req-2: The system shall allow admins to approve or reject the application with reasons for rejection.
- Req-3: The system shall notify applications of the decision via email and update member details in the list.

UC13 Manage Website

- Req-2: The system shall allow admins to update website content, including:
  - Loan information
  - Program details
  - News and announcements
  - Existing policies
- Req-2: The system shall provide a user-friendly interface for making content updates.
- Req-3: The system shall ensure all updates are immediately reflected on the live website.
- Req-4: The system shall maintain a history log of changes for audit purposes.
- Req-5: The system shall allow admins to upload multimedia contents as part of updates.

2.2.2 Domain Model: Class Diagram

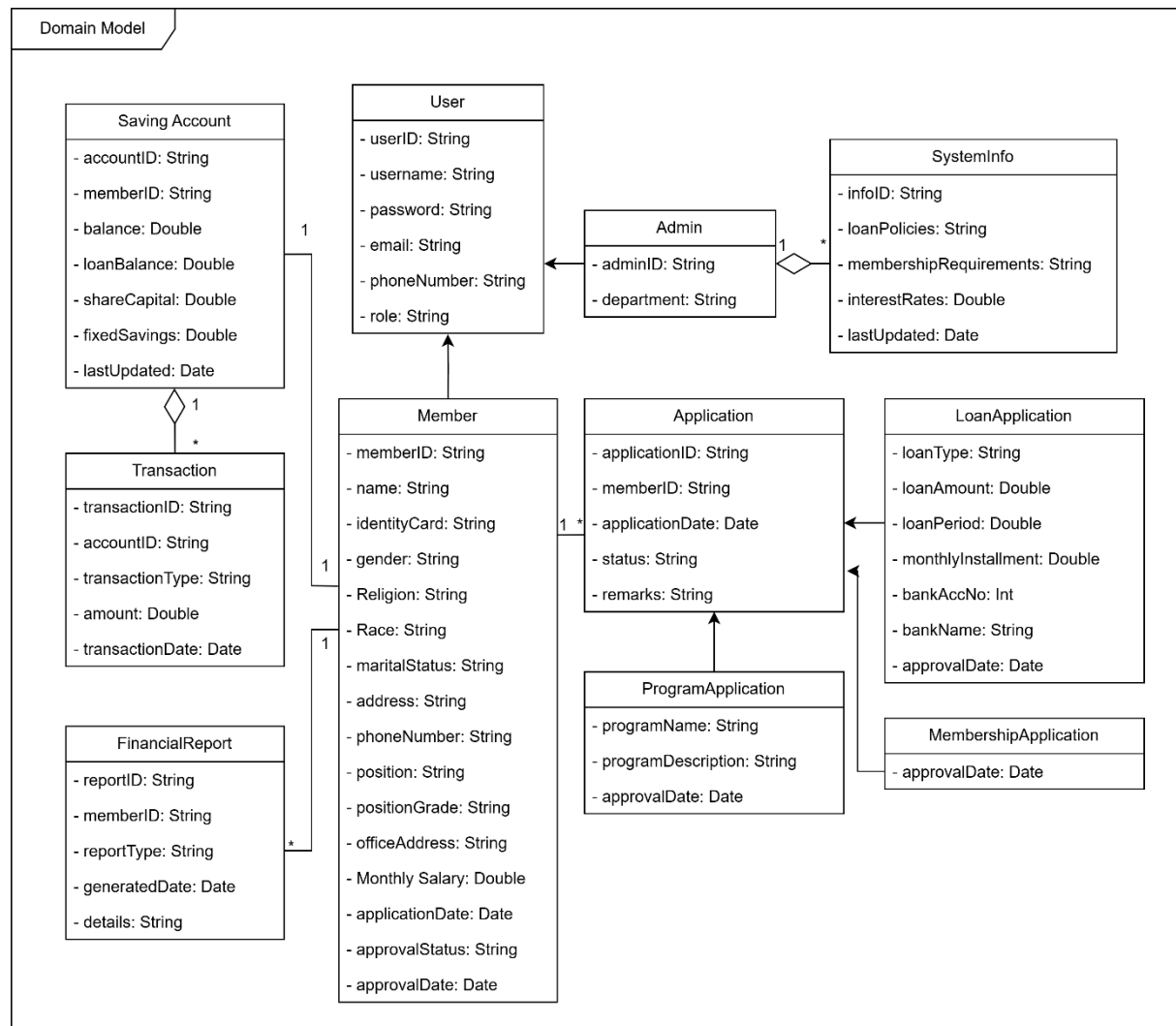The domain model of the KADA System is illustrated in Figure 1.2 below.

Figure 2.2.2.1: Domain Model for <KADA System>

Description of Classes

User Class
Represent as superclass for all users using the system, including members and admins.
- **userID:** A unique identifier for each user in the system.
- **username:** The username used for logging into the system.
- **password:** The password used for authentication.
- **email:** The email address associated with the user.
- **phoneNumber:** The contact phone number of the user.
- **role:** The role of the user, such as Member or Admin.

** The Member class is inherited from the User class. Each member is a specific type of user.

Admin Class
Represents an admin user responsible for managing the system.
- **adminID:** A unique identifier for each admin, referencing the userID.
- **department:** The department the admin belongs to (e.g., finance or operations).

** The Admin class is inherited from the User class. Each admin is a specific type of user.

Member Class
Represents a person registered as a member of the system.
- **memberID:** A unique identifier for each member, referencing the userID.
- **name:** The full name of the member.
- **identityCard:** The identity card number of the member (e.g., MyKad number).
- **gender:** The gender of the member (e.g., Male, Female).
- **race:** The race or ethnicity of the member.
- **maritalStatus:** The marital status of the member (e.g., Single, Married).
- **address:** The home address of the member.
- **phoneNumber:** The contact phone number of the member.
- **position:** The member's job position within the organization.
- **positionGrade:** The grade or level of the member's job position.
- **officeAddress:** The office address where the member works.
- **monthlySalary:** The member's monthly income.
- **applicationDate:** The date the member applied for membership.
- **approvalStatus:** The status of the membership application (e.g., Pending, Approved, Rejected).
- **approvalDate:** The date the membership application was approved.

SavingAccount Class
Represents a member's savings account within the system.

- **accountID:** A unique identifier for the saving account.
- **memberID:** A reference to the memberID that owns this account.
- **balance:** The current balance in the saving account.
- **loanBalance:** The total outstanding loan amount associated with this account.
- **shareCapital:** The share capital contributed by the member.
- **fixedSavings:** The fixed savings amount stored in the account.
- **lastUpdated:** The date when the account details were last updated.

** The SavingAccount class is associated with the Member class. The relation is one-to-one, where each member has exactly one saving account.

Transaction Class

Represents a financial transaction made on a saving account.
- **transactionID:** A unique identifier for the transaction.
- **accountID:** A reference to the accountID of the saving account associated with the transaction.
- **transactionType:** The type of transaction (e.g., Deposit, Withdrawal, Payment).
- **amount:** The monetary value of the transaction.
- **transactionDate:** The date the transaction was made.

Application Class

Represents a general application for membership, loans, or programs.
- **applicationID:** A unique identifier for the application.
- **memberID:** A reference to the memberID of the applicant.
- **applicationDate:** The date the application was submitted.
- **status:** The current status of the application (e.g., Pending, Approved, Rejected).
- **remarks:** Additional comments or feedback related to the application.

** The MembershipApplication, LoanApplication, and ProgramApplication classes are inherited from the Application class. Each specific application type extends the general application class.

MembershipApplication Class

A specific type of application for membership.
- **approvalDate:** The date the membership application was approved.

LoanApplication Class

A specific type of application for loans.
- **loanType:** The type of loan applied for (e.g., Personal, Business).
- **loanAmount:** The amount of money requested in the loan.
- **loanPeriod:** The duration of the loan in months.

- **monthlyInstallment:** The monthly repayment amount.
- **bankAccNo:** The bank account number associated with the loan disbursement.
- **bankName:** The name of the bank where the loan will be deposited.
- **approvalDate:** The date the loan application was approved.

ProgramApplication Class

A specific type of application for programs.
- **programName:** The name of the program the member is applying for.
- **programDescription:** A description of the program.
- **approvalDate:** The date the program application was approved.

FinancialReport Class

Represents a financial report generated for a member.
- **reportID:** A unique identifier for the financial report.
- **memberID:** A reference to the memberID of the member who owns this report.
- **reportType:** The type of financial report (e.g., Monthly, Annual).
- **generatedDate:** The date the report was generated.
- **details:** A summary of the report's contents, such as savings and loan balances.

** The FinancialReport class is associated with the Member class. The relation is one-to-many, where a member can generate multiple financial reports.

SystemInfo Class

Represents system-wide policies and configurations.
- **infoID:** A unique identifier for the system information entry.
- **loanPolicies:** The rules and regulations related to loan applications.
- **membershipRequirements:** The eligibility criteria for membership.
- **interestRates:** The interest rates applied to loans.
- **lastUpdated:** The date when the system information was last updated.

** The SystemInfo class is an aggregation of the Admin class. The relation is one-to-many, where an admin manages multiple system information entries

2.2.3 State Diagram

The state diagram shows the states and transitions of an object throughout the system. The *MembershipApplication class, LoanApplication class, Program Application class, SavingAccount class, Transaction class* and the *Financial Report class* would require a state diagram that shows the transition of application status.

Figure 2.2.3.1 shows the state diagram for the *Membership, loan, and program application process*. Once the user submits the application, the application will be in Processing state. If there are incomplete applications that need addition documents from applicants, it will move to waiting for documents state. Then the result of the application will be updated to either Approve state or Rejected state.
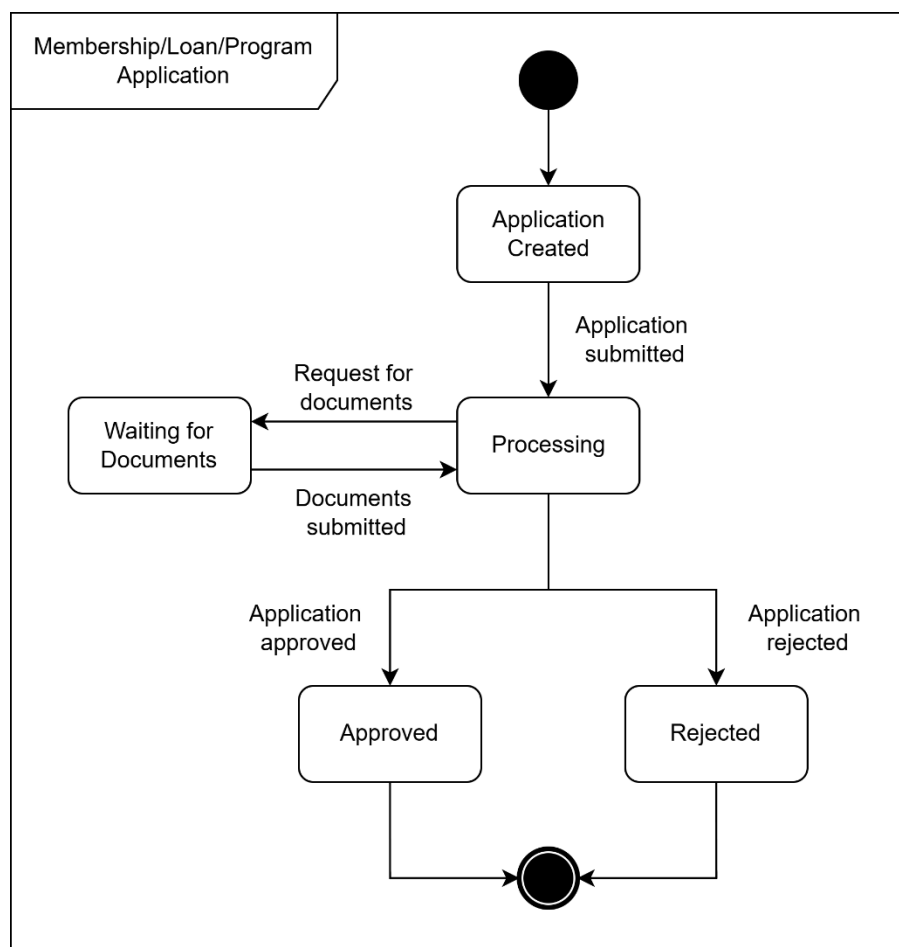

Figure 2.2.3.1: State Machine Diagram for Membership, Loan, and Program Application process

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Figure 2.2.3.2 shows the state diagram for the *Saving Account Lifecycle*. Once the user becomes a member, their saving account will be created. The account will move to the Active State where allows members to manage the account. If there are issues like policy violations or inactive, the account will move to Suspended state. A member needs to reactive the account so that the account can move back to Active state. Lastly, the account can transition to Closed state when it is permanently closed.
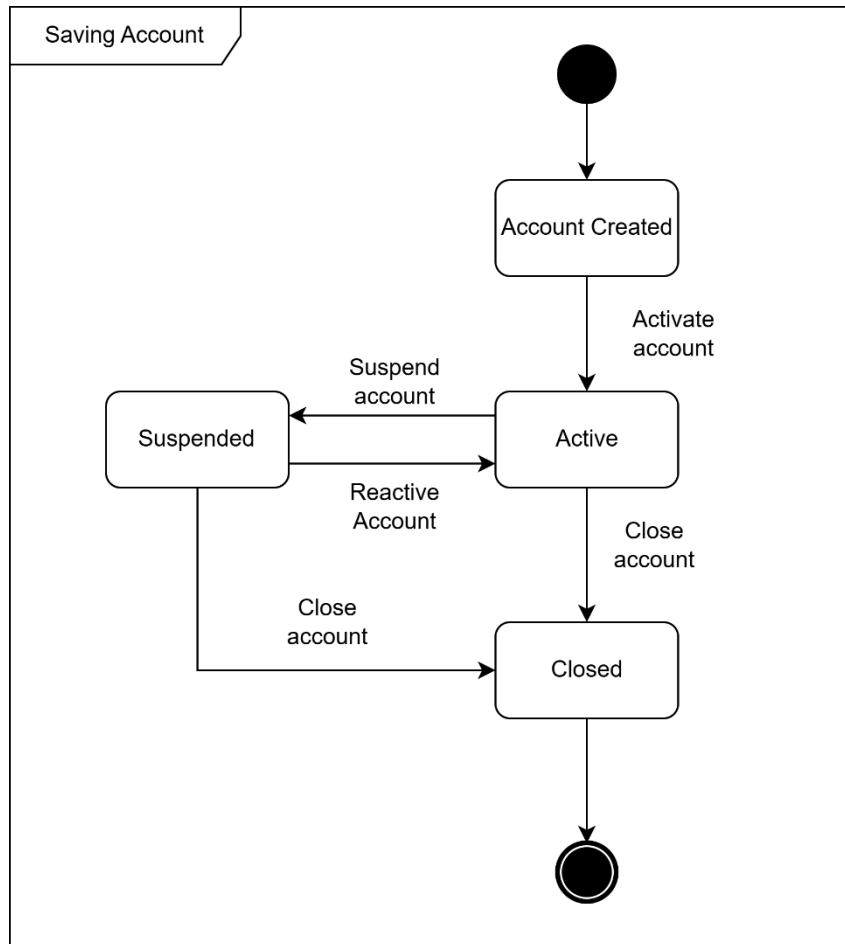

