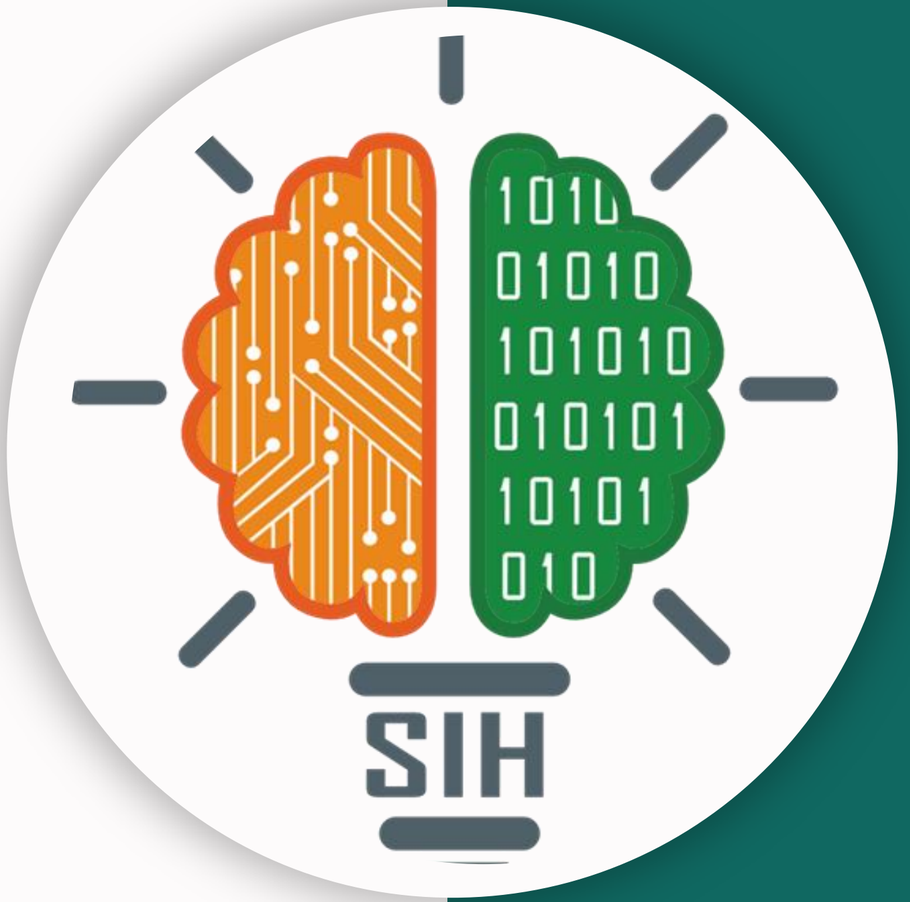
SMART INDIA HACKATHON 2024

Smart India Hackathon 2024



- **Problem Statement Title**-Modern Version of SocialCalc: A Collaborative Spreadsheet Application
- **Theme**-Education and Skills Development
- **PS Category- Software/Hardware**- Software
- Team ID-
- **Team Name** (Registered on portal)- Toman Manji

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IDEA/SOLUTION

Idea/Solution

Real-Time Collaboration with Scalable Architecture

- Implement real-time collaboration using WebSockets to allow multiple users to edit spreadsheets simultaneously, with changes instantly synchronized.
- Use a microservices architecture with load balancing to ensure scalability, handling a large number of concurrent users efficiently.

2. Enhanced Security and Data Management
   - Provide robust user authentication with OAuth 2.0 or JWT and role-based access control to protect sensitive data.
   - Ensure data persistence and integrity with version history, encryption, automated backups, and recovery options to prevent data loss.
3. Modern, Responsive User Interface
   - Develop a responsive, user-friendly interface using React to ensure seamless performance across all devices, supporting features like cell editing, formulas, and data visualization.
   - Enable integration with external APIs (e.g., Google Sheets, CSV import/export) to extend functionality and improve user experience.

Unique Value Propositions

- Real-Time Collaboration: Instantly sync changes across users with built-in conflict resolution.
- AI Assistance: Boost productivity with AI-powered suggestions and data insights.
- Extensibility: Easily customize and expand with plugins and integrations.
- Security and Scalability: Robust data protection and architecture designed for growth.
- Cross-Platform Access: Seamless, responsive user experience on any device.

Problem Resolution :

To resolve the problem of SocialCalc's outdated technology and limited scalability, we propose developing a modern version using contemporary web frameworks like Node.js. This new version will offer real-time collaboration with conflict resolution, enhanced security features, and AI-powered assistance for improved productivity. The platform will be highly scalable, ensuring smooth performance under heavy user loads, and will provide a responsive, cross-platform user interface for a consistent experience across devices. By incorporating flexible extensibility and seamless integration with external APIs, the solution will meet current web development standards and cater to diverse user needs

Technical Approach

Platform Development:

- React: For building the user interface.
- Node.js & Express.js: For backend server and API management.
- MongoDB: For storing spreadsheet data and user information.
- WebSocket (Socket.io): For real-time updates and collaborative features.
- JWT: For secure user authentication and authorization.

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Feasibility and Viability

Feasibility

1. Technology Stack: React, Node.js, and MongoDB are well-established technologies with strong community support and extensive documentation.
2. Real-Time Collaboration: WebSocket (Socket.io) can effectively handle real-time updates, which is crucial for collaborative features.
3. Development Resources: Ample resources and tools are available for development, reducing potential technical hurdles.
4. Deployment Options: Cloud platforms (e.g., Heroku, AWS) and Docker provide scalable and flexible deployment solutions.
5. Complexity Management: With proper planning, the complexity of implementing spreadsheet logic and real-time features can be managed effectively.

Viability

1. Market Demand: High demand for collaborative tools like Google Sheets, indicating a strong user base.
2. Competitive Advantage: Unique features or optimizations could set the project apart from existing solutions.
3. User Experience: React enables a responsive and interactive user interface, enhancing user satisfaction.
4. Scalability: The stack supports scalability to handle growing user and data volumes.
5. Cost Efficiency: Open-source technologies and cloud services help minimize initial development costs while allowing for scalability.

Impact and Benefits

Positive Impact:

- Real-Time Collaboration: Enables simultaneous editing by multiple users, boosting productivity.
- Accessibility: Web-based access from any device, enhancing convenience.
- Customization: Offers tailored features and functionality to meet specific user needs.
- Cost-Effective: Reduces costs through open-source technologies and cloud deployment.

Benefits

- Social: Empower students through real-world insights and experiences.
- Economic: Open new avenues for funding and donations.
- Environmental: Digital-first approach reduces paper-based communication.

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REFERENCE

- React: React Official Documentation
- Node.js: Node.js Official Documentation
- MongoDB: MongoDB Official Documentation
- Socket.io: Socket.io Official Documentation
- JWT: JWT Official Documentation