CERTIFICATE

Project Title: "**LearnHub: Your Center For Skill Enhancement "is** a bonafide work carried out by the following students:

- **TEAM ID:** LTVIP2026TMIDS35023
- **Team Leader:** Abdullah Arif
- **Team member:** Jilagam Pujith Veera Bhadra Sai Sudheer
- **Team member:** Nabha Srinija
- **Team member:** Yalla Manasa Siri

Date Of Submission: 20 February 2026

PROJECT REPORT

1. INTRODUCTION

→PROJECT OVERVIEW:

An online learning platform(OLP) is a digital platform that provides a variety of tools and resources to facilitate learning and education over the internet. These platforms have become increasingly popular, especially in recent years, as they offer flexibility and accessibility for learners of all ages and backgrounds. Here are some key features and a description of an online learning platform:

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→ **User-Friendly Interface:** Online learning platforms typically have an intuitive and user-friendly interface that makes it easy for learners, regardless of their technical proficiency, to navigate and access the content.

→ **Course Management:** Instructors or course creators can upload, organize, and manage course materials. Learners can enroll in courses and track their progress.

→ **Interactivity:** Many platforms include interactive elements like discussion forums, chat rooms, and live webinars, which foster communication and collaboration among learners and instructors.

→ **Certification:** Learners can earn certificates or badges upon completing courses or meeting certain criteria, which can be valuable for employment or further education.

→ **Accessibility:** Content is often accessible on various devices, including computers, tablets, and smartphones, making learning possible from anywhere with an internet connection.

→ **Self-Paced Learning:** Learners can typically access course materials at their own pace. This flexibility allows for learning that fits into individual schedules and preferences.

→ **Payment and Subscription Options**: There may be free courses, but some content may require payment or a subscription. Platforms often offer multiple pricing models.

→ **User Registration:** Sarah, a student interested in learning web development, visits the Online Learning Platform and creates an account. She provides her email and chooses a password.

→ **Browsing Courses:** Upon logging in, Sarah is greeted with a user-friendly interface displaying various courses categorized by topic, difficulty level, and popularity.

→ She navigates through the course catalog, filtering courses by name and category until she finds a "Web Development Fundamentals" course that interests her.

→ **Enrolling in a Course:** Sarah clicks on the course and reads the course description, instructor details, and syllabus. Impressed, she decided to enroll in the course.

→ After enrolling, Sarah can access the course materials, including video lectures, reading materials, and assignments.

→ **Learning Progress:** Sarah starts the course and proceeds through the modules at her own pace. The platform remembers her progress, allowing her to pick up where she left off if she needs to take a break.

→ **Interaction and Support:** Throughout the course, Sarah engages with interactive elements such as discussion forums and live webinars where she can ask questions and interact with the instructor and other learners.

→ **Course Completion and Certification:** After completing all the modules and assignments, Sarah takes the final exam. Upon passing, she receives a digital certificate of completion, which she can download and add to her portfolio.

→ **Paid Courses:** Sarah discovers an advanced web development course that requires payment. She purchases the course using the platform's payment system and gains access to premium content.

→ **Teacher's Role:** Meanwhile, John, an experienced web developer, serves as a teacher on the platform. He creates and uploads new courses on advanced web development topics, adds sections to existing courses, and monitors course enrollments.

→ **Admin Oversight:** The admin oversees the entire platform, monitoring user activity, managing course listings, and ensuring smooth operation. They keep track of enrolled students, handle any issues that arise, and maintain the integrity of the platform.

2.IDEATION PHASE

→ PROBLEM STATEMENT:

In many institutions, **skill development and learning resources are scattered**, outdated, or not personalized. Students often face difficulty finding credible, organized content, while educators lack a streamlined tool to deliver courses, track learner engagement, and share multimedia materials..

→ EMPATHY MAP CANAVS:

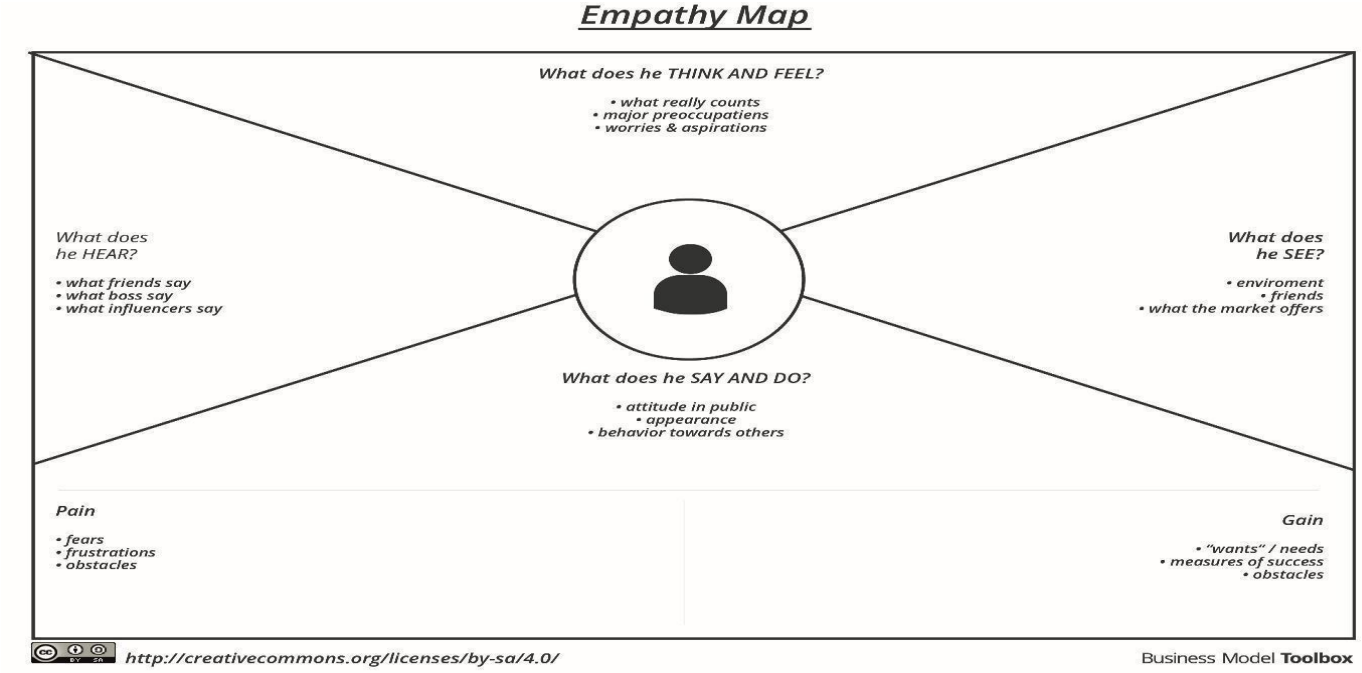
Ideation Phase Empathize & Discover

Date	20 February 2026
Team ID	LTVIP2026TMIDS35023
Project Name	**LearnHub: Your Center For Skill Enhancement**
Maximum Marks	4 Marks

Empathy Map Canvas:

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

It is a useful tool to helps teams better understand their users.
Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.



→ BRAINSTROMING:

