

AI-POWERED INTERACTIVE LEARNING ASSISTANT FOR CLASSROOMS



TEAM: TECH TITANS

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Department: B.Tech-CSE (Internet of Things)

Year of Study: IIIrd – year

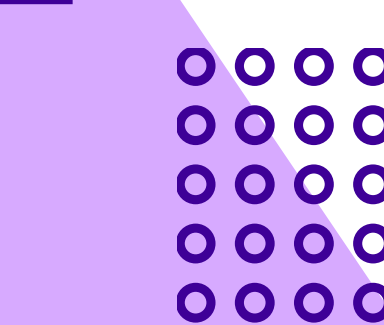
University : B. S. Abdur Rahman Crescent Institute of Science and Technology



PROBLEM STATEMENT:



Traditional e-learning platforms often provide static content that lacks personalization, interactivity, and adaptability to individual learning styles. Students face difficulty in accessing instant help, generating topic-specific study materials, and tracking their own learning progress. These limitations reduce engagement and effectiveness in self-paced digital learning environments.



OBJECTIVES

- Build an AI-powered learning platform using React and modern tools
- Provide real-time tutoring through an AI chatbot
- Generate personalized quizzes, flashcards, and summaries
- Offer interactive learning paths with progress tracking
- Display user performance through a visual dashboard
- Ensure scalability and responsiveness across devices



PROPOSED SOLUTION



AI LearnHub

Your AI-Powered Learning Platform

AI LearnHub is an AI-powered platform that enhances digital learning by offering:

- AI Tutor for real-time concept explanation and Q&A
- Study Material Generator for summaries, flashcards, and MCQs
- Structured Learning Paths with visual progress tracking
- Auto-generated Quizzes with scoring and feedback
- Progress Dashboard to monitor XP, scores, and activity
- Basic Authentication for login and session handling
- Offline access and analytics tracking for personalization

METHODOLOGY

AGILE DEVELOPMENT LIFECYCLE

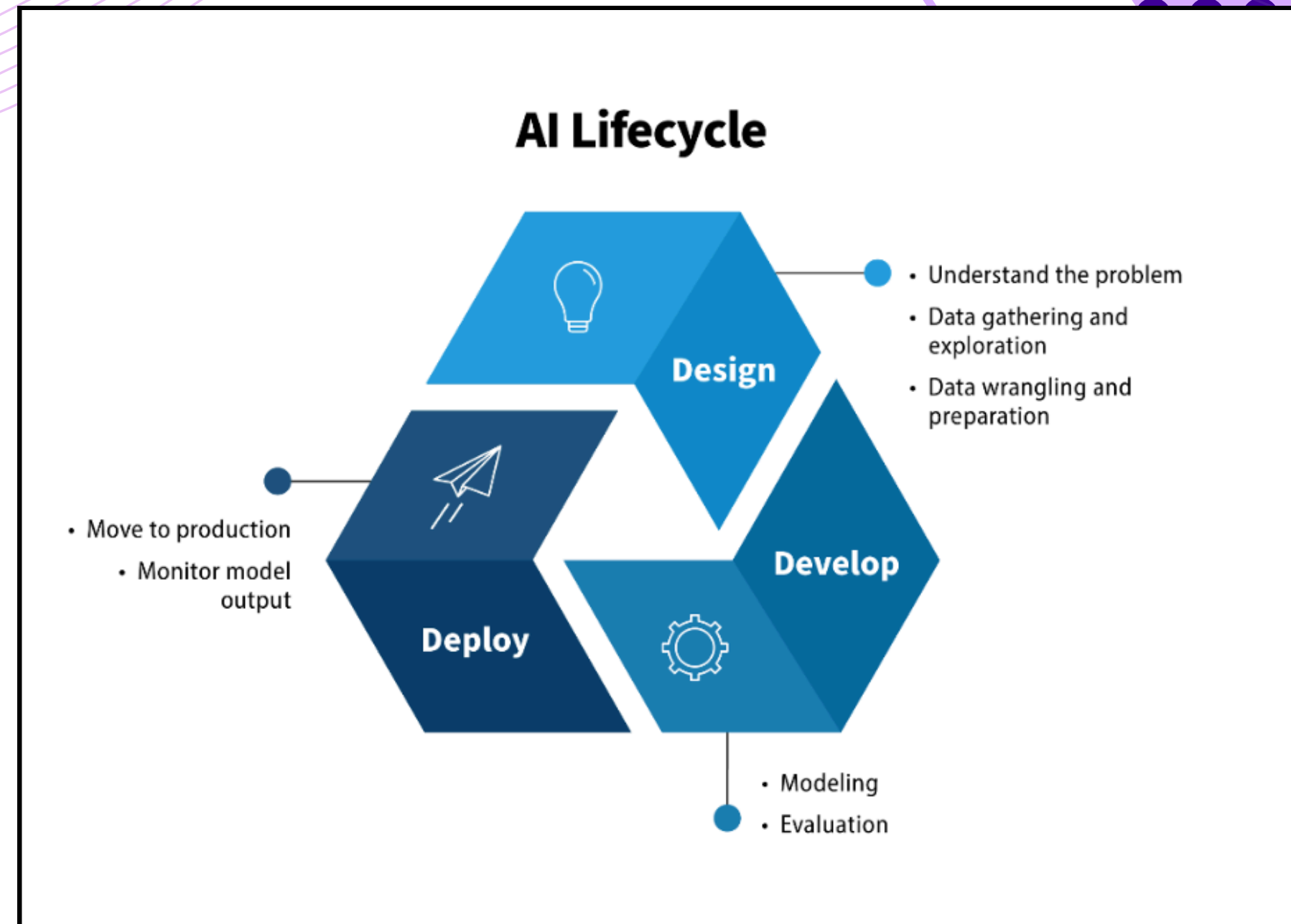
Data flow begins from user input to the frontend → AI request → AI response → display to user

