Online Learning Management System Using Java Spring Boot (*LEARN HUB*)

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Abstract: This project is an online learning system designed to manage and deliver educational content through a modern and user-friendly web application. The system is a modern web-based course management that offers a unified space for learning both programming languages and spoken languages**.** The system includes role-based access for administrators, teachers, and students, allowing smooth course management, and lesson access. Courses are delivered through structured lesson formats, including text explanations, PDFs, and video content, enabling students to learn at their own space and according to their preferred style. By focusing on clarity, organization, and ease of use, Learn Hub promotes effective learning and encourages continued engagement. The system is particularly suited for institutions or individuals seeking a centralized space to manage online teaching and learning.

Keyword: Teachers, Student, Administrator, Learning Management System, Role based access, Java SpringBoot, Vue.js, Vuetify.

INTRODUCTION

The Online Course Management System *(Learn Hub)* is a modern web-based course management system. The rapid advancement of digital technology has transformed the way people access and manage education. In particular, online course platforms have become essential for delivering education efficiently and flexibly. *Learn Hub* is an Online Course Management System developed to facilitate the management of educational content, users, course interactions and also for exam. The system supports three main roles: administrators, teacher, and students. Each user role has specific permissions to manage or interact with courses and lessons. The platform was developed using Java (Spring Boot) for the backend, Vue.js (with Vuetify) for the frontend, and MySQL (managed through HeidiSQL) for data storage. The goal of Learn Hub is to provide a basic but functional online environment where teachers can upload course materials and students can access them easily.

PROBLEM

When there is no face-to-face interaction, the connection between teachers and students becomes weak, and communication is limited. There is also no centralized system to properly manage users, roles, courses, and materials, which causes confusion and extra workload. Students often struggle to find all learning resources (like lesson videos or PDFs,) in one place. This makes learning harder and less organized. Administrators also face difficulties in

Accepted Date: 30.9.2025
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managing users, assigning roles, and controlling course content effectively without a proper system in place.

APPROACH

The system consists of three roles. They are admin, teacher and student. In the system, the student must log in first. After logging in, the student can browse available courses, access lessons and take exam provided by teacher. Figure 1 shows the System Flow Diagram for Student, representing the flow of data and actions performed by the student in the system. Figure 2 illustrates the System Flow Diagram for Instructor, showing how instructors create and manage courses and lessons. Figure 3 depicts the System Flow Diagram for Admin, representing administrative control over users, courses, and platform data.

The development approach for ***Learn Hub*** focused on building a simple, functional, and user-friendly course management system using modern web technologies. The backend was implemented with **Java (Spring Boot)** to handle business logic and secure APIs, while the frontend used **Vue.js with Vuetify** to create a clean user interface. The database was designed with clear entity relationships to support core features such as course creation, lesson management, user roles, and learning progress tracking. Throughout the project, the system was developed with a focus on ease of use, maintainability.