Ideation Phase Brainstorm & Idea Prioritization Template

Date	20 Feb 2026
Team ID	LTVIP2026TMIDS35023
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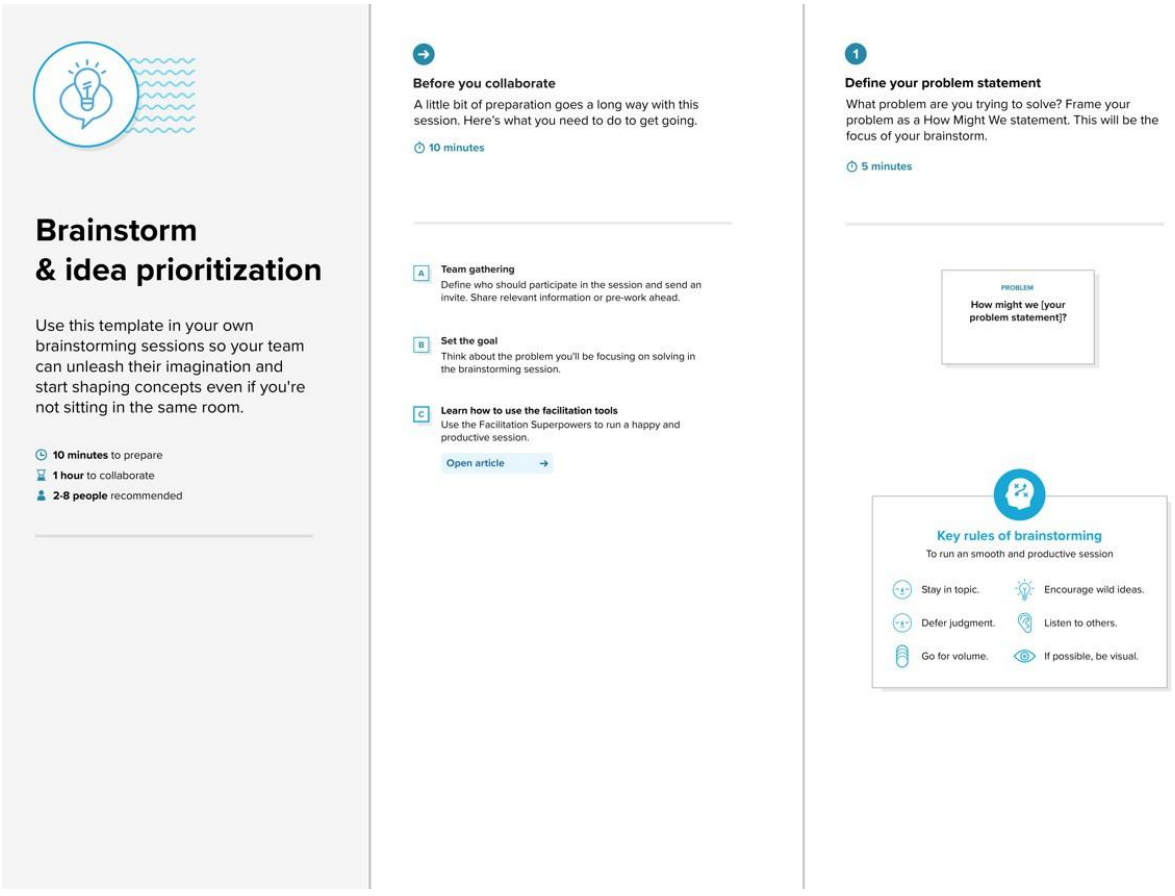
Maximum Marks	4 Marks

Brainstorm & Idea Prioritization Template:

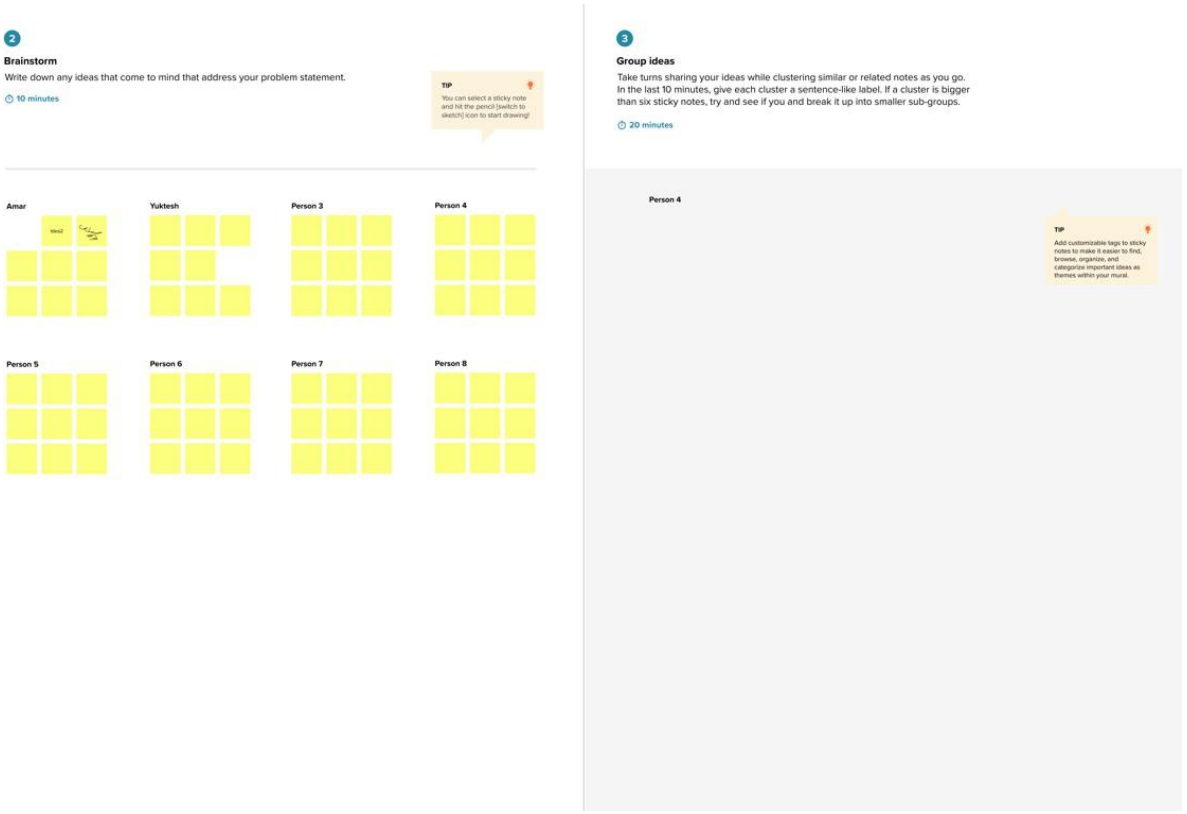
Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

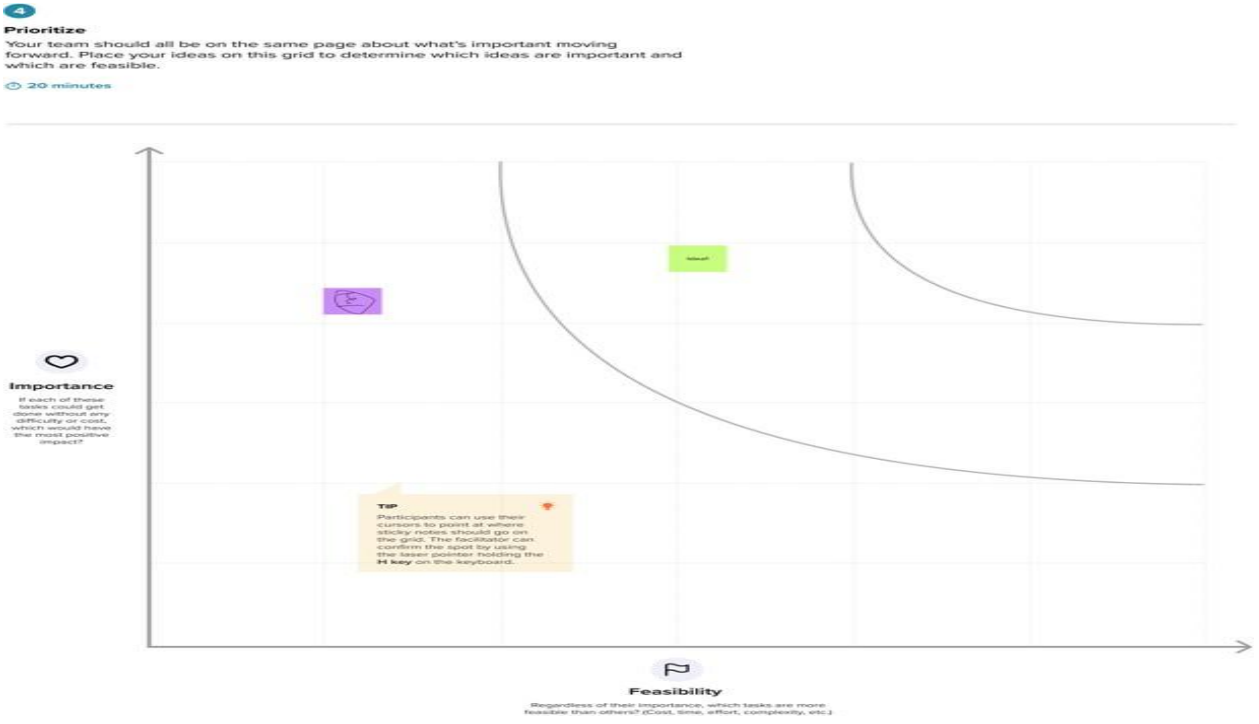
Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping:

