SOCIETY MANAGEMENT SYSTEM FOR RICHMOND COLLEGE SCOUTS' GROUP

By
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A report submitted in partial fulfilment of the requirements for the degree of Bachelor of Science Honors in Management and Information Technology (B.Sc. MIT)

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DECLARATION

I hereby certify that this project and all the artefacts associated with it is my own work and it has not been submitted before nor is currently being submitted for any other degree program.

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ABSTRACT

Currently, with the advent of information technology, every organization is striving to integrate web-based systems into their business processes. This has exacerbated the growing use of the internet. The Internet has transformed communication and introduced a concept where everyone is connected to everyday things in the network, allowing them to send and receive data at the same time.

As an Old organization with a lot of history in it RCSG is a well reputed student's body in Galle area. They are continuing operations using old documentation methods. This project hopes to give them some boost utilizing modern technologies. This document contains a conceptual and logical design for a web-based management system to manage their daily activities.

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1.4 ABBREVIATIONS

GUI – Graphical User Interface
PLC – Patrol Leaders Council
TL – Troop Leader
PL – Patrol Leader
APL – Assistant Patrol Leader
RCSG – Richmond College Scouts Group

2 Introduction

2.1 Description about the business organization

There are lot of community groups and societies are forming these days some are non-volunteering, and some are volunteering. 2nd Galle Richmond Scout Group is a Reputed Community society in Galle area. They consist with cub scout and rover groups. All these three from 2nd Galle scout troop. They are currently contributing to many community services projects in that area. They consist with nearly 1000 members. Yearly have over 300 new enrollments for cub and scout troop. Currently some use Online technologies like google forms. Their decision body consist with two councils. One is Group Scout Leader's council and the other one is Patrol Leaders Council. They have to continue scouts' education process along with their yearly project agenda. They have school agenda as well as the national agenda to perform yearly. I talked with some of these members and positions.

2.1 Business process

I am planning to develop a system to cater problems this society face while managing their work. As services they provide, organizing fund raising events, community services events, Blood donations, Knowledge share events projects as such.
First thing they do is register their members. Before registering member should know what this society does, they give an overview of their society to people who are interested in joining the group. They collect member details, and they give their constitution to that member when a successful registration has happened. Sometimes they use digital media to store details.
They contact members and communicate with members. Current communication is done normally trough WhatsApp, email, or some other media. They arrange meetings periodically with their members, generate and share reports periodically between members.

Projects and events are designed and planned by Patrol Leaders Council. The council members are shifting yearly and there is a procedure of assigning posts. The consultant of their council is Scout leader who is not from school but assigned to assist them by national scout headquarters. They work voluntarily.

2.2 Problem definition

I. The Societies Who use manual documentation does not have a backup.

II. It's hard to retrieve their member details when they us manual documentation.

III. They cannot evaluate their member performance.

IV. When society is getting bigger connection with the society to a member is getting less and the communication process is difficult and irregular.

V. Members cannot see project real progress state.

VI. No way to delight and motivate members over their performance.

VII. Repeated jobs for post

2.3 Aims and objectives

I. Documentation they do are member registration forms, periodic reports, Accounts Details, Official Announcements. To Provide backup for these documents by allowing uploads into the database.

II. To Provide a way to evaluate member performance by implementing a rating system.

III. To Integrate Member management, communication, project management into one. To provide project design, project plan and committee communication of a Project in one place by providing a common interface access.

IV. System To give a solution to motivate members by giving badges for their experience.

V. To Reduce Cost of processes by implementing database to store information

2.4 Scope with clear boundaries

In this system, I hope to computerize manual documentation. These will be added member rating, member profiles, Nice Graphical user interface, Simple and easy project design and planning tools, subgrouping members option, public notices, and messaging members. A way to take attendance.

3 SYSTEM ANALYSIS

3.1 User Stories

Table 3-1- User Stories

US ID	User	User Job Specifications
US - 01	Non-Member	I want to see what they are doing in their organization I want to apply for membership
US - 02	President	I want to receive complains from members I want to present complains to the PL Council I want to lead the PLC meeting I want to lead the troop I want to see PLC members details
US - 03	Secretary	I want to make announcements I want to Keep meeting minutes I want to keep a members list I want to keep Patrol name list I want to collect membership fee yearly I want to keep proficiency badges details of members I want to see troop members details
US-04	Assistant-Secretary	I want to check patrol Logbooks weekly I want to help secretary in his work I want to maintain Troop Logbook I want to check patrol reports monthly I want to check members logbooks I want to arrange learning materials weekly
US-05	Treasurer	I want to keep financial state I want to collect money I want to prepare expense and income reports I want to issue receipts I want to get scout leaders permissions before paying I want to buy badges and issue I want to keep receipt document I want to prepare budgets for Camps with Scout leader
US-06	Storekeeper	I want to Keep troop inventory list I want to issue and receive inventory items I want to check inventory monthly I want to give list of residual items to the PLC and get permission to remove them I want to remove residual items

US-07	Scout Leader	I want to see what PLC members are doing I want to take Attendance I want to Audit PLC members I want to see troop members details

3.2 Use Case Diagrams

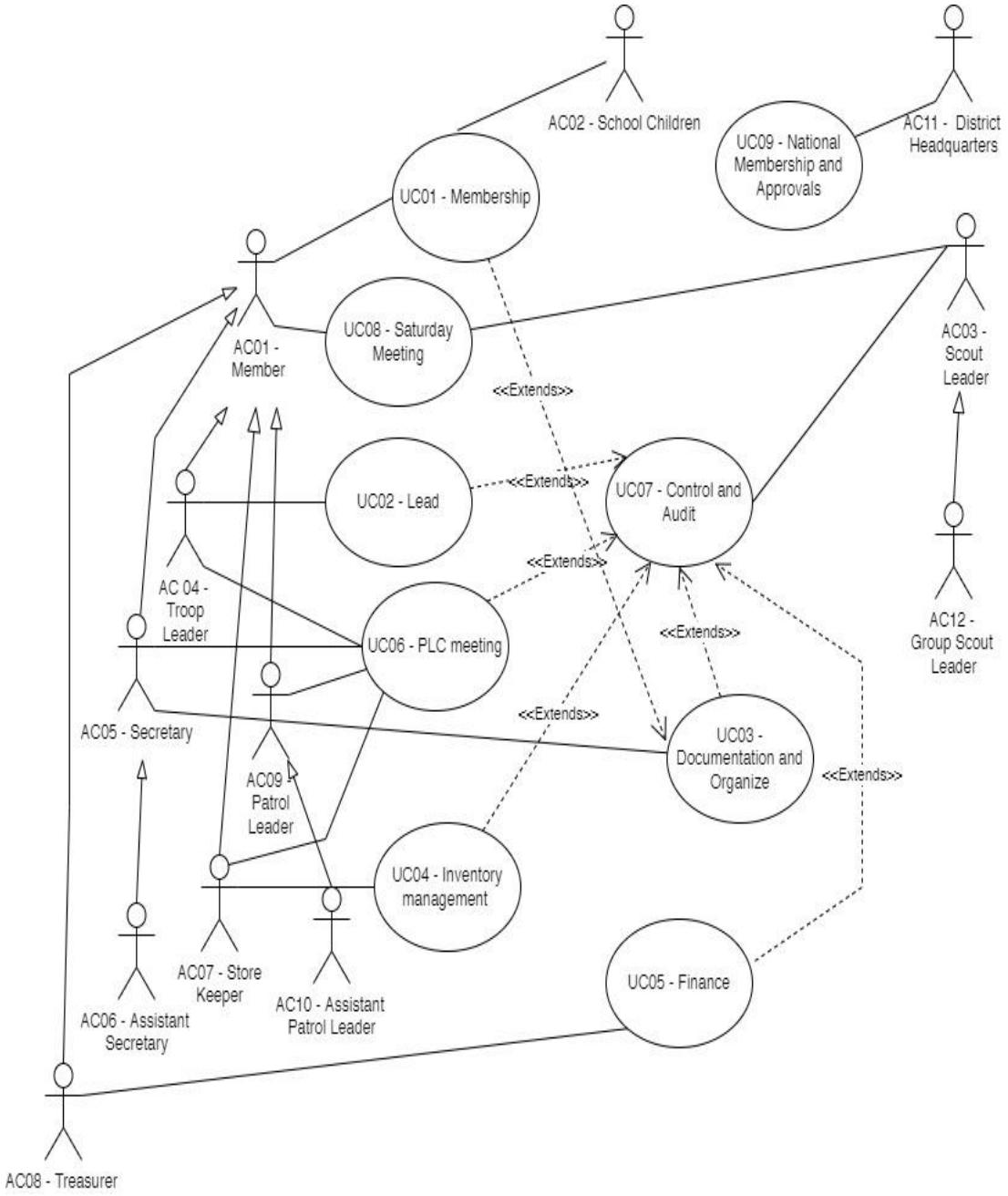


Figure 3-1 Analysis Main Use Case

3.3 Use Case Descriptions

3.3.1 UC01 – Membership

Use case ID	UC01
Use case Name	Membership
Actors	AC01-Member, AC02-School Children
Description	This memberships case represents the criteria of affording membership to a non-member.
Pre-condition	He should not be a member
Post-condition	
Normal Flow	1. School children fills the membership form 2. It is collected by any official PLC member 3. It is handed over to the Secretary of the PLC 4. Secretary checks form and Approve membership 4.1. Secretary present approved member list to the PLC monthly 5. Member can now participate to the weekly Saturday meetings
Alternate Flow	1. School children fills the membership form 2. It is collected by any official PLC member 3. It is handed over to the Secretary of the PLC 4. Secretary checks form and reject membership 5. Member can't participate to the weekly Saturday meetings
Exceptions	1. Child is not from this school 2. Child cannot fill the membership form
Use Case Relationships	[EXTENDS] UC08-Saturday Meetings
Constrains	School children must be from Richmond College Only
Trigger	

3.3.2 UC02 – Lead

Use case ID	UC02
Use case Name	Lead
Actors	AC04-Troop Leader
Description	This use case describes the leading of troop and PLC meeting
Pre-condition	Troop Leader must be Present
Post-condition	
Normal Flow	1. Secretary, Assistant Secretary and Scout leader together Prepares Saturday meeting agenda and PLC agenda 2. Troop Leader carries out two meetings according to the agenda
Alternate Flow	
Exceptions	if Troop Leader is not Present that day to the Saturday meeting. Scout Leader Leads the pack.
Use Case Relationships	
Constrains	Troop Leader must be present in the PLC to lead
Trigger	

3.3.3 UC03 – Documentation and Organize

Use case ID	UC03
Use case Name	Documentation and organize
Actors	AC05-Secretary, AC06-Assistant Secretary, AC03-Scout Leader
Description	This use case describes the whole documenting and organizing parts done by the secretary
Pre-condition	
Post-condition	
Normal Flow	1. Secretary, Assistant Secretary and Scout leader together Prepares Saturday meeting agenda 2. Secretary hand it over to Troop Leader
Alternate Flows	1. Secretary Prepares member list
	1. Secretary prepares national membership list from membership fee paid list
	1. Secretary prepares yearly troop agenda according to the PLC meeting decisions
	1. Secretary prepares troop event files
	1. Secretary prepares troop project files
	1. Secretary prepares PLC monthly meeting summery document
	1. Secretary prepares member badges status details form
	1. Secretary publishes announcements and news on notice board.
Exceptions	If Secretary doesn't receive any details from relevant sources Secretary can't prepare documents
Use Case Relationships	[EXTENDS] UC01- Membership

Constrains	Sources must provide details to the secretary
Trigger	

3.3.4 UC04 – Inventory Management

Use case ID	UC04
Use case Name	Inventory Management
Actors	AC07-Storekeeper
Description	This is the use case related to the Store they have.
Pre-condition	They must have the key to open the Store and They must take permission from storekeeper or scout leader
Post-condition	One who opens the store should hand over keys to storekeeper or the scout leader
Normal Flow	1. Storekeeper collects the inventory book 2. Storekeeper opens the door with his key 3. Storekeeper checks the present items in the store with his inventory list 4. Storekeeper notes the missing and damaged items.
Alternate Flow	1. Member asks items from the storekeeper 2. Storekeeper check whether they are available in the inventory book 3. Storekeeper issues items if they are available stock
	1. Member returns items to the storekeeper 2. Storekeeper adds them to the inventory 3. Storekeeper stores item in the store
Exceptions	If the items are lost one who borrowed last will have to pay or replace with new one
Use Case Relationships	
Constrains	
Trigger	

3.3.5 UC05 – Finance

Use case ID	UC05
Use case Name	Finance
Actors	AC08-Treasurer, AC03-Scout Leader
Description	This use case is related to the activities done by the treasurer.
Pre-condition	
Post-condition	
Normal Flow	1. Collect weekly patrol collection 2. Prepare Daily collection details statements 3. Hand over money to scout leader to deposit in the bank after signing a note
Alternate Flow	1. Prepare troop Camps, Projects, and Events Budgets
	1. Treasurer Hand Over Money to Scout Leader 2. Scout Leader Count money and sign in cash handover book 3. Scout Leader Deposits money in the bank
Exceptions	
Use Case Relationships	
Constrains	
Trigger	

3.3.6 UC06 – PLC Meeting

Use case ID	UC06
Use case Name	PLC Meeting
Actors	AC02-Troop Leader, AC05-Secretary, AC06-Assistant Secretary, AC03-Scout Leader, AC08-Treasurer, AC09-Patrol Leader, AC10-Assistant Patrol leader, AC07-Store Keeper
Description	This use case is for every activity happening in the monthly PLC meeting.
Pre-condition	
Post-condition	
Normal Flow	1. Take the Promise from the PLC members 2. Conduct meeting according to the day's agenda 2.1. Secretary's report on last meeting 2.1.1. Approve Report 2.2. Treasurer's report on financial state 2.2.1. Approve report 2.3. Storekeepers Report on inventory status 2.3.1. Approve Report 2.4. Patrol Leaders Reports about their patrols 2.5. Patrol Leaders and Other members Problems 2.6. Discuss about troop Events and Projects 2.6.1. Assign Committee 2.6.2. Assign Dates 2.7. Troop Leaders Message 2.8. Scout Leaders Message 2.9. End meeting
Alternate Flow	
Exceptions	Troop Leader is not present that day then the PLC cannot be held
Use Case Relationships	
Constrains	
Trigger	

3.3.7 UC07 – Control and Audit

Use case ID	UC07
Use case Name	Control and Audit
Actors	AC03-Scout Leader, AC12-Group Scout Leader
Description	This use case is for scout leader's main role.
Pre-condition	
Post-condition	
Normal Flow	1. Conduct Saturday Meeting 2. Train Members 3. Do the Senior's Test Passing
Alternate Flows	1. Examine PLC meeting
	1. Monitor Troop Leader's Performance
	1. Monitor Secretary's Performance 2. Check his documentation
	1. Monitor Treasurer's Activities 2. Check his documents
	1. Monitor storekeepers Activities 2. Check his documentation
Exceptions	Scout Leader is Absent
Use Case Relationships	[EXTENDS] UC02 – Lead [EXTENDS] UC06 - PLC meeting [EXTENDS] UC04 - Inventory management [EXTENDS] UC03 -Documentation and Organize [EXTENDS] UC05 - Finance
Constrains	
Trigger	

3.3.8 UC08 – Saturday Meeting

Use case ID	UC08
Use case Name	Saturday Meeting
Actors	AC01-Member, AC02-Troop Leader, AC05-Secretary, AC06-Assistant Secretary, AC03-Scout Leader, AC08-Treasurer, AC09-Patrol Leader, AC10-Assistant Patrol leader, AC07-Store Keeper, AC12-Group Scout Leader
Description	This use case is for Saturday weekly meeting. Training and test passing activities are happening in here.
Pre-condition	To participate on Saturday meeting the person should be a member or a scout leader
Post-condition	
Normal Flow	1. Morning Patrol Activates 1.1. Cleaning Premises 1.2. Small Training Activities 1.3. Daily collection 1.4. Patrol Inspection 2. Morning rally around flag post 3. Patrol Activates 4. Troop Training Sessions 5. Test Passing 6. End rally around flag post 7. Extra test passing for senior members
Alternate Flow	
Exceptions	When the day is a holiday there will be no meetings
Use Case Relationships	
Constrains	Members can leave meetings only with scout leader's permission
Trigger	

3.3.9 UC09 – National Membership and Approvals

Use case ID	UC09
Use case Name	National Membership and Approvals
Actors	AC03-Scout leader, AC05-Secretary, AC11-District Headquarters, AC06-Assistant Secretary
Description	This use case is indirectly related to the organization. The National headquarters do monitor individual troops trough their district headquarters.
Pre-condition	Should bring the relevant documents to the headquarters
Post-condition	
Normal Flow	1. Scout Leader / Secretary brings documents to be approved to the district headquarters 2. If the documents are complete and correctly filled a. Documents are approved 3. If the documents are incomplete and not correctly filled a. Documents are not approved
Alternate Flow	1. Scout Leader / Secretary brings list of membership fees paid members with money 2. National Membership is given to the members who paid yearly membership fees.
Exceptions	
Use Case Relationships	
Constrains	Documents should be filled correctly
Trigger	

3.4 Actor Descriptions

3.4.1 AC01 – Member

Actor Thumbnail	Actor: AC01 – Member
Actor Type and Stereotype	Abstract
Actor Description	Members primary role is to participate Saturday meetings and train for badges
Actor Relationships	There are 07 types of members, AC04 - Troop leader AC05 – Secretary AC06 – Assistant Secretary AC07 – Storekeeper AC08 – Treasurer AC09 – Patrol Leader AC10 – Assistant Patrol Leader This Actor is interfacing with following Use Cases, UC01 - Membership UC08 – Saturday Meeting
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Troop Leader Interview

3.4.2 AC02 – School Child

Actor Thumbnail	Actor: AC02 – School Child
Actor Type and Stereotype	Concrete
Actor Description	This actor is a person who is an outside of the organization eligible for membership.
Actor Relationships	This Actor interfaces with, UC01 - Membership
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Member interview

3.4.3 AC03 – Scout Leader

Actor Thumbnail	Actor: AC03 – Scout Leader
Actor Type and Stereotype	Abstract
Actor Description	This is the actor who takes care about every child in the organization and appointed by the Sri Lanka national Scout's headquarters. Keeps smooth flow of the troop by examining PLC members performances.
Actor Relationships	This actor interfaces with UC07 – Control and Audit This actor has a relationship with AC13 - Group Scout Leader
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Scout Leader Interview

3.4.4 AC04 – Troop Leader

Actor Thumbnail	Actor: AC04 – Troop Leader
Actor Type and Stereotype	Concrete
Actor Description	This is the actor who leads all members of the troop. Chosen from members the one who has the best experience, knowledge, and should be a senior patrol leader. His primary duty is to lead troop and handle monthly patrol leaders meeting.
Actor Relationships	This actor interfaces with, UC01 – Membership UC02 – Lead UC08 – Saturday Meeting UC06 – PLC meeting
Interface Specifications	
Author and History	
Reference Material	Troop Leader Interview

3.4.5 AC05 – Secretary

Actor Thumbnail	Actor: AC05 – Secretary
Actor Type and Stereotype	Abstract
Actor Description	This actor is responsible for all the documentation of the troop and PLC meeting.
Actor Relationships	This Actor interfaces with, UC01 – Membership UC03 – Documentation and Organize UC08 – Saturday Meeting UC06 – PLC meeting There is another actor who has same privileges but to assist him, AC06 – Assistant Secretary
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Secretary Interview

3.4.6 AC06 – Assistant Secretary

Actor Thumbnail	Actor: AC06 – Assistant Secretary
Actor Type and Stereotype	Concrete
Actor Description	Assistant Secretary's primary role is to assist Secretary
Actor Relationships	This Actor interfaces with, UC01 – Membership UC03 – Documentation and Organize UC08 – Saturday Meeting UC06 – PLC meeting
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Secretary Interview

3.4.7 AC07 – Storekeeper

Actor Thumbnail	Actor: AC07 – Storekeeper
Actor Type and Stereotype	Concrete
Actor Description	Storekeeper's primary duty is to manage inventory materials and keep them safe.
Actor Relationships	This Actor interfaces with, UC01 – Membership UC04 – Inventory Management UC08 – Saturday Meeting UC06 – PLC meeting
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Troop Leader Interview

3.4.8 AC08 – Treasurer

Actor Thumbnail	Actor: AC08 – Treasurer
Actor Type and Stereotype	Concrete
Actor Description	Treasurer's Primary duty is to handle financial activities of the troop. He keeps notes about events, camps, and other activities financial details. But payments are done by scout leader.
Actor Relationships	This Actor interfaces with, UC01 – Membership UC04 – Inventory Management UC08 – Saturday Meeting UC06 – PLC meeting
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Troop Leader Interview

3.4.9 AC09 – Patrol Leader

Actor Thumbnail	Actor: AC09 – Patrol Leader
Actor Type and Stereotype	Abstract
Actor Description	Patrol leader's primary role is to lead small member groups named as a patrol. He is representing monthly PLC meeting for his patrol.
Actor Relationships	He has a relationship with Actor, AC10 - Assistant Patrol Leader He is interfaced with Use Cases, UC01 – Membership UC08 – Saturday Meeting UC06 – PLC meeting
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Troop Leader Interview

3.4.10 AC10 – Assistant Patrol Leader

Actor Thumbnail	Actor: AC01 – Assistant Patrol Leader
Actor Type and Stereotype	Concrete
Actor Description	His Primary role is to carry out patrol leader's duties when he is not there.
Actor Relationships	
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Troop Leader Interview

3.4.11 AC11 – District Headquarters

Actor Thumbnail	Actor: AC11 – District Headquarters
Actor Type and Stereotype	Concrete
Actor Description	The Primary role of the District Headquarters is to approve projects and bridge individual scout groups with national headquarters. Scout Leader deals with this actor.

Actor Relationships	This Actor is interfacing with following Use Case, UC09 – National Membership and Approvals
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Troop Leader Interview

3.4.12 AC12 – Group Scout Leader

Actor Thumbnail	Actor: AC12 – Group Scout Leader
Actor Type and Stereotype	Concrete
Actor Description	This is the actor who takes care about every child in the organization and appointed by the school.
Actor Relationships	This actor interfaces with UC07 – Control and Audit
Interface Specifications	
Author and History	Author: Nadun
Reference Material	Scout Leader Interview

