Front End Engineering

Project Synopsis

Semester-VI (Batch-2022)

Elev8

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Problem Statement

Organizing events, contests, and hackathons often becomes a complex and inefficient process due to the lack of a centralized platform. Without an integrated solution, organizers struggle with manual coordination, tracking participants, and ensuring seamless communication, leading to mismanagement and decreased engagement. Participants also face difficulties in finding relevant opportunities, managing submissions, and staying updated. The absence of a streamlined system results in fragmented experiences, reducing the overall effectiveness of such activities.

TITLE OF PROJECT

Elev8 : Revolutionizing Events, Contests & Hackathons

OBJECTIVE

Objective: The objective of Elev8 is to develop a seamless, interactive, and efficient platform for managing events, contests, and hackathons. Built using the MERN stack, the project aims to simplify the entire lifecycle of these activities, from creation and participation to evaluation and engagement. By providing an intuitive user interface, robust backend architecture, and secure authentication system, Elev8 ensures smooth coordination between organizers and participants. The platform will incorporate features such as event scheduling, contest submissions, real-time judging, and team collaboration, making it a comprehensive solution. Additionally, security measures like encrypted data storage and token-based authentication will be implemented to protect user information.

OPTIONS AVAILABLE TO EXECUTE THE PROJECT

- **Development Stack:** The project will be built using the MERN stack to ensure a modern, scalable, and efficient web application.
- **Hosting and Deployment:** The platform can be deployed using Heroku, Vercel **,** or Digital Ocean, while domain registration can be managed through GoDaddy or Namecheap for a professional web presence.

- **Development Tools:** The team will utilize Visual Studio Code for coding, GitHub for version control, and Docker for containerized deployment and project management.

- **UI/UX Design:** Wireframing and prototyping will be done using tools like Figma or Adobe XD to create an intuitive and user-friendly interface.
- **Security & Authentication:** Secure authentication and authorization mechanisms, such as token-based authentication and HTTPS encryption, will be implemented to protect user data.

ADVANTAGES / DISADVANTAGES

- **Advantages:**

  - **Streamlined Event Management:** Elev8 simplifies the organization of events, contests, and hackathons by providing a centralized platform with features for scheduling, tracking, and managing participants efficiently.

  - **User-Friendly and Scalable:** Built using the **MERN stack**, the platform ensures a **responsive and intuitive UI**, making it accessible for both organizers and participants. It is also scalable, allowing for expansion as the number of users grows.

  - **Secure and Reliable:** With **token-based authentication, encrypted data storage, and HTTPS security**, Elev8 ensures that sensitive user information is protected from unauthorized access.

- **Disadvantages:**

  - **High Initial Development Time and Cost:** The project requires a significant investment in development time (100+ hours) and resources, including web hosting and domain registration costs ~ ₹13,200.

  - **Technical Complexity:** The implementation of real-time updates, secure authentication, and scalable databases requires expertise in MERN stack, API development, and cloud hosting, which might be challenging for beginners.

  - **Dependency on Third-Party Services:** The project relies on external services for hosting Heroku/Vercel, authentication, and payment gateways, which may lead to additional costs or limitations based on free-tier restrictions.

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REFERENCES

1. **MERN Stack Documentation** – Official documentation for MongoDB, Express.js, React, and Node.js to understand the core technologies.
    - MongoDB Docs
    - Express.js Docs
    - React Docs
    - Node.js Docs
2. **RESTful API Development** – Guides on designing and implementing REST APIs for handling CRUD operations.
    - REST API Best Practices
3. **Authentication & Security** – Implementation of JWT (JSON Web Tokens), OAuth, and HTTPS for secure authentication.
    - JWT Guide
    - OAuth 2.0 Overview
4. **UI/UX Design Principles** – Best practices for creating an intuitive and responsive user interface using Figma or Adobe XD.
    - Google's Material Design
    - Figma Learning
5. **Database Schema Design** – Structuring a NoSQL MongoDB database for efficient data storage and retrieval.
    - MongoDB Schema Design Guide
6. **Agile Project Management** – Using Scrum, Kanban, and Agile methodologies for efficient task execution.
    - Agile Methodology Basics
7. **Deployment & Hosting** – Hosting on Heroku, Vercel, or Digital Ocean, including domain management on GoDaddy/Namecheap.
    - Heroku Deployment Guide
    - Vercel Docs
8. **Version Control & Collaboration** – Using GitHub/GitLab for source code management and teamwork.
    - GitHub Docs
9. **Real-Time Features** – Implementing real-time updates using Socket.io for live interactions in hackathons.
    - Socket.io Documentation
10. **Online Learning Resources** – Courses on MERN stack development, API security, and UI/UX design from platforms like Udemy, Coursera, and YouTube.

- Coursera Web Development
- Udemy MERN Stack Course

11. **Testing & Debugging** – Resources on unit testing (Jest), API testing (Postman), and frontend testing.

- Postman API Testing Guide