PHASES

- Requirement analysis
- UI/UX prototyping
- Component-wise development
- API Integration
- Testing & Deployment

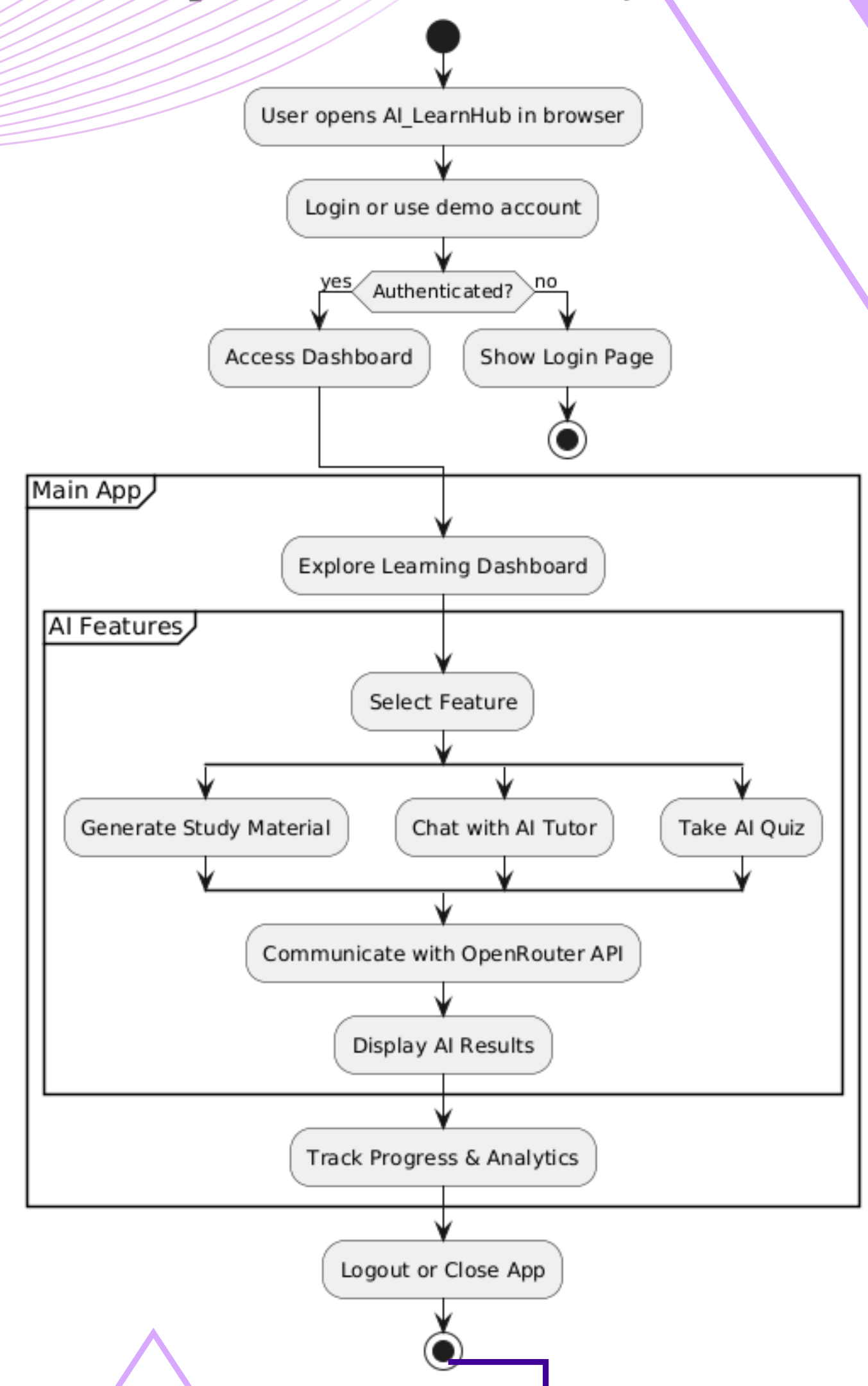
TOOLS

- Vite
- TypeScript
- React
- Tailwind CSS
- shadcn/ui



PROCESSFLOW

- User opens the platform and logs in
- Enters the dashboard (Main App UI)
- Selects a feature: AI Tutor / Study Material / Quiz
- Request is sent to OpenRouter AI API
- AI processes and returns the response
- Response is shown in the UI
- User progress and analytics are updated in the dashboard

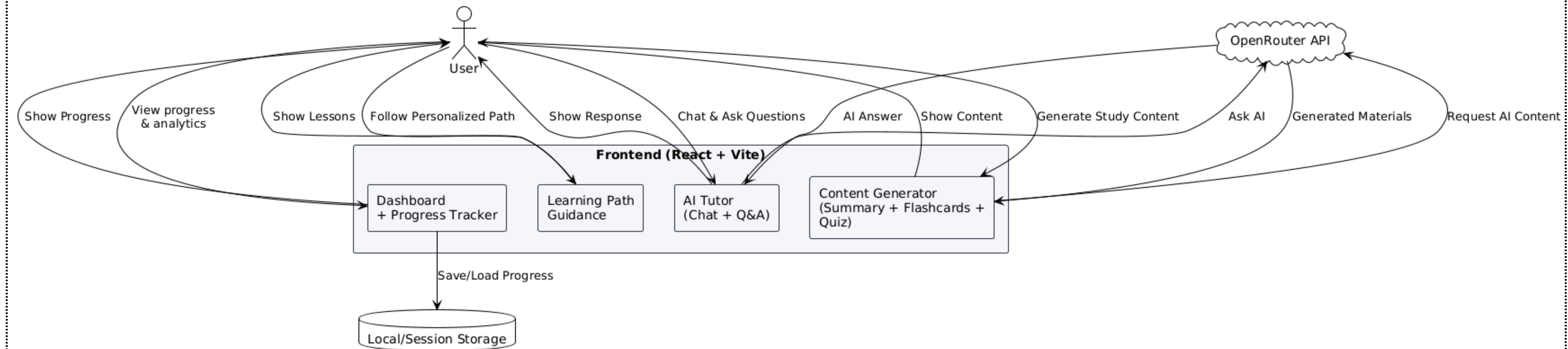


SYSTEM OVERVIEW

AI LearnHub is an AI-powered learning platform that offers:

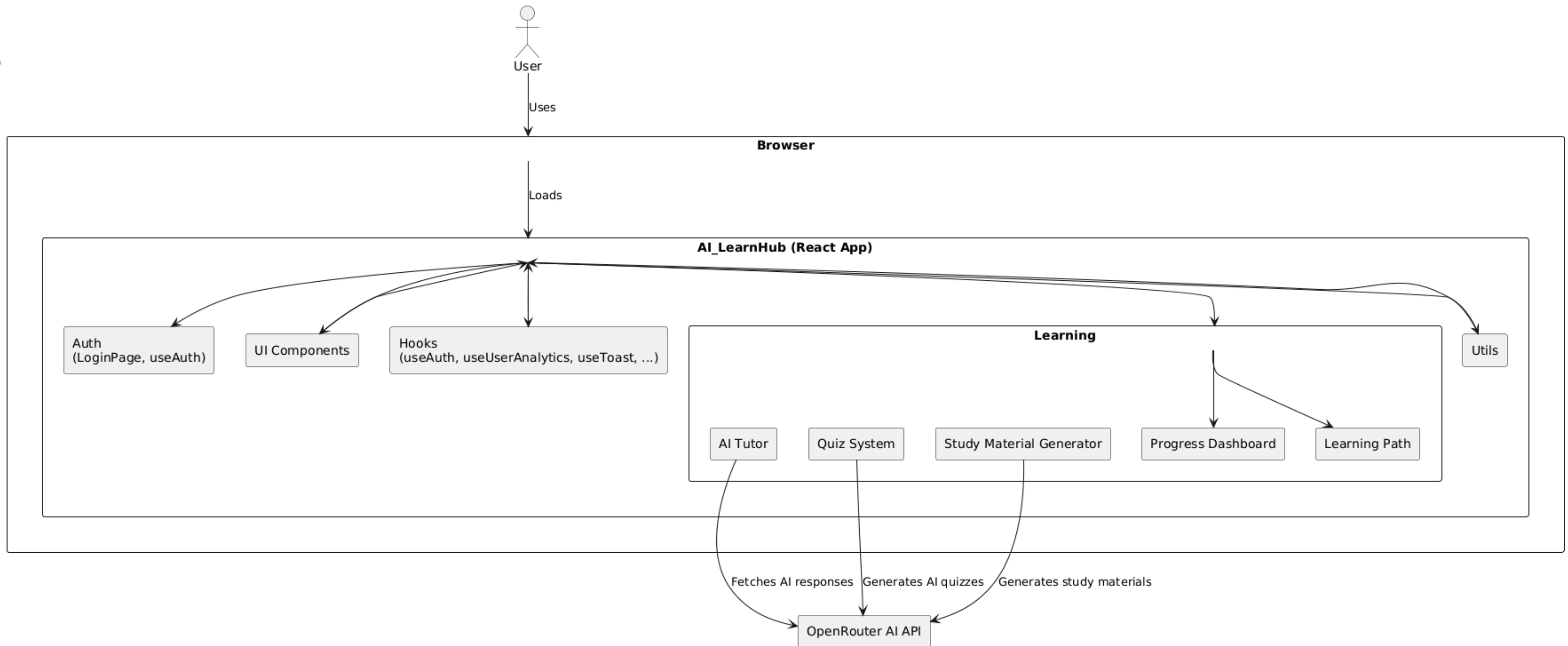
- Real-time AI Tutor support
- Personalized quizzes and flashcards
- Interactive learning paths
- Progress tracking via dashboard
- Built using React, Tailwind CSS, and OpenRouter API, and deployed on Vercel.

