



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

**SECJ2203: Software Engineering
System Documentation (SD)**

Koperasi Kakitangan KADA (KKK) Online System

Version 2.0

8/2/2025

Faculty of Computing

Prepared by:

Chua Jia Lin

Goe Jie Ying

Lam Yoke Yu

Tan Yi Ya

Teh Ru Qian

Revision Page

a. Overview

The current version of the KKK Online System is to improve cooperative procedures such as member registration, loan application management, administrative tasks, approval tracking and financial reporting. By digitising manual processes and enabling online registration, loan applications and approval tracking, it improves accessibility and efficiency. Board members look over and approve applications, while administrators manage data and policies.

b. Target Audience

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

c. Project Team Members

Member Name	Role	Task	Status
Tan Yi Ya	Project manager	<ul style="list-style-type: none">Specify design constraintsDefine performance and other requirements	Complete
Chua Jia Lin	System analyst	<ul style="list-style-type: none">Create user story for KKK adminDraw sequence diagramDraw activity diagram	Complete
Goe Jie Ying	System designer	<ul style="list-style-type: none">Create user story for apply membershipDraw sequence diagramDraw activity diagram	Complete
Lam Yoke Yu	System developer	<ul style="list-style-type: none">Document launch phaseDraw state diagramDraw class diagramDraw use case diagram	Complete
Teh Ru Qian	System testing	<ul style="list-style-type: none">Create user story for apply loanDraw sequence diagramDraw activity diagram	Complete

d. Version Control History

Version	Primary Author	Description of Version	Date Completed
1.0	Chua Jia Lin Goe Jie Ying Lam Yoke Yu Tan Yi Ya Teh Ru Qian	Completed all sections in the system documentation	30/11/2024
1.1	Chua Jia Lin Goe Jie Ying Lam Yoke Yu Tan Yi Ya Teh Ru Qian	Edited user diagram and class diagram	06/12/2024
1.2	Chua Jia Lin Goe Jie Ying Lam Yoke Yu Tan Yi Ya Teh Ru Qian	Edited use case diagram, user stories, activity diagrams, and sequence diagrams	10/12/2024
1.3	Chua Jia Lin Goe Jie Ying Lam Yoke Yu Tan Yi Ya Teh Ru Qian	Edited use case diagram	16/12/2024
2.0	Chua Jia Lin Goe Jie Ying Lam Yoke Yu Tan Yi Ya Teh Ru Qian	Updated all sections in the system documentation	8/2/2025

Table of Contents

Revision Page	2
a. Overview	2
b. Target Audience	2
c. Project Team Members	2
d. Version Control History	3
Table of Contents	1
1. Introduction	3
1.1 Purpose	3
1.2 Scope	3
1.3 Definitions, Acronyms and Abbreviation	4
1.4 References	4
1.5 Overview	4
2. Specific Requirements	5
2.1 Persona	6
2.1.1 Persona 1: KADA Employee (New User)	6
2.1.2 Persona 2: KKK member (Existing User)	6
2.1.3 Persona 3: KKK Admin	6
2.2 System Features	7
2.2.1 Use Case Diagram	7
2.2.2 Domain Model: Class Diagram	15
2.2.3 State Diagram	21
2.3 Launch Phase	23
2.4 User Story Details	24
2.4.1 US01 User Story Apply Membership	24
2.4.2 US02 User Story Update User Profile	26
2.4.3 US03 User Story View Financial Status	28
2.4.4 US04 User Story Apply for a Loan	30
2.4.5 US05 User Story View Loan Application Status	32
2.4.6 US06 User Story KKK Admin Login to System	34
2.4.7 US07 User Story KKK Member Apply Membership Termination	36
2.4.8 US08 User Story KKK Admin Approve New Member Application	38
2.4.9 US09 User Story KKK Admin Approve Loan Application	40
2.4.10 US10 User Story KKK Admin Generate Reports	42
2.4.11 US11 User Story KKK Admin Manage System	44
2.4.12 US12 User Story KKK Admin Approve Membership Termination	48
2.5 Performance and Other Requirements	50
2.5.1 Software System Attributes	50
2.5.2 Performance	50
2.5.3 Other Requirements	50

2.6 Design Constraints	51
2.6.1 Security constraints	51
2.6.2 Safety constraints	51
2.6.3 Business Rule	51

1. Introduction

This section provides an overview of the System Documentation (SD), including the introduction of the KKK Online System and its requirements.

1.1 Purpose

The purpose of this System Document is to describe the KKK Online System. This document describes and defines the user interface, functions, performance, security and quality requirements for developing the system.

This document is intended for the development team, including but not limited to designers, developers, project managers, end-user, test and managers.

1.2 Scope

The software product to be produced is KKK Online System. The system functions as an online medium to handle various actions such as member registration, service tracking, administrative management and data reporting. The KKK Online System includes functionality of:

1. New Member Registration

The new member can apply for cooperative membership using online application form, which reduces paperwork and enables remote access.

2. Loan Application Management

The loan application can be submitted through the online system, allowing applicants to track their application status online.

3. Administrator Controls

Administrators manage member data, prepare applications for board review, and update system policy.

4. Approval Process

The system allows applications to be displayed for board meetings, where directors review and make approval decisions that administrators then enter into the system.

5. Financial Reporting

The system generates monthly and annual reports from stored data, aiding the cooperative in evaluating its financial and operational performance from time to time.

The system does not include the following functionality:

1. Transaction into or out of user account
2. Generate monthly profit and loss report

The KKK Online System should ease the process of applying for membership, loan and other relevant processes by taking away the burden of travelling physically to carry out the action.

By digitising previously manual processes, the system aims to enhance data security, improve efficiency and accessibility for all stakeholders, including new applicants, members, administrators, and board members. The system should have different functions based on user roles, and support multiple end devices such as desktop and mobile platforms, to allow accessibility across various devices.

1.3 Definitions, Acronyms and Abbreviation

This section provides the definitions of all terms, acronyms, and abbreviations required to interpret this System Documentation.

KADA	<i>Lembaga Kemajuan Pertanian Kemubu</i>
KKK	<i>Koperasi Kakitangan KADA Kelantan Berhad</i>
SD	<i>System Documentation</i>
ISO/IEC	<i>International Organization for Standardization/International Electrotechnical Commission</i>
IEEE	<i>Institute of Electrical and Electronics Engineers</i>
TLS	<i>Transport Layer Security</i>
WPA	<i>Wi-Fi Protected Access</i>
UTC	<i>Coordinated Universal Time</i>

1.4 References

- [1] Sommerville, I. (2016). “Software Engineering”, 10th Edition, US: Pearson.
- [2] “Portal Lembaga Kemajuan Pertanian Kemubu | KADA KEMUBU.”
<http://www.kada.gov.my/>
- [3] R. Wherrity, “Waterfall Project Management: Comprehensive Guide For Success,” Brand,
<https://www.clearpointstrategy.com/blog/waterfall-project-management>

1.5 Overview

The remainder of this SD includes the following:

- A description of Persona that specifies the characteristics and needs of the intended user of the KKK system in general.
- System features with supporting diagrams to push the understanding further, for example use case diagram, class diagram and state diagram.
- Product backlog that plans each sprint according to the use case diagram, assigning each team member.
- A detailed description of the user story for each use case, simulating different

scenarios of user story, specifying the user needs further with supporting diagrams.

- Non-functional requirements that declare the characteristics or qualities of the system, to describe the behaviour and the operation norm of the system.
- Design constraints defined by the stakeholders.

This SD follows ISO/IEC/IEEE 29148 standard guidelines to ensure clarity, consistency, and usability.

2. Specific Requirements

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

2.1 Persona

This section introduces the target users of the system, focusing on their characteristics and needs. Understanding the personas helps ensure that the system is appropriate for its target audience.

2.1.1 Persona 1: KADA Employee (New User)

User Need: A KADA Employee needs to become a new member of the KKK.

User Stories:

1. As a KADA employee, I want to register myself as a new member of the cooperation so that I can access the benefits provided by the corporation
2. As a KADA employee, I want to complete my personal information and the details of my family.
3. As a KADA employee, I want to log in to the KKK system and check my personal information to ensure its accuracy.

2.1.2 Persona 2: KKK member (Existing User)

User Need: A KKK member needs a way to apply for a loan easily.

User Stories

1. As a KKK member, I want to apply for a loan to receive financial assistance.
2. As a KKK member, I want to update my details and select a loan amount so that my application is accurate.
3. As a KKK member, I want to upload necessary documents to complete my application.
4. As a KKK member, I want to check my loan status so I know if it is approved.
5. As a KKK member, I want to see my loan information and repayment amount after applying so that I can plan my payments.
6. As a KKK member, I want to apply for membership termination.

2.1.3 Persona 3: KKK Admin

User Need: KKK admins requires a system to ease the application approval process, policy updating process, reporting and record transaction process.

User Stories:

1. As a KKK admin, I want to login to the system so that I can access the features of the system.
2. As a KKK admin, I want to view applicant lists for new members and loan applications so that I can proceed with the approval process.
3. As a KKK admin, I want to approve new member applications so that I can check whether the applicant meets the requirements to become a member of the cooperative.
4. As a KKK admin, I want to approve loan applications so that I can check whether the applicant meets the requirements to make a loan .

5. As a KKK admin, I want to generate reports so that future decisions can be made for the cooperative.
6. As a KKK admin, I want to record transactions made by members so that transactions can be reflected in the member profile.
7. As a KKK admin, I want to update policies so that the cooperative business rules such as minimum share capital requirements for loan application and the loan interest rate can be known by members.
8. As a KKK admin, I want to administer the system so that the information on the system can be updated.

2.2 System Features

KKK Online System is a web-based software. The system provided a means for the KKK members and staff to better manage the member application and loan application. It also has other features such as updating user profile, viewing financial status, generating reports, recording transactions and updating policies and banners.

2.2.1 Use Case Diagram

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

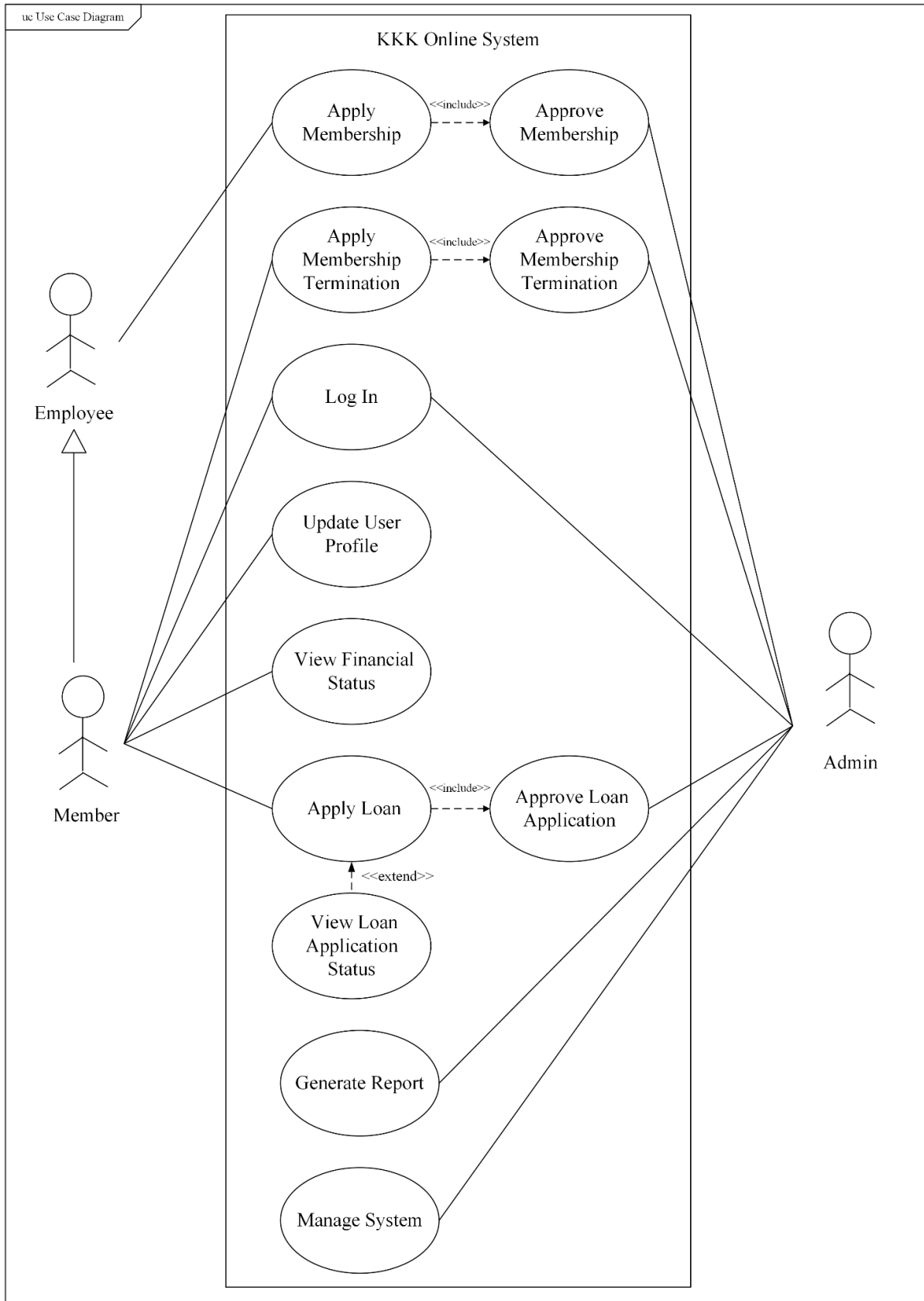


Figure 1.1 Use Case Diagram for KKK Online System

Table 1.1: Description of Module and Functions for KKK Online System

Use Case	Function	Description
UC01	Apply Membership	The employees in KADA can apply to be a member of the KKK cooperative by filling in the online form and upload any required documents.
UC02	Update User Profile	The cooperative members can update their user personal information, and the family and inheritor information.
UC03	Log In	The cooperative member and the administrator can log in the system by using the correct login credentials. The members will then be directed to the member's page and the administrator will be directed to the administrator's page. Member can get password reset email by using the forgot password button.
UC04	View Financial Status	Upon log in to the system, the cooperative member would be able to view their financial status including the share information (Maklumat Saham Ahli) and the loan information (Maklumat Pinjaman Ahli).
UC05	Apply Loan	The cooperative members can apply for financing services from the cooperative by filling in the online form and upload any required documents.
UC06	View Loan Application Status	Upon the loan application submission, they would be able to see their application status through the system.
UC07	Apply Membership Termination	The cooperative members can apply for membership termination and after that the member will no longer be a cooperative member.
UC08	Approve Membership	The admin would be able to update the status of the membership application.
UC09	Approve Loan Application	The admin would be able to update the status of the loan application.
UC10	Generate Report	The admin can generate reports that summarise the financial and membership information.

UC11	Manage System	<p>The admin may be able to do other administrative tasks that are necessary to maintain the system.</p> <p>After a transaction settled between the stakeholders, the admin would update the transaction in the system to reflect the transaction in the member profile. This includes updating the amount of share capital, funds, contributions and loans.</p> <p>Besides, the administrator would be able to update policies such as the minimum membership, minimum share capital requirement for loan application, loan interest rate, maximum loan repayment duration and maximum financing amount.</p> <p>The administrator can also update the website banner. This ensures the sustainability of the system.</p>
UC12	Approve Membership Termination	The admin would be able to update the status of the membership termination application.

2.2.2 Functional Requirement

UC01 Apply Membership

REQ-1: The system shall validate the user input.