3.5 Activity Diagram

3.5.1 UC 01 - Membership

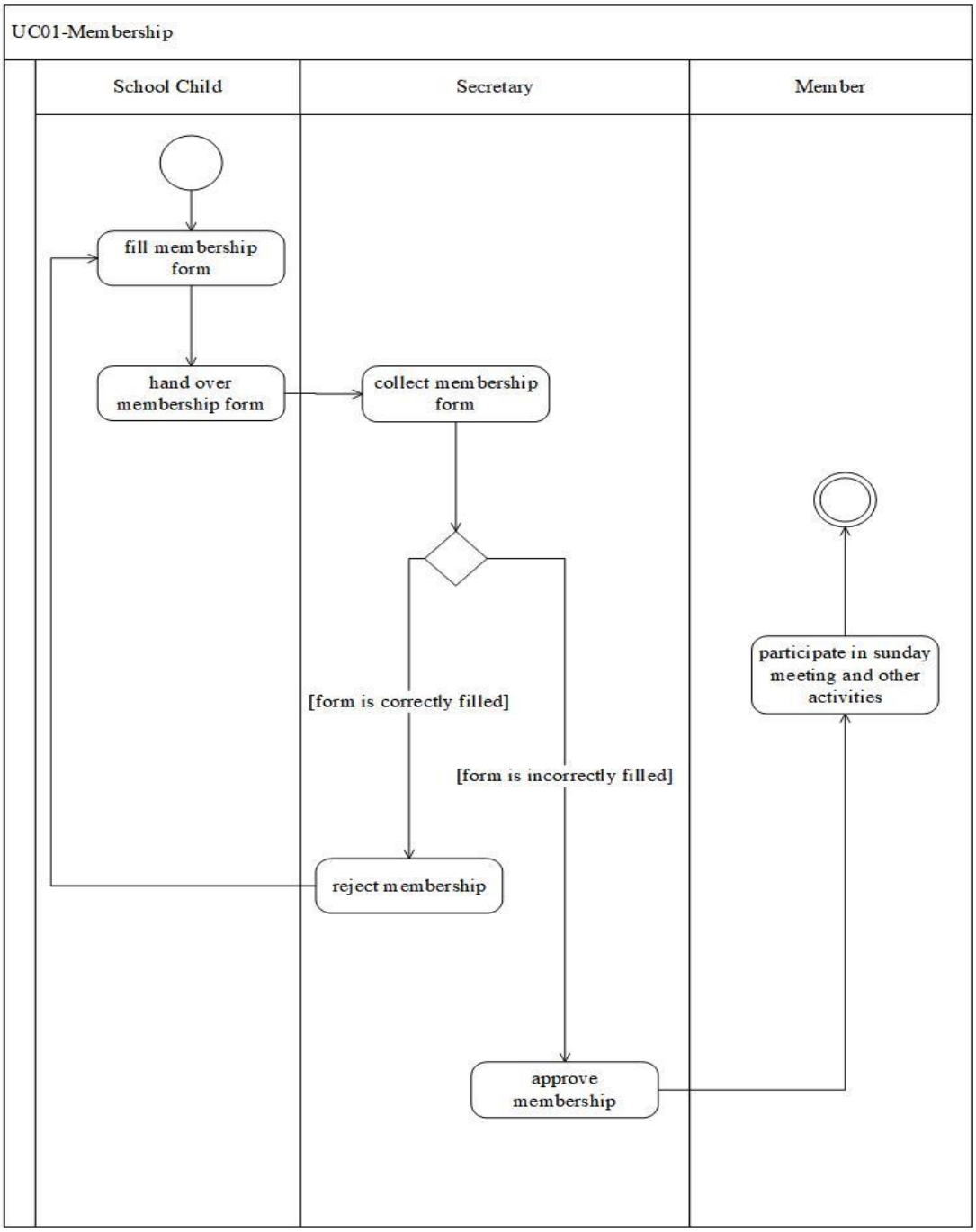


Figure 3-2 Analysis Activity Diagram UC 01 - Membership

3.5.2 UC02 – Lead

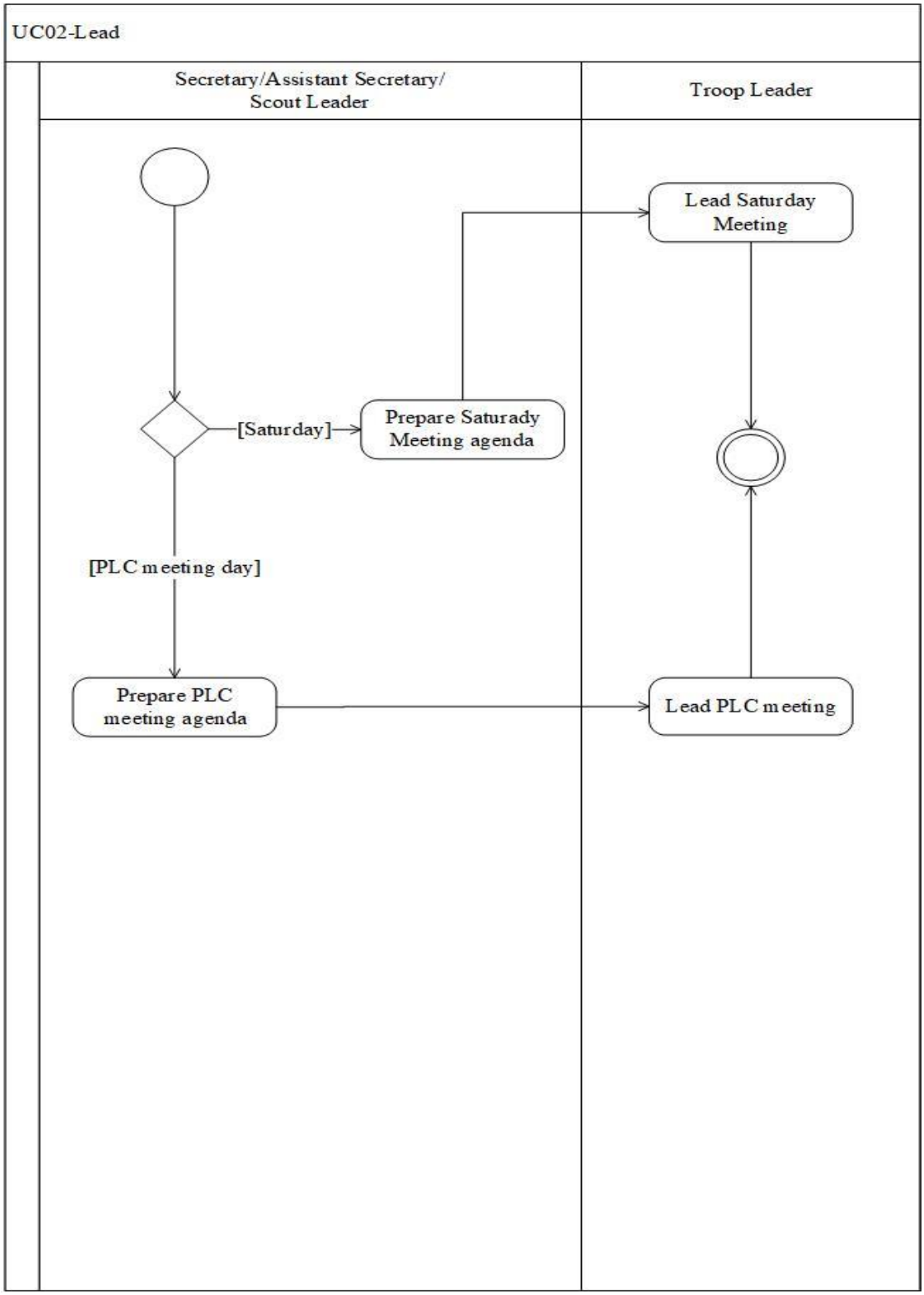


Figure 3-3 Analysis Activity Diagram UC 02 - Lead

3.5.3 UC 03 – Document and Organize

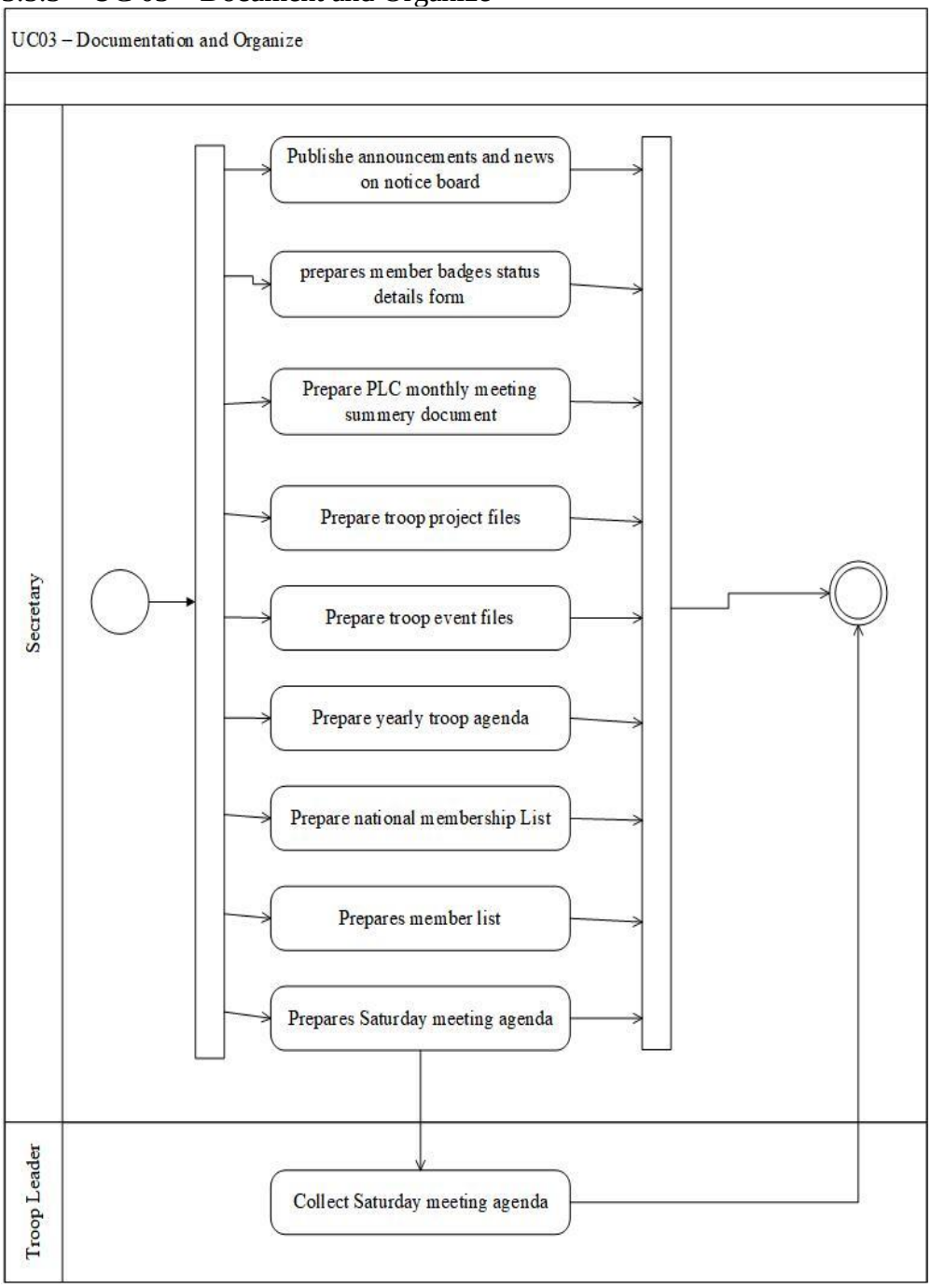


Figure 3-4 Analysis Activity Diagram UC 03 Document and Organize

3.5.4 UC 04 – Inventory Management

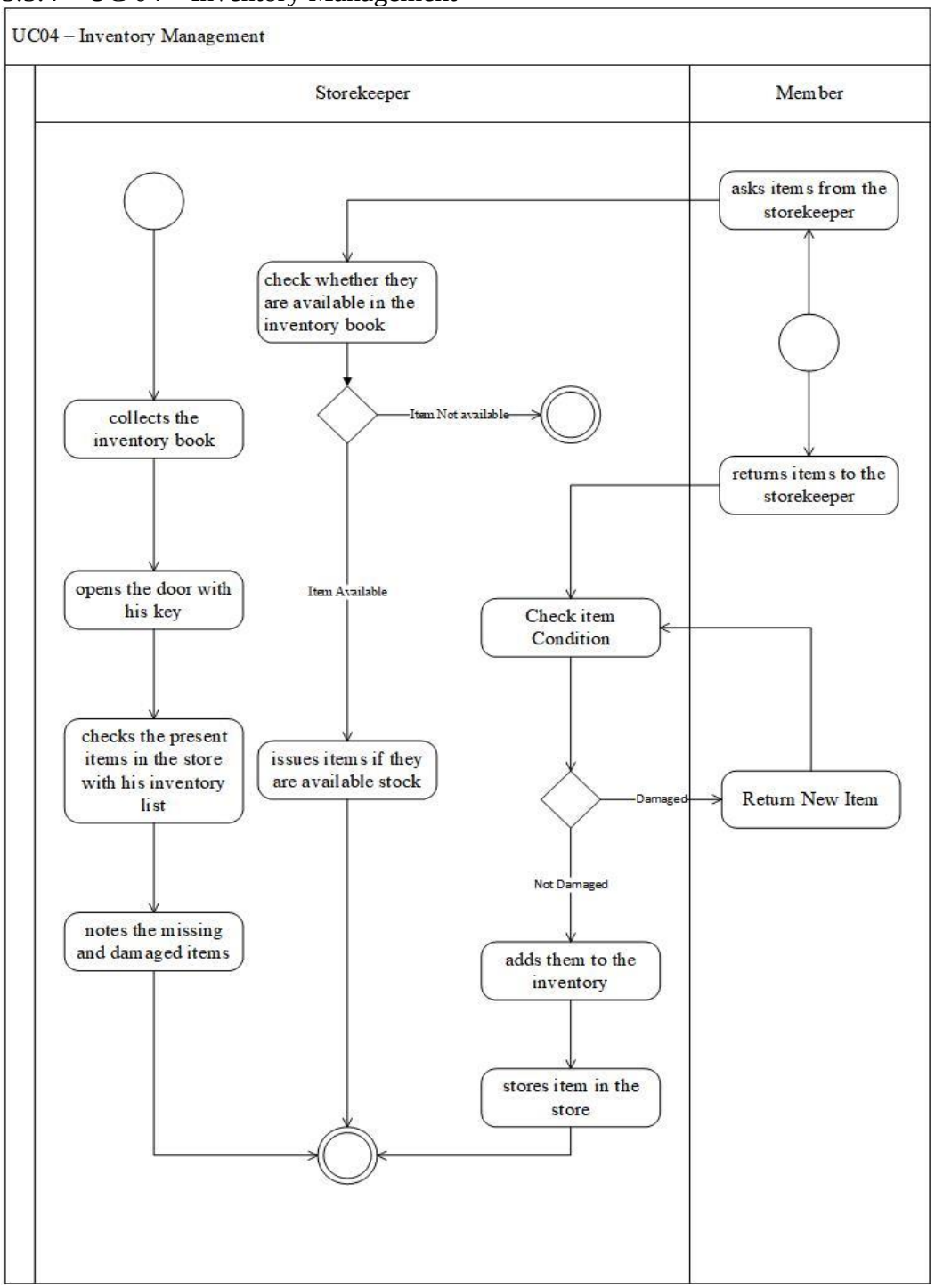


Figure 3-5 Analysis Activity Diagram UC 04 Inventory Management

3.5.5 UC 05 – Finance

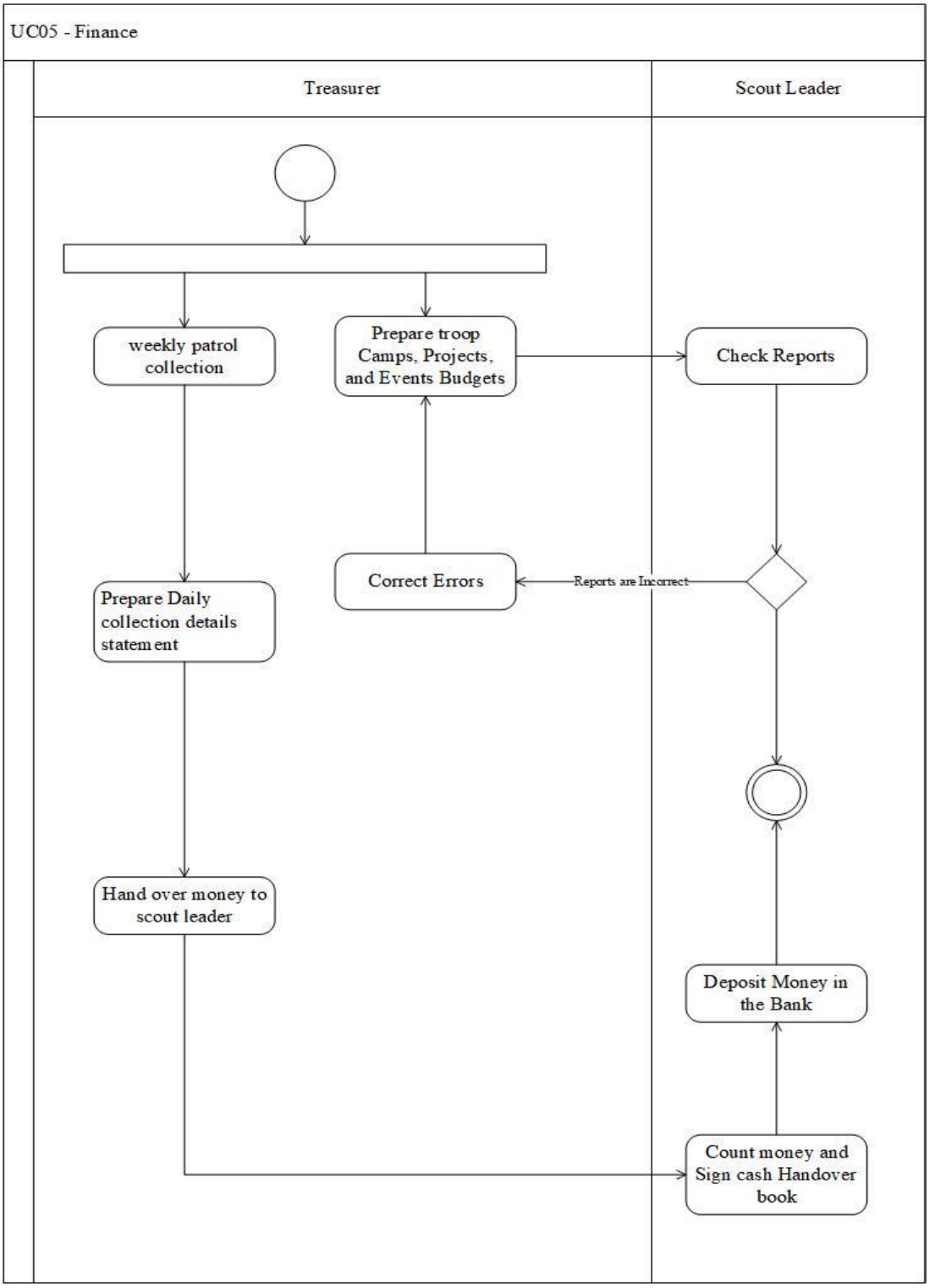


Figure 3-6 Analysis Activity Diagram UC 05 Finance

3.5.6 UC 06 – PLC Meeting

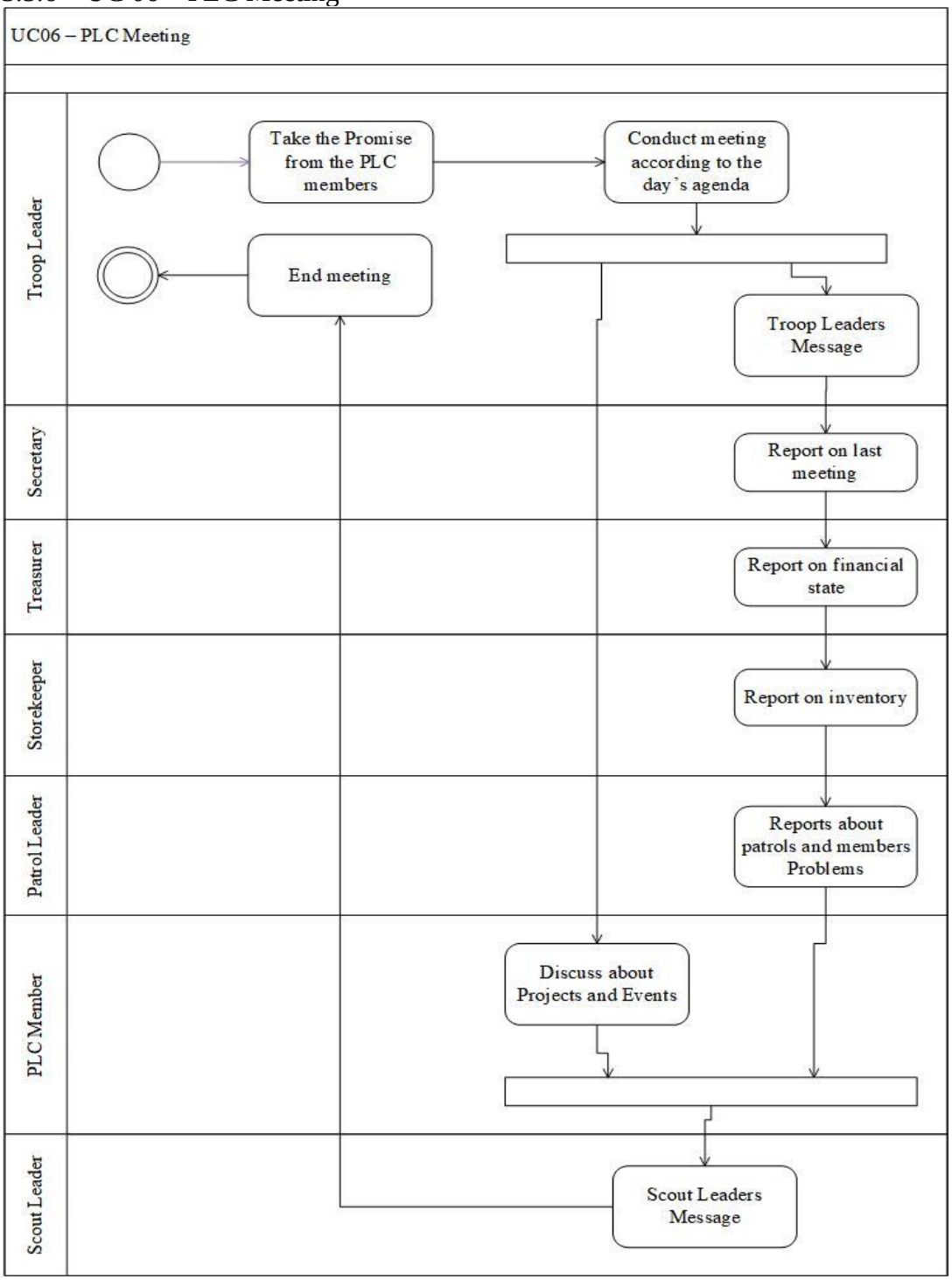


Figure 3-7 Analysis Activity Diagram UC 06 PLC Meeting

3.5.7 UC 07 – Control and Audit

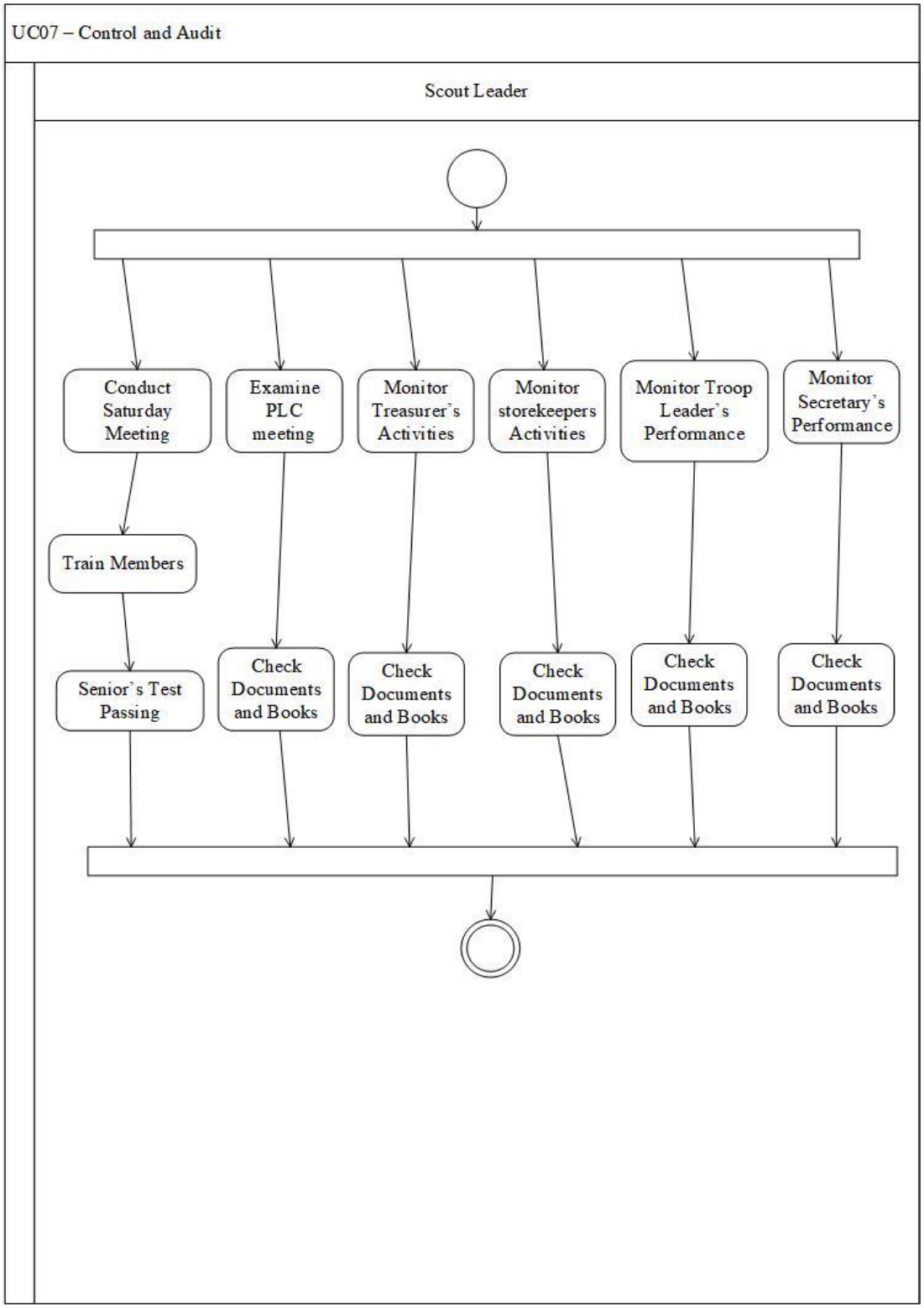


Figure 3-8 Analysis Activity Diagram UC 07 Audit and Control

3.5.8 UC 08 – Saturday Meeting

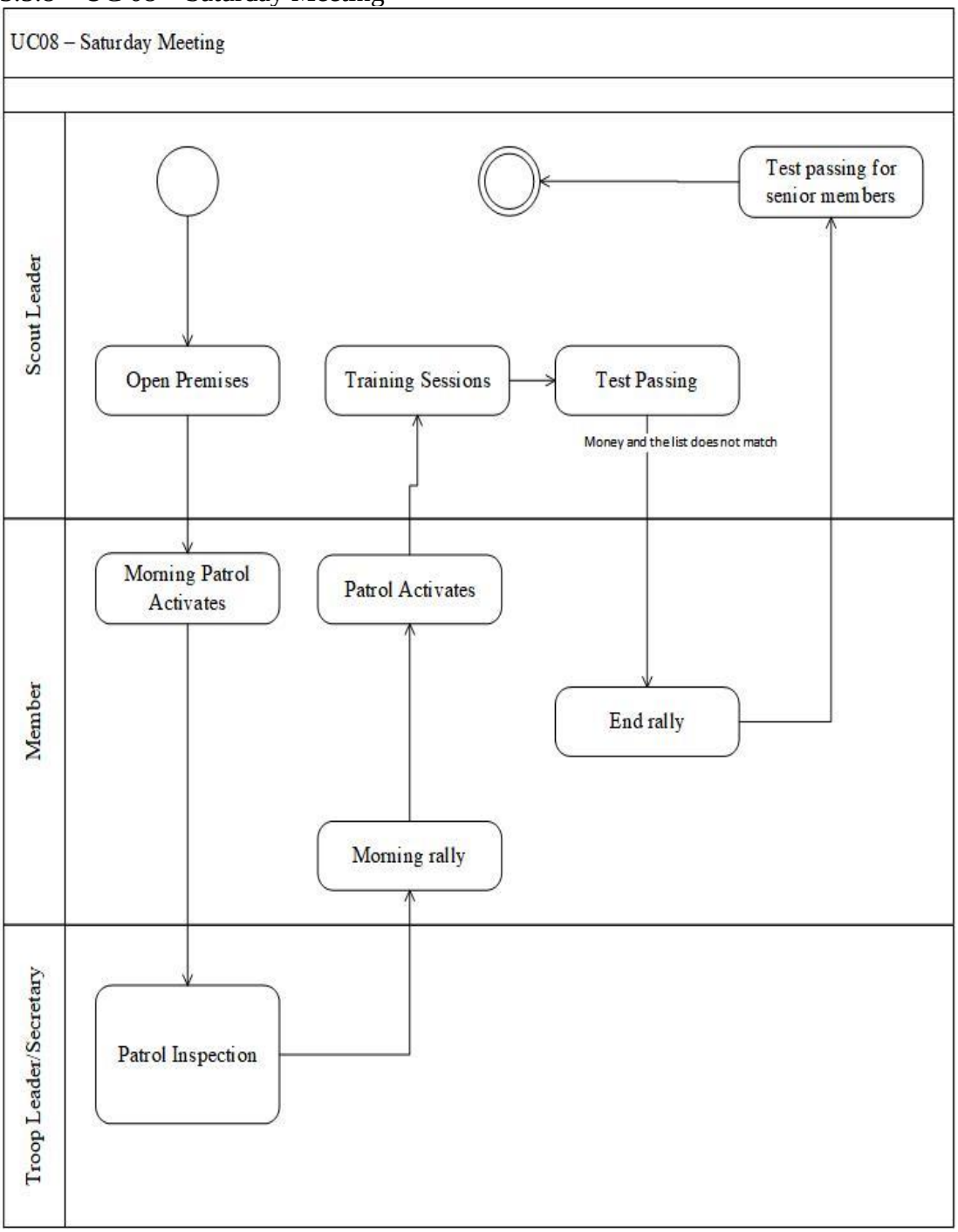


Figure 3-9 Analysis Activity Diagram UC 09 Saturday Meeting

3.5.9 UC 09 – National Membership and Approvals

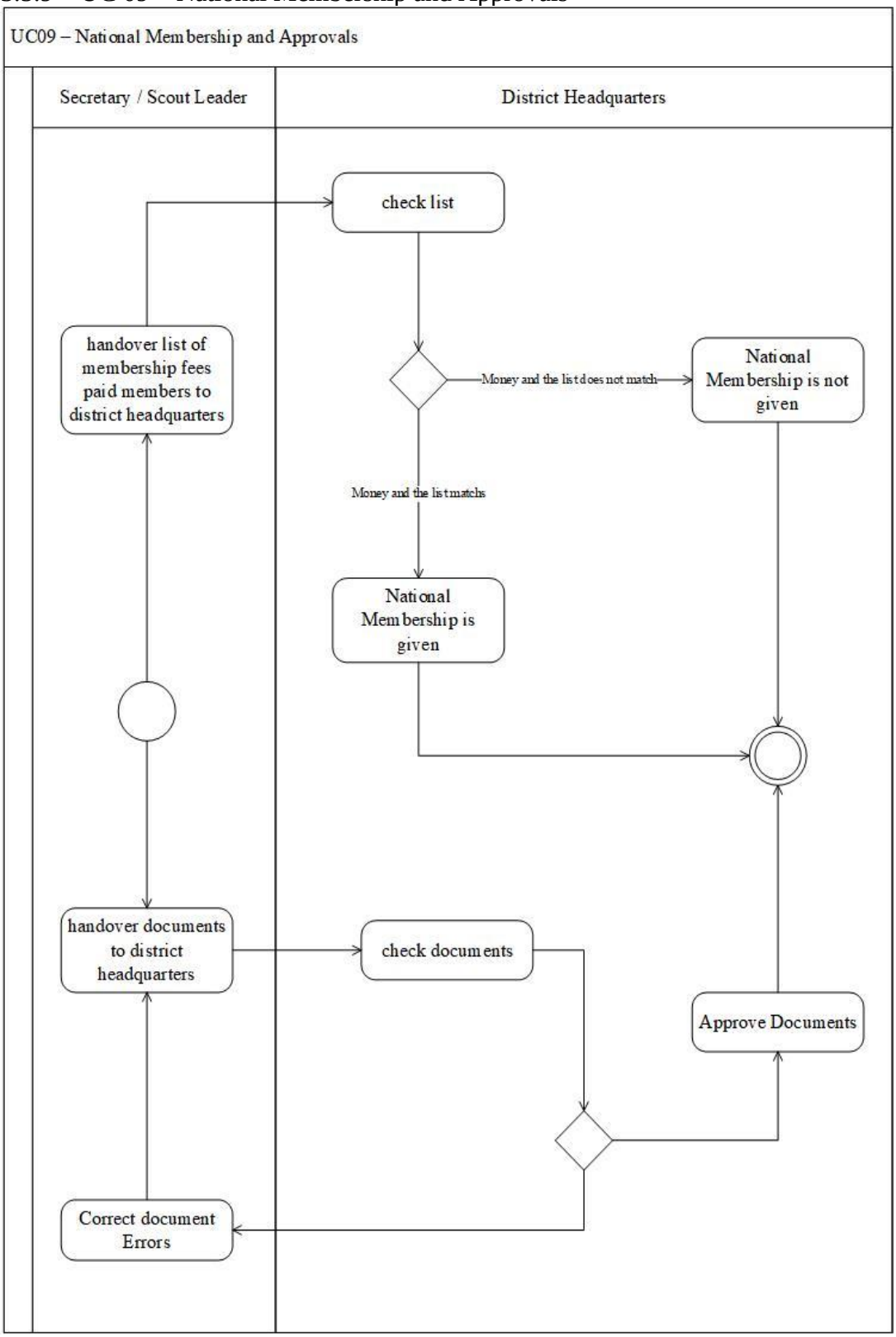


Figure 3-10 Analysis Activity Diagram UC 09 National Membership Fee and Approvals

3.6 Class Diagram

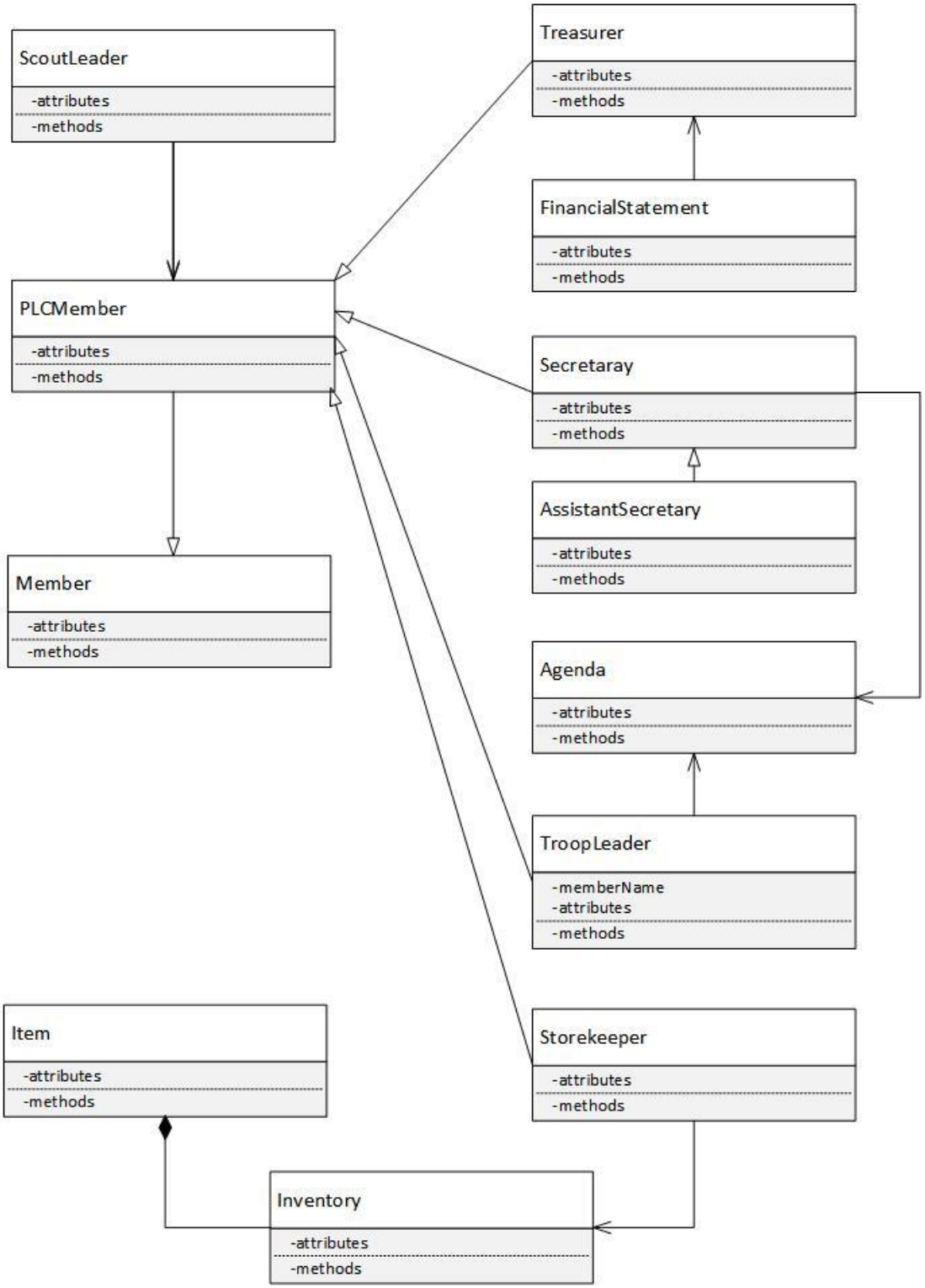


Figure 3-11 Analysis Class Diagram

3.7 Software Requirement Specification

3.7.1 Functional Requirements

Table 3-2 Functional Requirements

Requirement ID	Description	
FRQ-01	Shall be able to facilitate members to **self-register**	
	01.1	Shall be able to fill membership form
	01.2	Shall be able to upload required documents
	01.3	Shall be able to submit membership form for the approval
FRQ-02	Shall be able to **communicate**	
	02.1	Shall be able to message members
	02.2	Shall be able to make announcements
	02.3	Shall be able to upload documents with the announcements
	02.4	Shall be able to Post links with announcements
	02.5	Shall be able to upload images with the posts
FRQ-03	Shall be able to create member **subgroups (Patrols)**	
	03.1	Add new member subgroups
	03.2	Add members to the subgroups
	03.3	Remove members from subgroups
	03.4	Change member subgroups
	03.5	Name subgroups
FRQ-04	Shall be able to assign **positions**	
	04.1	Assign Scout Leader
	04.2	Assign Treasurer
	04.3	Assign Troop Leader
	04.4	Assign Secretary
	04.5	Assign Assistant Secretary
	04.6	Assign Storekeeper
	04.7	Assign Group Scout Leader
	04.8	Change Post holders
	04.9	Assign Assistant Patrol Leaders
	04.10	Assign Patrol Leaders
FRQ-05	Shall be able to share **learning materials**	
	05.1	Share text materials
	05.2	Share video materials
	05.3	Share audio materials
	05.4	Share pdf materials
	05.5	Share word files
	05.6	Share Images
FRQ-06	Shall be able to manage **members' data**	
	06.1	Add members
	06.2	Delete members
	06.3	Update member details

	06.4	Take the Attendance
FRQ-07	Shall be able to manage **inventory data**	
	07.1	Add items
	07.2	Delete Items
	07.3	Update Items
	07.4	Lend items
FRQ-08	Should be able to rate members	
FRQ-09	Should be able to provide interface for design projects	
FRQ-10	Should be able to provide interface for plan projects	
FRQ-11	Should be able to upload documents	
FRQ-12	Should be able to send notifications	
FRQ-13	Should be able to record attendances	
FRQ-14	Should be able to set polls	
FRQ-13	Shall have option to mark attendance sheets	

3.7.2 Non-Functional requirements

Table 3-3 Non-Functional Requirements

Requirement ID	Description	
NFRQ-01	Should provide a Graphical User Interface	
NFRQ-02	Patrol's minimum number of members shall be 4	
NFRQ-03	Shall be able to access concurrently for 300 members	
NFRQ-04	Shall be able to run on Troop PC	
NFRQ-05	Should have shortcuts to external resources such as links	
NFRQ-06	Should have a responsive interface	
NFRQ-07	Shall be able to Access the system remotely	
NFRQ-08	Shall have Security features	
	08.1	Encrypt passwords of the Positions
	08.2	Different user authorization Levels for Posts and members
	08.3	Three Super admin accounts
	08.4	Log of user logins

3.8 Complete BSO

BSO 1 – A web application that runs on external server

BSO 2 – A web application for Organization with android mobile application for members

BSO 3 – A web application that runs on cloud-based server

BSO 4 – A web application that runs on external server with an external payment gateway.

3.8.1 Cost Benefits Analysis

BSO 1

All the Mandatory Requirements are fulfilled No extra infrastructure Advantages.

Table 3-4 BSO 1 Cost benefit Comparison

Description	Cost (Rs.)/ Yr.,
Domain Name	5500
Hosting	20000
Total Cost	**25500**

BSO 2

All The Mandatory Requirements are Fulfilled and additional convenience for members.

Table 3-5 BSO 2 Cost benefit Comparison

Description	Cost (Rs.)/ Yr.,	Cost (Rs.)/One Time
Domain Name	5500	
Hosting	20000	
Android App Registration		8874
Total Cost		**34374**

BSO 3

All The Requirements are Fulfilled with Additional Security and Backup.

Table 3-6 BSO 3 Cost benefit Comparison

Description	Cost (Rs.)/ Yr.,
Domain Name	5500
Hosting	20000
Cloud Storage Cost	8519
Total Cost	**34019**

BSO 4

All The Requirements are Fulfilled and additional convenience for Treasurer.

Table 3-7 BSO 4 Cost benefit Comparison

Description	Cost (Rs.)/ Yr.,
Domain Name	5500
Hosting	20000
Payment Gateway (PayHere)	35880
Total Cost	**61380**

3.8.2 **Benefits Comparison**

Table 3-8 Benefit Comparison

Business Systems Option	Description	Ratio
BSO 1	All the mandatory Requirements are fulfilled the beneficiary ratio can be given as 1.0.	1.0
BSO 2	All the mandatory Requirements are fulfilled, and it has additional option of member convince. This is a very good extra feature in this context, and it is very useful for their operations.	1.4
BSO 3	All the mandatory Requirements are fulfilled, and it has additional option of extra security and backup. This is a slightly intermediate extra feature in this context but not much required.	1.2
BSO 4	All the mandatory Requirements are fulfilled, and it has additional	

	convenience for members and treasurer while paying. This is not much required extra feature in this context.	1.1

3.8.3 **Cost Comparison**

Table 3-9 Cost Comparison

Business Systems Option	Cost	Ratio
BSO 1	25500	1.0
BSO 2	34374	1.3
BSO 3	34019	1.3
BSO 4	61380	2.4

3.8.4 **Cost Benefit Ratio Comparison and Select Proper BSO**

There is a direct relationship between benefits ratio and the Selection and an inverse relationship between cost ratio and Selection. So, we can conclude

Affordability Ratio or cost benefit ratio = Benefit Ratio / Cost Ratio

Table 3-10 BSO Comparison

Business Systems Option	Benefit Ratio	Cost Ratio	Benefits / Cost Ratio
BSO 1	1.0	1.0	1.00
BSO 2	1.4	1.3	1.07
BSO 3	1.2	1.3	0.92
BSO 4	1.1	2.4	0.45

BSO 1 and BSO 2 has almost same cost benefit ratio. If we go into deep the best solution for this business scenario is the BSO 2 but they are not satisfied about it because of the extra cost, they must bear. They are much satisfied with BSO 1. So, I am selecting BSO 1.

4 SYSTEM DESIGN

4.1 Use Case Diagrams

4.1.1 System Main Use Case

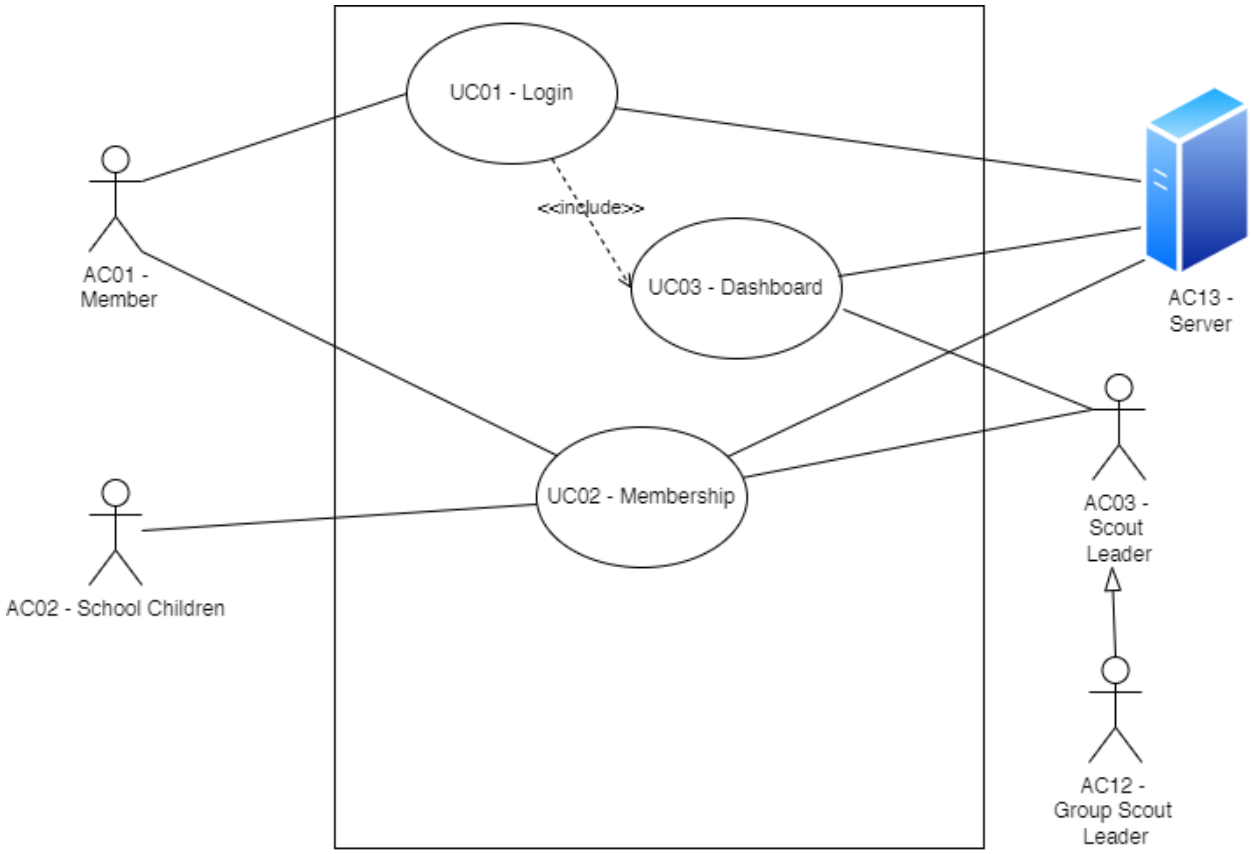


Figure 4-1 Design Use Case Main

4.1.2 UC01-Login

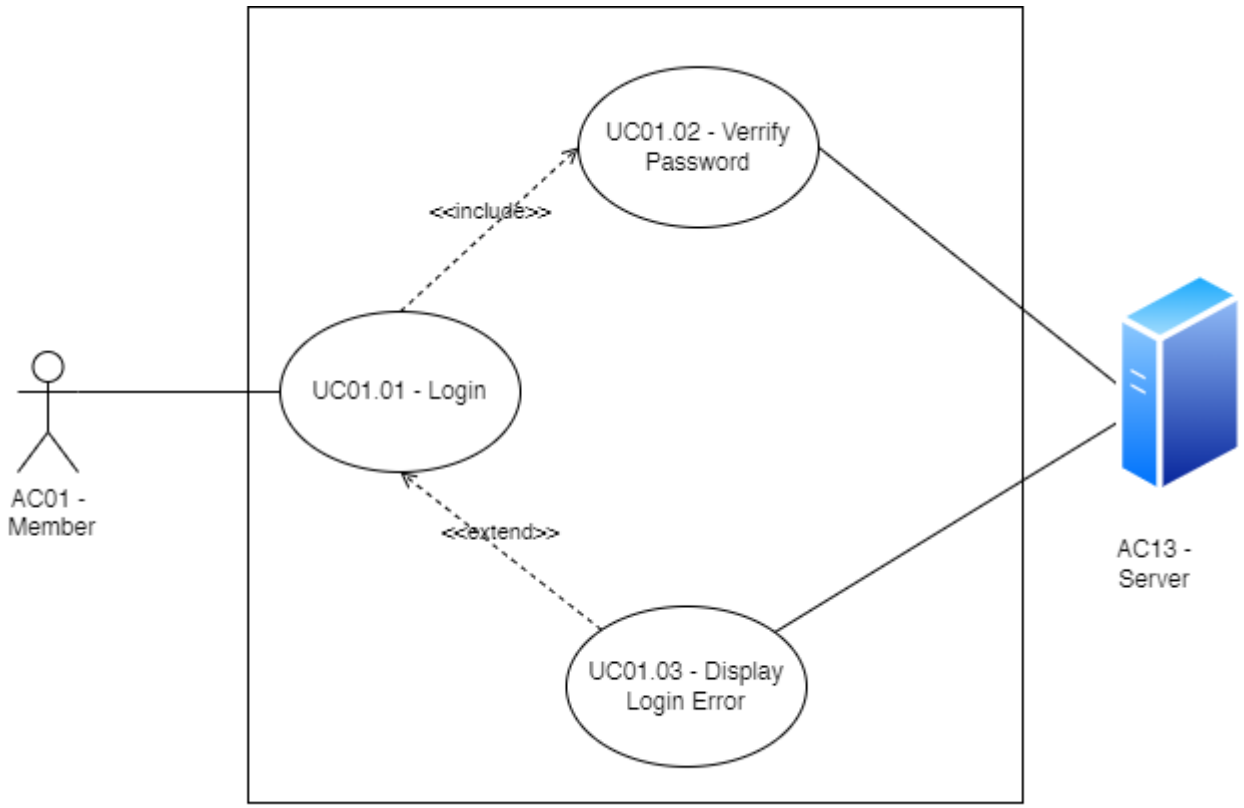


Figure 4-2 Design Use Case UC 01 Login

4.1.3 UC02-Membership

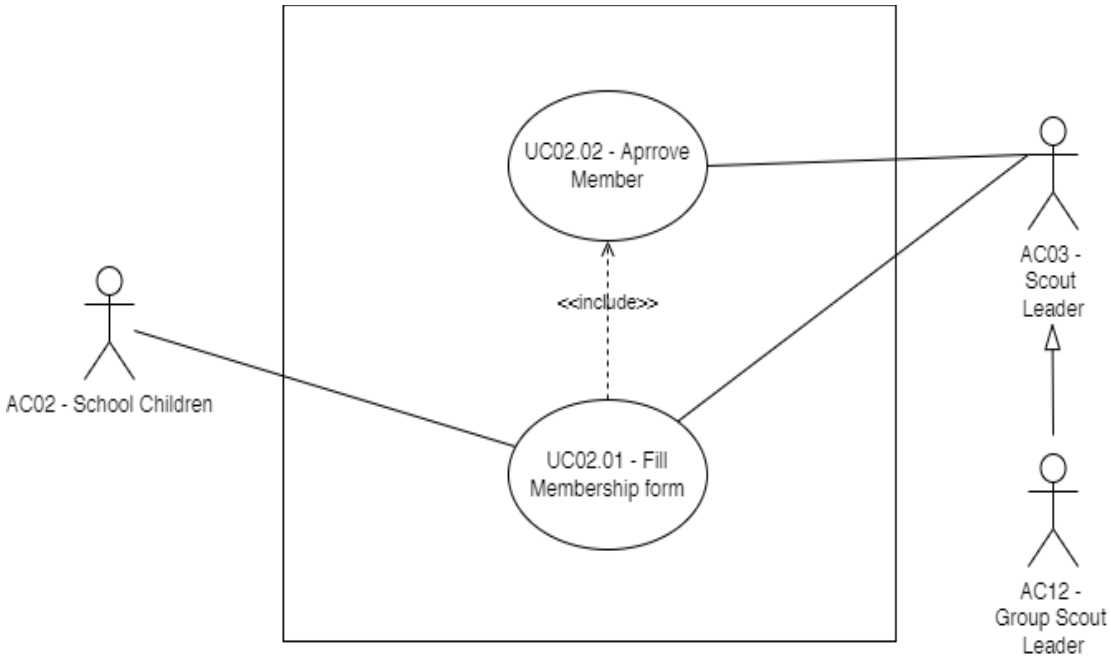


Figure 4-3 Design Use Case UC 02 Membership

4.1.4 UC03 – Dashboard

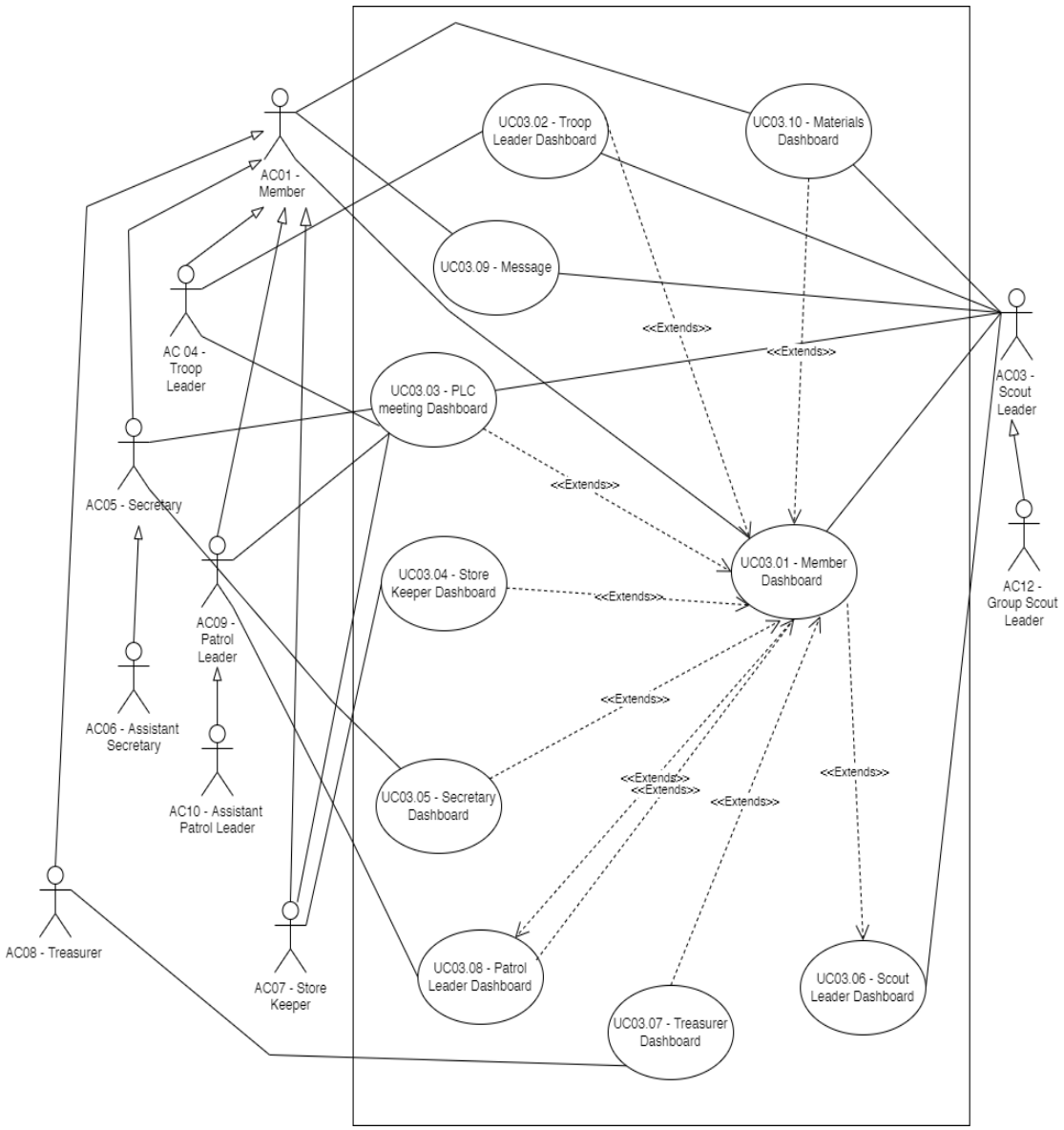


Figure 4-4 Design Use Case UC 03 Dashboard

4.2 Use Case Description

4.2.1 UC 01 – Login Use Case

Use case ID	UC01.01
Use case Name	Log in
Actors	AC01-Member, AC02-School Child, AC13-Server
Description	This Use Case describes the process happens when a user tries to login to the system.
Pre-condition	Anyone Who enters landing page
Post-condition	The user is logged in to the system
Normal Flow	1. Member visits the landing page 2. Member enters username and password 3. Member Clicks login button
Alternate Flow	
Exceptions	1. Username and associated Password is forgotten 2. Inform Scout Leader about the situation
Use Case Relationships	[INCLUES] UC01.02- Verify Password [EXTENDS] UC01.03 – Display Login Error
Constrains	
Trigger	User Click Login Button