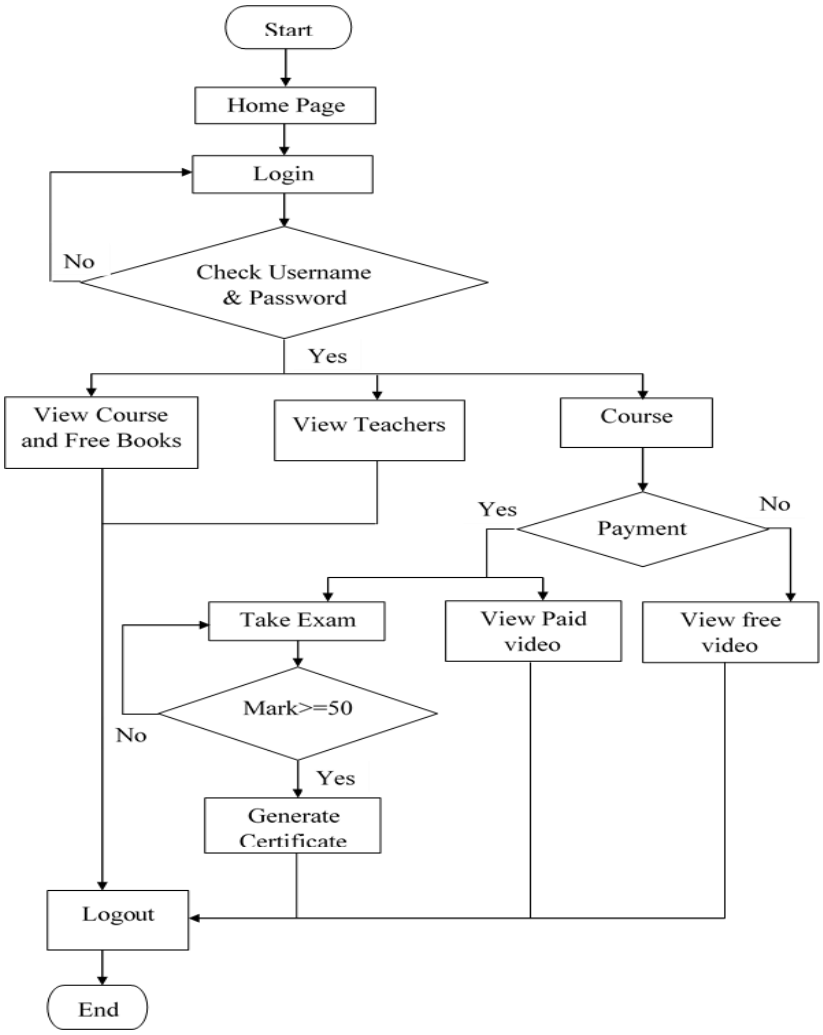

Figure 1: System Flow Diagram for Students

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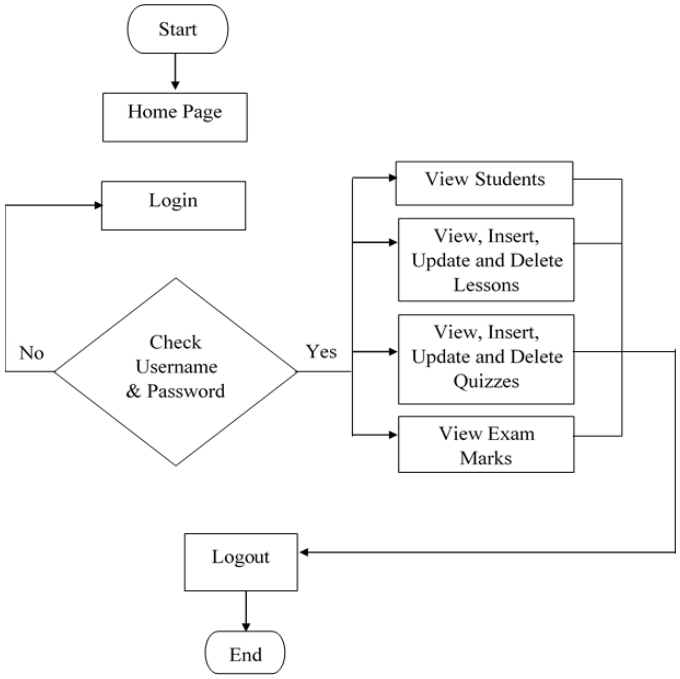