AI Learning Platform - System Overview

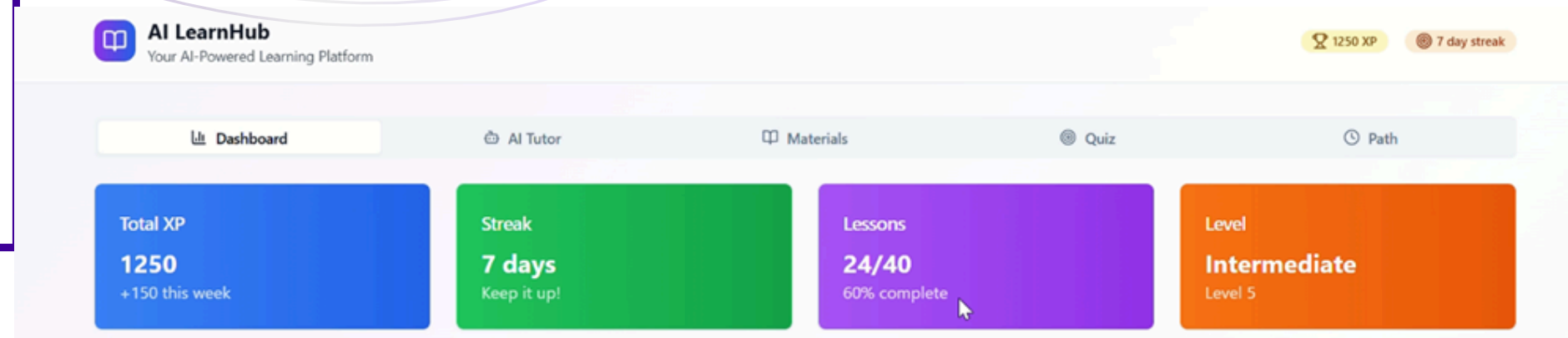


SYSTEM ARCHITECTURE

AI_LearnHub - High-Level Architecture

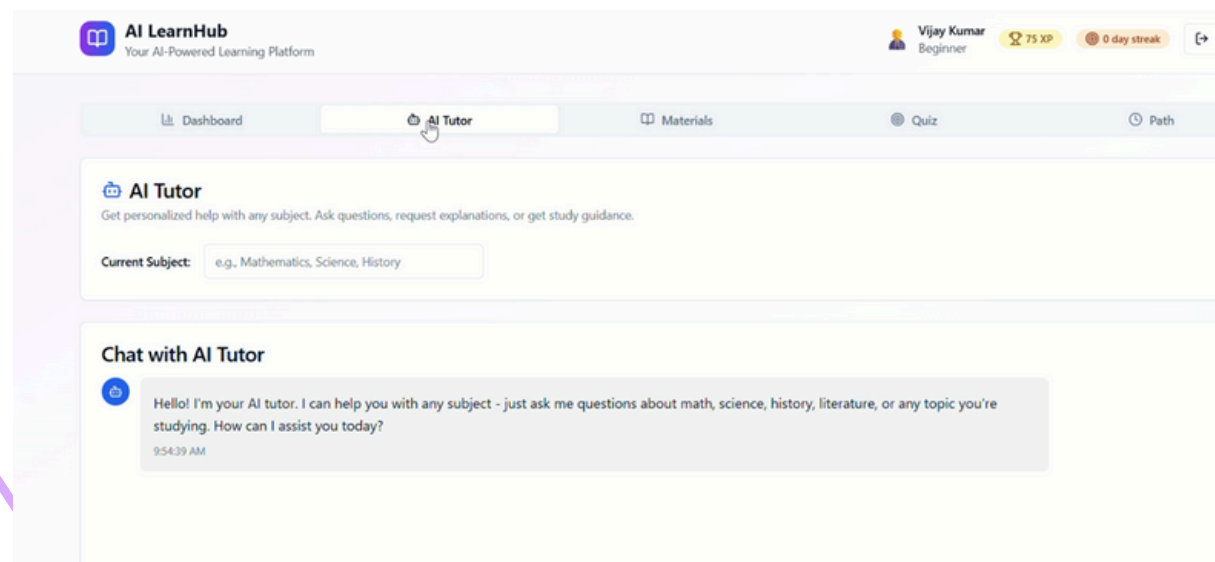


FEATURES



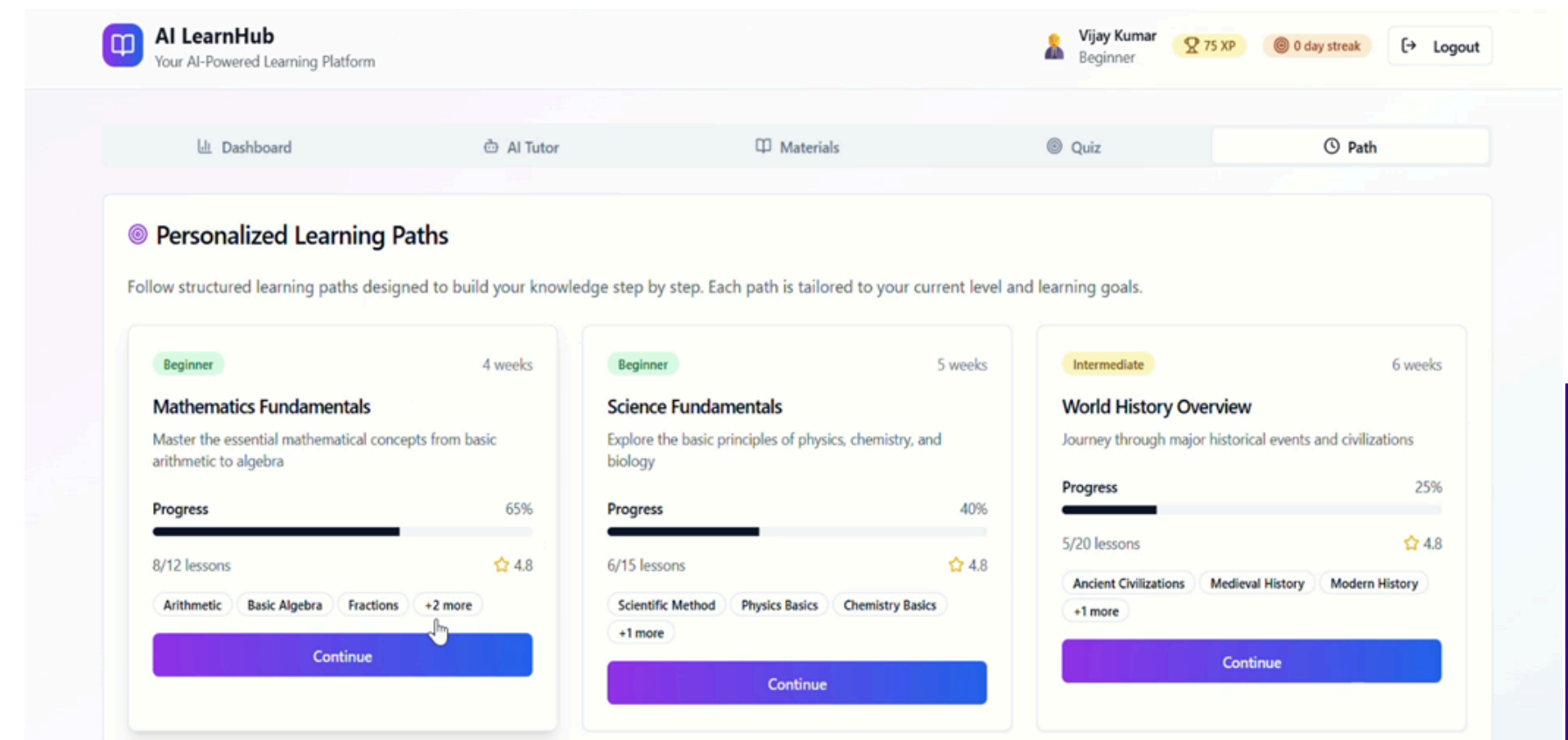
1. AI Tutor:

- Chatbot that assists learners by explaining concepts, answering questions.
- Context-aware replies using OpenRouter API.
- Quick prompt buttons for commonly used queries.



2. Learning Path:

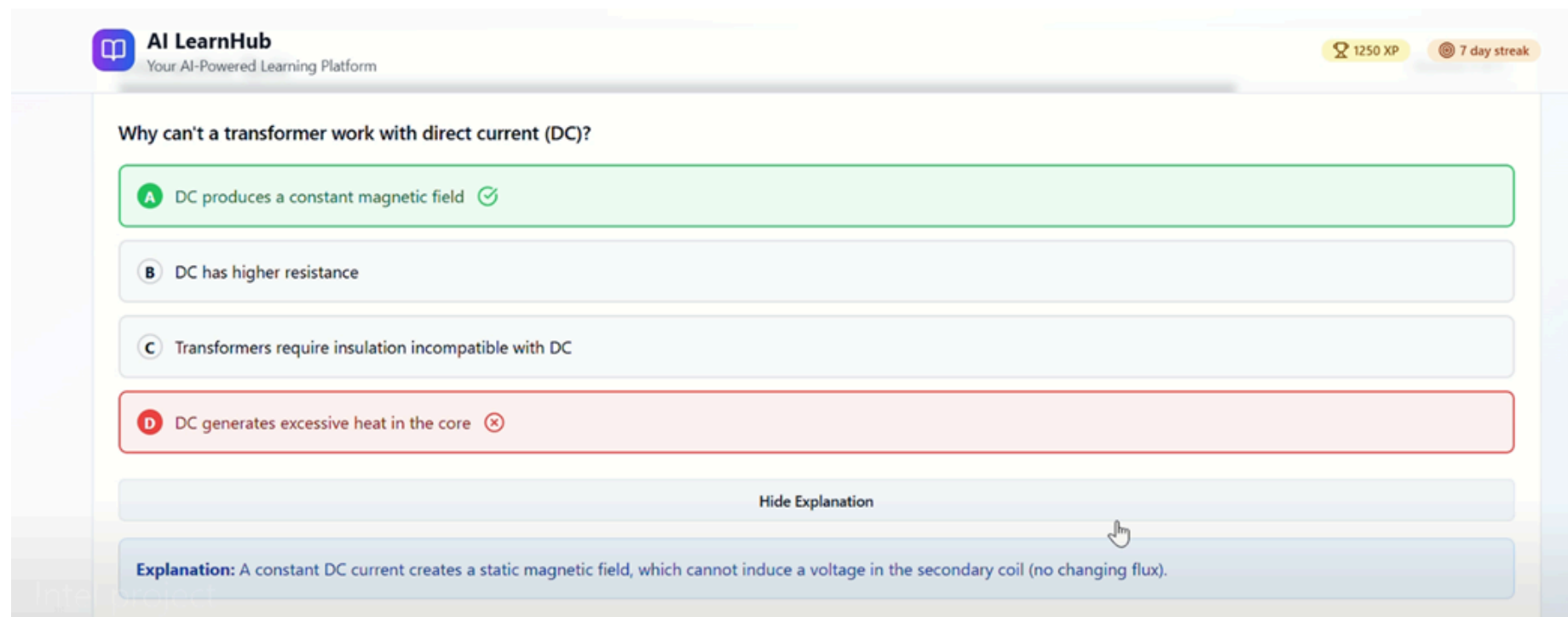
- Predefined and personalized learning journeys.
- Lesson-wise progression tracking.
- Skills and time required displayed for each course.