Figure 4-5 Design Use Case Description UC 01.01 Login

Use case ID	UC01.02
Use case Name	Verify Password
Actors	AC01-Member, AC02-School Child, AC13-Server
Description	This Use Case describes the process happens when a user tries to login to the system.
Pre-condition	The user should be a member
Post-condition	The user is logged in to the system
Normal Flow	1. Client-side validation is done to check whether the username and password is in correct format 2. Password entered is sent to the server and check if they are matching with the username and password set
Alternate Flow	
Exceptions	
Use Case Relationships	
Constrains	
Trigger	User Click log in button

Figure 4-6 Design Use Case Description UC 01.02 Verify Password

Use case ID	UC01.03
Use case Name	Display Login Error
Actors	AC01-Member, AC02-School Child, AC13- Server
Description	This Use Case describes the process happens when a user tries to login to the system.
Pre-condition	The user should be a member
Post-condition	The user is logged in to the system
Normal Flow	1. The user's password and log in inputs are colored in red to indicate they are wrong 2. Displays a text under login area saying that they are not matching and please try again
Alternate Flow	
Exceptions	
Use Case Relationships	
Constrains	
Trigger	Username and Password is not matching

Figure 4-7 Design Use Case Description UC 01.03 Display Login Error

4.2.2 UC 02 – Membership Use Case

Use case ID	UC02.01
Use case Name	Fill Membership Form
Actors	AC02-School Child, AC13-Server
Description	This is the use case that explains how a new member need to enter the system
Pre-condition	The user should not be a member
Post-condition	Form is sent to get approval of the scout leader
Normal Flow	1. School children fills the membership form 2. School children submit the from 3. Form is sent to the server as new member 4. [if record insert failed] Display Operation Failed message 5. [Else] Display Operation success message
Alternate Flow	
Exceptions	
Use Case Relationships	[INCLUDES] UC02.02 - Approve Member
Constrains	User must fill all mandatory fields
Trigger	Click fill membership form button

Figure 4-8 Design Use Case Description UC 02.01 Membership Form

Use case ID	UC02.02
Use case Name	Approve Member
Actors	AC03-Scout Leader, AC12- Group Scout Leader, AC13-Server
Description	This is the use case that explains how a member who filled the membership form is having eligibility to login as a user to the system.
Pre-condition	The user should fill the membership form correctly
Post-condition	
Normal Flow	1. Scout Leader Approves member Request
Alternate Flow	1. Scout Leader Rejects Application
Exceptions	
Use Case Relationships	
Constrains	User must fill all mandatory fields
Trigger	The school child Click the submit form button

Figure 4-9 Design Use Case Description UC 02.02 Approve Member

4.2.3 UC03 – Dashboard

Use case ID	UC03
Use case Name	Dashboard
Actors	AC01-Member, AC02-Troop Leader, AC05-Secretary, AC06-Assistant Secretary, AC03-Scout Leader, AC08-Treasurer, AC09-Patrol Leader, AC10-Assistant Patrol leader, AC07-Store Keeper, AC12-Group Scout Leader, AC13-Server
Description	This is the use case that explains how a new member need to enter the system. This is a collective use case of all dashboards.
Pre-condition	User must be logged in to the system
Post-condition	
Normal Flow	1. System directs to the related dashboard of the user automatically according to their position
Alternate Flow	
Exceptions	1. No Response from the system 2. Refresh the browser
Use Case Relationships	
Constrains	User must be an authorized user
Trigger	Password and username are matched

Figure 4-10 Design Use Case Description UC 03 Dashboard

Use case ID	UC03.01
Use case Name	Member Dashboard
Actors	AC01-Member, AC03-Scout Leader, AC13-Server
Description	This use case describes the functions of member dashboard
Pre-condition	User must be logged in to the system
Post-condition	
Normal Flow	1. View member dashboard a. Response to Attendance Requests b. Mark Saturday Meeting Attendance
Alternate Flow	1. [if Profile Clicked] View Profile Section 2. Main a. Update Photo b. Update Current Residence c. Update Guardians email d. Update Guardians Telephone Number e. Change Password 3. Camps a. Add b. Delete 4. Badges a. Add b. Delete 5. Community projects a. Add b. Delete 6. Adventure hikes a. Add b. Delete
	1. [if Troop Agenda Clicked] View Troop Agenda
	1. [if Weekly Meeting Agenda Clicked] View Weekly Meeting Agenda
	1. [if Test Passing Clicked] View Test Passing a. Apply Requirements b. View All Badges c. View My badges d. View Passed Badges e. View Failed Badges
Exceptions	[Scout Leader]

	Redirects to the Scout Leader Dashboard
Use Case Relationships	If Troop Leader [EXTENDS] UC03.02 - Troop Leader Dashboard [EXTENDS] UC03.03 - PLC Meeting Dashboard If Secretary [EXTENDS] UC03.05 - Secretary Dashboard [EXTENDS] UC03.03 - PLC Meeting Dashboard If Treasurer [EXTENDS] UC03.03 - PLC Meeting Dashboard [EXTENDS] UC03.07 - Treasurer Dashboard If Storekeeper [EXTENDS] UC03.03 - PLC Meeting Dashboard [EXTENDS] UC03.04 - Storekeeper Dashboard If Patrol Leader [EXTENDS] UC03.03 - PLC Meeting Dashboard [EXTENDS] UC03.08 - Patrol Leader Dashboard If Scout Leader [EXTENDS] UC03.06 - Scout Leader Dashboard [EXTENDS] UC03.03 - PLC Meeting Dashboard
Constrains	User must be an authorized user
Trigger	Password and username are matched

Figure 4-11 Design Use Case Description UC 03.01 Member Dashboard

Use case ID	UC03.02
Use case Name	Troop Leader Dashboard
Actors	AC02-Troop Leader, AC13-Server
Description	This is the use case that explains how a new member need to enter the system. This is a collective use case of all dashboards.
Pre-condition	User must be logged in
Post-condition	
Normal Flow	1. [If Issues Clicked] View issues
Alternate Flow	1. [If Membership Fee Clicked] View Membership fee paid list
	1. [If PLC Agenda Clicked] View PLC Agenda a. Insert Date to view Agenda
	1. [If Troop Agenda Clicked] View Troop Agenda a. Select Date to view Agenda
	1. [If Weekly Troop Attendance Clicked] View Weekly Attendance a. Select Date to view Attendance
	1. [If PLC Oath Clicked] View PLC WOW
Exceptions	
Use Case Relationships	
Constrains	User must be a Troop Leader
Trigger	User Select Position as Troop Leader from position Dropdown menu

Figure 4-12 Design Use Case Description UC 03.02 Troop Leader Dashboard

Use case ID	UC03.03
Use case Name	PLC Meeting Dashboard
Actors	AC02-Troop Leader, AC05-Secretary, AC03-Scout Leader, AC08-Treasurer, AC09-Patrol Leader, AC07-StoreKeeper, AC13-Server
Description	This Use Case consists with activities happening in the Patrol Leaders Council
Pre-condition	User must be logged in
Post-condition	
Normal Flow	1. [If Agenda Clicked] View Todays Agenda 2. [If User is type of secretary] a. Add to agenda i. While finished adding 1. Add date, minute to agenda ii. Click add to agenda iii. [if Add items Unsuccess] Show Operation Unsuccess Message iv. [Else] Show Operation success Message
Alternate Flow	1. [If Project Clicked] View Projects 2. [If User is type of secretary] 3. Add to Projects a. Add date, Name b. Select Project Status from drop down (ongoing, pending, complete) c. Click add to Projects button d. [if Add Unsuccess] Show Operation Unsuccess Message e. [Else] Show Operation success Message 4. Update Projects a. Add date, Name b. Select Project Status from drop down (ongoing, pending, complete) c. Click Update Project button d. [if Update Unsuccess] Show Operation Unsuccess Message e. [Else] Show Operation success Message
	1. [If Attendance Clicked] View Attendance a. Insert Date to view Attendance

	2. Mark Attendance a. View Date b. Click mark attendance c. [if Mark Unsuccess] Show Operation Unsuccess Message d. [Else] Show Operation success Message 3. Vote a. [if there is a new question] i. Read question ii. Reply Agree or disagree iii. [if Operation Unsuccess] Show Operation Unsuccess Message iv. [Else] Show Operation success Message
Exceptions	
Use Case Relationships	
Constrains	User must be a PLC member
Trigger	User Select PLC Meeting as Troop Leader from Main Dropdown menu

Figure 4-13 Design Use Case Description UC 03.03 PLC Meeting

Use case ID	UC03.05
Use case Name	Secretary Dashboard
Actors	AC05-Secretary, AC13-Server
Description	This use case represents actions done by the secretary
Pre-condition	User must be logged in to the system
Post-condition	
Normal Flow	1. [If Monthly Meeting Clicked] View Monthly Meeting a. View Todays Issues b. View Previous Votes 2. Call For a Vote a. Enter Vote title b. Click call for a vote button c. Add record to Votes Table d. [if Unsuccess] Show Operation Unsuccess Message e. [Else] Show Operation success Message 3. Set next meeting date a. Select next meeting date from date time picker b. Click Set date button c. Add record to Monthly meeting Table d. [if Unsuccess] Show Operation Unsuccess Message e. [Else] Show Operation success Message
Alternate Flow	1. [If Members Clicked] View Members 2. View Member Membership details for member 3. Enter Member name or Year 4. Click Search button 5. View Membership status 6. [if Unsuccess] Show Operation Unsuccess Message 7. [Else] Show Operation success Message 8. Insert Username 9. Click Mark as Membership paid Button 10. [if Unsuccess] Show Operation Unsuccess Message 11. [Else] Show Operation success Message
	1. [If Edit Troop Agenda Clicked] View Edit Troop Agenda 2. Select date from date time picker

	3. View troop agenda for the date picked by date time picker 4. Add to Agenda a. While finish inserting i. Insert date, time, title b. Click Add to agenda button to add c. Add agenda items with status pending d. [if Unsuccess] Show Operation Unsuccess Message e. [Else] Show Operation success Message 5. Update Agenda a. Insert date, time, title b. Select status from dropdown c. Click Update agenda button to Update d. [if Unsuccess] Show Operation Unsuccess Message e. [Else] Show Operation success Message
	1. [If Set Saturday meeting Agenda Clicked] View Set Saturday meeting Agenda 2. Add to Agenda a. While finish inserting i. Insert date, minute b. Click Add to agenda button to add c. Add agenda items with status pending d. [if Unsuccess] Show Operation Unsuccess Message e. [Else] Show Operation success Message
	1. [If Upload materials clicked] View Upload materials 2. Insert Title, Caption, Image, Video, Document for a post 3. Click upload button 4. Upload post to the server 5. [if Unsuccess] Show Operation Unsuccess Message 6. [Else] Show Operation success Message
Exceptions	
Use Case Relationships	
Constrains	User must be a secretary
Trigger	User Select Position as Secretary from position Dropdown menu

Figure 4-14 Design Use Case Description UC 03.05 Secretary Dashboard

Use case ID	UC03.06
Use case Name	Scout Leader Dashboard
Actors	AC03-Scout Leader, AC13-Server
Description	This is the use case that explains activities done by the scout leader position.
Pre-condition	User must be logged in to the system
Post-condition	
Normal Flow	7. [If Member list Clicked] View Member List a. [if old members Clicked] View Old members Section i. Enter member ii. Enter Marks iii. [If Add Marks Clicked] 1. Add marks to member 2. Add marks to the member marks field 3. [if Unsuccess] Show Operation Unsuccess Message 4. [Else] Show Operation success Message iv. [If Reduce Marks Clicked] 1. Reduce Marks From the member b. [if new members Clicked] View New members Section i. Enter member name ii. [If Allow Access Clicked] 1. Allow access to member 2. Copy Record to the member table from temporary members table and delete temporary member record 3. [if Allow Access Unsuccess] Show Operation Unsuccess Message 4. [Else] Show saves success Message iii. [If Reject Request Clicked] 1. Reject Request from the member

	2. Delete Record from the temporary member table 3. [if Reject Request Unsuccess] Show Operation Unsuccess Message 4. [Else] Show saves success Message
Alternate Flow	
Exceptions	
Use Case Relationships	
Constrains	User must be a Scout Leader
Trigger	User Select Position as Scout Leader from position Dropdown menu

Figure 4-15 Design Use Case Description UC 03.06 Scout Leader Dashboard

Use case ID	UC03.07
Use case Name	Treasurer Dashboard
Actors	AC08-Treasurer, AC13-Server
Description	Treasurer Use Case explains activities done by the treasurer from treasurer perspective.
Pre-condition	User must be logged in to the system
Post-condition	
Normal Flow	1. [If bills Clicked] view Bills a. Enter receipt id b. Search bill id 1. Issue Receipt a. Enter Amount b. Enter Reason c. Enter Item Name d. Enter Item Quantity e. Enter Item Unit f. Enter Total amount g. Enter person name which the bill issued to h. Click Issue Receipt i. Save Record in the Database j. [if Save Unsuccess] Show save Unsuccess Message k. [Else] Show saves success Message
Alternate Flow	1. [If Weekly Contribution Clicked] view Weekly Contribution a. Enter receipt id b. Click Search to search 2. Issue receipt a. Enter Patrol Name b. Enter Amount c. Enter Hand overed person name d. Click Issue receipt e. Save Record in the Database f. [if Save Unsuccess] Show save Unsuccess Message g. [Else] Show saves success Message
	1. [If Handover money Clicked] view Handover money a. Enter receipt id b. Click Search Button to Search Receipt id

	2. Issue receipt a. Enter Patrol Name b. Enter Amount c. Enter Hand overed person name d. Click Issue receipt e. Save Record in the Database f. [if Save Unsuccess] Show save Unsuccess Message g. [Else] Show saves success Message
	1. [If Reports Clicked] view Reports a. [if this month expenditure Clicked] View this month expenditure b. [if monthly expenditure Clicked] View this monthly expenditure for the year c. [if yearly expenditure Clicked] View yearly expenditure for 5 years d. [if Balance Clicked] View Balance of Expenses and Incomes e. [if Income and Expenses Sheet Clicked] View Incomes and expenses for the year in same sheet 2. [If Print List Clicked] a. Print The Table viewed on screen b. [if Print Unsuccess] Show Print Unsuccess Message c. [Else] Show Print success Message
Exceptions	
Use Case Relationships	
Constrains	User must be a Treasurer
Trigger	User Select Position as Treasurer from position Dropdown menu

Figure 4-16 Design Use Case Description UC 03.07 Treasurer Dashboard

Use case ID	UC03.08
Use case Name	Patrol Leader Dashboard
Actors	AC09-Patrol Leader, AC13-Server
Description	This Use Case explains all the activities done by patrol leader from his perspective.
Pre-condition	User must be logged in to the system
Post-condition	
Normal Flow	1. [If Member Details Clicked] View Member Details a. Enter Member Id i. [if main Clicked] view member main section ii. [if Dashboard Clicked] view member dashboard section iii. [if camps Clicked] view member camps' section iv. [if badges Clicked] view member badges section v. [if Adventure hikes Clicked] view member Adventure Hikes section vi. [if Community Projects Clicked] view member Community Projects section
Alternate Flow	1. [If Weekly Attendance Clicked] View Weekly Attendance a. [If Request Attendance Clicked] Request Attendance from Members for Saturday meeting b. [If All Clicked] View All Attendance Details of patrol c. [If Today Clicked] View Todays Attendance Details of patrol d. [If This Month Clicked] View This Month Attendance Details of patrol e. [If This Year Clicked] View This Year Attendance Details of patrol f. [If This Month Totals Clicked] View This Month Total Attendance of Patrol Members g. [If This Year Totals Clicked] View This Year Total Attendance of Patrol Members

	h. [If This Week Totals Clicked] View This Week Total Attendance of Patrol members
	1. [If Weekly Contribution Clicked] View Weekly Contributions of the Patrol a. [If All Clicked] View All contribution Details of patrol b. [If Today Clicked] View Todays contribution Details of patrol c. [If This Month Clicked] View This Month Contribution Details of patrol d. [If This Week Clicked] View This Week Contribution Details of patrol e. [If This Year Clicked] View This Year Contribution Details of patrol
	1. [If Test Passing Clicked] View Test Passing a. [If All Clicked] View All Test Passing Details of patrol b. [If Today Clicked] View Todays contribution Details of patrol c. [If This Month Clicked] View This Month Test Passing Details of patrol d. [If This Week Clicked] View This Week Test Passing Details of patrol e. [If This Year Clicked] View This Year Test Passing Details of patrol f. [If Status Drop Down Changed] Update Status of the Record g. [If Result Drop Down Changed] Update Result of the Record
	1. [If Issues Clicked] View Patrol Member Issues a. [If change Status Clicked] Allow Change Status Dropdown 2. Report an issue a. Enter member name b. Fill issue content field c. Report the issue
Exceptions	
Use Case Relationships	[EXTENDS] UC03.01 – Member Dashboard
Constrains	User must be a Patrol Leader
Trigger	User Select Position as Patrol Leader from position Dropdown menu

Figure 4-17 Design Use Case Description UC 03.08 Patrol Leader Dashboard

Use case ID	UC03.09
Use case Name	Message
Actors	AC01-Member, AC13-Server
Description	This is the interface that enables users to communicate
Pre-condition	User must be logged in to the system
Post-condition	
Normal Flow	1. [If New Message Clicked] View New Message a. Select recipients b. Enter Message Title
Alternate Flow	1. [If Sent Clicked] View Sent a. Select Message b. View Content
	1. [If Received Clicked] View Received a. Select Message b. View Content
Exceptions	
Use Case Relationships	
Constrains	
Trigger	User Select Messages from Main Dropdown menu

Figure 4-18 Design Use Case Description UC 03.09 Message Dashboard

Use case ID	UC03.10
Use case Name	Materials
Actors	AC01-Member, AC13-Server
Description	This Use Case explains all the study materials required for the Saturday meeting from member perspective.
Pre-condition	User must be logged in to the system
Post-condition	
Normal Flow	1. [If Posts Clicked] View Posts a. [if view button clicked] View Clicked post
Alternate Flow	1. [If Videos Clicked] View Videos a. [if view button clicked] View Clicked Video
	1. [If Images Clicked] View Images a. [if view button clicked] View Clicked Image
	1. [If Audios Clicked] View Audios a. [if view button clicked] View Clicked Audios
	1. [If Documents Clicked] View Documents a. [if view button clicked] View Clicked Document
Exceptions	
Use Case Relationships	[EXTENDS] UC 03.01 – Member Dashboard
Constrains	
Trigger	User Select Materials from Main Dropdown menu