- Email address format
- Identity card number format
- Phone number, fax number and home phone number format
- Name format
- Address, city and zip number format
- Position, position grade and personal file number format
- Fees format

REQ-2: The system shall display error messages for invalid input

- Missing required fields
- Incorrect input format

REQ-3: The system shall send an email to the user and the administrator upon the submission of the application.

REQ-4: The system shall ensure that all data is stored securely and comply with relevant data protection regulations.

REQ-5: The system shall display a confirmation message to the user after successfully updating the database.

UC02 Update User Profile

* REQ-1, REQ-2, REQ-4 and REQ-5 from the *UC01 Apply Membership* are also applicable to *UC02 Update User Profile*.

REQ-1: The system shall validate the user input.

- Email address format
- Phone number format

REQ-2: The system shall display error messages for invalid input

- Missing required fields
- Incorrect input format

REQ-4: The system shall ensure that all data is stored securely and comply with relevant data protection regulations.

REQ-5: The system shall display a confirmation message to the user after successfully updating the database.

REQ-6: The system shall retrieve all relevant user information.

- Member personal information

UC03 Log In

REQ-7: Users should be able to login using valid login credentials.

UC04 View Financial Status

* REQ-6 from the *UC01 Apply Membership* are also applicable to *UC05 Apply Loan*.

REQ-6: The system shall retrieve all relevant user information.

- Financial status of the user

UC05 Apply Loan

* REQ-1, REQ-2, REQ-3, REQ-4 and REQ-5 from the *UC01 Apply Membership* are also applicable to *UC05 Apply Loan*.

REQ-1: The system shall validate the user input.

- Loan amount format
- Loan period format
- Bank account format
- Monthly gross salary format
- Monthly net salary format
- Signature documentation format
- Email address format
- Identity card number format
- Phone number, fax number and home phone number format

- Name format
- Address, city and zip number format
- Position, position grade and personal file number format
- Fees format
- Member number format
- Employee verification format

REQ-2: The system shall display error messages for invalid input

- Missing required fields
- Incorrect input format

REQ-3: The system shall send an email to the user and the administrator upon the submission of the application.

REQ-4: The system shall ensure that all data is stored securely and comply with relevant data protection regulations.

REQ-5: The system shall display a confirmation message to the user after successfully updating the database.

* REQ-6 from the *UC02 Update User Profile* are also applicable to *UC05 Apply Loan*.

REQ-6: The system shall retrieve and auto-fill relevant user information in the "Butir-Butir Peribadi Pemohon" section based on the user's profile, so that the user does not need to re-enter the same information.

UC07 Apply Membership Termination

* REQ-3 and REQ-5 from the *UC01 Apply Membership* are also applicable to *UC07 View List*.

REQ-3: The system shall send an email notification to the applicant regarding the updated application status after the administrator makes the selection.

REQ-5: The system shall display a confirmation message to the user after successfully updating the database.

* REQ-6 from the *UC02 Update User Profile* are also applicable to *UC07 View List*.

REQ-6: The system shall retrieve all relevant information.

- List of member application
- List of loan application
- List of existing members
- List of current debtors

REQ-8: The system shall maintain an audit log of status changes made by the administrator, including timestamps and admin ID.

UC10 Generate Report

* REQ-6 and REQ-8 from the *UC08 View List* are also applicable to *UC10 Generate Report*.

REQ-6: The system shall retrieve all relevant information.

- List of member application status
- List of member status
- List of loan application status
- Transaction Records
- Policies Information

REQ-8: The system shall maintain an audit log of retrieval made by the administrator, including timestamps and admin ID.

REQ-9: The system shall generate and display the report for the selected month or year or both upon selection by the administrator.

REQ-10: The system shall allow the administrator to export the report in various formats such as PDF.

UC11 Manage System

* REQ-1, REQ-2, REQ-4 and REQ-5 from the *UC01 Apply Membership* are also applicable to *UC11 Manage System*.

REQ-1: The system shall validate the user input.

- Member Number
- Transaction Amount
- Validate the input fields for policies
- Ensure that the amount does not exceed the limit or form a negative record
- Integers
- Doubles
- File type
- Size and dimension of uploaded image

REQ-2: The system shall display error messages for invalid input

- Missing required fields
- Incorrect input format

REQ-4: The system shall ensure that all data is stored securely and comply with relevant data protection regulations.

REQ-5: The system shall display a confirmation message to the user after successfully updating the database.

* REQ-6 and REQ-8 from the *UC08 View List* are also applicable to *UC11 Administer*.

REQ-6: The system shall retrieve all relevant information.

- Members
- Financial Status
- Existing policies

- Existing banners

REQ-8: The system shall maintain an audit log of status changes made by the administrator, including timestamps and admin ID.

REQ-11: The system shall update the application and related databases with the new policy upon submission by the administrator.

2.2.3 Domain Model: Class Diagram

The domain model of the KKK Online System is illustrated in Figure 2.2 below and described in Table 2.1 below

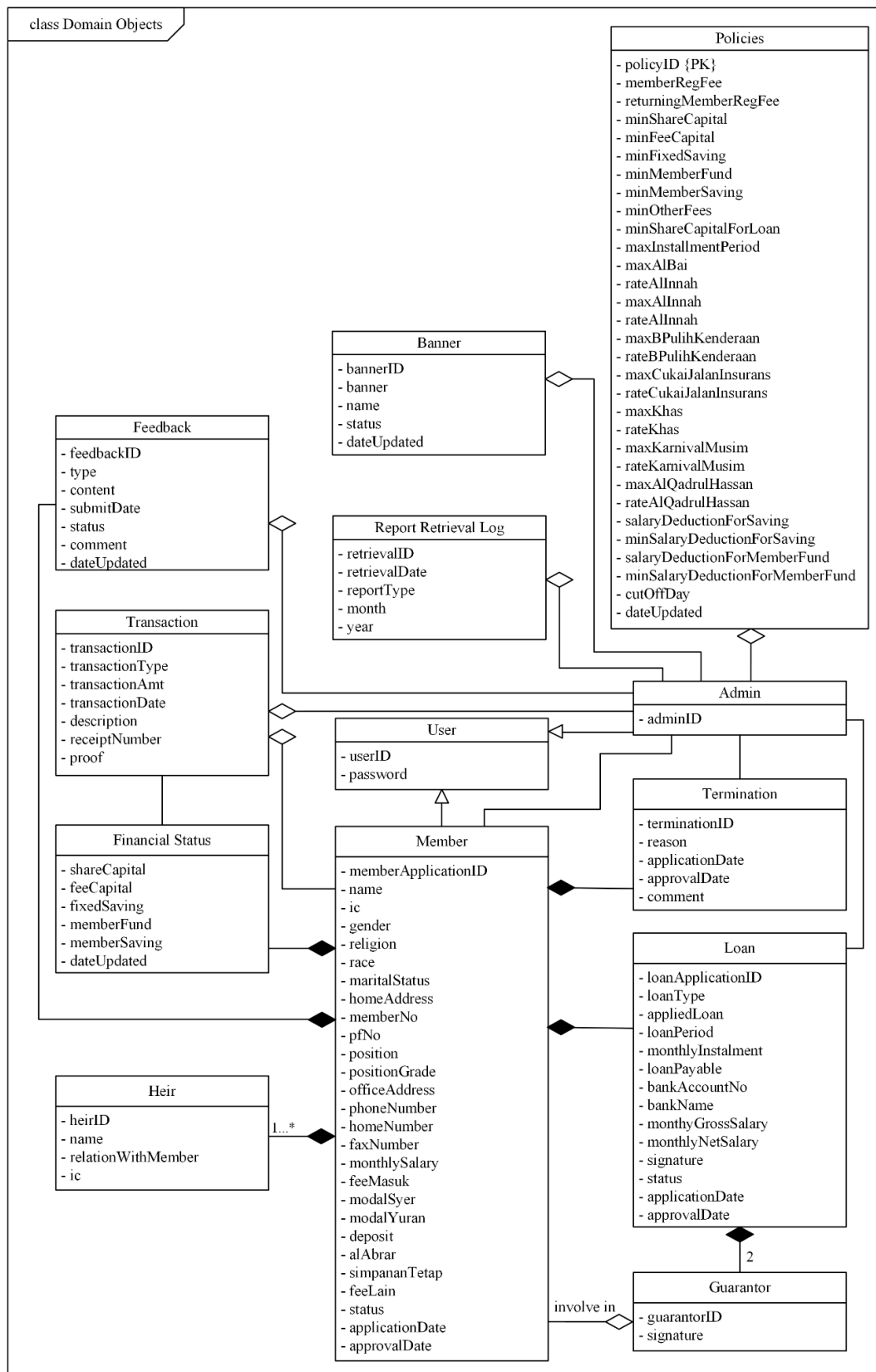


Figure 2.2: Domain Model for KKK Online System

Class	Description
User Class	<p>Represents all users that use the system. The information in this class will act as login credentials to the system.</p> <ul style="list-style-type: none"> • userID: A unique identifier for user • password: Password to login to the system
Member Class	<p>Represents a person registered in the system as a member. As a user applies for a member, an object of the member is created.</p> <p>The <i>Member</i> class is inherited from the <i>User</i> class. A member whose status is accepted would be eligible to apply for a loan.</p> <ul style="list-style-type: none"> • memberApplicationID: A unique identifier for membership application. • name: Name of the member. • ic: Identity card (MyKad) number of the member. • gender: Gender of the member. This attribute is an enumeration with the values Male (Lelaki) and Female (Perempuan). • religion: Religion of the member. This attribute is an enumeration with the values Islam, Buddhism (Buddha), Hinduism (Hindu), Christianity (Kristian) and Others (Lain-lain). • race: Race of the members. This attribute is an enumeration with the values Malay (Melayu), Chinese (Cina), Indian (India) and Others (Lain-lain). • maritalStatus: Marital status of the member. • homeAddress: Address of the member. • memberNo: Member number of the member. The member number would be available as the application is approved. • pfNo: PF number of the member. • position: Position held by the member. • positionGrade: Position grade of the member. • officeAddress: Address of the member on duty. • phoneNumber: Phone number of the member. • homeNumber: Home number of the member. • monthlySalary: Monthly salary of the member with the currency of RM. • feeMasuk: The member application fee (Fee Masuk) in RM, that the member shall pay if the member application is approved. • modalSyer: The share capital (Modah Syer) in RM, that the member shall buy if the member application is approved. • modalYuran: The fee capital (Modal Yuran) in RM, that the member shall pay if the member application is approved. • deposit: The fixed saving or fixed deposit (Wang Deposit Anggota) in RM, that the member would like to deposit. • alAbrar: The member fund contribution (Sumbangan Tabung Kebajikan) in RM, that the member would like to contribute each month from their salary.

	<ul style="list-style-type: none"> • simpananTetap: The member saving (Simpanan Tetap) in RM, that the member would like to save each month from their salary. • feeLain: The other fee (Lain-lain) in RM, that the member shall pay if the member application is approved. • status: Application status of the member. This attribute is an enumeration with the values Processing (Sedang Diproses), Rejected (Ditolak), Accepted (Dilulus) and Pension (Pencen) and Terminated (Berhenti). • applicationDate: Date when the application is submitted. • approvalDate: Date when the application is approved.. • adminID: A unique identifier for the admin who updated the result of member application.
Heir Class	<p>Represents an heir (pewaris) for a member.</p> <p>The Heir class is a composition of the <i>Member</i> class. The relation is one to many relation, where a member can have one or more heirs.</p> <ul style="list-style-type: none"> • heirID: A unique identifier for the heir. • name: Name of the heir. • relationshipWithMember: Relationship of the heir with associated the member. • ic: Identity card (MyKad) number of the heir.
Financial Status Class	<p>Represents the financial status of the associated member.</p> <p>The <i>Financial Status</i> class is a composition of the <i>Member</i> class. The relationship is a one to one relationship.</p> <ul style="list-style-type: none"> • shareCapital: Share capital (Modah Syer) of the associated member with the currency of RM. • feeCapital: Fee Capital (Modal Yuran) of the associated member with the currency of RM. • fixedSaving: Fixes Saving or Fixed Deposit (Simpanan Tetap) of the associated member with the currency of RM. • memberFund: Member Fund (Tabung Anggota) of the associated member with the currency of RM. • memberSaving: Member Saving (Simpanan Anggota) of the associated member with the currency of RM. • dateUpdated: The last date of the financial status is updated. The update is made by the admin and detailed in the Transaction class.
Loan Class	<p>Represents the loan application applied by the associated member.</p> <p>A member of the cooperative fulfilling the minimum share capital would be able to apply for loans.</p> <ul style="list-style-type: none"> • loanApplicationID: A unique identifier for the loan application. • loanType: The type of loan applied by the member. This attribute is an enumeration with the values Al-Bai, Al-Innah, Baik Pulih Kenderaan, Road Tax and Insurance, Special Scheme (Khas), Special Season Carnival (Karnival Musim Istimewa) and Al-Qadrul Hassan. • appliedLoan: The amount of loan applied by the member in RM.

	<ul style="list-style-type: none"> ● loanPeriod: The instalment period of the applied loan. ● monthlyInstalment: The monthly instalment amount of the applied loan in RM. ● loanPayable: The remaining loan in RM, that the member has to repay. The amount will be updated every month after salary deduction. ● bankAccountNo: The bank account number of the applicant. ● bankName: The bank associated with the bank account number provided. ● monthlyGrossSalary: The monthly gross salary of the applicant in RM. ● monthlyNetSalary: The monthly net salary of the applicant in RM. ● signature: The reference to the uploaded acknowledgement form with the signature of the applicant's employer. ● status: Application status of the member. This attribute is an enumeration with the values Processing (Sedang Diproses), Rejected (Ditolak), Accepted (Diterima) and Cleared (Dijelaskan). ● applicationDate: Date when the application is submitted. ● approvalDate: Date when the application is approved.. ● adminID: A unique identifier for the admin.
Guarantor Class	<p>Represents a guarantor for the loan application.</p> <p>The <i>Guarantor</i> class is a composition of the <i>Loan Application</i> class, where there must be two guarantors for each application. At the same time. The <i>Guarantor</i> class is associated with the <i>Member</i> class, where the guarantor has to be a member.</p> <ul style="list-style-type: none"> ● guarantorID: A unique identifier for the guarantor application. ● memberNo: The member number of the guarantor. ● signature: The reference to the uploaded acknowledgement form with the signature of the applicant's employer.
Termination Class	<p>Represents the record for member termination.</p> <p>A member of the cooperative who does not have debts with the cooperative would be able to apply for loans.</p> <ul style="list-style-type: none"> ● terminationID: A unique identifier for membership termination that was filled by the member. ● reason: A description of reason. ● applicationDate: Date when the application is submitted. ● approvalDate: Date when the application is approved. ● comment: Comment of the admin. ● adminID: A unique identifier for the admin.
Admin Class	<p>Represents a person registered in the system as an admin.</p> <p>The <i>Admin</i> class is inherited from the <i>User</i> class. The adminID would be the same as the userID. An admin would be able to update the status of the <i>Member</i> class, <i>Loan</i> class, <i>Policies</i> class, <i>Transaction</i> class and <i>Banner</i> class.</p>

	<ul style="list-style-type: none"> • adminID: A unique identifier for the admin.
Report Retrieval Log Class	<p>The class records the details of report retrieval. This serves as a record for tracking and auditing purposes.</p> <p>This class is associated with the Admin class and Report class. The aggregation between the Admin class and the Report Retrieval Log class specifies the admin who retrieves the report. While the aggregation between the Report class specifies the report that is retrieved.</p> <ul style="list-style-type: none"> • retrievalID: A unique identifier for the report. • retrievalDate: Date when the report is retrieved. • reportType: The type of report. This attribute is an enumeration with the values Monthly (Bulanan) and Annually (Tahunan). • month: Month of the report. The value ranged from 0 to 12. If this is an annual report, it will be represented by 0. • year: Year of the report.
Banner Class	<p>The class records the details of website banner updates. This serves as a record for tracking purposes.</p> <p>This class is associated with the Admin class. The aggregation between the Admin class and the Banner Update Log class specifies the admin who updated the banner.</p> <ul style="list-style-type: none"> • bannerID: A unique identifier for the uploaded banner. • banner: The path reference to the uploaded banner. • name: The name of the banner uploaded. • status: The status of the banner, either active or inactive. • dateUpdated: Date when the banner is updated.
Policies Class	<p>Represents the policies that validates the input for the system.</p> <ul style="list-style-type: none"> • policyID: A unique identifier for the policy. • memberRegFee: The registration fee (Fee Masuk) in RM, that should be paid by the applicant once approved to be a member. • returningMemberRegFee: The registration fee (Fee Masuk) in RM, that should be paid by the applicant, if the member has been a member previously, once approved to be a member. • minShareCapital: Minimum share capital (Modah Syer Minimum) for a member in RM. • minFeeCapital: Minimum fee capital (Modal Yuran Minimum) in RM. • minFixedSaving: Minimum fixed saving or fixed deposit (Wang Deposit Anggota Minimum) in RM. • minMemberFund: Minimum member fund contribution (Sumbangan Tabung Kebajikan Minimum) in RM. • minMemberSaving: Minimum member savings (Simpanan Tetap Minimum) in RM. • minOtherFees: Minimum amount of other fee (Lain-lain) in RM. • minShareCapitalForLoan: Minimum share capital (Modah Syer Minimum) for a member in RM.