FEATURES

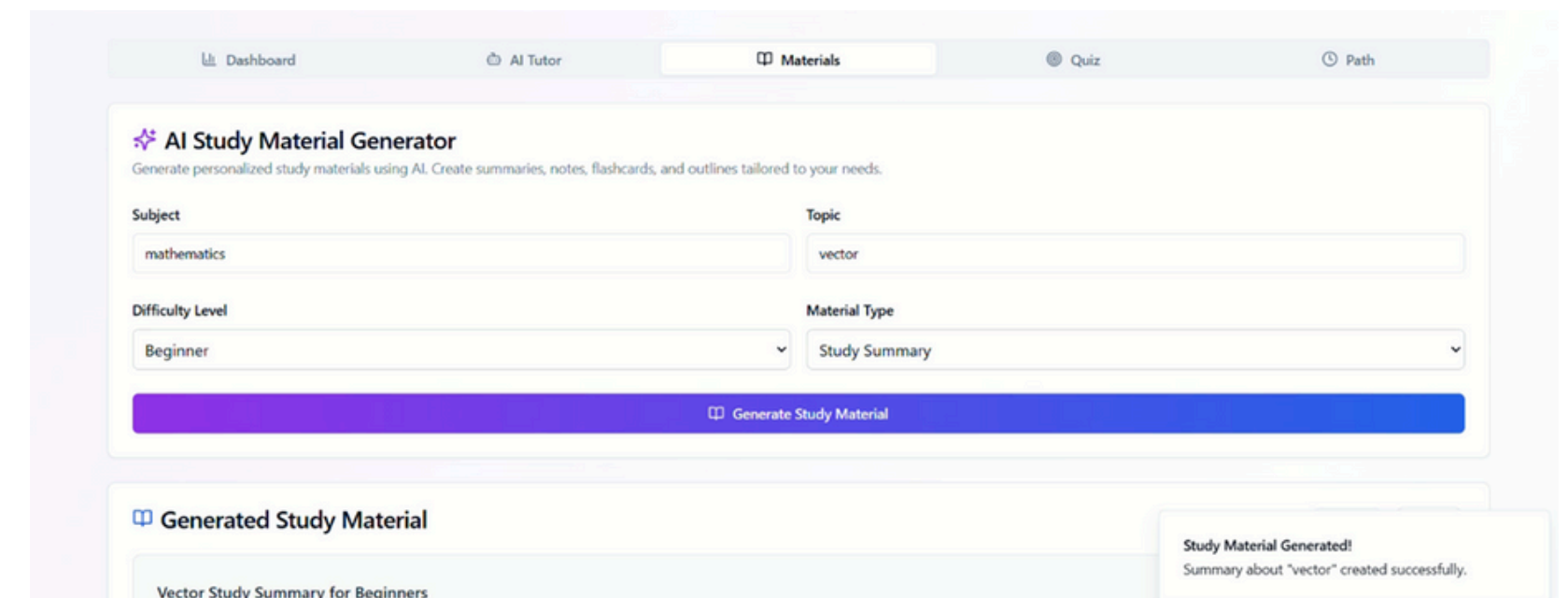
3. Quiz System:

- AI-generated quizzes with explanation and scoring.
- Dynamic based on any subject/topic input.
- Visual feedback and review section.



4. Study Material Generator:

- Generates topic-based summaries, flashcards, and MCQs.
- Stored locally for future revision.
- Uses generative AI to personalize content.
- Encourages revision without internet access



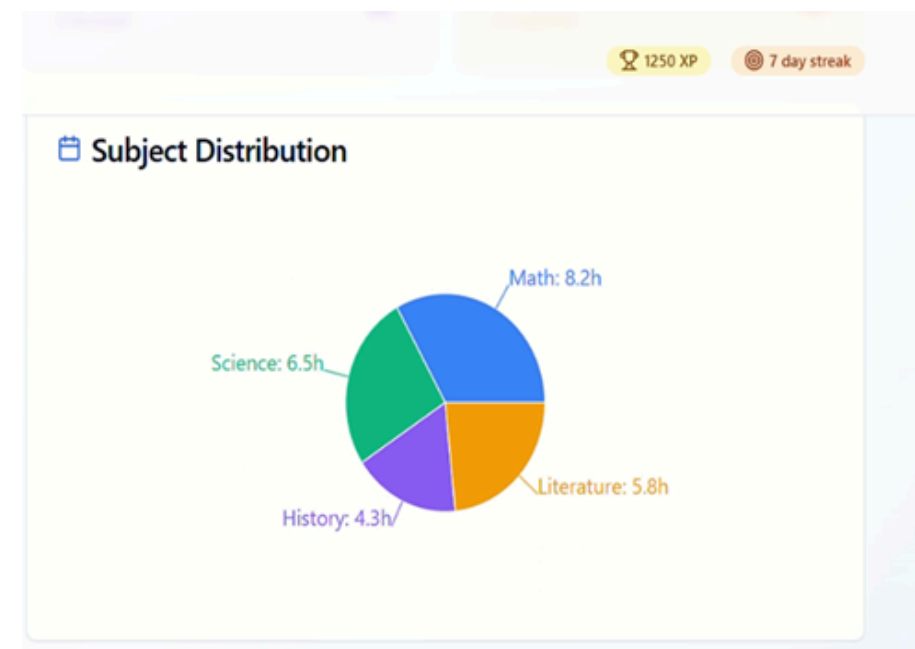
FEATURES

5. Progress Dashboard:

- Tracks weekly study hours, subject-wise performance.
- Displays XP points, achievements, lesson stats.