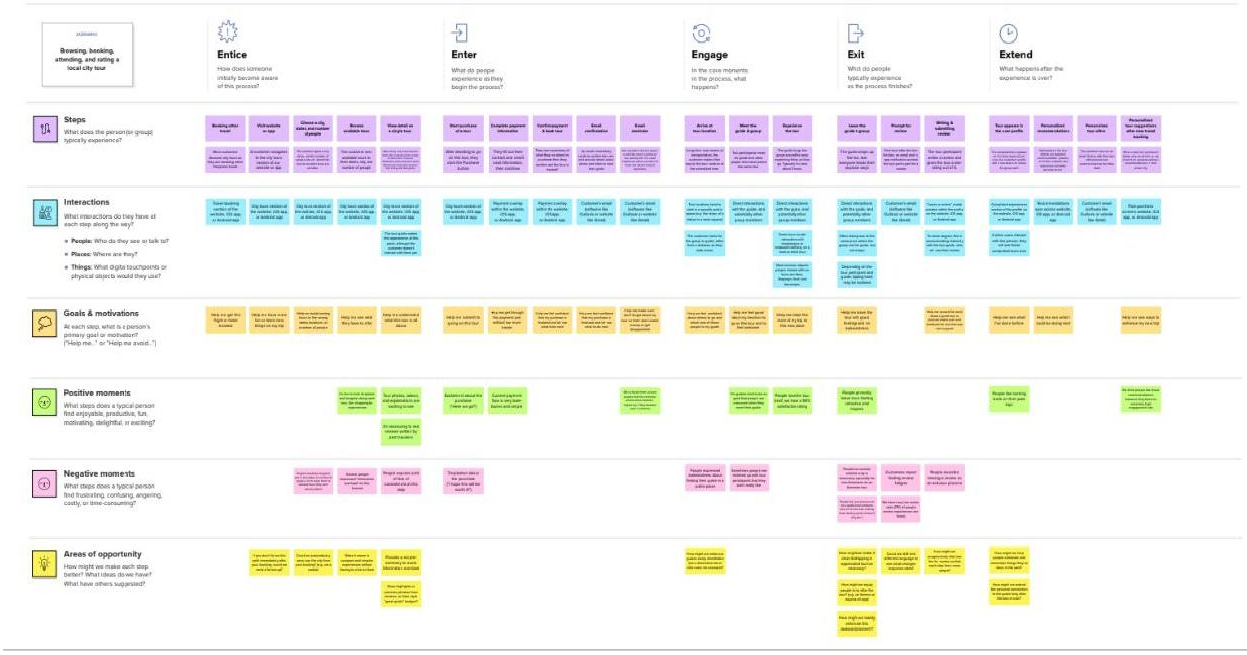


Step-3: Idea Prioritization



3.REQIREMENT ANALYSIS

→ Customer Journey map:



→ Solution Requirement:

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

→

Date	20 Feb 2026
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Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Manual registration via a form for students and teachers
FR-2	User Confirmation	Upon form submission, users are immediately registered and can log in without approval delay
FR-3	User Authentication	Secure login using credentials (email and password) with JWT-based token authentication

FR-4	Role-Based Dashboard	Users are redirected to role-specific dashboards (Student or Teacher) after login
FR-5	Course Creation (Teacher)	Teachers can create new courses with title, description, and multimedia content (videos/images/text)
FR-6	Course Management	Teachers can update or delete their created courses
FR-7	Course Viewing (Student)	Students can browse all available courses with previews
FR-8	Course Enrollment (Student)	Students can enroll in available courses from their dashboard
FR-9	Content Access	Enrolled students can view full course content including videos, documents, and images
FR-10	Progress Tracking	Students can track their completion status for enrolled courses
FR-11	Logout	Users can securely log out, ending the JWT session

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	LearnHub provides a clean, intuitive, and responsive interface using React, allowing both students and teachers to easily navigate and use the system with minimal training.
NFR-2	**Security**	User data is protected with JWT-based authentication and secure password storage using hashing. Role-based access ensures only authorized users can access respective dashboards and features.
NFR-3	**Reliability**	The system is designed to function consistently, ensuring users can register, log in, and access content without interruption. Error handling is implemented to catch and log failures.
NFR-4	**Performance**	Built with Vite and React for fast loading times and smooth transitions. The application is optimized to handle multiple simultaneous users with minimal lag.
NFR-5	**Availability**	The platform ensures high uptime and can be hosted on cloud services to maintain continuous access for users. Downtime is minimized through proper deployment and monitoring.
NFR-6	**Scalability**	The architecture allows for future growth in user base and features. Additional components (like quizzes, certificates, payments) can be added without major redesign.

→ Data Flow Diagram:

\Project Design Phase-II
Data Flow Diagram & User Stories

Date	20 Feb 2026
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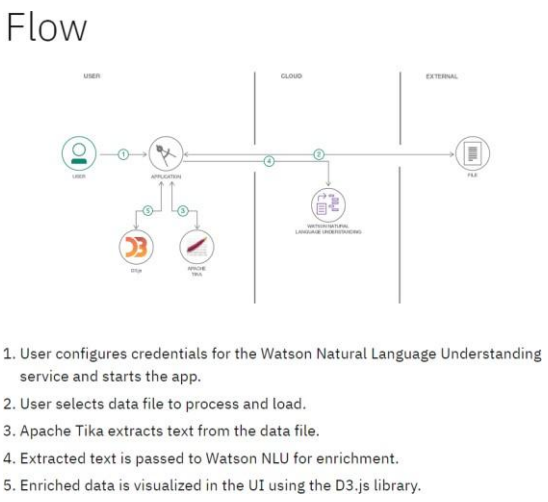
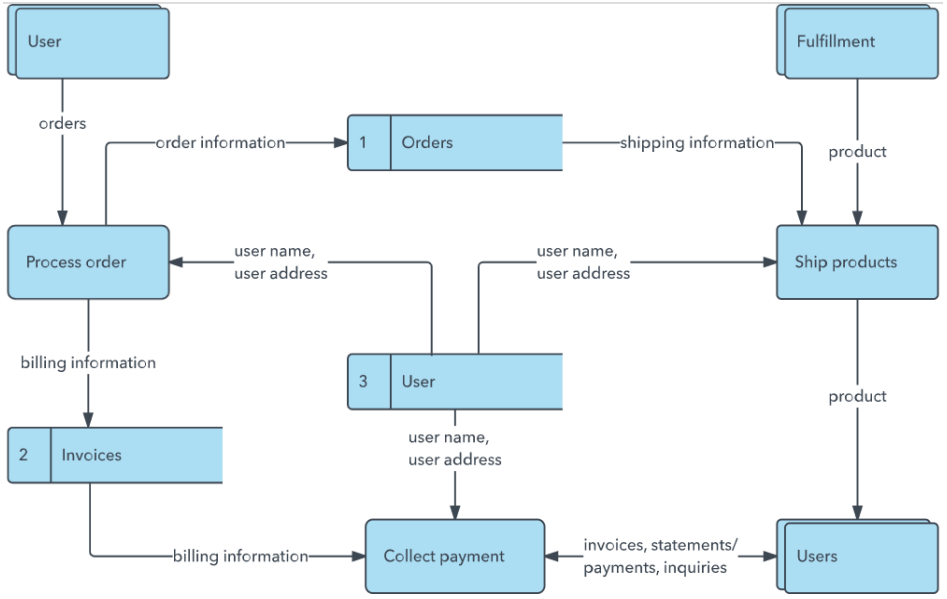
Data Flow Diagrams:
A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is

Example:





User Stories:

User Type	Functional Requirement	User Story No.	User Story / Task	Acceptance Criteria	Priority	Release
Student	Registration	USN-1	As a student, I can register via form with email and password	I can create an account and access my student dashboard	High	Sprint-1
Student	Login	USN-2	As a student, I can log in using my email and password	I enter valid credentials and log in successfully	High	Sprint-1
Student	View Courses	USN-3	As a student, I can view a list of all available courses	Courses with title, educator, and brief description are displayed	High	Sprint-1
Student	Enroll in Courses	USN-4	As a student, I can enroll in a course I am interested in	Course appears in my dashboard and I can access its content	High	Sprint-1
Student	View Course Content	USN-5	As a student, I can view the full content (video/image/text) of enrolled courses	All sections of the course are accessible after enrollment	High	Sprint-1
Student	Track Progress	USN-6	As a student, I can track my progress in a course	My progress (completed/incomplete) is updated as I go through course sections	Medium	Sprint-2
Teacher	Registration	USN-7	As a teacher, I can register via form with email and password	I can create an account and access my teacher dashboard	High	Sprint-1
Teacher	Login	USN-8	As a teacher, I can log in using my email and password	I can access my dashboard upon successful login	High	Sprint-1
Teacher	Create Course	USN-9	As a teacher, I can create a new course with title and description	New course is saved and visible in my dashboard	High	Sprint-1
Teacher	Add Course Content	USN-10	As a teacher, I can add multiple sections (video, image, text) to a course	Content appears in structured format in course view	High	Sprint-1
Teacher	Update/Delete Courses	USN-11	As a teacher, I can update or delete my created	Changes are saved and reflected immediately	Medium	Sprint-2

			courses			
Teacher	View Enrolled Students	USN-12	As a teacher, I can view the list of students enrolled in my course	Enrolled student list is visible for each course	Low	Sprint-2
Admin (Optional)	Manage Users	USN-13	As an admin, I can view all registered users and their roles	Full user list is available with filters and role labels	Medium	Sprint-2
Admin (Optional)	Manage Courses	USN-14	As an admin, I can view all courses created by teachers	List of courses with details is accessible from admin dashboard	Medium	Sprint-2