	<ul style="list-style-type: none"> ● maxInstalmentPeriod: Maximum loan instalment period (Tempoh Ansuran Maksima) in months. ● maxAlBai: Maximum financing amount (Jumlah Pembiayaan Maksimum) for loan type Al-Bai in RM. ● rateAlBai: Profit rate or interest rate (Kadar Keuntungan) for Al-Bai loan type in percentage. ● maxAlInnah: Maximum financing amount (Jumlah Pembiayaan Maksimum) for loan type Al-Innah in RM. ● rateAlInnah: Profit rate or interest rate (Kadar Keuntungan) for Al-Innah loan type in percentage. ● maxBPulihKenderaan: Maximum financing amount (Jumlah Pembiayaan Maksimum) for loan type Vehicle Overhaul in RM. ● rateBPulihKenderaan: Profit rate or interest rate (Kadar Keuntungan) for Vehicle Overhaul loan type in percentage. ● maxCukaiJalanInsurans: Maximum financing amount (Jumlah Pembiayaan Maksimum) for loan type Road Tax and Insurance in RM. ● rateCukaiJalanInsurans: Profit rate or interest rate (Kadar Keuntungan) for Road Tax and Insurance loan type in percentage. ● maxKhas: Maximum financing amount (Jumlah Pembiayaan Maksimum) for loan type Special Scheme in RM. ● rateKhas: Profit rate or interest rate (Kadar Keuntungan) for Special Scheme loan type in percentage. ● maxKarnivalMusim: Maximum financing amount (Jumlah Pembiayaan Maksimum) for loan type Special Season Carnival (Karnival Musim Istimewa) in RM. ● rateKarnivalMusim: Profit rate or interest rate (Kadar Keuntungan) for Special Season Carnival (Karnival Musim Istimewa) loan type in percentage. ● maxAlQadrulHassan: Maximum financing amount (Jumlah Pembiayaan Maksimum) for loan type Al-Qadrul Hassan in RM. ● rateAlQadrulHassan: Profit rate or interest rate (Kadar Keuntungan) for Al-Qadrul Hassan loan type in percentage. ● salaryDeductionForSaving: Monthly Salary Deduction Amount for Saving (Potongan Gaji Bulanan untuk Simpanan Tetap) in RM. ● minSalaryDeductionForSaving: Minimum monthly Salary Deduction Amount for Saving (Potongan Gaji Bulanan untuk Simpanan Tetap) that a member can set in RM. ● salaryDeductionForMemberFund: Monthly Salary Deduction Amount for Member Fund (Potongan Gaji Bulanan untuk Tabung Kebajikan) in RM. ● minSalaryDeductionForMemberFund: Minimum Monthly Salary Deduction Amount for Member Fund (Potongan Gaji Bulanan untuk Tabung Kebajikan) in RM. ● cutOffDay: The cut off day for salary to be deducted for member application and loan application. ● dateUpdated: Date when the policy is updated.
--	--

Transaction Class	<p>Represent the transaction record. This class also serves as a record for tracking and auditing purposes.</p> <p>This class is associated with the Admin class and the Member class. The aggregation with the Admin class specifies the admin who updated the transaction. The aggregation with the Member class specifies the member whose financial status is being updated.</p> <ul style="list-style-type: none"> ● transactionID: A unique identifier for the transaction record. ● transactionType: The type of transaction made. This attribute is an enumeration with the values Share Capital (Modah Syer), Fee Capital (Modal Fee), Fixed Saving (Simpanan Tetap), memberFund (Tabung Anggota), memberSaving (Simpanan Anggota), Al-Bai, Al-Innah, Baik Pulih Kenderaan, Road Tax and Insurance, Special Scheme (Khas), Special Season Carnival (Karnival Musim Istimewa) and Al-Qadrul Hassan. ● transactionAmt: The amount of the transaction in RM. ● transactionDate: Date when the transaction is updated. ● description: The description of the transaction. ● receiptNumber: The receipt number of the transaction proof. ● proof: The path reference to the uploaded proof.
-------------------	--

Table 2.2: Description of Classes for KKK Online System

2.2.4 State Diagram

The state diagram shows the states and transitions of an object throughout the system. The *Member* class and the *Loan* class would require a state diagram that shows the transition of application status.

Figure 1.3 shows the state diagram for the *Member* class. Once the user submits the application, the application will be in Processing state. After the meeting with the Board of Directors, the result of the application will be updated to either Approve state or Rejected state. As the application is approved, the applicant will be a member of the cooperative. If the member would like to quit the cooperative, the member can apply for membership termination. After approval, the member will be in the Terminated state. If the member retired, the member will be moved to Pension status. A member that is under the Pension status can also apply for termination or moved to termination status if the member passed away.

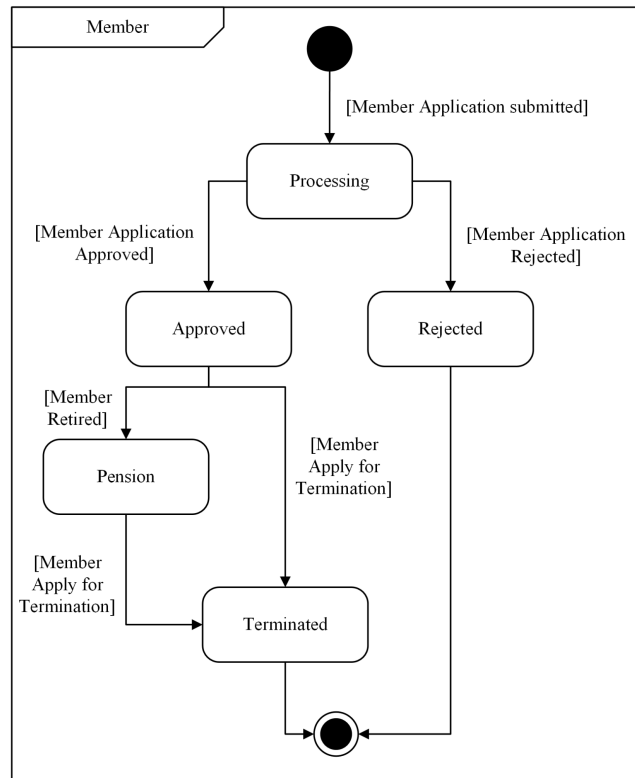


Figure 1.3: State Machine Diagram for Member Class

Figure 1.4 shows the state diagram for the Loan class. Once the user submits the application, the application will be in Processing state. After the meeting with the Board of Directors, the result of the application will be updated to either Approve state or Rejected state. If the loan is approved, the member shall repay the loan by monthly installments or pay directly to the cooperative until the debt is cleared.

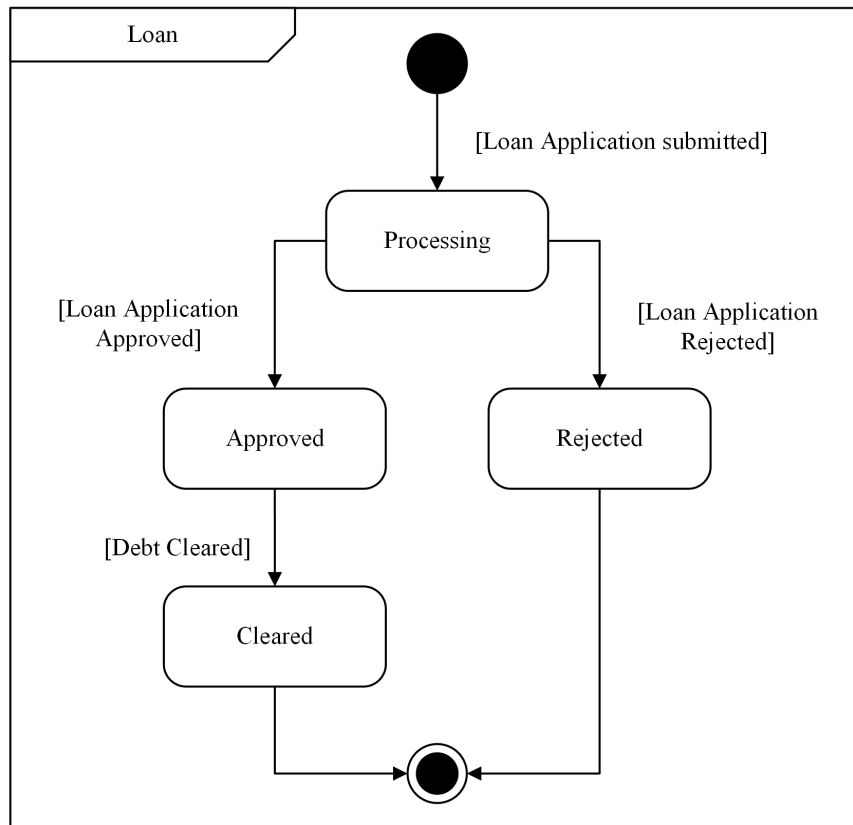


Figure 1.4: State Machine Diagram for Member Class

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 KKK Online System.

Table 1.2 Product Backlog for the KKK Online System

Sprint	Use Case Involved	Team Members Assigned
Sprint 1 User Module	UC01 Apply Membership (US01) UC03 Log In (US06)	Tan Yi Ya
	UC02 Update User Profile (US02)	Chua Jia Lin
Sprint 2 Member Module	UC04 View Financial Status (US03)	Chua Jia Lin
	UC05 Apply Loan (US04) UC06 View Loan Application Status (US05)	Teh Ru Qian
	UC07 Apply Membership Termination (UC07)	Chua Jia Lin
Sprint 3 Admin Approve Module	UC08 Approve Membership (US08) UC09 Approve Loan Application (US09) UC12 Approve Membership Termination (US12)	Goe Jie Ying

Sprint 4 Admin Module	UC10 Generate Report (US10)	Teh Ru Qian
	UC11 Manage System (US11)	Lam Yoke Yu

2.4 User Story Details

This section outlines the user's goals and expectations for the system, focusing on the required actions. It defines the user story's scope, flow of events, sequence diagram, and activity diagram to ensure the system effectively meets the user's needs.

2.4.1 US01 User Story Apply Membership

Table 2.1 shows the user story description, followed by the sequence diagram in Figure 2.1 and the activity diagram in Figure 2.2.

Table 2.1: User Story Description for Apply Membership

User story: Apply Membership
ID: US01
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 corporative
Flow of events: <ol style="list-style-type: none"> 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 “Akuan Kebenaran” statement and the employee agrees by ticking the confirmation box. 5. The employee submits the application for review.
Alternative flow: <ol style="list-style-type: none"> 1. If incomplete details are provided, the system prompts the employee to fill in the missing fields before proceeding. 2. If the application is being rejected, the member cannot log into the system.
Acceptance Criteria: Precondition: <ol style="list-style-type: none"> 1. The applicant must be a current employee of KADA. Postcondition: <ol style="list-style-type: none"> 1. If the application is approved, the employee becomes a registered member of KKK and can access the benefits provided. 2. If the application is rejected, the employee will not be able to 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.

