NATIONAL INSTITUTE OF BUSINESS MANAGEMENT

School of Computing and Engineering

“School Management System”

Final Year Diploma Project Report

Academic Year 2022-23

Submitted By:

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M H D T TISSERA (CODSE224F-054)

Project Guide:

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Head of School of Computing and Engineering

Date: 2024/12/20

Place: NIBM Colombo School of Computing and Engineering

Diploma in Software Engineering

Declaration

I/We hereby declare that this project report is my/our own work and has not been submitted previously for any academic qualification. All sources of information have been acknowledged.

Signatures:

_____

E M A S B EKANAYAKA (CODSE224F-001)

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S D HEIYANTHUDUWA (CODSE224F-016)

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M H D T TISSERA (CODSE224F-054)

Abstract

The School Management System is a comprehensive software solution designed to address the growing needs of modern educational institutions. This project implements a robust platform that integrates various aspects of school administration, academic management, and communication into a unified system. The system employs cutting-edge technologies including biometric authentication, role-based access control, and real-time data processing to provide an efficient and secure environment for all stakeholders.

The implementation demonstrates significant improvements in administrative efficiency, reducing manual workload through automation of routine tasks and streamlining communication channels, thereby enhancing the overall educational experience. The system's modular architecture ensures scalability and maintainability, while its intuitive interface promotes rapid adoption among users of varying technical proficiency.

The project's significance lies in its potential to transform traditional educational management practices, particularly in government schools where resources are often limited. By digitizing core processes and providing real-time access to information, the system enables better decision-making and more effective resource utilization, ultimately contributing to improved educational outcomes.

Keywords: School Management, Education Technology, Academic Administration, Database Management, Web Application

Acknowledgement

We would like to express our sincere gratitude to our project guide, Dr. Thisara Weerasinghe, and the faculty of the School of Computing and Engineering for their invaluable support and guidance throughout this project.

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1 Introduction

1.1 Background

The digital revolution has transformed virtually every sector of society, yet many educational institutions, particularly government schools, continue to operate using traditional manual systems. This technological gap not only impacts administrative efficiency but also affects the quality of education and student engagement. In an era where students are increasingly tech-savvy and parents expect real-time updates about their children's progress, the need for a comprehensive digital solution has become paramount.

1.2 Project Context

This School Management System project emerges from a critical need to modernize educational institution operations in government schools. The initiative was conceived after extensive consultation with educators, administrators, and education technology experts, who identified significant opportunities for improving educational outcomes through digital transformation.

1.3 Project Objectives

- Modernization of Educational Operations
- Improvement of Stakeholder Engagement

1.4 Scope and Significance

The project encompasses a complete overhaul of school management processes, from daily administrative tasks to long-term strategic planning. Its significance lies in its potential to:

- Reduce administrative burden through automation
- Enhance student performance tracking accuracy with digital records

2 Methodology

2.1 Introduction

The methodology adopted for this project follows a structured software development lifecycle, including requirements gathering, system analysis, design, implementation, and testing. Data collection techniques included interviews, questionnaires, and document reviews with stakeholders.

2.2 Development Approach

A phased development approach was used:

- **Phase 1: Foundation** – User authentication, profile management, database setup
- **Phase 2: Core Functionality** – Academic management, attendance tracking, and assessment features
- **Phase 3: Advanced Features** – Reporting, communication platform, analytics dashboard

2.3 Chapter Summary

This chapter outlined the methodology and development approach used to ensure the system meets stakeholder requirements and is delivered on time.

3 Analysis

3.1 Current Environment Assessment

Government schools often operate with limited resources and manual processes, leading to inefficiencies and data management challenges. The current environment was assessed through stakeholder interviews and process mapping.

3.2 Feasibility Study

A feasibility study was conducted to evaluate technical, operational, and economic viability. The results indicated strong potential for improvement through digital transformation.

3.3 Problem Statement

Teachers spend considerable time on administrative tasks that could be automated, while parents struggle to stay informed about their children's progress. The lack of standardized processes and difficulty in tracking student performance data are key issues.

3.4 Chapter Summary

This chapter analyzed the current system, identified limitations, and established the need for a comprehensive school management solution.

4 Solution Design

4.1 System Architecture

The system is designed with a modular architecture, ensuring scalability and maintainability. Key modules include authentication, academic management, attendance, assessment, reporting, and communication.

Table 4.1: Technologies Used

Category	Technology
Frontend	HTML, CSS, JavaScript
Backend	Node.js, Express.js
Database	MySQL
Version Control	Git

4.2 Design Patterns and Principles

The design follows best practices such as separation of concerns, robust error handling, and secure data flow. Standardized API interfaces and middleware facilitate integration between modules.

4.3 System Modeling and Documentation

4.3.1 Use Case Analysis

4.3.2 System Workflows

4.4 Report Layout Design

Each report layout is numbered, named, and described in the appendix.

