LearnHub: Your Center for Skill Enhancement

1. INTRODUCTION

1.1 Project Overview

An Online Learning Platform (OLP) is a web-based application that enables students to enroll in courses, teachers to create and manage courses, and administrators to monitor the platform.

The system is developed using the MERN stack (MongoDB, Express.js, React.js, Node.js).
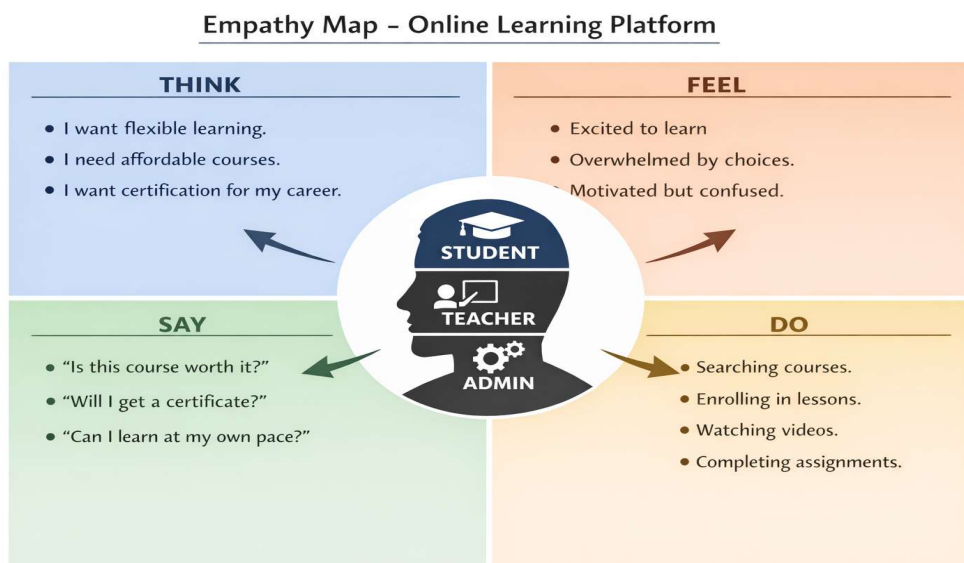
1.2 Purpose

The purpose of this project is to provide a centralized digital learning system with role-based access, course management, secure authentication, and certification generation.

2. IDEATION PHASE

2.1 Problem Statement

Traditional learning systems lack flexibility, accessibility, centralized course management, and automated certification. This project solves these challenges through a scalable MERN-based platform.

2.2 Empathy Map Canvas

Empathy Map – Online Learning Platform

THINK
- I want flexible learning.
- I need affordable courses.
- I want certification for my career.

FEEL
- Excited to learn
- Overwhelmed by choices.
- Motivated but confused.

STUDENT
TEACHER
ADMIN

SAY
- "Is this course worth it?"
- "Will I get a certificate?"
- "Can I learn at my own pace?"

DO
- Searching courses.
- Enrolling in lessons.
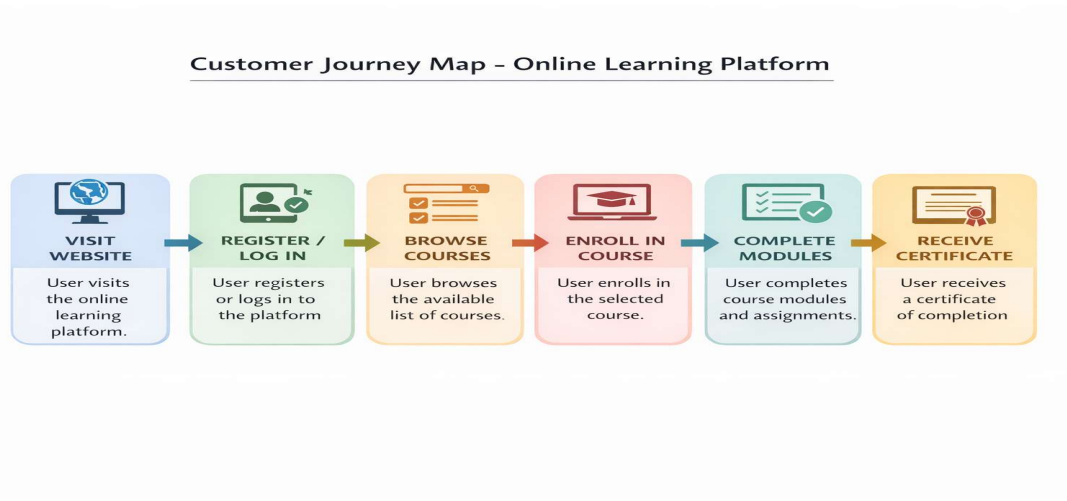- Watching videos.
- Completing assignments.