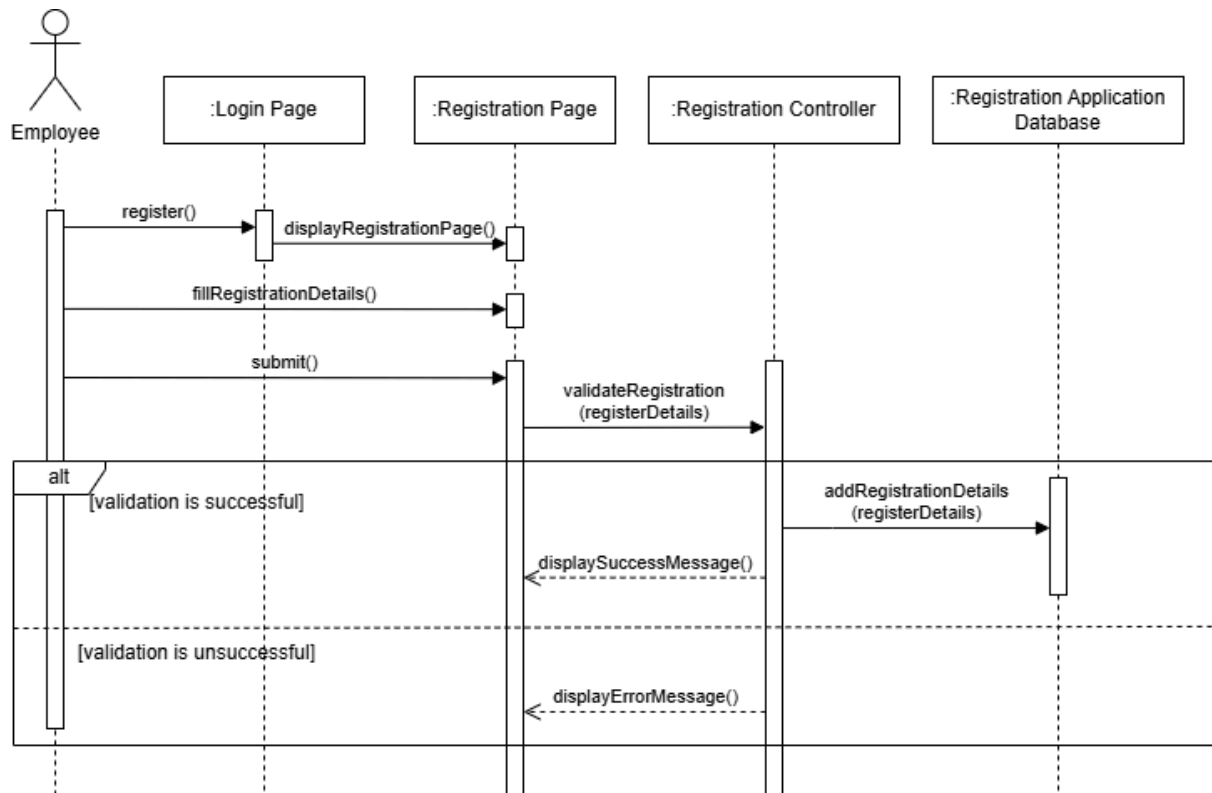


Figure 2.1: Sequence Diagram for Apply Membership

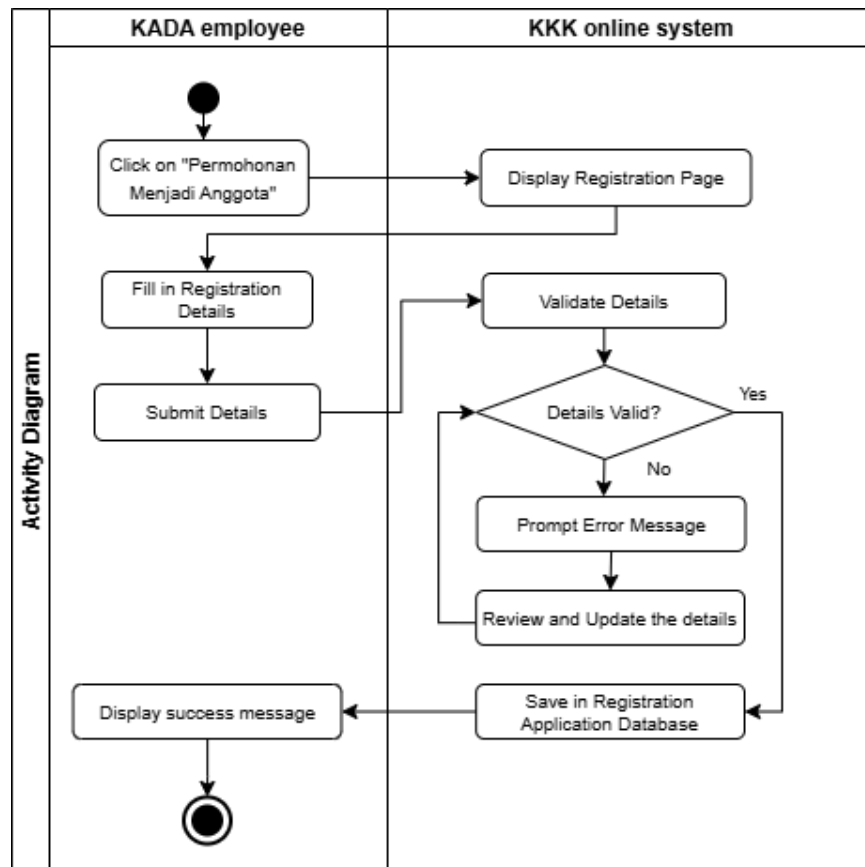


Figure 2.2: Activity Diagram for Apply Membership

2.4.2 US02 User Story Update User Profile

Table 2.2 shows the user story description, followed by the sequence diagram in Figure 2.3 and the activity diagram in Figure 2.4.

Table 2.2: User Story Description for Update User Profile

User story: Update User Profile
ID: US02
User Story Description: As a registered KKK member I want to view and verify my personal details So that I can ensure my information is accurate
Flow of events: <ol style="list-style-type: none"> 1. The employee logs into the KKK system. 2. The employee navigates to the "Profil" section. 3. The employee reviews the personal and family details for accuracy.
Alternative flow: If there are errors in the information, the employee clicks "Kemaskini" to update the information and clicks "Simpan" to save the changes.

Acceptance Criteria:

Precondition:

1. The employee is logged into the system.
2. The employee information is available in the system.

Postcondition:

1. The employee has verified or updated their personal details.

Exception flow:

If an error occurs while updating the information, the system prompts the employee to try again later.

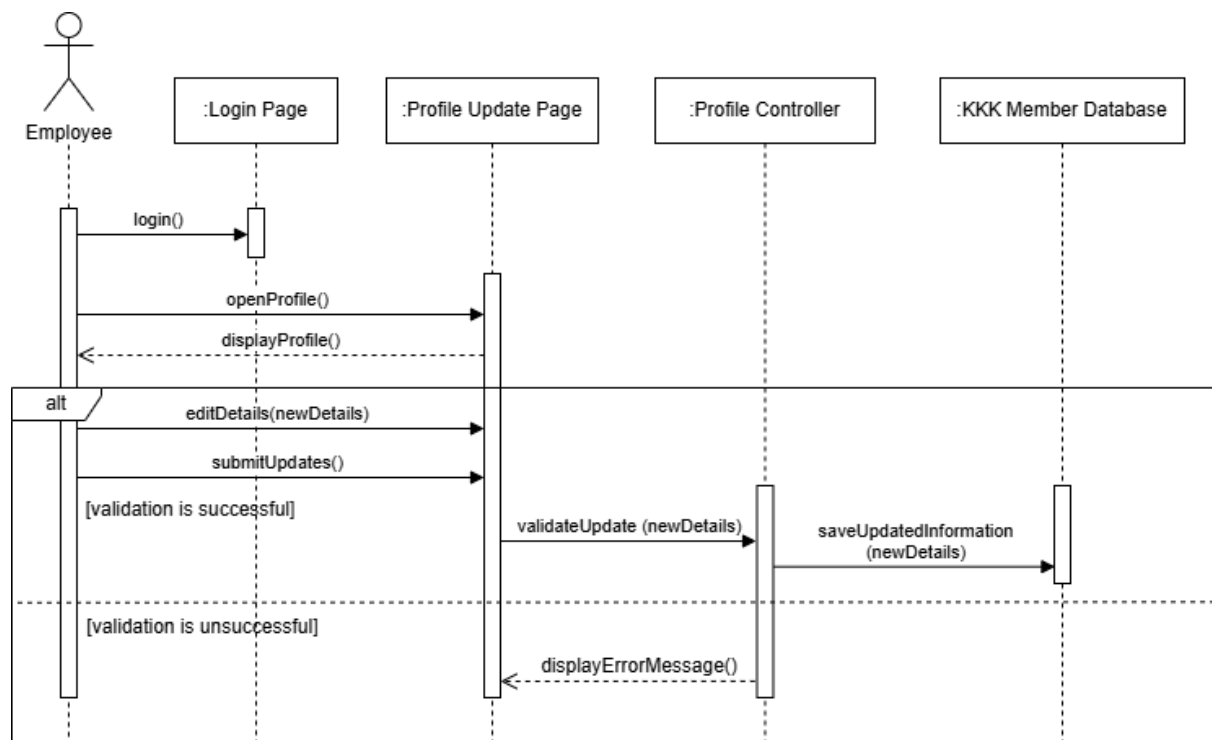


Figure 2.3: Sequence Diagram for Update User Profile

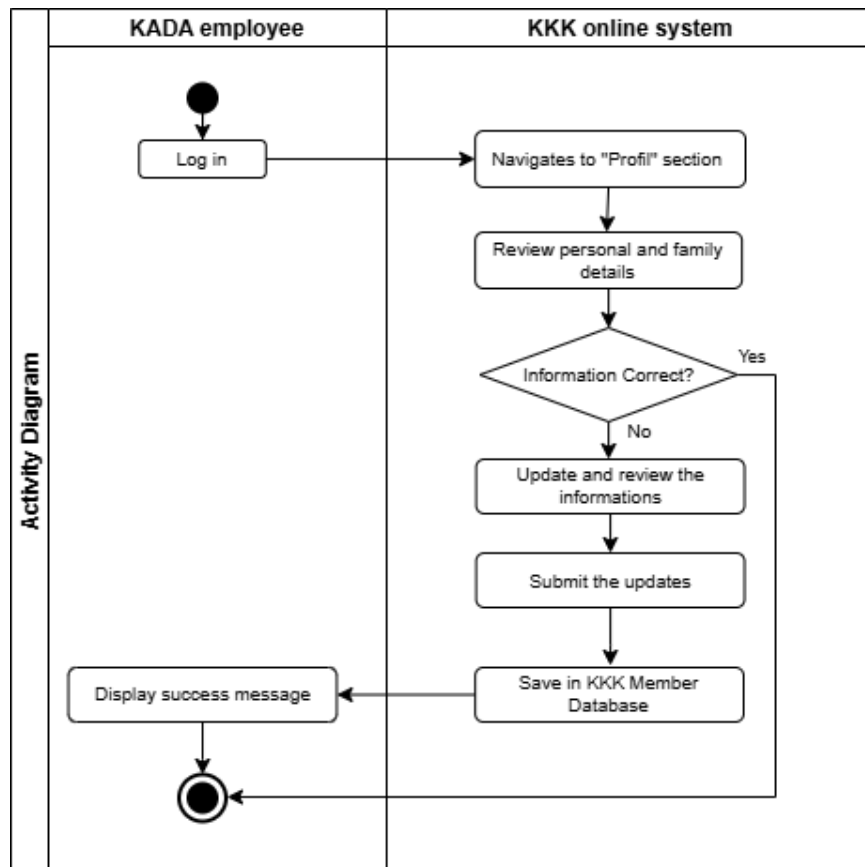


Figure 2.4: Activity Diagram for Update User Profile

2.4.3 US03 User Story View Financial Status

Table 2.3 shows the user story description, followed by the sequence diagram in Figure 2.5 and the activity diagram in Figure 2.6.

Table 2.3: User Story Description for View Financial Status

User story: View Financial Status
ID: US03
User Story Description: As a registered KKK member I want to view and verify my financial information So that I can know about my current financial status
Flow of events: <ol style="list-style-type: none"> 1. The employee logs into the KKK system. 2. The employee reviews the financial information displayed on the main page.
Alternative flow: -

Acceptance Criteria:

Precondition:

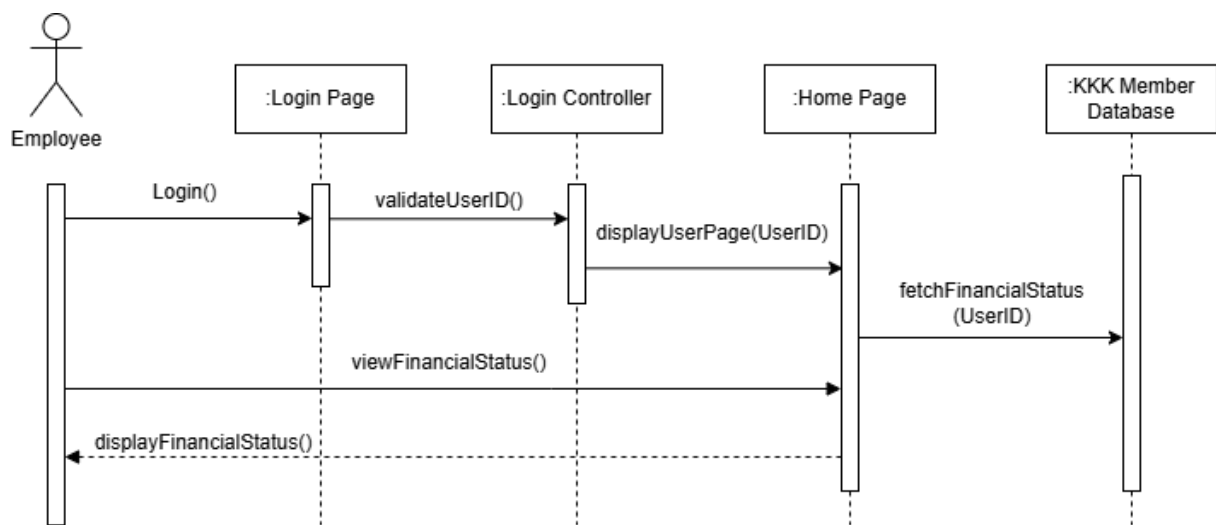
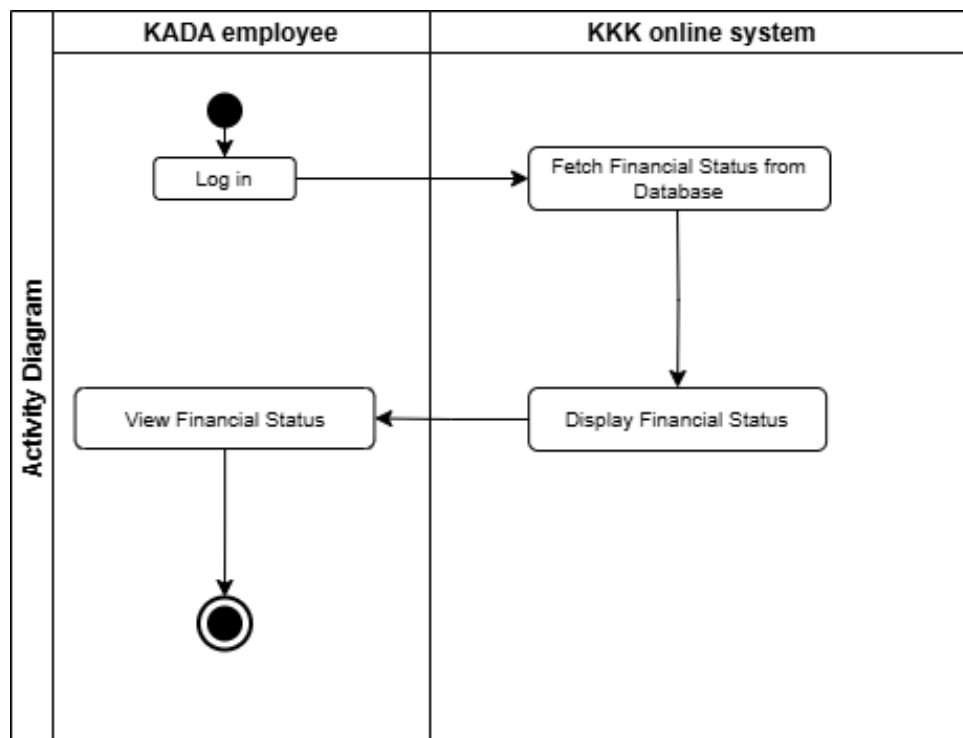
1. The employee is logged into the system.
2. The employee information is available in the system.

Postcondition:

1. The employee successfully views their current share information.

Exception flow:

The employee successfully views their current financial information.

*Figure 2.5: Sequence Diagram for View Financial Status**Figure 2.6: Activity Diagram for View Financial Status*

2.4.4 US04 User Story Apply for a Loan

Table 2.4 shows the user story description, followed by the sequence diagram in Figure 2.7 and the activity diagram in Figure 2.8.

