

# TECH STACK

## Frontend Technologies

### **1. Core Framework and Libraries:**

- **React.js:** A popular JavaScript library for building user interfaces, particularly single-page applications. Its component-based architecture simplifies development and reuse.
- **React Router:** Essential for managing navigation and routing in single-page applications, ensuring smooth transitions between views.
- **Context API:** Redux is a robust state management tool for complex applications, while Context API is suitable for simpler scenarios. Redux Toolkit makes Redux easier to use.
- **Socket.io-client:** Enables real-time features such as notifications, live updates, or collaboration tools.
- **Tailwind CSS:** A utility-first CSS framework that allows rapid UI styling with predefined classes.
- **Material-UI (MUI):** A robust library of pre-designed React components following Google's Material Design principles. It speeds up UI development.

### **2. Additional Frontend Libraries:**

- **React DnD or react-beautiful-dnd:** Provide intuitive drag-and-drop functionality for features like Kanban boards.
- **Chart.js:** Chart.js is more customizable and offer beautiful data visualizations.

## Backend Technologies

### *1. Core Framework and Runtime:*

- **Node.js:** The runtime environment for executing JavaScript server-side.
- **Express.js:** A lightweight and flexible web framework that simplifies routing and middleware setup.
- **MongoDB:** A NoSQL database that stores data in a flexible, JSON-like format, suitable for projects requiring schema flexibility.
- **Mongoose:** An ODM library for MongoDB that provides schema validation and query-building tools.
- **Cloudinary:** Store files in buckets (cloud-based directories).

### *2. Additional Backend Tools:*

- **Socket.io:** Facilitates real-time communication between clients and servers.
- **JWT:** A stateless method for user authentication and authorization.
- **Bcrypt:** Hashing passwords securely before storing them.
- **Multer:** Handles file uploads for features like profile pictures or document storage.

## AI Integration

- **Gemini API:** Provides state-of-the-art AI models for tasks like text generation or analysis.

## DevOps & Tools

### *1. Development Tools:*

- **Git:** For version control and collaboration.
- **npm:** For managing dependencies. Yarn is faster and ensures deterministic installs.
- **Jest/React Testing Library:** For unit and integration tests.

### *2. Deployment & Monitoring:*

- **CI/CD Pipeline:** Automates building, testing, and deploying code. GitHub Actions offers tight GitHub integration.
- **Vercel:** Cloud hosting solutions for scalability and reliability.

## Security

- **Helmet.js:** Sets HTTP headers to secure the app against common vulnerabilities.
- **CORS:** Configures cross-origin resource sharing policies.
- **Rate Limiting Middleware:** Prevents abuse by limiting request rates.

This stack ensures a balance between functionality, performance, and security while offering scalability and developer productivity. Let me know if you'd like deeper insights into any of these tools or their configurations!