→ Technology Stack:

Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	20 Feb 2026
Team ID	LTVIP2026TMIDS35023
Project Name	**LearnHub: Your Center For Skill Enhancement**
Maximum Marks	4 Marks

Table 1: Components & Technologies

S.No	Component	Description	Technology Used
1	User Interface	Web-based UI for students, teachers, and admin interactions	React.js, HTML, CSS, JavaScript, Bootstrap
2	Application Logic – 1	Handles routing, API calls, course logic, and business operations	Node.js, Express.js
3	Application Logic – 2	Role-based login, user sessions, and secure access handling	JWT (JSON Web Token), bcrypt.js
4	Application Logic – 3	Chat system between students and teachers/admins *(future enhancement)*	Socket.io *(planned)*
5	Database	Stores users, courses, enrollments, roles, and learning progress	MongoDB
6	Cloud Database	Cloud-hosted scalable NoSQL storage	MongoDB Atlas
7	File Storage	For uploading media content (course images/videos/screenshots) *(optional)*	Local filesystem or Cloudinary *(optional)*
8	External API – 1	Location/IP tracking features *(future enhancement)*	IPInfo API *(optional)*
9	External API – 2	Not used in the current version	—
10	Machine Learning Model	Not applicable in this version	—
11	Infrastructure	Hosting frontend and	Render (Backend),

		backend on cloud platforms	Vercel / Netlify (Frontend)

Table 2: Application Characteristics

S.No	Characteristics	Description	Technology Used
1	Open-Source Frameworks	Core frameworks and libraries used in full-stack app development	React.js, Node.js, Express.js, MongoDB
2	Security Implementations	Implements secure user access, encrypted credentials, and token-based sessions	bcrypt.js, JWT, Helmet (Express middleware)
3	Scalable Architecture	Modular, layered design with separation of concerns (frontend, backend, database)	MERN Stack (3-tier architecture)
4	Availability	Deployed on cloud infrastructure ensuring high uptime and global accessibility	Render, MongoDB Atlas
5	Performance	Fast user interactions, asynchronous API calls, and optimized data handling	React, Axios, MongoDB

4. PROJECT DESIGN

→ Problem Solution Fit:

Project Design Phase
Problem – Solution Fit Template

→

Date	20 Feb 2026
Team ID	LTVIP2026TMIDS35023
Project Name	**LearnHub: Your Center For Skill Enhancement**
Maximum Marks	2 Marks

1. The Problem

In many educational institutions and skill development environments:

- Learning content is often scattered, outdated, or not organized in a structured format.
- Students lack clarity regarding their learning progress and find it difficult to access consistent resources.
- Teachers do not have an easy-to-use platform to create, manage, and deliver digital courses effectively.
- Existing systems frequently lack media support, interactivity, and user-friendly dashboards for students and teachers.
- There is no centralized platform that connects learners and educators for streamlined course management and engagement.

2. The Solution – LearnHub

LearnHub is a web-based platform designed to provide a centralized solution for both students and teachers by offering the following:

- Teachers can create comprehensive courses with video lectures, images, and supporting text content.
- Students can browse, enroll in, and access multiple skill-based courses from a single dashboard.
- The system features role-based dashboards to separate functionalities for students and teachers.
- Students can track their learning progress across different course sections.
- Built using Vite and React, the platform ensures fast loading, responsiveness, and a smooth user experience.

3. Behavioral Insights

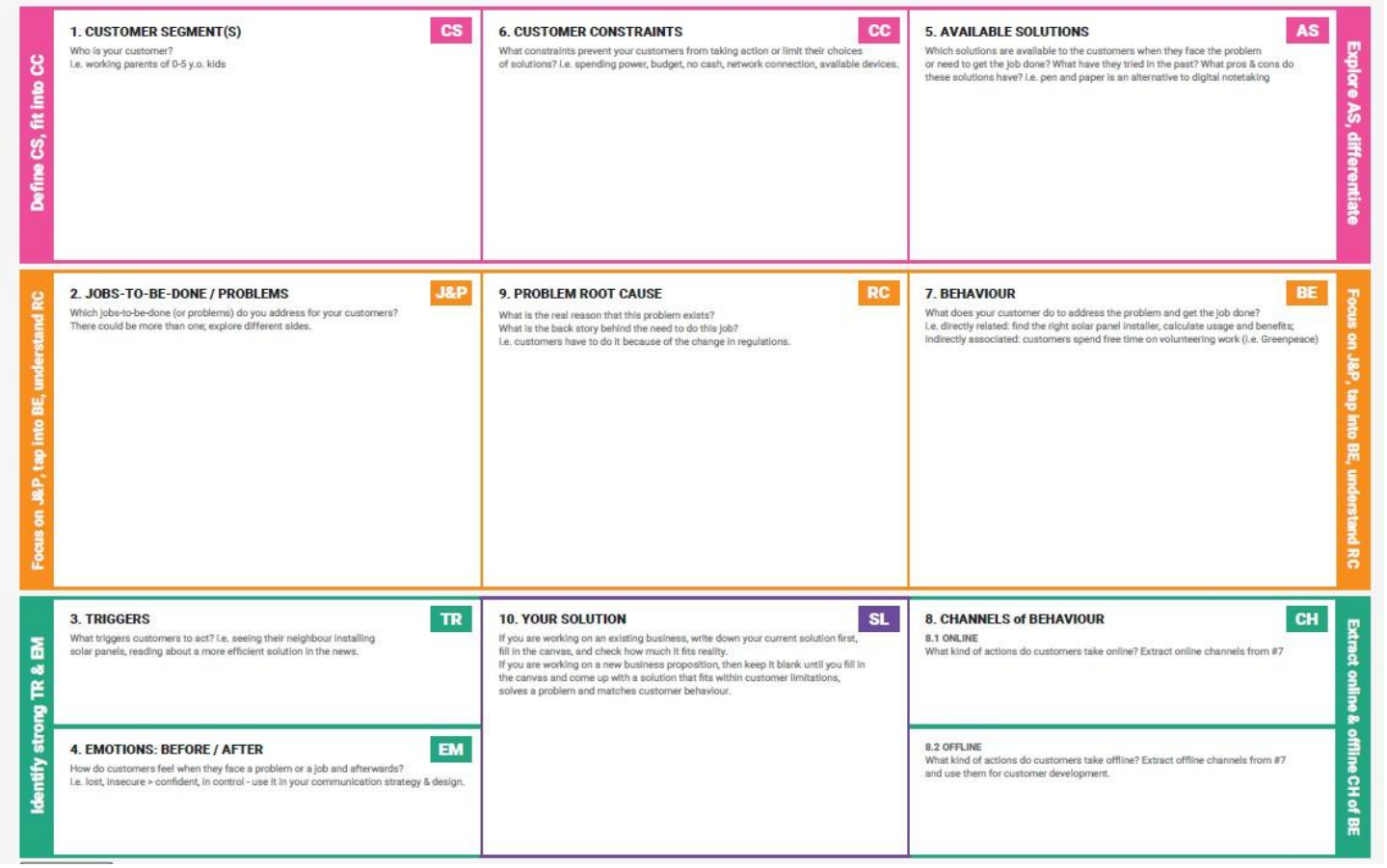
- Students are already familiar with web and mobile learning applications and prefer digital access to courses.
- They expect a transparent and self-paced learning environment that allows them to monitor their progress.
- Teachers prefer a structured system that allows them to easily upload, organize, and manage course materials.
- Both users value a modern and intuitive interface that simplifies learning and teaching interactions.

4. Fit Justification

Element	Observation / Challenge
Student Confusion	Students are unsure about course structure and progress
Limited Access to Content	Students struggle to find or access organized learning resources
Teacher Inconvenience	Teachers lack a simple tool to create and manage course material
Role Confusion	No separation of features for teachers and students
Lack of Engagement	No system for learners to track achievements or status
Scalability Issues	Manual or static content delivery limits expansion

5. Benefits

- ✓ **Faster Adoption**: The platform offers a simple, web-based user interface with minimal setup, enabling quick onboarding for both students and teachers.
- ✓ **Improved User Satisfaction**: By providing transparency in course access and real-time progress tracking, the platform enhances trust and engagement among users.
- ✓ **Scalable Architecture**: The modular and role-based system design supports future growth, addressing the evolving needs of students, educators, and administrators.
- ✓ **Future-Ready Foundation**: LearnHub is built to support future enhancements such as real-time chat between students and teachers, mobile app integration, and advanced content analytics.