Table 2.4: User Story Description for Apply for a Loan

User story: Apply for a Loan
ID: US04
User Story Description: As a KKK Member I want to apply for a loan through the system So that I can get financial support
Flow of events: <ol style="list-style-type: none">1. The member logs into the system.2. Click "Pinjaman" on the navigation bar.3. Enter the loan amount.4. Fills in all personal details, including name, address and income information.5. Uploads the required documents such as "Butir-Butir Penjamin" and "Borang Pengesahan Majikan".6. Submits the loan application.7. The system confirms the application submission.
Alternative flow: <ol style="list-style-type: none">1. If eligibility requirements are not met, the system displays an error message.2. If incomplete details are provided, the system prompts the employee to complete it.
Acceptance Criteria: Precondition: <ol style="list-style-type: none">1. The member is logged into the system. Postcondition: <ol style="list-style-type: none">1. The loan application is saved and processed.
Exception flow: -

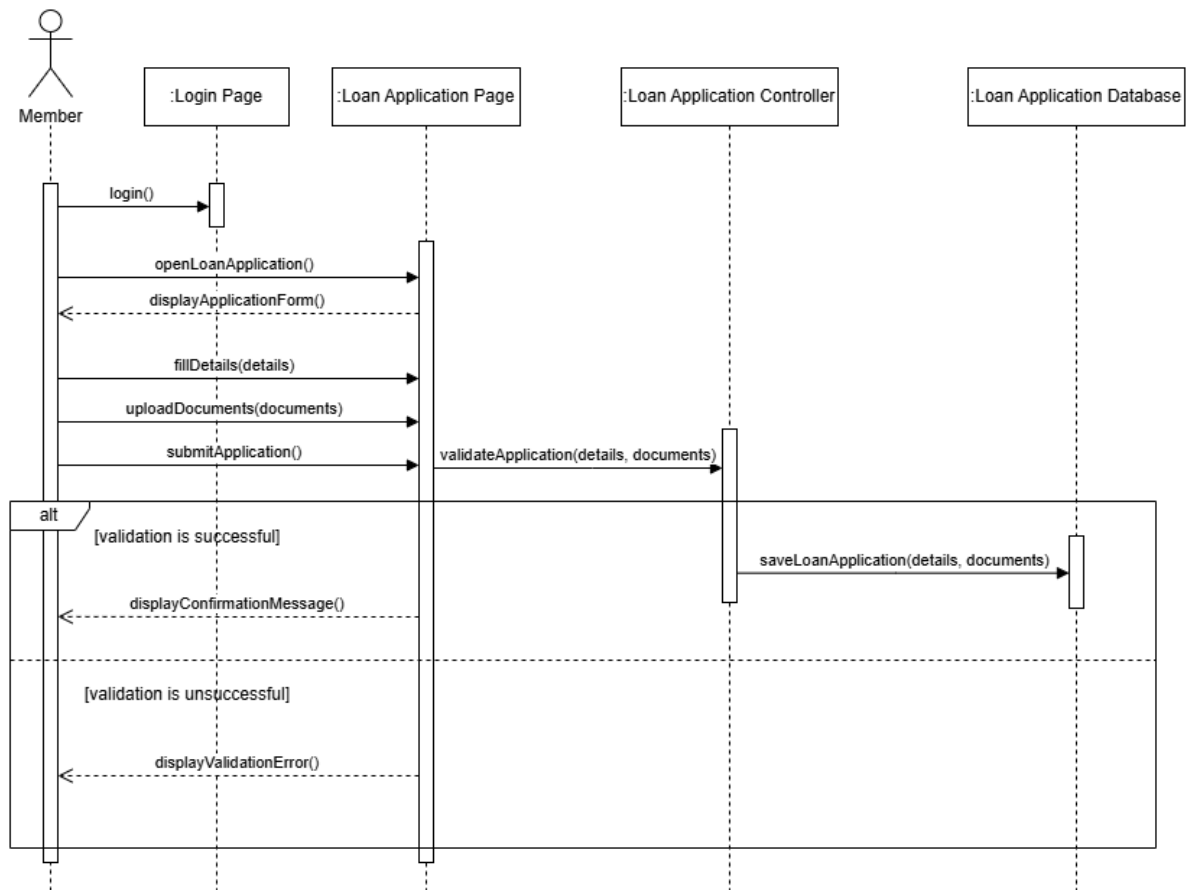


Figure 2.7: Sequence Diagram for Apply for a Loan

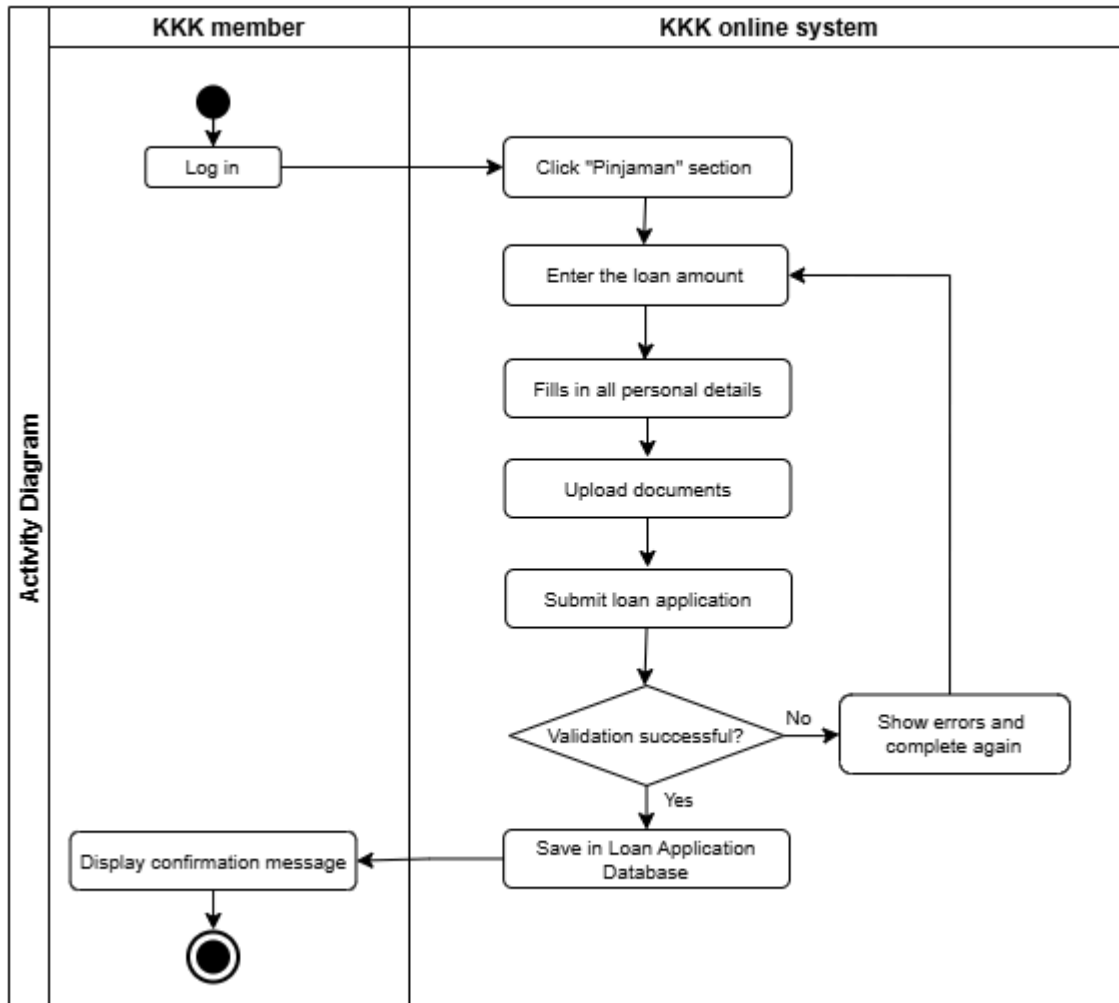


Figure 2.8: Activity Diagram for Apply for a loan

2.4.5 US05 User Story View Loan Application Status

Table 2.5 shows the user story description, followed by the sequence diagram in Figure 2.9 and the activity diagram in Figure 2.10.

Table 2.5: User Story Description for View Loan Application Status

User story: View Loan Application Status
ID: US05
User Story Description: As a KKK member I want to check the status of my loan application So that I know whether it is approved or rejected

Flow of events:

1. The system processes the loan application.
2. Click the “Pinjaman” section.
3. The system displays current loan status, such as “Sedang Diproses”, “Diterima” and “Ditolak”.
4. The system displays loan details, including total amount, repayment schedule and outstanding balance.

Alternative flow:

If no active loan exists, the system displays a message stating no current loans.

Acceptance Criteria:

Precondition:

1. The member has submitted a loan application.

Postcondition:

1. The member is able to view the current loan status and details in the system.

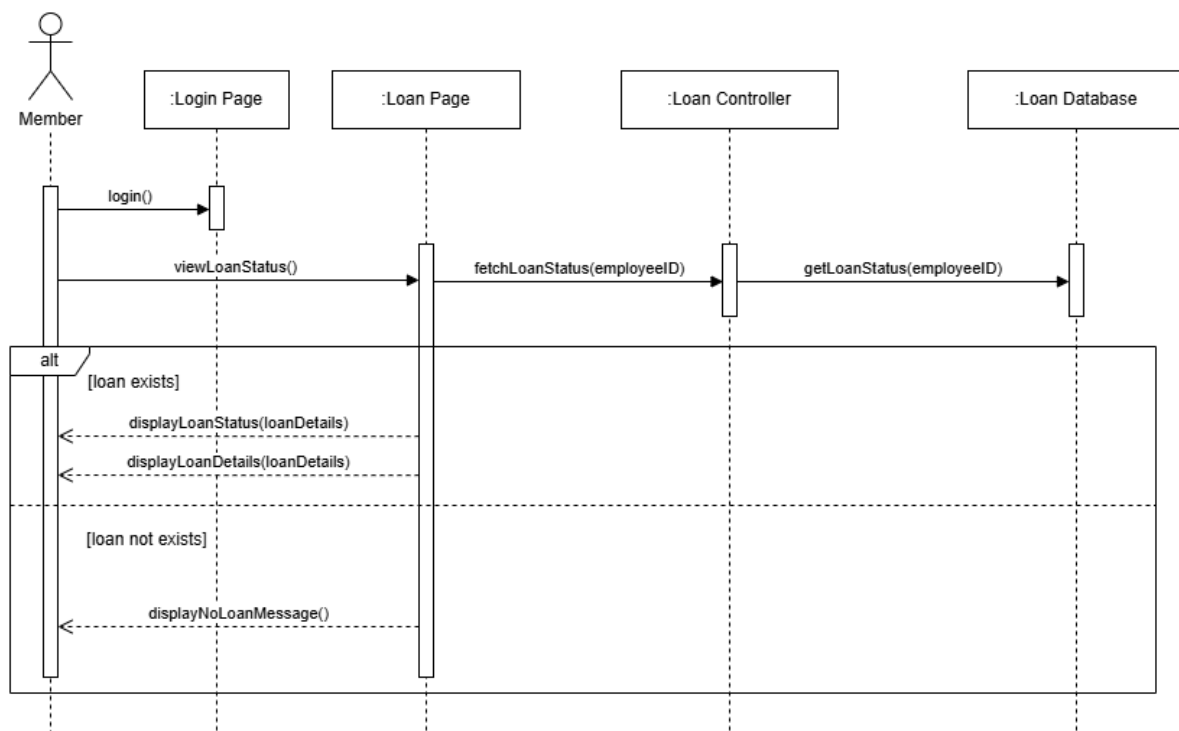
Exception flow: -

Figure 2.9: Sequence Diagram for View Loan Application Status

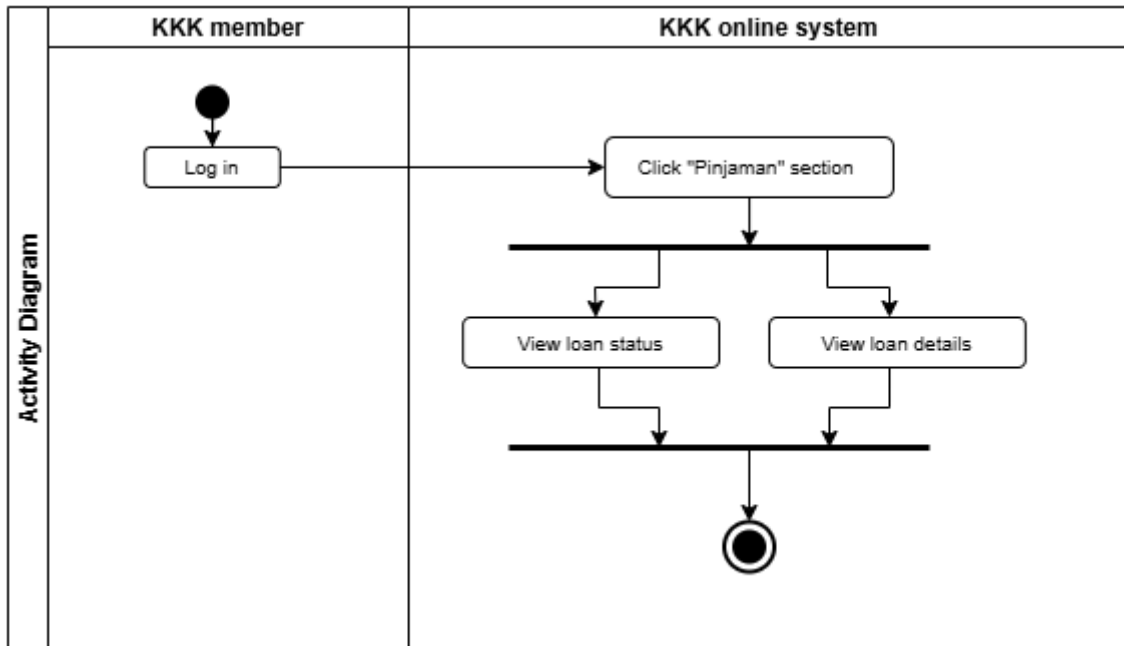


Figure 2.10: Activity Diagram for View Loan Application Status

2.4.6 US06 User Story KKK Admin Login to System

Table 2.6 shows the user story description, followed by the sequence diagram in Figure 2.11 and the activity diagram in Figure 2.12.

Table 2.6: User Story Description for KKK Admin Login to System

User story: KKK Admin Login to System
ID: US06
User Story Description: As a KKK admin I want to login to the system So that I can access the features of the system
Flow of events: <ol style="list-style-type: none"> 1. Admin opens up the KKK web application and is directed to the login page. 2. Admin key in user ID and password in their respective column. 3. Admin clicks “Log masuk”. 4. System validate user ID and password.
Alternative flow: If invalid user ID and password entered, the system prompts the user to re-enter user ID and password.