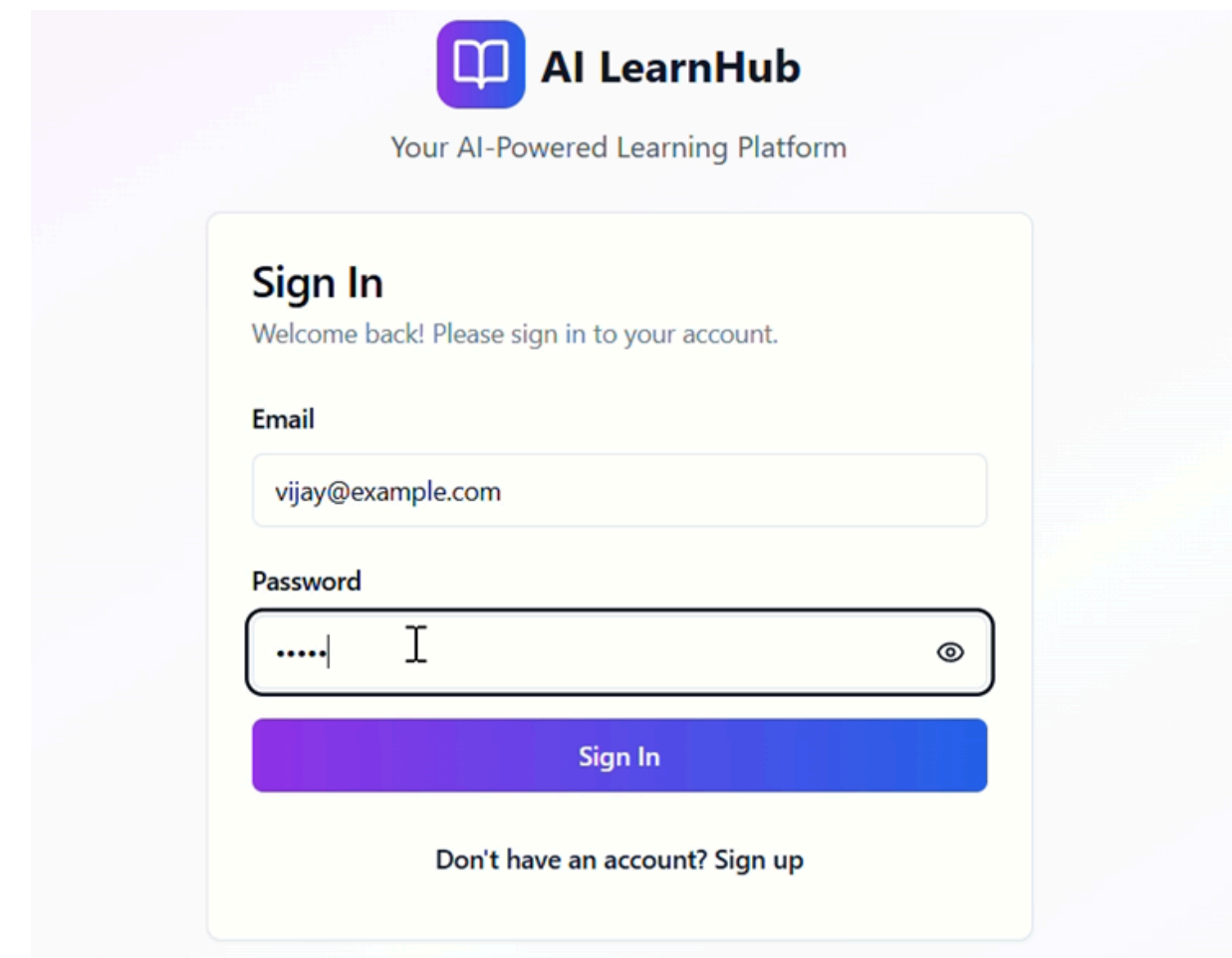


- Graphs and charts powered by Recharts.



6 Authentication System:

- Basic login interface (demo account supported)
- Custom React hooks for state management and auth tracking
- Can be extended for full backend authentication



The figure shows a screenshot of the 'AI LearnHub' sign-in interface. At the top, it says 'AI LearnHub Your AI-Powered Learning Platform'. Below this is a section titled 'Sign In' with the text 'Welcome back! Please sign in to your account.' There are two input fields: 'Email' with the value 'vijay@example.com' and 'Password' with a masked password '.....'. A blue 'Sign In' button is below the password field. At the bottom, there is a link that says 'Don't have an account? Sign up'.

TECHNOLOGIES USED

Technology	Purpose
React.js	Frontend Framework
TypeScript	Type safety in JavaScript
Vite	Fast development server
Tailwind CSS	Utility-first styling framework
shadcn/ui	Ready-to-use accessible components
OpenRouter API	AI responses for education
Vercel	Hosting and deployment
Radix UI	Accessibility primitives