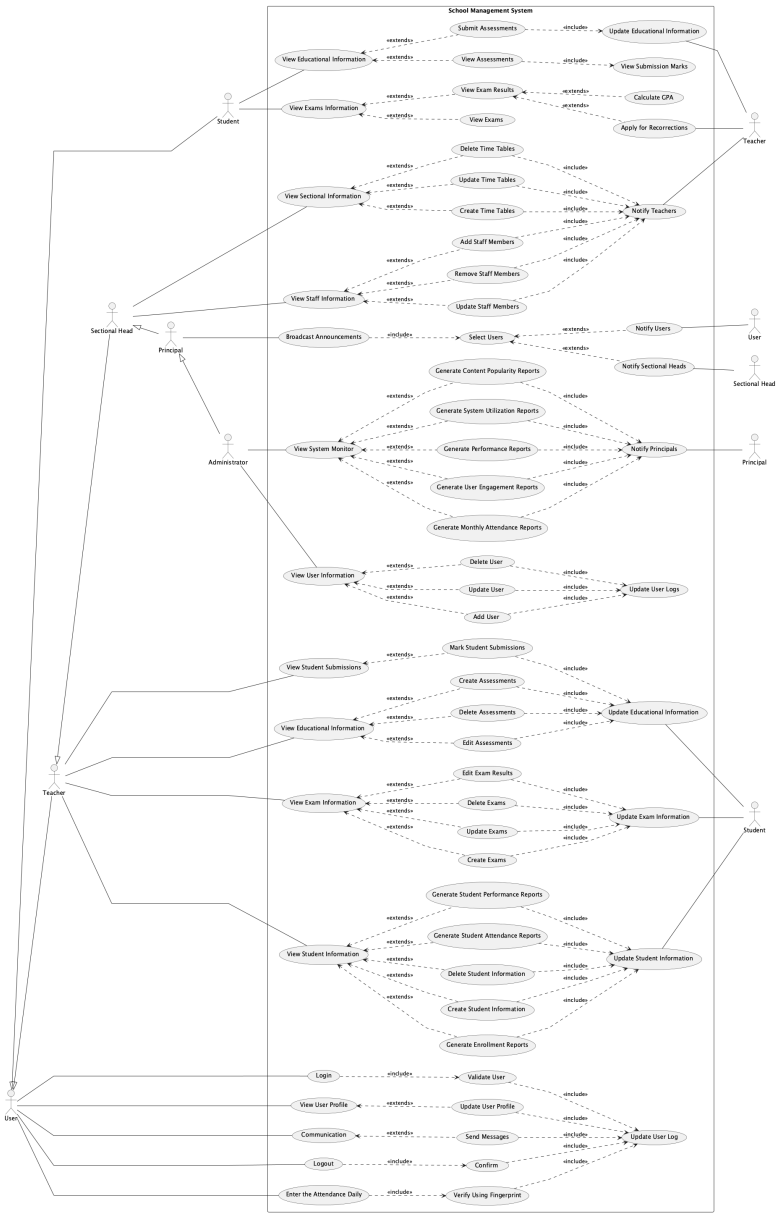


Figure 4.1: Use Case Diagram

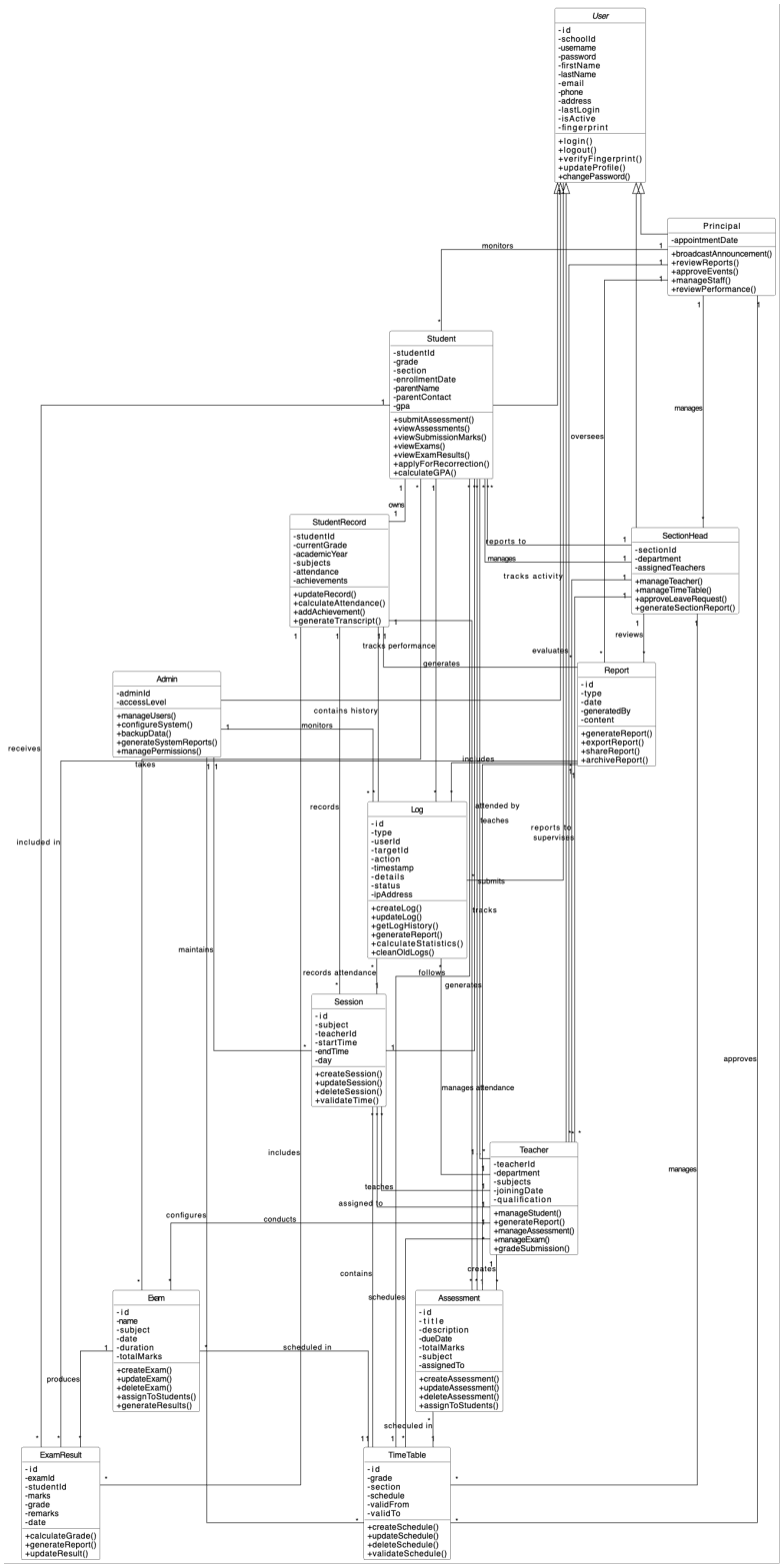


Figure 4.2: Class Diagram

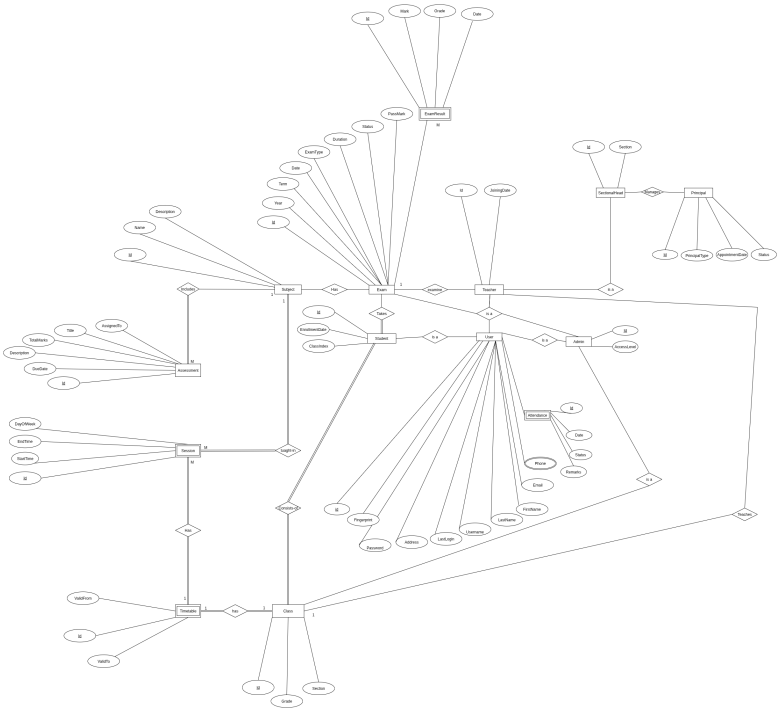


Figure 4.3: Entity-Relationship Diagram

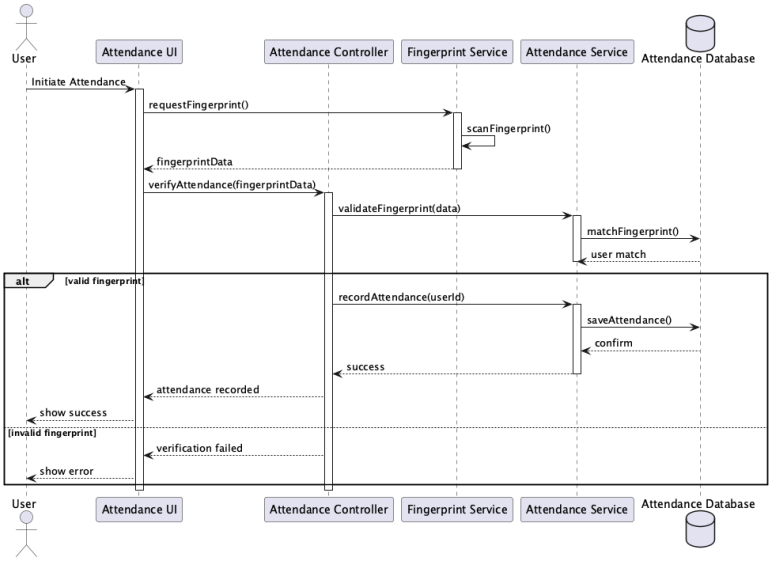


Figure 4.4: Attendance Sequence Diagram

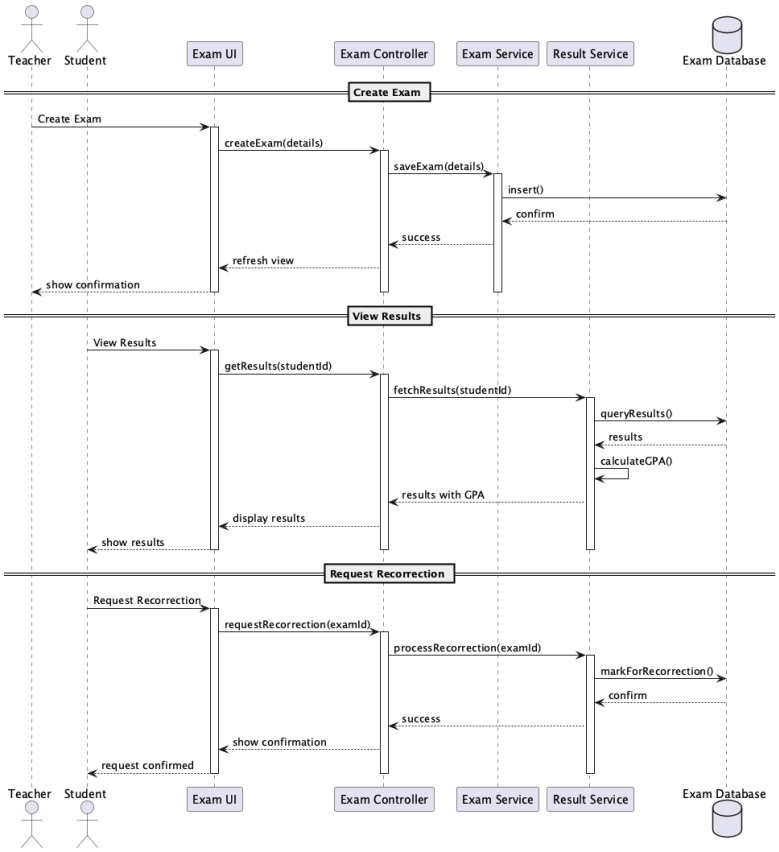


Figure 4.5: Exam Sequence Diagram

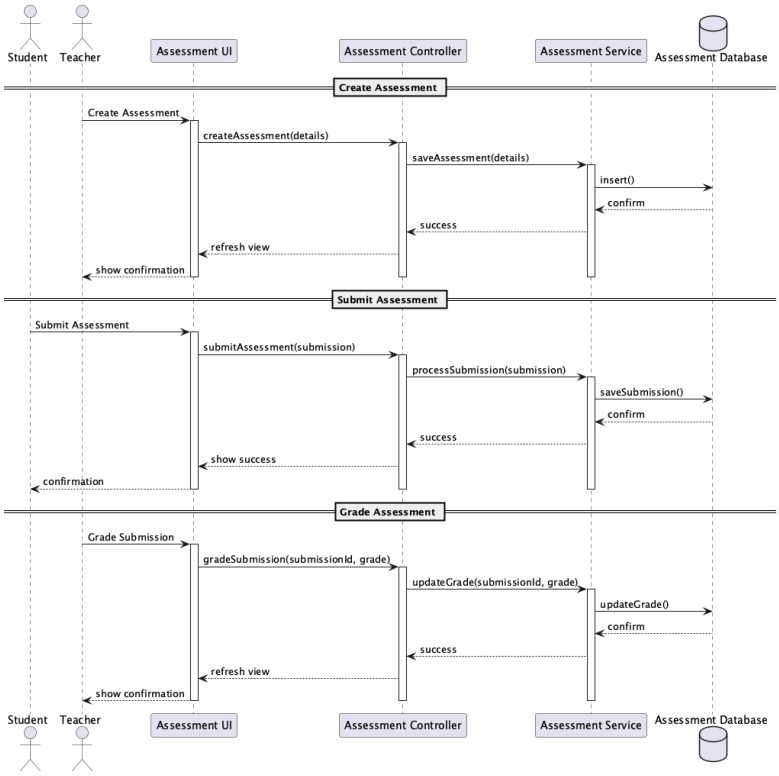


Figure 4.6: Assessment Sequence Diagram

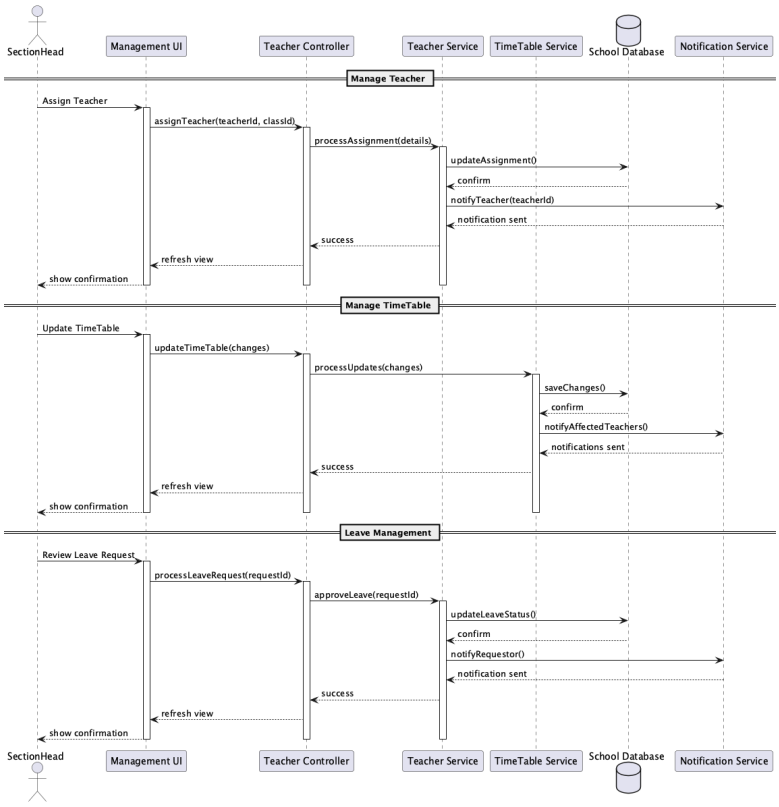


Figure 4.7: Teacher Management Sequence Diagram

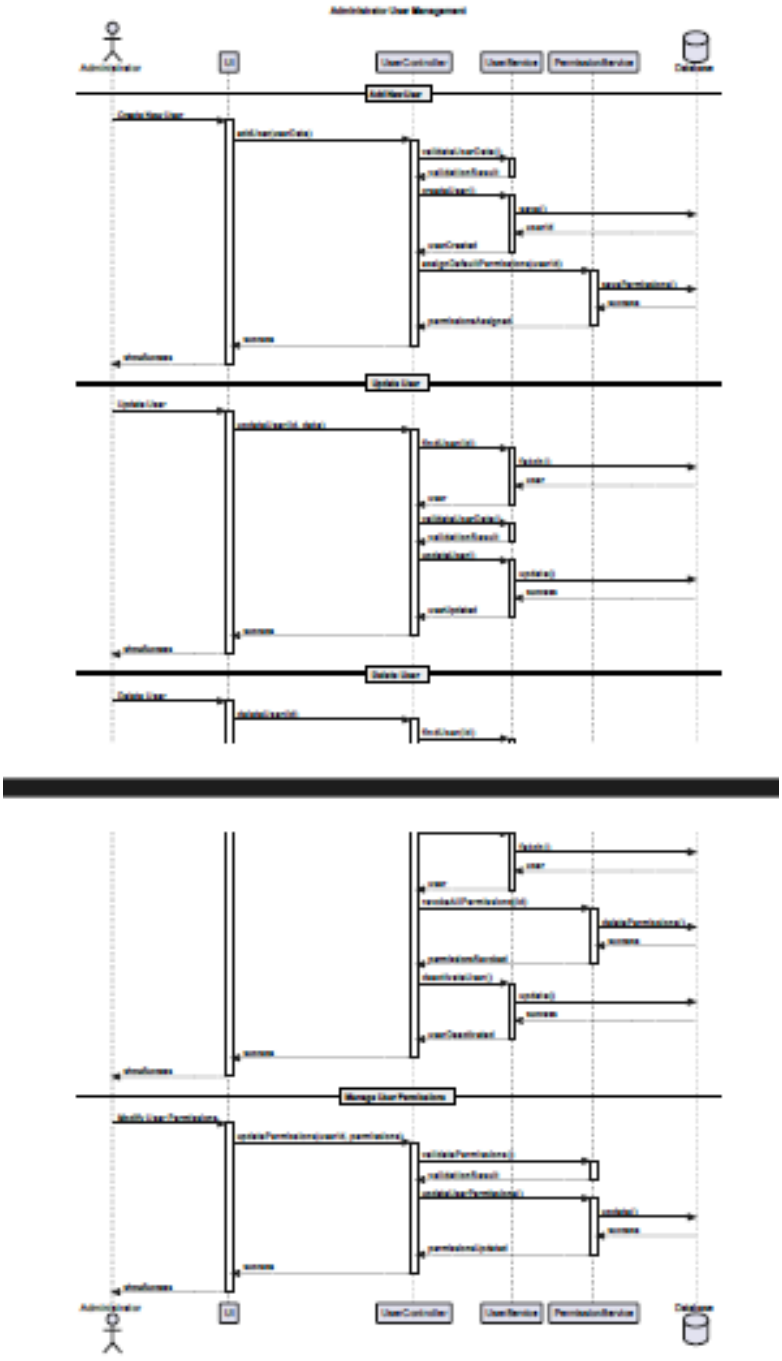


Figure 4.8: Admin User Management Sequence Diagram

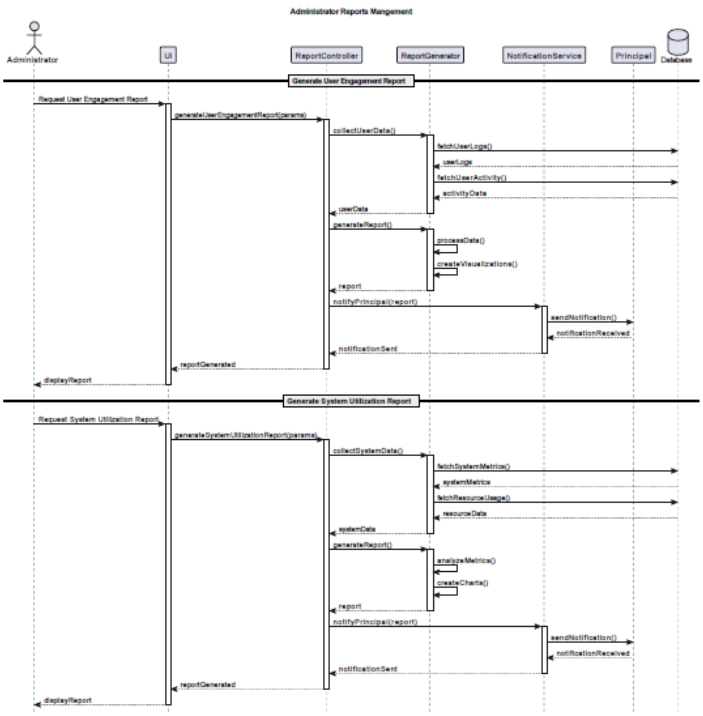