Acceptance Criteria:

Precondition:

1. Admin has user ID and password.

Postcondition:

1. Admin redirected to the Admin main page.

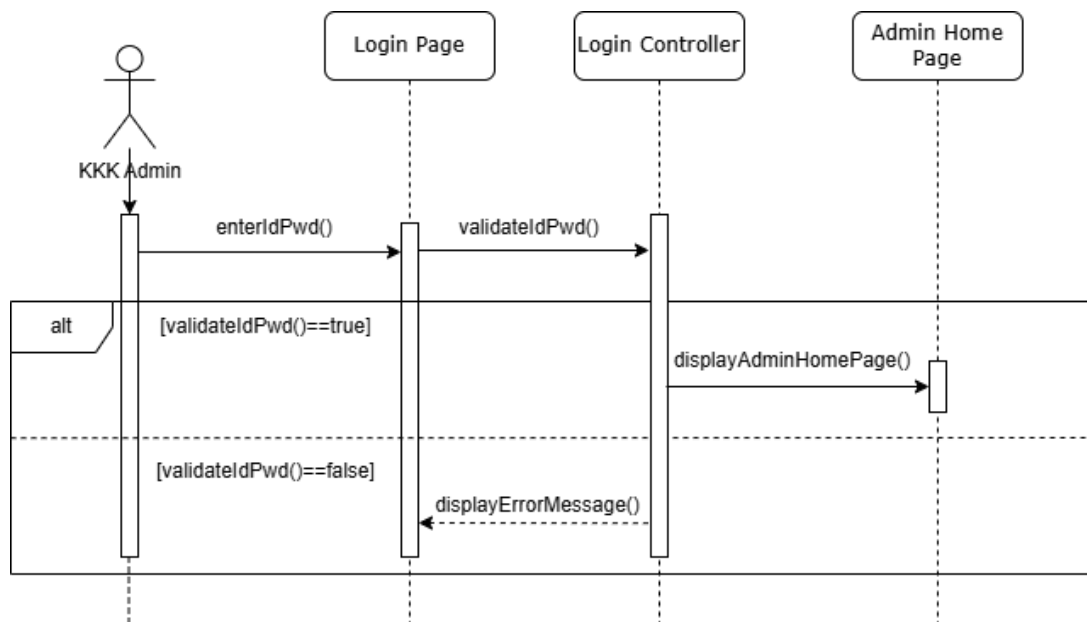
Exception flow: -

Figure 2.11: Sequence Diagram for KKK Admin Login to System

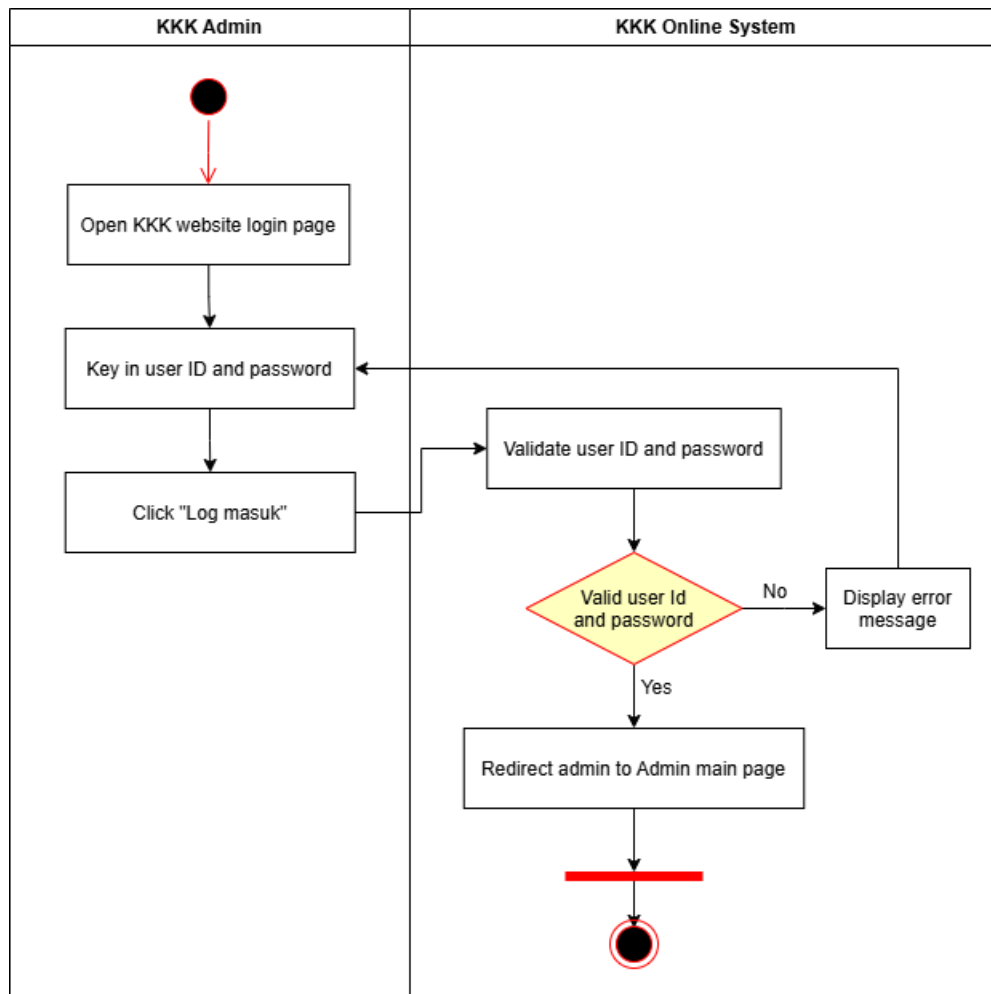


Figure 2.12: Activity Diagram for KKK Admin Login to System

2.4.7 US07 User Story KKK Member Apply Membership Termination

Table 2.7 shows the user story description, followed by the sequence diagram in Figure 2.13 and the activity diagram in Figure 2.14.

Table 2.7: User Story Description for Apply Membership Termination

User Story: Apply Membership Termination
ID: US07
Actor: Member
Precondition: <ul style="list-style-type: none"> The member logged in to the system.
Flow of events: <ol style="list-style-type: none"> Click "Berhenti Sebagai Anggota" on the navigation bar. Enter the reason. Submit the application.

Alternative flow: If loans are not paid in full, the system displays an error message.

Postcondition: The membership termination application is saved and processed.

Exception flow: -

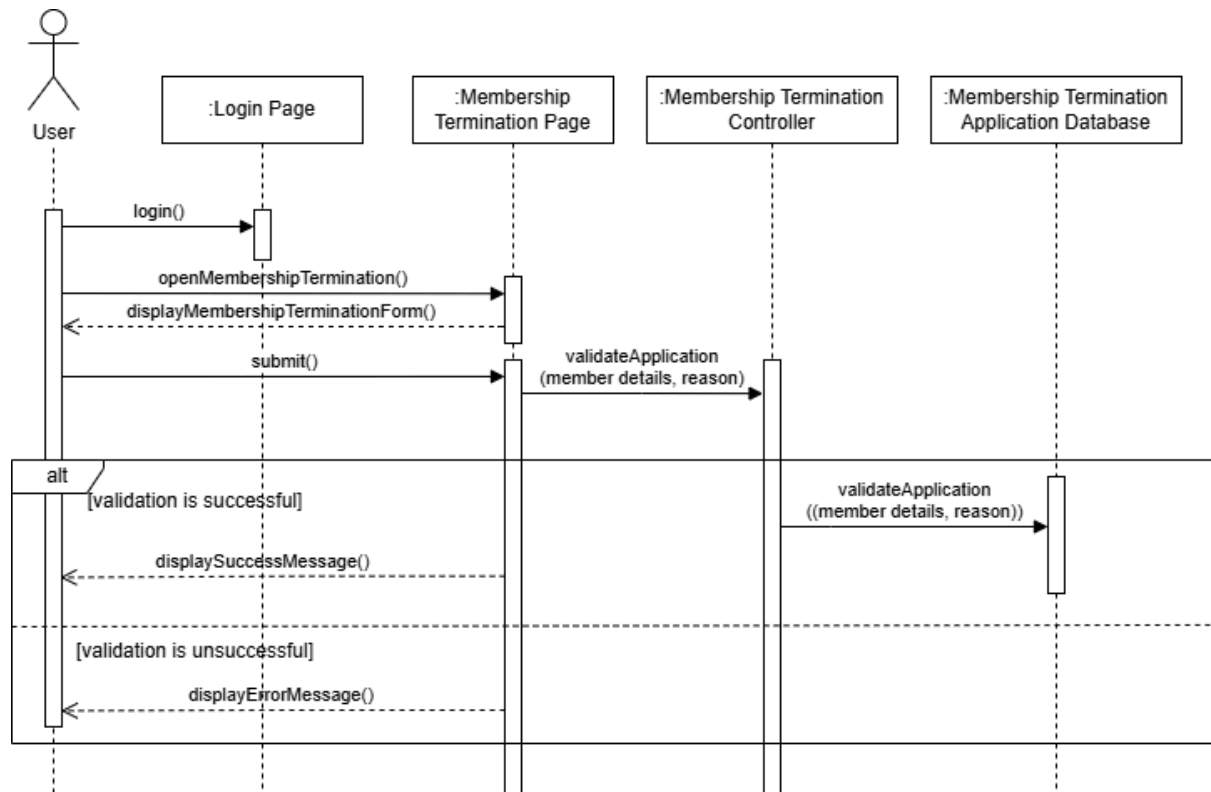


Figure 2.13: Sequence Diagram for Apply Membership Termination

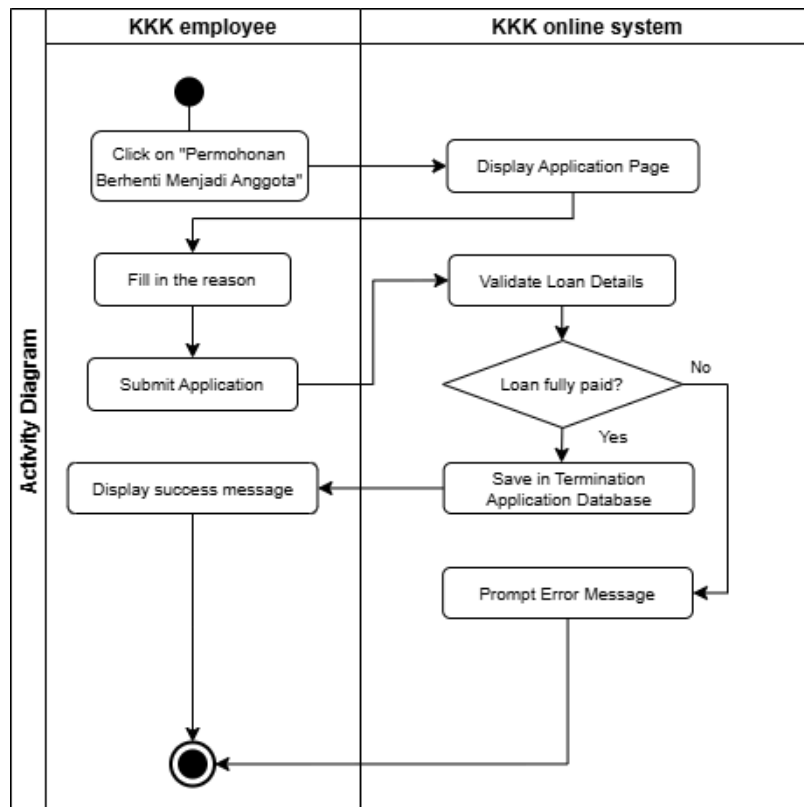


Figure 2.14: Activity Diagram for Apply Membership Termination

2.4.8 US08 User Story KKK Admin Approve New Member Application

Table 2.8 shows the user story description, followed by the sequence diagram in Figure 2.15 and the activity diagram in Figure 2.16.

Table 2.8: User Story Description for KKK Admin Approve New Member Application

User story: KKK Admin Approve New Member Application
ID: US08
User Story Description: As a KKK admin I want to approve new member applications So that I can check whether the applicant meets the requirements to become a member of the cooperative
Flow of events: <ol style="list-style-type: none"> Admin navigates to “Permohonan Anggota”. Admin clicks “...” to view more about the applications. Admin reviews the membership applications.
Alternative flow: <ol style="list-style-type: none"> If approved, the system updates the application status to “Diterima.” If rejected, the system updates the application status to “Ditolak.”

Acceptance Criteria:

Precondition:

1. Admin logged in to the system.

Postcondition:

1. When the membership applications' status is updated to "Diterima" status, the applicant will be updated to "Senarai Anggota".

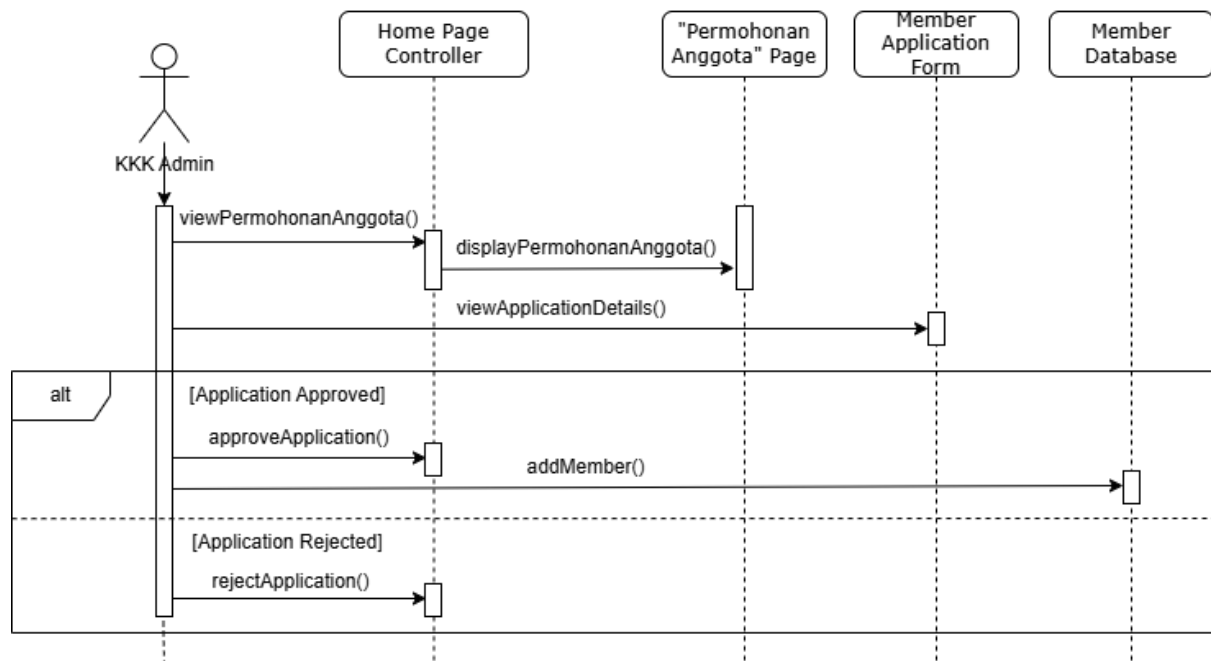
Exception flow: -

Figure 2.15: Sequence Diagram for KKK Admin Approve New Member Application

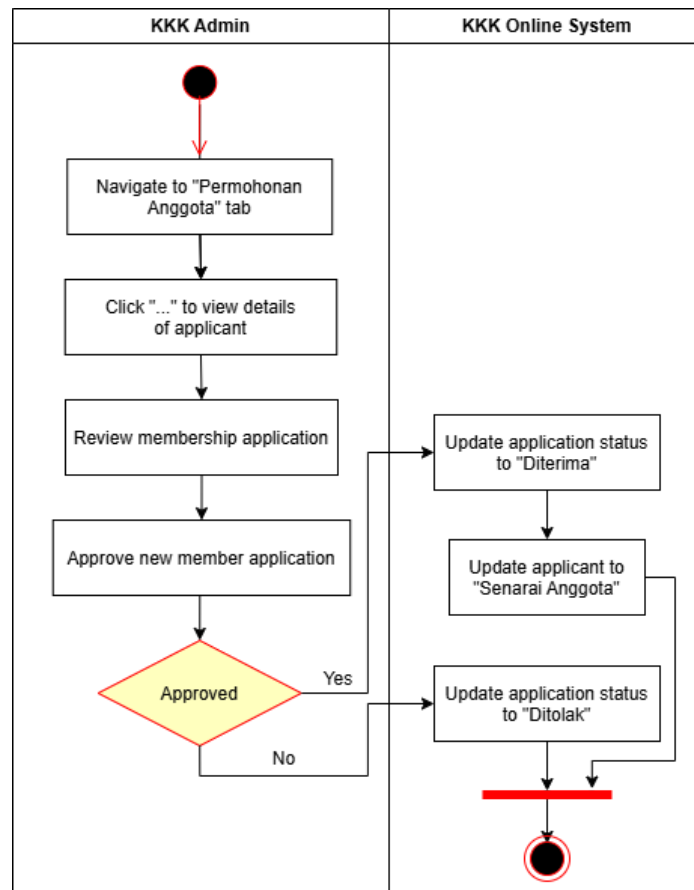


Figure 2.16: Activity Diagram for KKK Admin Approve New Member Application

2.4.9 US09 User Story KKK Admin Approve Loan Application

Table 2.9 shows the user story description, followed by the sequence diagram in Figure 2.17 and the activity diagram in Figure 2.18.

Table 2.9: User Story Description for KKK Admin Approve Loan Application

User story: KKK Admin Approve Loan Application
ID: US09
User Story Description: As a KKK admin I want to approve loan applications So that I can check whether the applicant meets the requirements to make a loan
Flow of events: <ol style="list-style-type: none"> Admin navigates to “Permohonan Pinjaman”. Admin clicks “...” to view more about the applications. Admin reviews the loan applications.

Alternative flow:

1. If approved, the system updates the application status to “Diterima.”
2. If rejected, the system updates the application status to “Ditolak.”