Figure 4-19 Design Use Case Description UC 03.10 Materials

4.3 Activity Diagram

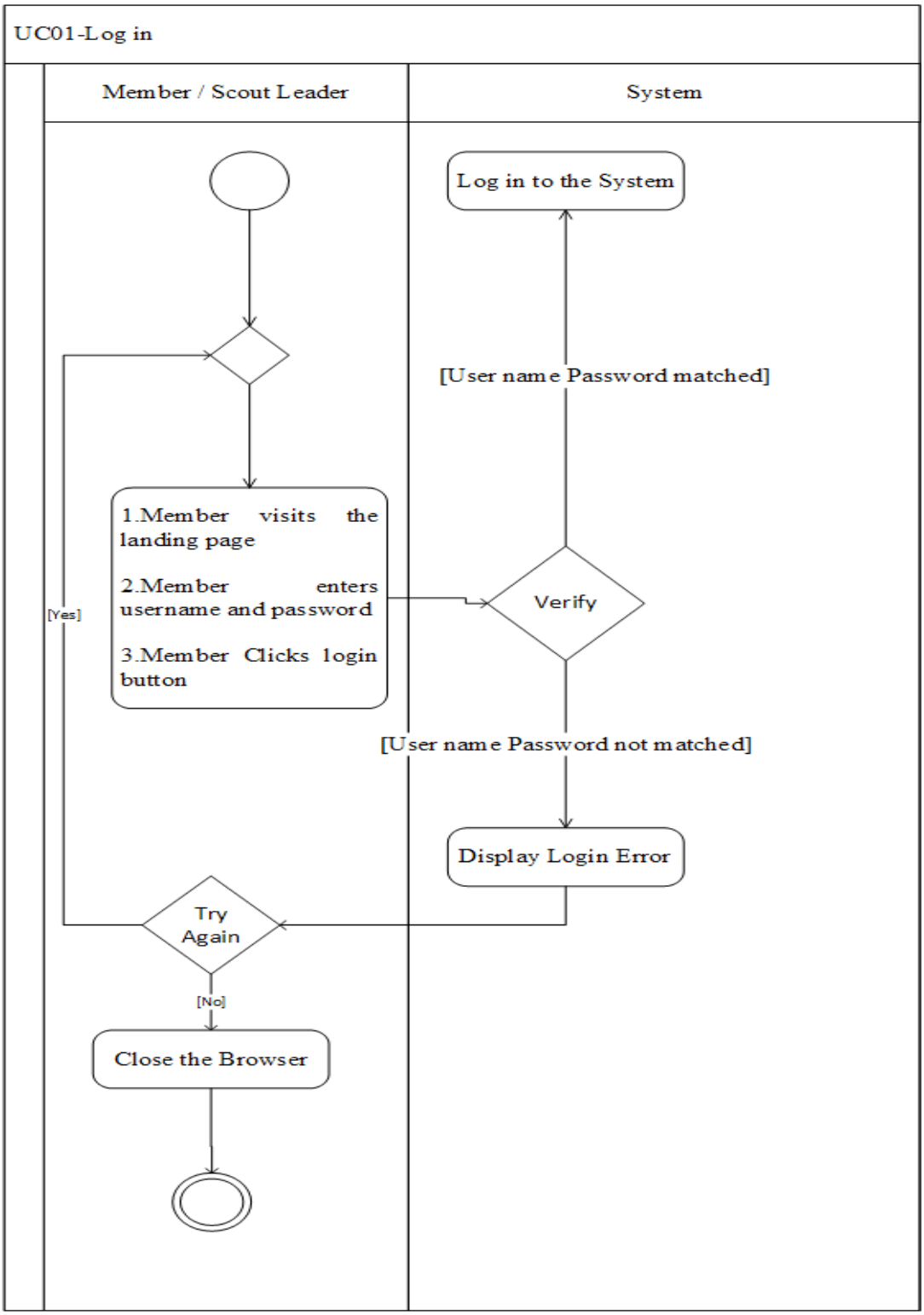


Figure 4-20 Design Activity Diagram UC 01 Login

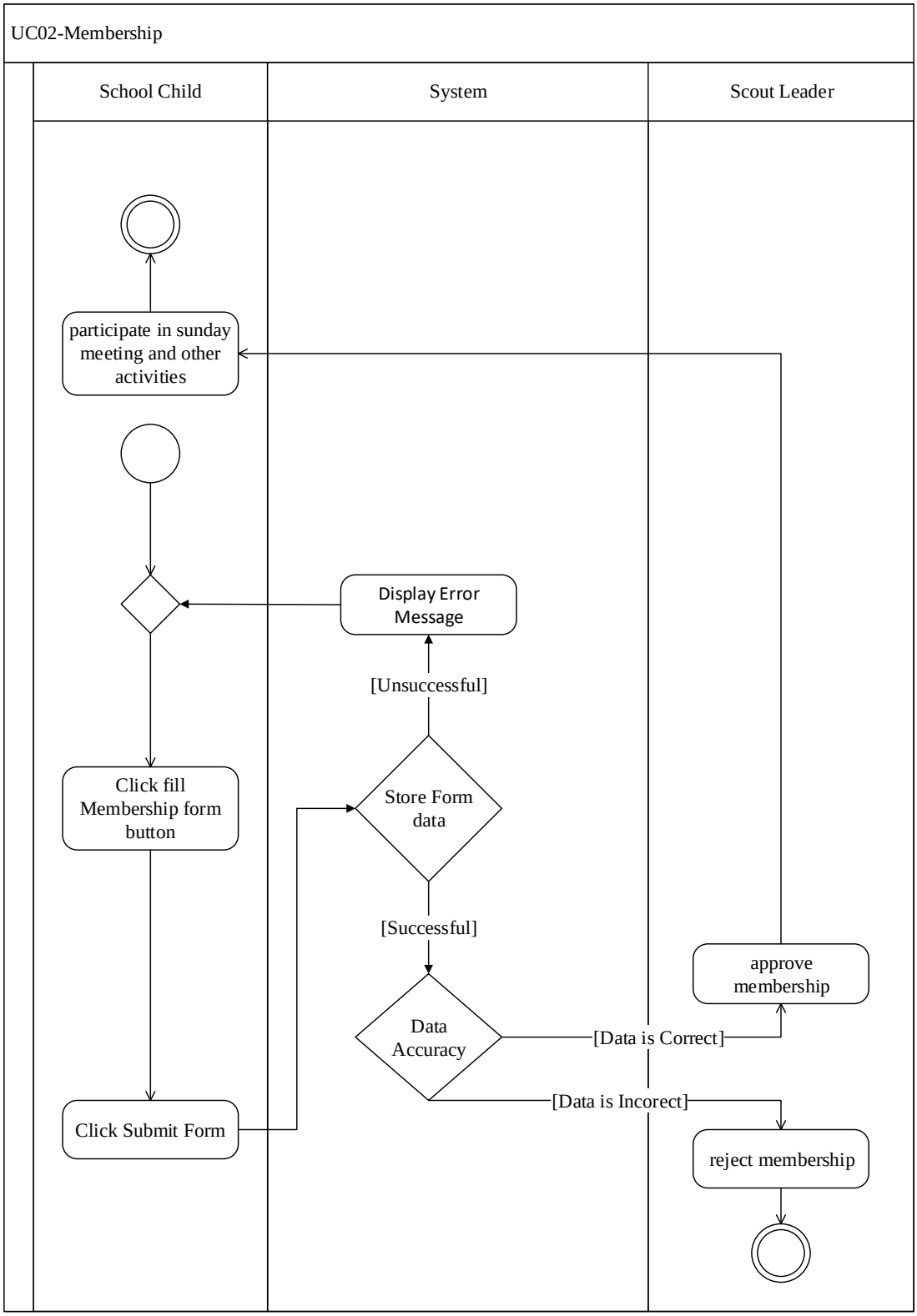


Figure 4-21 Figure Design Activity Diagram UC 02 Membership

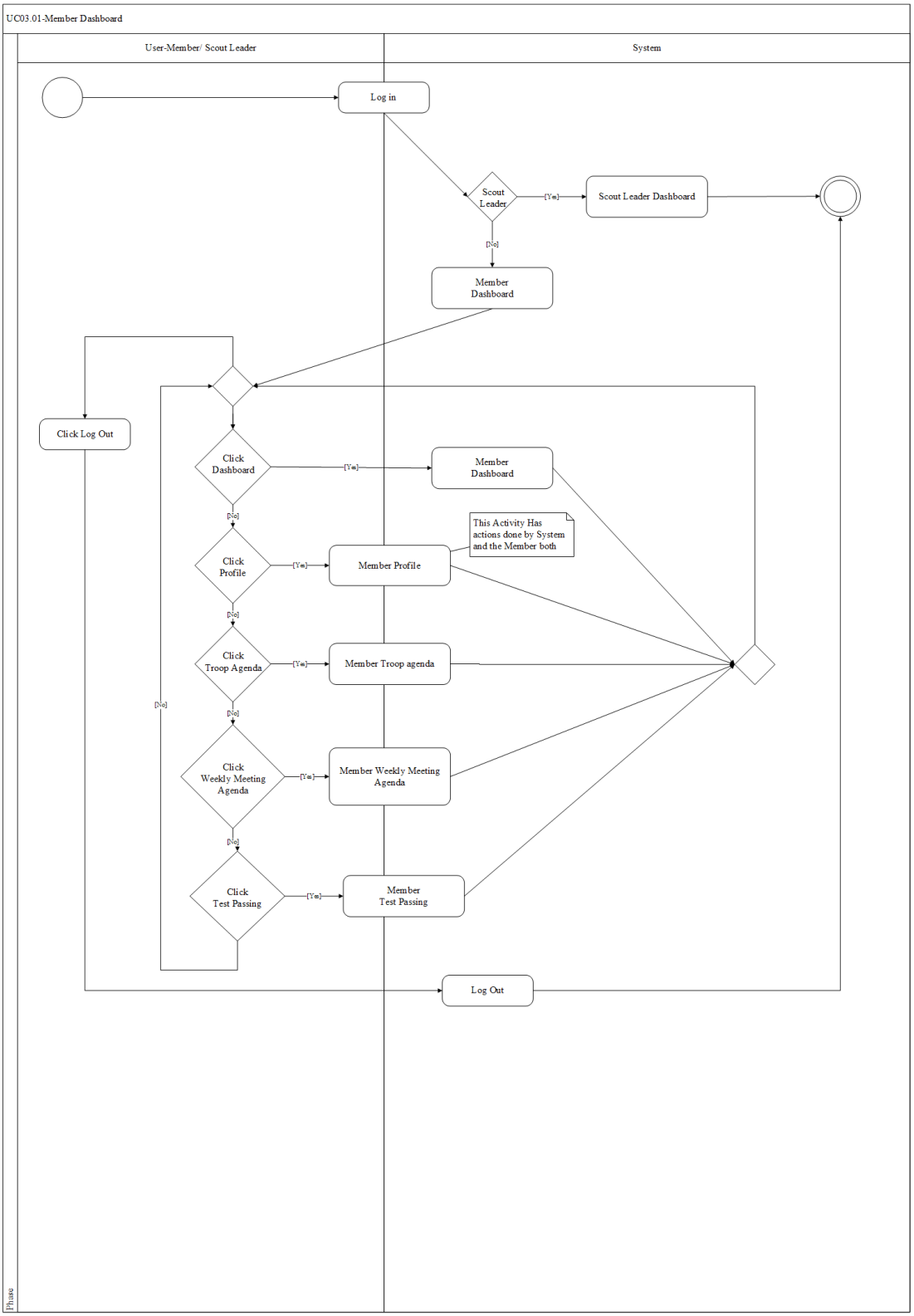


Figure 4-22 Figure 4 Activity Diagram UC 03.01 Member Dashboard

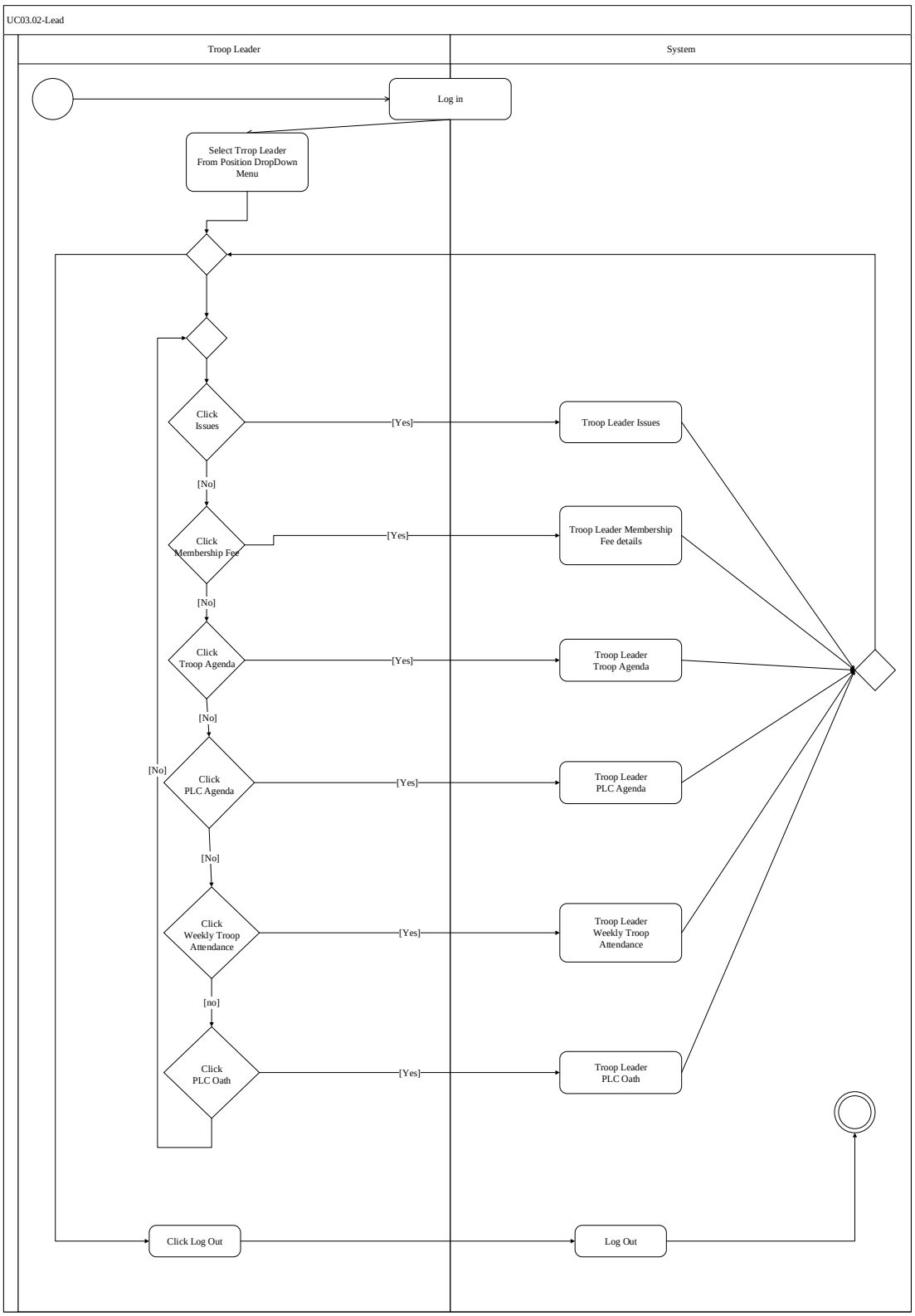


Figure 4-23 Figure 4 Activity Diagram UC 03.02 Troop Leader Dashboard

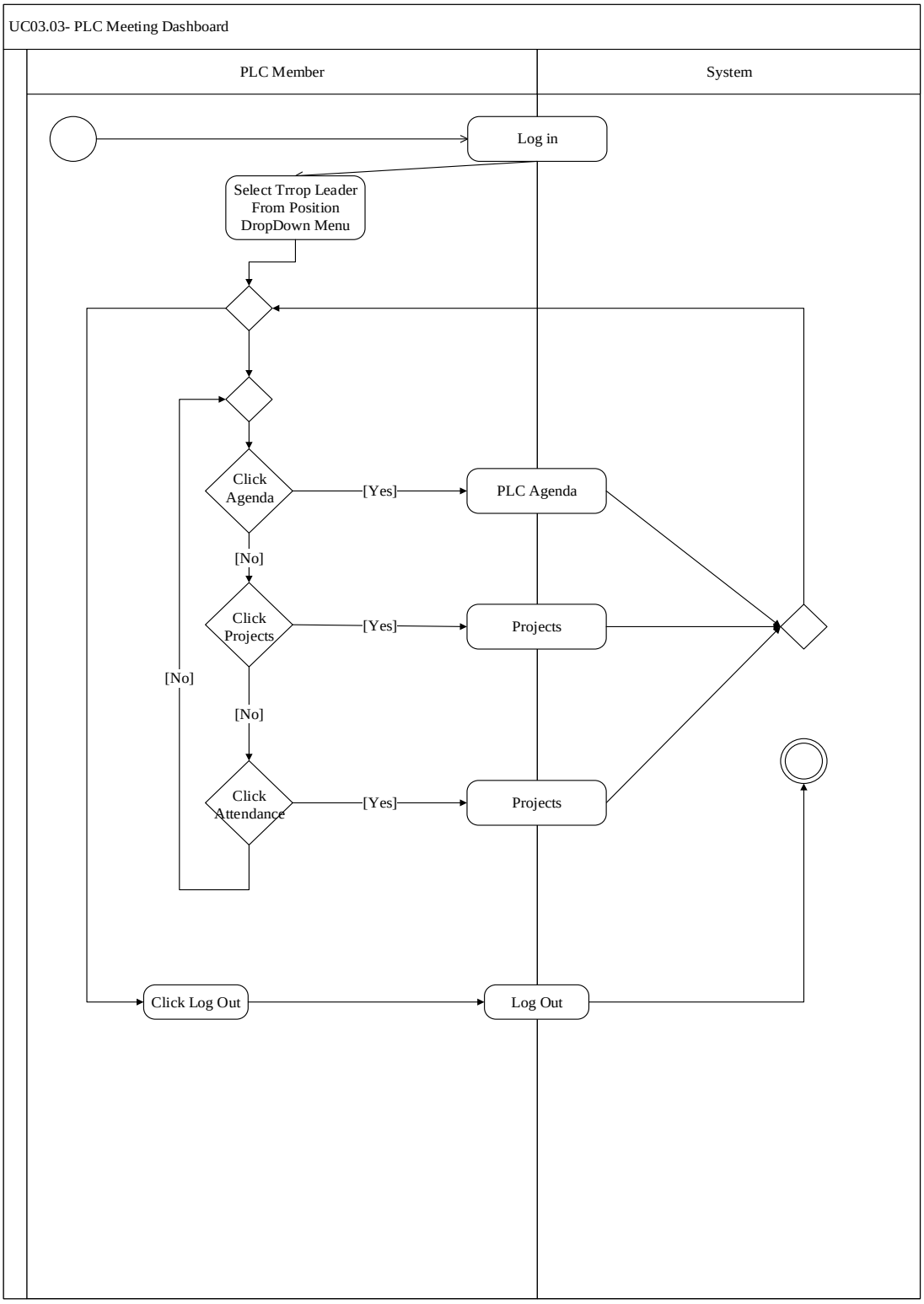


Figure 4-24 Activity Diagram UC 03.03 PLC Meeting Dashboard

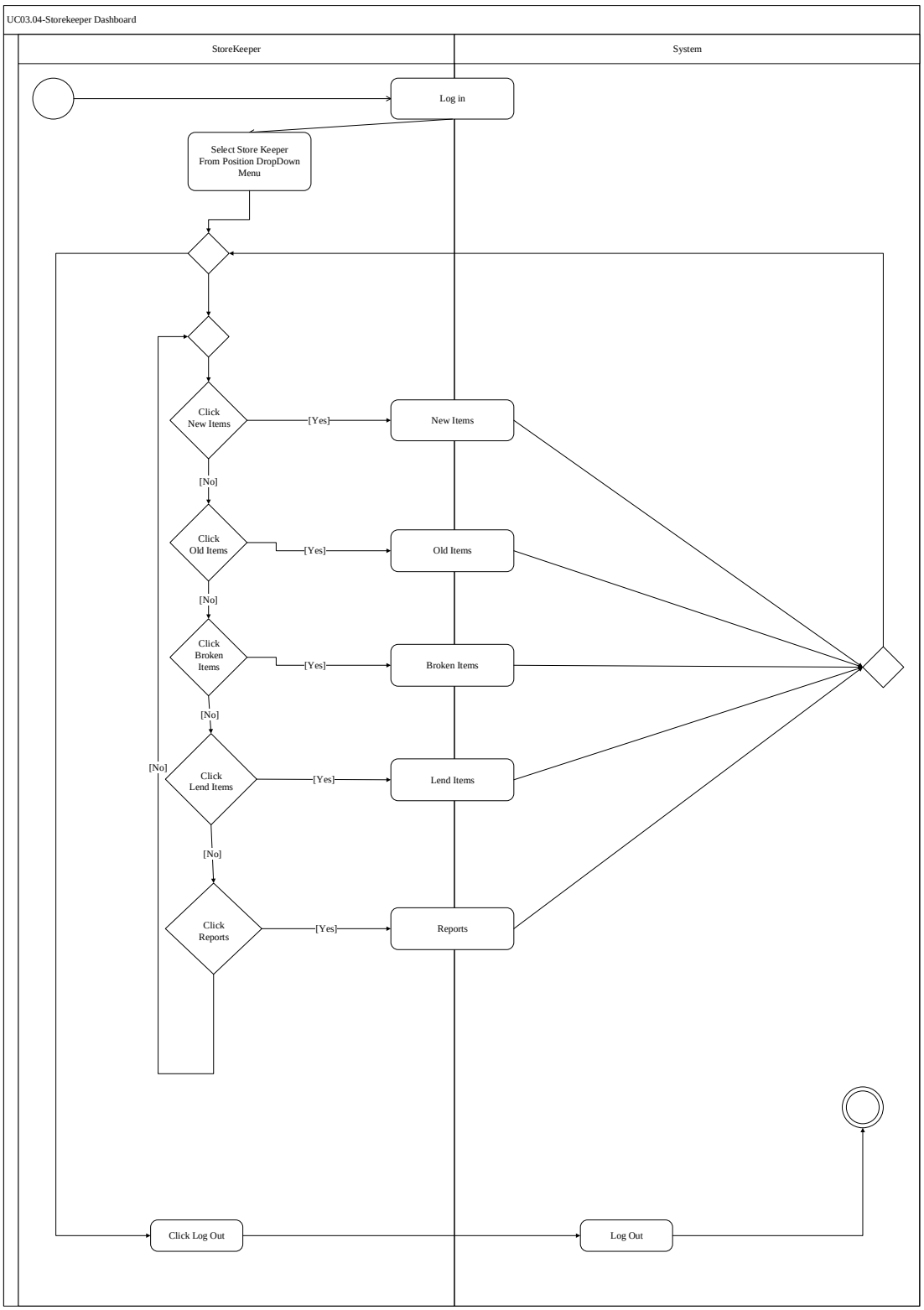


Figure 4-25 Activity Diagram UC 03.04 Storekeeper Dashboard

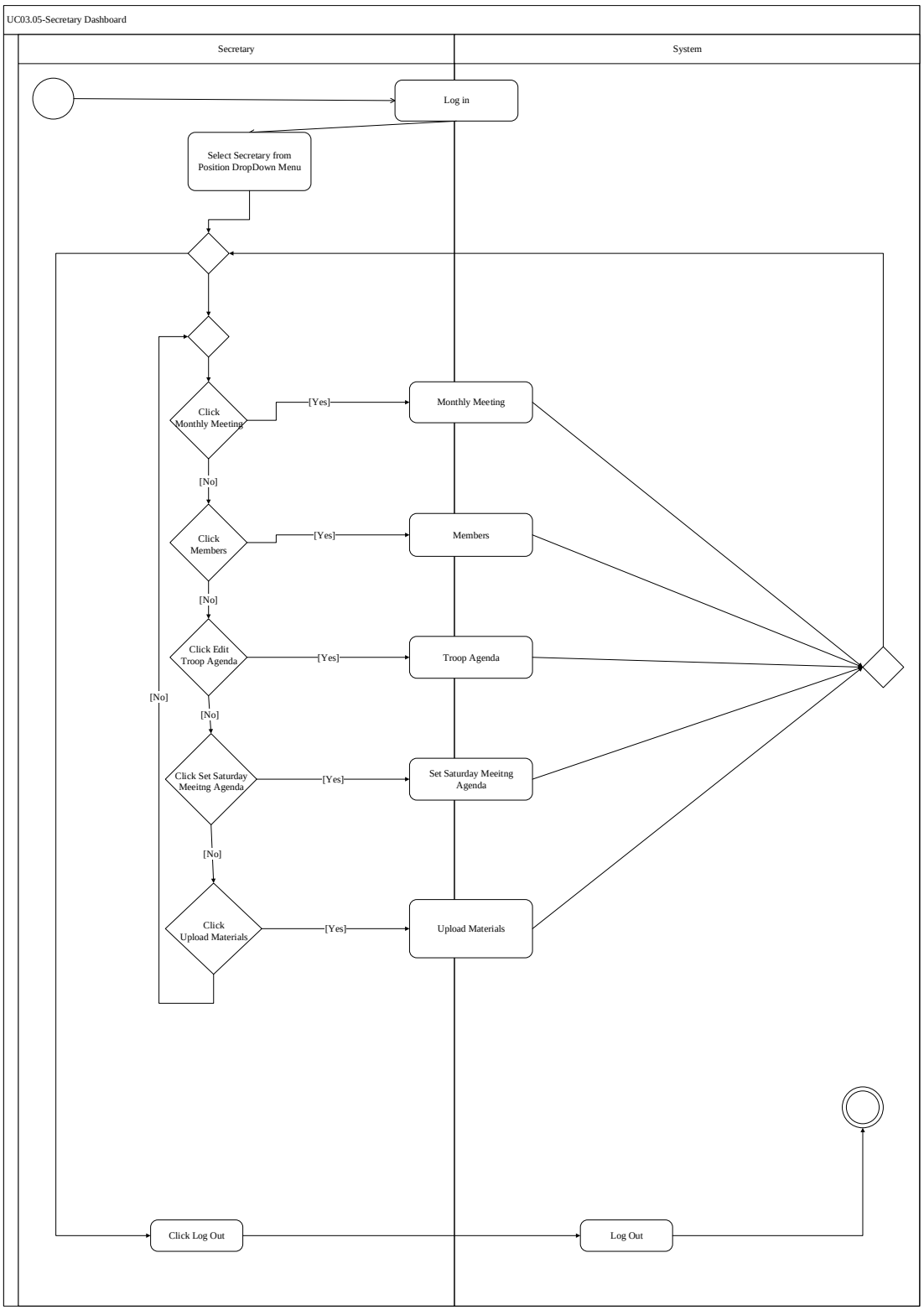


Figure 4-26 Activity Diagram UC 03.05 Secretary Dashboard

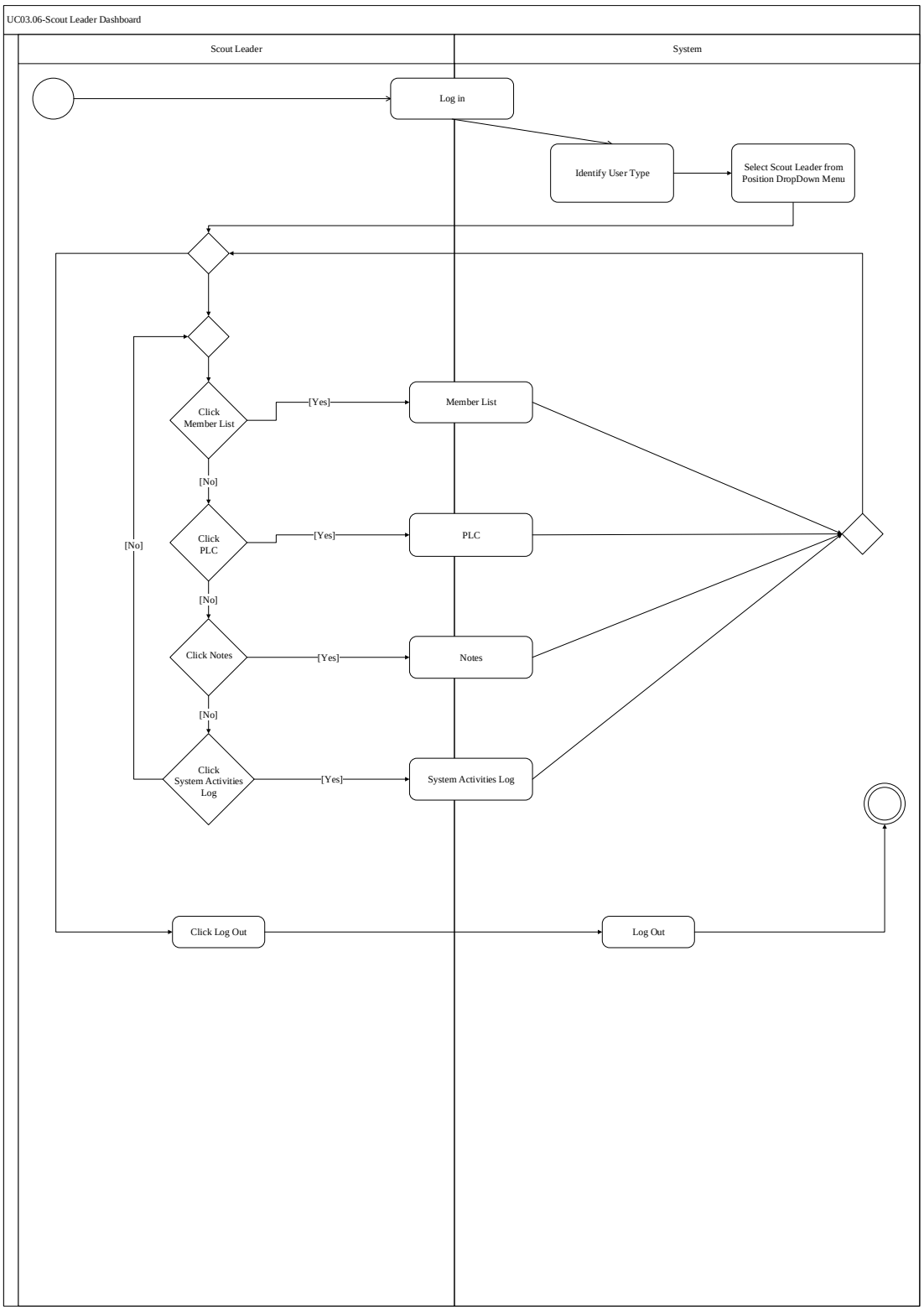


Figure 4-27 Activity Diagram UC 03.06 Scout Leader Dashboard

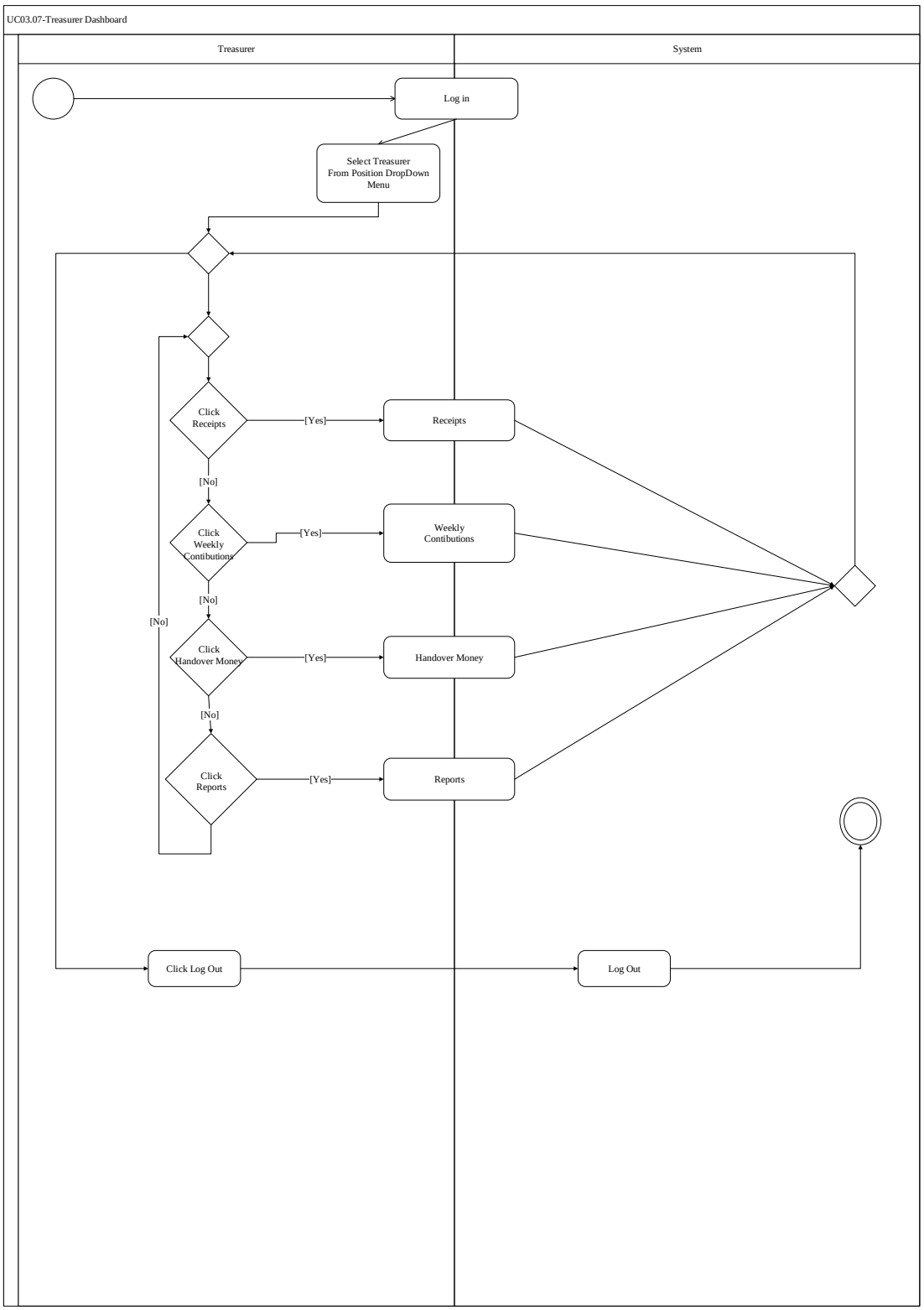


Figure 4-28 Activity Diagram UC 03.07 Treasurer Dashboard

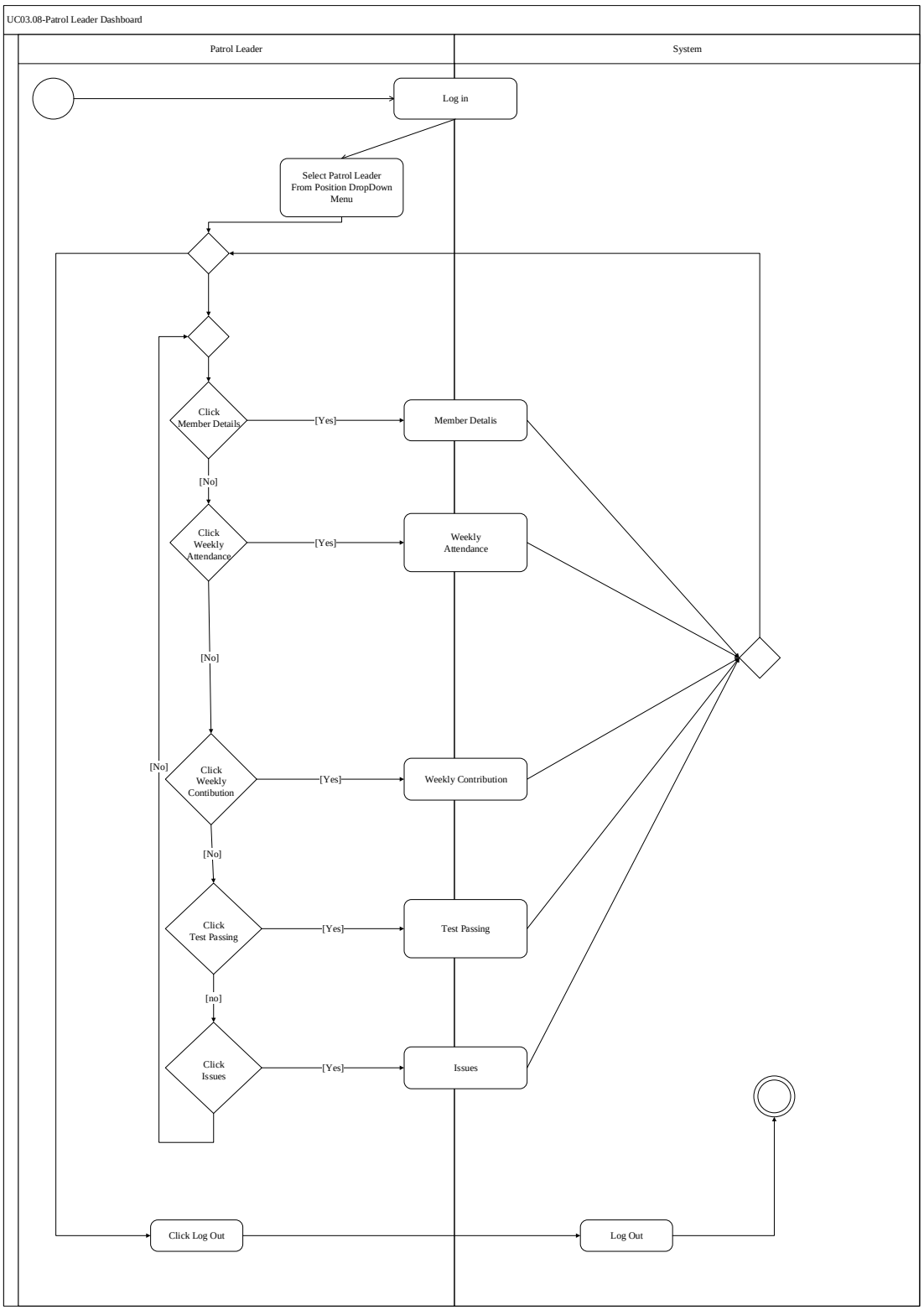


Figure 4-29 Activity Diagram UC 03.08 Patrol Leader Dashboard

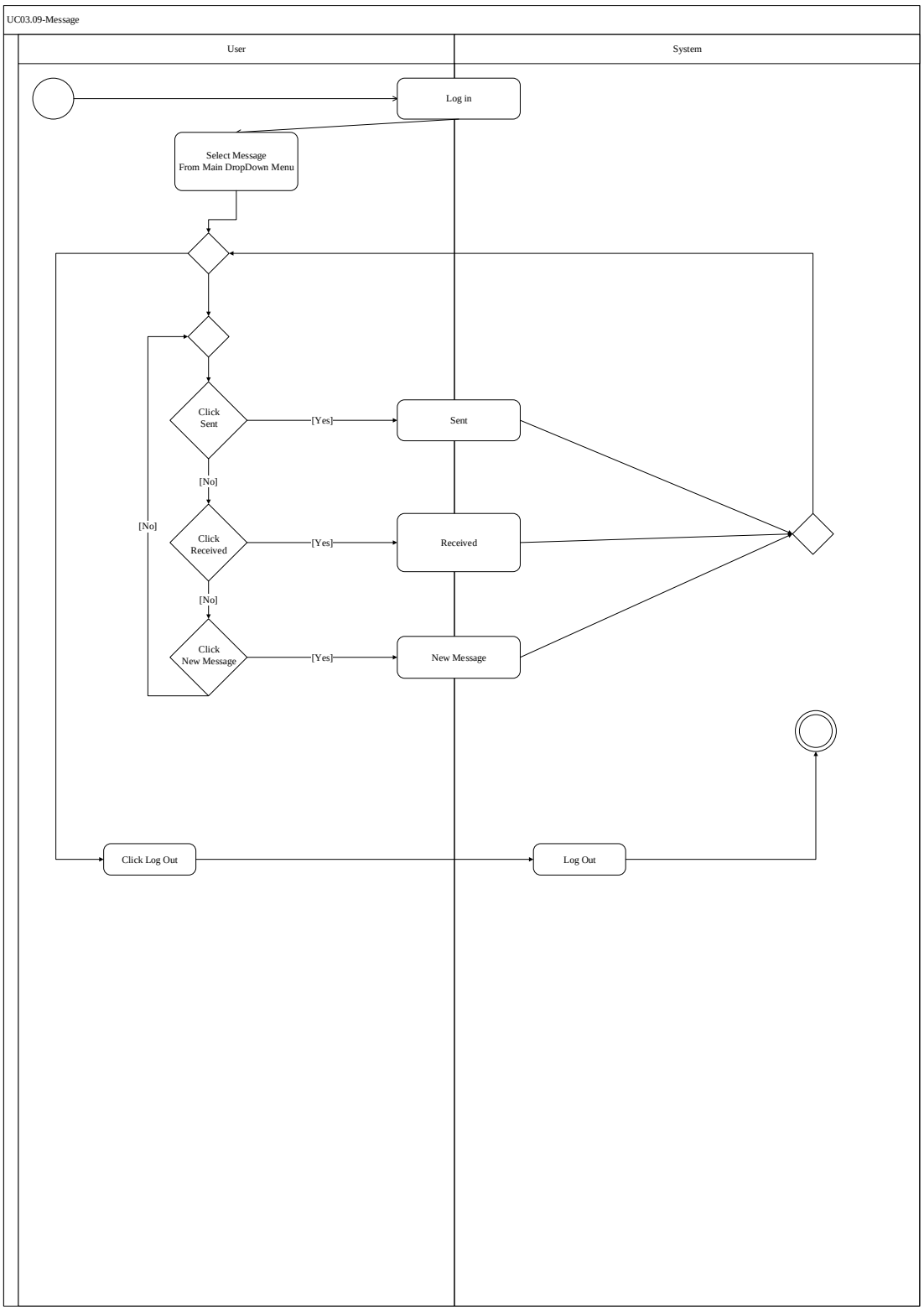


Figure 4-30 Activity Diagram UC 03.09 Message Dashboard

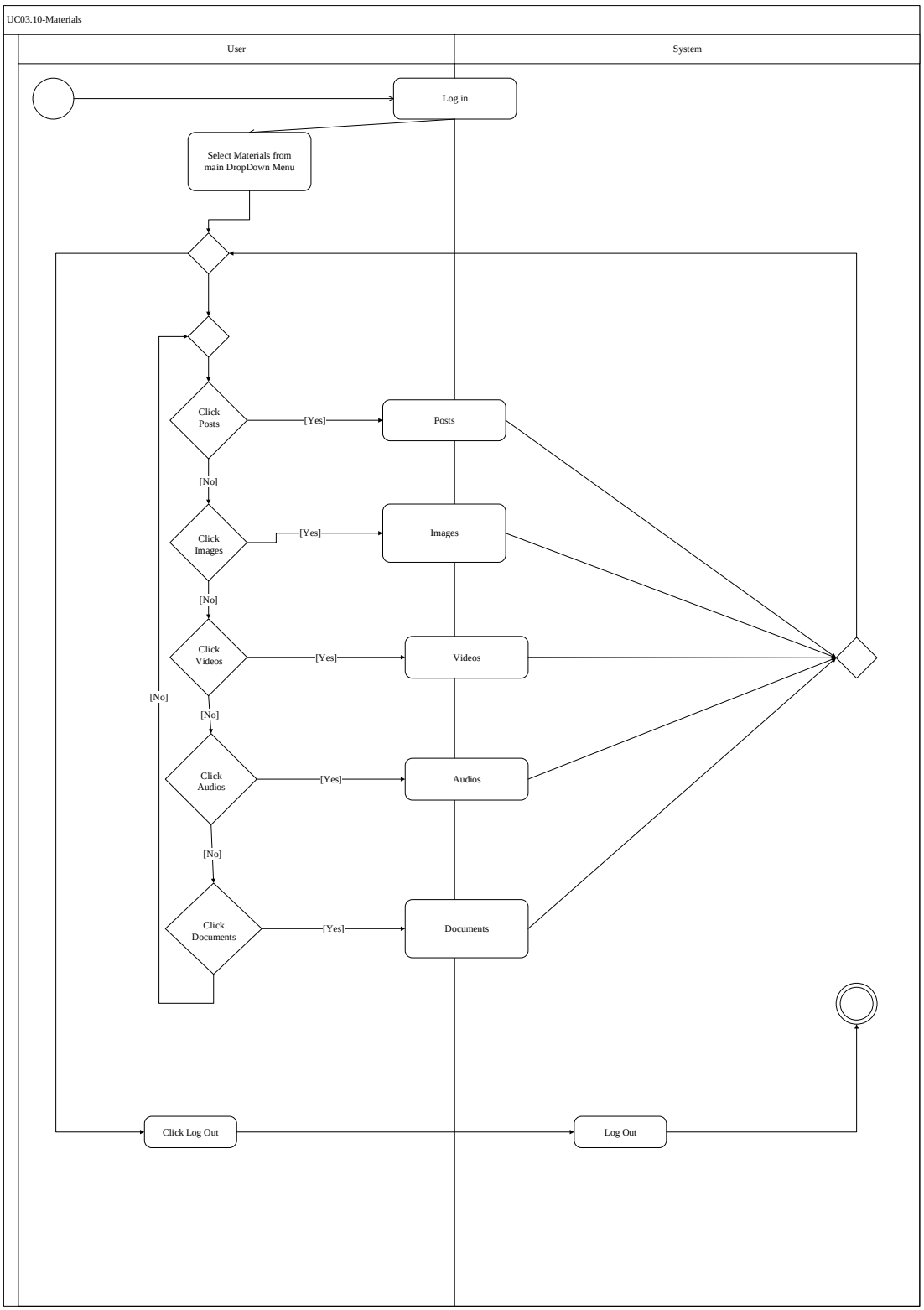


Figure 4-31 Activity Diagram UC 03.10 Materials Dashboard

4.4 Class Diagram

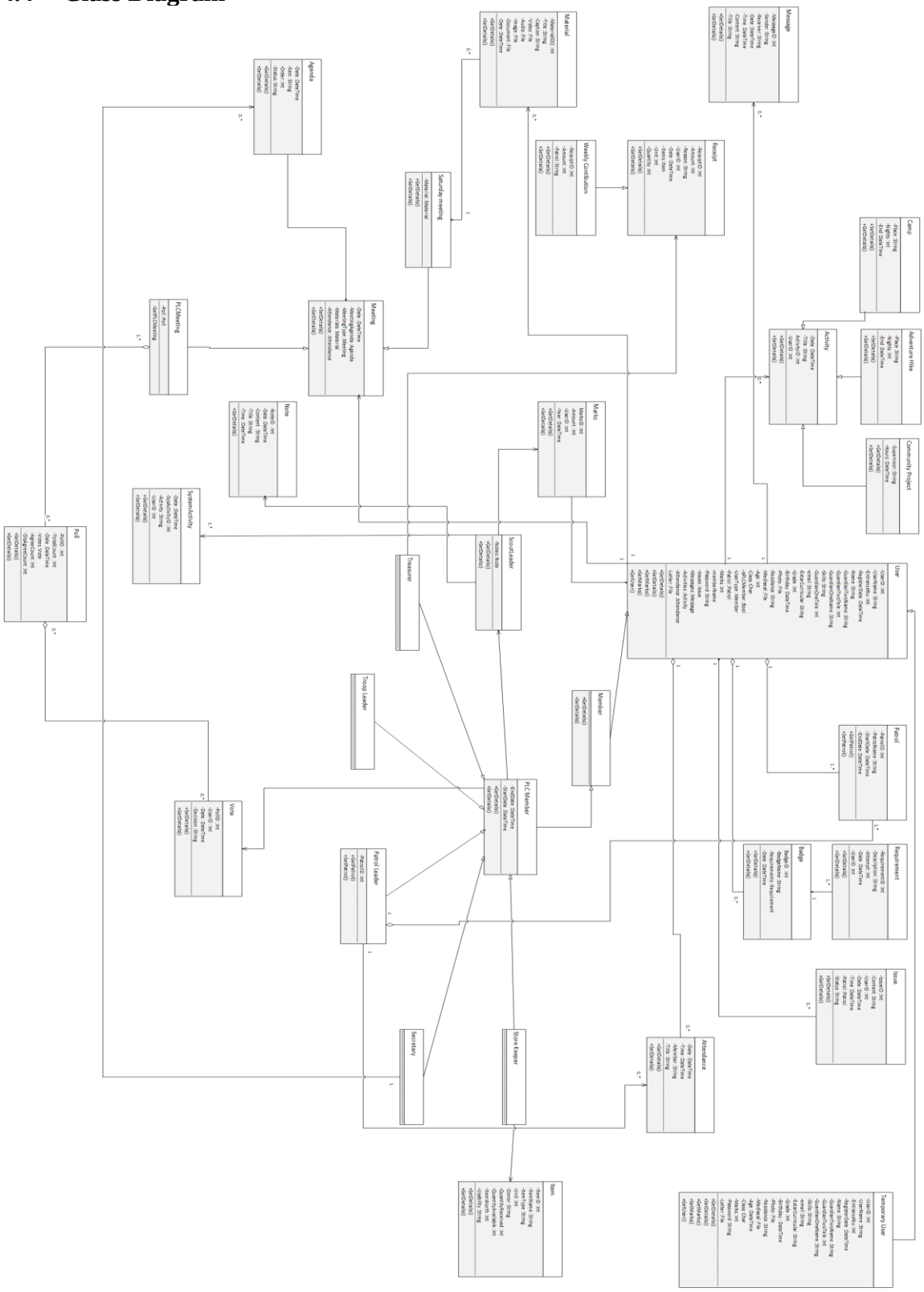


Figure 4-32 Design Class Diagram

4.5 Sequence Diagram

4.5.1 UC 01 Login

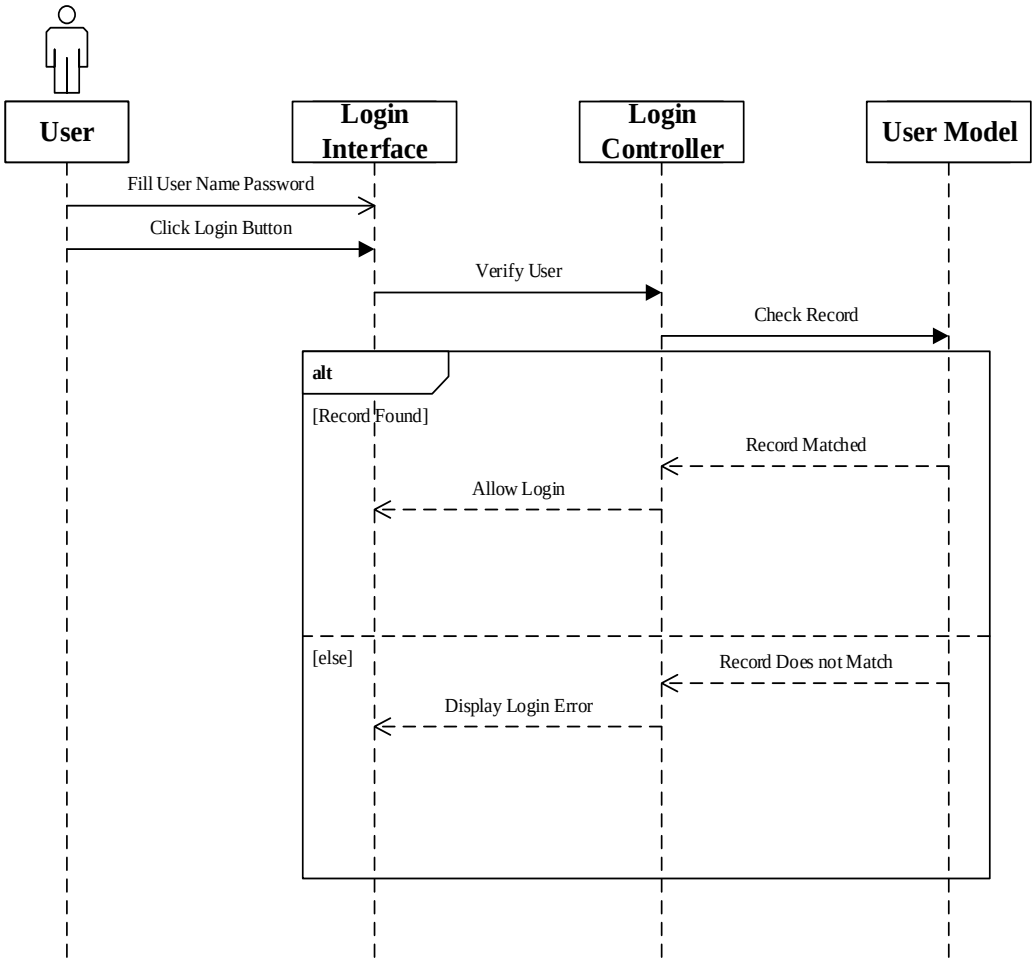


Figure 4-33 Sequence Diagram UC 01 Login

4.5.2 UC 02 Membership

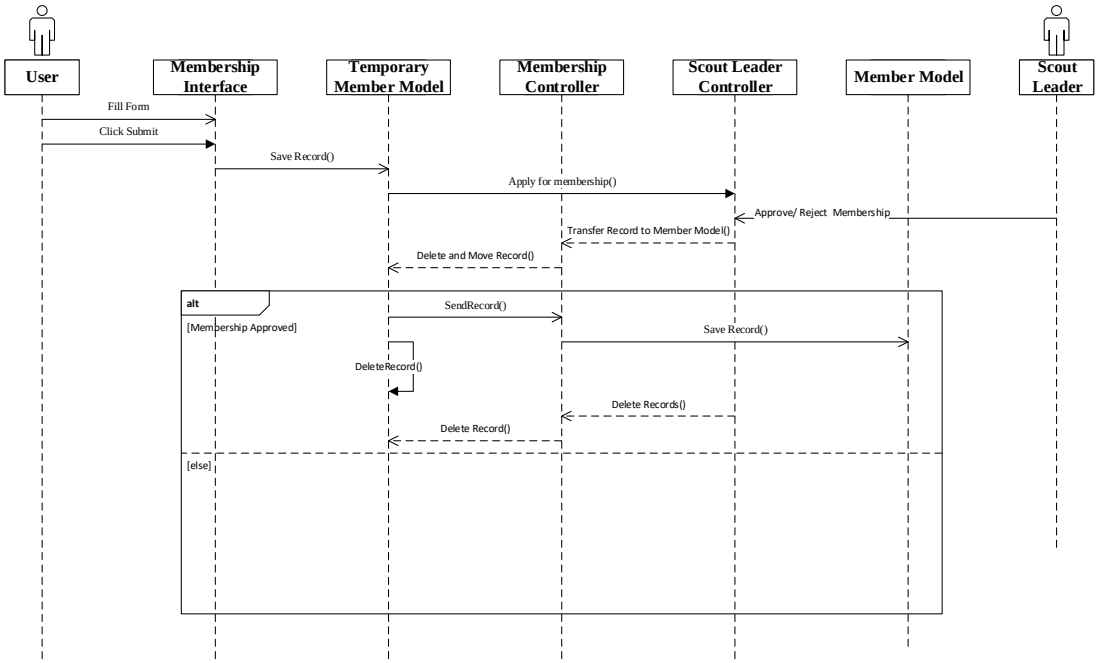


Figure 4-34 Sequence Diagram UC 02 Membership

4.5.3 UC 03 Dashboard

4.5.3.1 UC03.01-Member dashboard