2.3 Brainstorming

- User authentication system
- Role-based dashboards
- Course enrollment and payment system
- Certificate generation
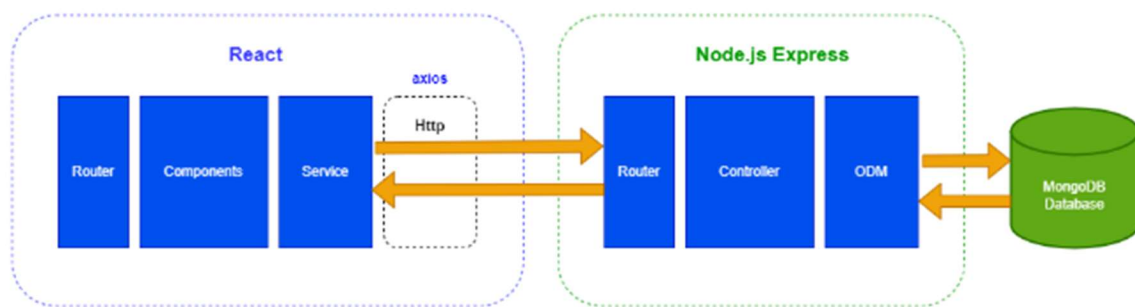- Search and filter functionality

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

Customer Journey Map – Online Learning Platform

VISIT WEBSITE	REGISTER / LOG IN	BROWSE COURSES	ENROLL IN COURSE	COMPLETE MODULES	RECEIVE CERTIFICATE
User visits the online learning platform.	User registers or logs in to the platform	User browses the available list of courses.	User enrolls in the selected course.	User completes course modules and assignments.	User receives a certificate of completion

3.2 Solution Requirements

- MongoDB Database
- Node.js Runtime
- Express.js Backend
- React.js Frontend
- JWT Authentication
- REST APIs

3.3 Data Flow Diagram

3.4 Technology Stack

- Frontend: React.js, Bootstrap, Material UI
- Backend: Node.js, Express.js
- Database: MongoDB
- Authentication: JWT
- Tools: Vite, Axios, Nodemon

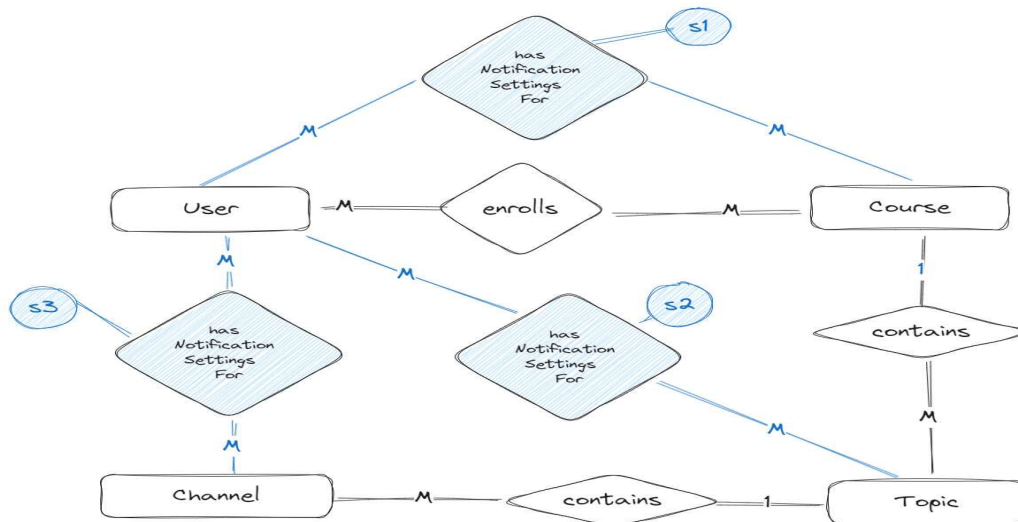## 4. PROJECT DESIGN

4.1 Problem-Solution Fit

Problem: Lack of centralized digital learning system.