Acceptance Criteria:

Precondition:

1. Admin logged in to the system.

Postcondition:

1. When the loan applications’ status is updated to “Diterima” status, the application will be updated to “Senarai Pinjaman”.

Exception flow: -

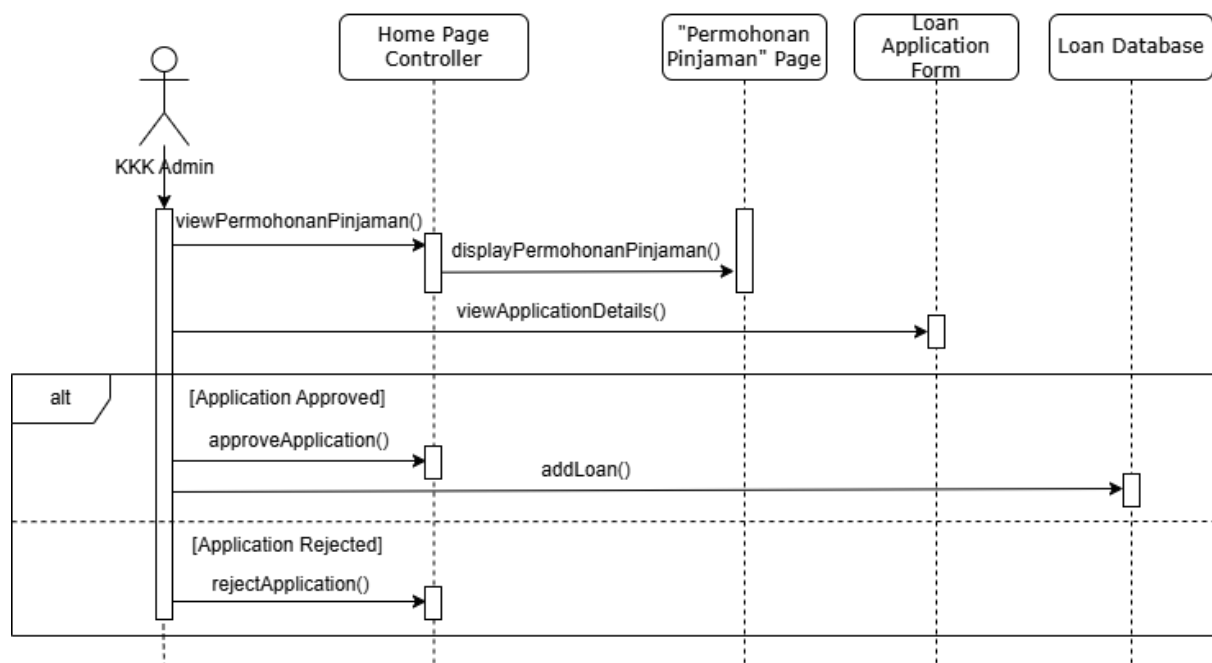


Figure 2.17: Sequence Diagram for KKK Admin Approve Loan Application

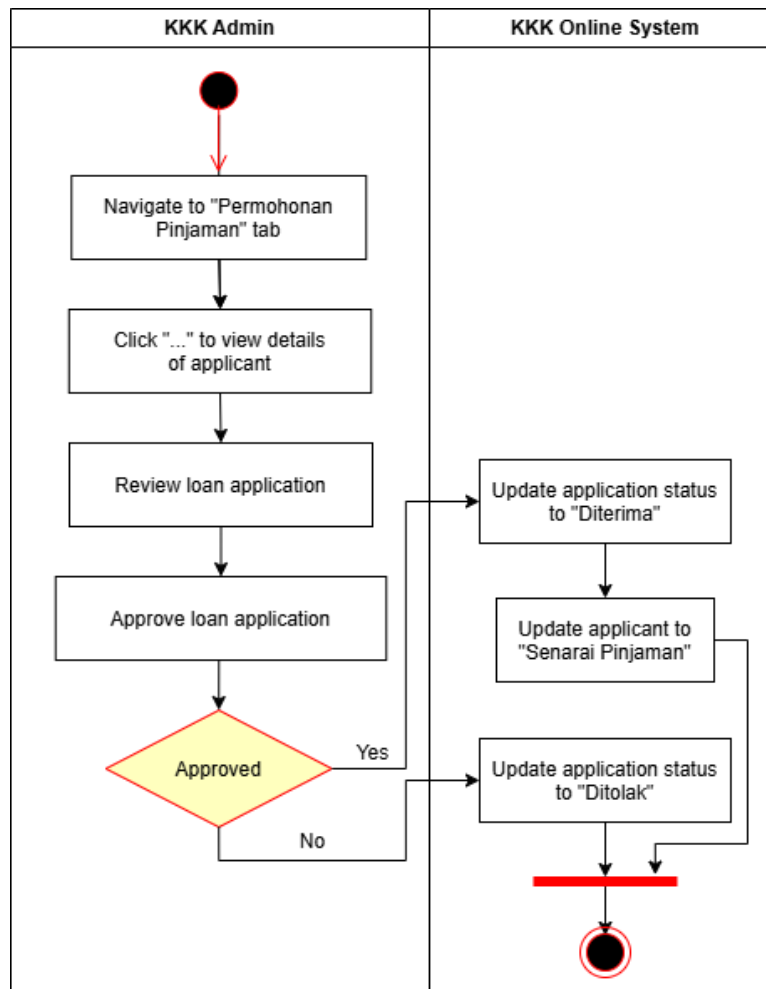


Figure 2.18: Activity Diagram for KKK Admin Approve Loan Application

2.4.10 US10 User Story KKK Admin Generate Reports

Table 2.10 shows the user story description, followed by the sequence diagram in Figure 2.19 and the activity diagram in Figure 2.20.

Table 2.10: User Story Description for KKK Admin Generate Reports

User story: KKK Admin Generate Reports
ID: US10
User Story Description: As a KKK admin I want to generate reports So that future decisions can be made for the cooperative

Flow of events:

1. Admin navigates to the “Laporan” tab.
2. Admin selects the report type, either monthly or annual and specifies the time frame.
3. System retrieves relevant data from the database, including new member applications, loan applications, fees claimed and contributions claimed.
4. System generates a financial summary and detailed breakdown of each category for the specified period.
5. System displays the report, providing options to view in detail, export or print the report.

Alternative flow:

If invalid time frame is selected, the system prompts the user to select the correct time frame.

Acceptance Criteria:

Precondition:

1. Admin logged in to the system.

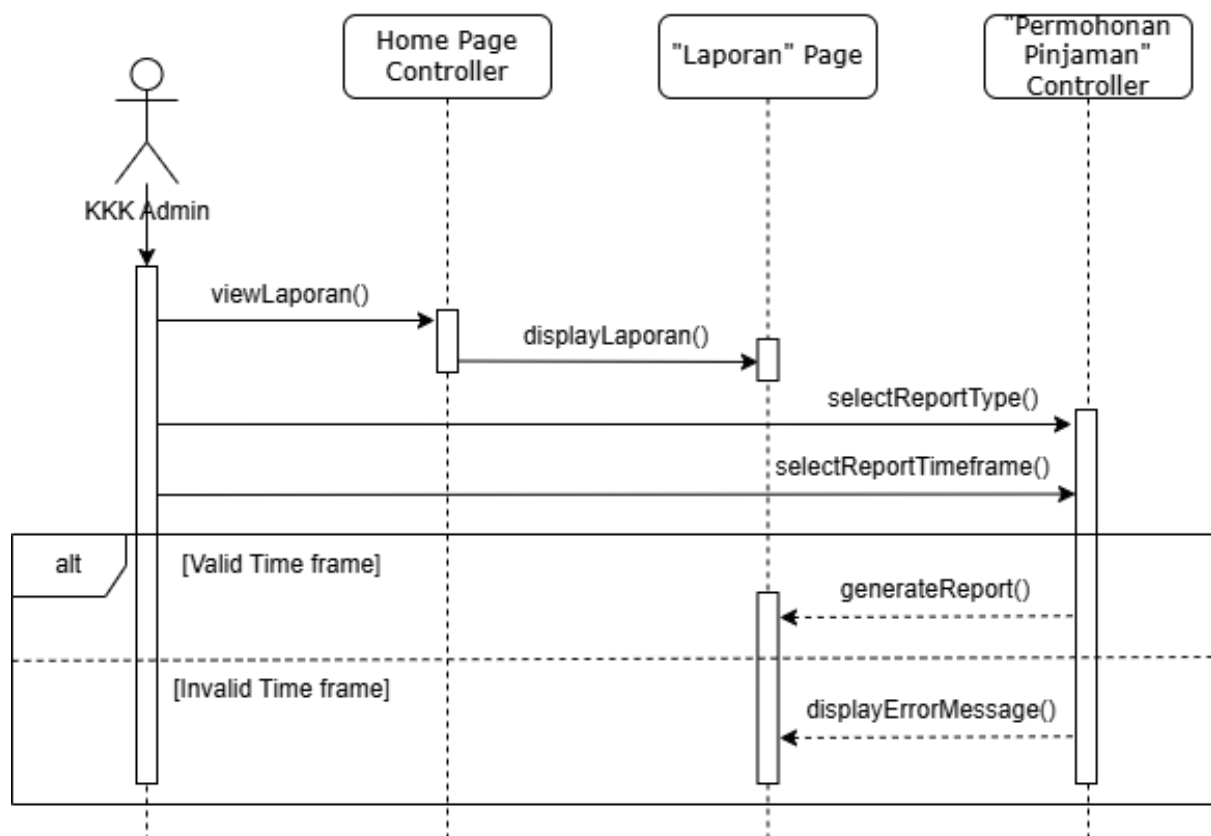
Exception flow: -

Figure 2.19: Sequence Diagram for KKK Admin Generate Reports

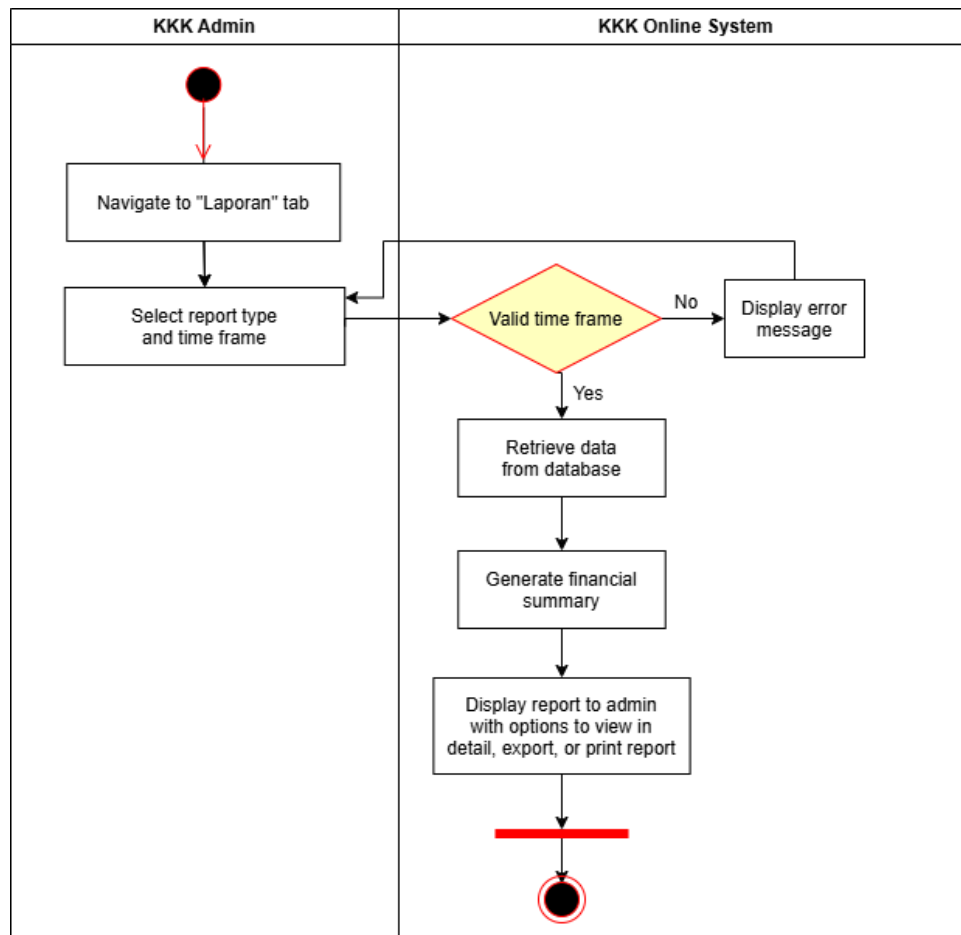


Figure 2.20: Activity Diagram for KKK Admin Generate Reports

2.4.11 US11 User Story KKK Admin Manage System

Table 2.11 shows the user story description, followed by the sequence diagram in Figure 2.21 and the activity diagram in Figure 2.22.

Table 2.11: User Story Description for KKK Admin Manage System

User story: KKK Admin Manage System
ID: US11
User Story Description: As a KKK admin I want to administer the system So that the information on the system can be updated.

Flow of events:

1. Record Transaction
 - 1.1 Admin navigates to the Record Transaction tab.
 - 1.2 The system displays the list of members.
 - 1.3 Admin searches and selects the member to be updated.
 - 1.4 The system displays the financial status of the member.
 - 1.5 Admin enters the amount to be added or subtracted.
 - 1.6 The system prompts a confirmation message
 - 1.7 Admin clicks “Ok”.
 - 1.8 The system updates the database and the transaction is recorded.
2. Update Policies
 - 2.1 Admin navigates to “Kemaskini Polisi”.
 - 2.2 System displays all policies.
 - 2.3 Admin clicks “Kemaskini” to update the relevant section.
 - 2.4 Admin updates the new values.
 - 2.5 Admin clicks “Simpan”.
 - 2.6 The system prompts a confirmation message.
 - 2.7 The admin clicks “Ok”.
 - 2.8 The system updates the database and the policies are updated.
3. Update Banners
 - 3.1 Admin navigates to “Kemaskini Iklan”.
 - 3.2 Admin uploads a new photo.
 - 3.3 Admin clicks “Kemaskini”.
 - 3.4 System prompts a confirmation message.
 - 3.5 The admin clicks “Ok”.
 - 3.6 The system updates the database and the banners are updated.

Alternative flow:

If “OK” is not selected, the system will not update the database.