Figure 2.2.3.2: State Machine Diagram for Saving Account Lifecycle

Figure 2.2.3.3 shows the state diagram for the *Transaction Processing*. When a user initiates a transaction, it will enter the Transaction Created state. The system then begins processing the transaction and moves to Pending Processing State. If a user has insufficient funds or other reasons, it will move to Failed state. While if transaction successful, it will move to Completed state. A user can cancel the transaction any time, so that it will move to Cancelled state.
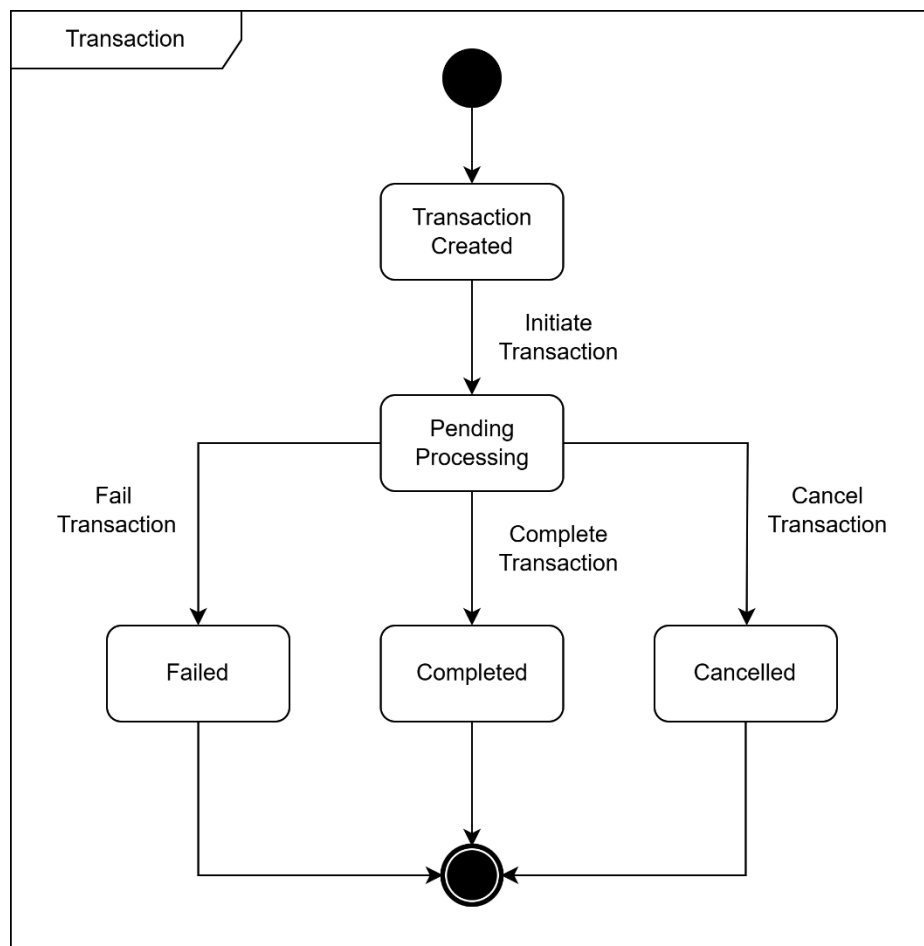

Figure 2.2.3.3: State Machine Diagram for Transaction Processing

Figure 2.2.3.4 shows the state diagram for the *Financial Report Generation* process. When a member requests a financial report, it will enter the Report Requested state. Then the system begins compiling the requested data and moves to Generating state. If the process completed successful, the report moves to Completed state. However, if errors occur like missing or corrupted data, the report will transition to Failed state. A member can cancel the generation any time so that it will move to Cancelled State.
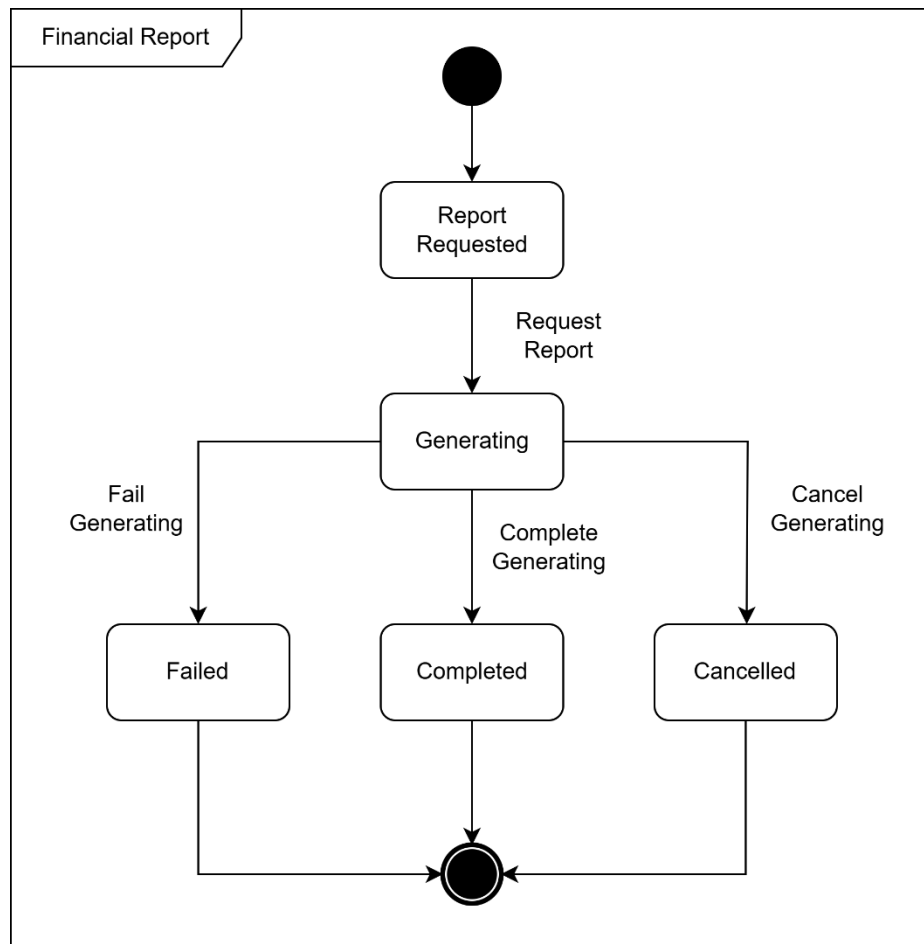

Figure 2.2.3.4: State Machine Diagram for Financial Report Generation

2.3 **Launch Phase**

The product backlog lists the parts and modules for the project according to the priorities. Table 1.2 shows the product backlog for the KADA Online System.

Table 1.2 Product Backlog for the KADA Online System

Sprint	Use Case Involved	Team Members Assigned
Sprint 1 User Module	UC001 Apply Membership UC002 View Application Status UC003 Log In	Choh Jing Yi Elijah She Yu Sheng Lee Yin Shen
Sprint 2 Member Module	UC004 Apply Loan Application UC005 Apply Program Application UC006 Manage Saving Account	Choh Jing Yi Elijah She Yu Sheng Lee Yin Shen
Sprint 3 Admin Module	UC007 Create Finance Report UC008 View Financial Status UC009 Admin view Application List	Joanne Ching Yin Xuan Lim Yu Han
Sprint 4 Admin Module	UC010 Approve Membership Application UC011 Approve LOAN Application UC012 Approve Program Application UC013 Manage Website	Joanne Ching Yin Xuan Lim Yu Han

2.4   **User Story Details**

This section highlights the goals and expectations of users for the KADA system, emphasizing the necessary actions to be taken. Each user story outlines the scope, event flow, and includes supporting diagrams, such as sequence and activity diagrams, to ensure the system fulfills user's needs.

2.4.1 US001: User Story Apply for Membership

Table 2.1: User Story Description for Applying for Membership

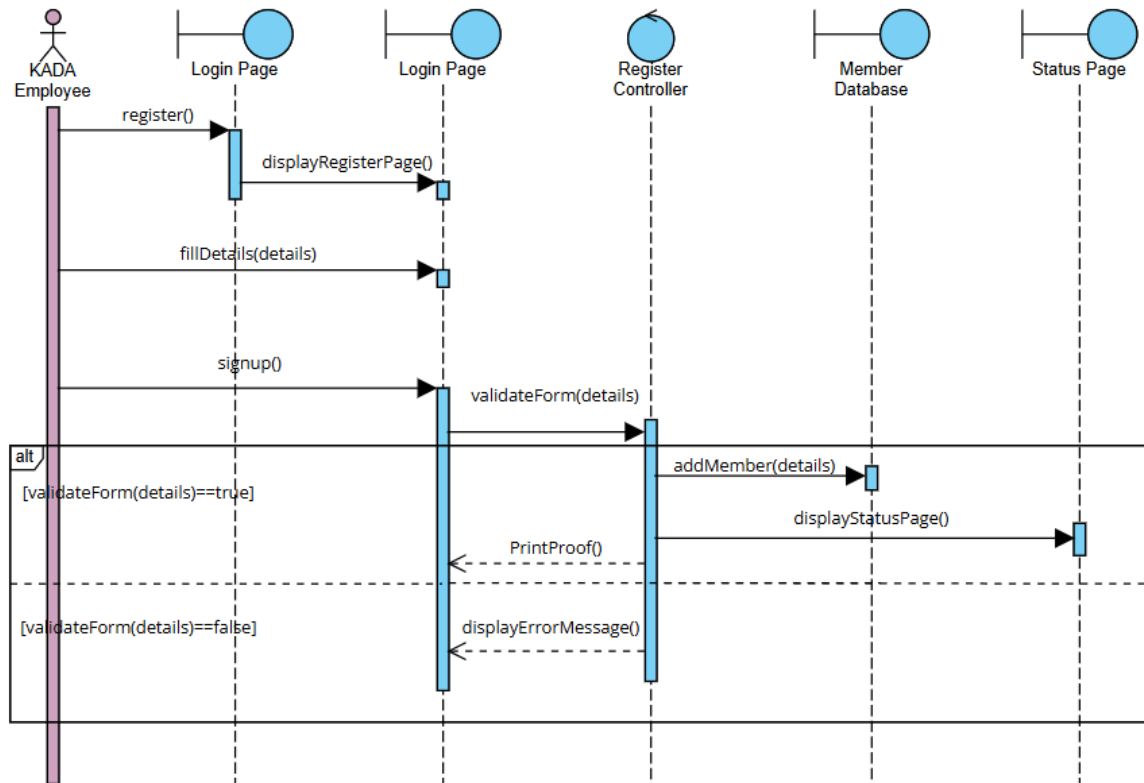| User story: Apply for Membership |
|---|
| **ID**: US001 |
| **User Story Description**
As a KADA employee
I want to register myself as a new member of the cooperative
So that I can access the benefits provided by the corporate |
| **Flow of events:**
1.   The employee accesses the system through the website.
2.   The employee chooses to register as a member.
3.   The employee inputs all the required details.
4.   The system presents the "Important Info before applying" statement and the employee agrees by ticking the confirmation box.
5.   The employee applies for review.
6.   The employee will get a proof of submission |
| **Alternative flow 1:**
1. If incomplete details are provided, the system prompts the employee to fill in the missing fields before proceeding.

2. If the application is rejected, the member cannot log into the system. |
| **Acceptance Criteria**
Precondition:
1.   The applicant must be a current employee of KADA.

Postcondition:
1.   If the application is approved, employee becomes a registered member and can access the benefits provided by the cooperative.
2.   If the application is rejected, the employee cannot log into the system.
3.   The system stores the accepted employee's data in the database |
| **Exception flow:**
If an error occurs while updating the information, the system prompts the employee to try again later. |

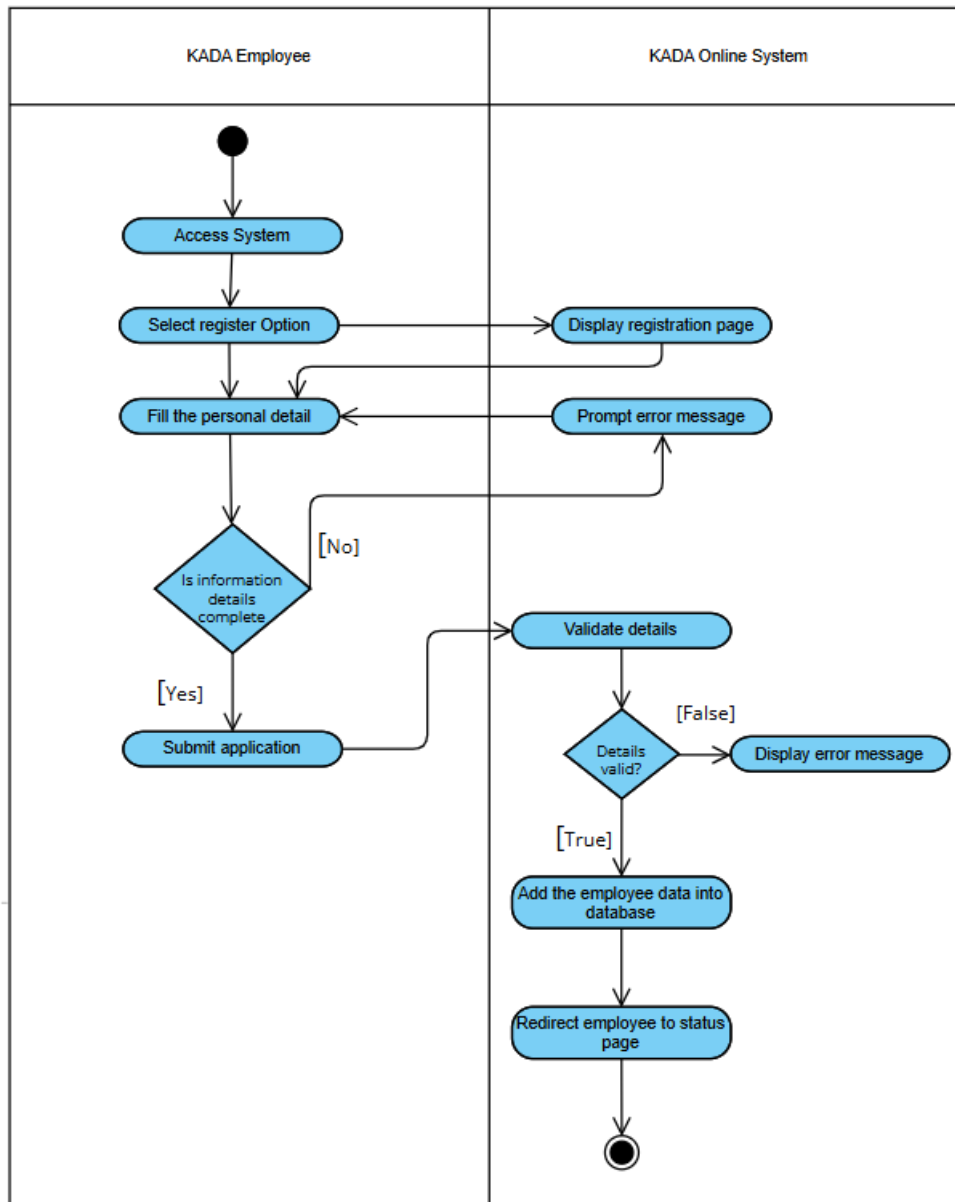*Figure 2.1: Sequence Diagram for Apply for Membership*

Figure 2.2: Activity Diagram for Apply Membership

2.4.2 US002: User Story View Application Status

Table 2.2: User Story Description for View Application Status

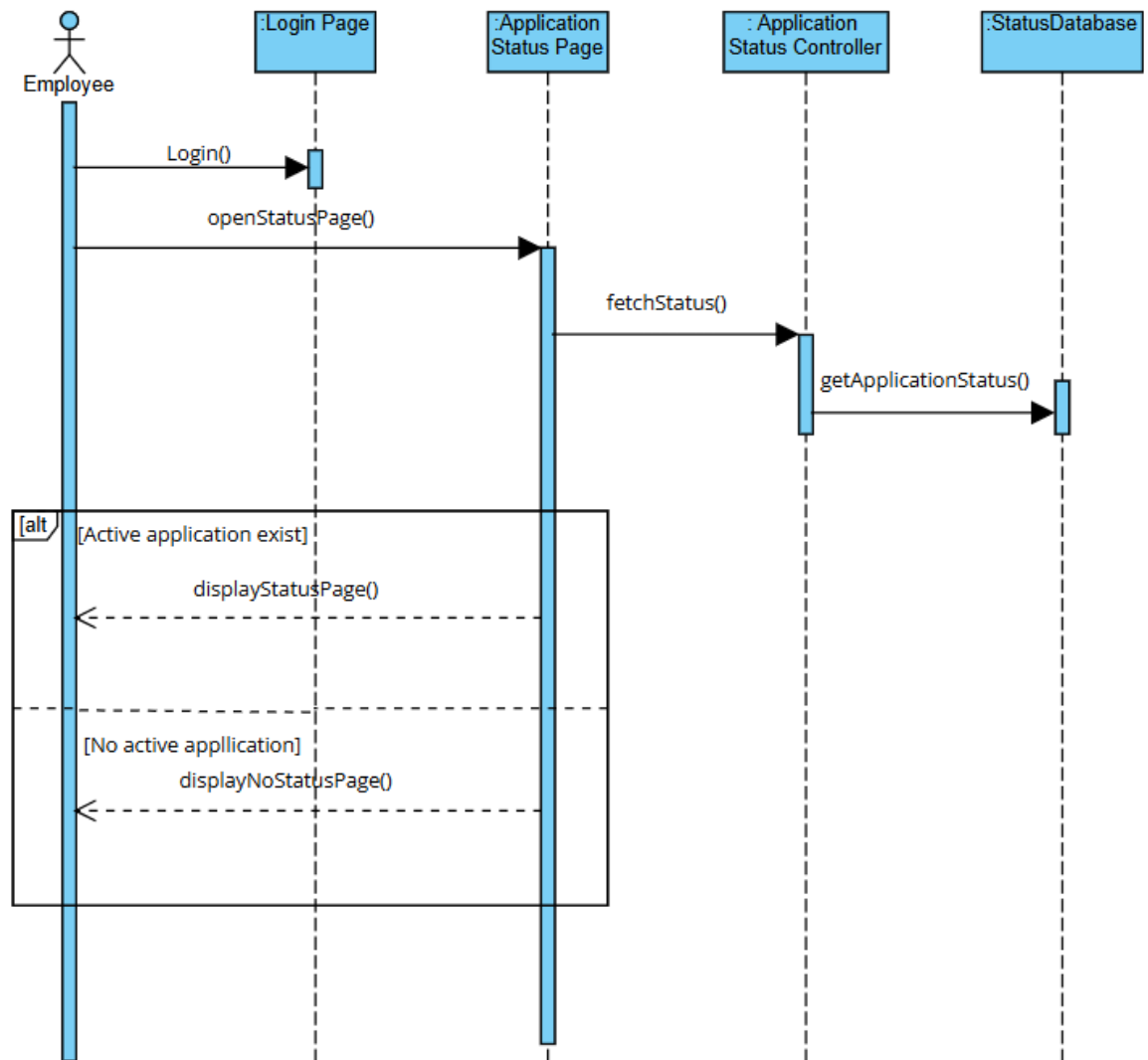| **User story: View Application Status** |
|---|
| **ID**: US002 |
| **User Story Description**
As a cooperative member
I want to view my application status
So that I get to know my current application status |
| **Flow of events:**

1. The employee logs into the system.
2. Click "Status" on the navigation bar
3. Employee reviews all statuses in this system including membership, program, and loan application. |
| **Alternative flow *n*:**
If the employee has no active applications, the system displays a message stating, "No active applications." |
| **Acceptance Criteria**
Precondition:
1.   The employee is logged into the system.
2.   The employees' information is available in the system, including their application statuses.