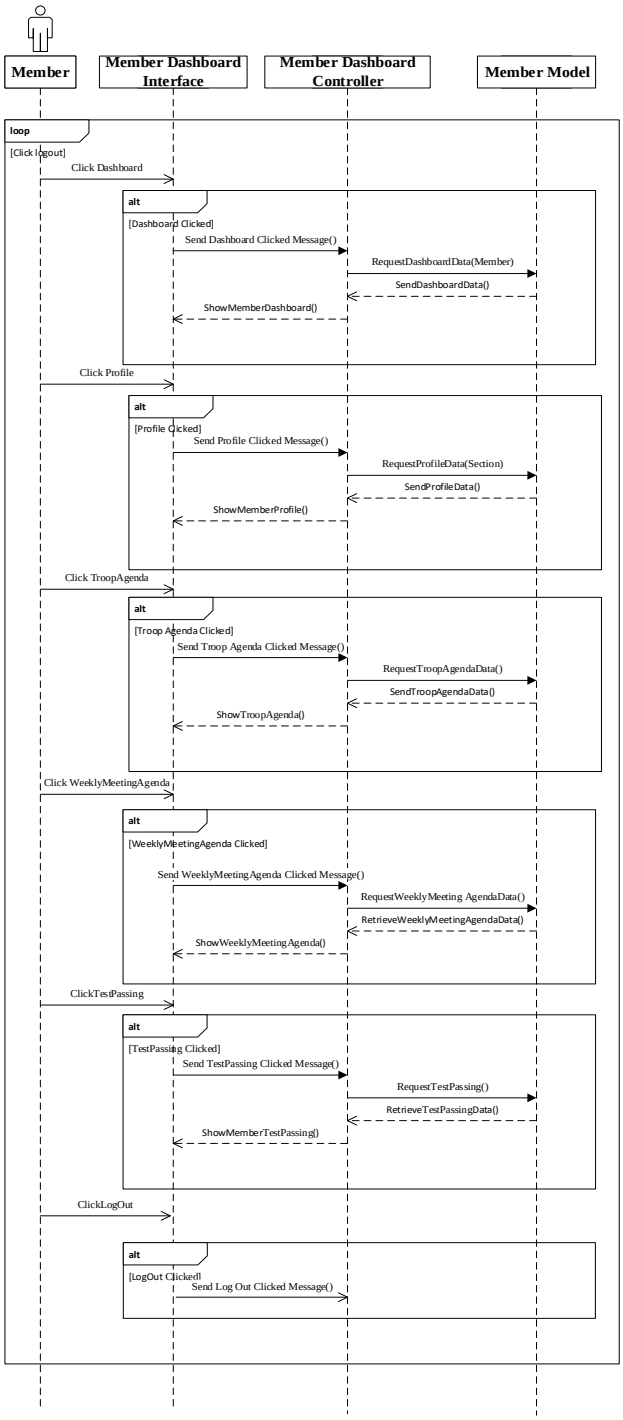


Figure 4-35 Sequence Diagram UC 03.01 Member Dashboard

4.5.3.2 UC03.02-Troop Leader Dashboard

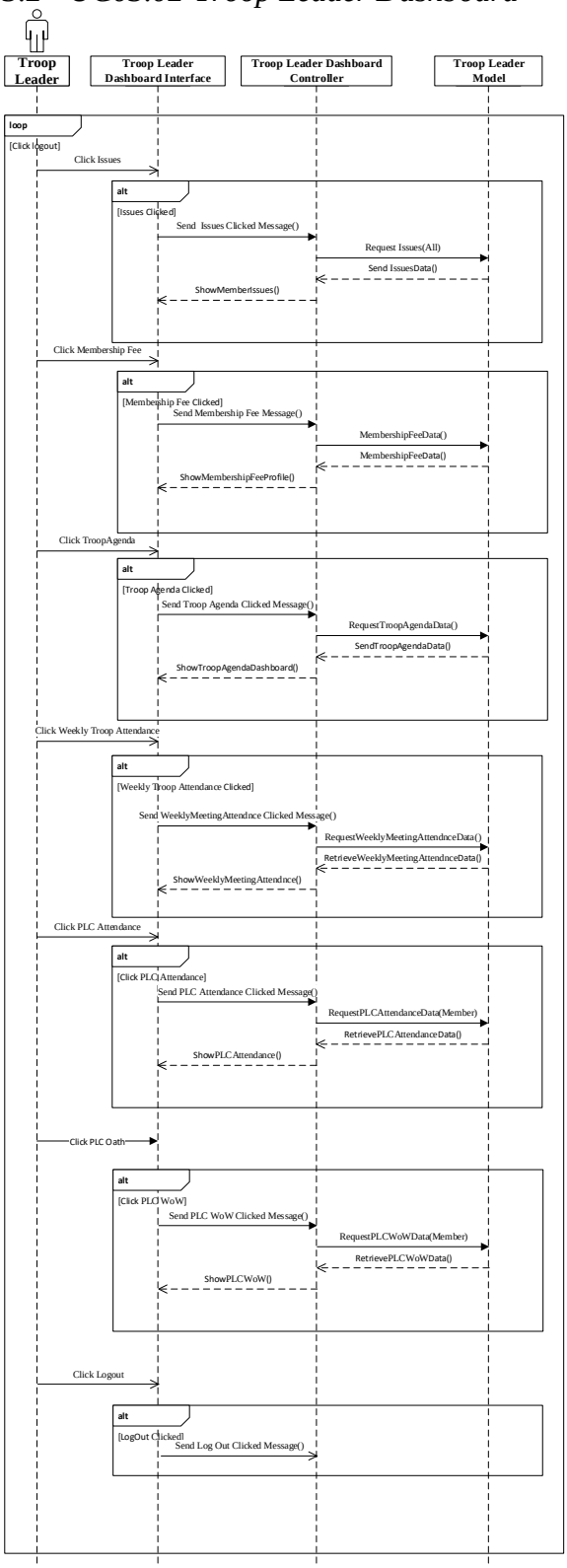


Figure 4-36 Sequence Diagram UC 03.02 Troop Leader Dashboard

4.5.3.3 UC03.03-PLC Meeting Dashboard

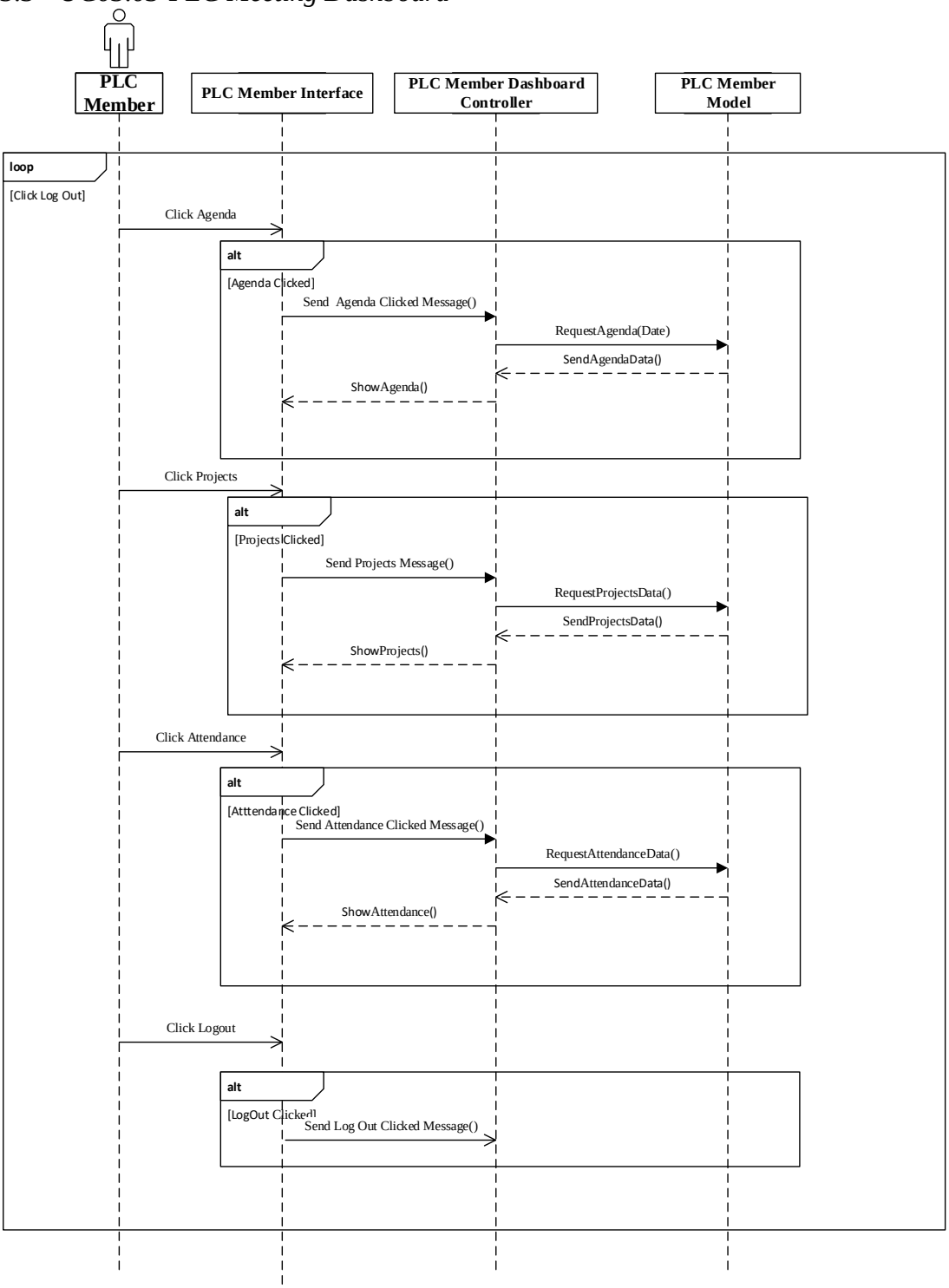


Figure 4-37 Sequence Diagram UC 03.02 PLC Meeting Dashboard

4.5.3.4 UC03.04-Storekeeper Dashboard

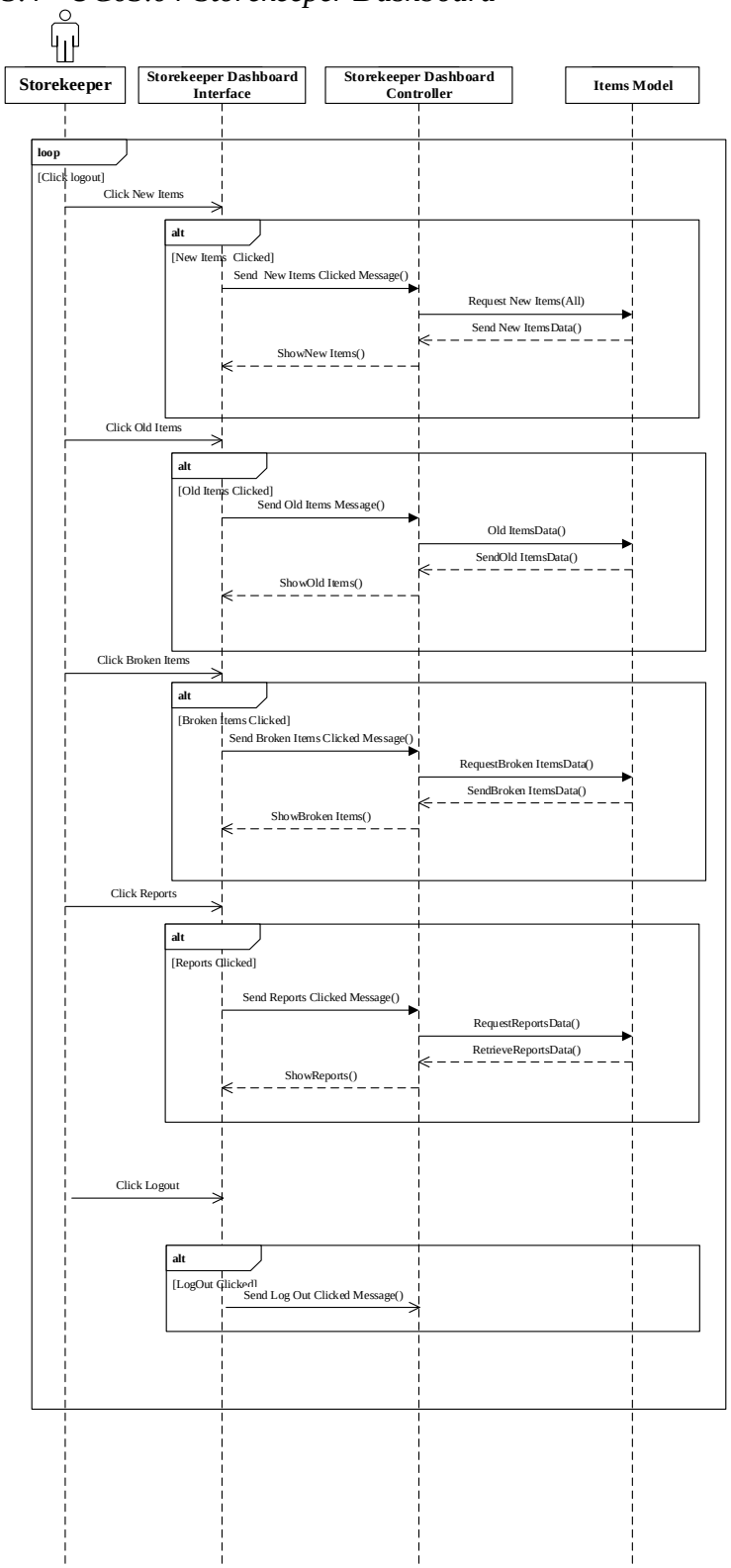


Figure 4-38 Sequence Diagram UC 03.04 Storekeeper Dashboard

4.5.3.5 UC03.05-Secretary Dashboard

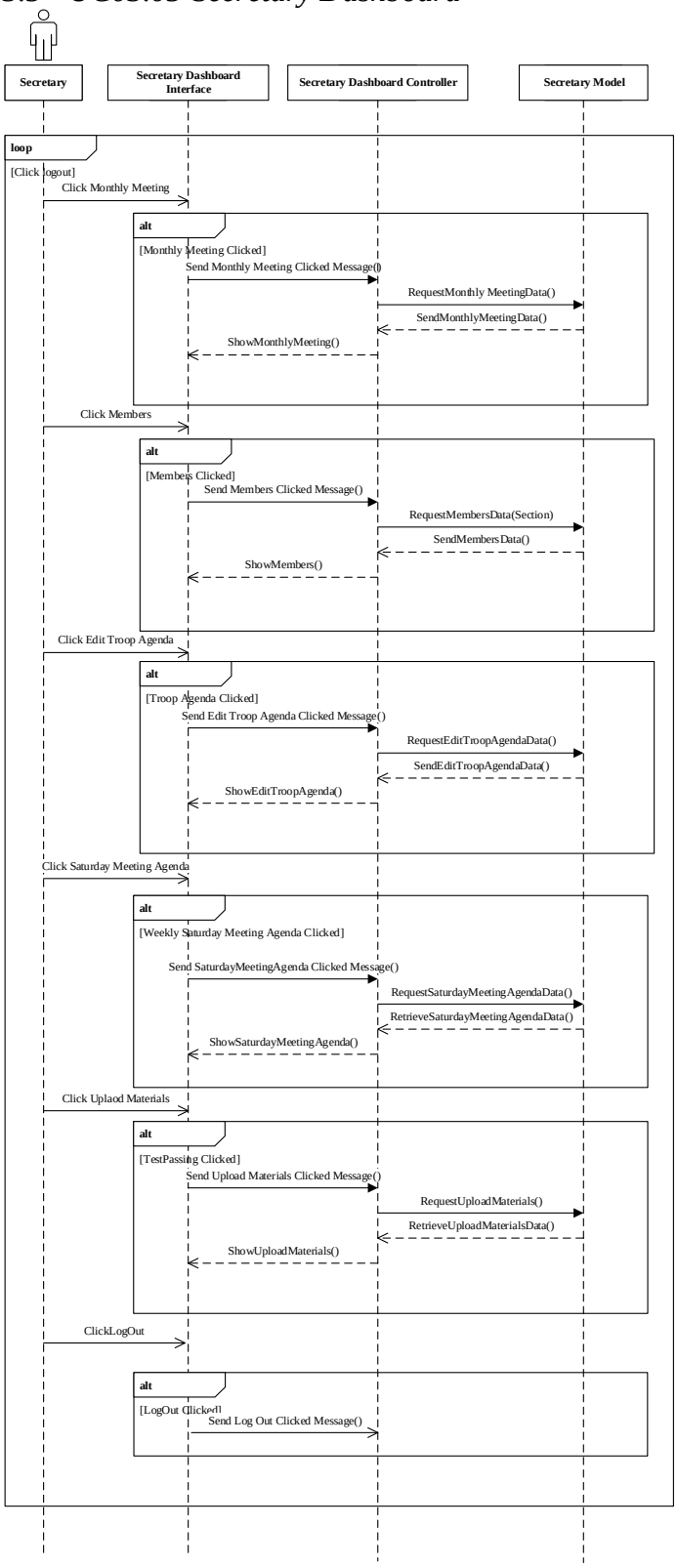


Figure 4-39 Sequence Diagram UC 03.05 Secretary Dashboard

4.5.3.6 UC03.06-Scout Leader Dashboard

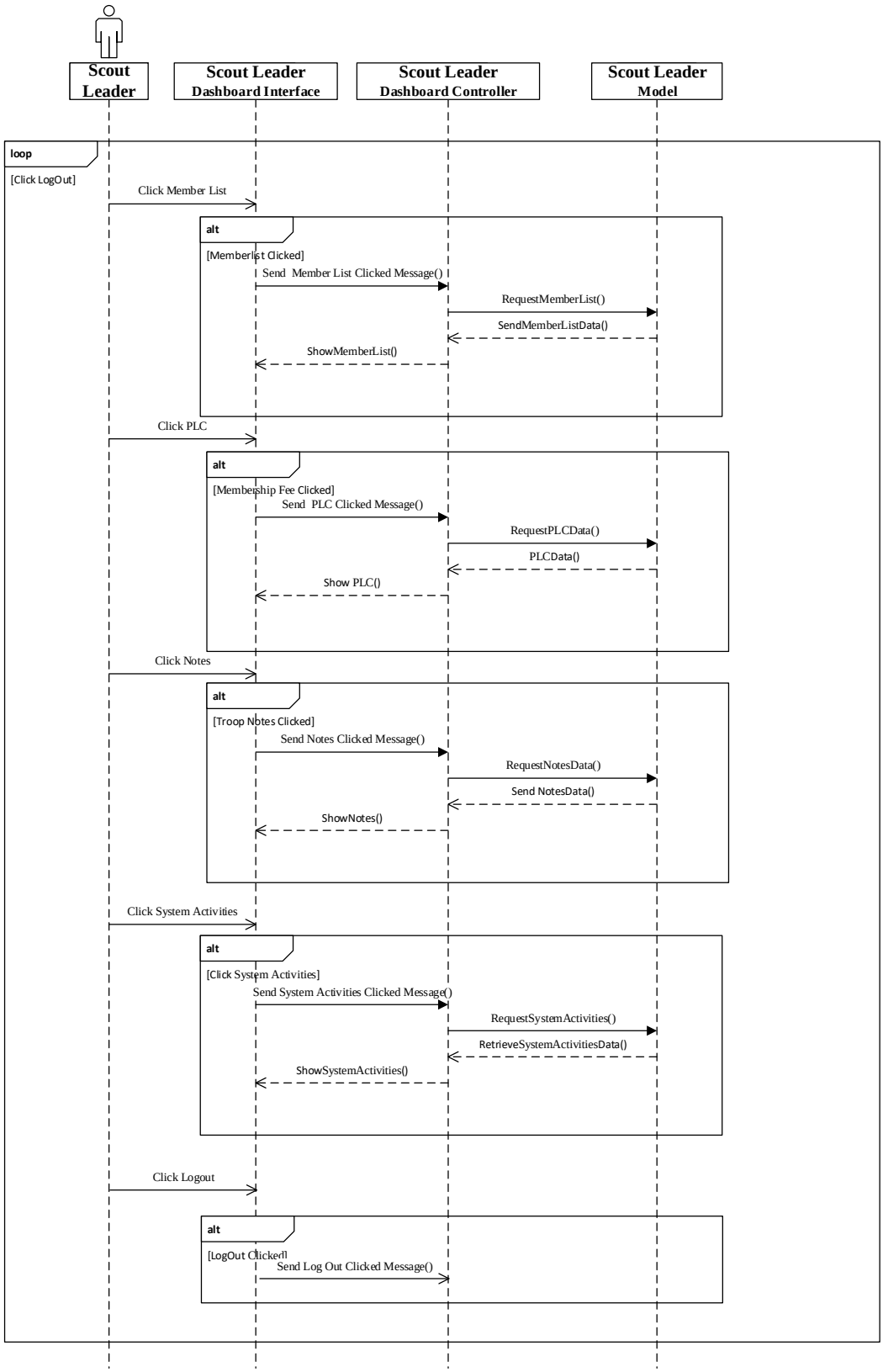


Figure 4-40 Sequence Diagram UC 03.06 Scout Leader Dashboard

4.5.3.7 UC03.07-Treasurer Dashboard

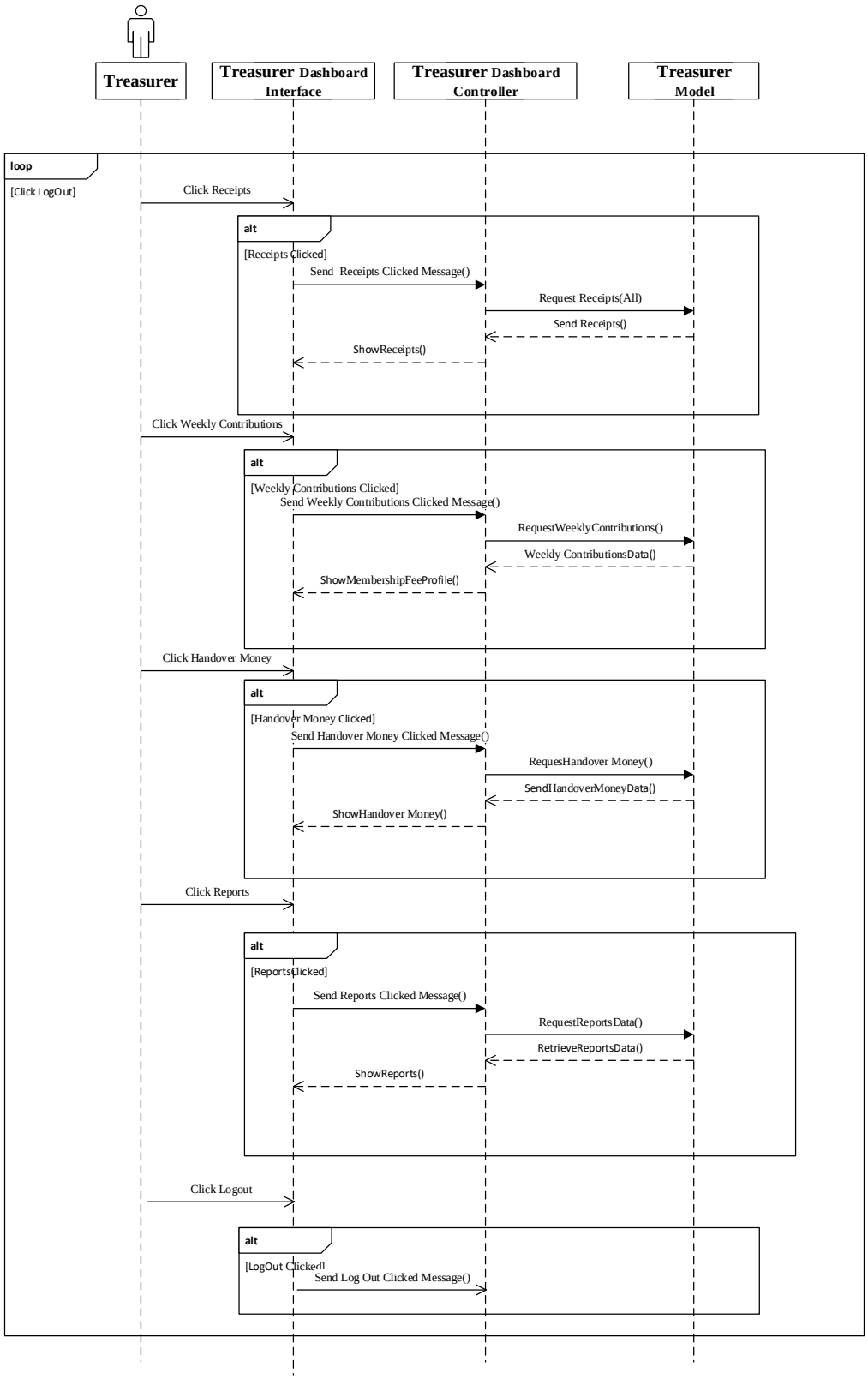


Figure 4-41 Sequence Diagram UC 03.07 Treasurer Dashboard

4.5.3.8 UC03.08-Patrol Leader Dashboard

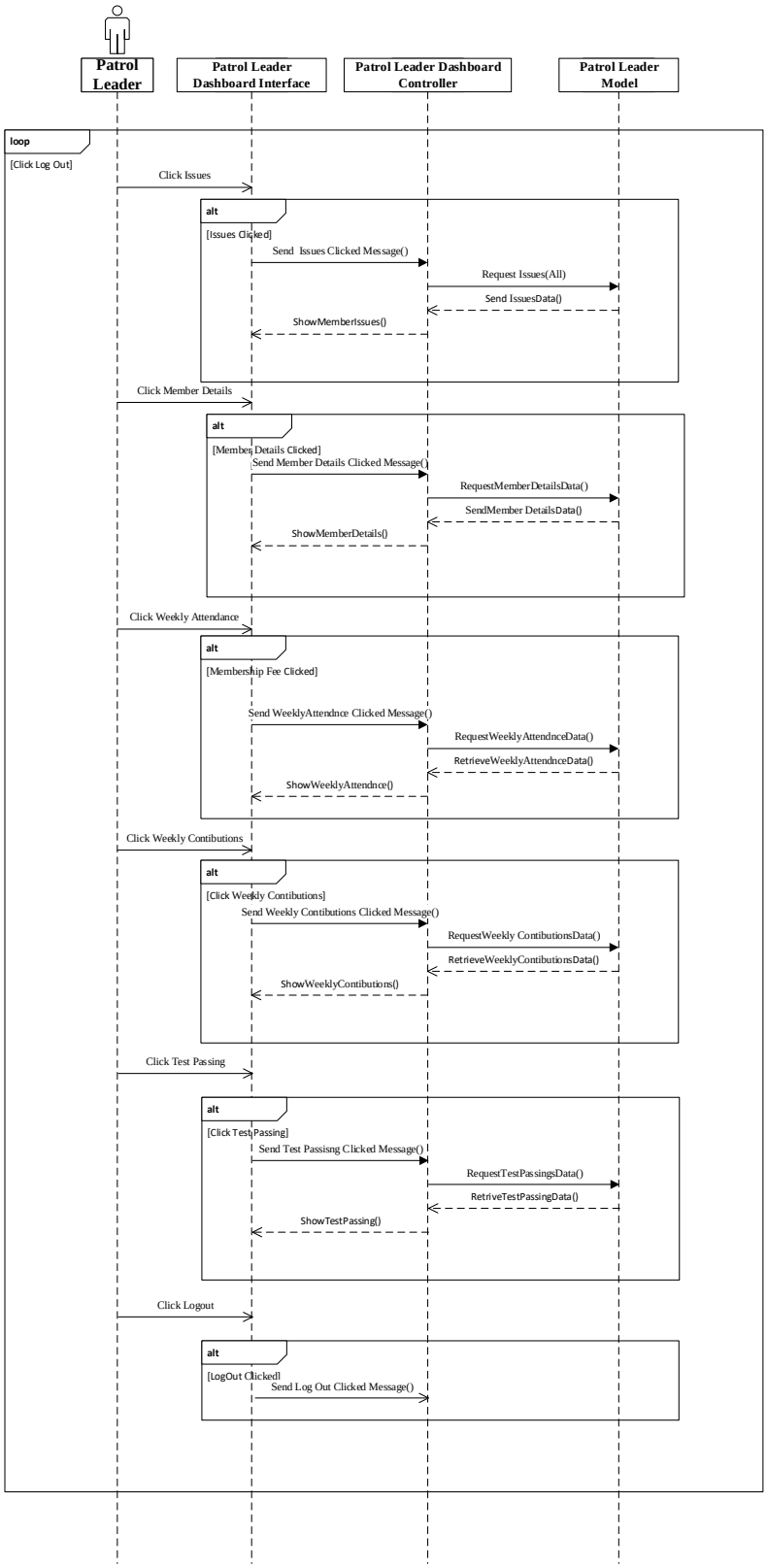


Figure 4-42 Sequence Diagram UC 03.08 Patrol Leader

4.5.3.9 UC03.09-Message

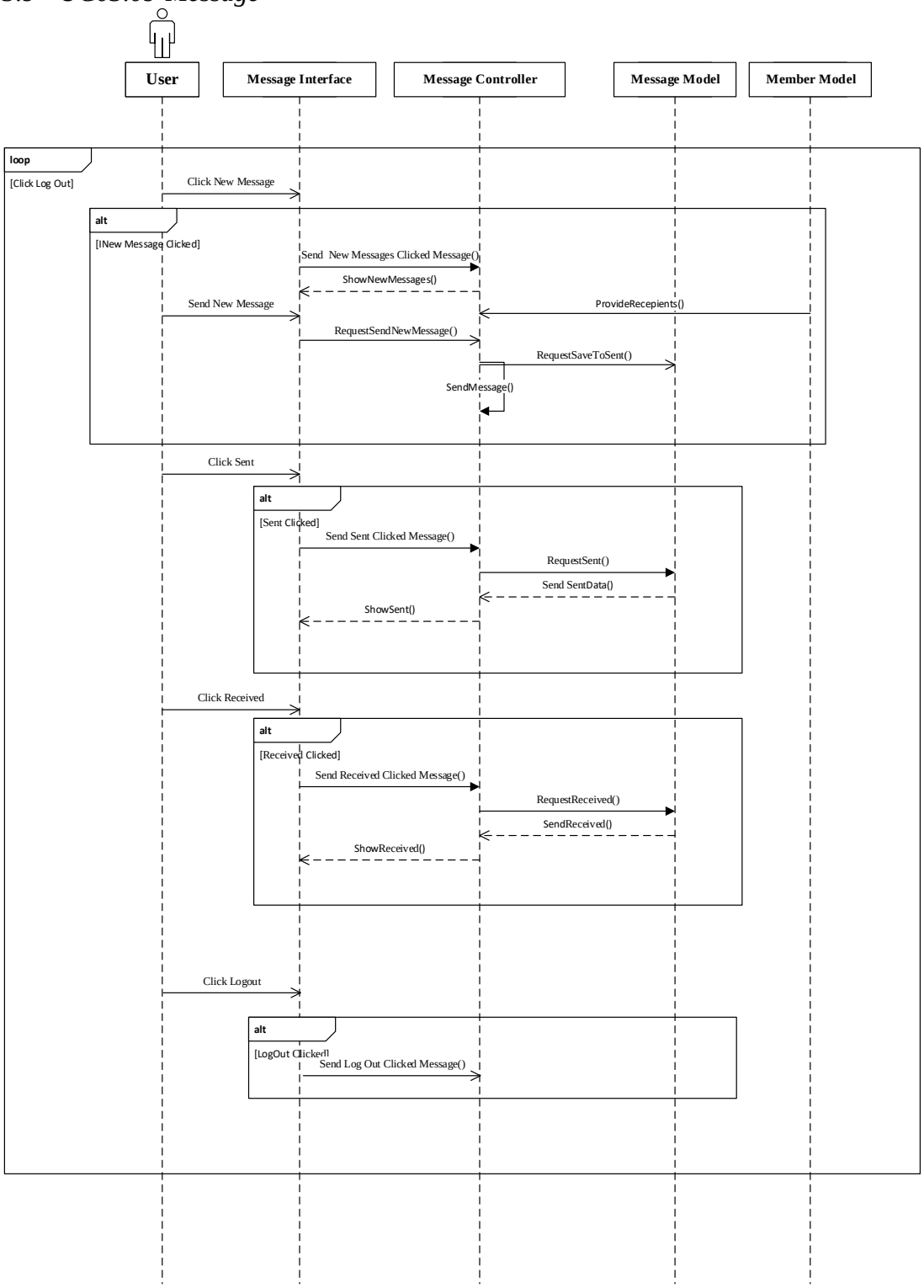


Figure 4-43 Sequence Diagram UC 03.09 Message Dashboard

4.5.3.10 UC03.10-Materials

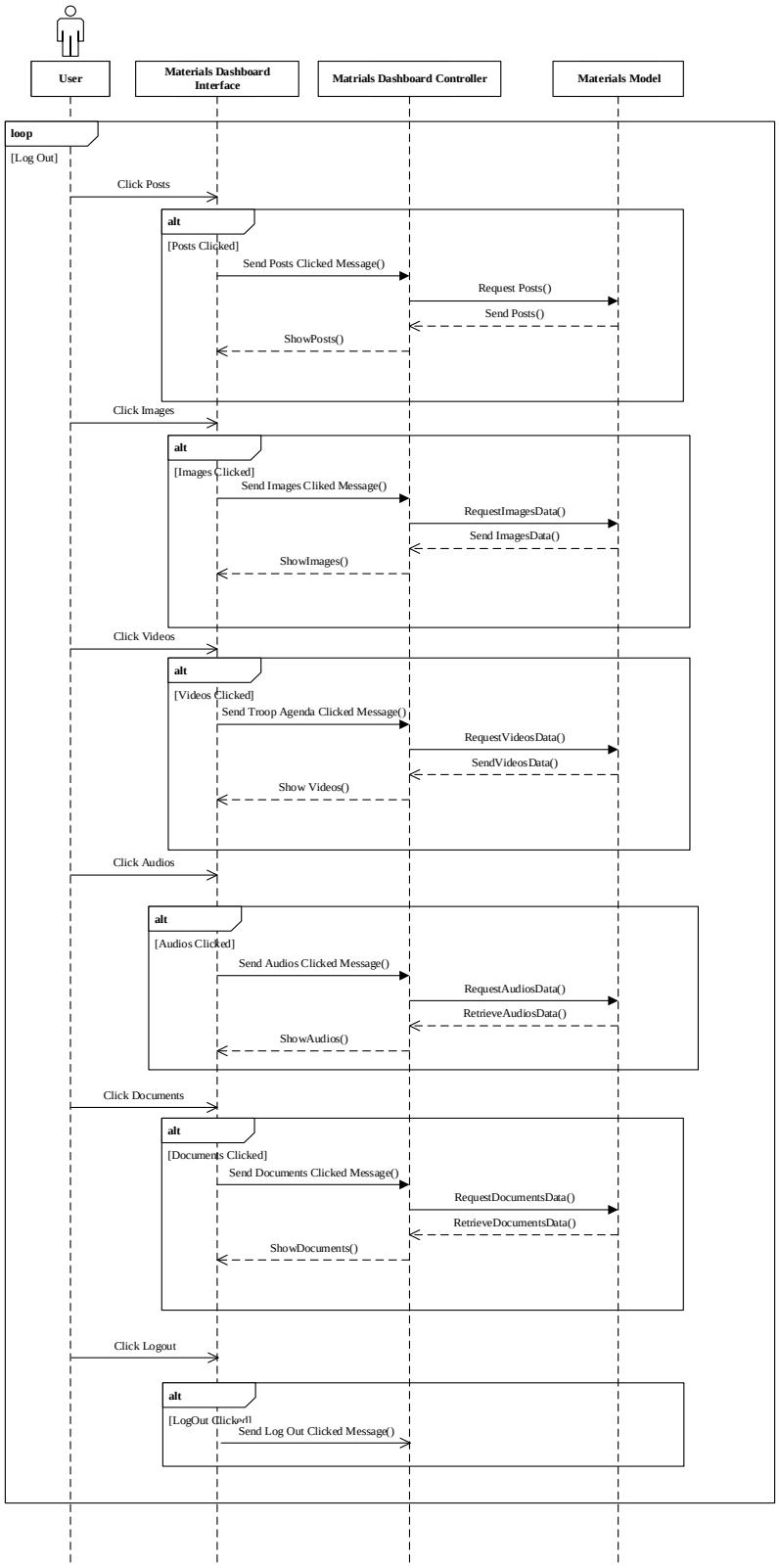


Figure 4-44 Sequence Diagram UC 03.10 Materials Dashboard

4.6 Normalized Database Design

4.6.1 ER Diagram

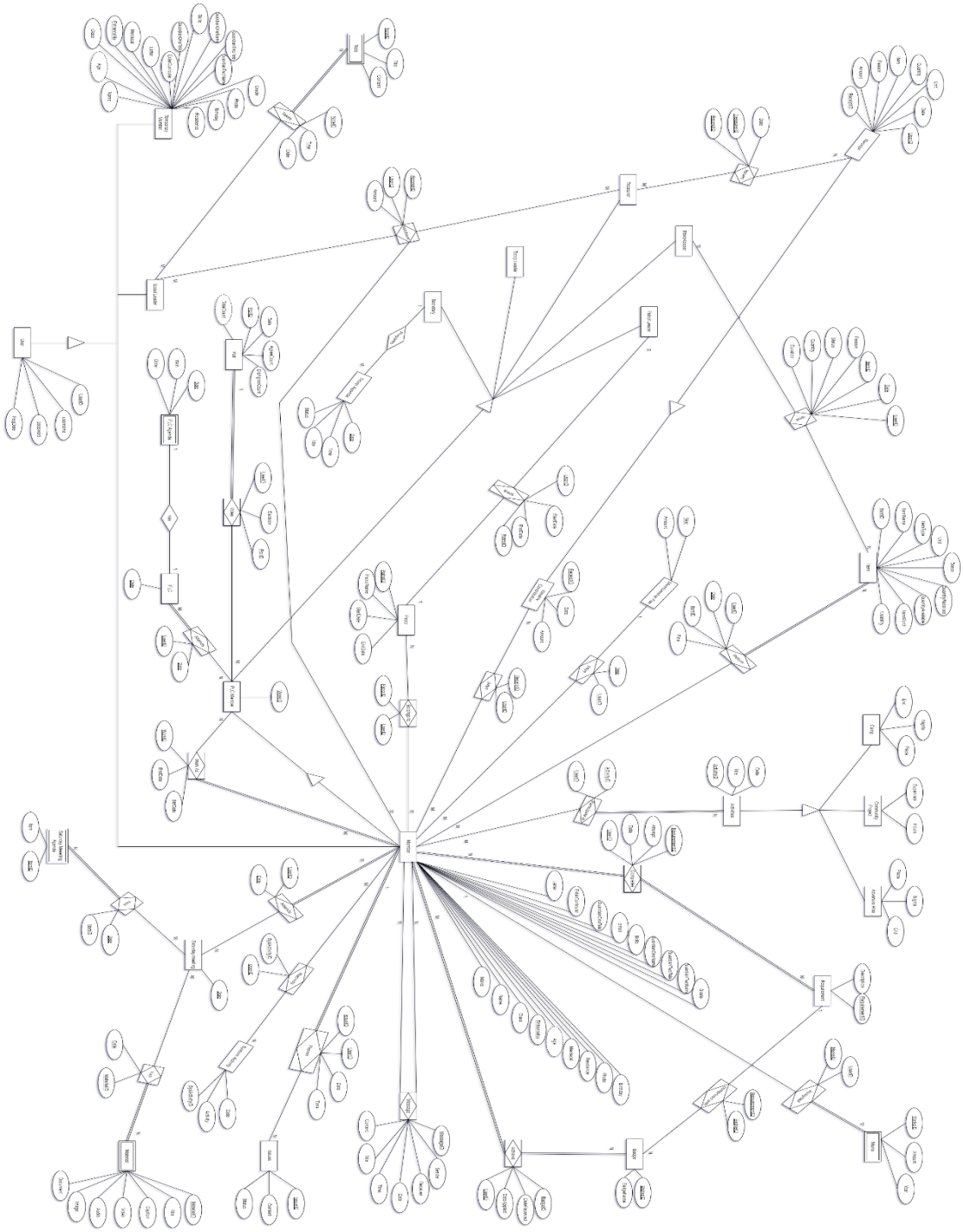


Figure 4-45 Design Entity Relationship Diagram

4.6.2 **Normalized Database**

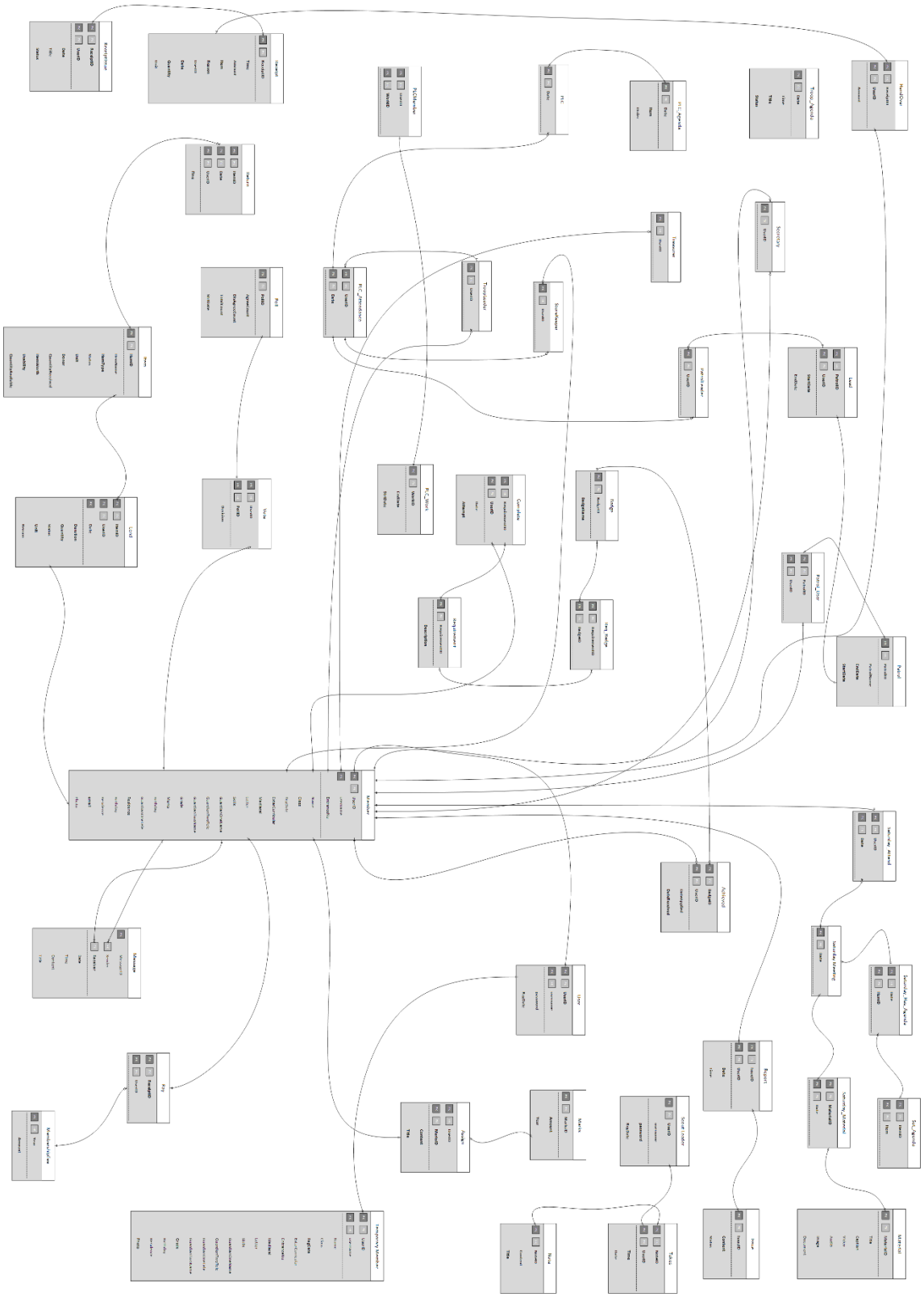


Figure 4-46 Normalized Database Diagram

4.7 Data Capturing Layouts and Report Layouts

4.7.1 Landing Page

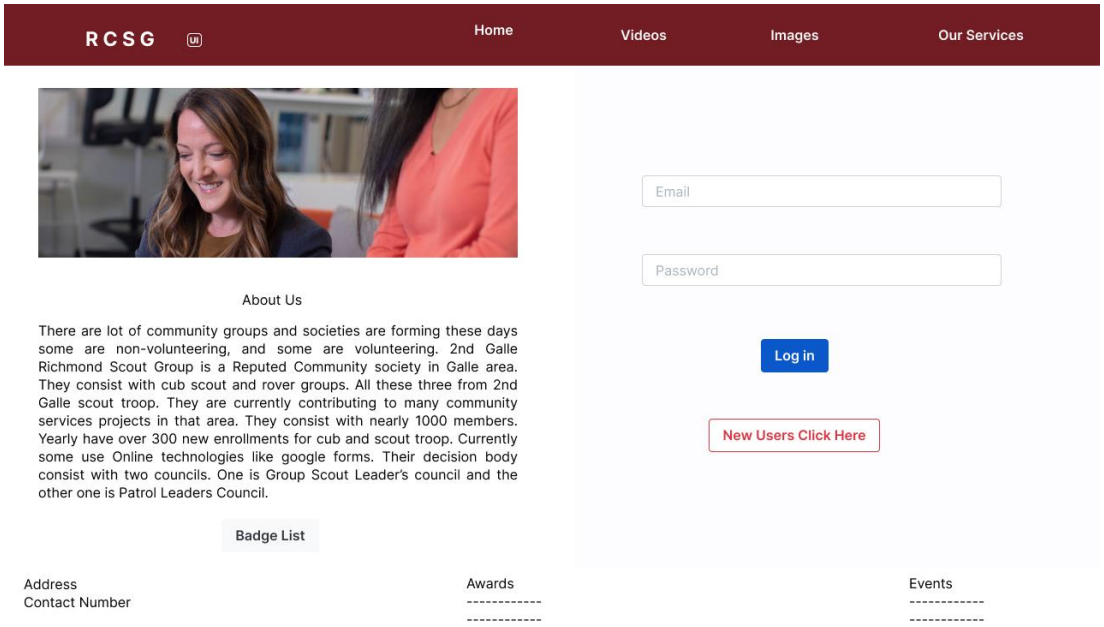
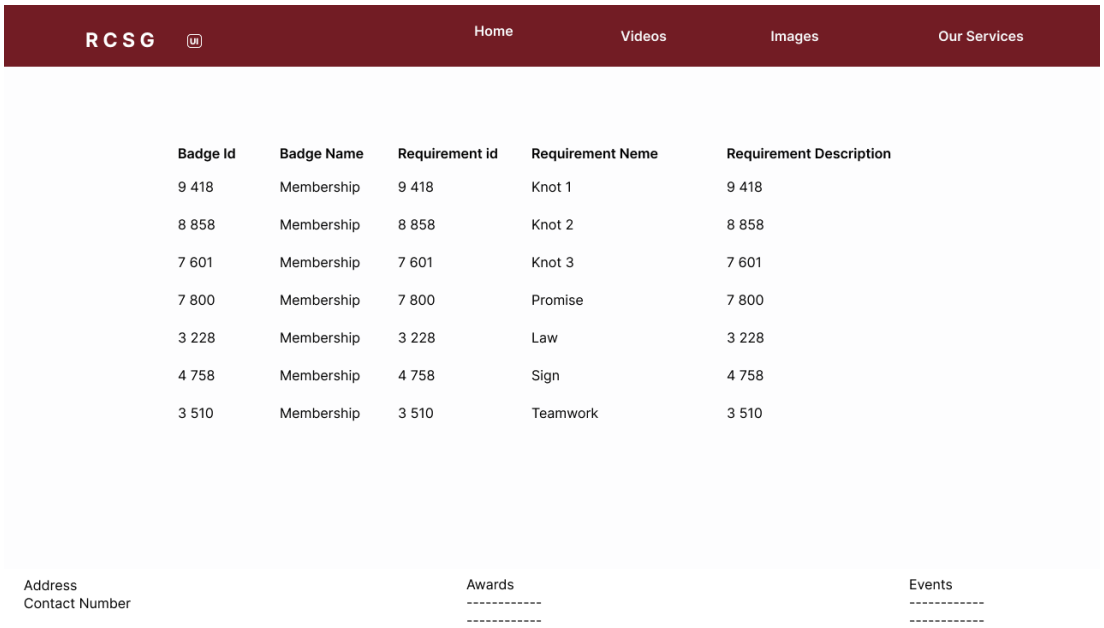


