LONDON METROPOLITAN UNIVERSITY

CS6P05ES Project

Interim Report

Learning Management System (LMS) for EduMatrix Institute.

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Declaration

Module: CS6P05ES **Deadline: 11/02/2024**

Module Leader: Prof. Ruvan Abeysekara **Student ID: 23039295**

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(ii) Falsifying data in experimental results.

(iii) Personation, where a substitute takes an examination or test on behalf of the candidate. Both candidate and substitute may be guilty of an offence under these Regulations.

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- Submit as a PDF file.
- Submit **BOTH** the Formal and Second submissions
- The report is a formal document and should be written in formal English
- Write for someone who is technically proficient but not necessarily familiar with your particular project
- Do not use ‘possessive words’ such as I, me, my, we… in reports
- Your report should cover everything as detailed in this template. You should delete the guidance notes before submission

Abstract

The Learning Management System (LMS) project aims to address manual inefficiencies in student and course management at the EduMatrix Institute in Kurunegala.

This document explains the project's background, objectives, completed work, and present progress, and a proposed road map for future work, as well as a progress review, highlighting the importance of a technology-driven solution to enhance the learning environment. The proposed solution involves developing a user-friendly LMS with React.js for the frontend, Spring Boot for the backend, and MySQL using for database management.

The identified challengers are time-consuming processes, insufficient assessment procedures, and a lack of comprehensive reporting tools. This project aims to address these difficulties, as emphasized by research emphasizing technology's revolutionary impact on education.

The document serves as a foundation for the successful implementation of an innovative educational solution at the EduMatrix Institute.

Contents

Table of Figures

1. Introduction

In the rapidly evolving landscape of education, the integration of technology has become imperative to enhance the learning experience. The Learning Management System (LMS) development project is developing in due to the growing need for a comprehensive, user-friendly platform for managing, delivering, and tracking educational content.

Leading the charge in innovative efforts to completely change EduMatrix's educational system is the Learning Management System (LMS) project. The goal of this project is to bring in an era of technology-driven, updated learning at EduMatrix Institute while resolving the difficulties with manual administration activities.

EduMatrix faces challenges with manual record-keeping, time-consuming administrative processes, and the demand for more dynamic and engaging learning environments. The LMS is planned as a comprehensive solution to these challenges, with the goal of automating administrative tasks, facilitating interactive content delivery, and providing robust analytics for informed decision making. And also, Manual procedures currently in place hinder efficient course management and student involvement. In response, management has begun the development of a complete Learning Management System to solve these issues and improve the entire educational experience.

1.1 Aims and Objectives

This project aims to developing a learning management system to enhance automation, simplify student administration, and improve course management. The system will enable interactive content delivery, real-time progress tracking, improved assessment and grading methods, and strong reporting capabilities for administrators and instructors. It also aims to provide a modern, efficient, and user-friendly educational platform.

The objectives of this system include:

— Simplify student administration and course management processes.

- Facilitate interactive content delivery to enhance the learning experience.
- Enable real-time progress tracking for monitoring student advancements.
- Improve assessment and grading methods to provide timely and efficient feedback.
- Offer robust reporting capabilities for both administrators and instructors.
- Provide a modern, efficient, and user-friendly educational platform.
- Create detailed technical documentation covering system architecture and guidelines.
- Develop user manuals for administrators, instructors, and students.
- Prepare training materials to facilitate efficient system usage and maintenance.

1.2 Resource Requirements

To successfully complete the Learning Management System project for EduMatrix Institution, it will require a robust set of hardware and software resources. The development team requires a set of essential software tools and frameworks, as well as hardware components.

1.2.1 Software Requirements

- React Js, bootstrap (Frontend)
- Spring boot (Backend)
- MySQL (Database)
- Visual Studio Code, IntelliJ Idea (IDE)

1.2.2 Hardware Requirements

- Computers
- Barcode Readers
- Small stand cameras

2. Background

The global education landscape has always been immensely influenced by technological developments. Turning to history books, one can learn about the era of carvings on rocks to preserve and share the learnings of individuals with others. The modern world serves as a sweet abode for technological advancements that are shaping the way people spend their time and live their lives. Technology has brought convenience to all spheres of life, a phenomenon witnessed on a daily basis. This convenience has extended to education as well, manifesting in the form of eLearning and online education facilitated by Learning Management Systems (LMS). (campuspress, 2022)