Postcondition:
The employees successfully view their current application status, including membership, program, and loan applications. |
| **Exception flow:**
If an error occurs while retrieving or displaying the status information, the system prompts the employee to try again later, with an error message: "Unable to retrieve application status. Please try again later." |

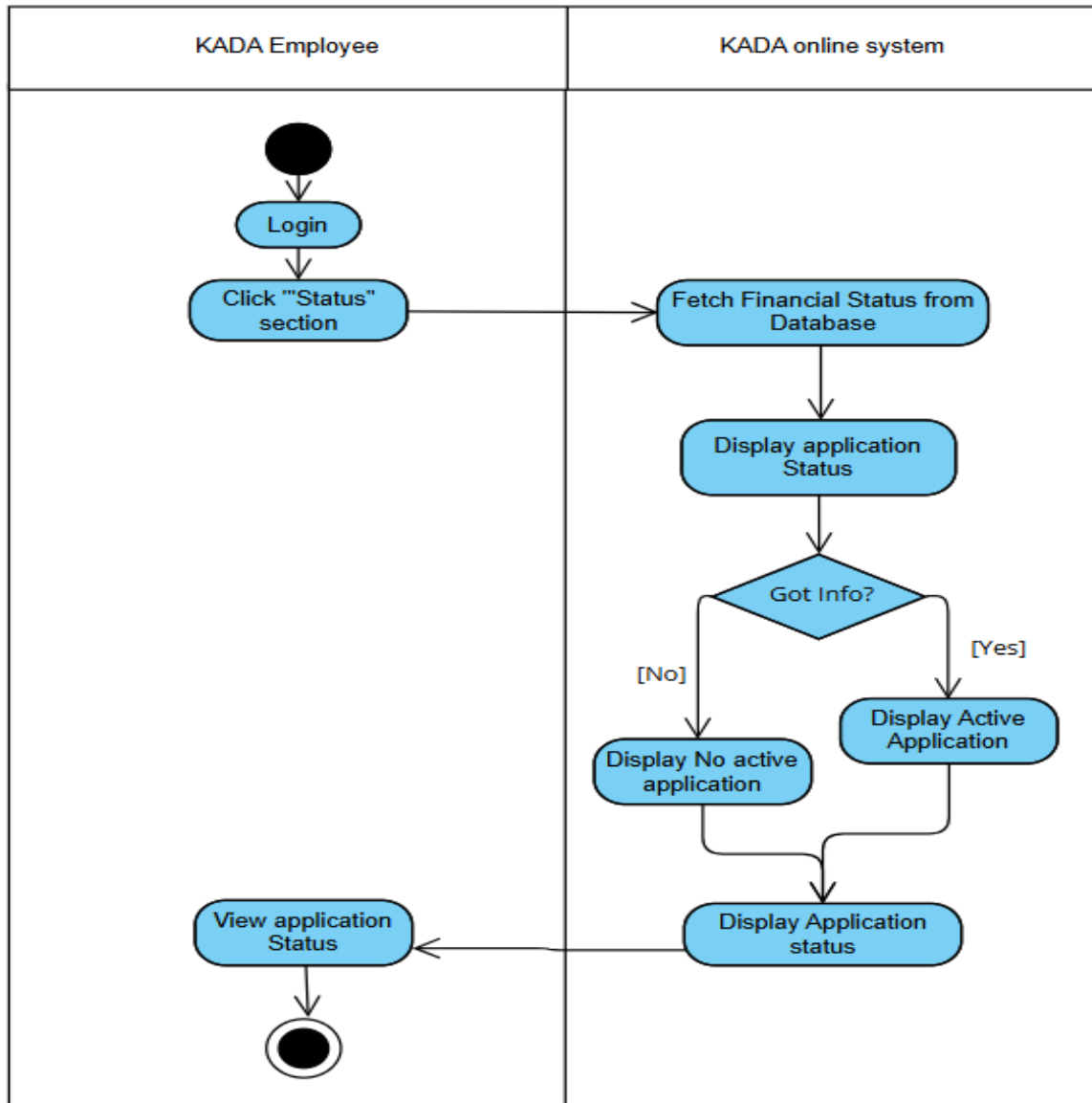*Figure 2.3: Sequence Diagram for Application Status*

Figure 2.4: Activity Diagram for Application Status

2.4.3 **US003: User Story Log In**

Table 2.3: User Story Description for Log In

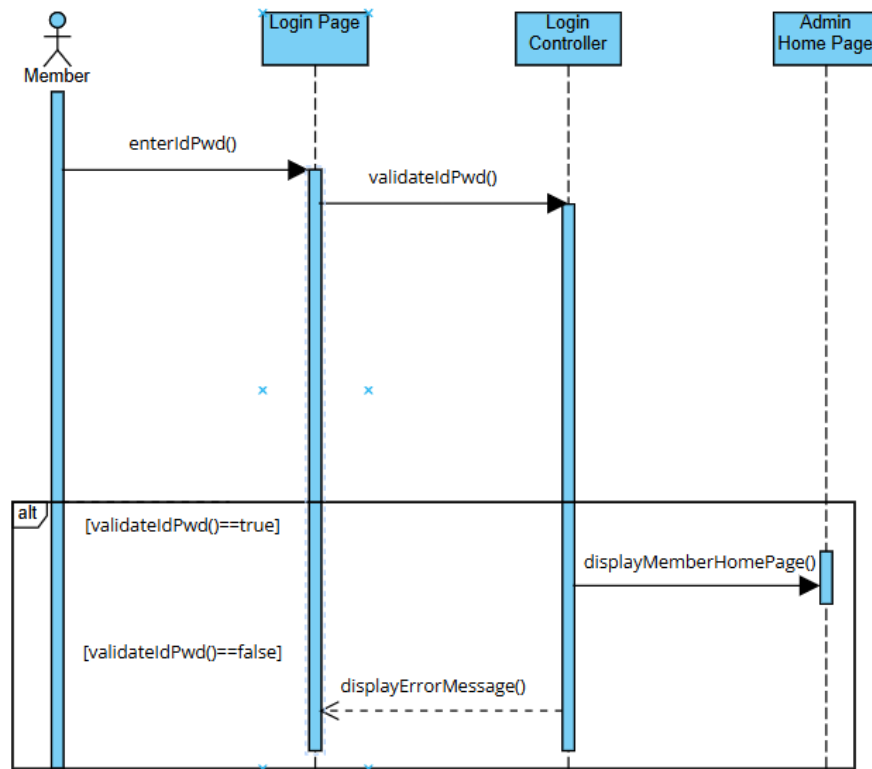| User story: Log In |
|---|
| **ID**: US003 |
| **User Story Description**
As a cooperative member or admin
I want to log in to the system using my unique username and password
So that I can access my respective dashboard |
| **Flow of events:**

1.   Members or Admin opens the KADA cooperation website.
2.   Members or Admin clicks "Log Masuk".
3.   Members or Admin key in user ID and password in their respective column.
4.   System validates user ID and password. |
| **Alternative flow 1:**
If invalid user ID and password entered, the system prompts the user to re-enter user ID and password. |
| **Acceptance Criteria**
Precondition:
The system contains unique usernames and passwords for all members and admins.

Postcondition:
1.The member successfully logs in and is redirected to the member page.
2.The admin successfully logs in and is redirected to the admin page. |
| **Exception flow:**
If the system encounters an error during the login process, the system displays the error message: "Unable to process login at the moment. Please try again later." |

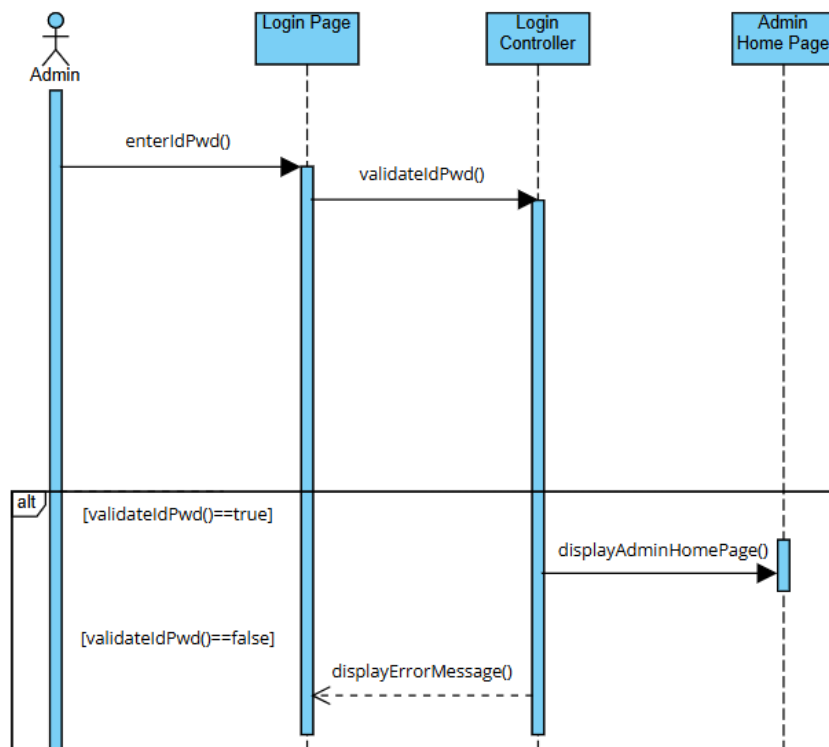*Figure 2.5: Sequence Diagram for Member Login to System*

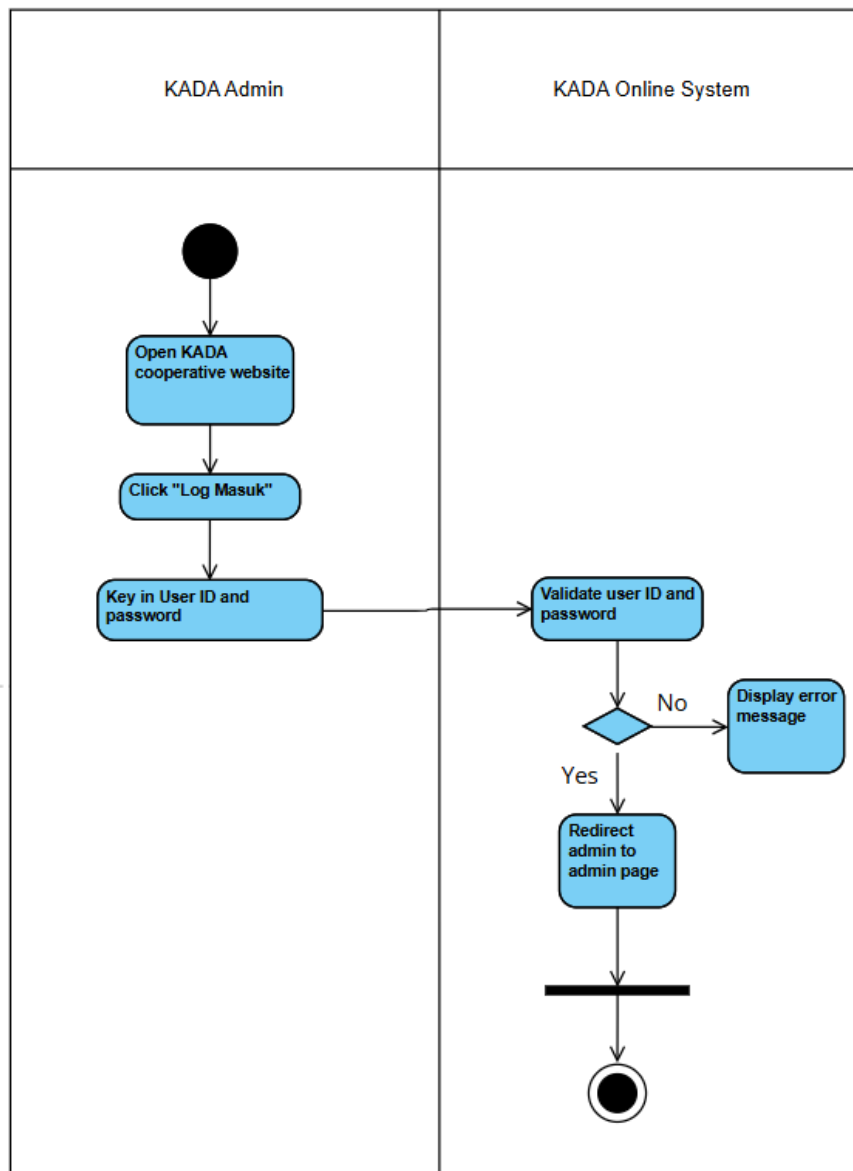*Figure 2.6: Sequence Diagram for Admin Login to System*

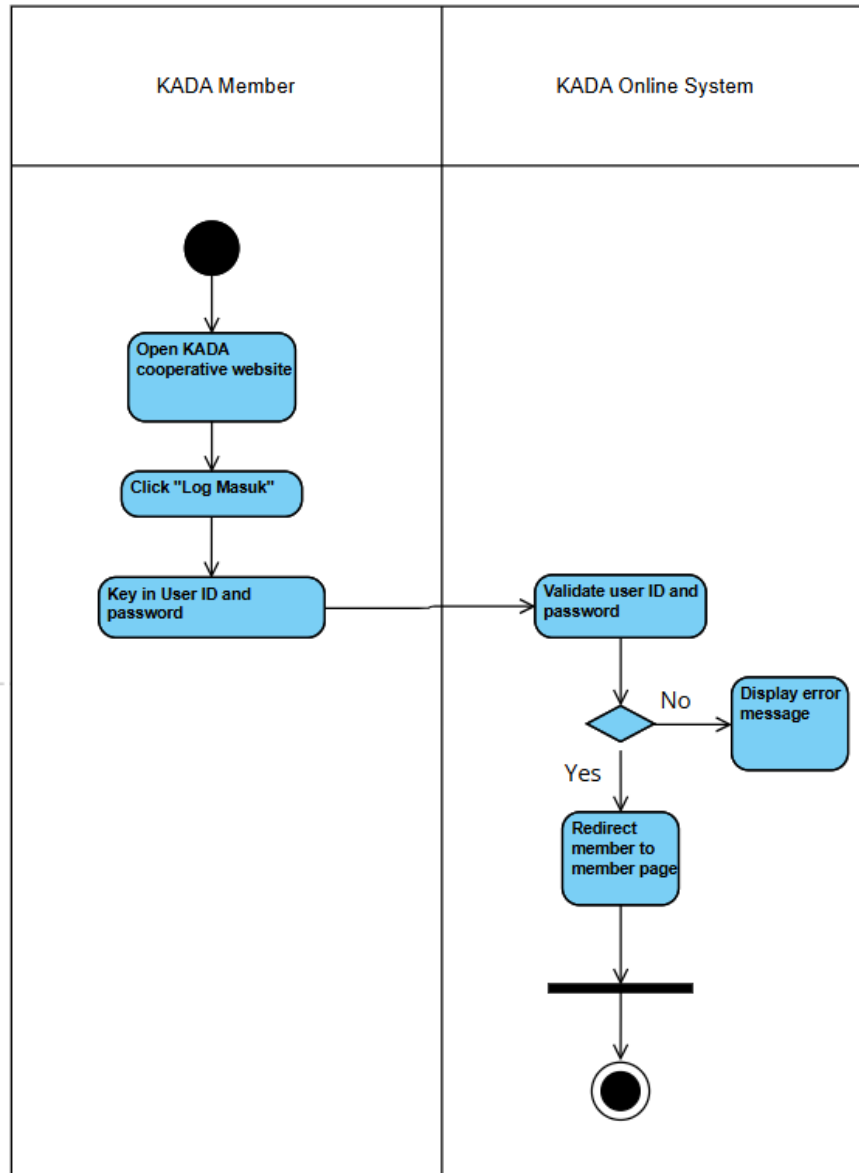*Figure 2.7: Activity Diagram for Admin Login to System*

Figure 2.8: Activity Diagram for Member Login to System

2.3.4 US004: User Story Applying for a Loan

Table 2.4: User Story Description for Applying for a Loan

User story: Applying for a Loan
ID: US004
User Story Description **As a** cooperative member **I want to** apply for a loan through the system **So that** I get to know my current financial status

Flow of events:
1. The member logs into the system.
2. Click "Loan" on the navigation bar.
3. Click the "Apply" button under the Loan Apply section on the navigation bar.
4. The system will show the available Loan Type.
5. The members can navigate the loan repayment schedule to see the total financing and monthly installment.
6. The member can choose the desired loan type to apply for.
7. The member fills in all the personal details and enters the loan amount in the form.
8. The member presses the submit button to submit the application form.
9. The system will prompt a message to confirm the submission.
10. After submission, the system displays three options:
    10.1 Redirects the member to the homepage.
    10.2 View Status: Allows the member to check the status of their loan application.
    10.3 Print Proof: Enables members to print confirmation or proof of their loan application.