Figure 4.9: Administrator Report Management Sequence Diagram

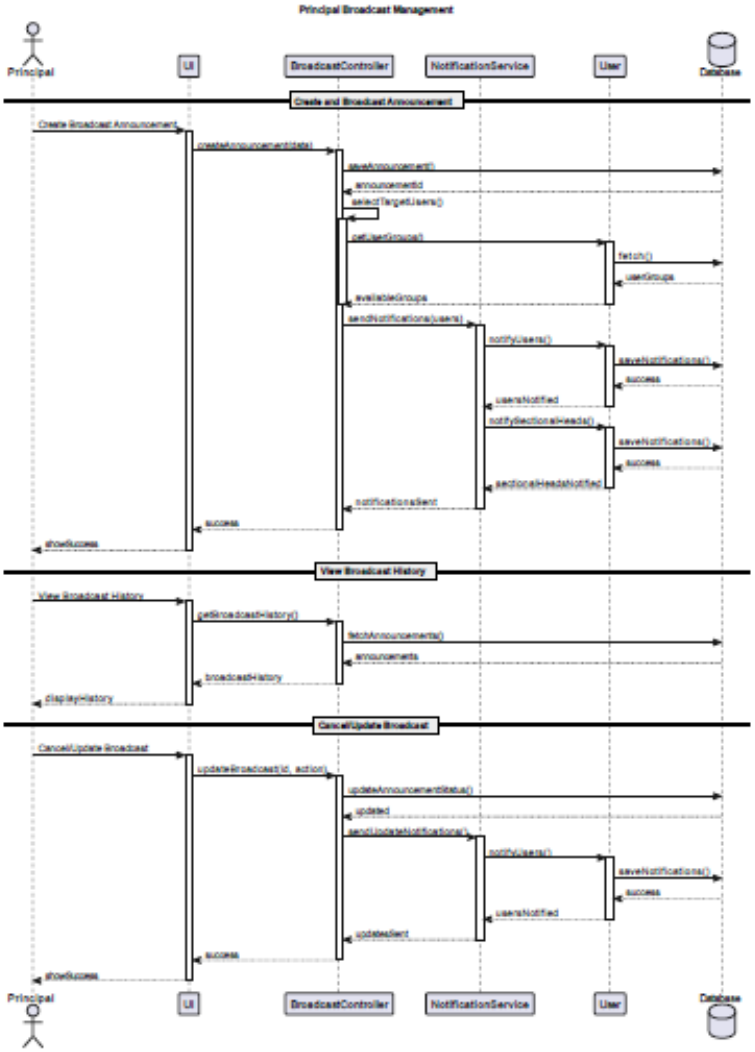


Figure 4.10: Principal Broadcast Sequence Diagram

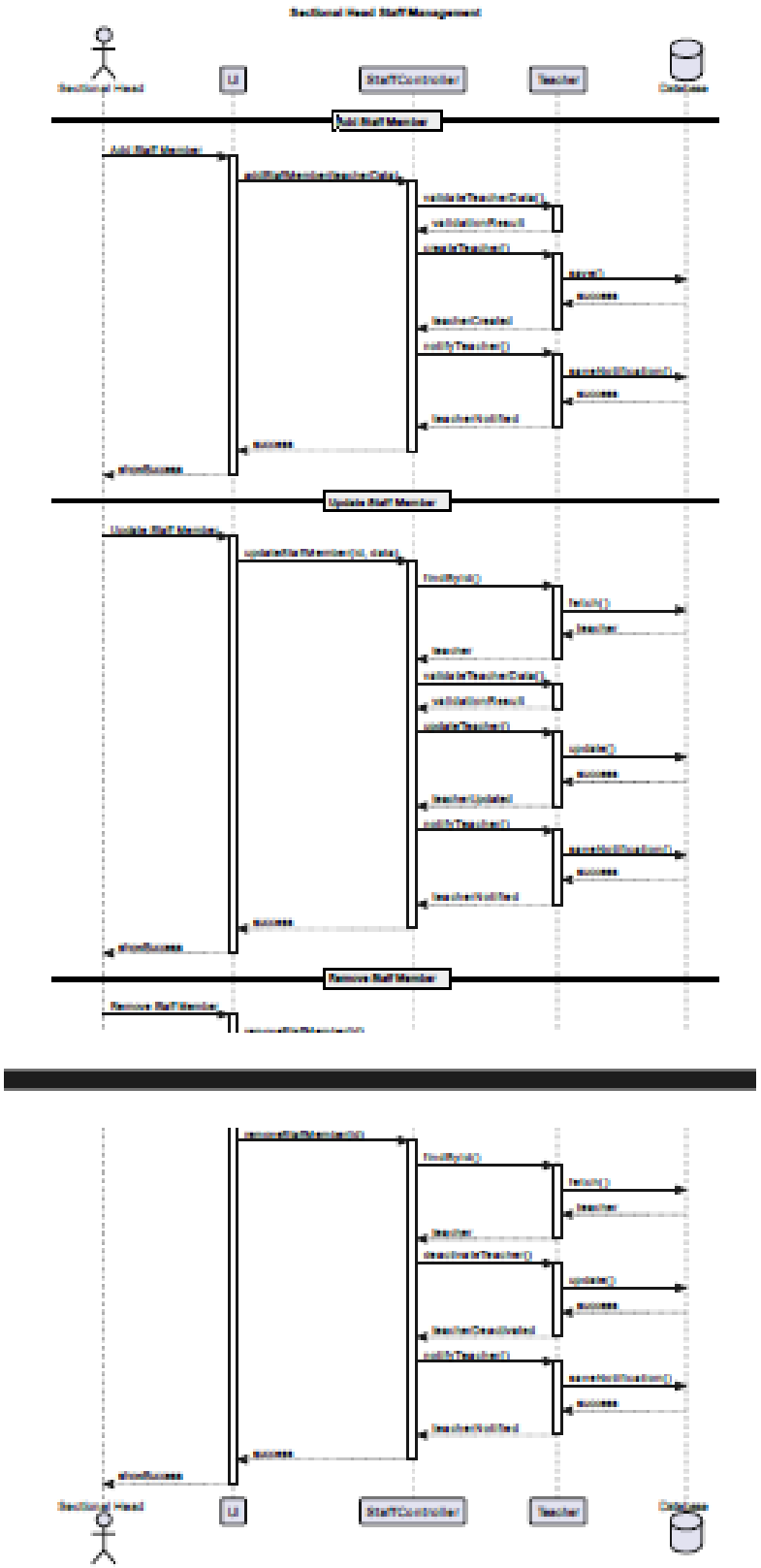


Figure 4.11: Sectional Head Staff Management Sequence Diagram

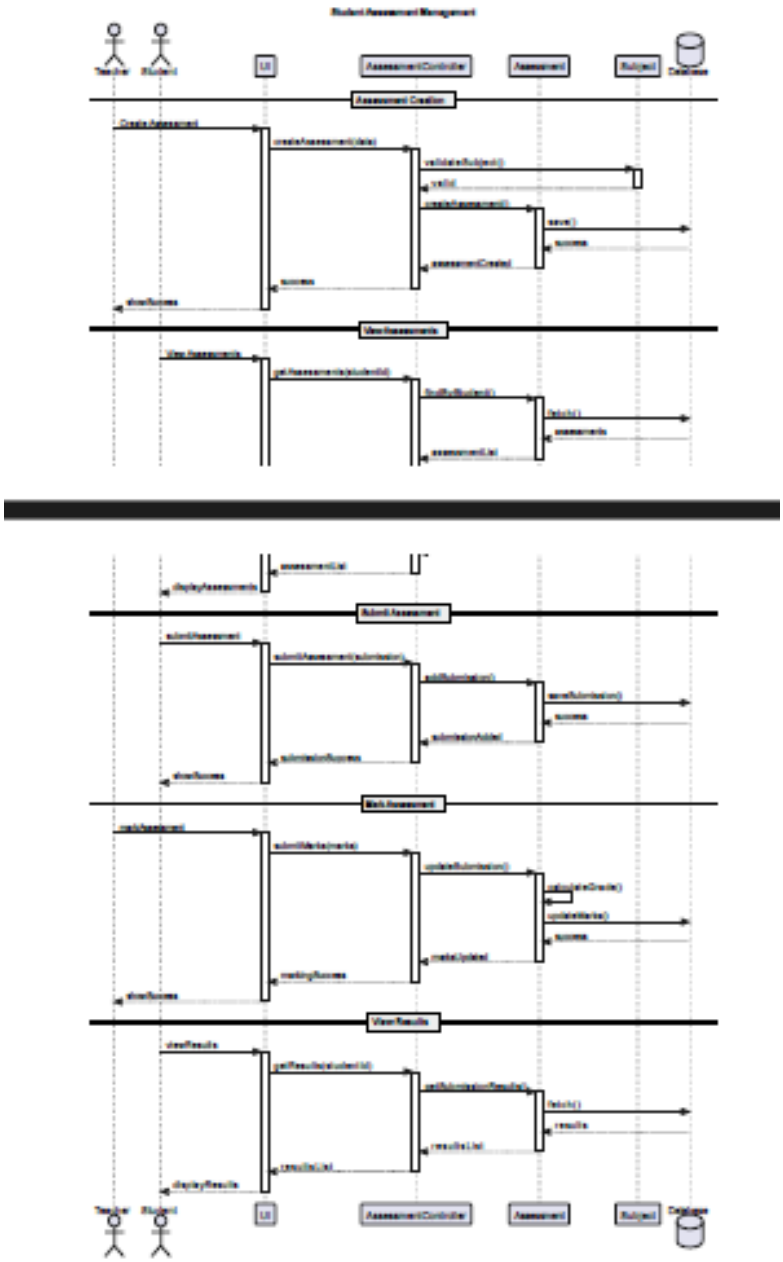


Figure 4.12: Student Assessment Management Sequence Diagram

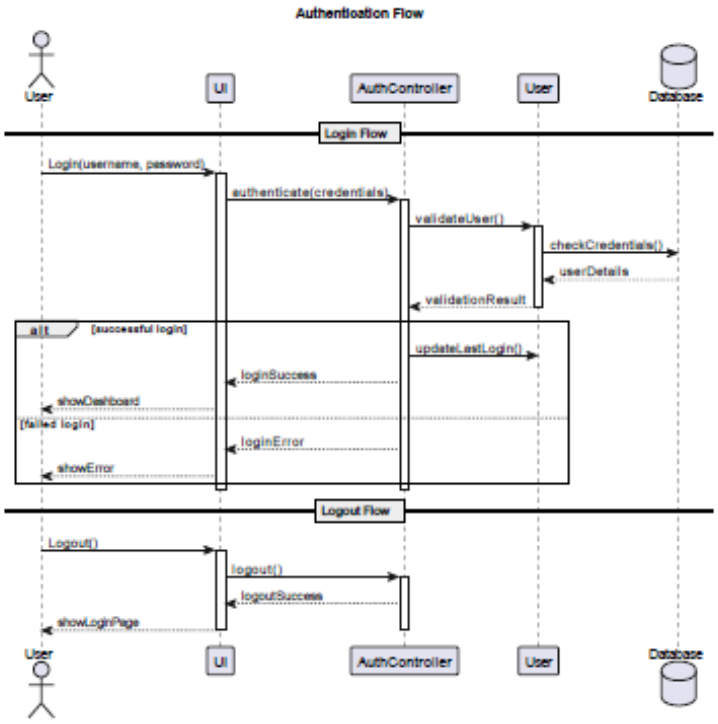


Figure 4.13: Authentication Flow Sequence Diagram

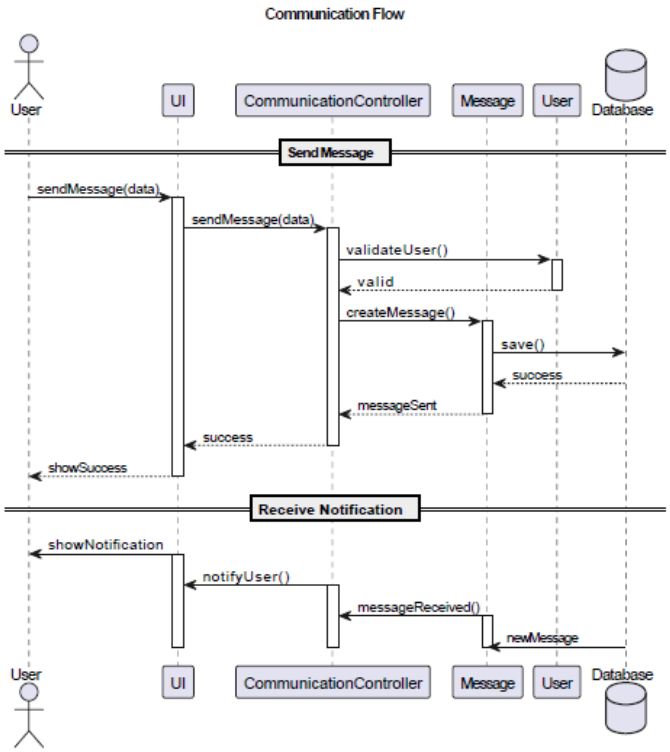


Figure 4.14: Communication Flow Sequence Diagram

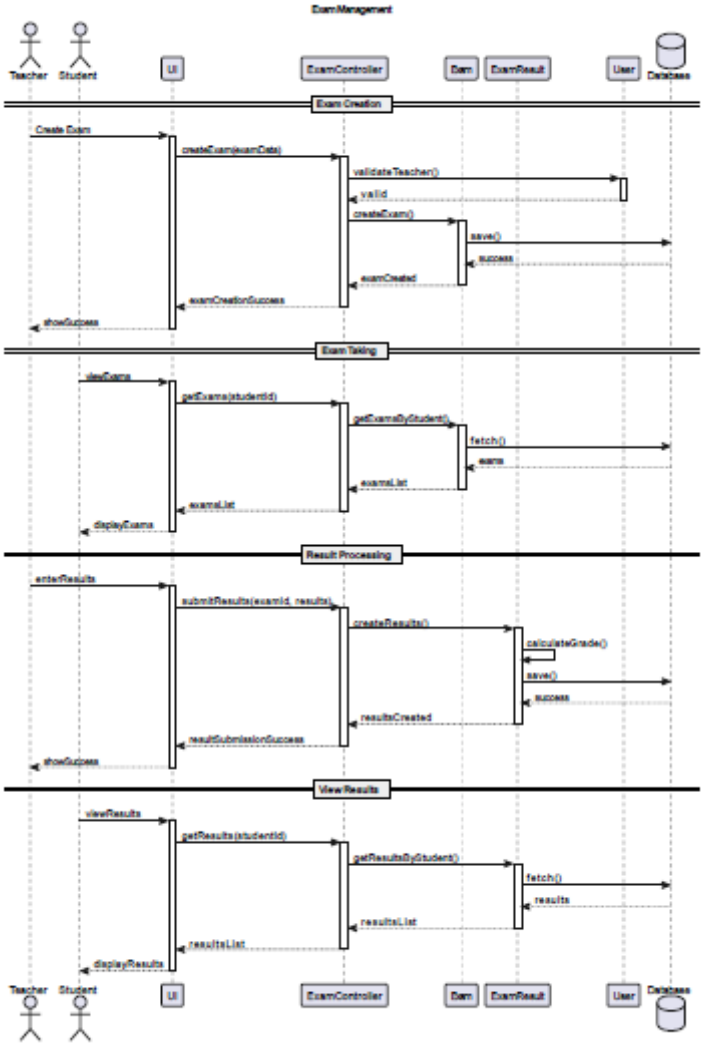


Figure 4.15: Exam Management Sequence Diagram

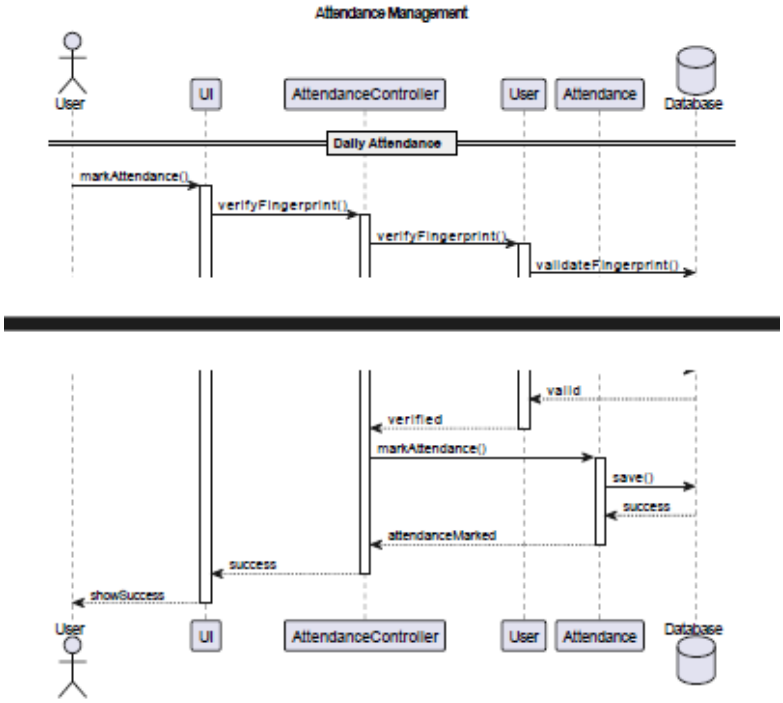


Figure 4.16: Attendance Management Sequence Diagram