The potential of technology in the classroom is enormous: it enables individualized, mastery-based learning, saves teacher time, and provides students with the digital skills required for 21st-century careers. Indeed, controlled pilot studies have demonstrated significant gains in student outcomes through tailored blended learning.1 During this period of school closures and distant learning, education technology has become a lifeline for the continuance of learning. (Jake Bryant,Felipe Child,Emma Dorn,Stephen Hall, 2020)

A century ago, the education system used radio to provide on-air lessons, which were accessible to anybody within the listening range. Following this, the overhead projector was introduced in the 1930s and quickly became a popular tool for disseminating classroom instruction. Another notable technical innovation in the 1950s was the advent of videotapes, which allowed lectures to be preserved and shared. Calculators appeared in the 1970s, and the Scantron system was used for efficient student grading, among other developments of the era. (Zahid, 2022)

In today's world, connecting online has become more convenient than meeting in person. This trend, exacerbated by the COVID-19 pandemic, has contributed to the growth of eLearning. Learning Management Systems (LMS) are properly credited for allowing huge online learning in recent years, significantly altering the educational environment. (Zahid, 2022)

The introduction of personal computers marked possibly the most significant technical revolution in education. Individuals may now attend courses and lectures

online, access training sessions from anywhere in the world, and even receive professional degrees without ever having to visit a traditional educational institution, due to these technologies and the following development of Learning Management Systems (LMS). (valamis, 2024)

Currently, as educational institutions strive to adapt to diverse learning needs and modalities, the need for a robust LMS has become increasingly apparent. The LMS serves as a centralized hub, facilitating course management, managing user access, and creating a dynamic environment for content delivery.

3. Work Completed

The author (developer) first analyzed the project requirements and decided on what are the methodologies and technologies used to implement this system. After the complete requirement analysis, the author planned the project and gathered the needed research documents. And the author first decided to do the project using the waterfall methodology (the author thought the requirements were fixed in the project). But author thinks in the middle of the process ideas can change and need to add new requirements. After that, the author decided to do the project using Agile methodology. Agile methodology is a practice that encourages continuous repetition of development and testing throughout the life cycle of project software development. The author chose React JS (JavaScript) for the frontend because it provides dynamic, responsive interfaces, enhancing the overall user experience for students and instructors. And the Spring Boot (Java) framework was chosen for the backend for scalable and efficient services, and MySQL was also chosen for the database structure. After that, the author created a use case diagram, an entity relationship diagram, and other needed diagrams for this system.

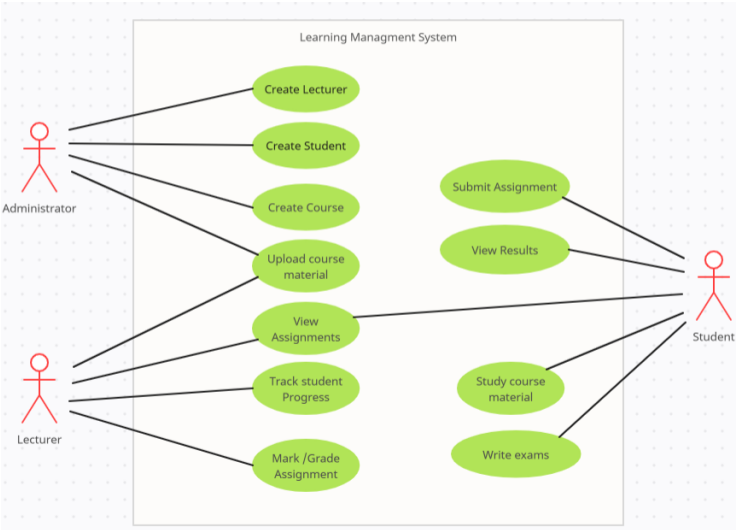

Figure 1-Use Case Diagram

The diagram appears to be a conceptual model of a learning management system (LMS). Here users are students, instructors, and administrators.