Alternative flow 1: If the member navigates away during the process, the system saves the entered data as a draft for later completion.
Acceptance Criteria: Precondition 1. The member must have an active account in the cooperative system. 2. The member must log in to access the "Loan" section. Postcondition 1. The loan application is successfully recorded in the system. 2. The member can view their application status in the "View Status" section.
Exception flow:

1. If an error occurs while submitting the application form, the system prompts the member with an error message: "An error occurred while submitting your loan application. Please try again later."

2. If mandatory fields are not filled, the system warns: "Please complete all required fields before submitting."
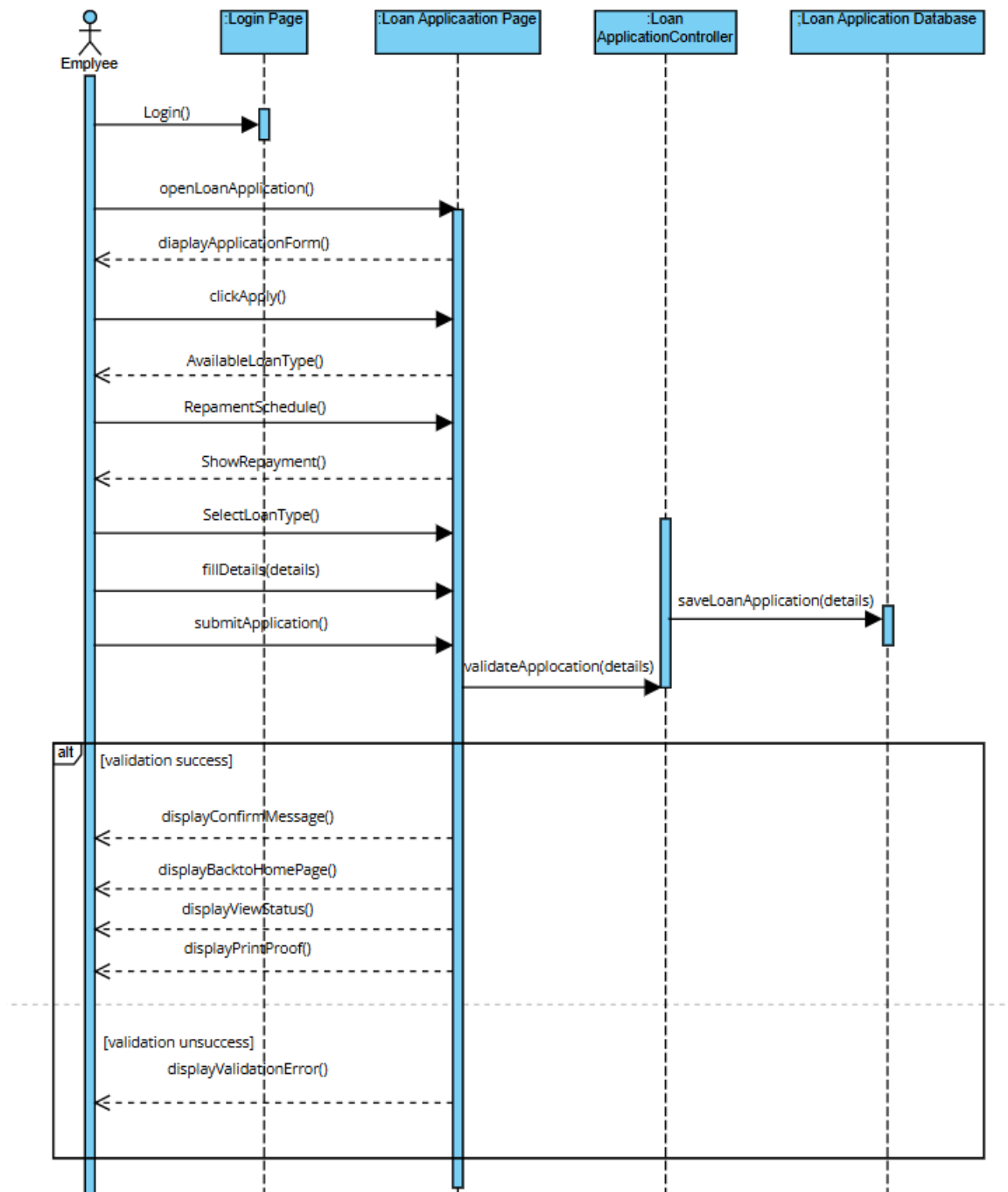
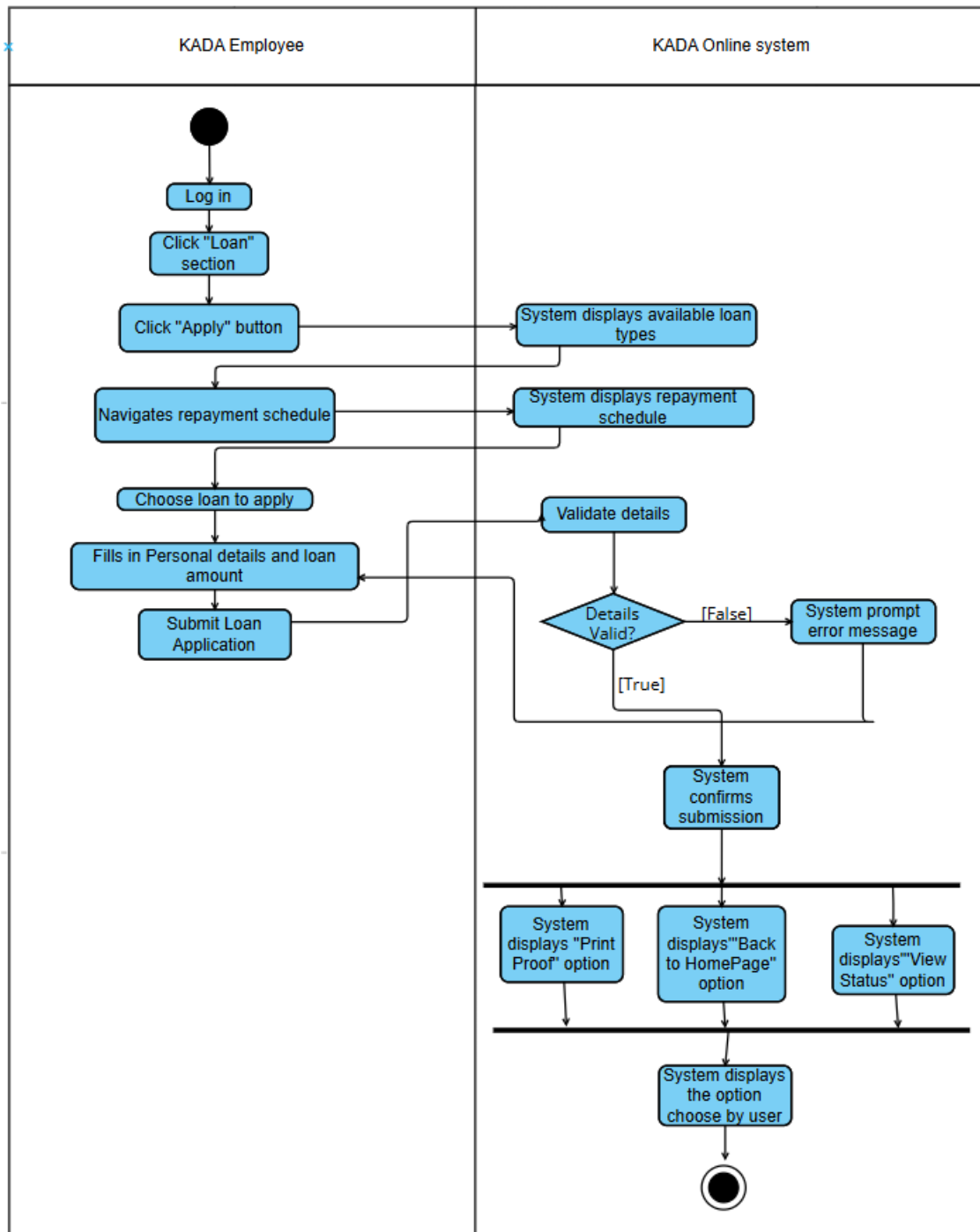*Figure 2.9: Sequence Diagram for Apply Loan*

Figure 2.10: Activity Diagram for Apply Loan

2.3.5 US005: User Story Apply Program

Table 2.5: User Story Description for Apply Program

<table>
<tr><td colspan="1" align="center">User story: Apply Program</td></tr>
<tr><td>ID: US005</td></tr>
<tr><td>

User Story Description

As a cooperative member

I want to apply for the KADA program through the system

So that I can participate in the program
</td></tr>
<tr><td>

Flow of events:

1.   The member logs into the system.
2.   Click the "KADA Program" on the navigation bar.
3.   Click the available KADA Programs under the dropdown.
4.   The system displays the program details and the required documents.
5.   The members can review the details of the KADA Program and the eligibility criteria.
6.   The member fills in personal details and program-specific information.
7.   The member uploads the required documents.
8.   The member presses the submit button to submit the application form.
9.   The system will prompt a message to confirm the submission.
10.   After submission, the system will redirect the member to the homepage.
</td></tr>
<tr><td>

Alternative flow 1:

If the member navigates away during the process, the system saves the entered data as a draft for later completion.
</td></tr>
<tr><td>

Acceptance Criteria:

Precondition
1. The member must have an active account in the cooperative system.

Postcondition
1. The application is successfully recorded in the system.
2. The member can view their application status in the "View Status" section.
</td></tr>
<tr><td>

Exception flow:

1. If an error occurs while submitting the application form, the system prompts the member with an error message: "An error occurred while submitting your loan application. Please try again later."

2. If mandatory fields are not filled, the system warns: "Please complete all required fields before submitting."

3. If required documents are not uploaded, the system warns: "Please upload all mandatory documents before submitting."
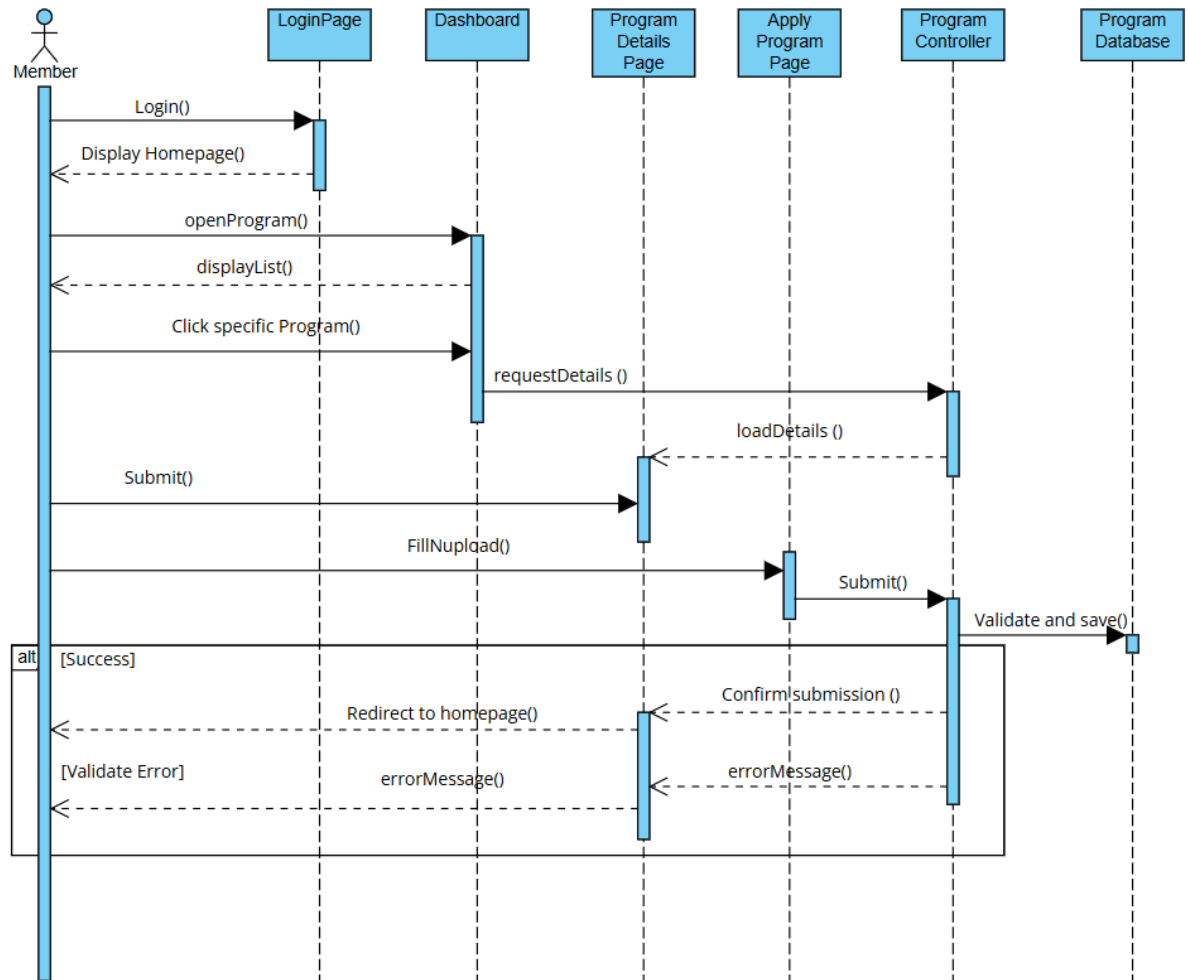</td></tr>
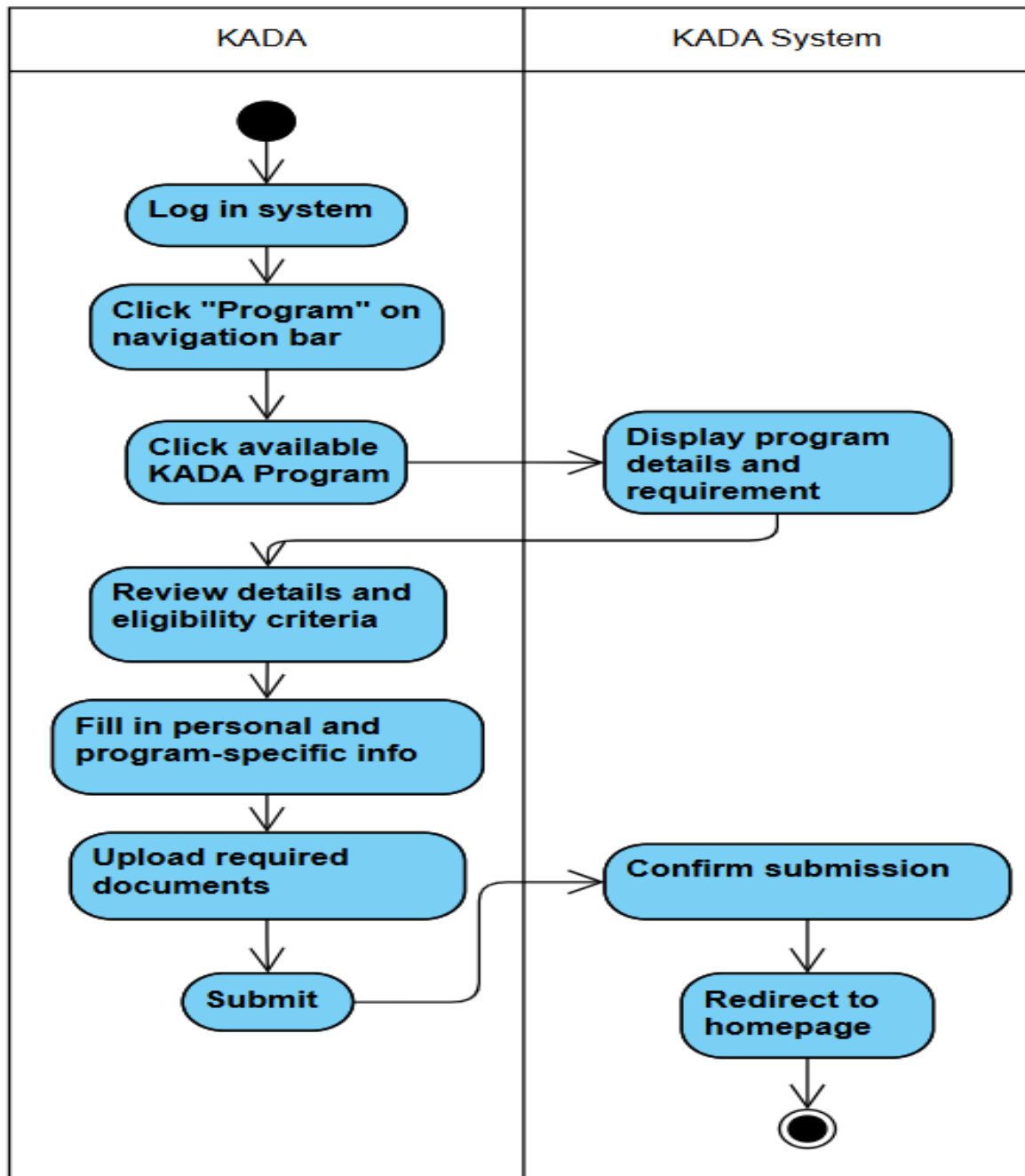</table>

