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PROJECT TITLE:LOAN CIRCLE

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CHAPTER 1

1. Executive Summary

Project Title: Loan Circle System

Purpose of the Document: To present the system design, implementation, and management strategies for the Loan Circle System.

Target Audience: Project stakeholders, developers, women groups, financial officers, and system administrators.

Project Summary:

Brief Problem: Many women in Zanzibar face challenges accessing financial services, especially loans, due to lack of formal financial structures and requirements.

Solution: The Loan Circle System is a web application that offers group-based loan services exclusively for women, promoting financial inclusion and empowerment. In this system, loans will be provided to women, but only to those who are members of a registered group, in order to help them meet and sustain their essential needs.

2. Introduction

Background and Context: Access to credit remains a major barrier for women in Zanzibar. Community-based lending through trusted groups provides a practical alternative.

Problem Statement: There is no digital system for managing group-based loans tailored for women.

Justification for the Project: Empowering women economically contributes to overall community development. A digital solution simplifies loan access and management.

General Objective: To develop a secure and user-friendly web-based loan system for women in groups.

Specific Objectives:

- ✓ Register women and their groups
- ✓ Allow loan applications from registered groups
- ✓ Track loan repayment and group performance

Scope of the System: The system will handle registration, loan application, tracking, and reporting. It does not include direct fund transfer features.

Stakeholders: Women users, group leaders, system administrators, financial advisors.

CHAPTER 2

3. Business Process Overview

Current Business Workflow: Loans are managed manually via meetings and paper records.

Identified Gaps / Challenges: Errors in record keeping, delays in approvals, lack of transparency.

Proposed Improvements: Automate loan processing and record keeping, and ensure transparency and accountability

Business Goals and KPIs:

- ✓ Increase access to loans by 70% in 12 months.
- ✓ Reduce loan processing time to under 3 days.
- ✓ 90% repayment rate within due periods.

Process Flow Diagram:

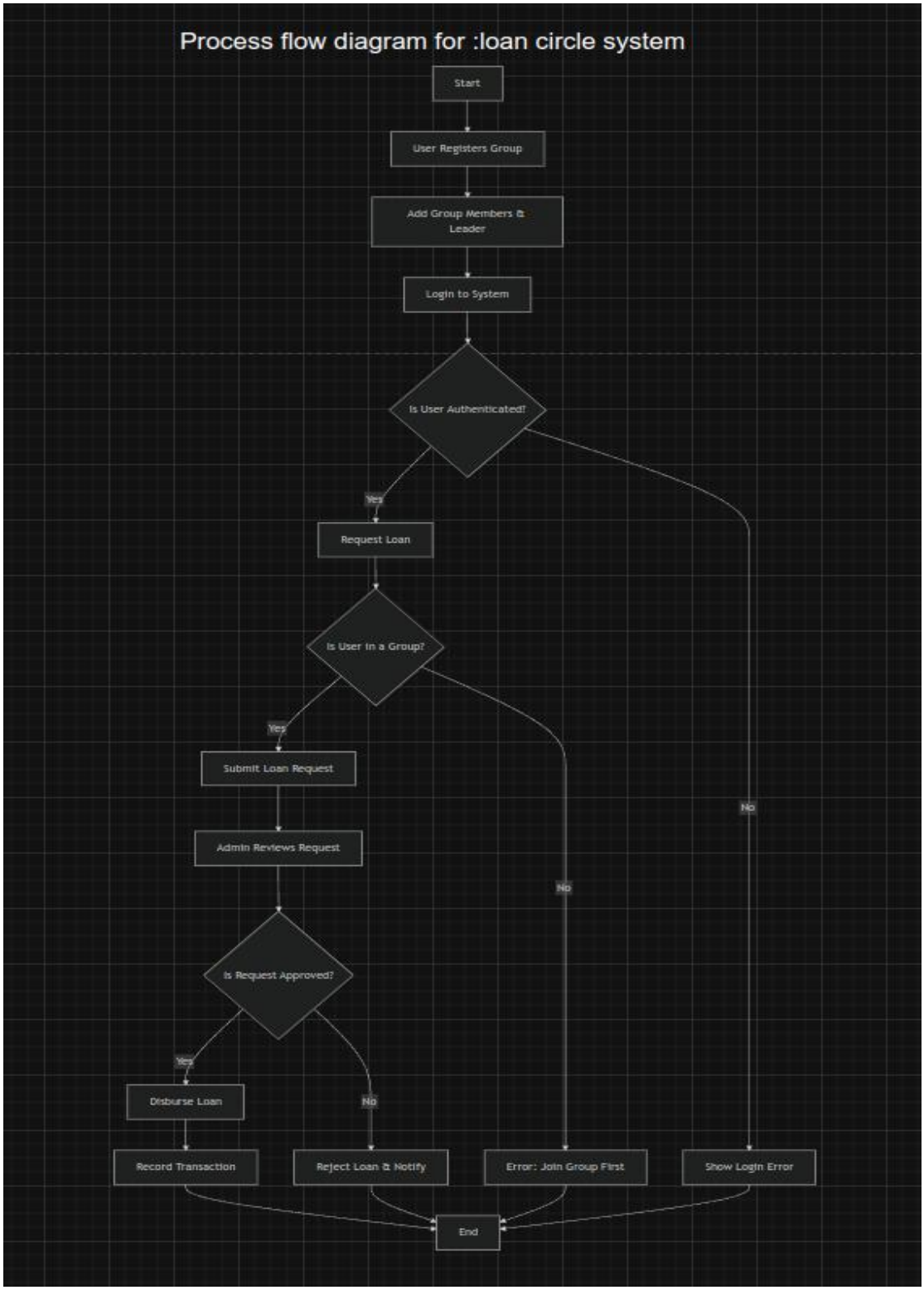

Figure 1 loan circle process flow diagram

4. Functional Requirements:

a. **Requirements Specification (SRS)**

- ✓ Group and member registration.
- ✓ Loan application and approval module.
- ✓ Repayment tracking.

b. **Non-functional Requirements**:

- ✓ System should be mobile-friendly.
- ✓ Fast response time (<3 sec per action).

c. **Security Requirements**:

- ✓ Encrypted user data.
- ✓ Role-based access control

d. **Assumptions & Constraints**:

- ✓ Internet access is available.
- ✓ Users can operate a smartphone or computer.

CHAPTER 3

5. Development Methodology

Chosen Model: Agile Methodology

Why This Method: Allows iterative feedback from users and flexible changes.

Roles and Responsibilities:

Role	Responsibility
Developer	System development
Client	Provide requirements and feedback
Admin	Maintain system

Table 1Reles and Responsibilities

Iteration Plan or Timeline:

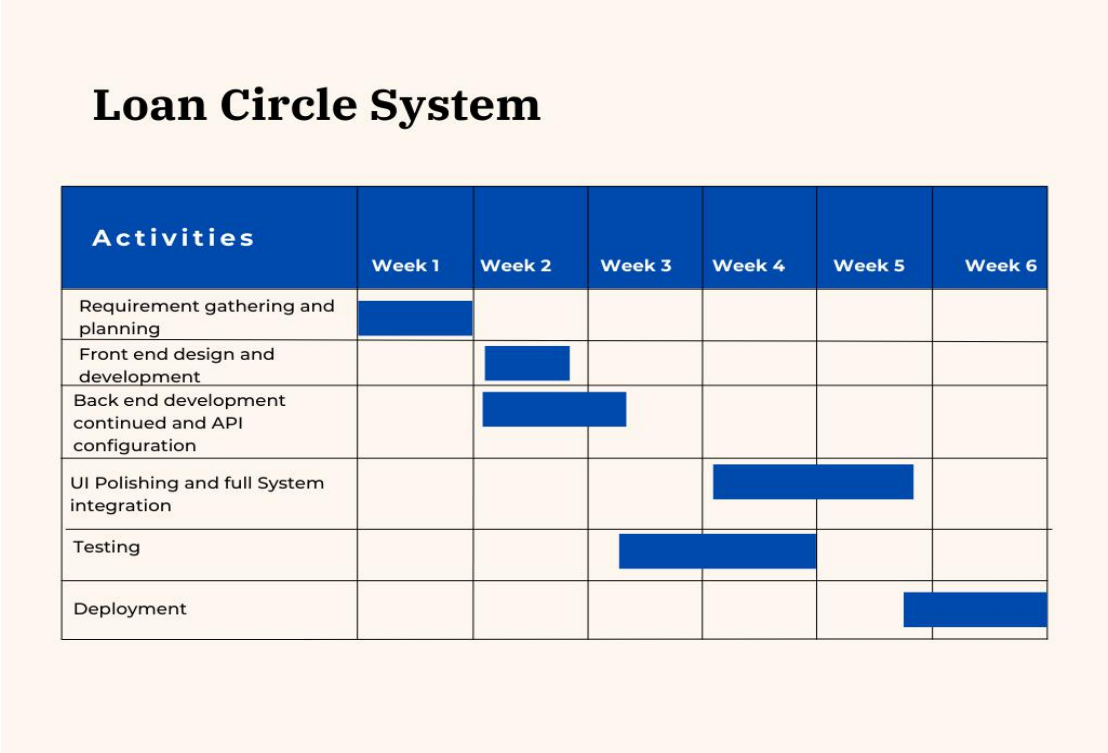

Figure 2 loan circle system activities

5. System Architecture (SDD)

Logical Architecture:

The **Loan Circle System** follows on a **3-tier architecture:**

Presentation layer
- ✓ Builds the user interface for users to interact with the system

Business logic layer
- ✓ Handles business logic, processes user requests, and manages communication with database

Data layer
- ✓ Stores persistent data including users, groups, loans, and repayments

Technology Stack :

Component	**Technology Used**	**Role / Function in the System**
Frontend	HTML, CSS, JavaScript, React	Provides the user interface and enables interaction with the system
Backend	Spring Boot	Processes business logic, handles requests, manages groups, loans, and repayments
Database	PostgreSQL	Stores persistent and secure data such as users, groups, loan applications, and repayments

