THE NATIONAL UNIVERSITY OF COMPUTER

AND EMERGING SCIENCES-FAST KARACHI

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Course Name:
OBJECT ORIENTED PROGRAMMING -LAB


Title Of The Project:
LEARNING MANAGEMENT SYSTEM


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Executive Summary

Overview:

The Learning Management System (LMS) project aims to create a C++-based application that supports remote education by enhancing accessibility, interactivity, and personalized learning. The project was designed with dual interfaces tailored to both students and teachers, offering features such as lecture uploads, online quizzes, and user-friendly navigation.

Key Findings:

- Developed a fully functional C++ LMS application with dual interfaces.
- Ensured accessibility through native language content creation.
- Successfully integrated online assessments.
- Aligned the system with Sustainable Development Goals (SDGs) related to education, innovation, and reduced inequalities.

Introduction

Background:

E-learning platforms are transforming traditional education by offering flexible, inclusive, and interactive learning environments. This project aligns with OOP principles by implementing core object-oriented concepts like encapsulation, inheritance, and polymorphism in a real-world application.

Project Objectives:

- Design a user-friendly LMS using C++ with clear segregation between student and educator roles.
- Provide functionality for educational content delivery through announcements.
- Implement assessment features via online quizzes with score tracking.
- Promote SDG goals through digital inclusion and innovation in learning.

- Enable secure registration and login with password masking.
- Facilitate user progress tracking through quiz score records

Project Description

Scope:

Included Features:

- Dual interface for teachers and students
- Secure user registration with password masking
- Course-based announcements
- Online quiz creation
- Online quiz taking
- User activity tracking

Excluded Features:

- Real-time video conferencing
- Mobile application version
- Third-party integrations

Technical Overview:

- Programming Language: C++
- IDEs Used: Embarcadero Dev C++, Visual Studio
- Resources: Static libraries, YouTube tutorials (MUMINJOON, Simplilearn)

Methodology

Approach:

The project was carried out using a weekly task-planning model. Progress was tracked against a project timeline, focusing on modular development and early testing of core functionalities.

Roles and Responsibilities:

Saman (23K-6078):

- Entire project development and design
- User Interface development
- Integration of quizzes
- Handled integration of registration, login, and session management
- Documentation, debugging and testing

Project Implementation

Design and Structure:

The application was built with two main modules:

- **Educator Module:** Enables educators to create quizzes and post announcements for courses.
- **Student Module:** Allows students to view announcements, take quizzes, and check their scores.

Functionalities Developed:

- User registration and login system
- Distinct dashboards for students and teachers
- Online quiz system
- Announcement system
- User session management

Challenges Faced:

- **UI Design in C++:** Overcame limitations by focusing on command-line interface aesthetics.
- **Data handling:** Implemented simple file storage and retrieval mechanisms for user data and content.
- **Limited library support:** Relied on static libraries and online community support to implement key features.

Results

Project Outcomes:

- Delivered a stable and usable LMS application using C++.

- Successfully demonstrated the application of OOP principles in a practical scenario.

- Provided a scalable base for future enhancements such as database integration and GUI.

Screenshots and Illustrations:
[Diagram]diagram.png

Testing and Validation:

- Manual testing was conducted for all user flows.
- Edge cases like invalid logins, empty inputs, and multiple users were handled.
- Functional testing ensured each module performed its intended task.

Conclusion

Summary of Findings:

This project demonstrates how a C++ application can be used to simulate an educational platform, supporting the shift from traditional to digital learning methods. It fulfills the core goals of providing accessible, interactive, and flexible learning environments.

Final Remarks:

The LMS developed has the potential to be expanded further with GUI integration, database support, and mobile compatibility. This experience enhanced practical understanding of OOP and showed how technology can bridge educational gaps across the globe.