Figure 2.11: Sequence Diagram for Apply Program

Figure 2.12: Activity Diagram for Apply Program

2.3.6 US006: User Story Manage Saving Account

Table 2.6: User Story Description for Manage Saving Account

User story: Manage Saving Account
ID: US006
User Story Description **As a** cooperative member **I want to** manage my savings account through the system **So that** I can deposit money, pay for loans, apply for programs, and view my account information conveniently.

Flow of events:
1. The member logs into the system.
2. The system authenticates the member's credentials.
3. The members navigates to "Saving Account" section.
4. The members choose an option to:
   - view account details (current balance, recent transaction history and loan balances).
   - deposit money or making payments.
   - view transactions history.
  - apply for cooperative programs.
5. System process the member's selected actions and provides appropriate feedback. (success or error)

Alternative flow 1: Scenario: Failed Login 1. The member enters incorrect login credentials. 2. The system displays an error message, "Invalid username or password." 3. The member can retry logging in or reset their password.
Acceptance Criteria: 1. The members must be able to log in securely. 2. The system must allow the member to view account details, including current balance, recent transactions, and loan balance. 3. Deposits or payments must be processed securely, and feedback must be provided for both successful and failed transactions. 4. The transaction history must be accessible for each member. 5. The system must enable members to apply for cooperative programs easily. Precondition 1. The members must be registered with the cooperative and have an active savings account. 2. The system must be operational and accessible. Postcondition

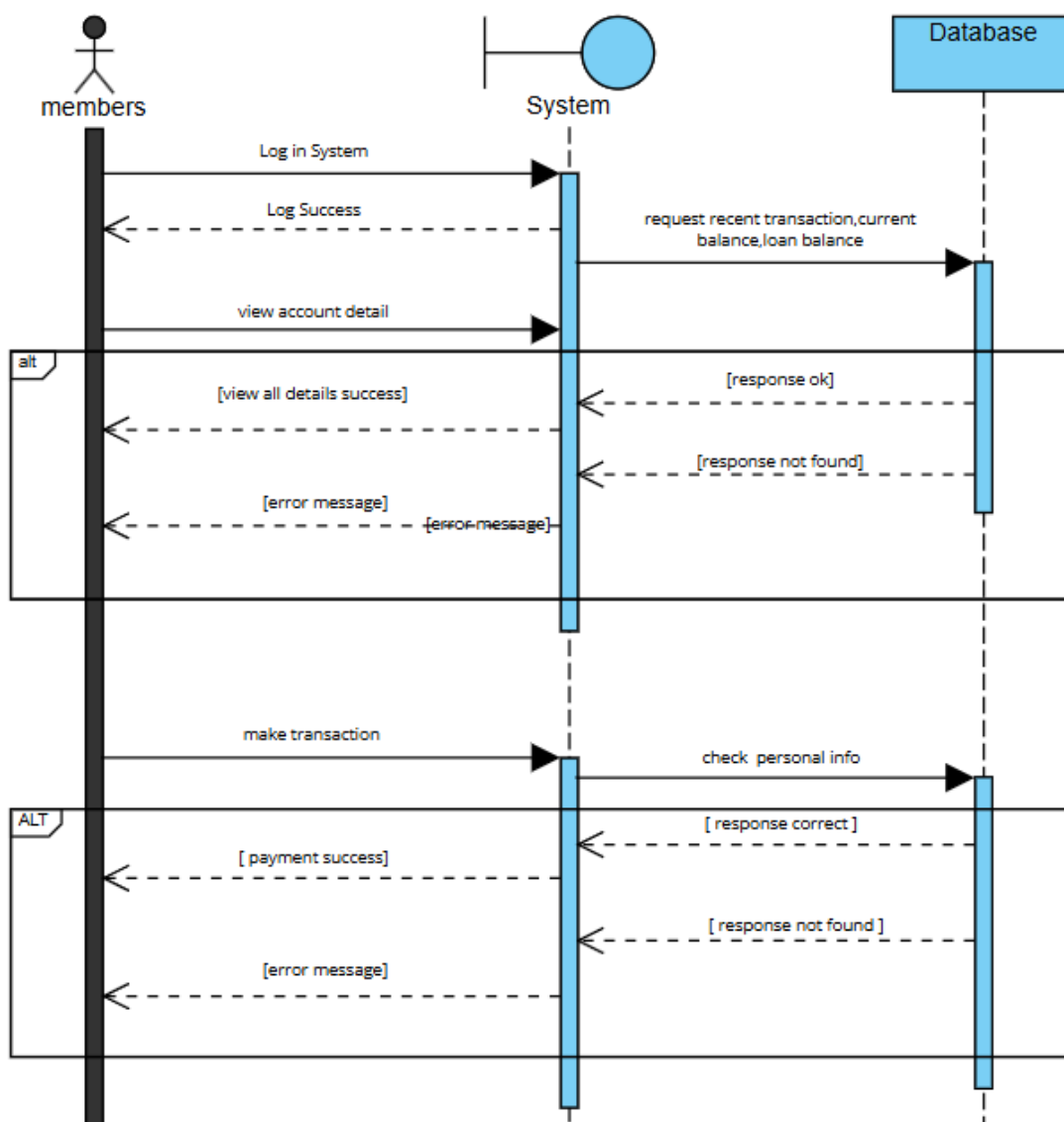| 1. The member's selected action (e.g., deposit, payment, program application) is processed and recorded. |
|---|
| 2. Updated account information is available for future interactions. |
| **Exception flow:**

1. If the member attempts a payment exceeding their available balance, the system displays an error message: "Insufficient funds." |

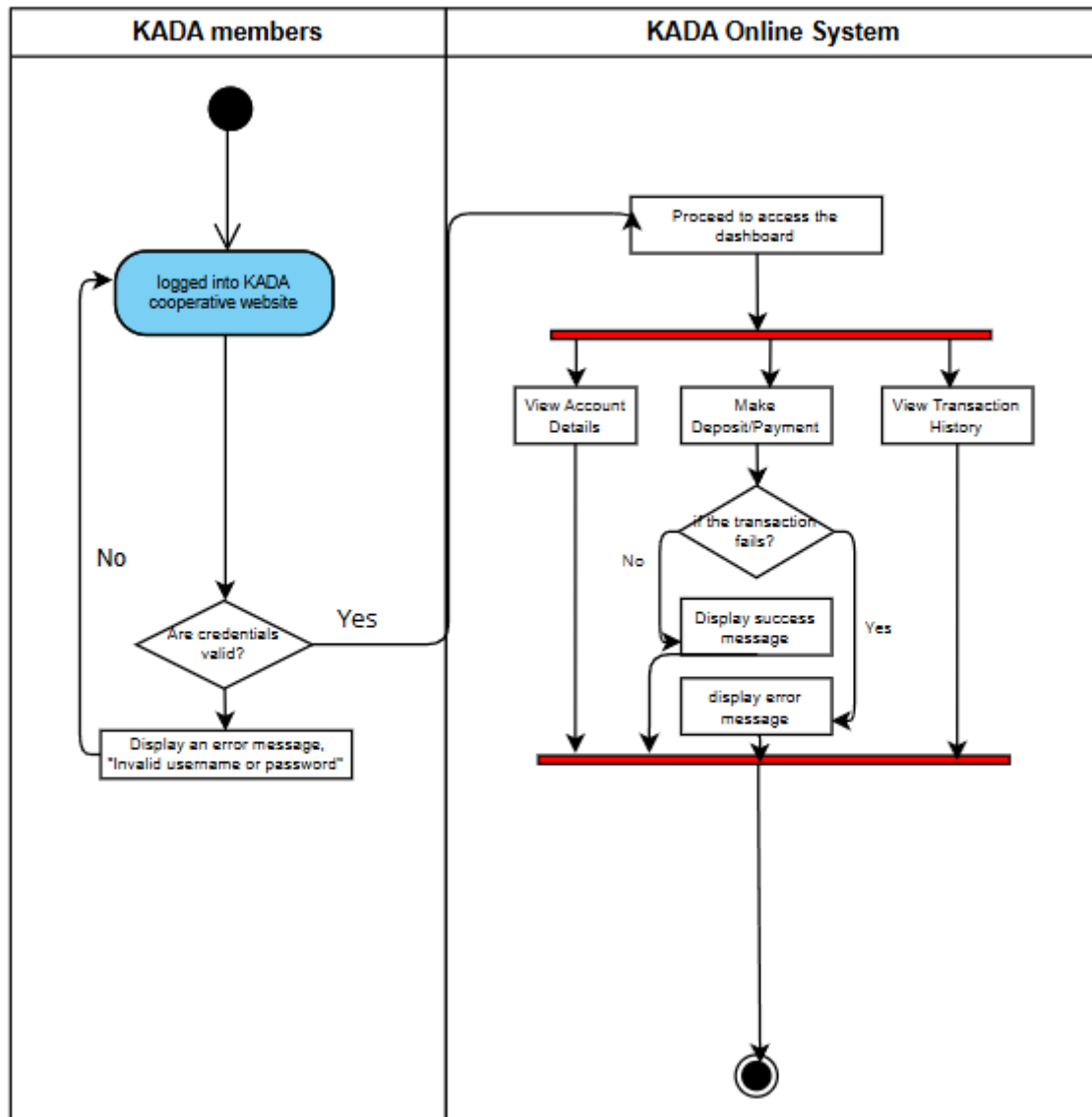

Figure 2.13: Sequence Diagram for Manage Saving Account

Figure 2.14: Activity Diagram for Manage Saving Account

2.3.7 US007: User Story Create Finance Report

Table 2.7: User Story Description for Create Finance Report

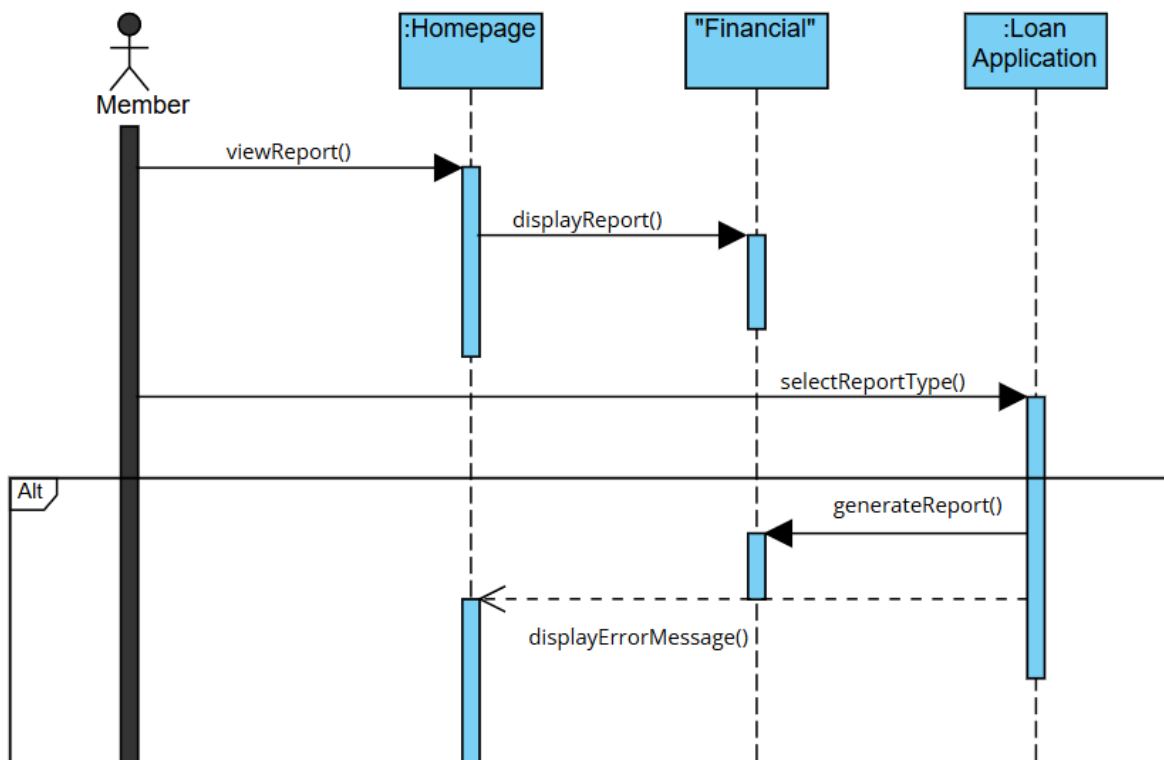| User story: Processing the report |
|---|
| **ID**: US007 |
| **User Story Description**
As a KADA members
I want to generate the reports
So that future decisions can be made for the members. |
| **Flow of events:**

1. The member navigates to the "Financial".
2. The member selects the report type, either monthly or annually.
3. The system retrieves relevant data from the database, including new membership applications, Loan applications, fee claimed, and contributions claimed.
4. The system generates a financial summary and detailed breakdown of each category for the specified period.
5. The system displays the report, providing options to: view the report in detail, then download the financial summary report. |
| **Alternative flow *n*:**
1. If a report type is invalid, the system prompts the member to select the correct type again. |
| **Acceptance Criteria**
Precondition:
1. The member is logged into the system.