Table 2Technology stack

Deployment Architecture Diagram

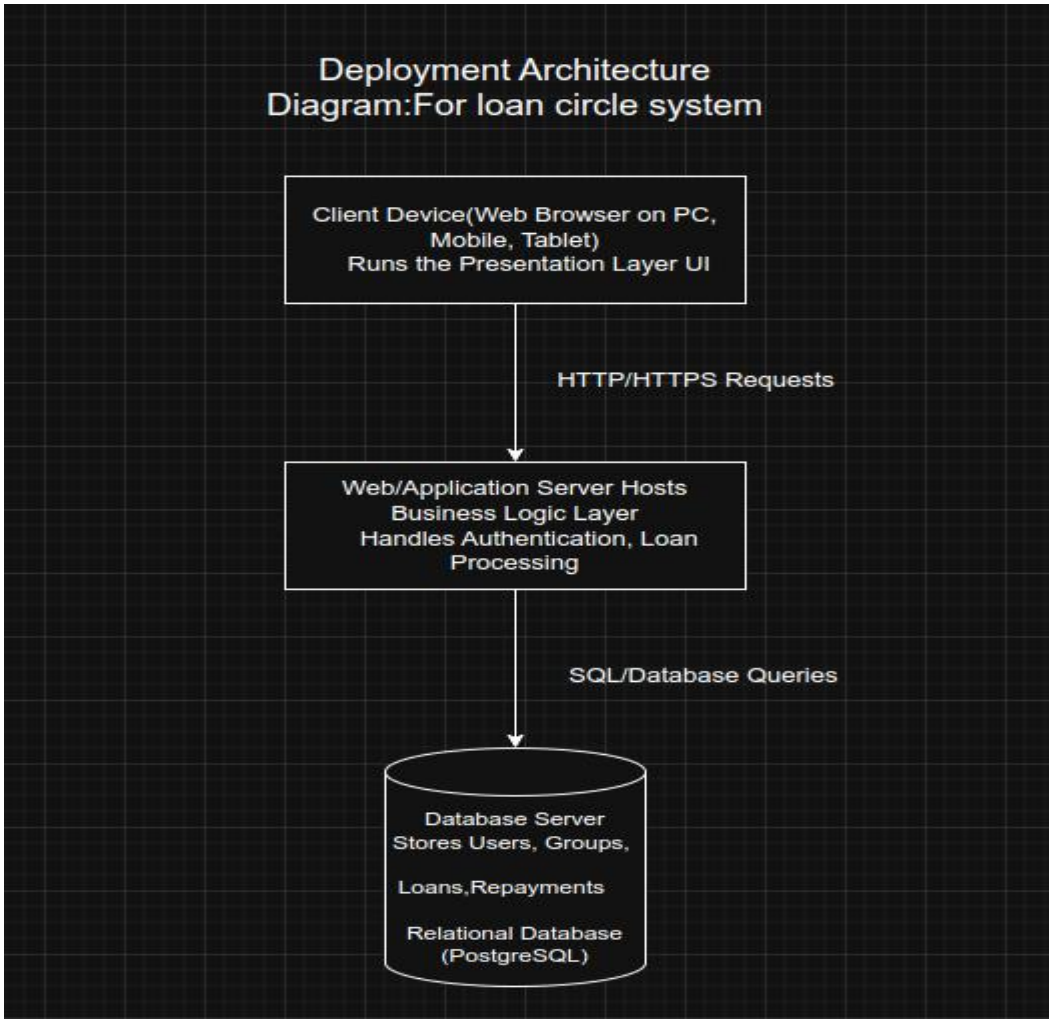

Figure 3Deployment laon circle architecture

System Components Overview:

- ✓ User module: Manages user accounts and authentication
- ✓ Group module: Manages group creation, updates, and members
- ✓ Loan module: Handles loan applications, approvals, and disbursements
- ✓ Reports module: Generates reports on loans, repayments, and group status

7. System Design Details

a. **Conceptual Design**:

The Loan Circle System is a group-based loan management platform designed specifically for women in Zanzibar. Women must be part of a registered group to request loans. The system facilitates:Group registration,Member management ,Loan applications and approvals,Loan repayment tracking.

The key component for this system:

- ✓ Groups: Collections of women who apply for loans together.
- ✓ Members: Individual women who belong to a group.
- ✓ Loans: Financial support requested and given to groups.
- ✓ Payments: Amounts paid back towards loans.
- ✓ Administrators: People who manage the system, approve loans, and monitor repayments.

b. **Database Design**: The table of the loan cirle system with it fields

Groups Table

group_id (PK),group_name,leader_name,location

Members Table

member_id (PK),full_name,phone_number,group_id (FK)