Figure 4-47 User Interface Landing Page



Badge Id	Badge Name	Requirement id	Requirement Neme	Requirement Description
9 418	Membership	9 418	Knot 1	9 418
8 858	Membership	8 858	Knot 2	8 858
7 601	Membership	7 601	Knot 3	7 601
7 800	Membership	7 800	Promise	7 800
3 228	Membership	3 228	Law	3 228
4 758	Membership	4 758	Sign	4 758
3 510	Membership	3 510	Teamwork	3 510

Figure 4-48 User Interface Requirements

4.7.2 Registration Page

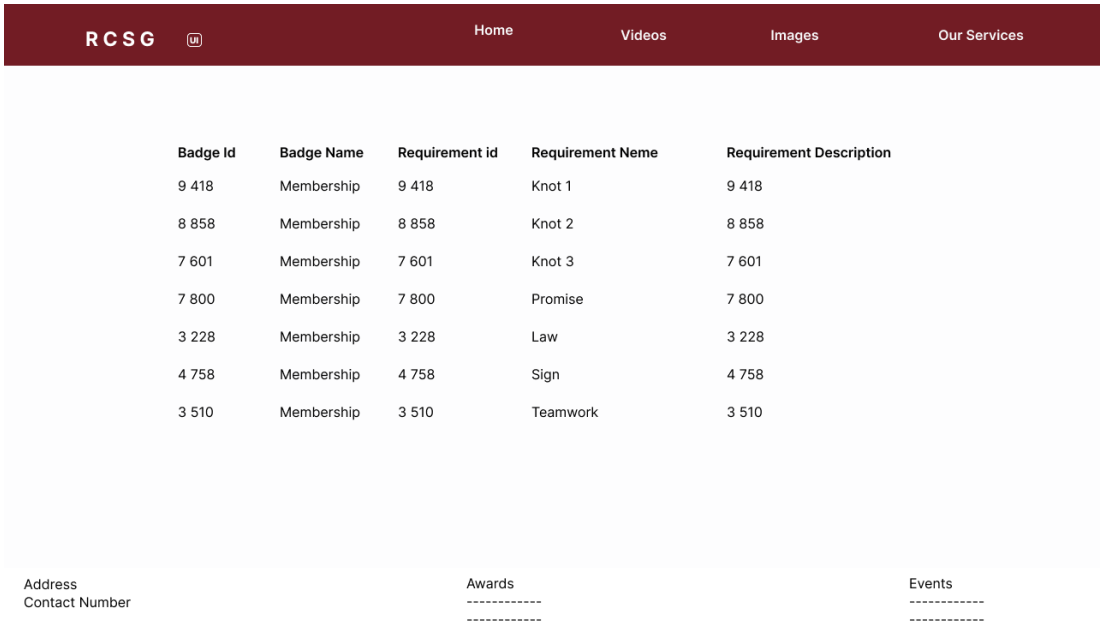


Figure 4-49 User Interface Registration

4.7.3 Member Dashboards

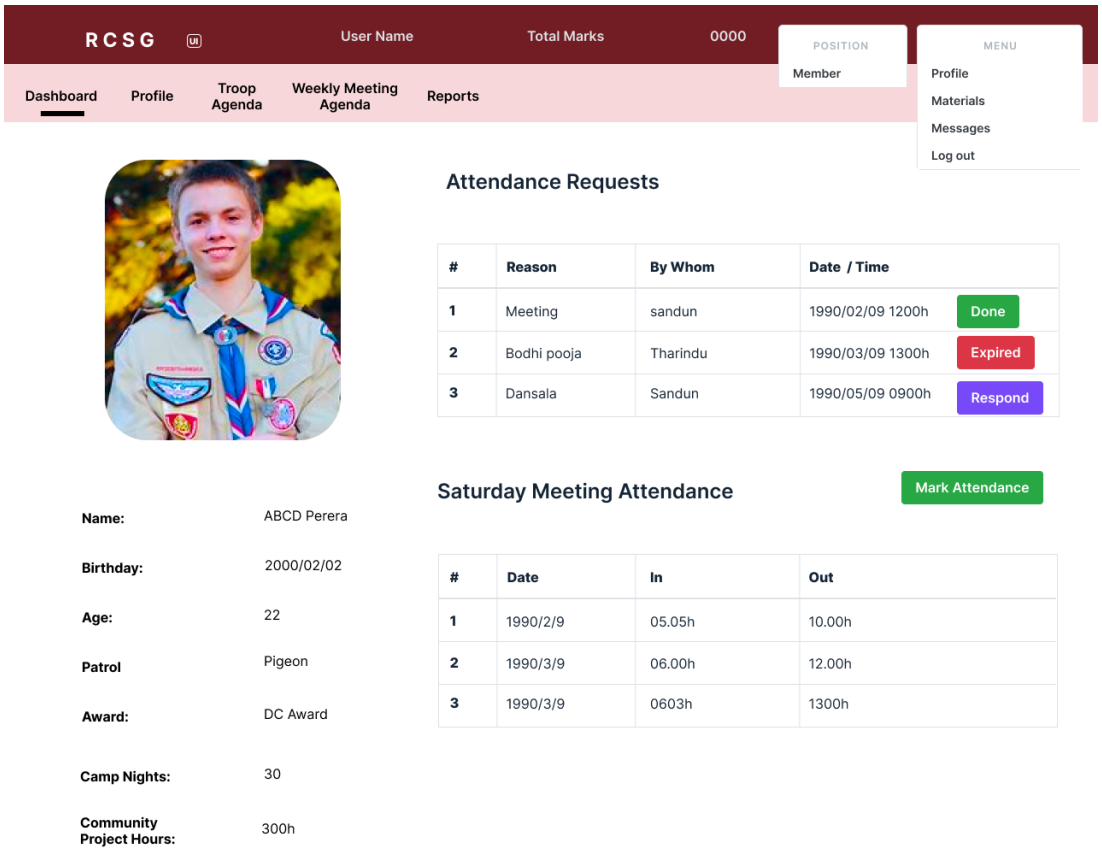


Figure 4-50 User Interface Member Dashboard

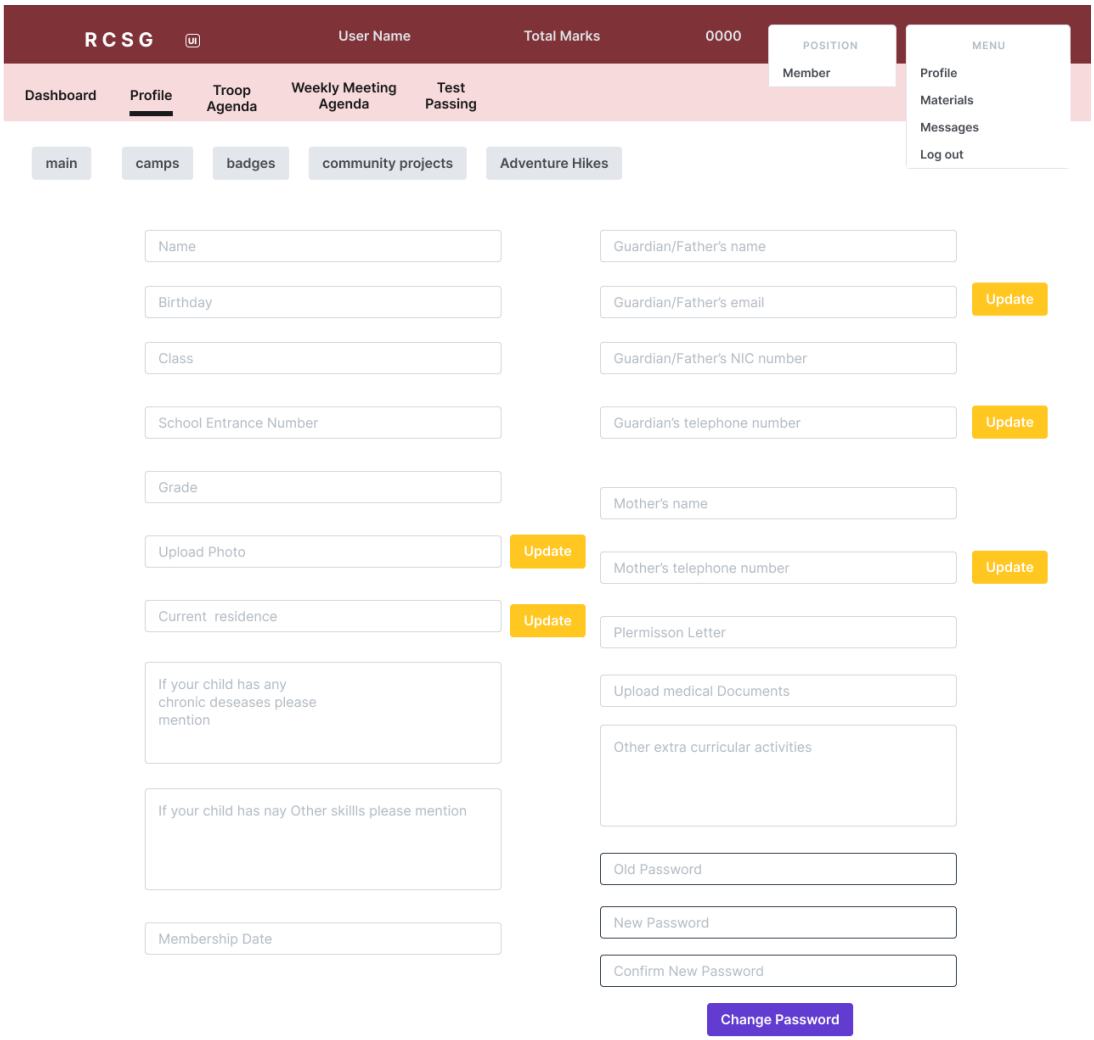


Figure 4-51 User Interface Member Profile

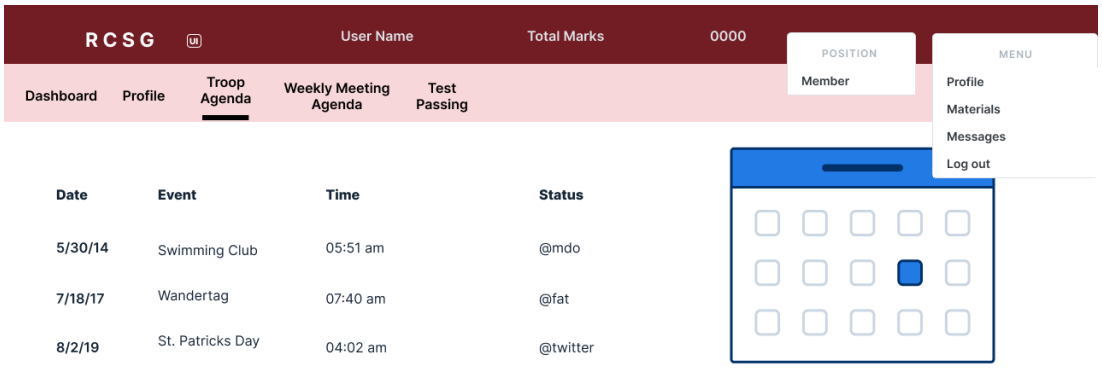


Figure 4-52 User Interface Member Troop Agenda

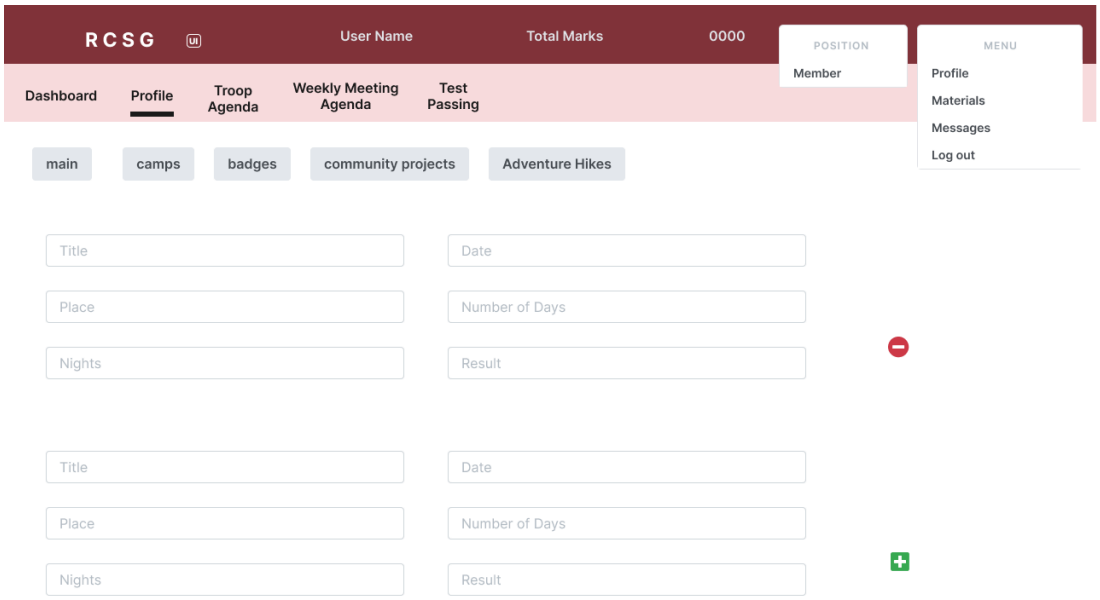


Figure 4-53 User Interface Member Adventure Hikes

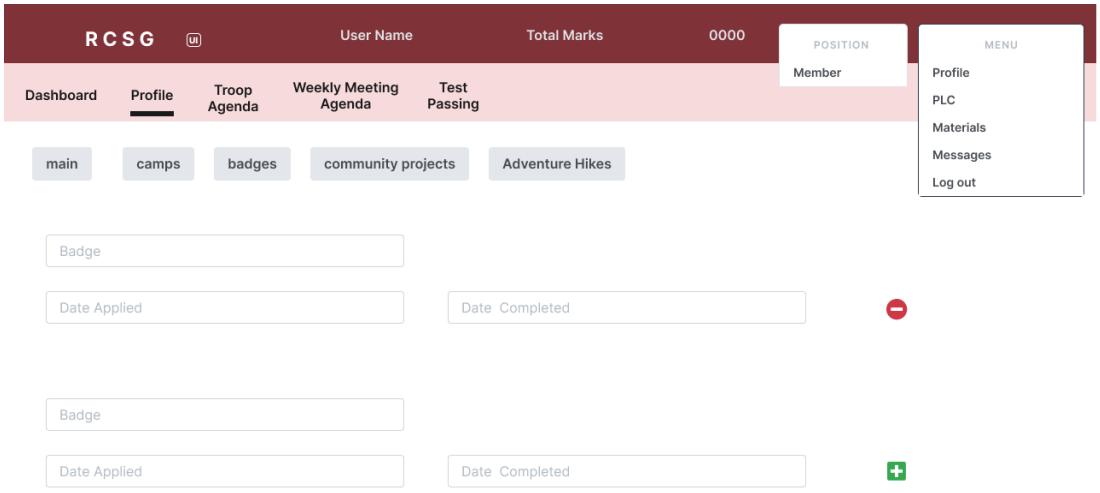


Figure 4-54 User Interface Member Badges

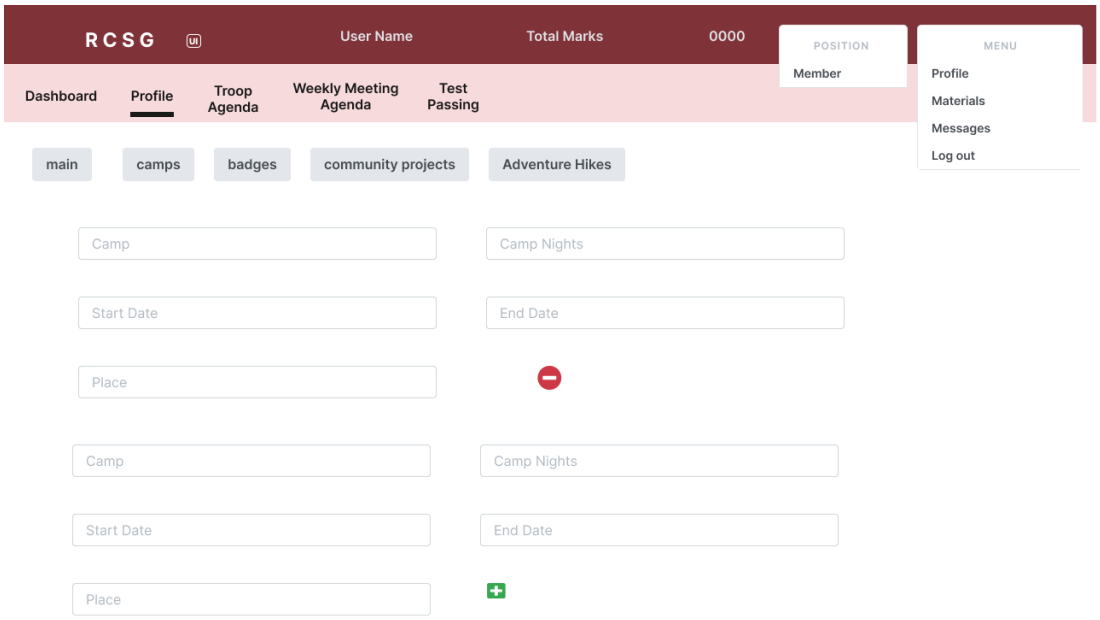


Figure 4-55 User Interface Member Camps

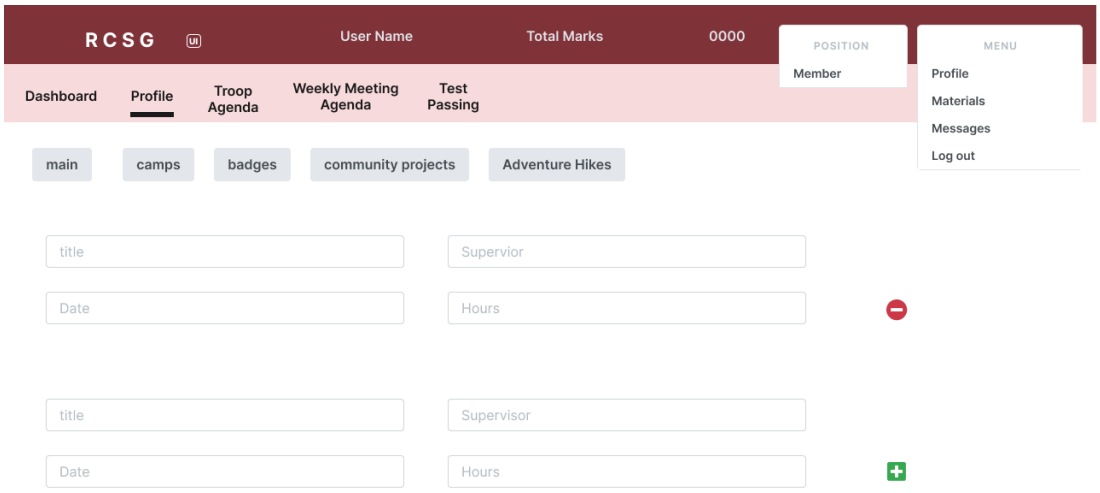


Figure 4-56 User Interface Member Community Projects

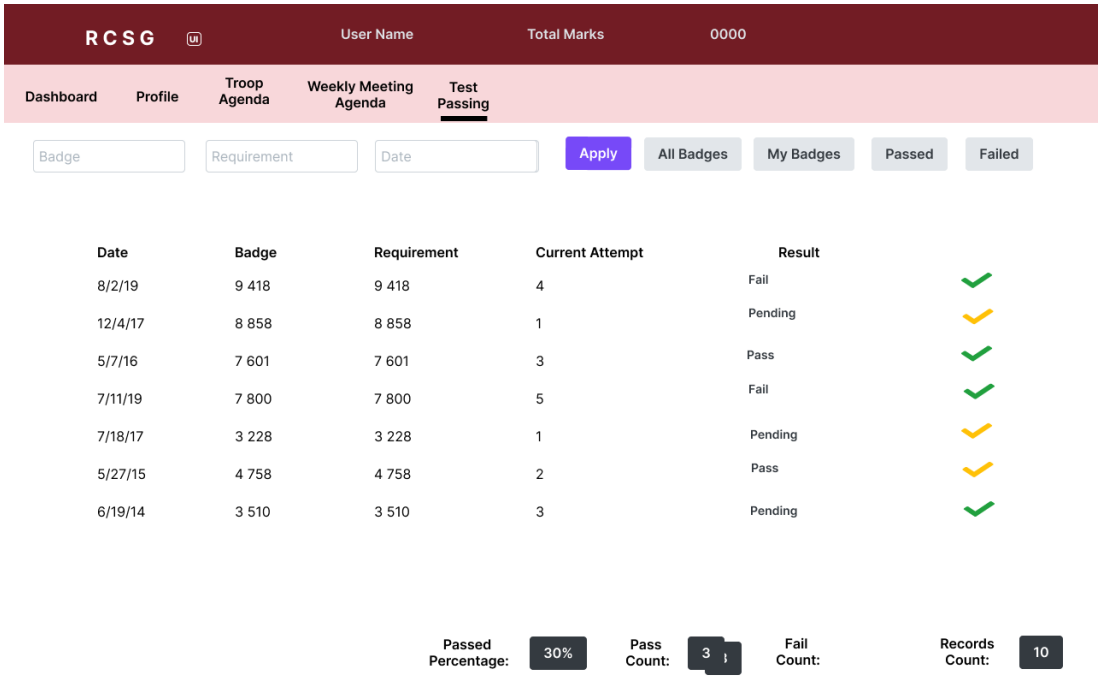


Figure 4-57 User Interface Member Test Passing

4.7.4 Scout Leader Dashboards

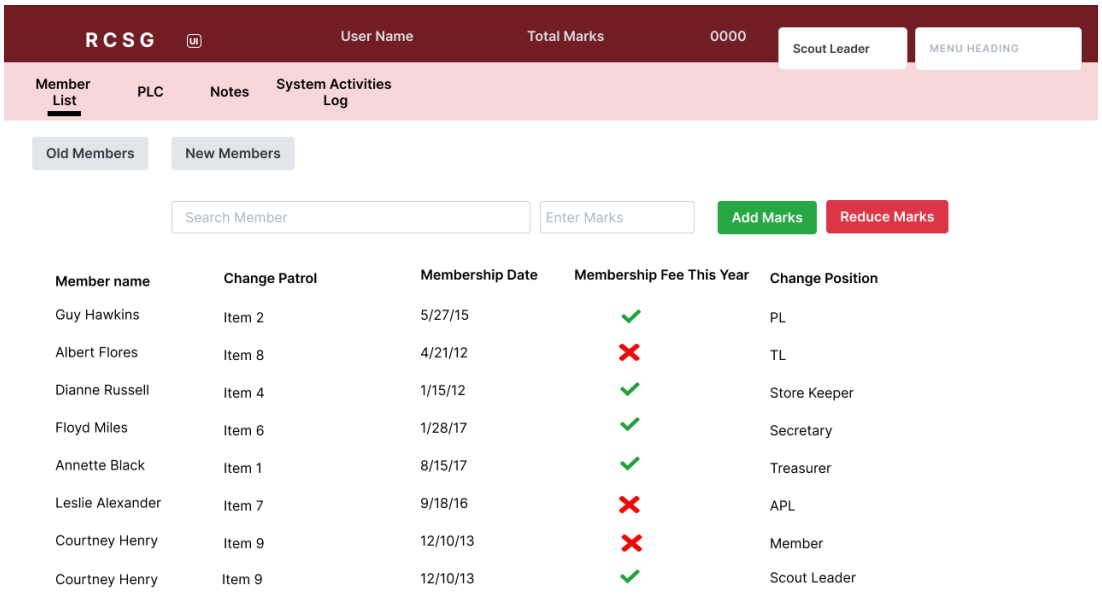


Figure 4-58 User Interface SL Old members

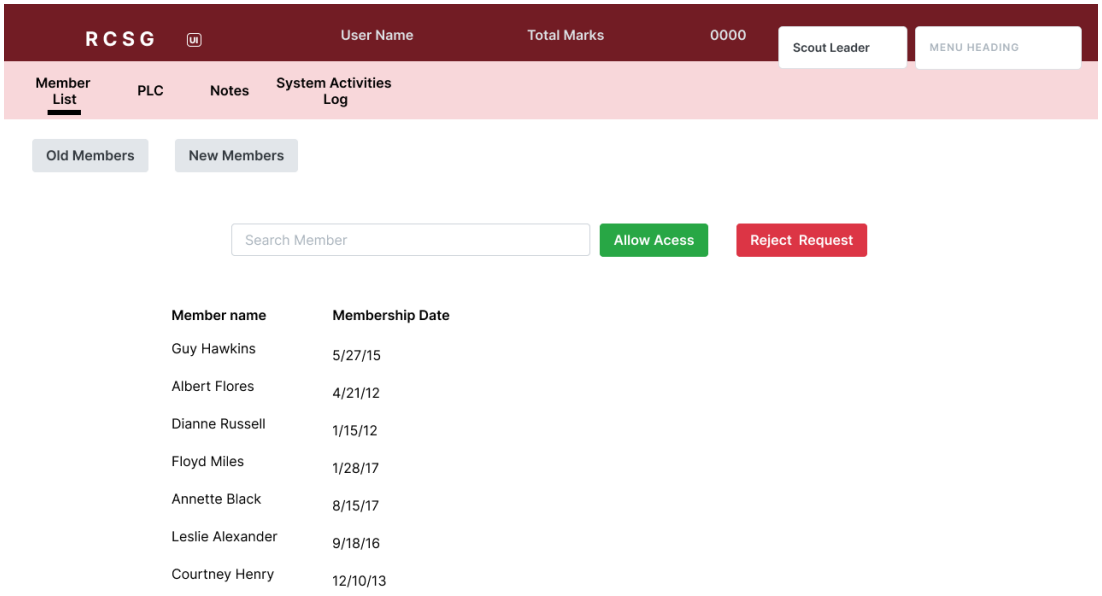


Figure 4-59 User Interface SL New Members

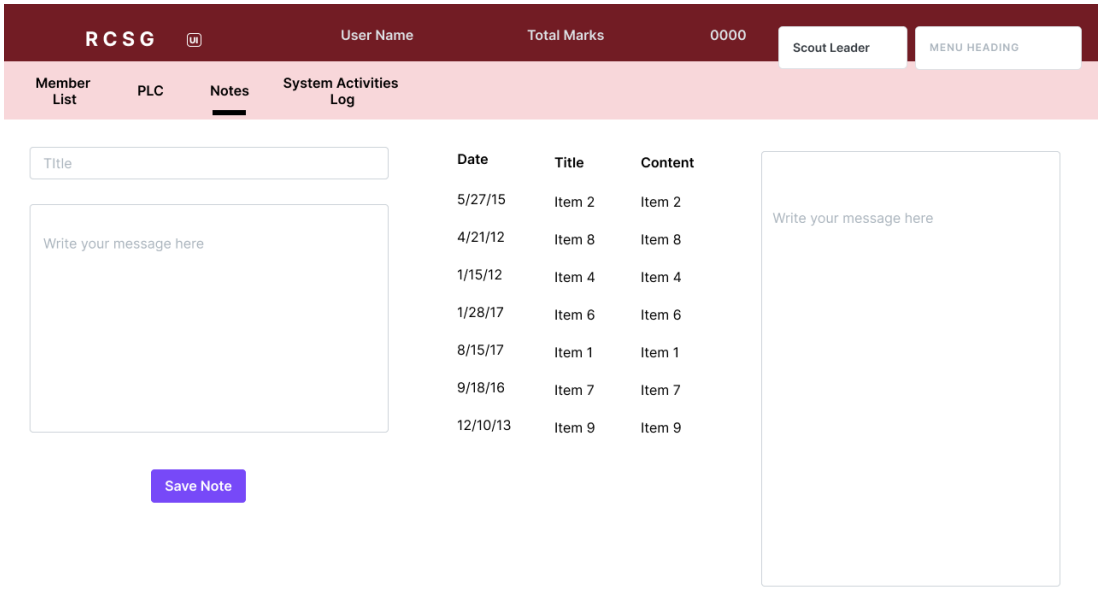


Figure 4-60 User Interface SL Notes

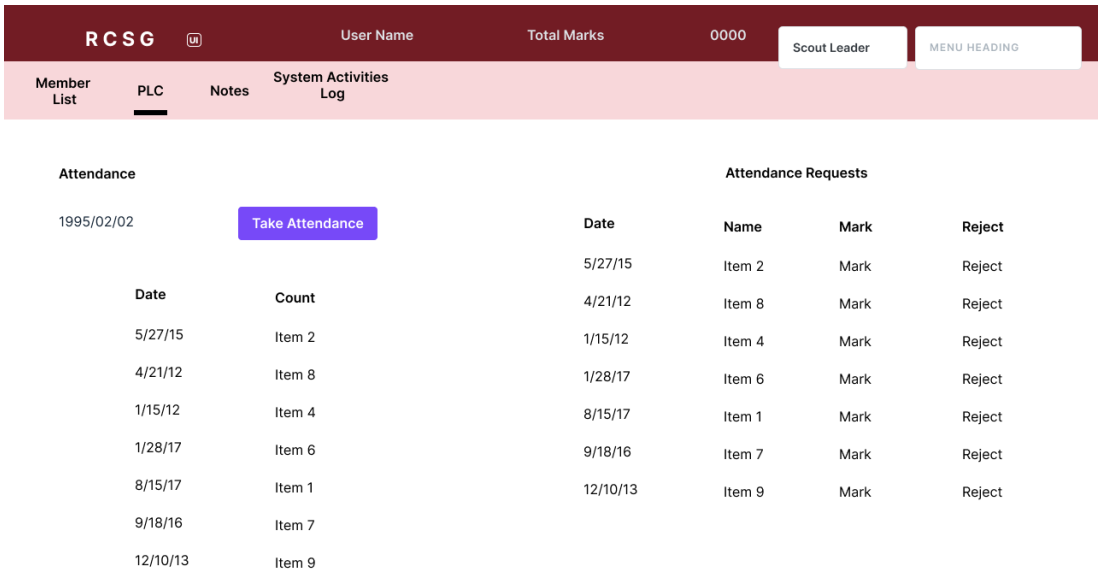


Figure 4-61 User Interface SL PLC

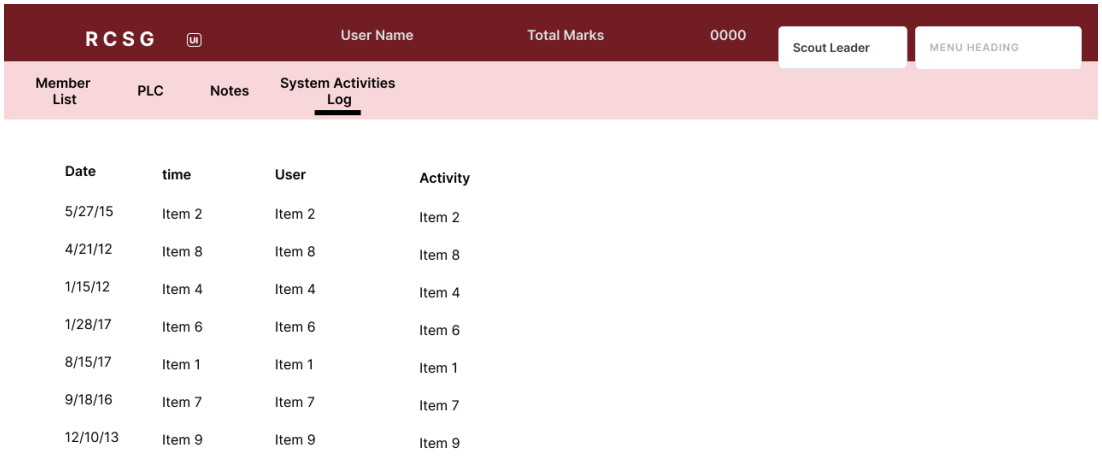


Figure 4-62 User Interface SL System Activities

4.7.5 Patrol Leader Dashboards

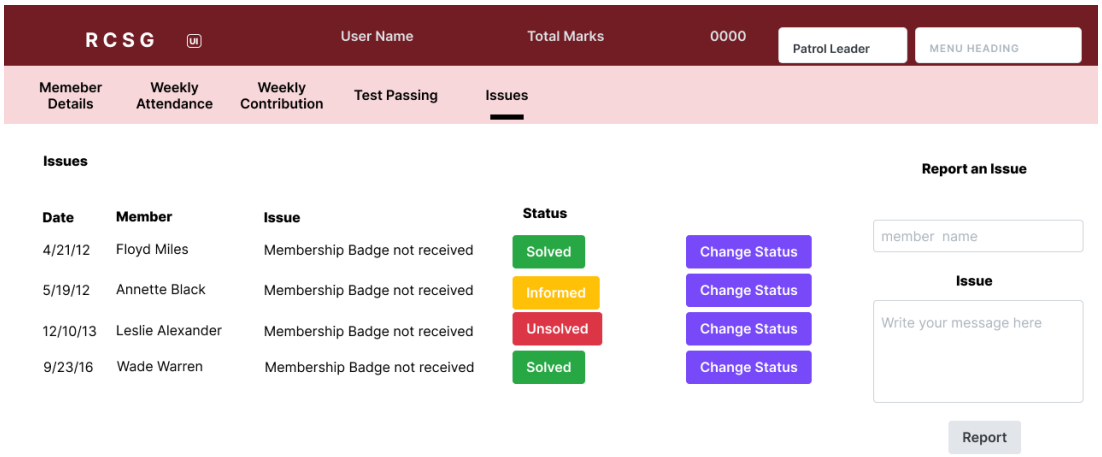


Figure 4-63 User Interface PL Issues

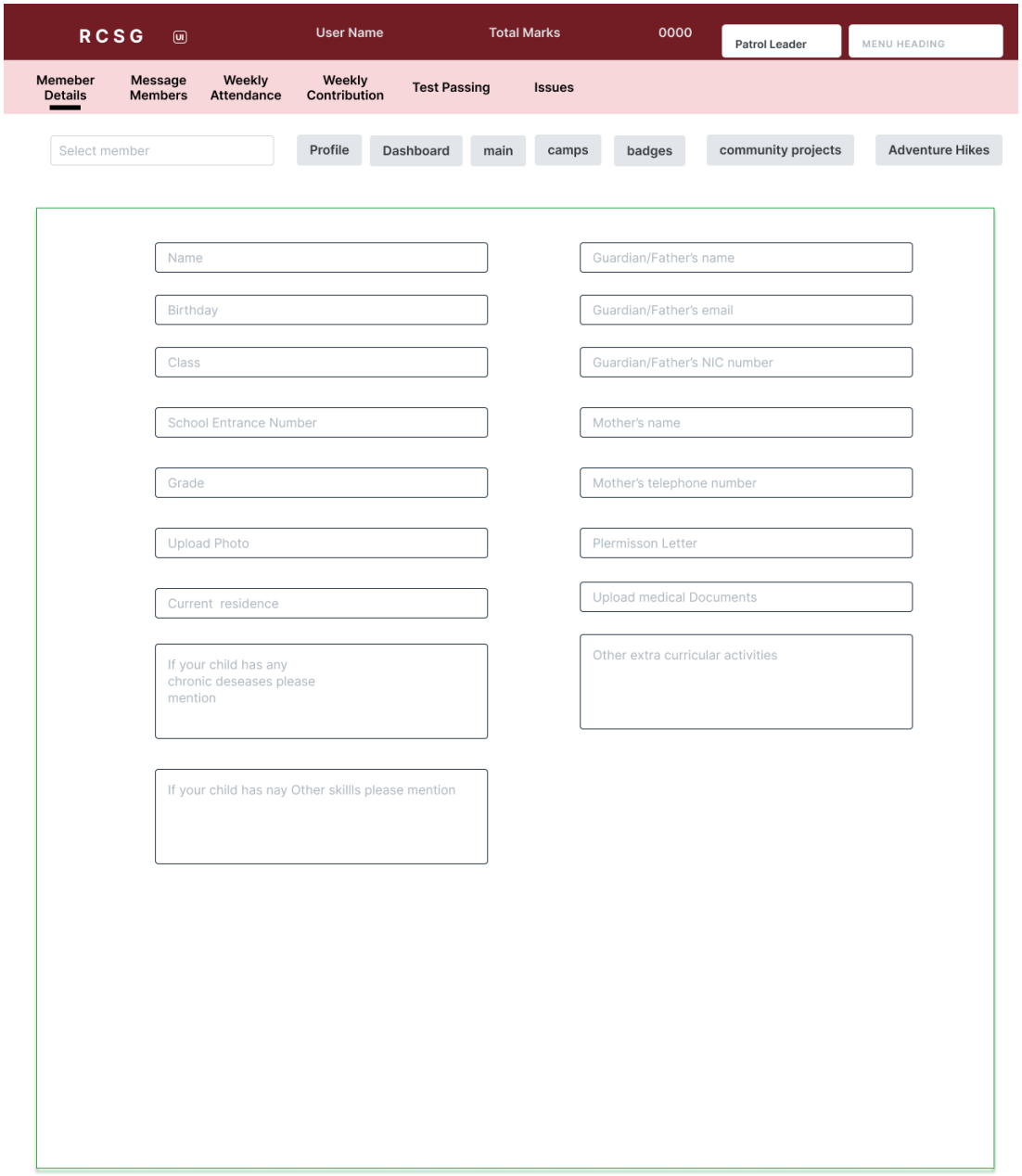


Figure 4-64 User Interface PL Member Details

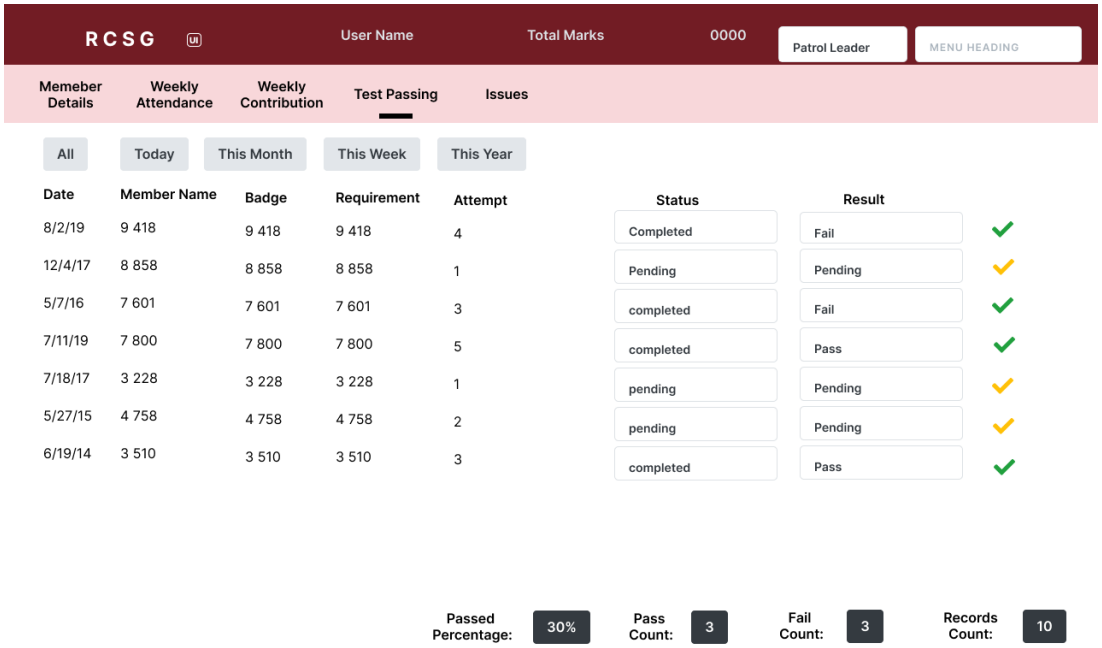


Figure 4-65 User Interface PL Test Passing

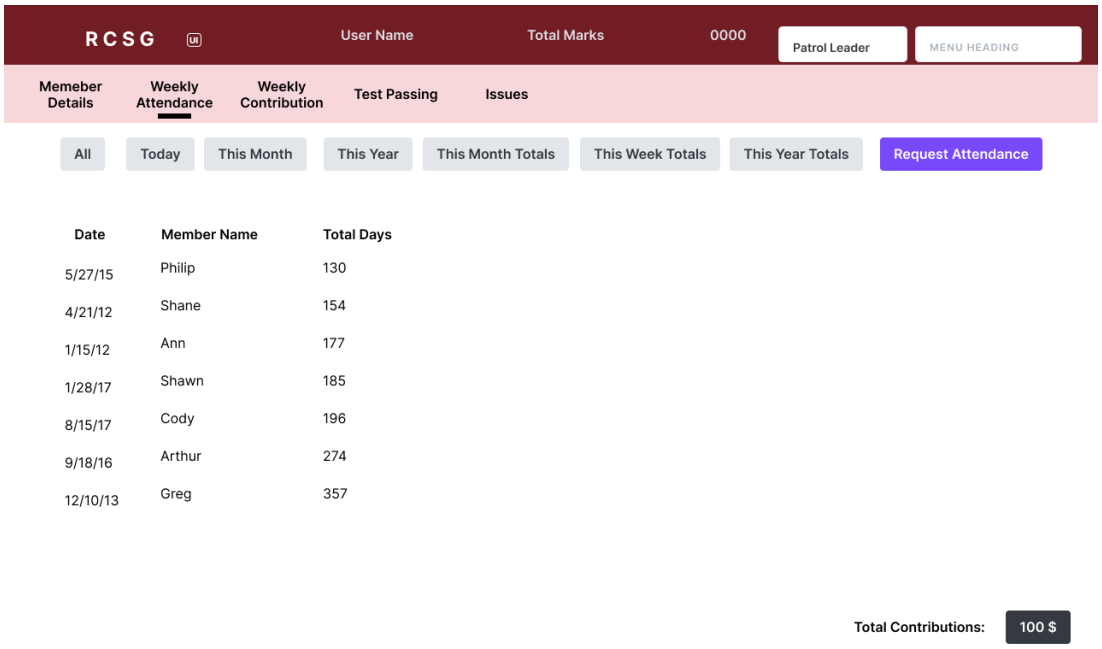