Solution: MERN-based full-stack online learning application.

4.2 Proposed Solution

- Role-based login system
- Course creation and management
- Enrollment tracking
- Payment integration
- Certificate generation

4.3 ER Diagram Description

5. PROJECT PLANNING & SCHEDULING

- Setup & Configuration – 1 Week
- Backend Development – 2 Weeks
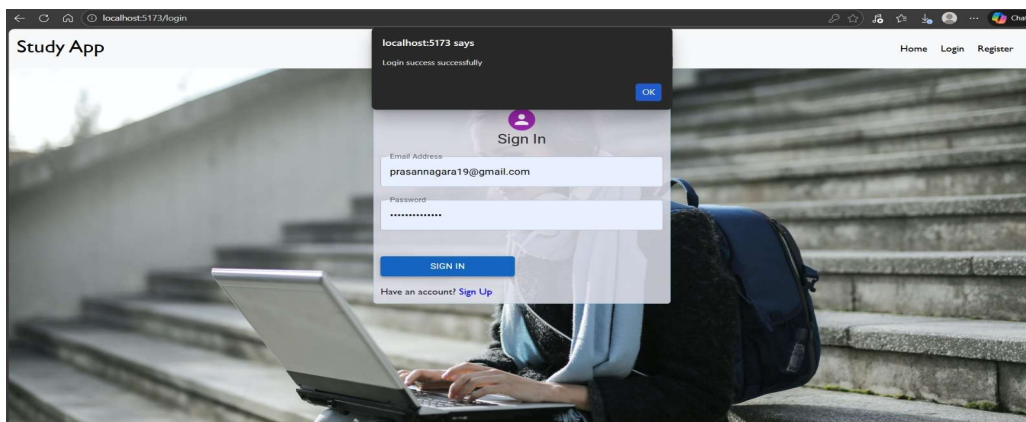- Frontend Development – 2 Weeks
- Testing & Deployment – 1 Week

6. FUNCTIONAL AND PERFORMANCE TESTING

Functional Testing includes authentication validation, enrollment functionality, and certificate generation.

Performance Testing ensures load time under 3 seconds and efficient database queries.

7. RESULTS

The application successfully implements role-based dashboards for Admin, Teacher, and Student with full course lifecycle management.

Study App Home Add Course

Hi GARA NAGA PRASANNA   Log Out

Course Type

Personal Development

Course Educator

Prasanna

Course Price(Rs.)

999

Course Description

RoHitman

Section Title

CT 2025

Section Content (Video or Image)