Loans Table

loan_id (PK),group_id (FK).loan_amount,issue_date,due_date,status

Payments Table

payment_id (PK),loan_id (FK),amount_paid,payment_date

Admins Table

admin_id (PK),username,password

c. **UI Prototypes**

The loan circle system UI prototype

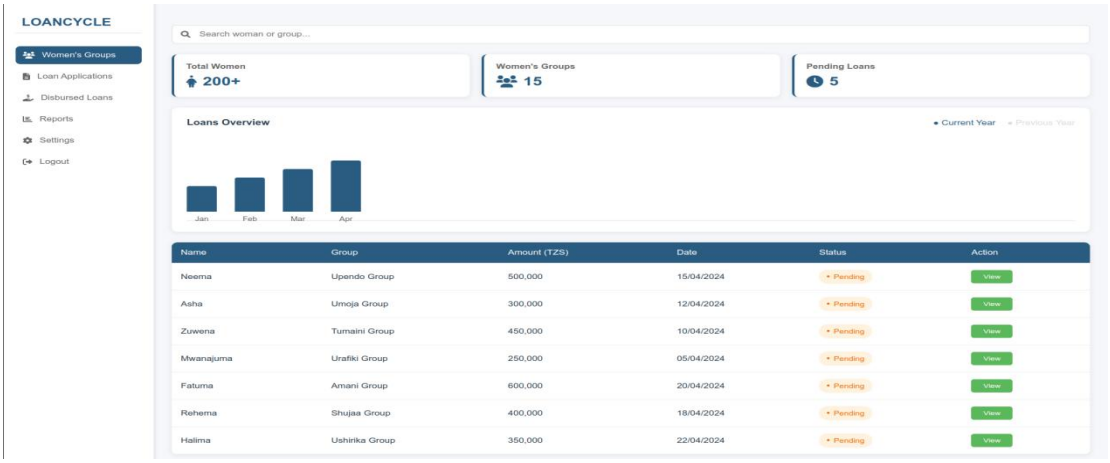

Figure 4 laon circle UI prototype

d. **Activity Diagrams**

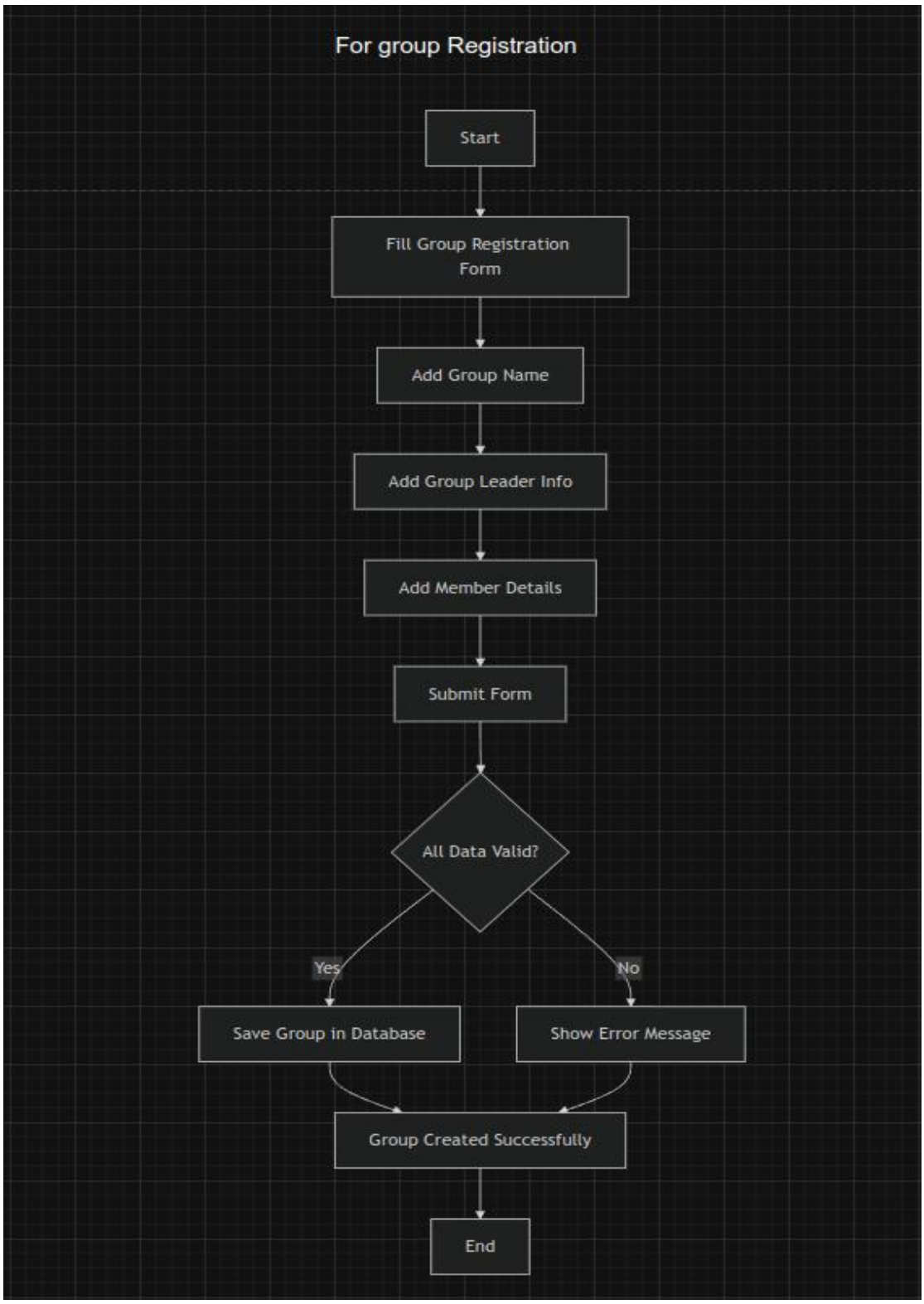

Table 3 Activity diagram for group registration