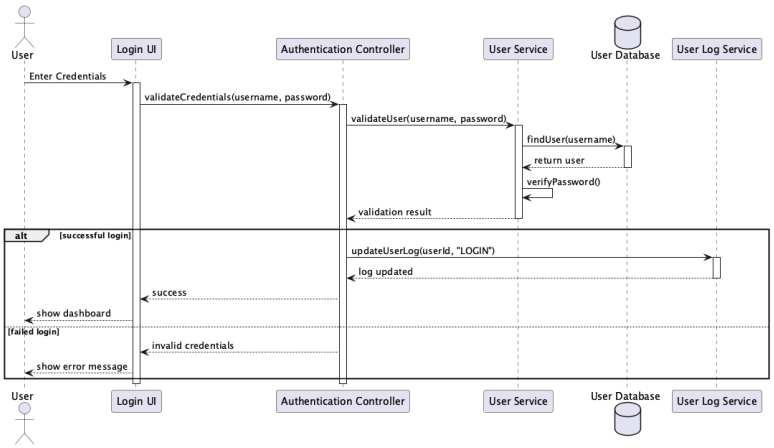


Figure 4.17: Authentication Sequence Diagram

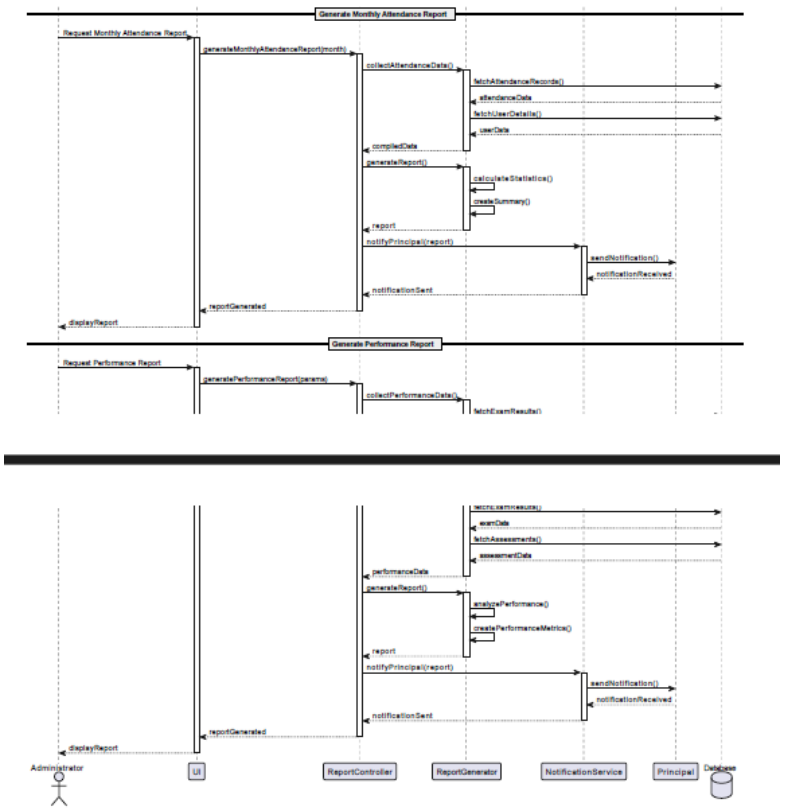


Figure 4.18: Generate Monthly Report Administrator Sequence Diagram

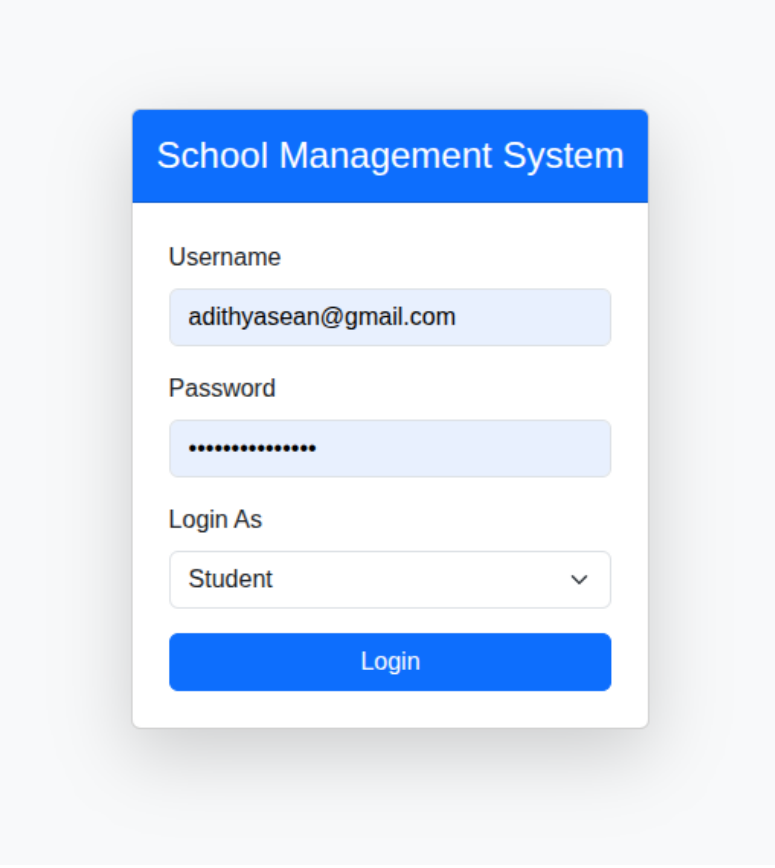


Figure 4.19: Login Page

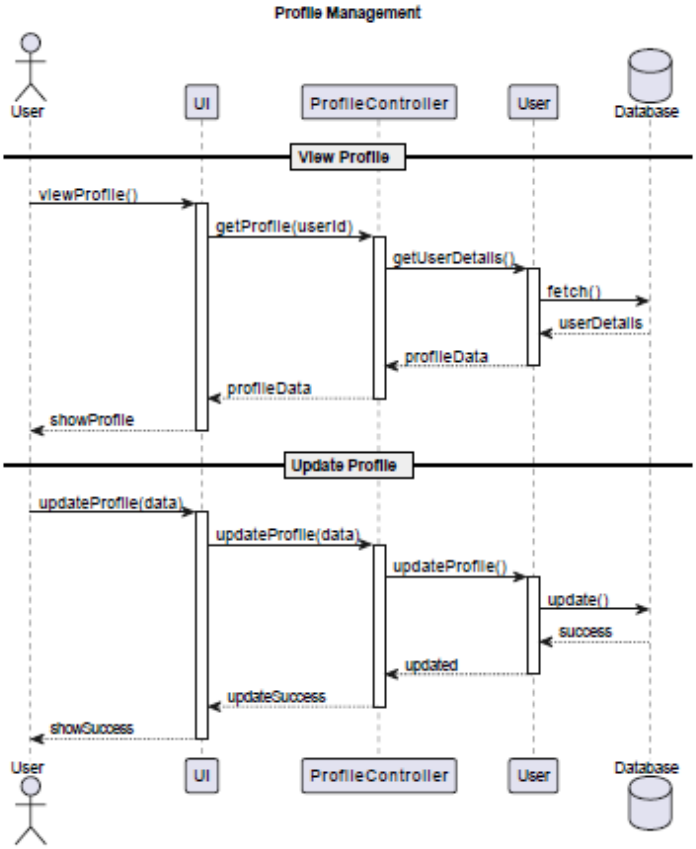


Figure 4.20: Profile Management

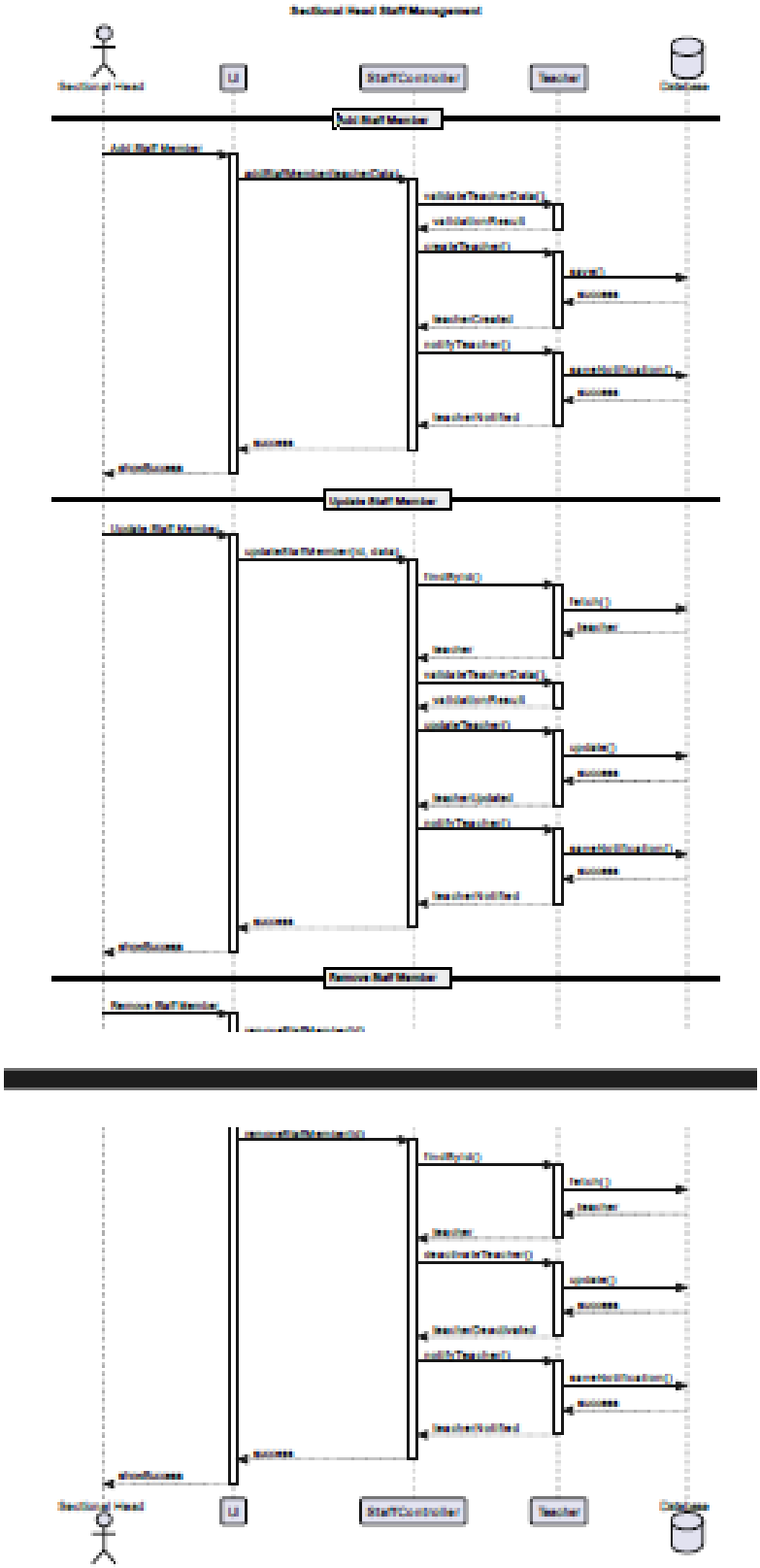


Figure 4.21: Sectional Head Staff Management

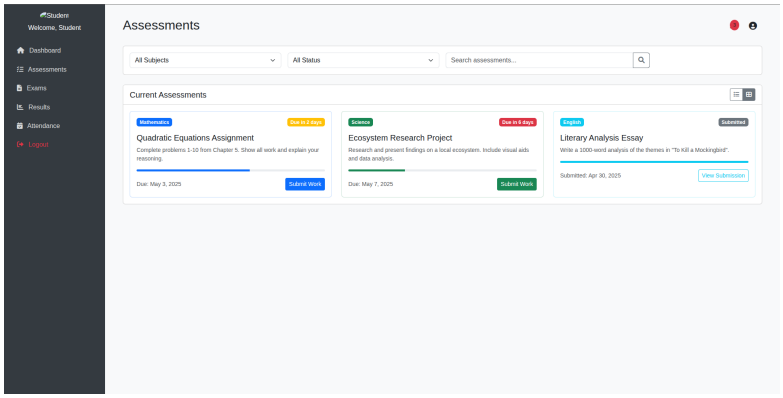


Figure 4.22: Student Assessment Page

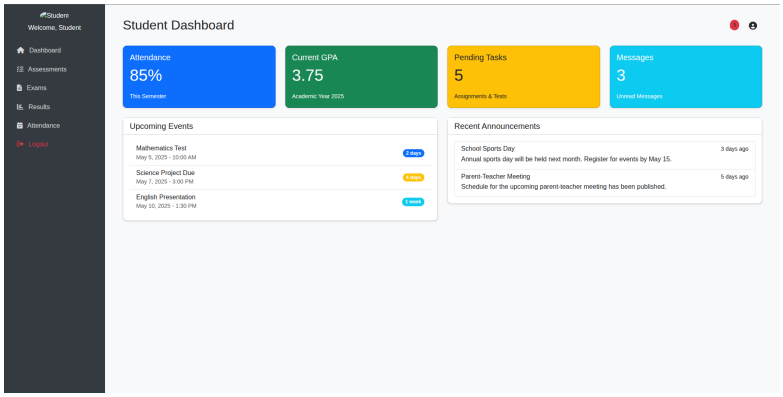


Figure 4.23: Student Dashboard Page

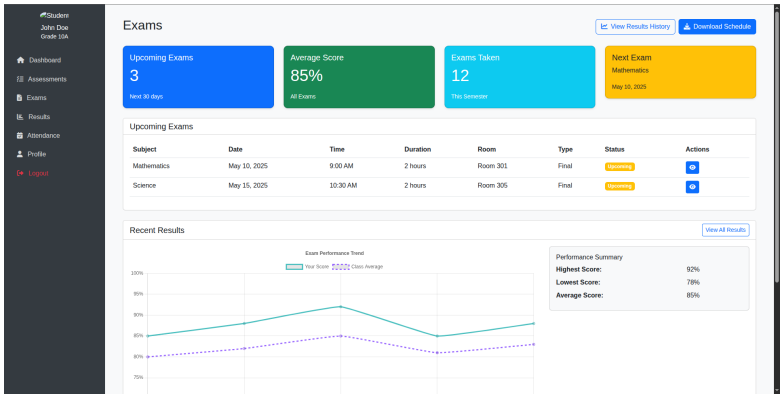


Figure 4.24: Student Exams Page

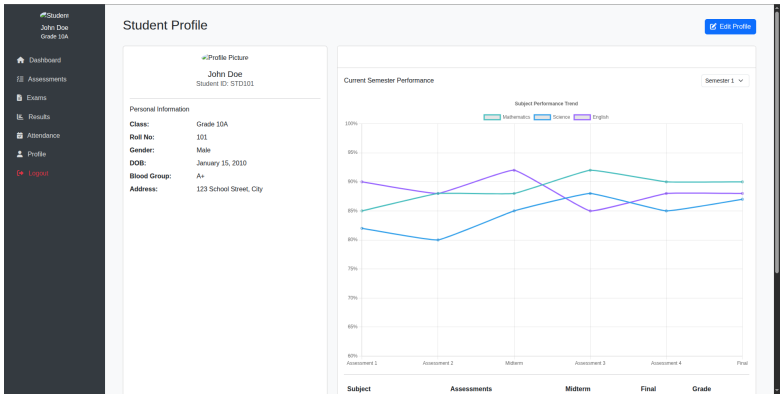


Figure 4.25: Student Profile Page