→ Proposed Solution:

Project Design Phase
Proposed Solution Template

Date	20 Feb 2026
Team ID	LTVIP2026TMIDS35023
Project Name	**LearnHub: Your Center For Skill Enhancement**
Maximum Marks	2 Marks

S.No.	Parameter	Description
1. 1.	**Problem Statement (Problem to be solved)**	In many educational and skill-building environments, students face difficulty accessing structured, engaging, and centralized learning resources. Teachers lack an intuitive platform to create and manage courses. Most traditional systems are either manual or disconnected, lacking transparency, progress tracking, and proper learner-educator interaction.
2. 2.	**Idea / Solution Description**	LearnHub is a web-based course creation and enrollment platform that bridges the gap between students and teachers. It allows teachers to create multimedia-rich courses and students to enroll, view, and track their progress. The platform includes role-based dashboards for Teachers and Students, offering a clean and responsive experience built with the MERN stack (MongoDB, Express.js, React.js, Node.js).
3. 3.	**Novelty / Uniqueness**	- Role-based dashboards for tailored user experience - Simple, modern interface using Vite + React - Modular MERN stack architecture ensures scalability and maintainability - Future scope includes live teacher-student chat, mobile app support, certification system, and content analytics
4. 4.	**Social Impact / Customer Satisfaction**	LearnHub enhances access to quality learning by offering a centralized platform for self-paced education. Students benefit from clear course structures and progress tracking, while teachers can easily distribute knowledge. This results in increased student engagement, better skill development, and improved teacher productivity.
5. 5.	**Business Model (Revenue Model)**	Though currently an academic/non-commercial project, LearnHub can adopt the following models: • **SaaS Platform:** Subscription-based access for institutions or training centers • **Course Marketplace:** Allow educators to sell their courses with a revenue share • **Premium Features:** Paid features like certifications, analytics, quiz modules, and LMS integrations
6. 6.	**Scalability of the Solution**	LearnHub follows a scalable three-tier architecture (frontend, backend, database) and is deployable on cloud platforms like Vercel, Render, or AWS. It supports multiple user roles, concurrent sessions, and can be extended with additional features such as mobile app integration, multi-language support, real-time chat, and more.

→ Solution Architecture:

Project Design Phase
Solution Architecture

Date	20 Feb 2026
Team ID	LTVIP2026TMIDS35023
Project Name	**LearnHub: Your Center For Skill Enhancement**
Maximum Marks	4 Marks

➢ Overview:

The solution architecture of LearnHub is designed to provide a modular, scalable, and user-centric platform for digital learning. It connects teachers and students through a responsive web interface and enables seamless course creation, enrollment, and content access. The system is built using the MERN stack (MongoDB, Express.js, React.js, Node.js) and follows modern web development practices for performance and maintainability.

➢ Goals of the Architecture:

Utilize modern technologies to simplify course distribution and learning.
Structure the system into clear layers for frontend, backend, and database.
Ensure secure and role-based access for students and teachers.
Enable scalability for future enhancements like mobile apps, chat, and certification.
Maintain clean separation of concerns for easy development and deployment.

➢ Architecture Layers:

1. Presentation Layer (Frontend)
Technology: React.js (with Vite), HTML, CSS, Bootstrap
Purpose: Interface for students and teachers to interact with the system.
Features:
Role-based dashboards (Student, Teacher)
Student: View courses, enroll, access content, track progress
Teacher: Create courses, upload materials, manage students
Responsive design for web access

2. Application Layer (Backend)
Technology: Node.js, Express.js
Purpose: Handles business logic, API routing, user session handling, and course operations.
Key APIs:

User registration and login (JWT-authenticated)
Role validation (Student vs. Teacher)
Course creation and section management (video/image/text)
Enrollment tracking and progress update

3. Data Layer (Database)
Technology: MongoDB (via MongoDB Atlas – Cloud DB)
Purpose: Stores users, courses, enrollments, sections, and learning progress.
Security:
Passwords encrypted using bcrypt.js
JWT tokens for secure session management

- Supporting Services:

Authentication: JSON Web Tokens (JWT), bcrypt.js for secure password handling
Deployment:
Frontend: Vercel or Netlify
Backend: Render or Railway

- Optional / Future Integrations:

Real-Time Chat: Socket.io for live doubt clearance sessions (future)
Cloud Storage: Cloudinary or Firebase for uploading videos, documents, and images
Certification Module: Auto-generated certificates after course completion
Analytics: Engagement and completion rate tracking for students

→ Development Phases:

Sprint	Scope
Sprint 1	User registration/login, role-based dashboards, course creation, enrollment
Sprint 2	Course content management (sections), progress tracking, view enrolled students
Sprint 3	Future scope: chat feature, analytics, certificate generation, mobile app

5. PROJECT PLANNING & SCHEDULING

→ Project Planning:

Project Planning Phase

Project Planning Template (Product Backlog, Sprint Planning, Stories, Story points)

Date	25 June 2025
Team ID	LTVIP2025TMID54806
Project Name	**LearnHub: Your Center For Skill Enhancement**
Maximum Marks	5 Marks

1. Product Backlog and Sprint Schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint -1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	
Sprint -1	Registration Confirmation	USN-2	As a user, I will receive a confirmation email once I have registered for the application.	1	High	
Sprint -1	Social Registration (Gmail)	USN-4	As a user, I can register for the application through Gmail.	2	Medium	
Sprint -1	Login	USN-5	As a user, I can log into the	1	High	

			application by entering email and password.			
Sprint -2	Social Registration Restriction	USN-3	As a user, I can't register for the application through Facebook.	2	Low	

2. Project Tracker, Velocity & Burndown Chart:

Sprint	**Total Story Points**	**Duration**	**Sprint Start Date**	**Sprint End Date (Planned)**	**Story Points Completed (as on Planned End Date)**	**Sprint Release Date (Actual)**
Sprint-1	20	6 Days	20 June 2025	25 June 2025	20	25 June 2025
Sprint-2	20	6 Days	26 June 2025	01 July 2025	*Pending / To be updated*	*Pending*
Sprint-3	20	6 Days	02 July 2025	07 July 2025	*Pending / To be updated*	*Pending*
Sprint-4	20	6 Days	08 July 2025	13 July 2025	*Pending / Work planned between 19 to 30 June*	*Pending*

3. Velocity Calculation

- ✓ To estimate delivery timelines and monitor team performance, **velocity** is calculated based on the number of story points completed in a sprint.

Formula:

Average Velocity (AV) = Total Story Points / Sprint Duration

Example Calculation:

- Sprint Duration: 10 days
- Total Story Points Completed: 20

Average Velocity = 20 / 10 = 2 story points per day

6. FUNCTIONAL AND PERFORMANCE TESTING

→ Performance Testing:

User Acceptance Testing (UAT)

Date	20 Feb 2026
Team ID	LTVIP2026TMIDS35023
Project Name	**LearnHub: Your Center For Skill Enhancement**
Maximum Marks	4 Marks

- **Project Details**:

Project Name: LearnHub: Your Center for Skill Enhancement
Project Description: *LearnHub* is a web-based learning management platform that allows teachers to create structured, multimedia-rich courses and enables students to enroll, learn, and track progress. It supports role-based dashboards for Students and Teachers and includes authentication, progress tracking, and content management features.
Project Version: 1.0
Testing Period: 26 June 2025 to 27 June 2025

- **Testing Scope:**
  - ✓ Features and Functionalities to be Tested
  - ✓ User Registration (via form and Gmail)
  - ✓ Secure Login with JWT authentication
  - ✓ Role-Based Dashboards (Student, Teacher)
  - ✓ Course Creation by Teacher
  - ✓ Course Enrollment by Student
  - ✓ Course Content Viewing and Progress Tracking
  - ✓ Email Notification on Registration (if applicable)
  - ✓ Access Control and Role Validation
  - ✓ Backend API integration and data flow
  - ✓ User Stories / Requirements to be Tested
  - ✓ USN-1 to USN-5 from the Product Backlog
  - ✓ Registration via form and Gmail login (OAuth)
  - ✓ Login with role-based redirection
  - ✓ Teacher can create and manage courses
  - ✓ Student can enroll and track learning progress

- **Testing Environment:**

✓ URL/Location: http://localhost:5173
✓ Backend: http://localhost:5000

Example:

Role	Email	Password
Student	testuser@gmail.com	123456
Teacher	teacher1@gmail.com	123456
Admin*	admin@gmail.com	admin123

Test Cases

Test Case ID	Test Scenario	Test Steps	Expected Result	Actual Result	Pass/Fail
TC-001	User Registration	1. Open Register Form2. Enter email and password3. Submit	User account should be created and redirect to dashboard	User registered successfully	Pass
TC-002	Admin assigns complaint to agent	1. Admin logs in2. Views unassigned complaints3. Assigns to agent	Complaint status updates in agent dashboard	Complaint correctly assigned	Pass
TC-003	Agent updates complaint status	1. Agent logs in2. Views assigned complaint3. Changes status	Status updated for customer view	Customer sees updated status	Pass
TC-004	Invalid login	1. Go to login2. Enter wrong credentials3. Submit	Login should fail with error message	Error message shown	Pass
TC-005	Complaint Tracking	1. Customer logs in2. Clicks "View Complaints"	Complaint list should appear	Complaint history displayed	Pass

Bug Tracking

Bug ID	Bug Description	Steps to Reproduce	Severity	Status	Additional Feedback
BG-001	OTP Email not received on registration	1. Fill registration form2. Submit3. No email received	Medium	Open	Check email service configuration or SMTP logs
BG-002	Gmail login error	1. Click "Login with Gmail"2. Redirects with error message	High	In Progress	Validate Google OAuth credentials and callback URL
BG-003	Admin dashboard slow to load	1. Login as Admin2. Navigate to dashboard	Low	Closed	Fixed with optimized API response

Sign-Off:

- **Tester Name**: Yalla Manasa Siri
- **Date**: 20 February 20, 2026
- **Signature:** YMSiri

Notes

- All test cases covered positive and negative scenarios.
- Bugs logged with steps, severity, and current status.
- Project is ready for deployment, pending final sign-off from the project manager and product owner.