Figure 2-ER Diagram

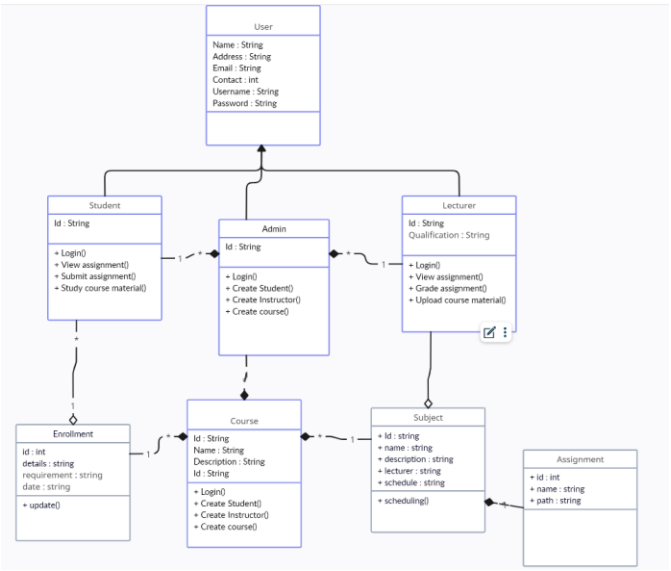

Figure 3-Class Diagram

The developer has completed the below tasks so far.

— Project Planning and Project Documentation.

— Project Proposal Submission.

— Chosen all using technologies.

— Designed all diagrams.

— Student login interface.

— Lecturer Backend Implements.

— Admin Dashboard.

— Student Backend Implement.

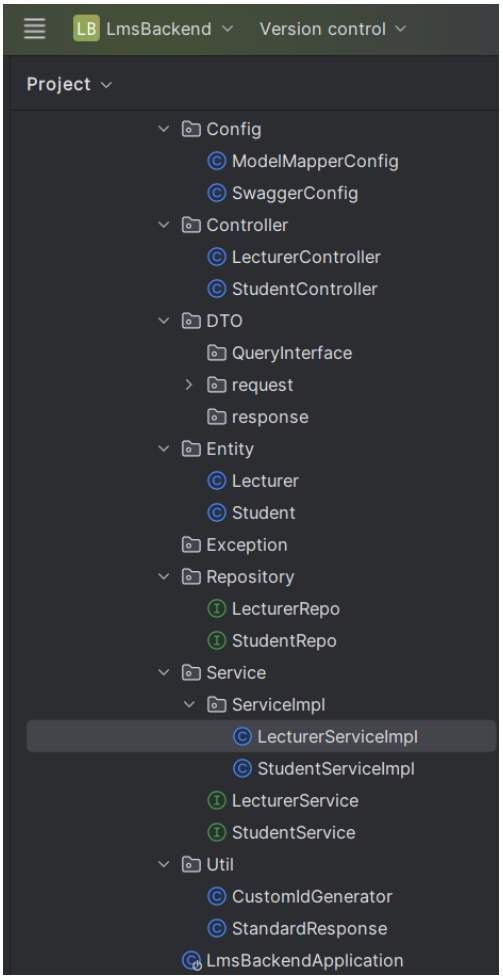

Figure 4-Backend.

This currently author developed backend structure. Using layerd architecture in spring boot. Here need to add other components.

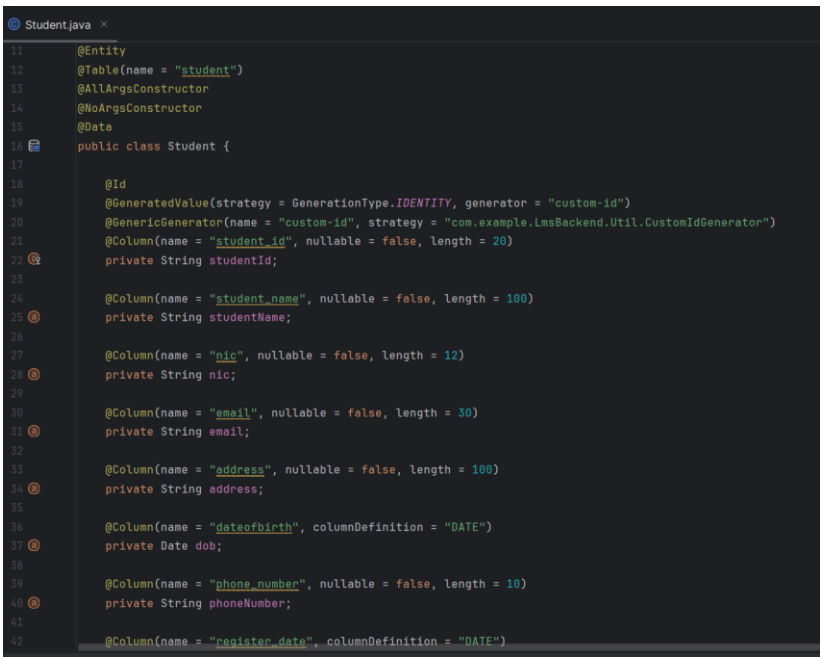

Figure 5-Student Entity

This is student entity class.