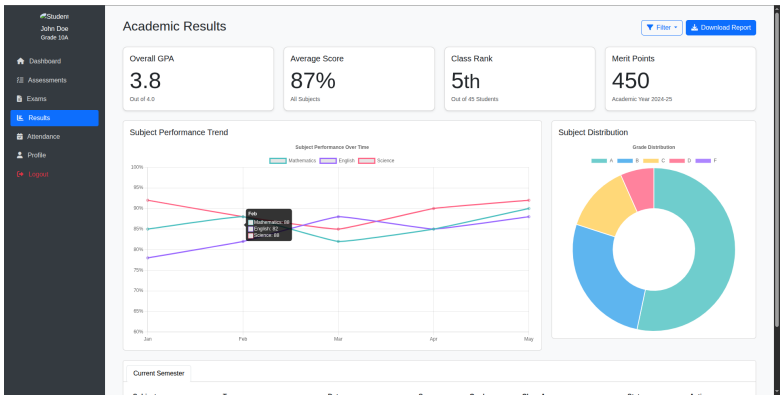


Figure 4.26: Student Results Page

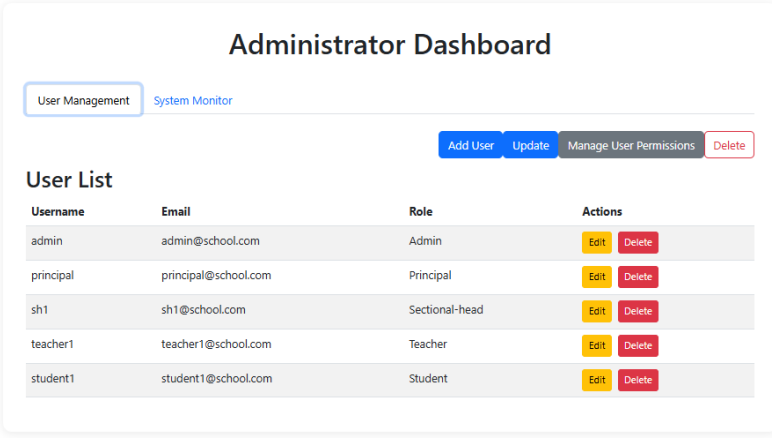


Figure 4.27: Admin Dashboard Page

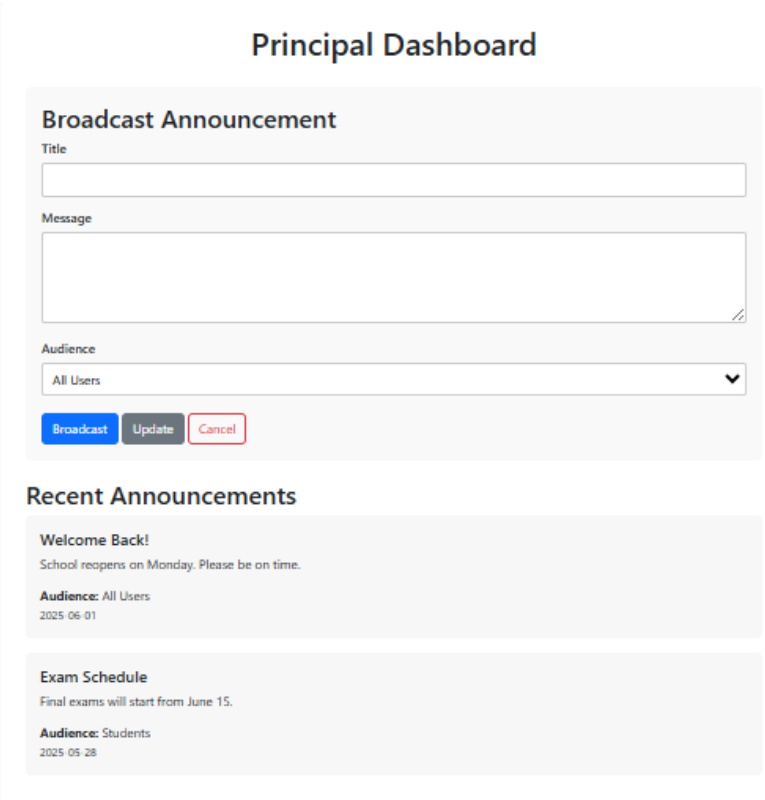


Figure 4.28: Principal Dashboard Page

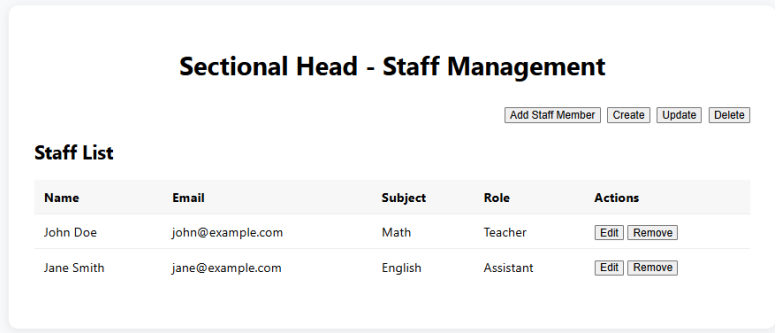


Figure 4.29: Sectional Head Staff Management Page

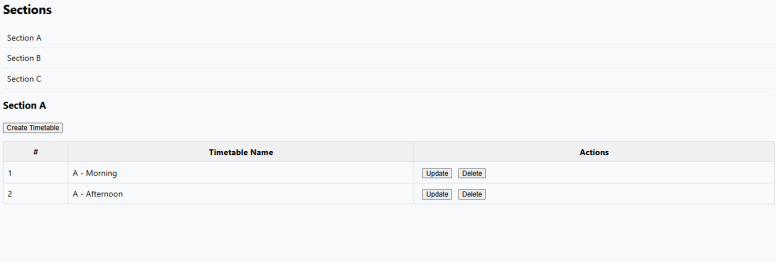


Figure 4.30: Sectional Head Time Table Management Page

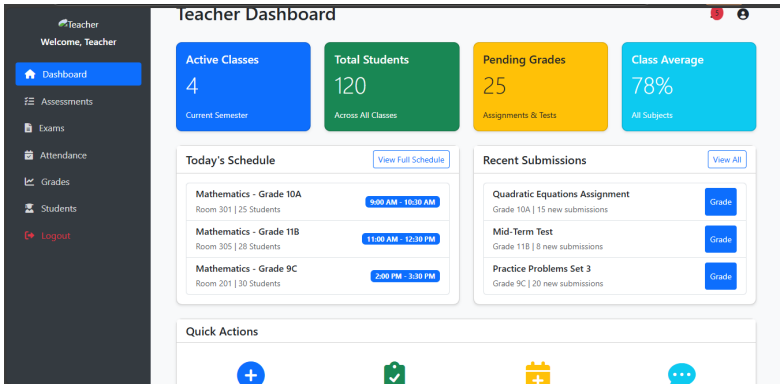


Figure 4.31: Teacher Dashboard Page

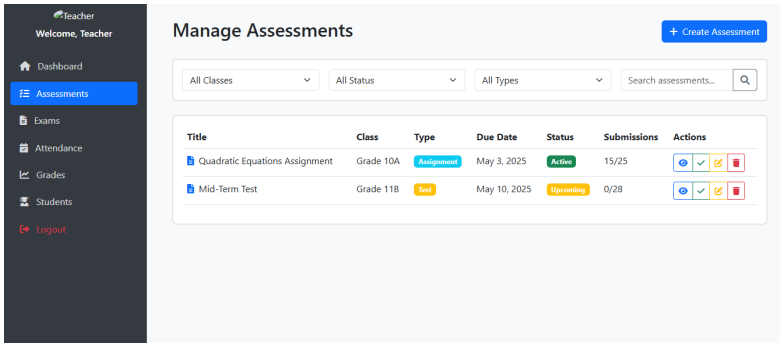


Figure 4.32: Teacher Assessments Page

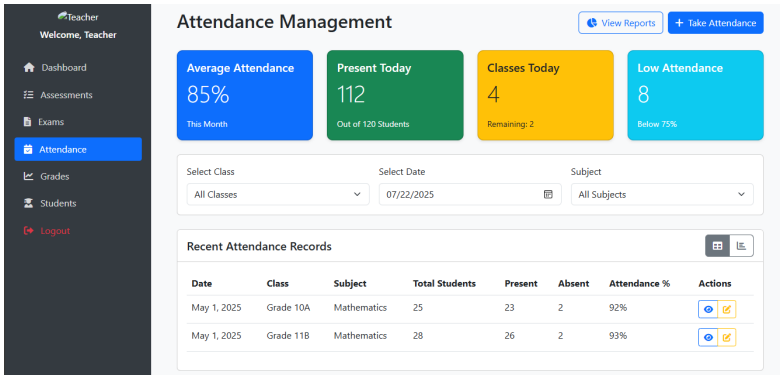


Figure 4.33: Teacher Attendance Page

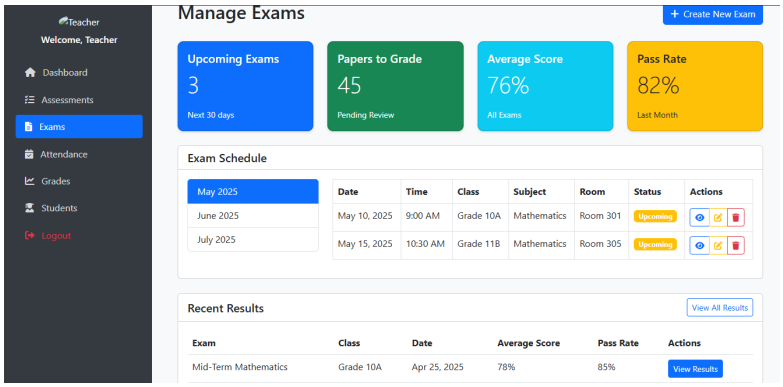