Figure 4-66 User Interface PL weekly Attendance

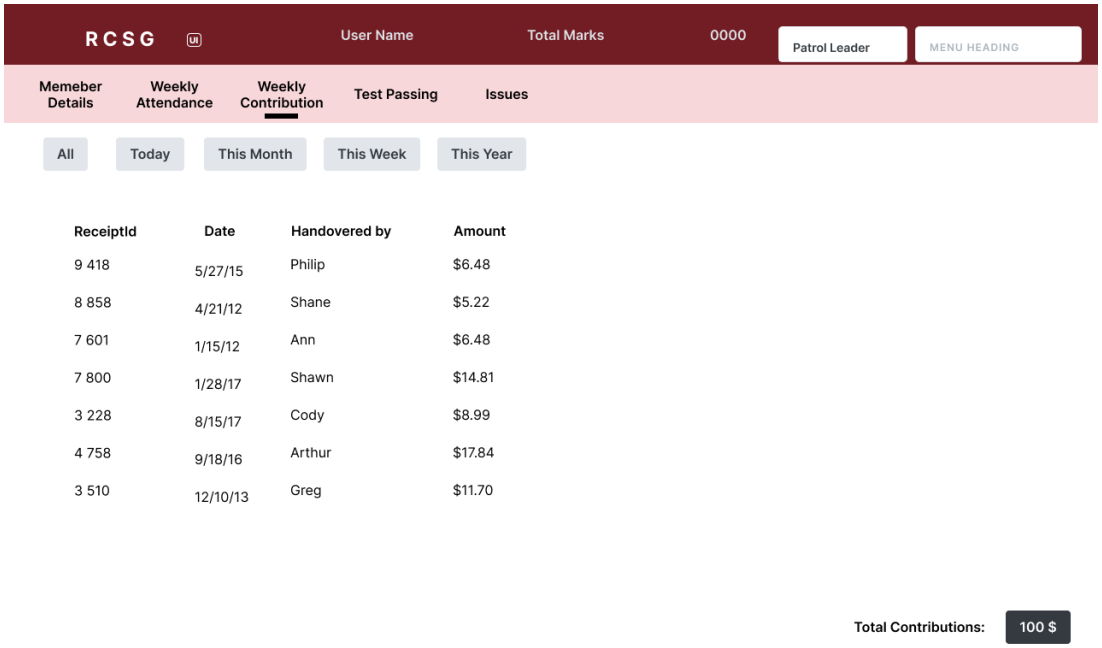


Figure 4-67 User Interface PL Weekly Contribution

4.7.6 Troop Leader Dashboards

Figure 4-68 User Interface TL Membership Fee

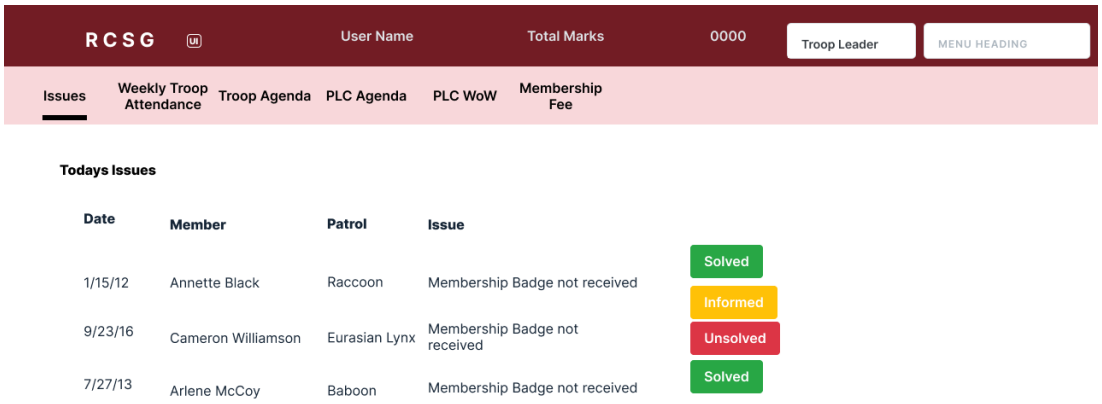


Figure 4-69 User Interface TL Issues

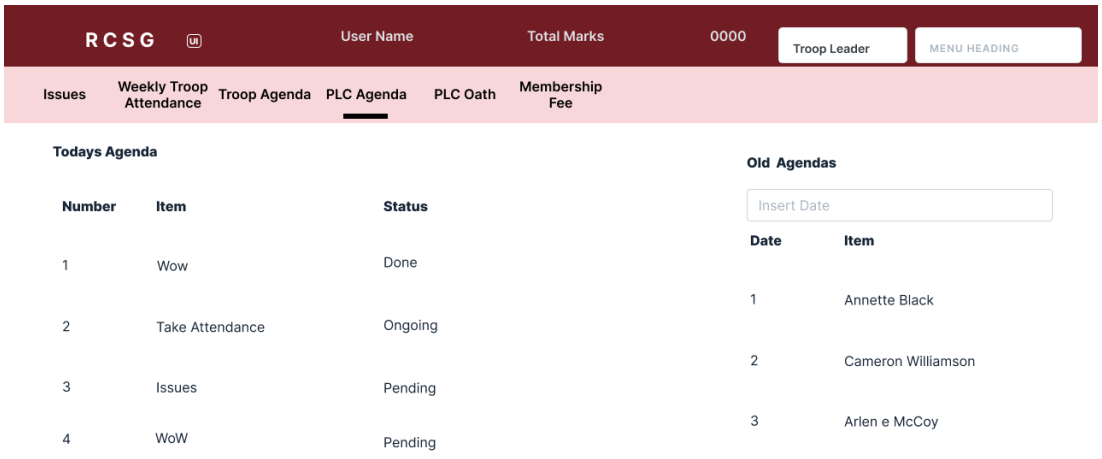


Figure 4-70 User Interface TL PLC Agenda

Figure 4-71 User Interface TL weekly Troop Attendance

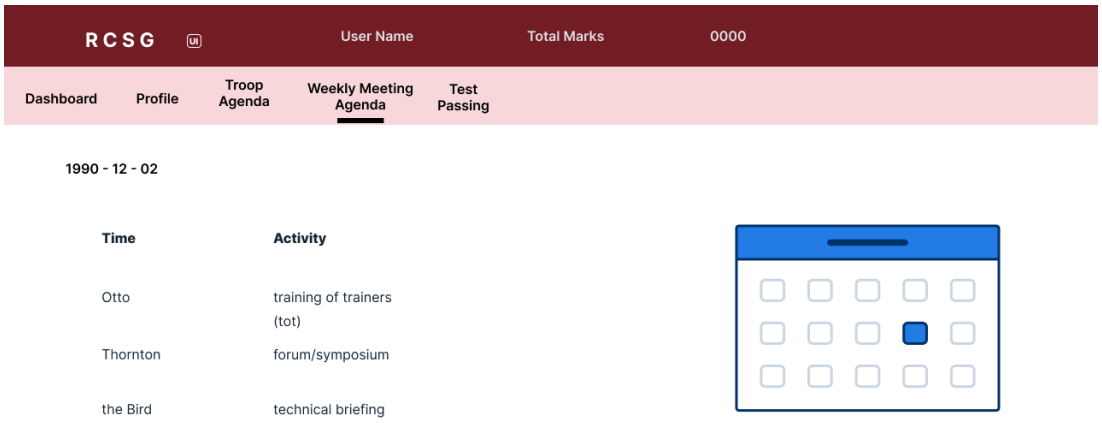


Figure 4-72 User Interface TL Weekly Meeting Agenda

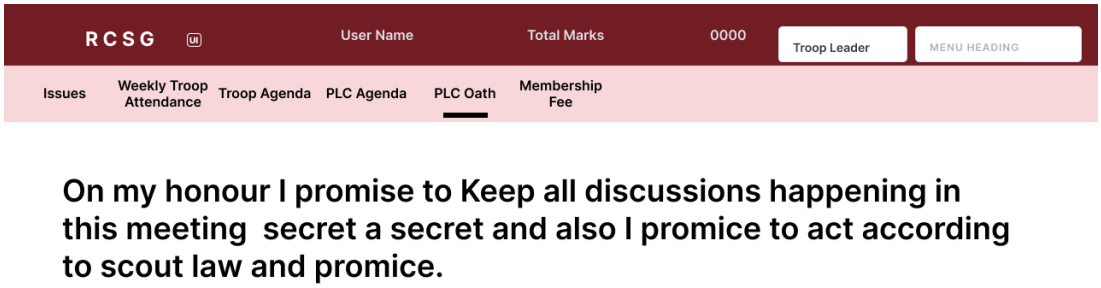


Figure 4-73 User Interface TL PLC Oath

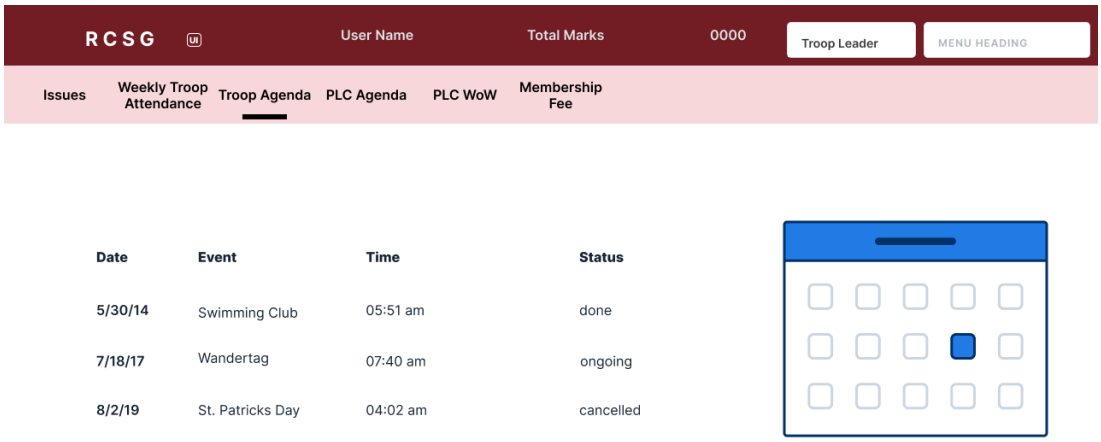


Figure 4-74 User Interface TL Troop Agenda

4.7.7 Treasurer Dashboards

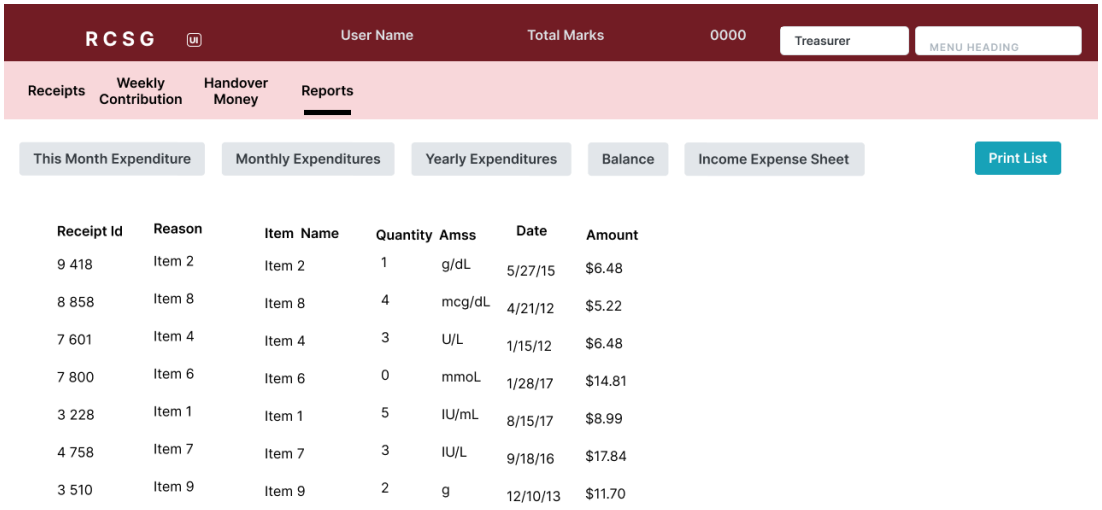


Figure 4-75 User Interface Treasurer Reports

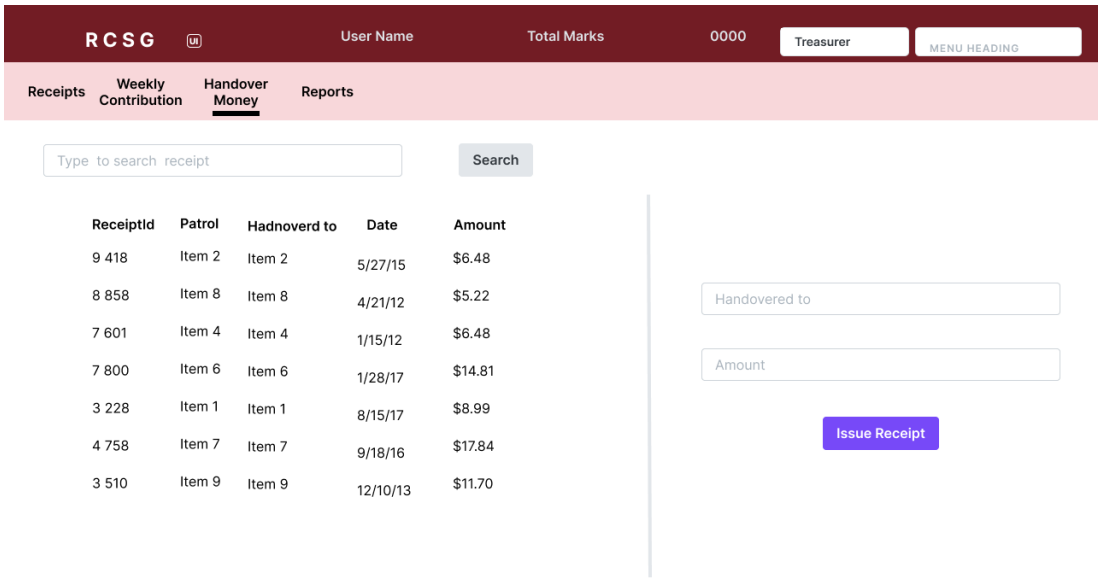


Figure 4-76 User Interface Treasurer Handover

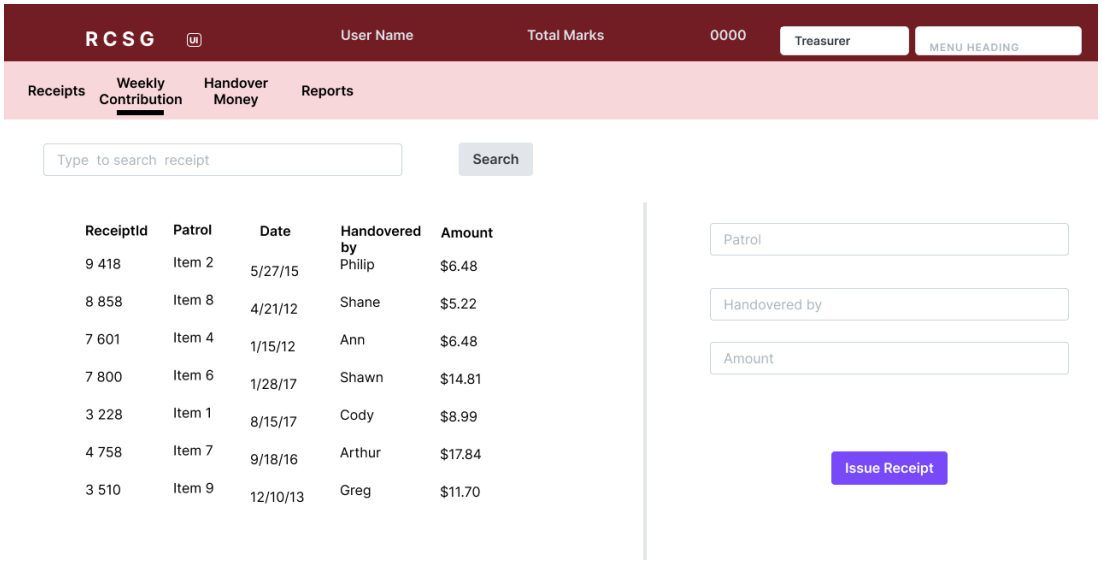


Figure 4-77 User Interface Treasurer Weekly Contribution

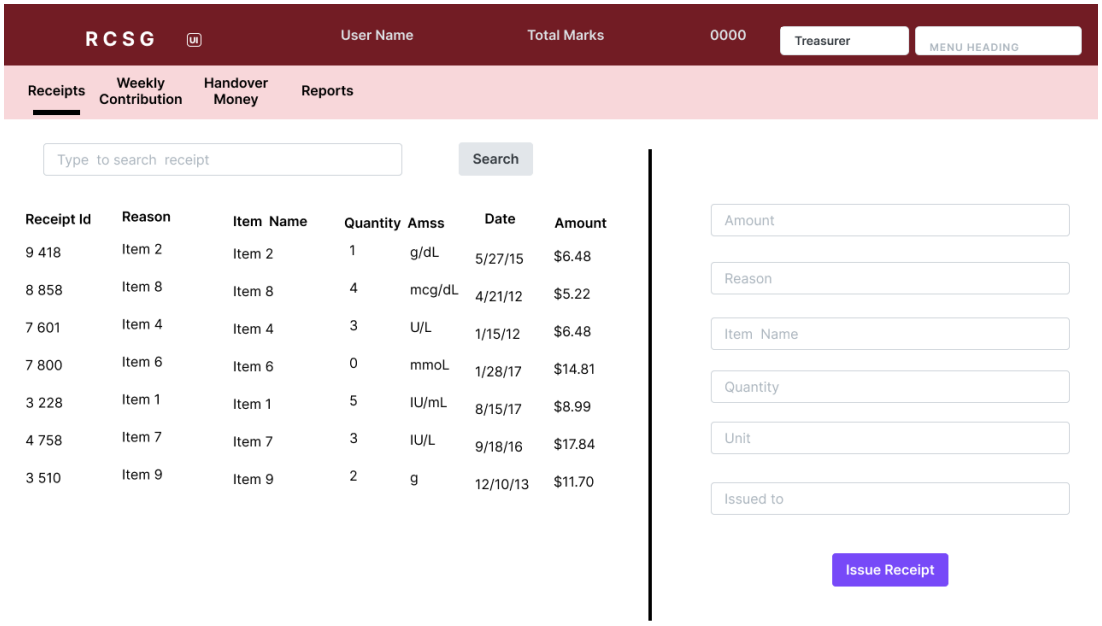


Figure 4-78 User Interface Treasurer Receipts

4.7.8 Storekeeper Dashboards

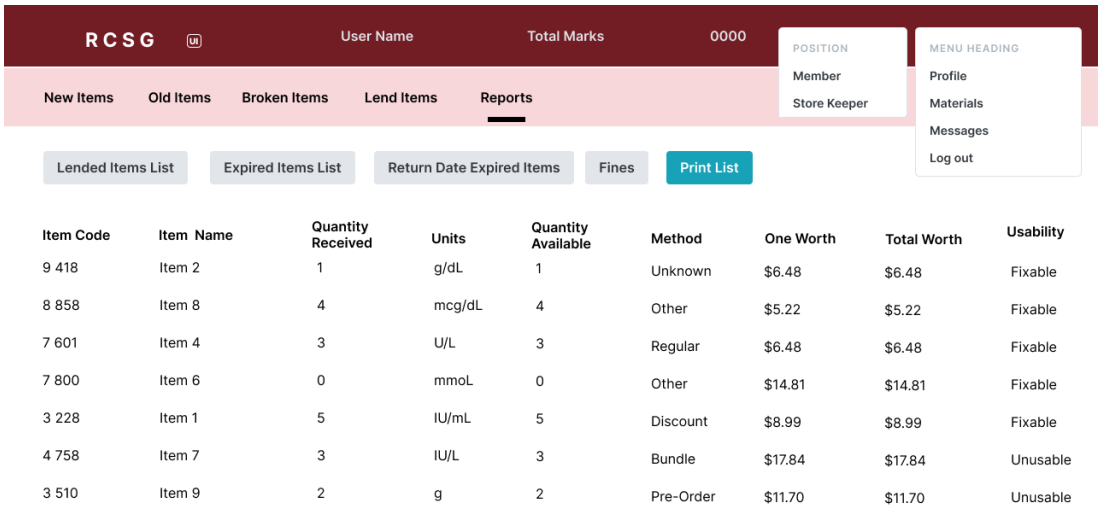


Figure 4-79 User Interface storekeeper Reports

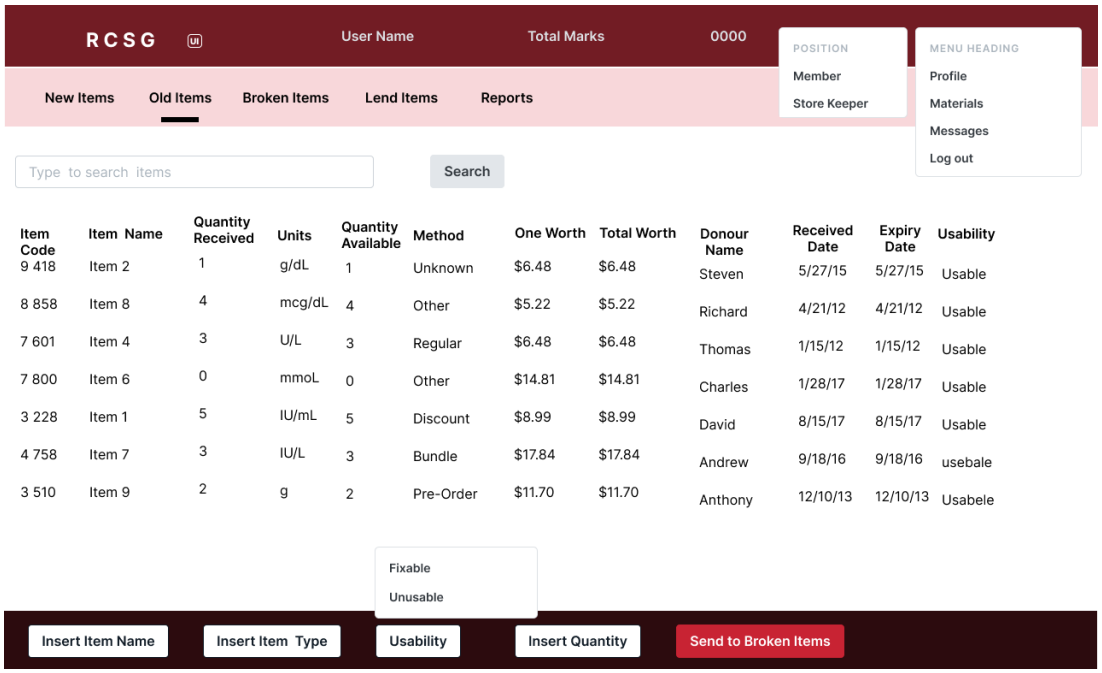


Figure 4-80 User Interface storekeeper Old Items

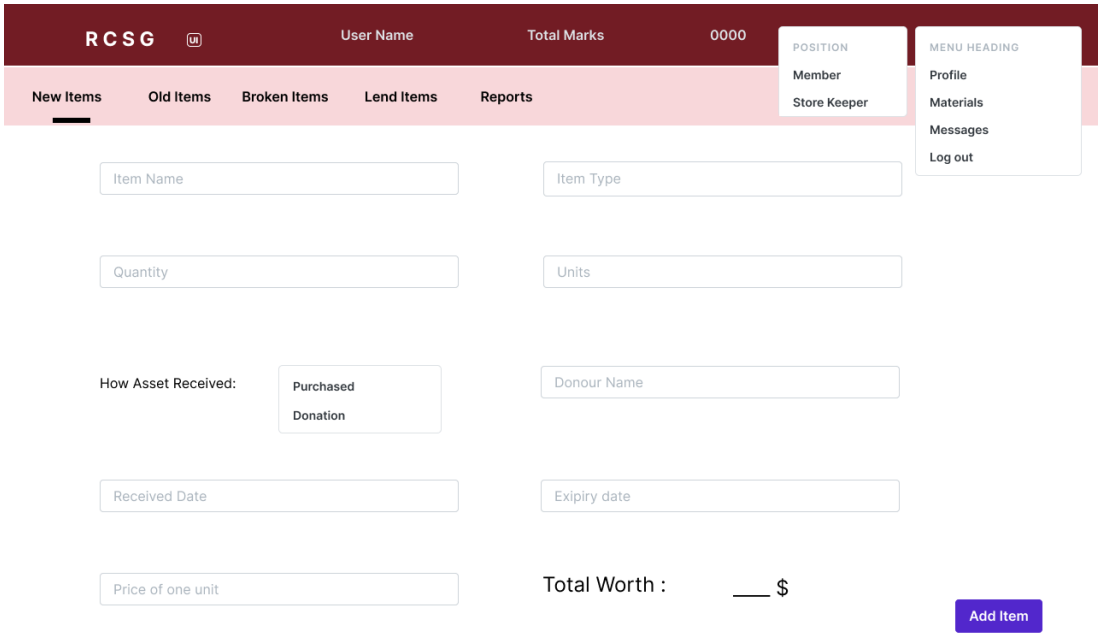


Figure 4-81 User Interface storekeeper New Items

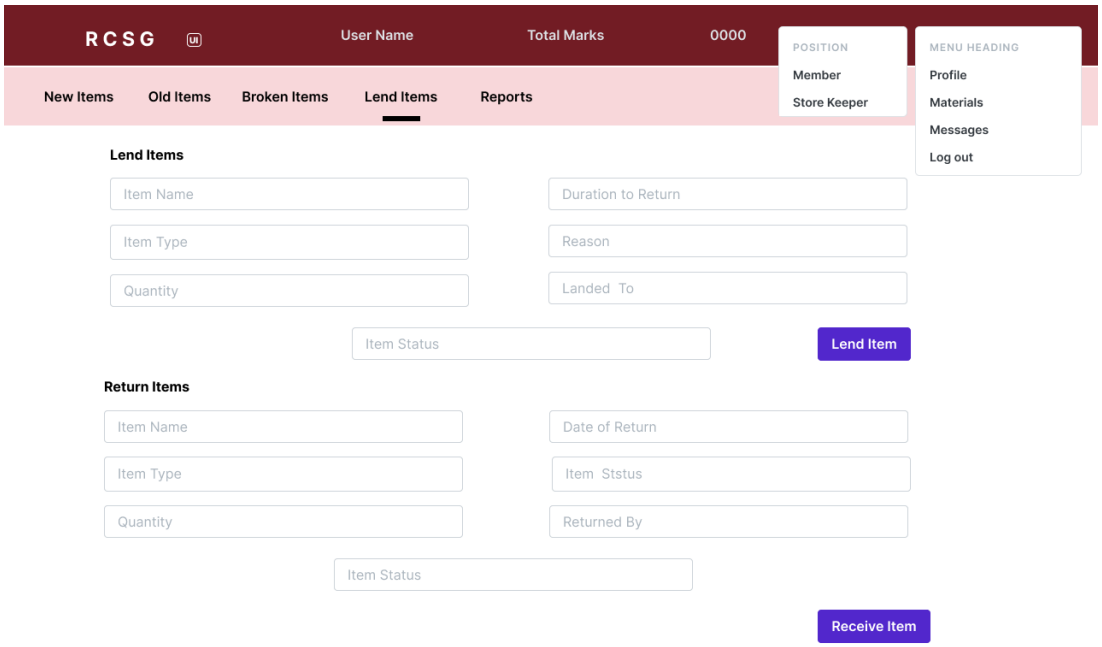
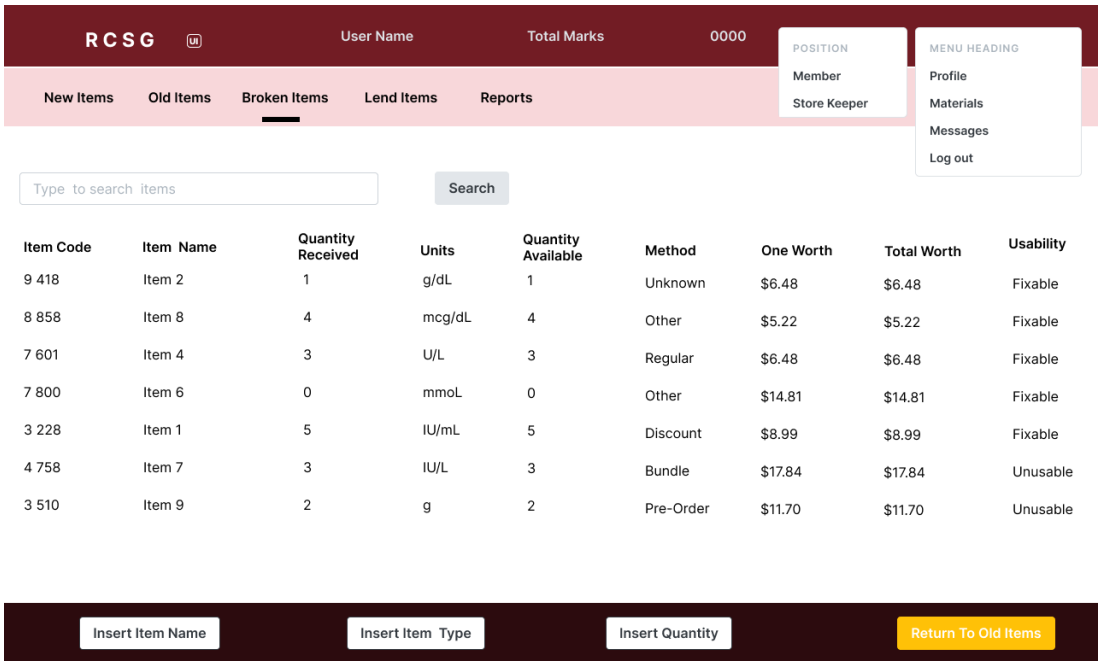


Figure 4-82 User Interface storekeeper Lend Items



Item Code	Item Name	Quantity Received	Units	Quantity Available	Method	One Worth	Total Worth	Usability
9 418	Item 2	1	g/dL	1	Unknown	$6.48	$6.48	Fixable
8 858	Item 8	4	mcg/dL	4	Other	$5.22	$5.22	Fixable
7 601	Item 4	3	U/L	3	Regular	$6.48	$6.48	Fixable
7 800	Item 6	0	mmoL	0	Other	$14.81	$14.81	Fixable
3 228	Item 1	5	IU/mL	5	Discount	$8.99	$8.99	Fixable
4 758	Item 7	3	IU/L	3	Bundle	$17.84	$17.84	Unusable
3 510	Item 9	2	g	2	Pre-Order	$11.70	$11.70	Unusable