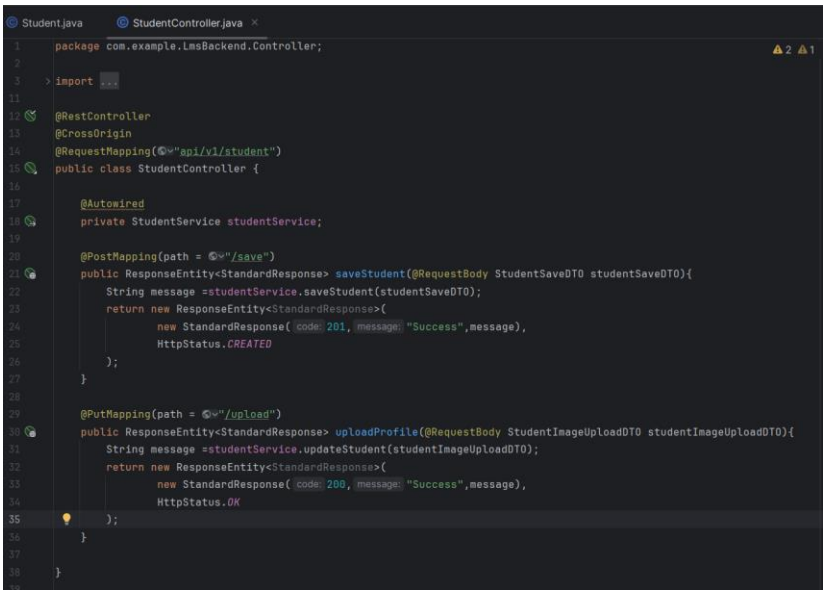

Figure 6-Student controller.

This is student controller. This place is the receiving request from frontend. After that request send to service and next sending to repository.

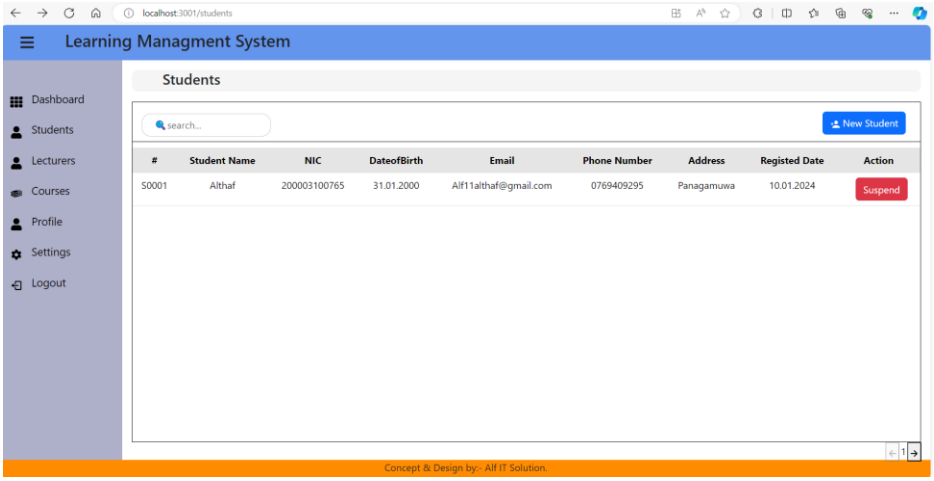

Figure 7-View Student

This page in the admin side. Admin can view student details and admin can suspend the student also in this page. Here clicks the ‘New Student’ button the visible the add new student form.