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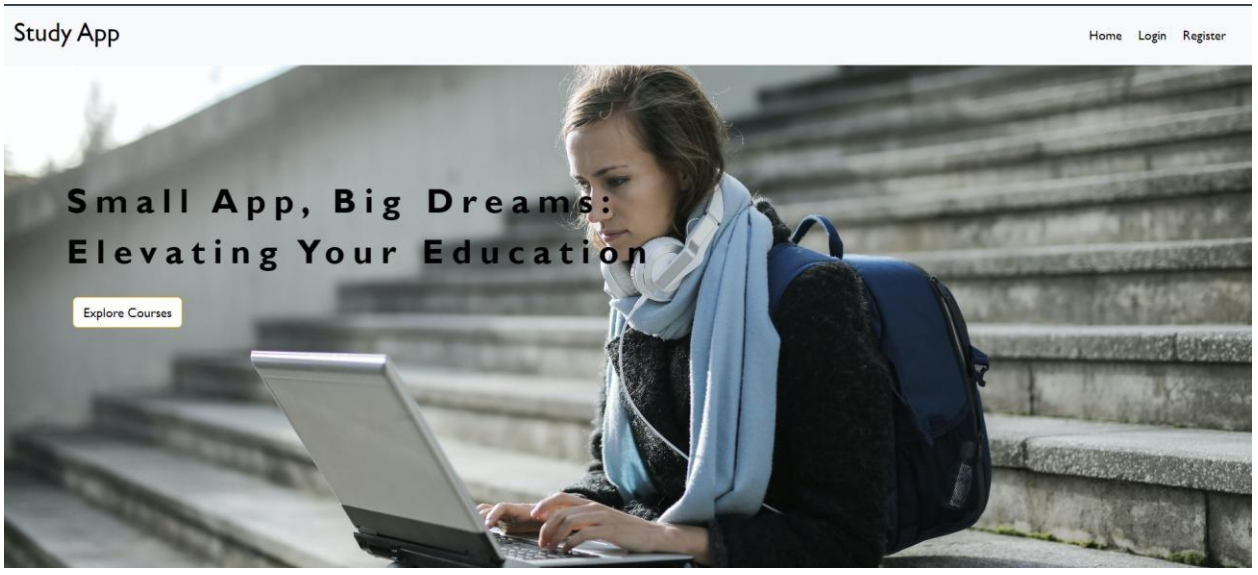
7. RESULTS

➢ OUTPUT SCREENSHOTS:

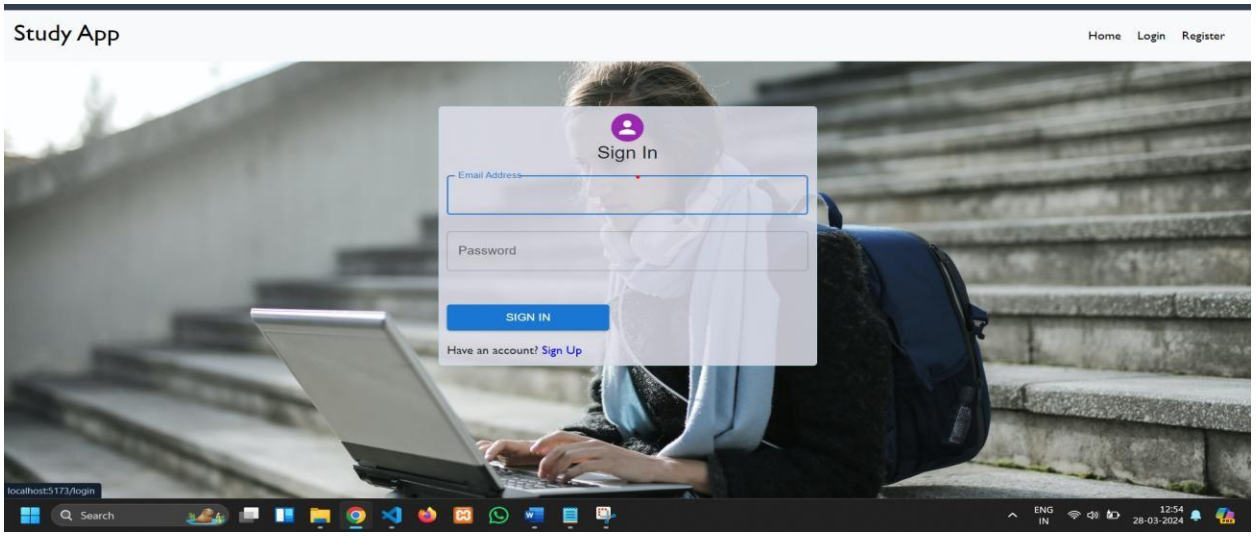
Project Implementation:

On completing the development part, we then run the application one last time to verify all the functionalities and look for any bugs in it. The user interface of the application looks a bit like the one's provided below.