Postcondition:
Financial reports are generated. |
| **Exception flow: -** |

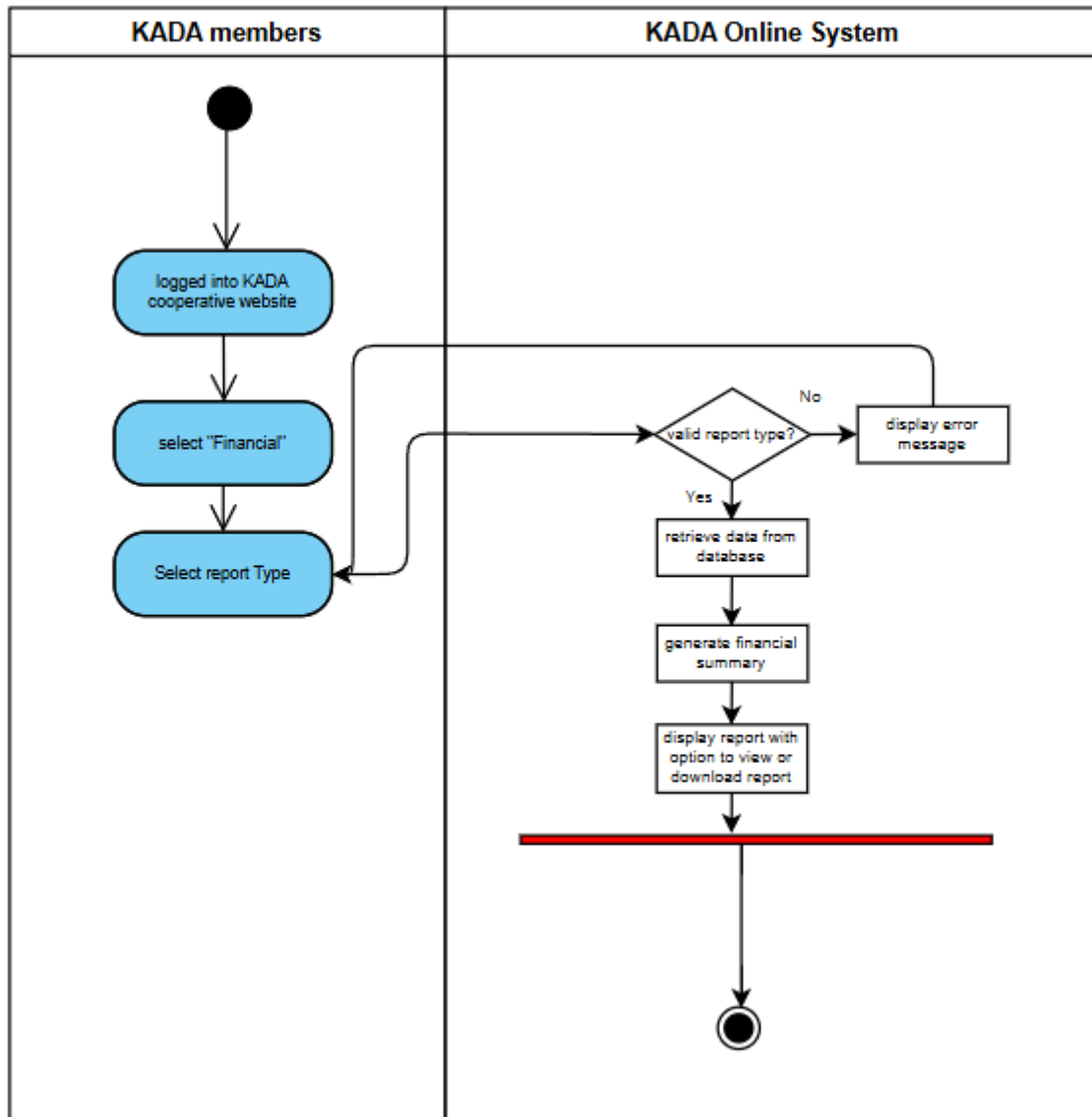*Figure 2.15: Sequence Diagram for Create Financial Report*

Figure 2.16: Activity Diagram for Create Financial Report

2.3.8 US008: User Story View Financial Status

Table 2.8: User Story Description for View Financial Status

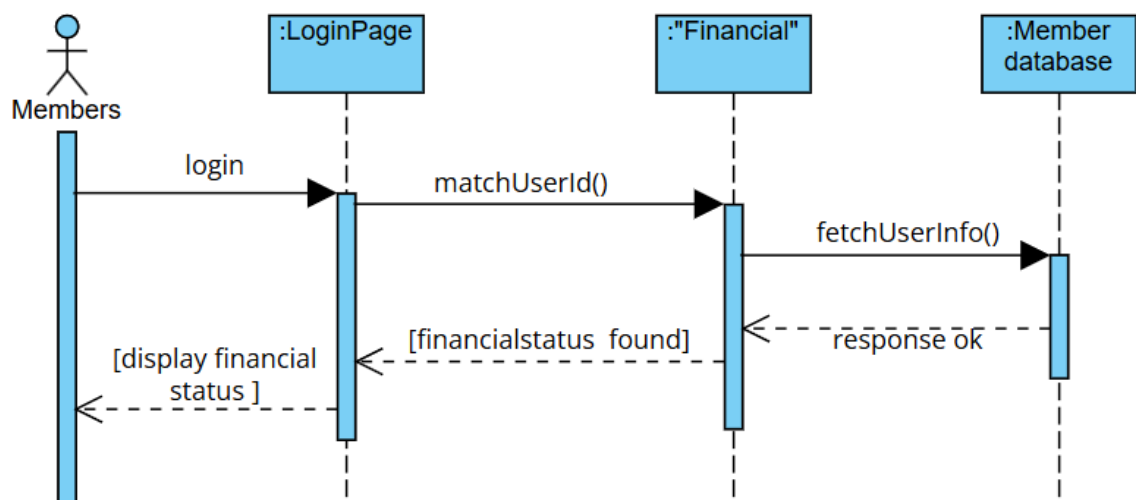| User story: View Financial Status |
|---|
| **ID**: US008 |
| **User Story Description**
As a KADA member
I want to view and verify financial information.
So that I can know about my current financial status. |
| **Flow of events:**

1. The member logs into the member website.

2. The member navigates "Financial".

3. The member successfully view the financial information displayed. |
| **Alternative flow:** |
| **Acceptance Criteria**
Precondition:
1. The member is logged into the system.

Postcondition:
The members successfully view the current financial information. |
| **Exception flow: -** |

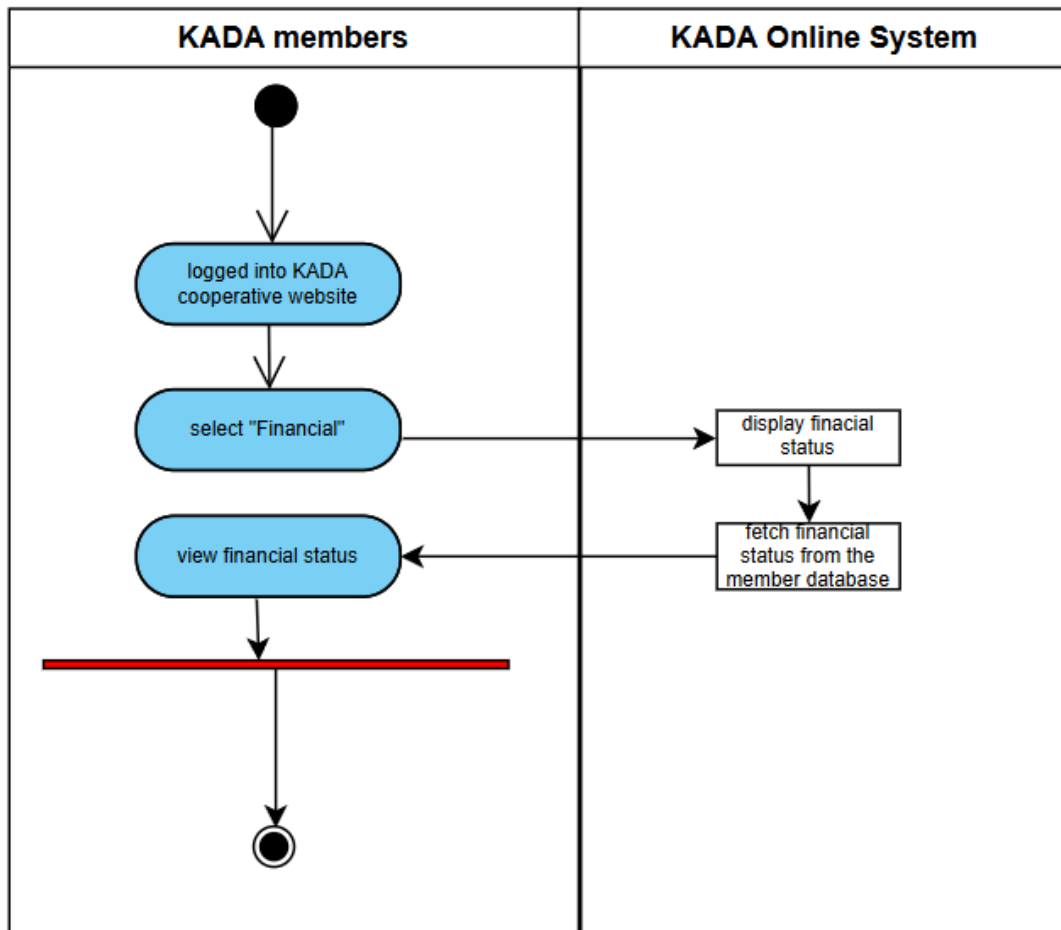*Figure 2.17: Sequence Diagram for View Financial Status*

Figure 2.18: Activity Diagram for View Financial Status

2.3.9 US009: User Story View Application List

Table 2.9: User Story Description for View Application List

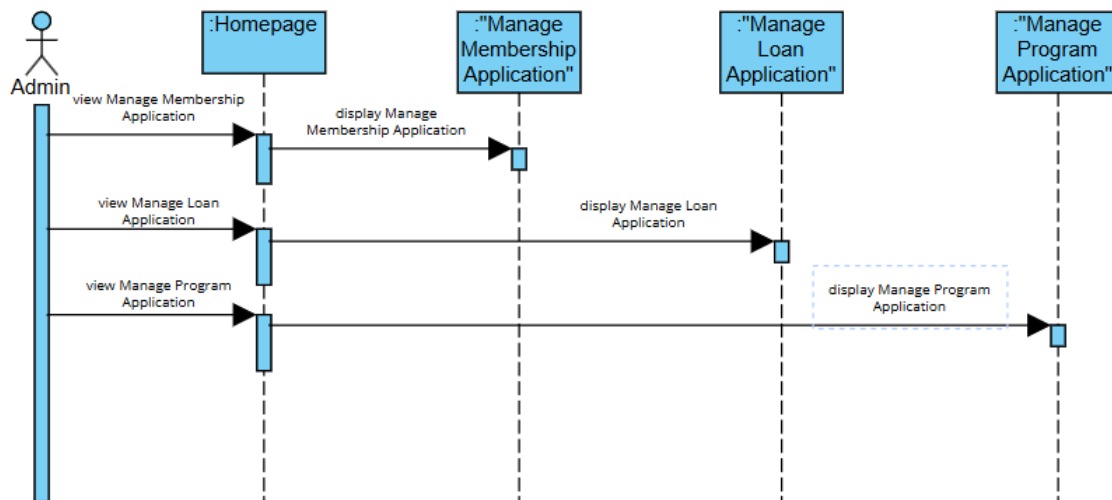| **User story: Membership Management** |
|---|
| **ID**: US009 |
| **User Story Description**
As a KADA admin
I want to view applicant lists for new members, loans and program applications.
So that I proceed with the approval process. |
| **Flow of events:**

1. The admin navigates "View Member List".
2. The admin can select
   - "Manage Loan Application" to view loan application
   - "Manage Membership Application" to view membership application
   - "Manage Program Application" to view program application
3. The system retrieves information from databases. |
| **Alternative flow: -** |
| **Acceptance Criteria**
Precondition:
1. The admin is logged into the system. |
| **Exception flow: -** |

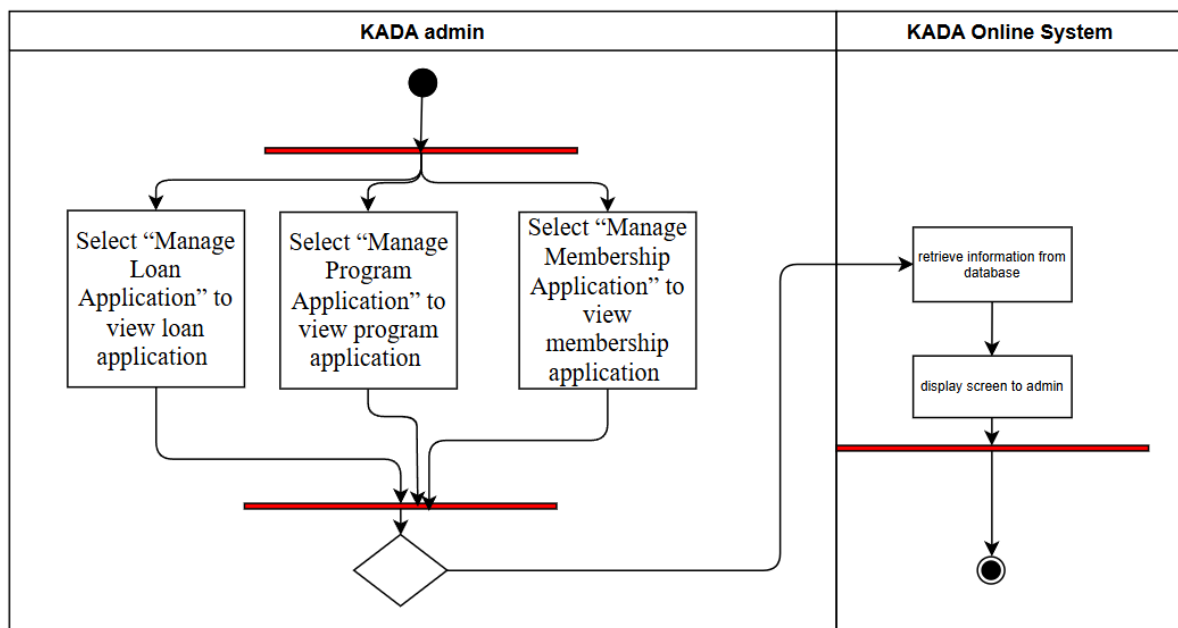*Figure 2.19: Sequence Diagram for View Application List*

Figure 2.20: Activity Diagram for View Application List

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2.3.10 US010: User Story Approve Membership Application

Table 2.10: User Story Description for Approve Membership Application

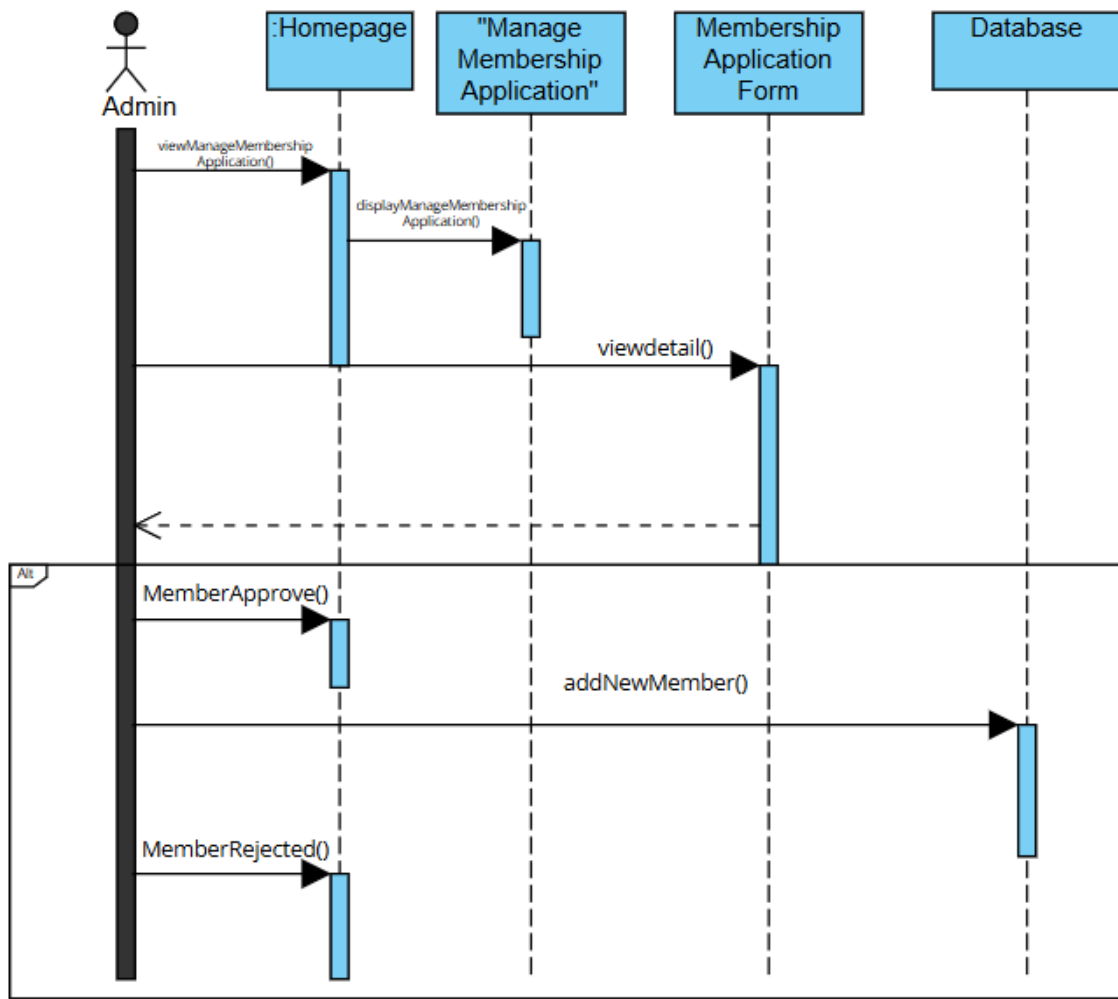| **User story: Approve Membership Application** |
|---|
| **ID**: US010 |
| **User Story Description**
As a KADA admin
I want to approve a new member
So that i need to check whether members meet the requirement to become a member. |
| **Flow of events:**

1. The admin navigates "Manage Membership Application".
2. The admin selects "Batch Processing".
3. The admin reviews the member information. |
| **Alternative flow:**
1. If the member meets the requirement, the status will change to "approve".
2. If not, the status will change to "rejected". |
| **Acceptance Criteria**
Precondition:
1. The admin is logged into the system.