Figure 4.34: Teacher Exams Page

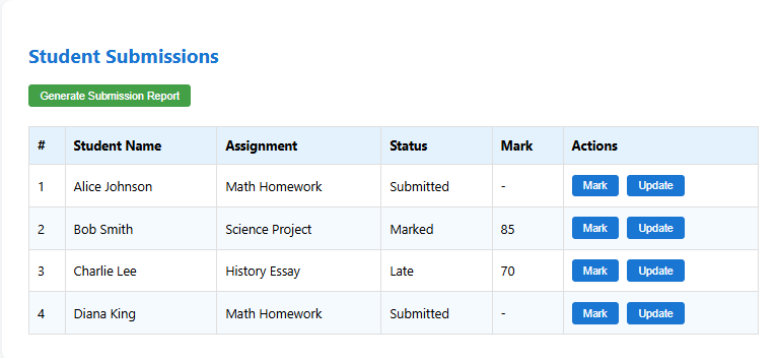


Figure 4.35: Teacher Submission Management Page

Figure 4.36: Placeholder for future diagrams

5 Conclusion

The School Management System represents a significant step forward in educational institution management. By addressing current system limitations and incorporating modern technology, the system promises to:

- Improve administrative efficiency
- Support data-driven decision making

The modular design ensures future scalability and adaptability to changing educational needs.

Bibliography

[1] Diploma in Software Engineering Project Guidelines, NIBM

A Appendices

A.1 Project Schedule

A.2 Letters from Organization

A.3 Questionnaires and Interview Questions