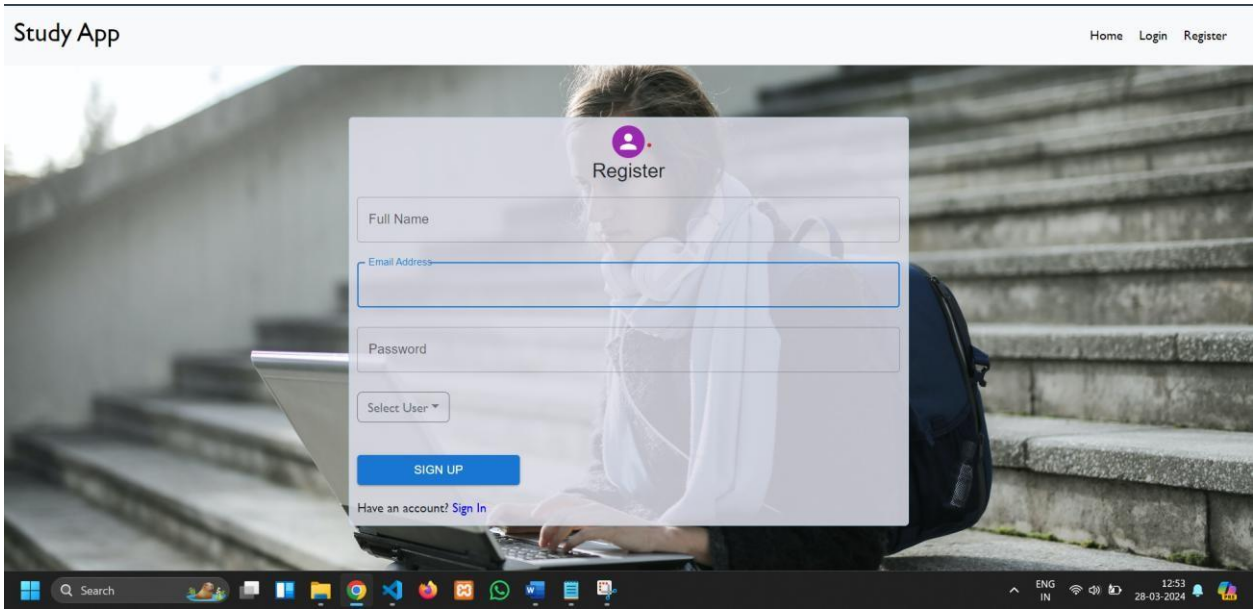
- **LANDING PAGE:**



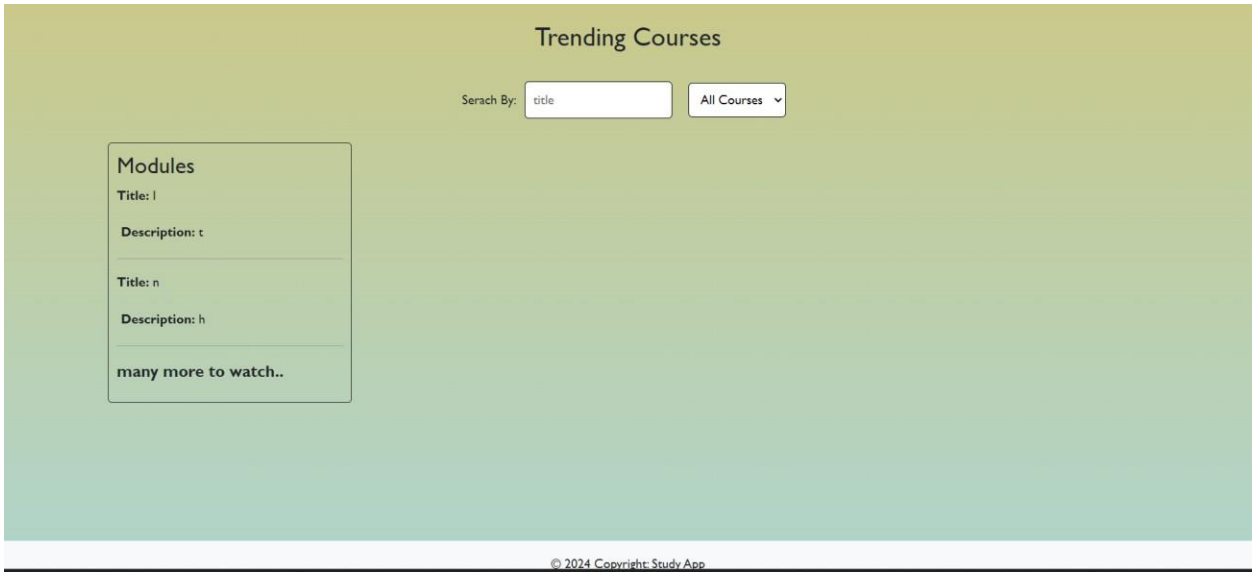
- **LOGIN PAGE:**



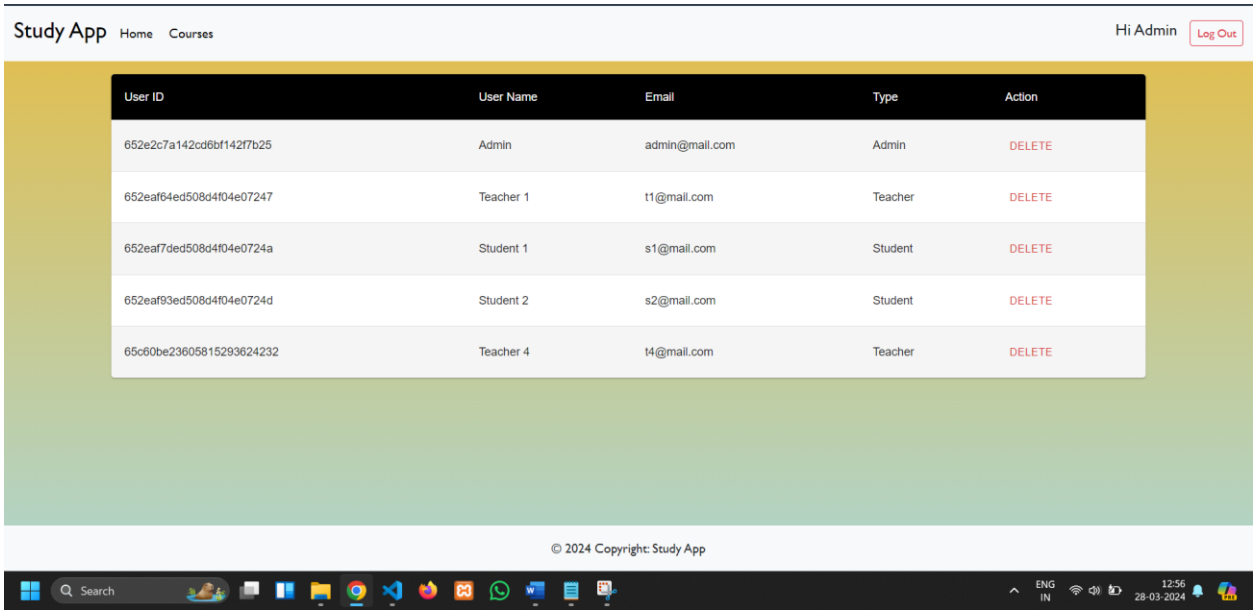
- **REGISTRATION PAGE:**



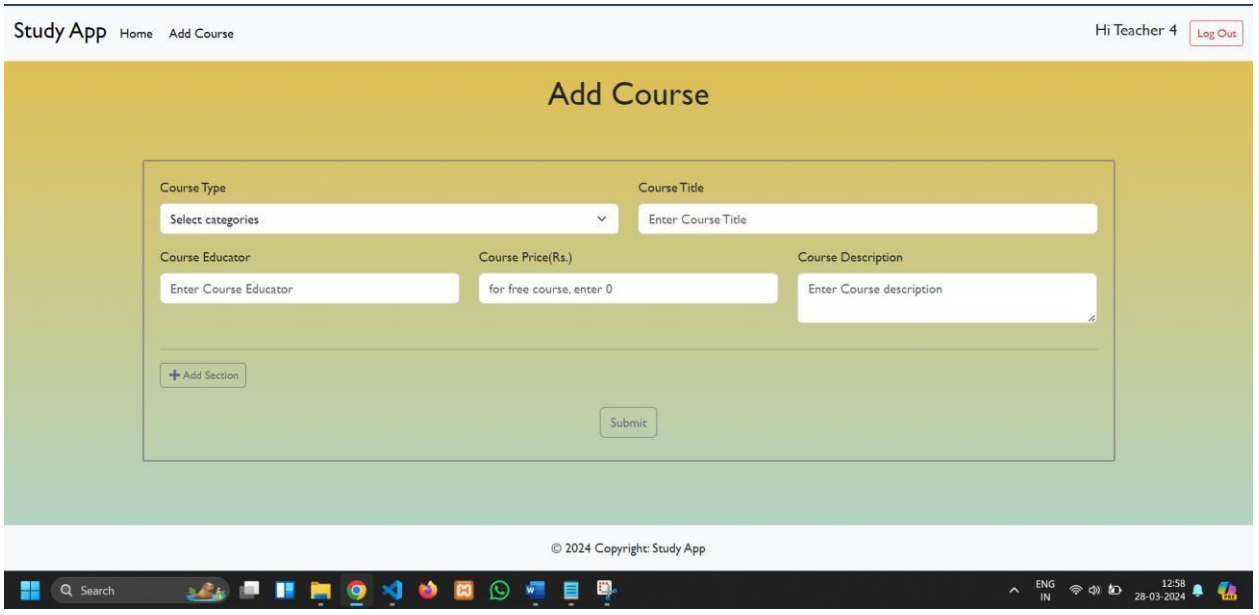
- **COURSES PAGE:**



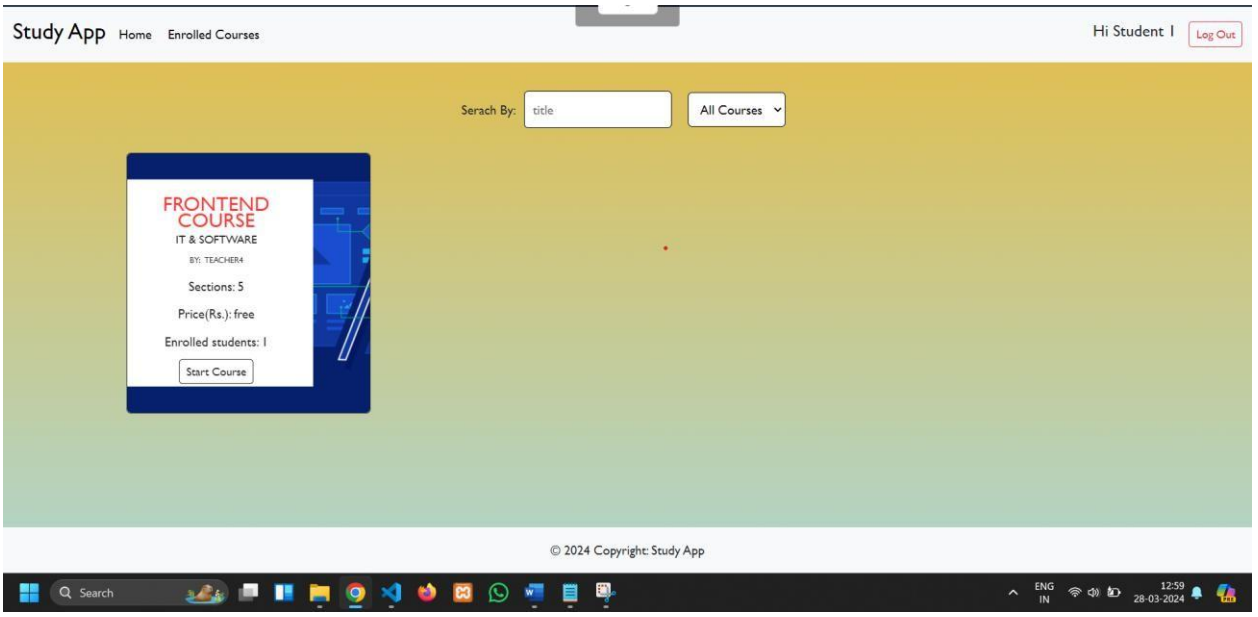
- **ADMIN DASHBOARD:**

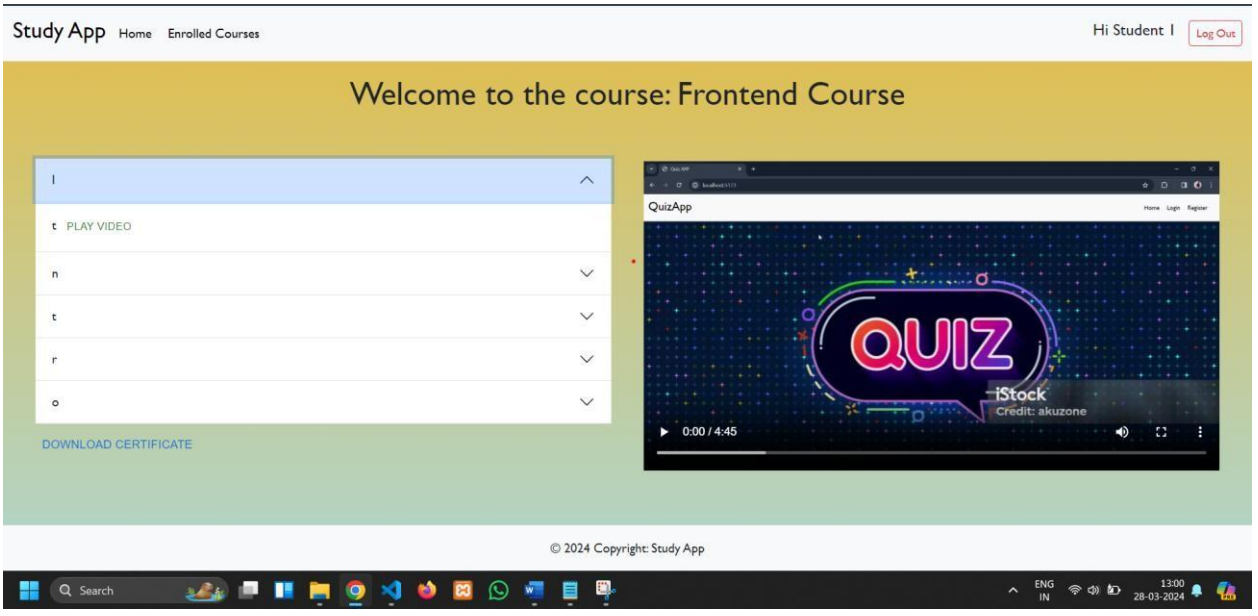


- **TEACHER DASHBOARD:**



- **STUDENT DASHBOARD:**





8. ADVANTAGES AND DISADVANTAGES

Advantages:

1. User-Friendly Interface
   The platform offers a clean and intuitive interface built with React and Vite, ensuring smooth navigation for both students and teachers.
2. Role-Based Access Control
   Separate dashboards and functionalities for Students and Teachers enhance user experience and maintain access control based on roles.
3. Centralized Learning Platform
   All courses, enrollments, and progress data are managed in one place, making the learning process organized and efficient.
4. Progress Tracking
   Students can track their course progress in real-time, encouraging self-paced learning and improving motivation.
5. Scalable Architecture
   Built using the MERN stack, LearnHub is modular and can be easily scaled to accommodate more users, courses, and institutions.
6. Cloud Integration
   Supports deployment on platforms like Vercel (frontend) and Render (backend), with cloud database support via MongoDB Atlas to ensure high availability.
7. Improved Learning Outcomes
   Teachers can create multimedia-rich content (videos, images, text), making learning more engaging and accessible.

Disadvantages:

1. No Offline Support
   The platform requires an internet connection; students cannot access courses or track progress offline.
2. Lack of Real-Time Interaction
   The current version does not support live chat or real-time doubt clearance between students and teachers (planned in future versions).
3. Limited Third-Party Integration
   Issues may arise with Google OAuth (Gmail login) if misconfigured or if API limits are exceeded.
4. Basic Analytics
   There is no detailed reporting or analytics module yet for tracking student performance or engagement patterns.
5. Email Notifications Dependency
   OTP or confirmation emails may fail if mail services (SMTP or APIs) are misconfigured or throttled.

9. CONCLUSION

LearnHub is a full-stack web application developed to streamline and digitize the course creation and enrollment process for educational and skill-development environments. The platform provides an efficient, user-friendly, and organized learning environment where **teachers can create multimedia-rich courses** and **students can enroll, track their progress, and engage with content** seamlessly.

The project is built using the **MERN stack (MongoDB, Express.js, React.js with Vite, and Node.js)**, which offers a modern, modular, and scalable architecture. With **role-based dashboards** tailored for **students and teachers**, LearnHub ensures that course management, learning, and progress tracking are conducted in a structured, accessible, and secure way.

The platform successfully addresses key educational challenges such as:

- Eliminating traditional, unstructured learning processes by digitizing course access and progress tracking.
- Providing centralized access to learning content with real-time visibility into enrolled course status.