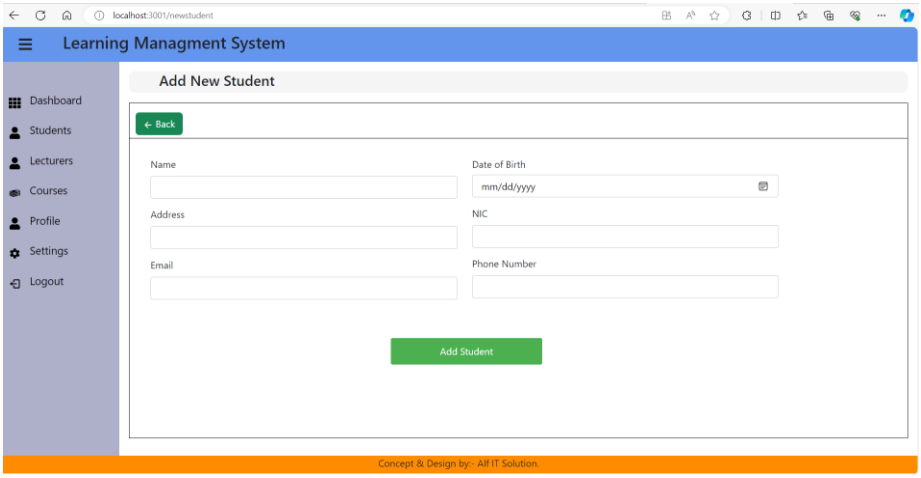

Figure 8-New Student

Here admin can add new student.

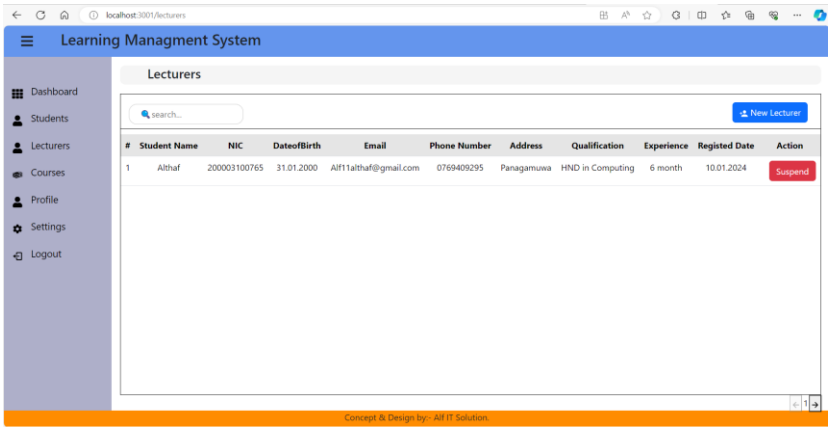

Figure 9-View Lecturer

This page in the admin side. Admin can view lecturer details and admin can suspend/ delete the lecturer also in this page. Here clicks the ‘New Lecturer’ button the visible the add new lecturer form.

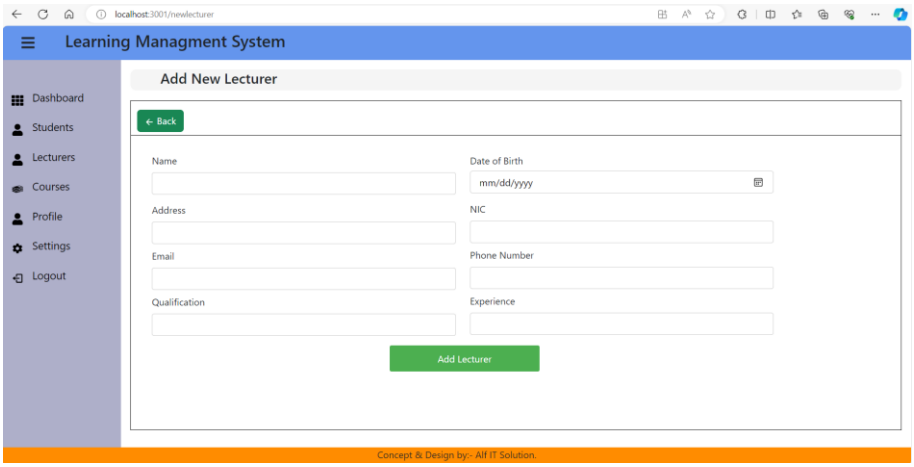

Figure 10-Add lecturer.

Here admin can add new lecturer.

4. Further Work

Below tasks are needed to implement in the system. These parts are main part of the system. Author needs to focus on deeply to these tasks and author need to develop quickly.

4.1 Frontend Development

In the Frontend implementation part author (developer) needs to develop lots of parts. Mainly author developed Admin side UIs only. Needs to develop Students and lecturers side UI's. Here author will be focusing on UI design to create attractively.

4.2 Backend Development

In the backend implementation, the author needs to develop lots of parts. Mainly, the author developed the student and lecturer components. The author needs to develop courses, assessments, lessons, course subjects, and course subjects and course enrolment. Now the author has decided to test after each component is finished. That helps if there are any bugs in the code that are easy to find in the backend.