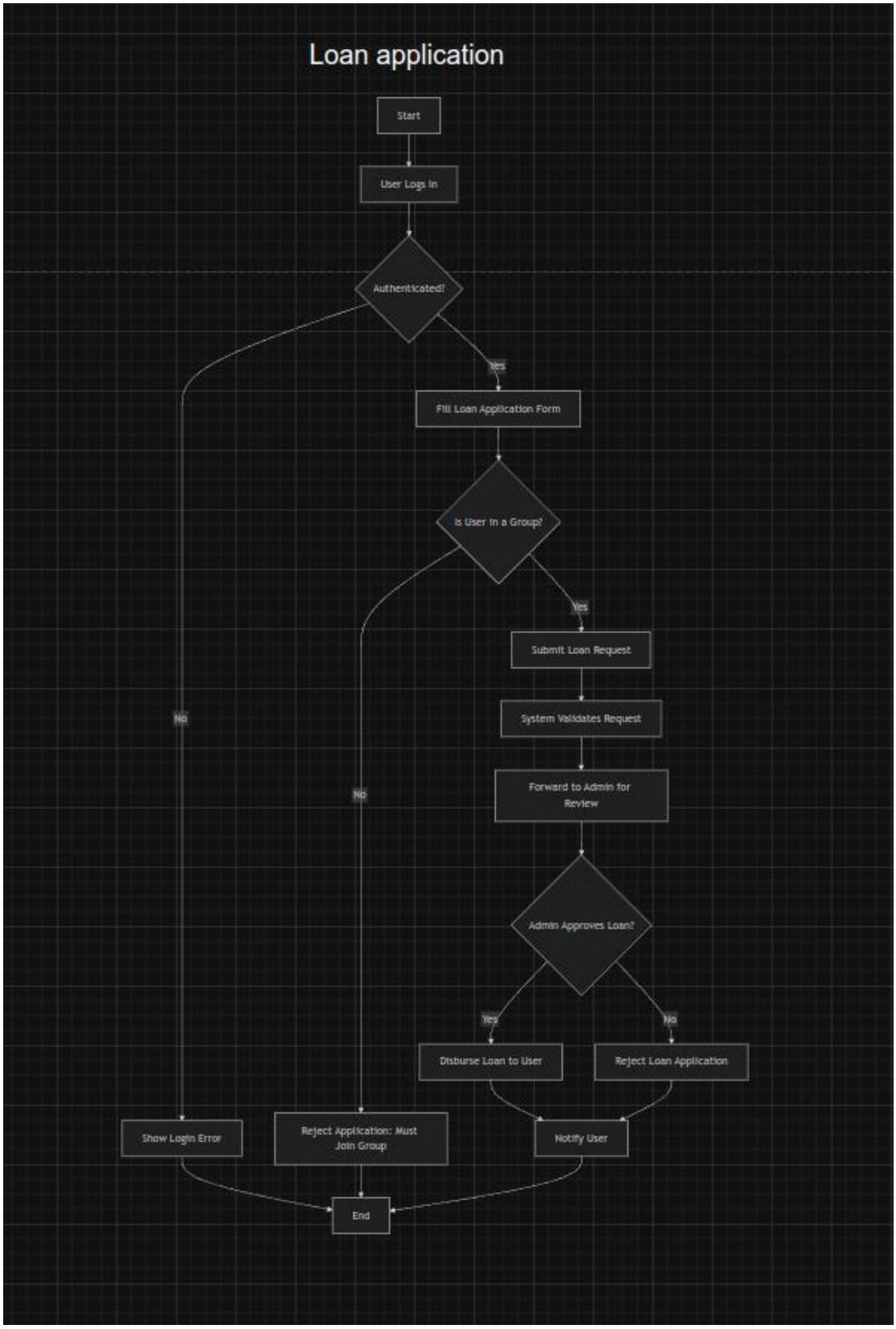

Table 4 Activity diagram for loan application

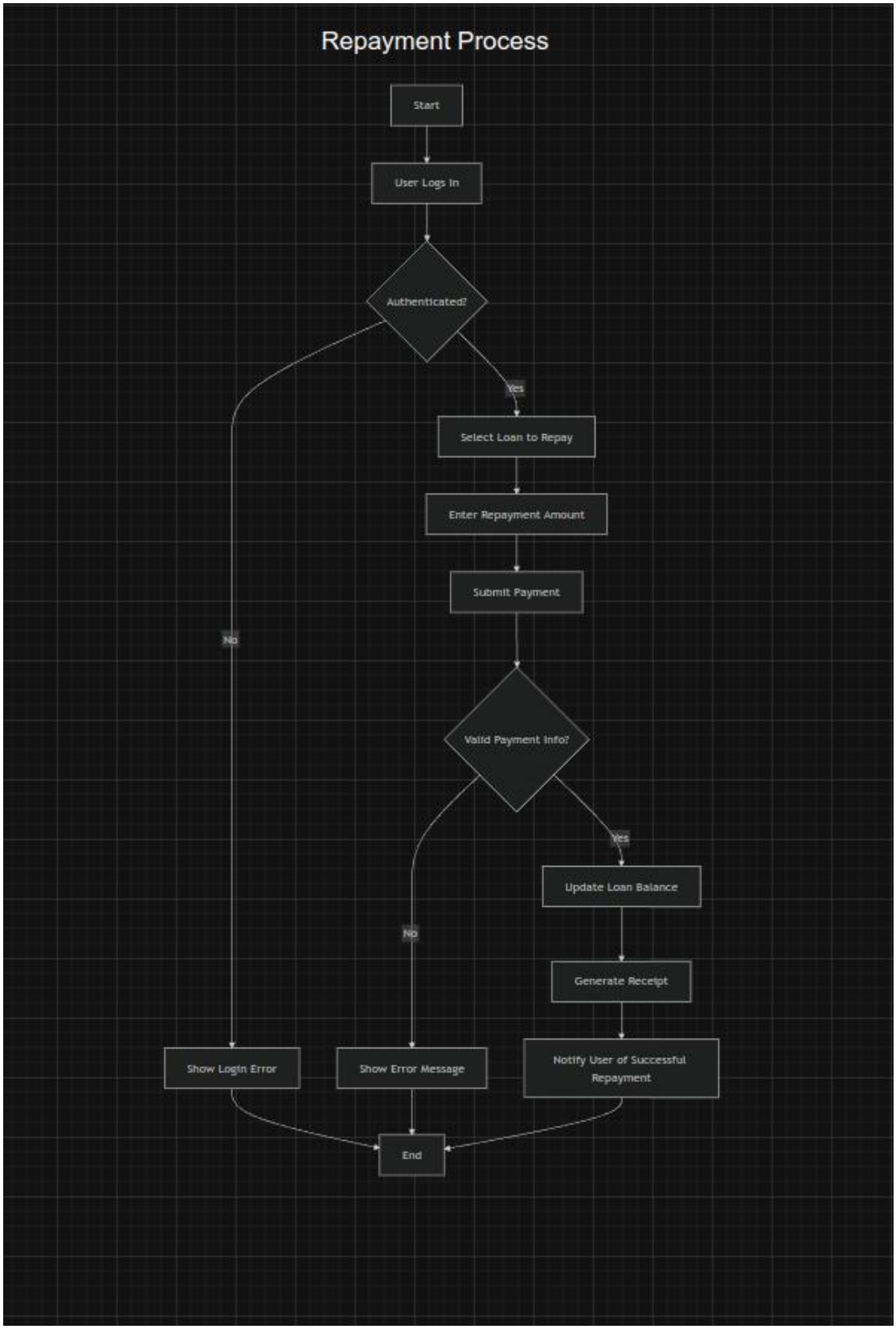

Table 5 Activity repayment process

e. **Use Case Modeling**:

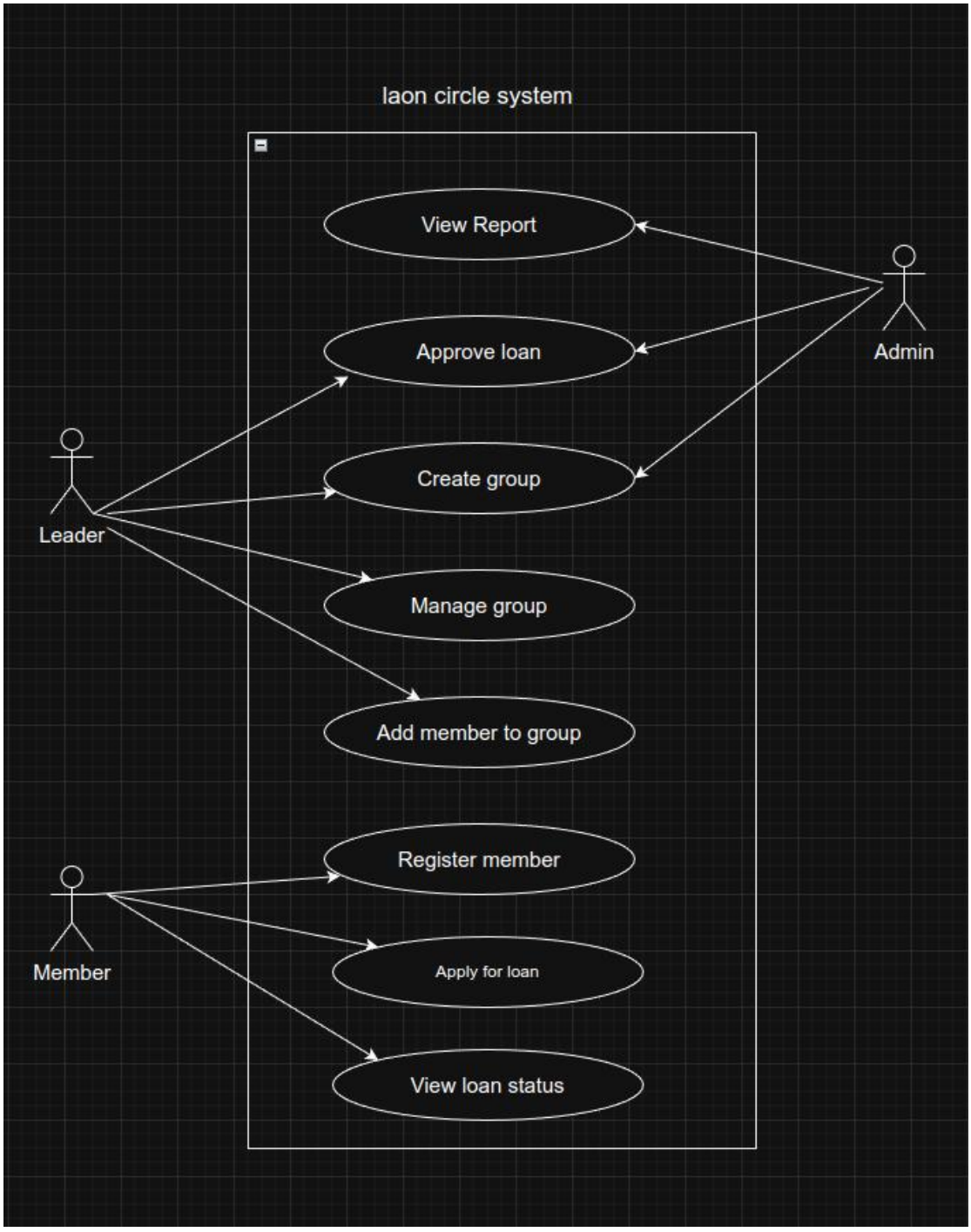

Table 6 Use case modeling loan circle system

f. **Class Diagram**:

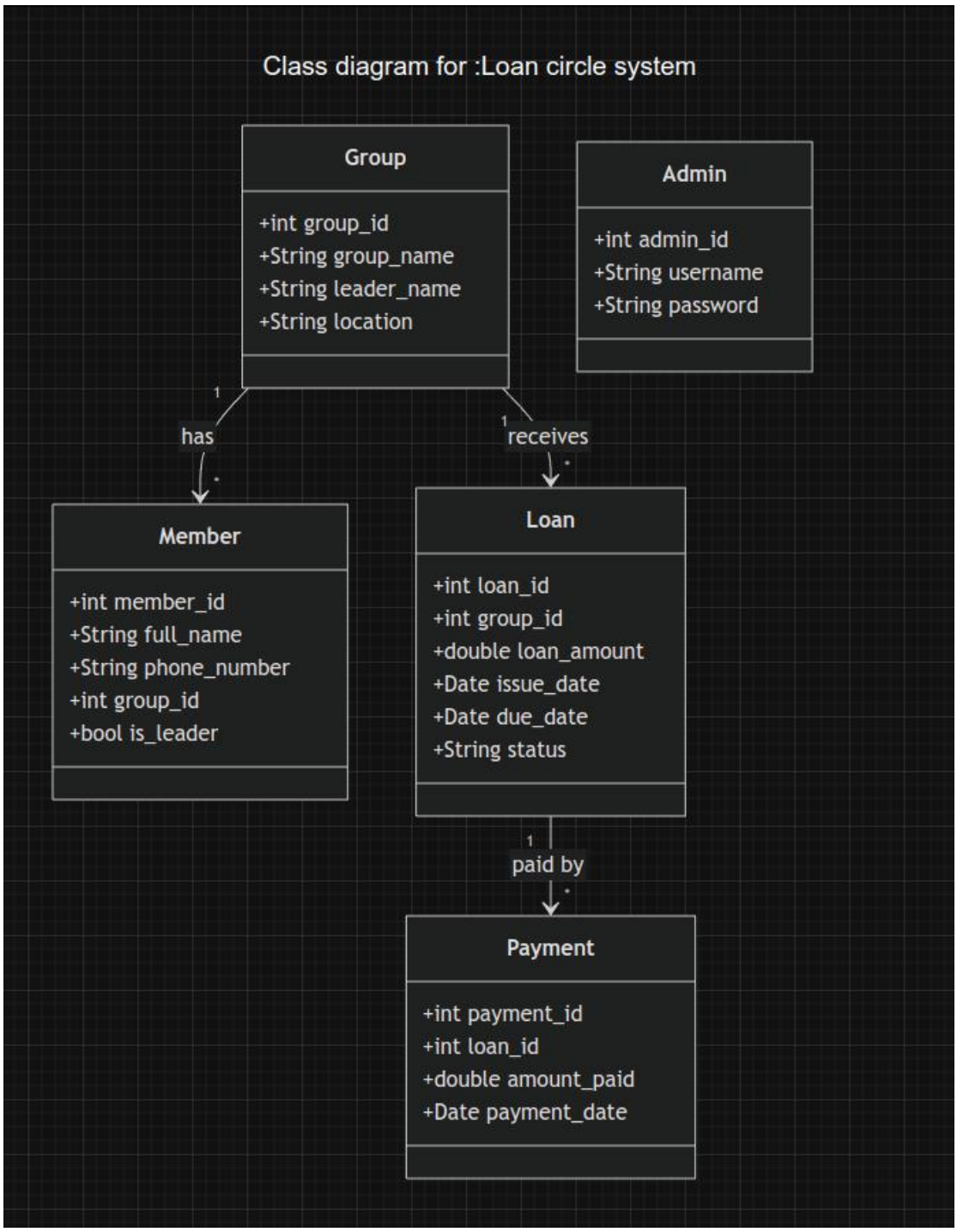

Table 7 class diagram loan circle

CHAPTER 4

8. System Implementation Strategy

- ✓ **Front-End Technology (e.g., React, Angular):**

The Loan Circle System will use **HTML**, **CSS**, **Bootstrap**, **JavaScript**, and **React** to build a responsive and user-friendly interface. These technologies will allow group leaders and members to easily manage group details, loan applications, and repayments from both desktop and mobile devices.

- ✓ **Back-End Technology (e.g., Spring Boot, Django):**

The system will be powered by **Spring Boot**, a robust Java-based framework. It will handle all core logic including user authentication, group and loan management, loan approval workflows, and repayment tracking through well-defined RESTful APIs.

- ✓ **Database Engine (e.g., PostgreSQL):**

The application will use **PostgreSQL** as the main database. It is ideal for storing structured data such as user accounts, group profiles, loan applications, repayment histories, and system logs. PostgreSQL ensures data integrity and supports advanced querying capabilities.

- ✓ **DevOps Tools (CI/CD, Monitoring):**

The development process will be managed using **GitHub** for version control and **CI/CD pipelines** to automate testing and deployment. The system will be deployed on cloud platforms such as **Heroku** or **DigitalOcean** to ensure reliability, scalability, and ease of access for all users.

9. Testing and Quality Assurance

Test Plan Overview:
We will create a detailed test plan that outlines what needs to be tested in the Loan Circle System, including all features like user registration, group management, loan

application, and repayment tracking. The plan will define testing schedules, responsibilities, and expected outcomes to ensure all parts work correctly.

Unit / Integration / System Testing:

- ✓ **Unit Testing:** Each part of the system (like loan calculation, user login) will be tested individually to confirm it works as expected.
- ✓ **Integration Testing:** Different parts of the system (e.g., front-end forms with back-end APIs) will be tested together to check they work smoothly when connected.
- ✓ **System Testing:** The entire Loan Circle System will be tested as a whole to verify that all functions work properly in a real-use environment.

Acceptance Criteria:

The system will be accepted only if it meets key criteria such as:

- ✓ All required features are working without errors.
- ✓ Users can easily register, create groups, apply for loans, and track repayments.
- ✓ The system is reliable, secure, and performs well under expected usage.

10. Deliverables for Loan Circle System

Software Application:

- ✓ A fully functional Loan Circle System that allows women's groups to register, manage members, apply for loans, and track repayments easily and securely.

Technical Documentation:

- ✓ Complete documentation covering the system's design, database structure, APIs, and how the front end and back end work together, to help future developers understand and maintain the system.

User Guide or Manual:

- ✓ A simple, clear manual showing how group leaders and members can use the system from signing up, creating groups, submitting loan requests, to monitoring repayment status.

Training Materials:

- ✓ Training slides, videos, or handouts designed to help users (especially women group leaders) learn how to operate the Loan Circle System confidently.

Deployment Scripts:

- ✓ Scripts and instructions for deploying the Loan Circle System on cloud platforms like Heroku or DigitalOcean, making installation and updates easy and repeatable.

11. Maintenance and Sustainability Plan

Ongoing Support:

- ✓ The Loan Circle System will have continuous technical support to fix any bugs, ensure smooth operation, and help users if they face any challenges. Support will be provided especially to group leaders and administrators who manage loan records and group details.

Feedback Loop:

- ✓ Users (especially women group members and leaders) will be able to give feedback through a simple form or contact option. Their suggestions and complaints will help improve the system and make it more user-friendly and effective.

System Update Policy:

- ✓ The system will be updated regularly to fix errors, improve performance, and add new features based on user needs. All updates will be tested on GitHub before deployment to ensure they don't affect existing data or functionality. Updates will be scheduled and communicated in advance to users.

CHAPTER 5

12. Appendices

Glossary of Terms

Loan Circle: A community-based group lending system where members support each other through collective loans.

Group Leader: The person responsible for managing a group within the Loan Circle System.

Member: An individual woman who belongs to a registered group eligible to apply for loans.

Loan Application: A formal request submitted by a group for financial support.

Repayment: The process of paying back the loan amount over a defined period.

Administrator: A system user responsible for approving loans and managing the platform.

RESTful API: A set of rules that allows different software applications to communicate over the internet.

Spring Boot: A Java-based framework used to develop the back-end of the system.

React: A JavaScript library used for building the user interface (frontend) of the system.

PostgreSQL: A relational database management system used for storing system data securely.

Acronyms

API: Application Programming Interface

CI/CD: Continuous Integration / Continuous Deployment

DBMS: Database Management System

HTML: HyperText Markup Language

JS: JavaScript

UI: User Interface

UX: User Experience

SRS: Software Requirements Specification

SDD: Software Design Document

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