Postcondition:
After the status in the "Manage Membership Application" change, the status in "View Member List" will also be change. |
| **Exception flow: -** |

Figure 2.21: Sequence Diagram for Approve Membership Application
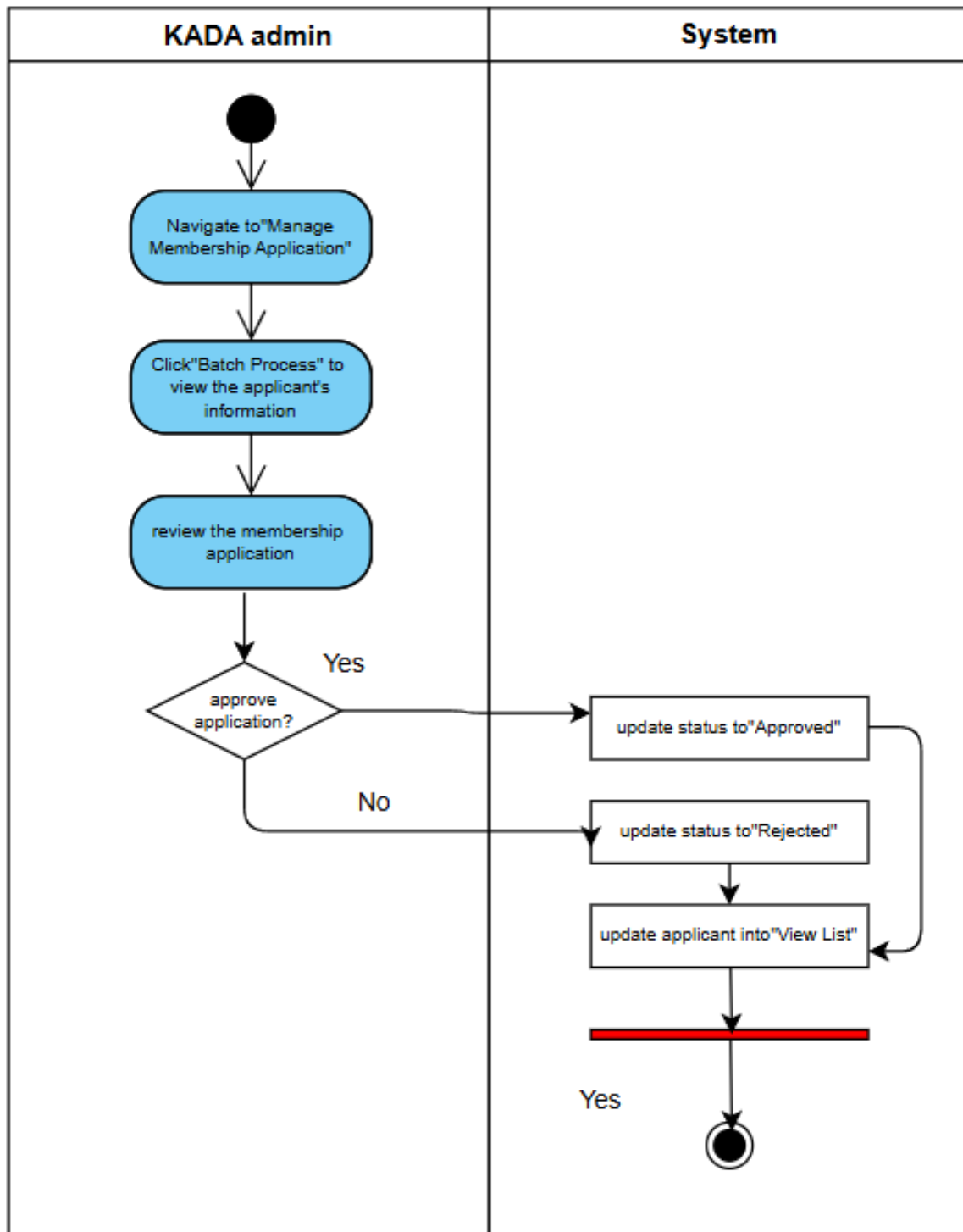
Figure 2.22: Activity Diagram for Approve Membership Application

2.3.11 US011: User Story Approve Loan Application

Table 2.11: User Story Description for Approve Loan Application

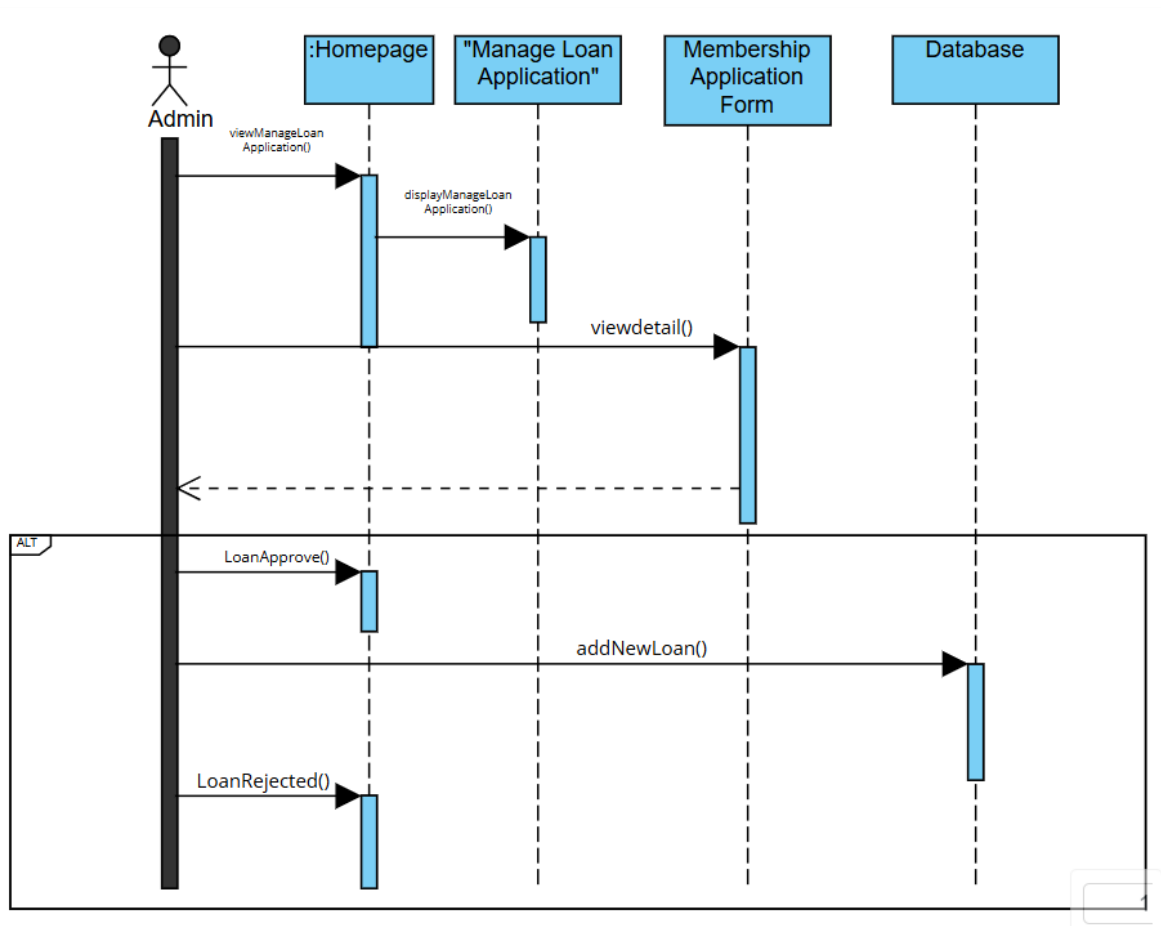| **User story: Approve Loan Application** |
|---|
| **ID**: US011 |
| **User Story Description**
As a KADA admin
I want to approve a new loan
So that I need to check whether members meet the requirement to apply for the loan. |
| **Flow of events:**

1. The admin navigates "Manage Loan Application".
2. The admin selects "Batch Processing".
3. The admin reviews the member information. |
| **Alternative flow:**
1. If the member meets the requirement, the status will change to "approve".
2. If not, the status will change to "rejected". |
| **Acceptance Criteria**
Precondition:
1. The admin is logged into the system.

Postcondition:
After the status in the "Manage Loan Application" change, the status in "View Member List" will also be change. |
| **Exception flow: -** |

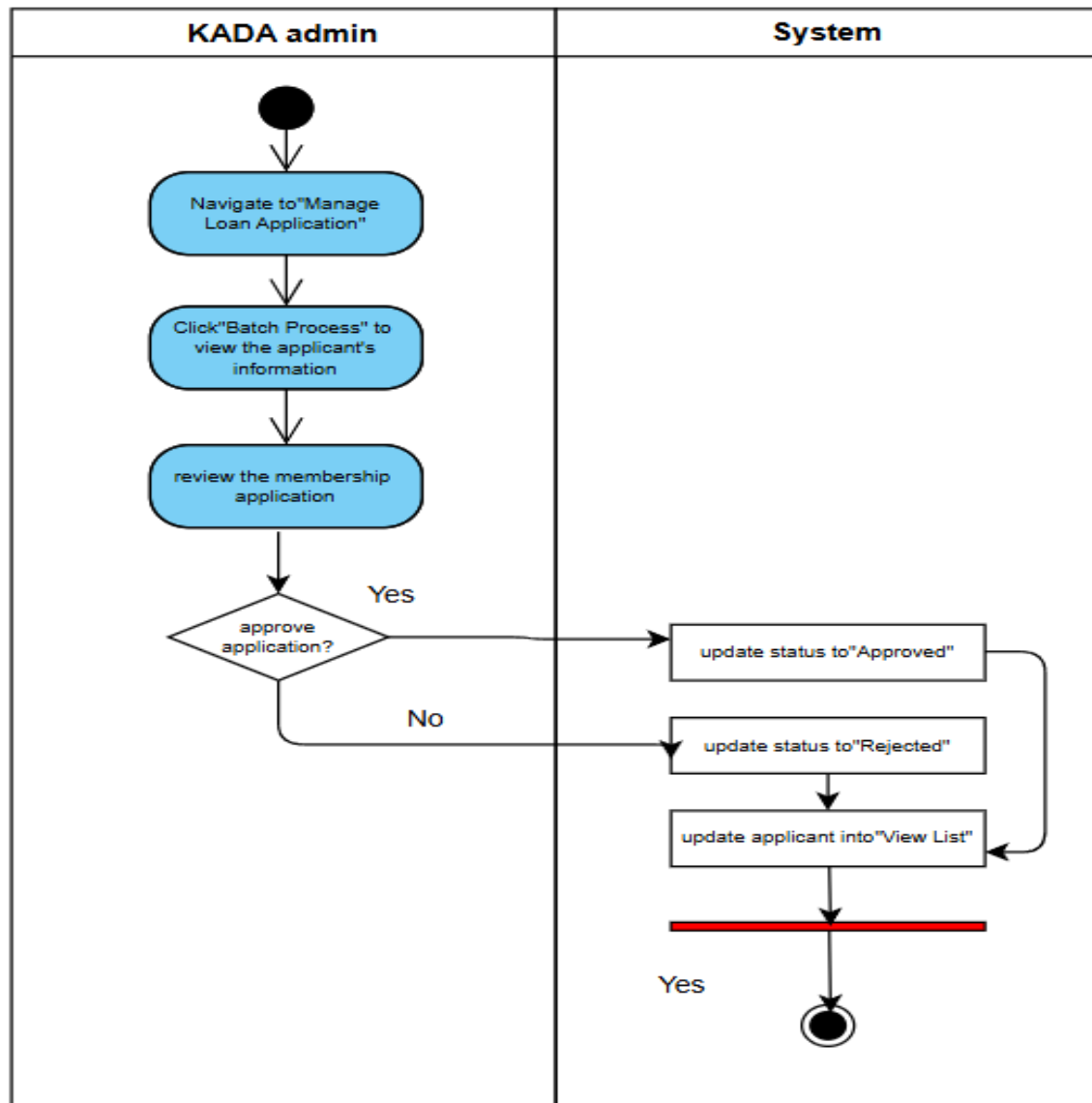*Figure 2.23: Sequence Diagram for Approve Loan Application*

Figure 2.24: Activity Diagram for Approve Loan Application

2.3.12 US012: User Story Approve Program Application

Table 2.12: User Story Description for Approve Program Application

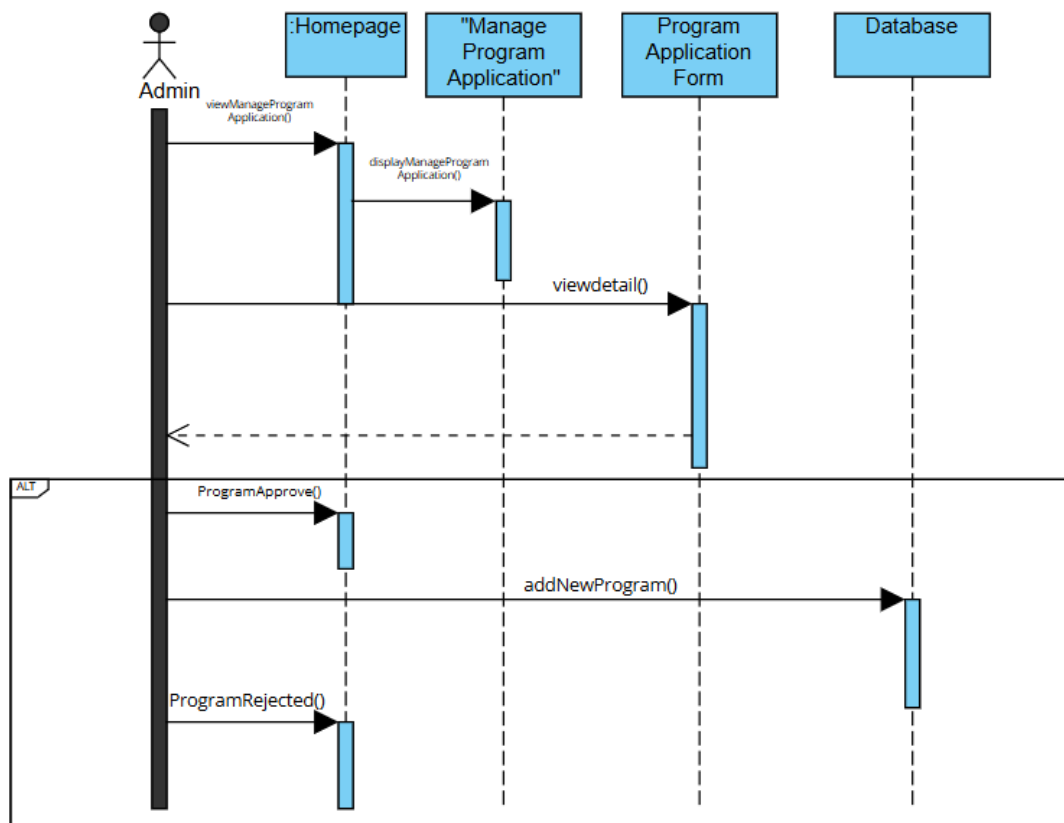| User story: Approve Program Application |
|---|
| **ID**: US012 |
| **User Story Description**
As a KADA admin
I want to approve the new program
So that i need to check whether members meet the requirement to apply for the program. |
| **Flow of events:**

1. The admin navigates "Manage Program Application".
2. The admin selects "Batch Processing".
3. The admin reviews the member information.
 |
| **Alternative flow:**
1. If the member meets the requirement, the status will change to "approve".
2. If not, the status will change to "rejected". |
| **Acceptance Criteria**
Precondition:
1. The admin is logged into the system.