Figure 4-83 User Interface storekeeper Broken Items

4.7.9 Material Dashboard

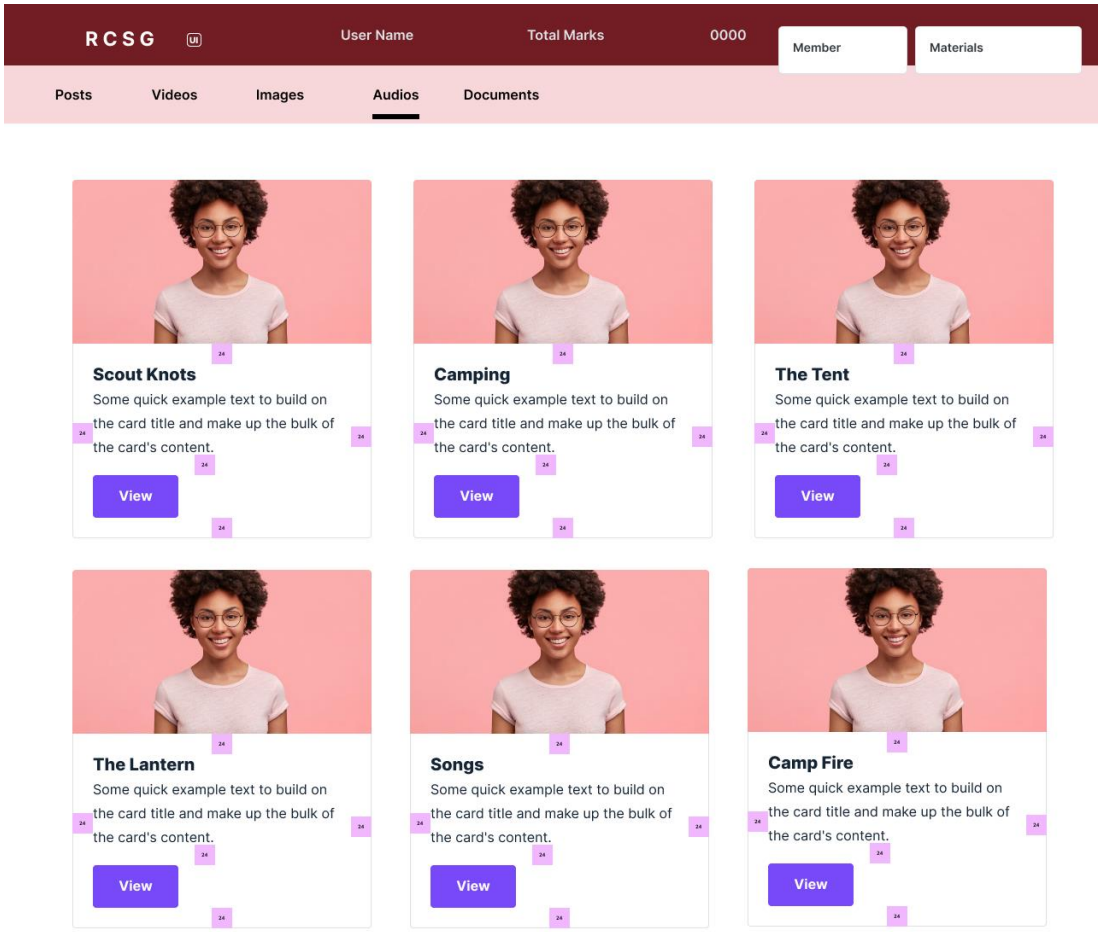


Figure 4-84 User Interface Materials Audios

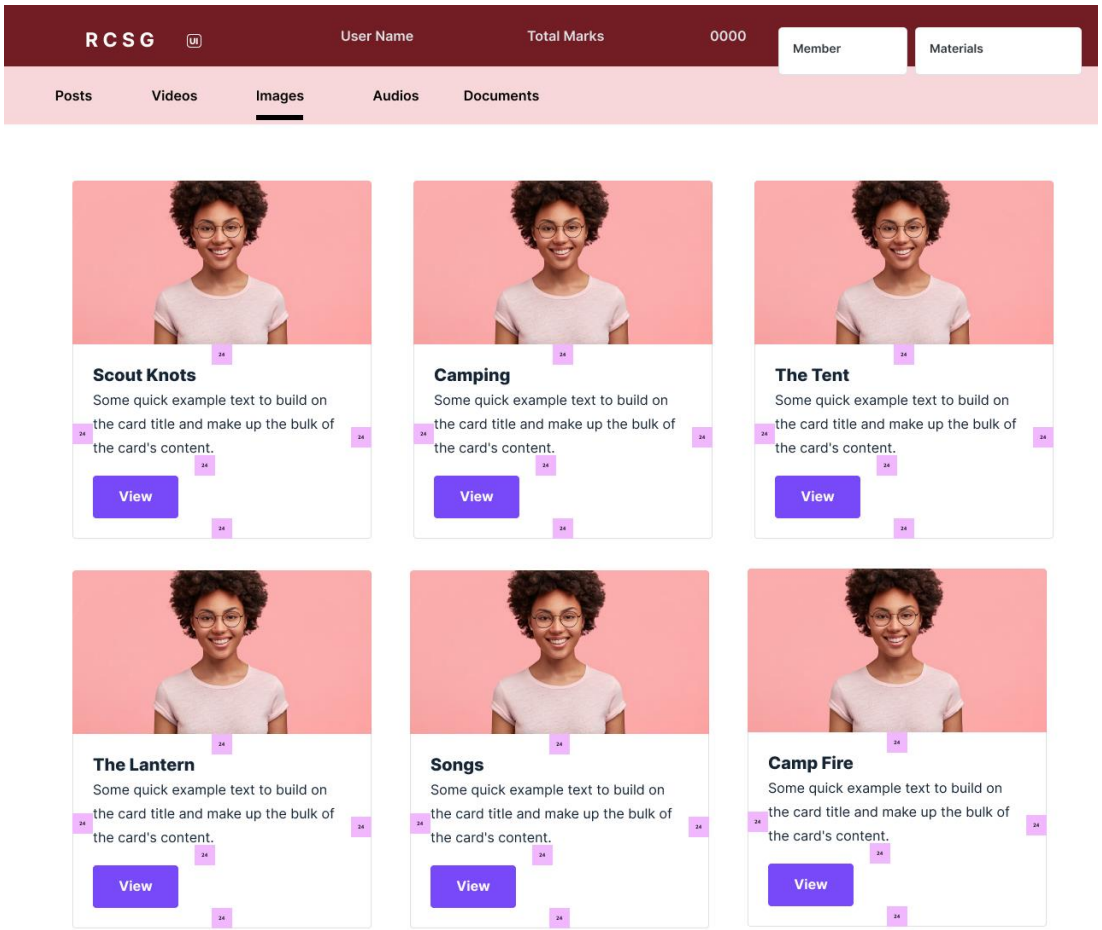


Figure 4-85 User Interface Materials Images

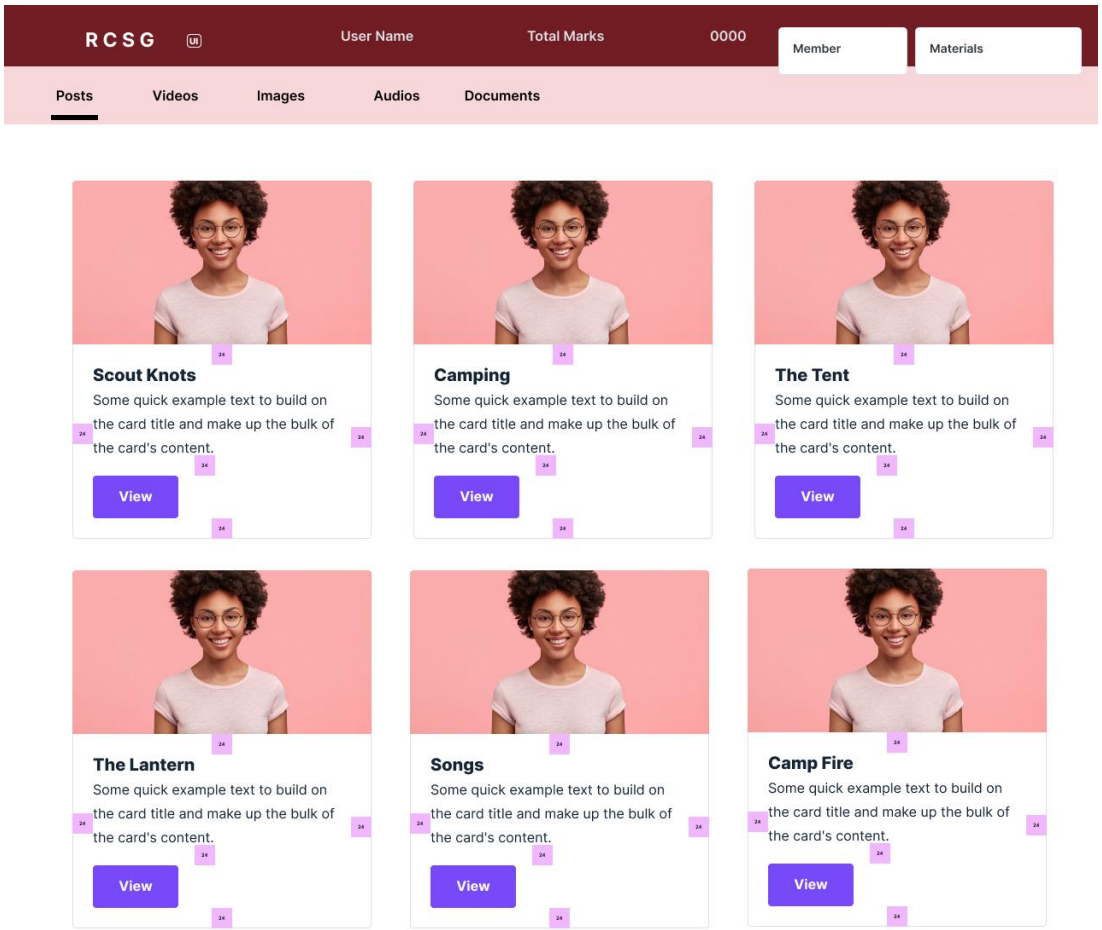


Figure 4-86 User Interface Materials Posts

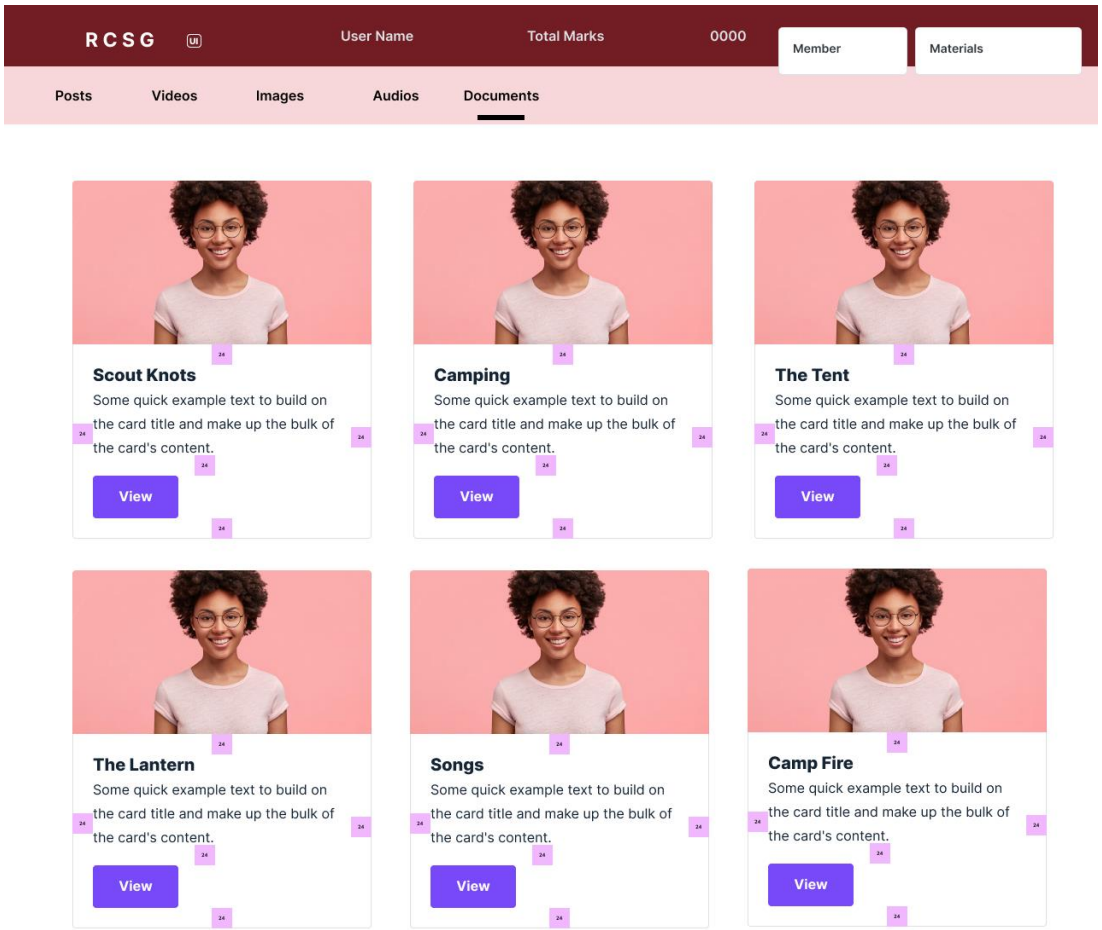


Figure 4-87 User Interface Materials Documents

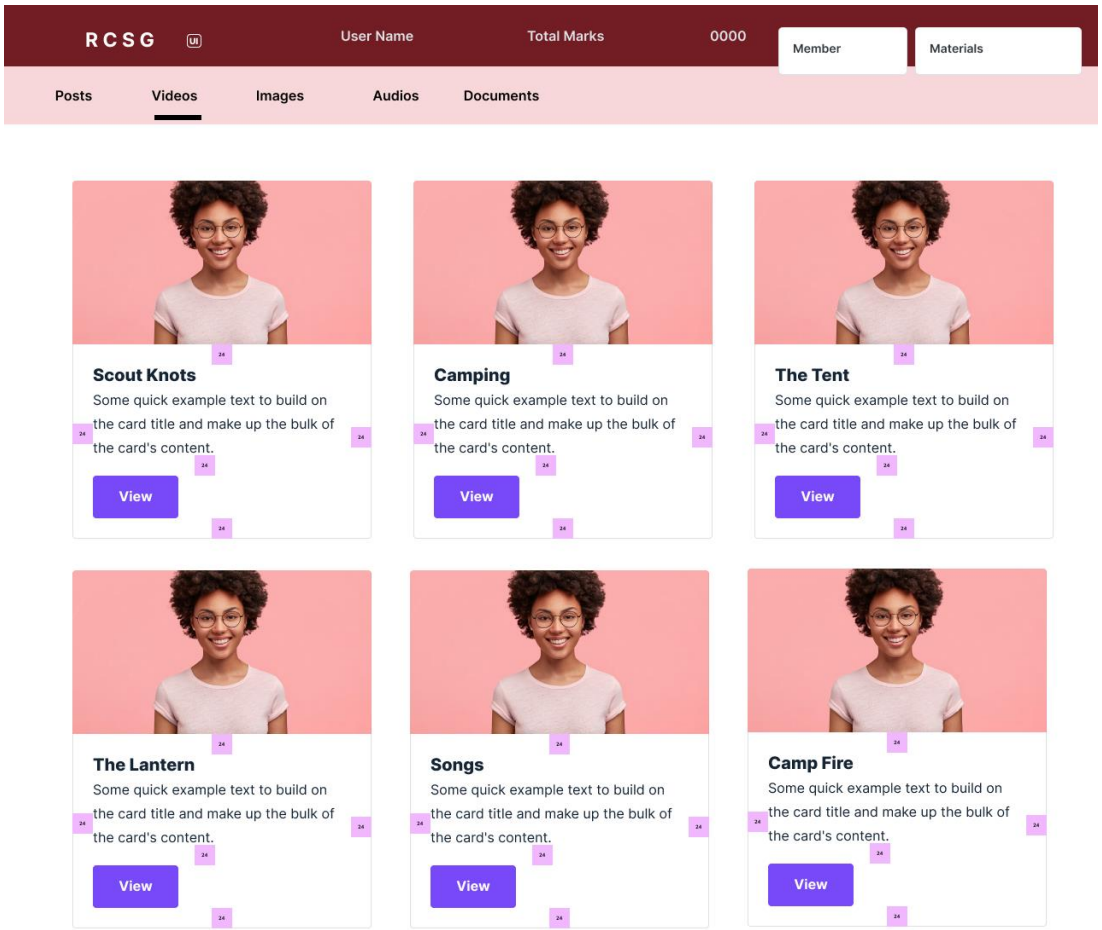


Figure 4-88 User Interface Materials Videos

3.2.1. PLC Meeting

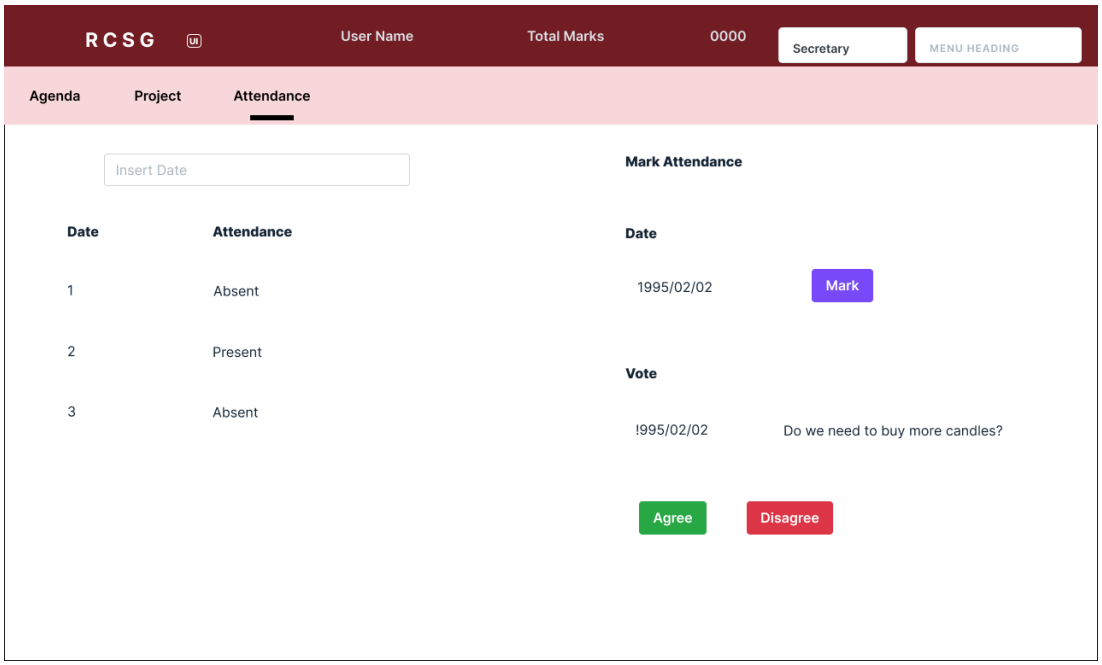


Figure 4-89 User Interface PLC

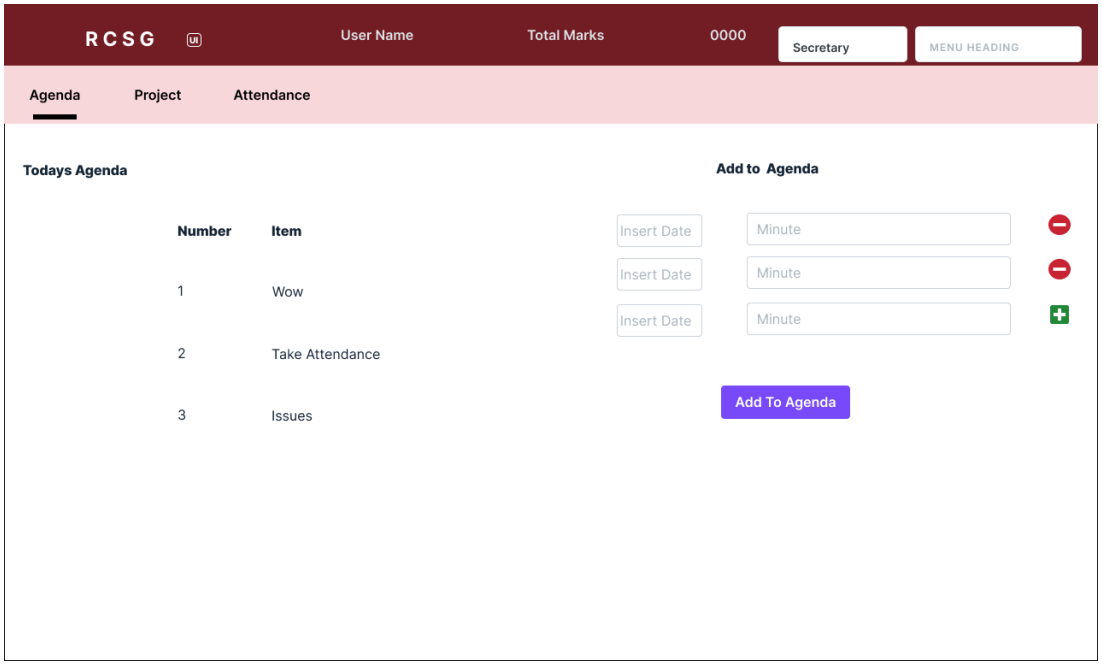


Figure 4-90 User Interface PLC Agenda

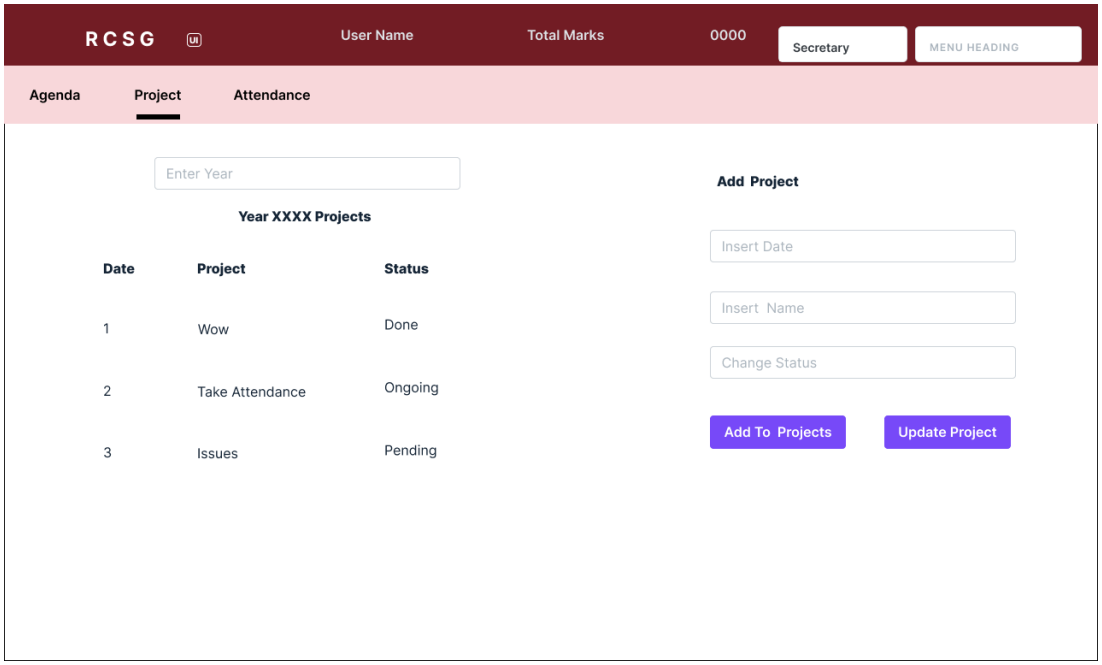


Figure 4-91 User Interface PLC Projects

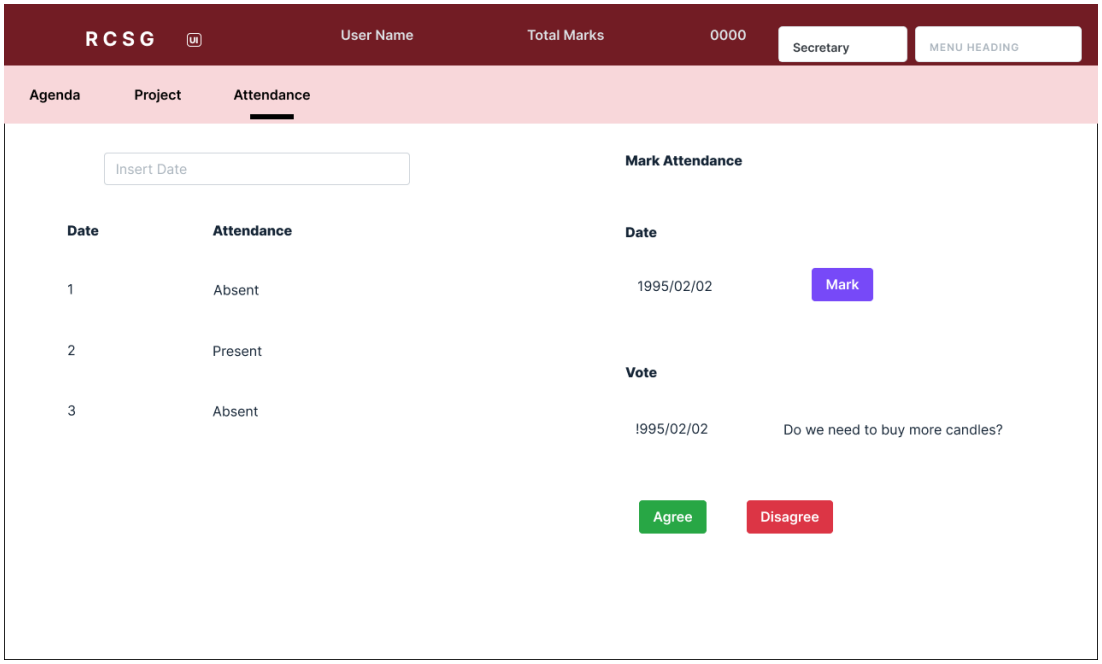


Figure 4-92 User Interface PLC Attendance

4.7.10 Message Dashboard

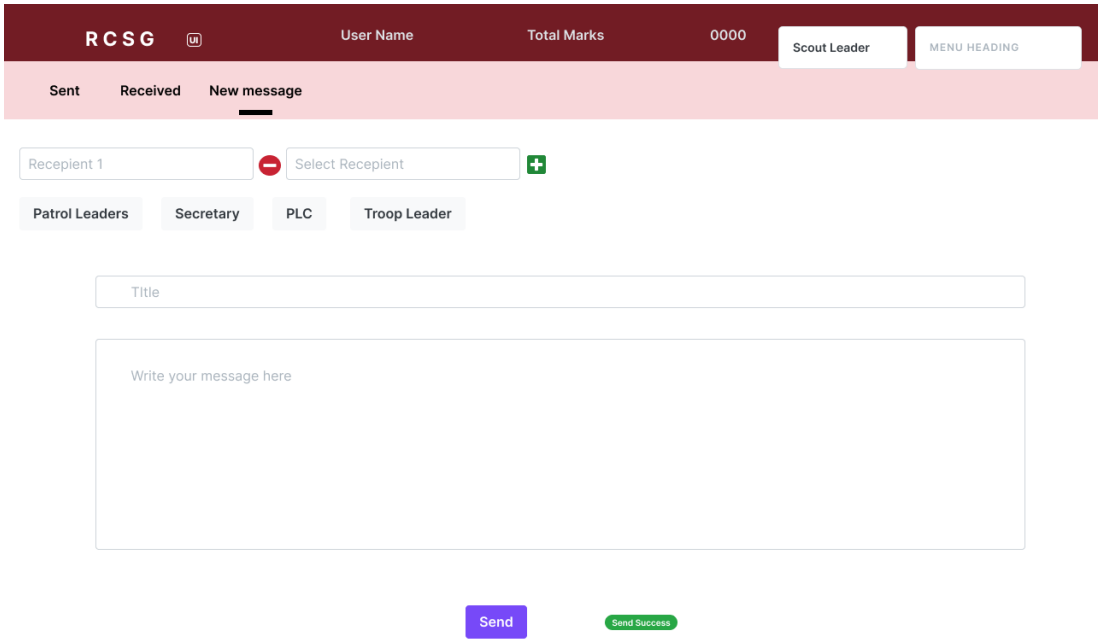


Figure 4-93 User Interface Message New

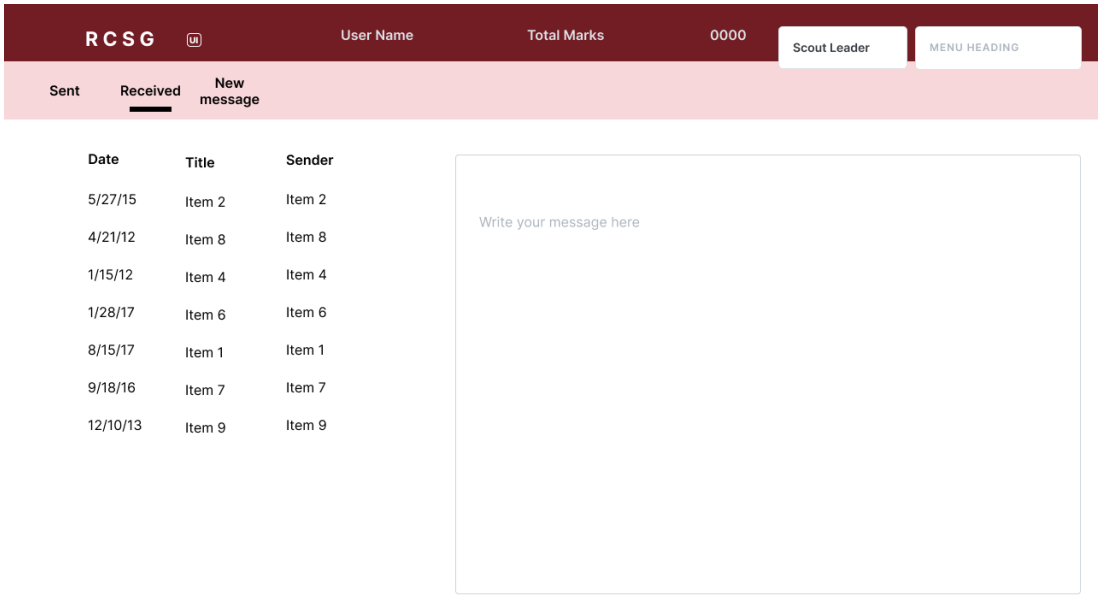


Figure 4-94 User Interface Message Received

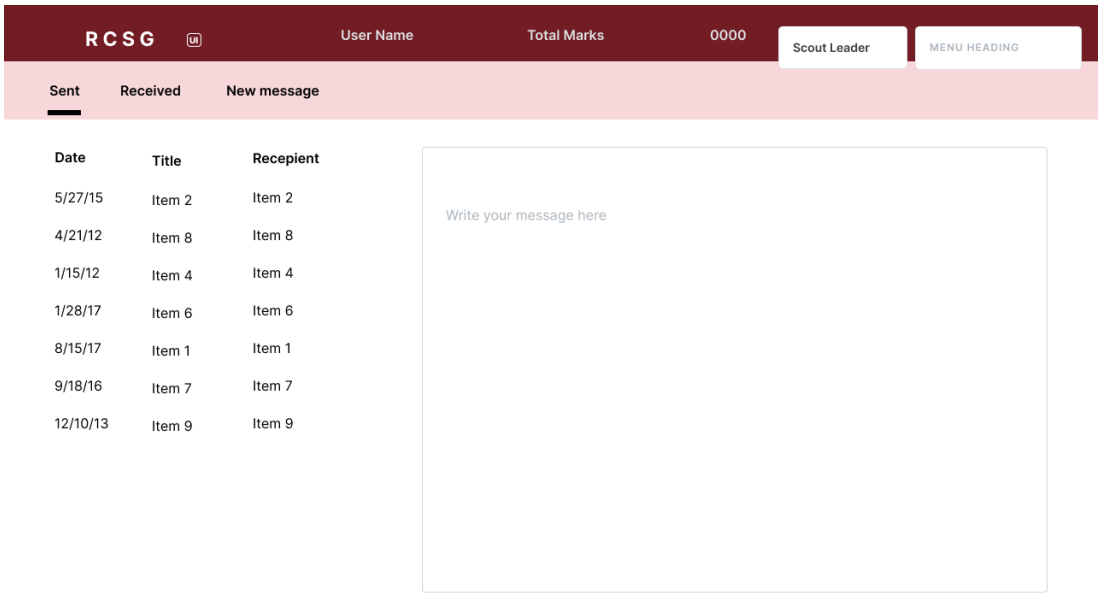


Figure 4-95 User Interface Message Sent

4.7.11 Secretary Dashboard

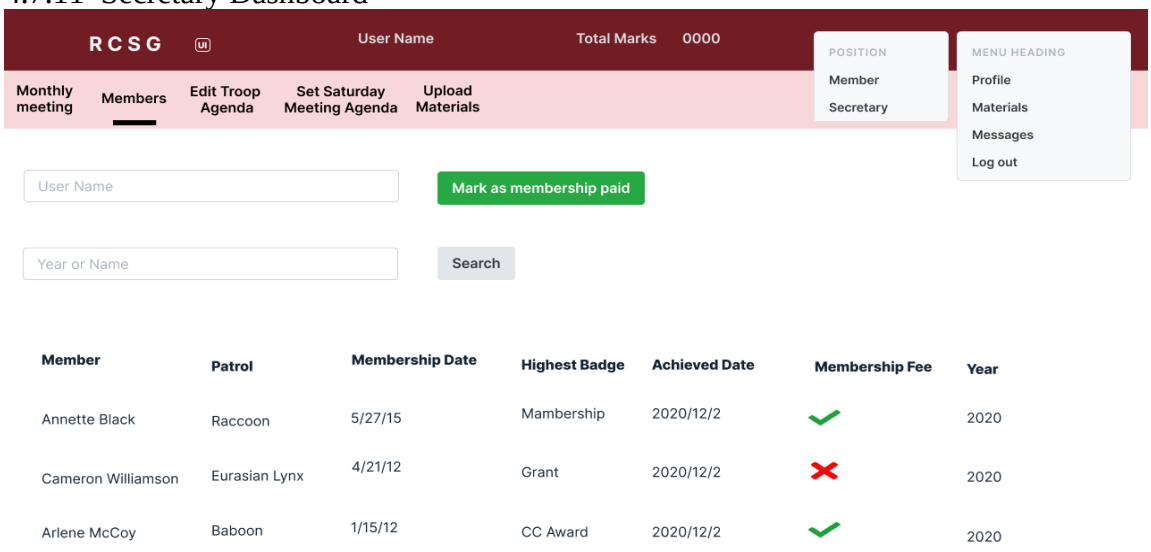


Figure 4-96 User Interface Secretary Members dashboard

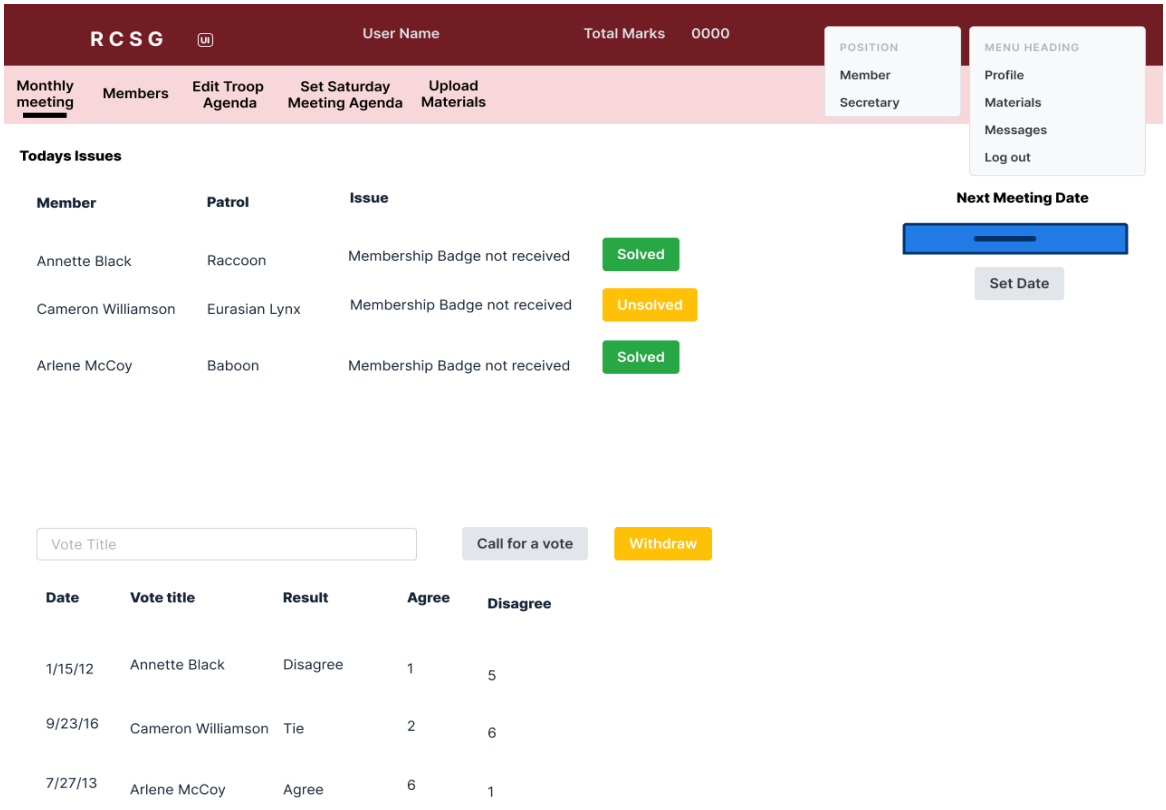


Figure 4-97 User Interface Secretary monthly meeting

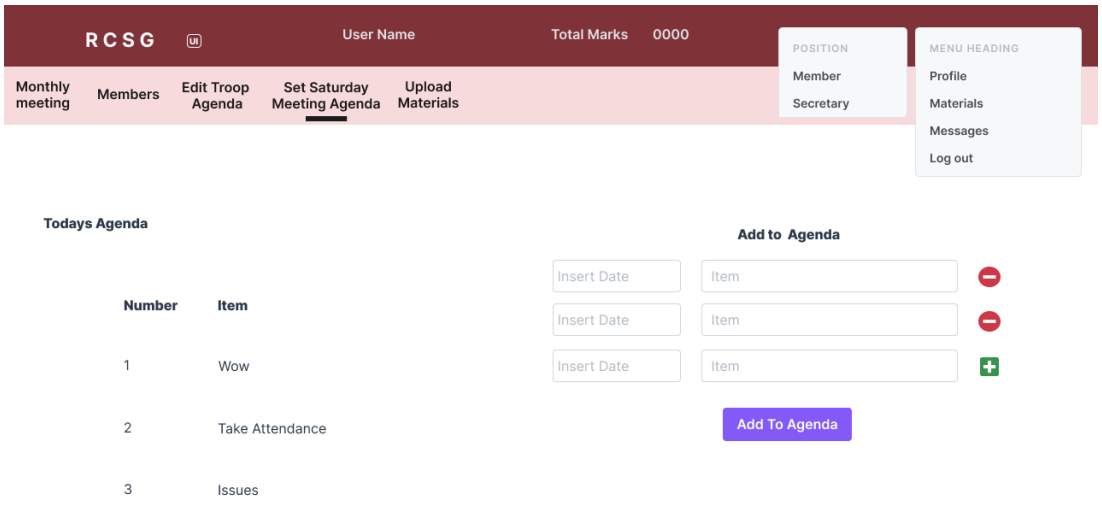


Figure 4-98 User Interface Secretary Set Saturday meeting agenda

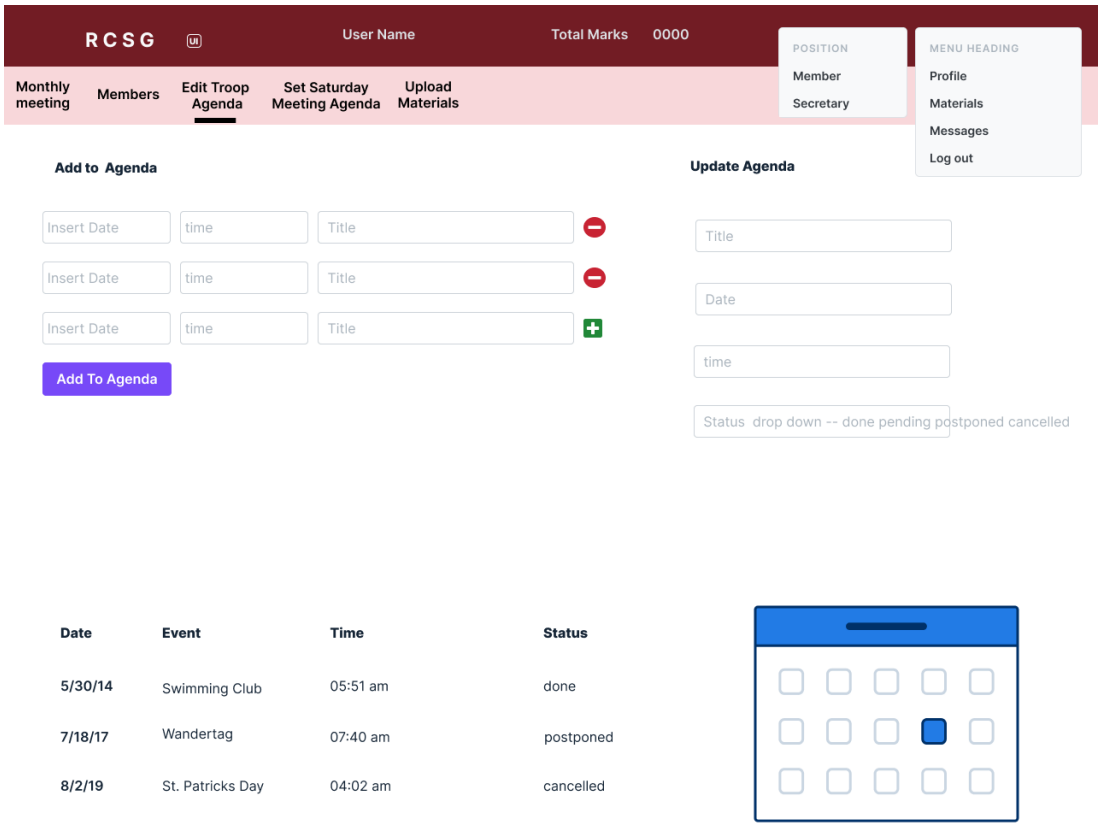


Figure 4-99 User Interface Secretary Edit Troop Agenda

5 CONCLUSION

5.1 Objectives Met

I needed to plan this system for the first time, so I had no reference example systems. Design a novel system that never existed is a great challenge. Lack of electricity at daytime was another challenge. My laptop was not available for one month I had to pause this design project for one month till my laptop is returned so I had less time to design. Most of my friends were designing the system using Structured System Analysis method (SSADM) methods. First, I also used SSADM method for Analysis. In the design phase I moved to Unified modelling Language (UML) because I felt it is better to use Object-Oriented Modelling (OOSAD). Then I also moved to UML Object-Oriented Modelling.

When Designing dashboards some interfaces repeated. I was able to identify them after designing all repeatedly. So I took common properties out and assembled in a way that reduce repetition.

5.2 Usability Accessibility Reliability Friendliness

When considering usability, Graphical User Interfaces were designed considering the usability engineering concepts learned. So that the users are satisfied, and their resources are utilized in a satisfactory level at the design phase. When considering accessibility, necessary privileges are designed to be provided for the relevant user types providing appropriate credentials for different access levels. When considering reliability encryption will be used for secured data such as passwords to protect them and only the personnel with accurate user credentials will be allowed to access the system. Easy understandable and simple user interfaces, functionalities and real time responsiveness are the main features which are to be provided to enhance the user friendliness of the system.

5.3 Limitations and Drawbacks

Main drawback of the system is that they need manual documents for their organization. Since Sri Lanka Scouts' Association (SLSA) does not accept soft copies or online forms, they must prepare manual documents. So, all documents cannot be computerized. Particularly forms given by SLSA. They can't afford much money for a software if they could have a better system than this.

5.4 Future Modifications, Improvements, Extensions

The most useful BSO is BSO 2 for this organization. With a mobile and web app it will be very easy for both members and management. This system can be programmed to print documents for desired output. So, it is good to implement interfaces for the users to decide what to output.

6 REFERENCES

https://www.visual-paradigm.com/guide/uml-unified-modeling-language

https://www.geeksforgeeks.org

https://www.guru99.com/database-normalization.html

https://www.tutorialspoint.com/dbms/er_diagram_representation.htm

https://www.tutorialspoint.com/dbms/database_normalization.htm