Acceptance Criteria:

Precondition:

1. Admin logged in to the system.

Exception flow: -

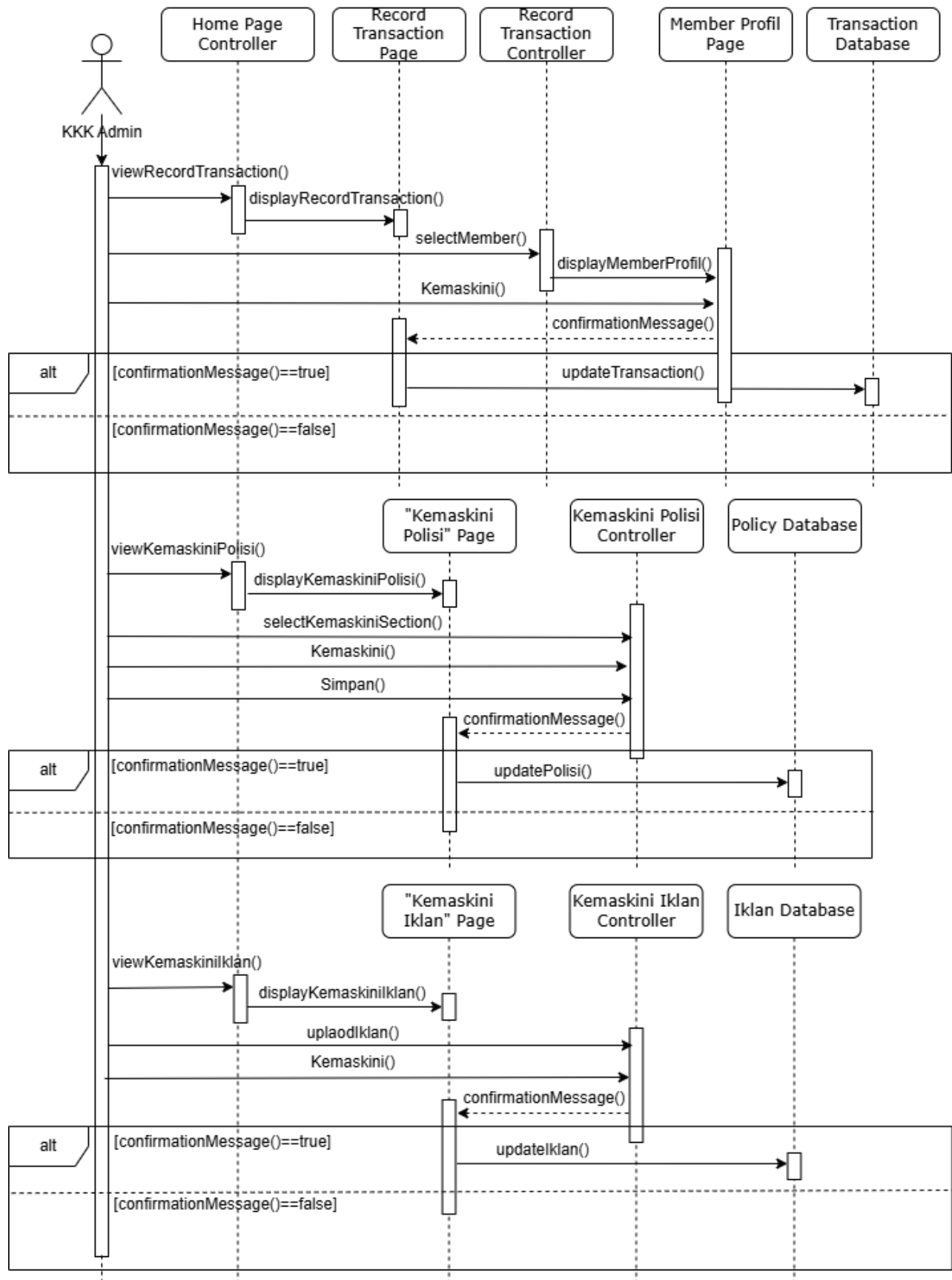


Figure 2.21: Activity Diagram for KKK Admin Administer

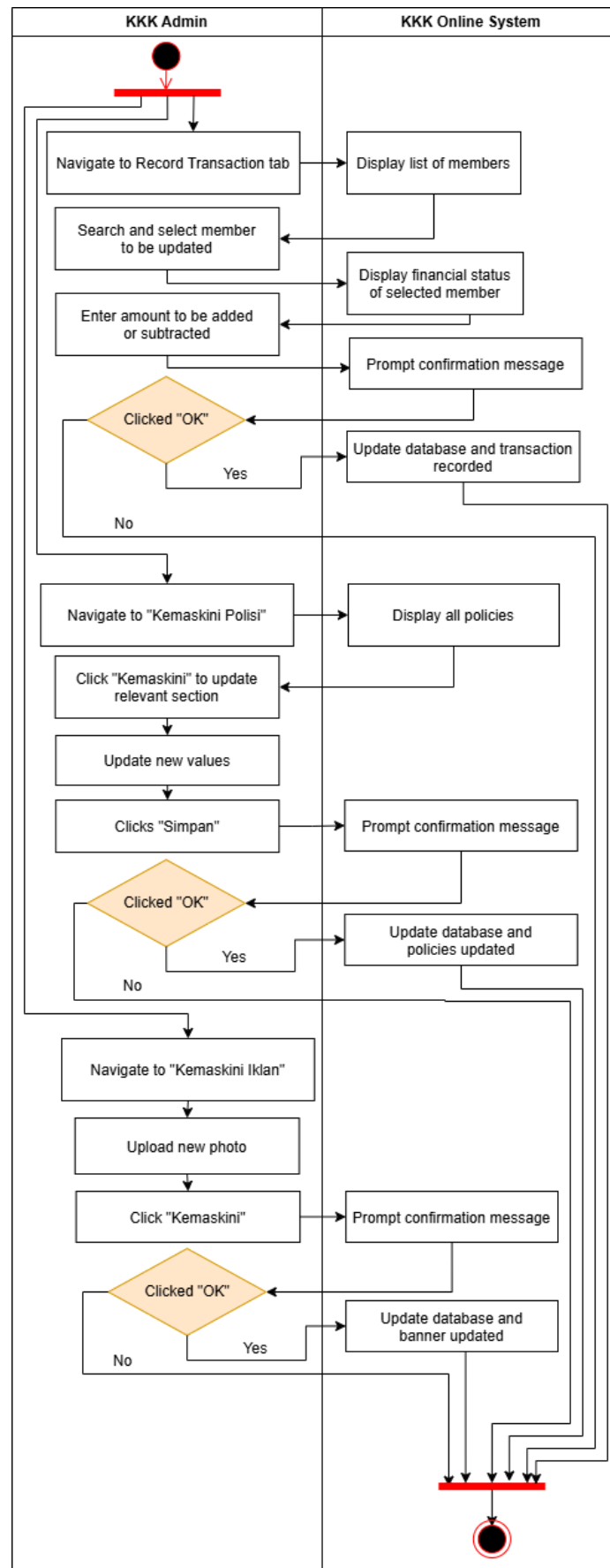


Figure 2.22: Activity Diagram for KKK Admin Administer

2.4.12 US12 User Story KKK Admin Approve Membership Termination

Table 2.12 shows the user story description, followed by the sequence diagram in Figure 2.23 and the activity diagram in Figure 2.24

Table 2.12: User Story Description for Approve Membership Termination

User Story: Approve Membership Termination
ID: US12
Actor: Admin
Precondition: <ul style="list-style-type: none">• Admin logged in to the system.
Flow of events: <ol style="list-style-type: none">1. Admin navigates to “Permohonan Berhenti Menjadi Anggota”.2. Admin clicks “...” to view more about the applications.3. Admin reviews the membership termination applications.
Alternative flow: <ol style="list-style-type: none">1. If approved, the system updates the application status to “Diterima.”2. If rejected, the system updates the application status to “Ditolak.”
Postcondition: <ul style="list-style-type: none">• When the membership termination applications’ status is updated to “Diterima” status, the applicant will be updated to “Senarai Anggota Lepas” and the member status will be changed to “Berhenti”.
Exception flow: -

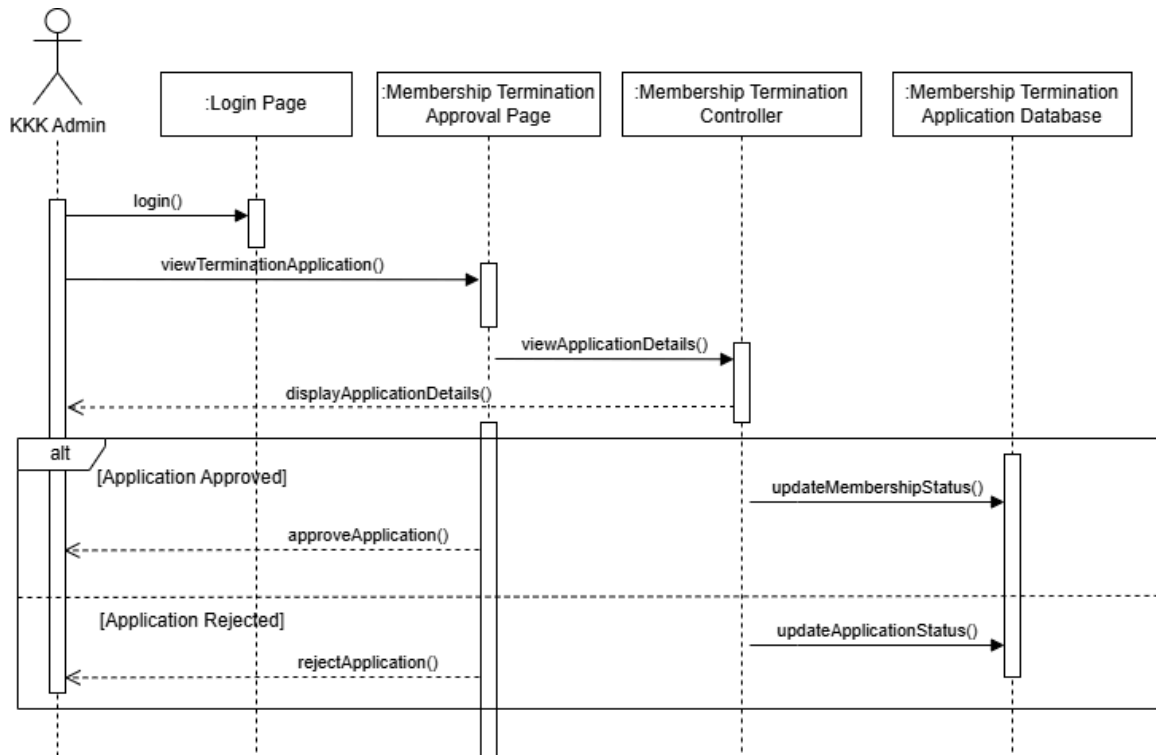


Figure 2.23: Sequence Diagram for Approve Member Termination

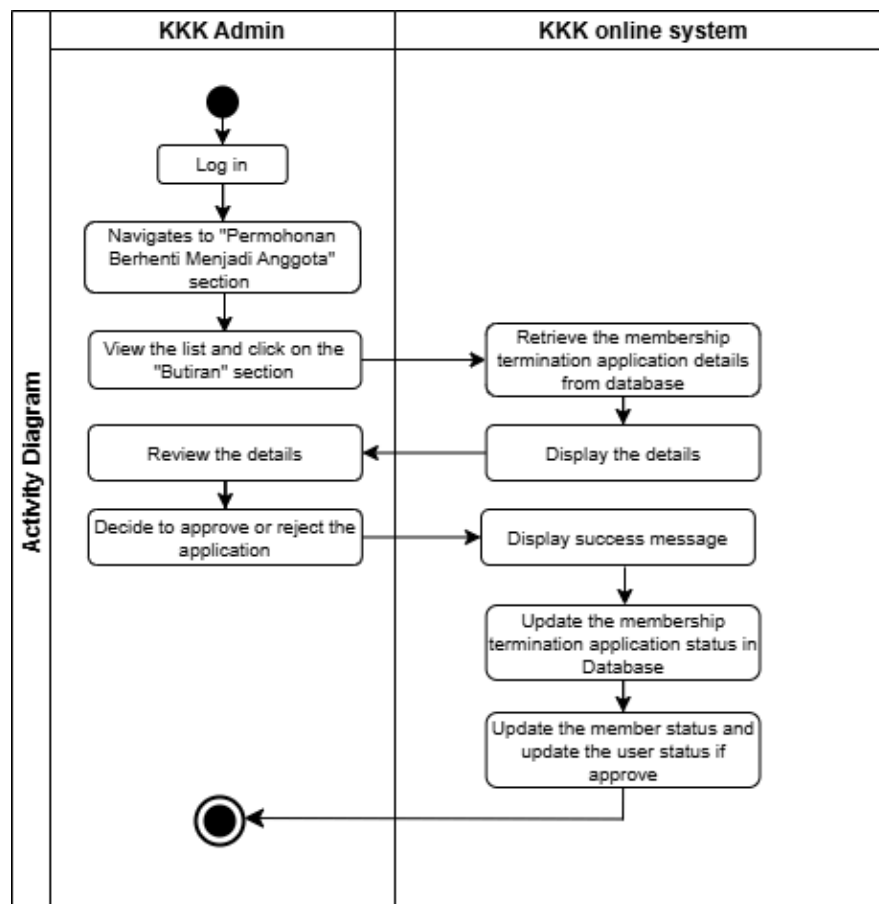


Figure 2.24: Activity Diagram for Approve Membership Termination

2.5 Performance and Other Requirements

This section defines the way systems behave or operate, separated from functional requirements. The characteristics and quality attributes are specified such as usability, reliability, performance, security, maintainability, and compatibility.

2.5.1 Software System Attributes

Software system attributes specify the overall qualities or characteristics that are expected to achieve in the system. These attributes are the foundation of the KKK Online System, as stated below:

1. **Acceptability:** System must be compatible with different operating systems such as Windows, macOS, Linux, and mobile devices like iOS and Android. System must be adaptable with all device types, including workstations, laptops, tablets and smartphones.
2. **Correctness:** The system must fully meet its requirements specifications, with any deviation from the requirements considered as incorrect.
3. **Reliability:** Systems should be reliable, failures should be minimised and issues that could lead to software failure should be addressed.
4. **Usability:** System should be easy to use, be learnable to beginners, convenient, and effective in handling errors.

2.5.2 Performance

This section defines the software system response time of user actions under a certain workload, throughput and resource usage.

1. System shall be able to maintain 99.9% uptime, making it always available for corporate users. Service interruption or temporal shut down such as maintenance or update should be minimised or communicated beforehand.
2. System response time should be at most 1 seconds under normal loads.
3. System should be able to support at least 100 active user sessions at the same time and multiple user sessions should not slow down response time.
4. The system must retrieve member data within 1 second of a search query under normal load with up to 50 concurrent queries.

2.5.3 Other Requirements

Localisation Requirements

- The system is used exclusively for the KKK, and the cooperative is in Malaysia.
- Languages supported: Malay only.
- Date formats: DD/MM/YYYY
- Time zone adjustment: UTC+8
- Currency: Ringgit Malaysia (RM)

2.6 Design Constraints

This section describes the design constraints of the system, which includes security constraints, safety constraints and the business rules that must be adhered to.

2.6.1 Security constraints

This section states the requirements regarding any security or privacy concerns surrounding use of the system and protection of the data used or collected. User identity authentication requirements are defined.

1. The system must have an automated data backup and recovery mechanism to prevent data lost. Regular backup should be scheduled and backup data are stored in a secure, offsite location.
2. Passwords of all users of the system must have a bit strength of at least 64 bit, that is at least 6 characters long and includes a mix of uppercase and lowercase letters, numbers, and special symbols.
3. Wireless communication throughout the system will be encrypted using TLS 1.3 at the application layer and WPA2-Enterprise at the data link layer.
4. The system shall provide two level of access:
 - An administrator level for unrestricted access to all system functionality.
 - A member layer for access to member functionality only.

2.6.2 Safety constraints

This section specifies the requirements that are concerned with possible loss, damage or harm that could result from the usage of the system.

1. System should ensure all personal and financial data collected during membership registration or loan applications is protected against unauthorised access by the General Data Protection Regulation (GDPR) and ISO/IEC 27001 standards.
2. All activities should be logged and able to retrace back, to provision recovery from system failure All logs must be protected against unauthorised changes, and can only be accessed by authorised personnel for maintenance purposes.
3. The system must be capable of restoring itself to the nearest previous state if an error occurs, for example system crash or a connectivity loss.

2.6.3 Business Rule

This section defines the policies and constraints the system must adhere to, and functions specific to roles that aligns with the organisational practices.

1. Only the admin can modify member applications policies, loan application policies and salary deduction policies.
2. Accessing member personal information is limited to admin authority. System should restrict access to member data by non admin role, except every member is able to view and modify their own personal data.