Figure 2: System Flow Diagram for Teachers

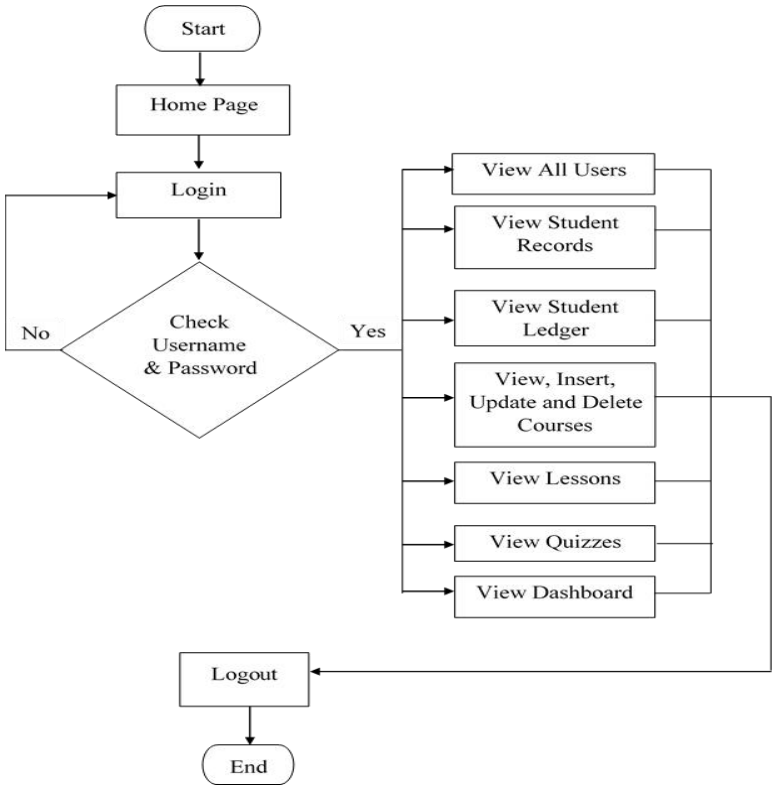

Figure 3: System Flow Diagram for Administrator

In the design of the Online Course Management System, an Entity-Relationship (ER) diagram has been constructed to represent the data architecture and relationships among various entities involved in the system. In the database, there are seven data tables: User Account, Courses, Student Ledger, Lessons, Quiz, Exam and Answer ER diagram for Online Course Management System is presented in Figure 4.

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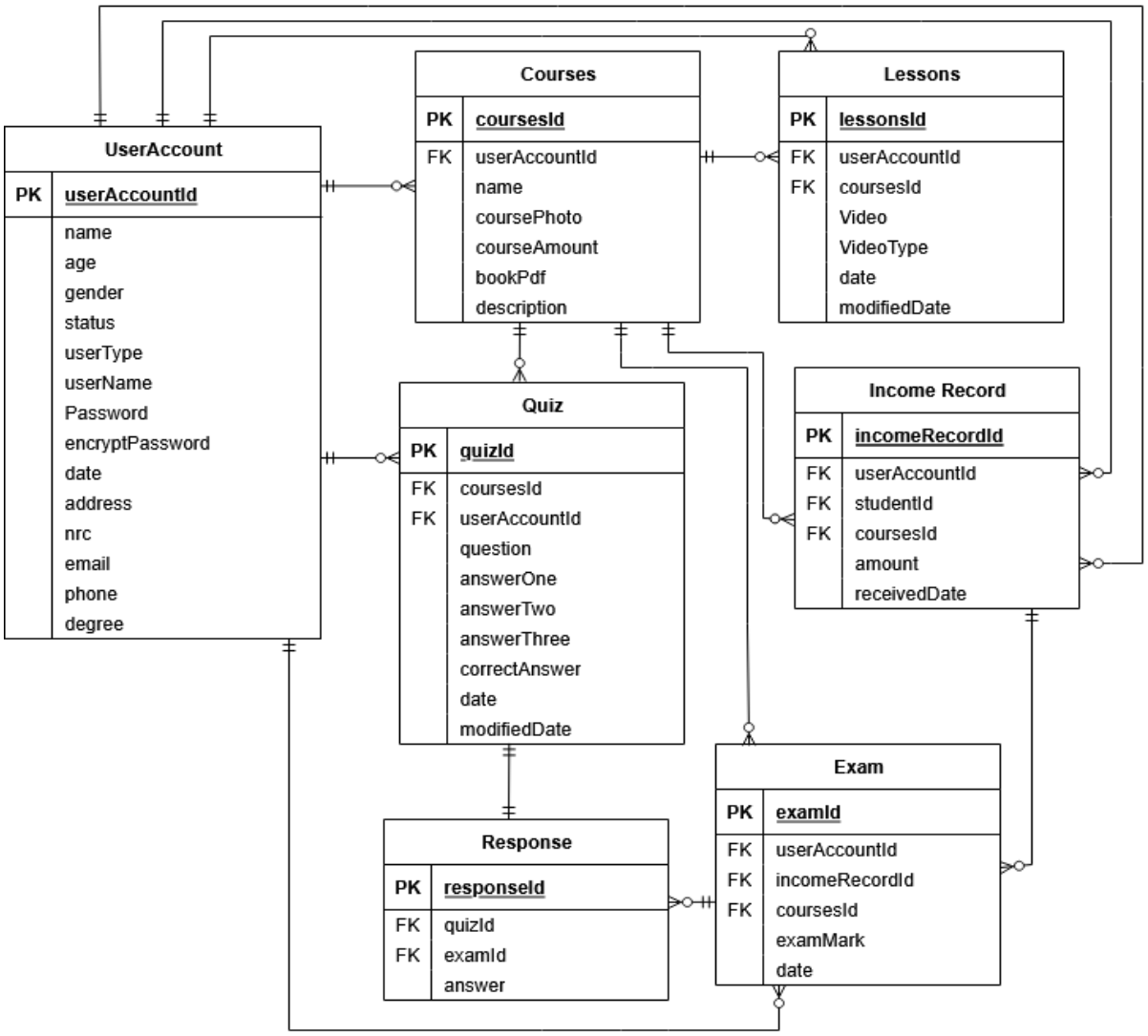