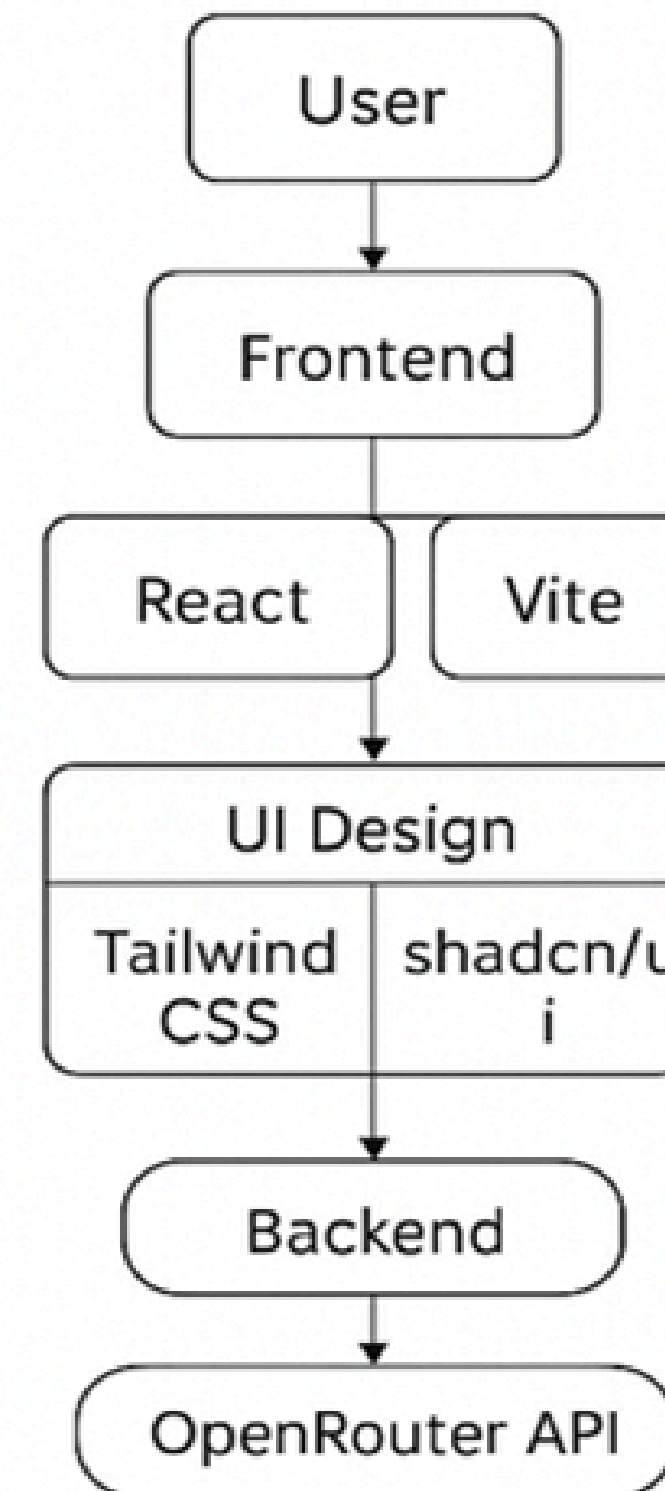
TESTING & DEPLOYMENT



AI LearnHub

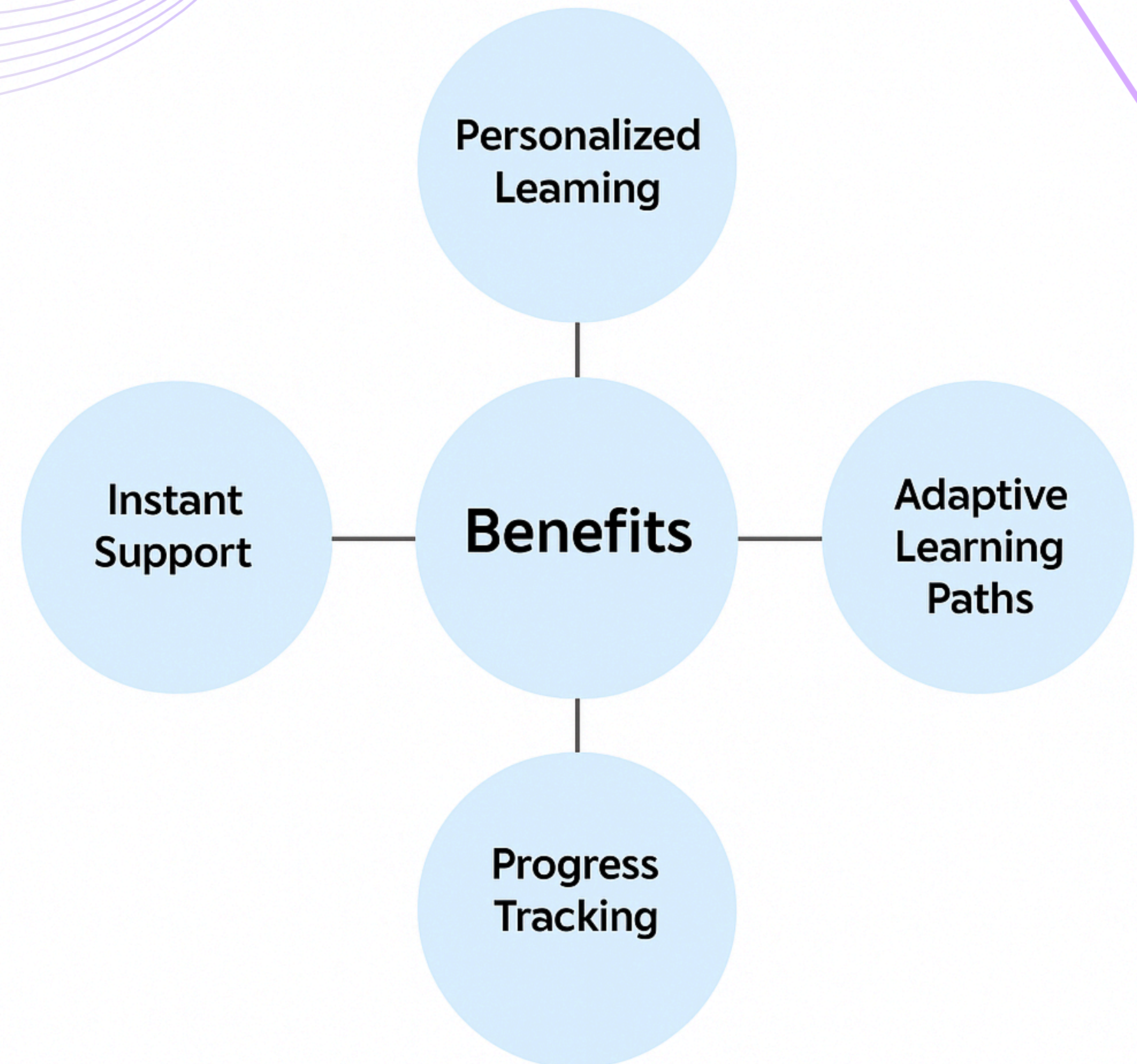
Your AI-Powered Learning Platform

- Manual & functional testing
- Lighthouse audit for performance
- Responsive across devices
- Hosted on Vercel with CI/CD
- Secure API key handling via .env



BENIFITS & RESULTS

- 70% learning path completion
- 300 AI tutor interactions tested
- Dashboard actively tracked performance
- 100% uptime post-deployment



TEAM MEMBERS AND CONTRIBUTION

Name	Role	Responsibilities
Dinesh Y (Team Leader)	AI & Frontend Lead	AI integration, major UI components
Alan Bevis J P	QA & UI Support	Testing, UI polishing, bug tracking
Basheerah Batool .M	Docs, Frontend & Deployment	Documentation, support in UI, deployment

CONCLUSION

AI LearnHub demonstrates the potential of integrating AI with modern frontend development to revolutionize e-learning. The platform supports personalized, adaptive learning paths while giving users the freedom to interact and generate resources. With continuous improvements and community-driven content, it can serve as a benchmark in intelligent educational platforms.



THANK YOU