Postcondition:
After the status in the "Manage Program Application" change, the status in "View Member List" will also be change. |
| **Exception flow: -** |

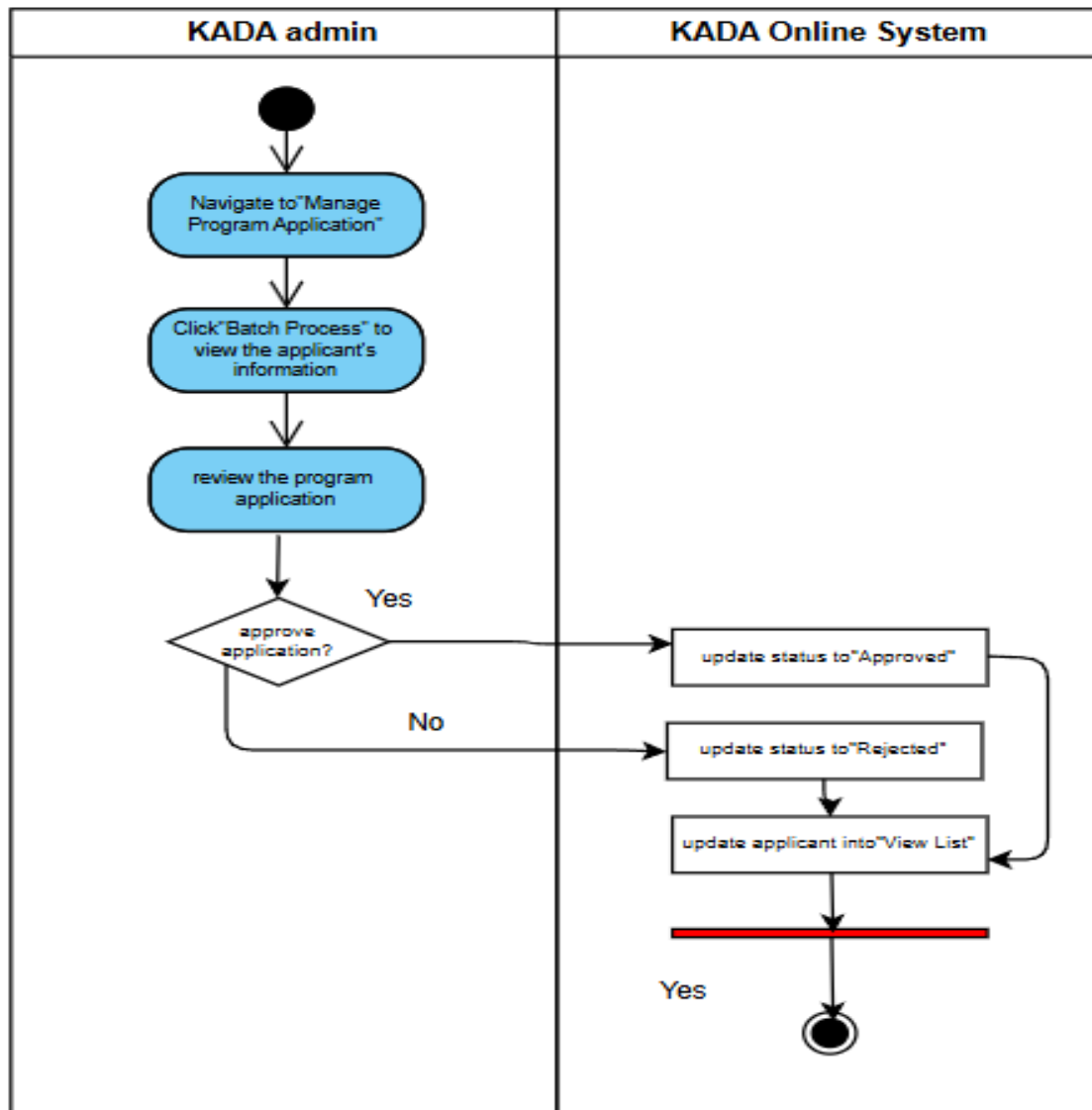*Figure 2.25: Sequence Diagram for Approve Program Application*

Figure 2.26: Activity Diagram for Approve Program Application

2.4.13 US013 User Story Admin Update Policies

Table 2.13: User Story Description for Manage Website

User story: Manage Website
ID: US013
User Story Description: **As an** admin **I want** to update policies **So that** I can update the policies and modify the website design

Flow of events:
 	
1.   The admin logs into the system.
2.   Navigate to the "Manage Website Info" section.
3.   Choose one of the following options:
3.1 Update Policies:
  3.1.1 Select the "Policies" tab.
  3.1.2 Click "Edit" next to the specific policy
  3.1.3 Make the necessary updates and click "Save."
  3.1.4 The system confirms that the policy has been successfully updated.
3.2 Modify Website Design:
  3.2.1 Select the "Website Design" tab.
  3.2.2 Choose the section of the website to edit
  3.2.3 Apply changes
  3.2.4 Click "Preview" to review the changes before saving.
  3.2.5 Click "Save" to apply the modifications.
 	
  4.The system updates the database and reflects the changes on the website.
 	
  5.The admin logs out after completing all necessary updates.

Alternative flow: If "OK" is not selected, the system will not update the database.
Acceptance Criteria: Precondition: Admin logged in to the system.
Exception flow: -

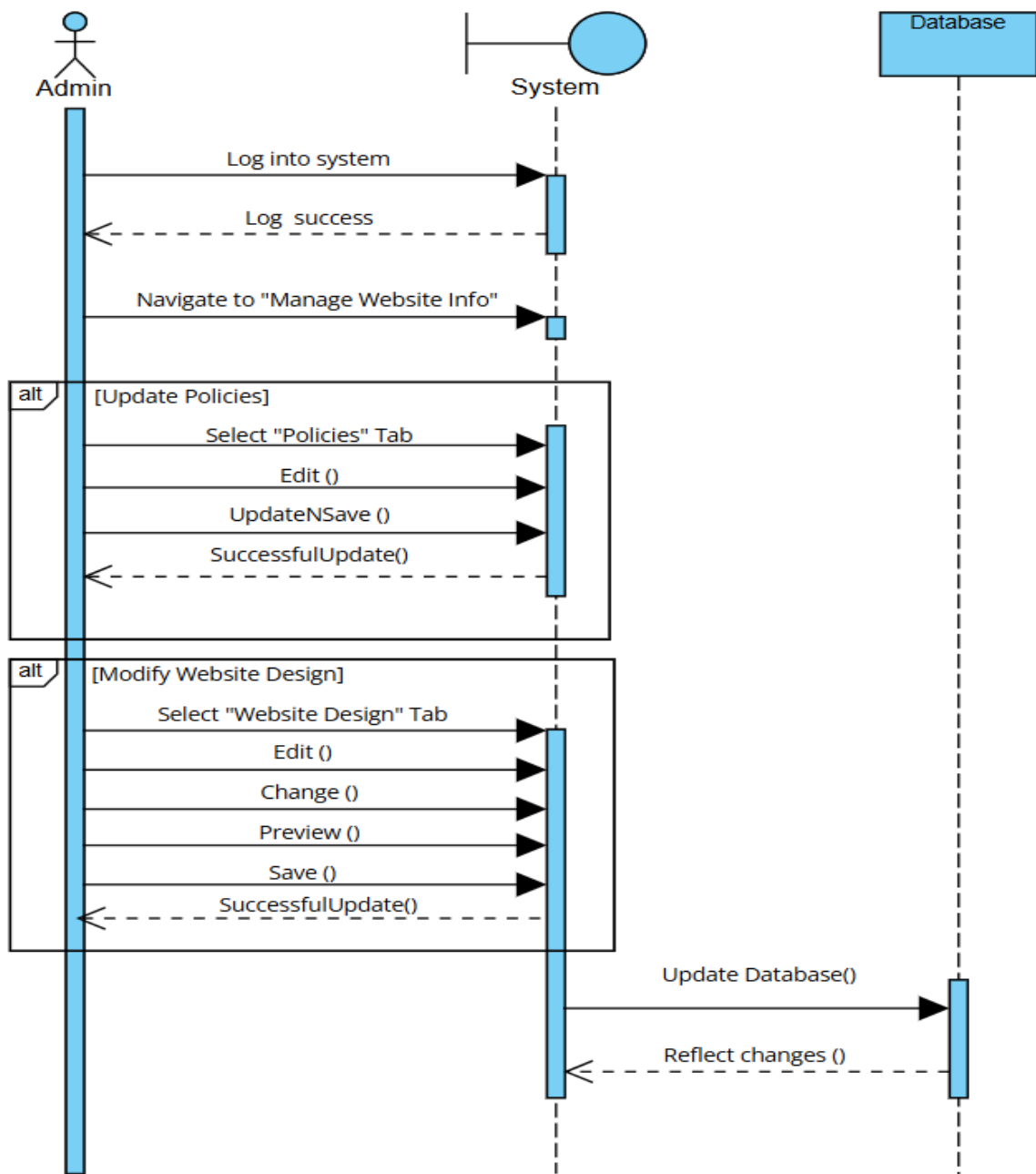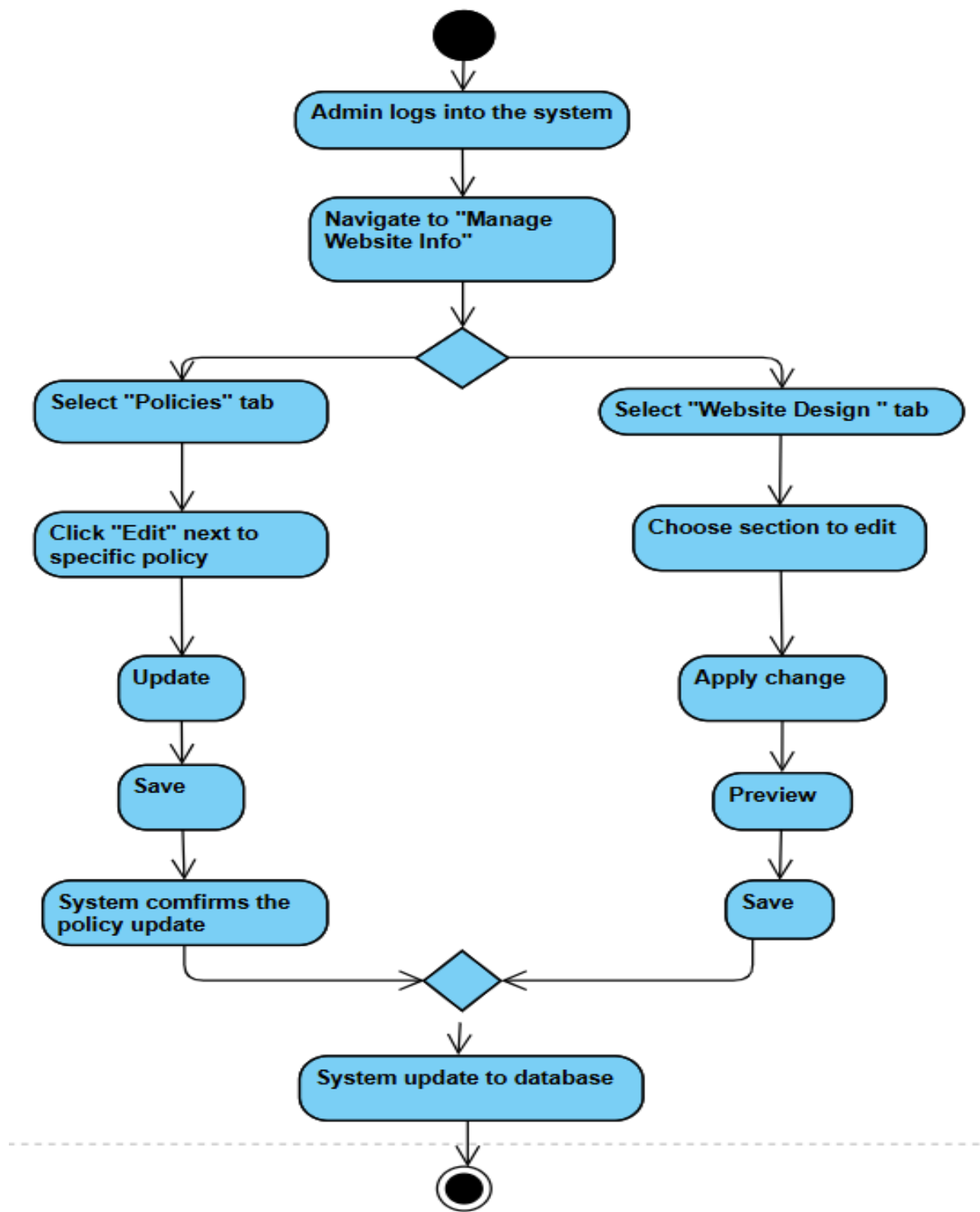*Figure 2.27: Sequence Diagram for Manage Website*

Figure 2.28: Activity Diagram for Manage Website

2.5   **Performance and Other Requirements**

2.5.1 Software System Attribute:

▪   Usability: The system should be user-friendly and adjustable font sizes.

▪   Reliability: The system has a meantime between failures (MTBF) of at least 500 hours and can recover from server outages in 15 minutes.

▪   Maintainability: Regular upgrades to system modules are possible without affecting the user's ongoing activity.

▪   Portability: The solution functions flawlessly on mobile platforms like iOS and Android as well as contemporary web browsers like Chrome and Edge.

▪   Compatibility: To streamline and expedite software development, the system will incorporate external APIs for reporting and payment processing with current KADA tools.

▪   Security: When users are completing private actions, such as applying for a loan or opening a savings account, the system will employ two-factor authentication (2FA) for admin and member login and AES-256 encryption to protect data.

▪   Legal and Regulatory: In order to oversee and control cooperative movements, the system must conform to the criteria set forth by the Malaysian Cooperative Commission (MCC).

▪   Environmental Impact: To lessen the system's carbon footprint, it will use green data centers and lessen its dependency on paper-based documentation.

2.5.2 Performance Requirements:

▪   Response Time: To guarantee effective communication, the KADA system must react to form submissions, such as member registration and loan applications, admin and member login requests, within one second, regardless of busy hours.

▪   Throughput: There will be no delay when the system manages at least 300 concurrent user sessions.

▪   Capacity: Up to 30,000 records of registered members' data can be stored in the database, which is sufficient for 10 years.

▪   Availability: During business hours, the system will have a minimum uptime of 99.5%, and during maintenance, it will have a 98% uptime.

2.5.3 Other Requirements
Localisation Requirements

- The system is specifically for the KADA cooperative in Malaysia.
- Supported languages: Malay only
- Date format: DD/MM/YY
- Currency: Ringgit Malaysia (RM) for all financial transactions.

Data Migration Requirements

- The KADA system will replace the existing manual and partially digitalized process, so an admin interface must be developed to ensure existing member profiles, loan records and financial reports are accurately transferred into the new system.

Accessibility Requirements

- Mobile responsiveness is required to provide usability on devices of various screen sizes.

Backup and Documentation Requirements

- Automatic backups must be scheduled daily to secure critical data.

Training Requirements

- Administrators and end-users must receive detailed user manuals and training materials.
- Interactive tutorials should be provided in the system to help new users navigate essential features.

2.6 **Design Constraints**

Environmental Constraint: The hosting environment must include geographically distributed data centers to reduce latency and improve access speed for rural users.

Hardware Constraint: Servers with a minimum configuration of 500GB SSD and 16GB RAM are required to run the system. Modern browsers like Chrome and Firefox are required for the system to function on client devices.

Security Constraint: RBAC must be enforced for administrators and end users, and all user data must be secured during transmission using the TLS protocol.

Compatibility Constraint: To guarantee that data may be imported and exported without issues, the system must smoothly connect with the current KADA accounting software.

Performance Constraint: Within three minutes, the monthly reporting module should produce summaries for up to 50,000 transactions.