Choose File ro.mp4

✕

Section Description

Rohit Sharma

➕ Add Section

Submit

Study App Home Add Course

Hi GARA NAGA PRASANNA   Log Out

Rohitsharma

Description: RoHitman

Category: Personal Development

Sections: I

Enrolled students: 0

Delete

Study App Home Enrolled Courses

Hi Jyothi   Log Out

Serach By: title   All Courses ▾

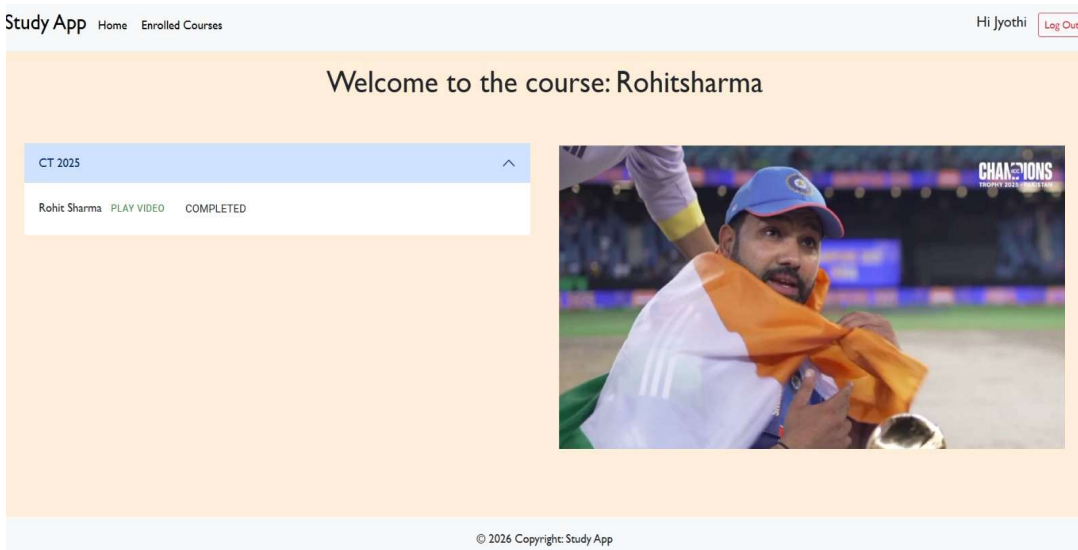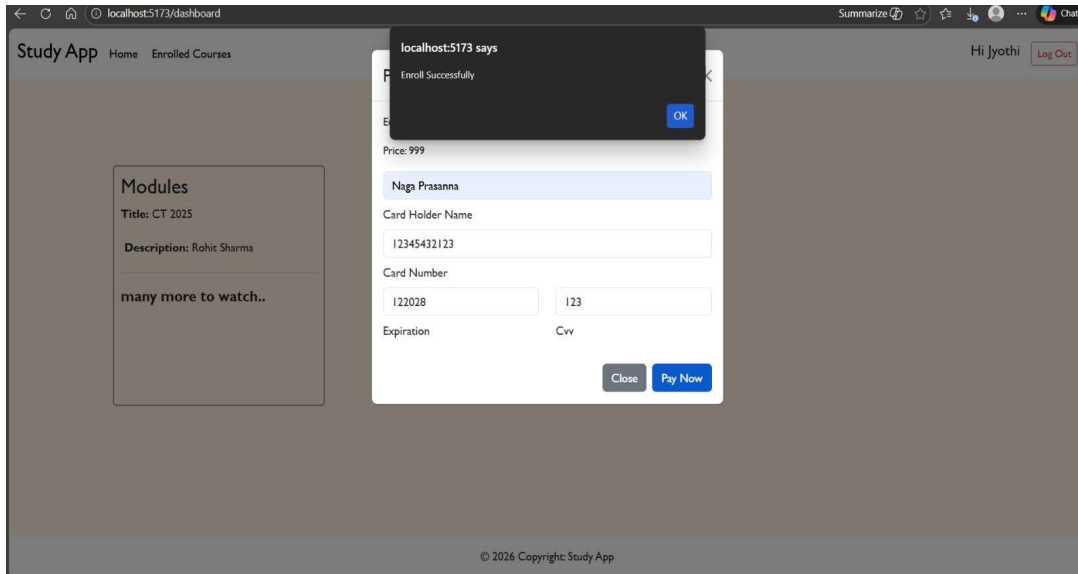Modules

ROHITSHARMA

PERSONAL DEVELOPMENT

BY: PRASANNA   ohit Sharma

Sections: I

Price(Rs.): 999   to watch.

Enrolled students: 0

Start Course

8. ADVANTAGES & DISADVANTAGES

Advantages
- Scalable MERN architecture
- Secure JWT authentication
- Self-paced learning
- Interactive dashboards

Disadvantages
- Complex backend configuration
- Payment integration complexity

9. CONCLUSION

The Online Learning Platform using MERN provides a secure, scalable, and interactive digital learning solution with role-based access and real-time communication.

10. FUTURE SCOPE

- AI-based course recommendation
- Live video integration
- Mobile application version
- Cloud deployment