- Enabling teachers to independently create, manage, and deliver learning material without technical complexity.
- Empowering students to learn at their own pace while monitoring their achievements.

This system was developed as part of a collaborative internship under **SmartInternz**, allowing the team to engage in **hands-on full-stack development**, apply **agile project planning**, and gain real-world experience in building scalable educational platforms.

By fulfilling the key functional and non-functional requirements — including usability, scalability, and security — **LearnHub** establishes a strong foundation as a **Minimum Viable Product (MVP)**. It is ready for testing in real educational scenarios and demonstrates the capability to transform current challenges in education into practical, tech-driven solutions using industry-standard tools and best practices.

10. FUTURE SCOPE

To improve the learning experience and extend platform capabilities, the following enhancements are planned for future versions of LearnHub:

1. Mobile App Integration
    - Develop native Android and iOS applications to allow students and teachers to access courses, dashboards, and content on mobile devices.
    - Provide offline learning features and push notifications for deadlines or updates.
2. Real-Time Chat & Notifications
    - Integrate Socket.IO for live communication between students and teachers.
    - Add real-time notifications for assignment updates, new course releases, and announcements.
3. AI-Powered Course Recommendation
    - Implement machine learning algorithms to suggest personalized courses to students based on their interests, learning history, or enrolled categories.
4. Multilingual Support
    - Introduce multiple language options in the user interface to support learners from different regions and backgrounds.
    - Allow course creators to upload content in various languages.
5. Analytics Dashboard
    - Equip teachers with visual insights into student engagement, course completion rates, and feedback.
    - Allow students to view their own learning analytics and progress charts.
6. Feedback and Rating System
    - Enable students to provide ratings and reviews for courses and instructors after completion.
    - Help teachers improve course quality based on direct learner feedback.
7. Offline Learning Mode
    - Allow students to download course content for offline access, especially in low-connectivity areas.
    - Sync learning progress once reconnected to the internet.

Running the Application:

A. FRONTEND:

- To run the **React frontend**-
  - ✓ Open terminal and navigate to the frontend folder:

```
cd frontend
```

  - ✓ Install dependencies:

```
npm install
```

  - ✓ Start the frontend:

```
npm run dev
```

  - ✓ Open browser and visit:

    http://localhost:3000

B. BACKEND:

- To run the **Node.js + Express backend**:
  - ✓ Open another terminal and navigate to the backend folder:

```
cd backend
```

  - ✓ Install dependencies:

```
npm install
```

  - ✓ Start the backend server:

```
npm start
```

  - ✓ Server runs at:

    http://localhost:8000

APPENDIX

- Video Demo Link:

https://drive.google.com/file/d/11gJP_O_YC5PhNftqRpKZviYLQfIXZOjs/view?usp=sharing

- Git Hub Link:

https://github.com/yallamanasasiri1685/Learn-Hub-Your-Center-for-Skill-Enhancement.git