After the complete frontend and backend development author needs to test the system unit testing (student, lecturer, admin side). After successful unit testing needs to test full system testing.

Finally, the author needs to finish the final documents of the project to submit on time.

5. Progress Review

This is the proposed Grantt chart of author developed.

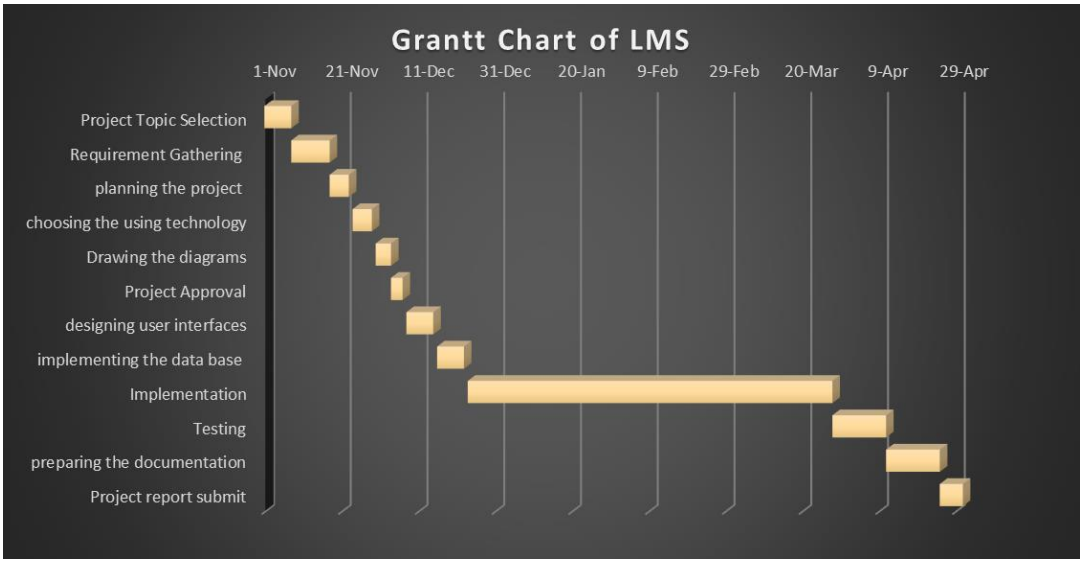

Figure 11-Proposed Grantt chart.

Table 1-Task status report

Task	Status
Project Topic Selection	Completed
Requirement Gathering	Completed
planning the project	Completed
choosing the using technology	Completed
Drawing the diagrams	Completed
Project Approval	Completed
Project proposal submission	Completed
Student login UI	Completed
Lecturer Backend	Completed
Admin Dashboard	Completed

Student Backend Implement	Completed
Admin Backend Implement	Pending
Student Dashboard	Pending
Interim Report submission	Pending
Student Frontend balanced development	Incomplete
Admin Frontend balanced development	Incomplete
Lecturer login UI	Incomplete
Unit Testing (Admin Side)	Incomplete
Lecturer Frontend	Incomplete
Unit Testing (Student Side)	Incomplete
Backend Testing	Incomplete
Unit Testing (Lecturer Side)	Incomplete
System Testing	Incomplete
Preparing the document	Incomplete
Project report submit	Incomplete

This table shows several phases and components of this project. Project topic selection, requirement gathering, Planning the project, Choosing the using technology, Drawing the diagrams (including the use case diagram, ER diagram, and class diagram) and project approval, project proposal submission. And in the development process student login UI, lecturer's backend implements, admin dashboard, student backend implement are completed.

And now admin backend implementation, student dashboard, and interim report submission are on-going processes of the project.

Student frontend balanced development, admin frontend balanced development, lecturer login UI, unit testing of admin, lecturer frontend implementation, unit testing of student, full backend testing, unit testing of lecturer side, and full system testing are needed to complete this project.

And also, after these tasks are completed, the author needs to prepare the document to submit this project report.

The developer has completed 40% of the project, and 60% of the pending tasks are to be implemented. The project progress is late, but the author thinks the project can be delivered to campus within the deadline. The project's late progress may be attributed to several issues, one of which is the author's parallel engagement in two other software projects on campus (academic work). Balancing many tasks at the same time can be time-consuming and resource intensive. And also, author studied Spring framework and React Js to do the project that’s also reason for the project progress late.

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