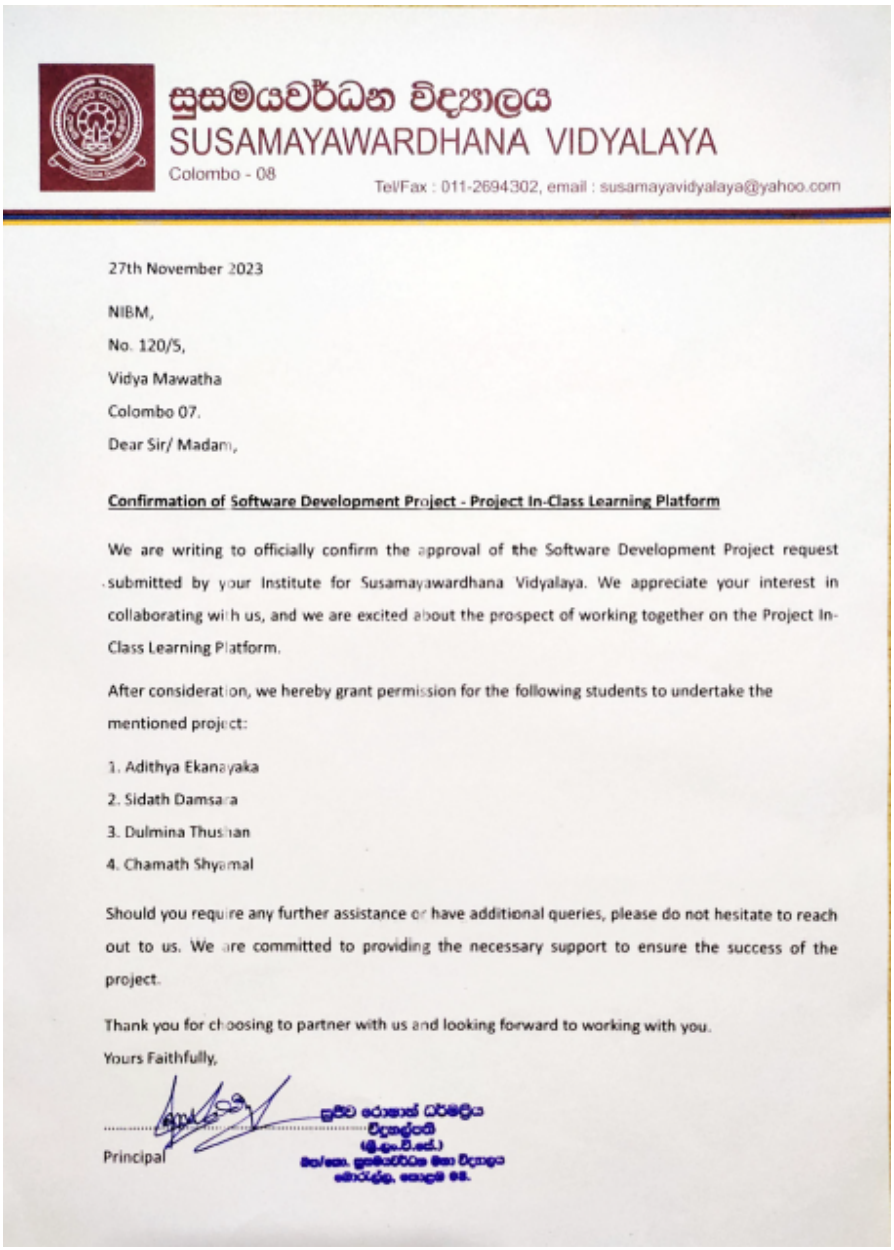
A.4 Meeting Minutes and Log Sheets

A.5 Reviewed Documents

A.6 Software Setup and Configuration

A CD with the software setup and configuration files is included with the final submission.

A.7 Permission Letter



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SUSAMAYAWARDHANA VIDYALAYA
Colombo - 08
Tel/Fax : 011-2694302, email : susamayavidyalaya@yahoo.com

27th November 2023

NIBM,
No. 120/5,
Vidya Mawatha
Colombo 07.

Dear Sir/ Madam,

Confirmation of Software Development Project - Project In-Class Learning Platform

We are writing to officially confirm the approval of the Software Development Project request submitted by your Institute for Susamayawardhana Vidyalaya. We appreciate your interest in collaborating with us, and we are excited about the prospect of working together on the Project In-Class Learning Platform.

After consideration, we hereby grant permission for the following students to undertake the mentioned project:

1. Adithya Ekanayaka
2. Sidath Damsara
3. Dulmina Thushan
4. Chamath Shyamal

Should you require any further assistance or have additional queries, please do not hesitate to reach out to us. We are committed to providing the necessary support to ensure the success of the project.

Thank you for choosing to partner with us and looking forward to working with you.

Yours Faithfully,

.....
Principal

Figure A.1: School Permission Letter