Figure 4: Entity Relationship Diagram

RESULTS

The final result of the *Learn Hub* project is a fully functional, web-based course management system that allows administrators, teachers, and students to effectively manage and participate in online learning. The system enables Administrators to manage users, assign roles, and monitor system activity. Admins can analyze courses based on the highest sales revenue to identify top-performing content and optimize future offerings. The system also allows teachers to create, update, and delete courses, upload lesson materials (such as YouTube videos, PDF files). It let students browse available courses, enroll in them, and access lesson materials in an organized and user-friendly layout. The system was successfully implemented using Java (Spring Boot) for the backend, Vue.js with Vuetify for the frontend, and MySQL (managed via HeidiSQL) for database storage. These technologies ensured a clean separation between backend and frontend. Figure 5 illustrates the final system implementation for the Online Learning Management System, demonstrating how users interact with different parts of the platform.

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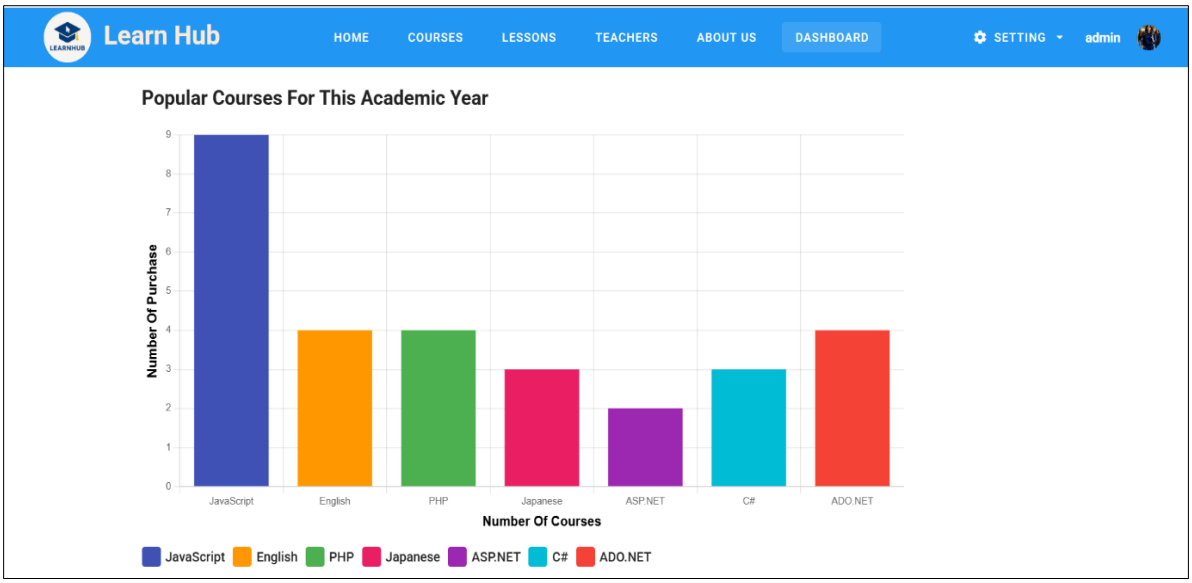

Figure 5: Implementation of the Online Course Management System

CONCLUSION

Learn Hub provides a simple and functional platform for managing online courses. It supports basic learning activities by giving students easy access to lessons and teachers a way to publish educational content. The system demonstrates effective integration between Spring Boot, Vue.js, and MySQL and provides a strong foundation for future improvements such as quizzes, certification, or real-time interaction features. Overall, Learn Hub successfully meets the core objectives of a basic online learning management system.

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