EduStream — Case Study Report

Prepared by: Hiragar Darshan Mukeshbhai

Enrollment no:2301031030012

Div:A4

Role: Lead Developer (Frontend Prototype)

Version: 1.0

1.Introduction:-

EduStream is a modern online learning platform aimed at delivering interactive and engaging courses to students and professionals. The demand for digital education is rapidly increasing in India and worldwide, and learners expect platforms that are reliable, visually appealing, and easy to use.

The core idea of EduStream is to allow users to explore rich course content such as videos, audio lectures, and images, while also giving them tools to track their progress, purchase courses securely, and receive real-time feedback during assessments.

The focus here is on building the **first four critical features** of the system:

I. Media Gallery & Playback Controls

II. User Preferences & Dark Mode

III. Authentication & Secure Purchases (cart flow)

IV. Real-Time Form Validation

2. Objectives:-

The key objectives of this project are:

- User-Friendly Learning Experience: Provide smooth navigation and interaction with videos, audio, and other media without lag.
- Personalisation: Allow users to customise their learning environment through features like dark mode and preference storage.
- Secure Interactions: Build a safe login and purchasing flow that keeps user information protected.
- Real-Time Feedback: Make forms and quizzes interactive by validating input instantly, reducing mistakes and increasing trust.

3.Target Users:-

EduStream is designed for multiple groups of users:

I. **Learners / Students**
II. **Instructors**
III. **Administrators**

4.System Architecture:

The EduStream platform follows a client–server architecture. The frontend (client) is built with ReactJS and Tailwind CSS, while the backend is planned with Laravel and MongoDB. The frontend communicates with the backend through REST APIs or SPA endpoints.

Key architectural choices for frontend:

- **Component-Based Structure:** Each feature (auth, cart, media, validation) has its own folder with UI, logic, and API code.
- **Global State Management:** Authentication and cart data will be stored in React Context, ensuring consistency across the app.
- **Routing:** React Router (or a minimal routing system) will handle navigation between pages like Catalog, Course Detail, Login, and Checkout.
- **Persistence:** User preferences (e.g., dark mode, saved cart items) will be saved in localStorage.
- **Canvas Integration:** The HTML5 Canvas API will be used for overlays on video content, such as progress or highlights.

5.Technology Stack:-

Technology	Purpose
ReactJS	Core framework for building UI components
Tailwind CSS	Styling and responsive design
HTML5 & Canvas API	Media handling and custom overlays
JavaScript (ES6+)	Application logic
LocalStorage	Storing preferences like theme or cart items

6.Key Challenges:-

I. **Performance with Media and Background Tasks:-** To keep media playback smooth, the system will lazy-load videos and images.

II. **Security of User Data & Payments:-** Tokens will be handled carefully, with access tokens kept in memory and only safe information persisted.

III. **Scalability and Maintainability:-** Reusable components and a feature-folder structure will make the project scalable. Hooks will separate logic from UI, and API contracts will be clearly documented.

IV. **Synchronization between Frontend & Backend:-** Managing login and cart requires smooth sync with backend APIs. The frontend will keep a single source of truth (React Context) and refresh data whenever server confirmation is needed.

7. Features:-

I. **Media Gallery: Responsive grid, playback with progress overlay**

II. **Dark Mode: One-click toggle,Login & Cart: Dummy login,**

III. **Validation: Forms and quizzes give instant feedback**

IV. **Dashboard: Shows course completion and activity charts**

8.Setup Instructions:-

1. **Download , extract and Open the zip folder**
2. **Run npm install → npm run dev EduStream**
3. **Open http://localhost:3000**
4. **Login with test@test.com / 123456**

9. Conclusion:-

The EduStream prototype delivers a clear and functional demo of how a modern learning app could work. While the backend and payments are not yet implemented, the main flows are complete and user-friendly, forming a strong base for future development.