

THS
FEST
2.0

Round 1

CAMPUS NAVIGATOR & EVENT HUB:
A SMART CAMPUS APP THAT PROVIDES REAL-TIME
NAVIGATION, EVENT UPDATES, AND
ACCESSIBILITY SUPPORT FOR STUDENTS AND
VISITORS.

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Our project is a real-time campus navigation and event discovery app that helps students stay updated on ongoing events, registration desks, and important locations as they move around the campus.

Problem

Due to the lack of a real-time mechanism to inform them of events occurring nearby, students frequently miss out on campus activities. For new students in particular, navigating the campus can be challenging, and information about activities is typically dispersed over social media, texts, and banners. Low engagement and lost opportunities result from this. Additionally, locating appropriate routes presents difficulties for children with accessibility needs. By providing a real-time, interactive, and inclusive platform for campus travel and event discovery, our solution tackles all of these problems.

Interactive Map User Interface

The interactive map user interface provides a personalized 3D campus map with real-time avatar movement, event and facility "Pol" marks, interactive overlay graphics, a day/night cycle mimics the lighting in the actual world.

The Mechanics of Discovery

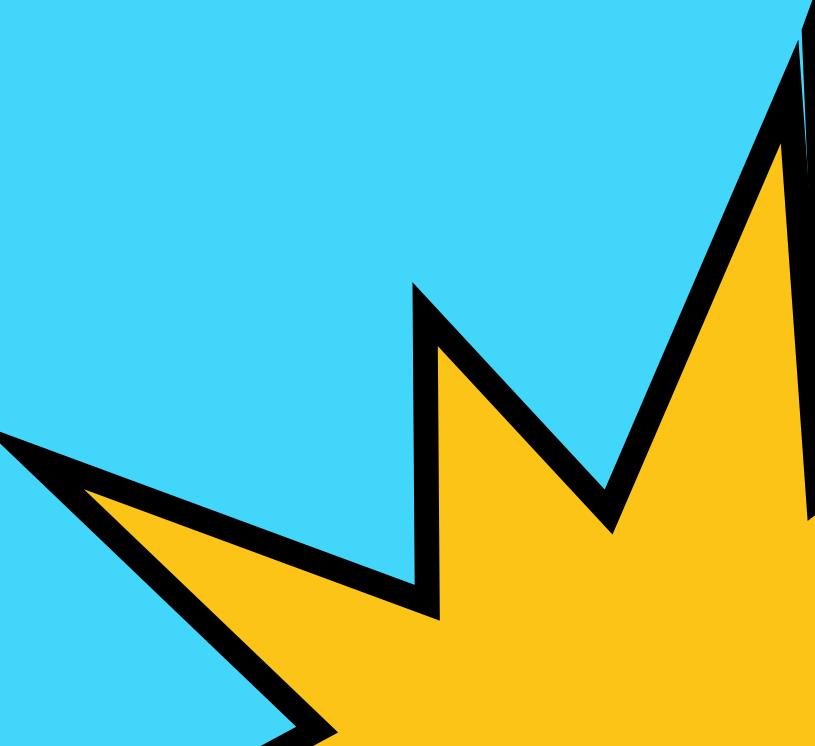
Event Radar uses distance markers to display nearby activities, providing feedback from vibrations when approaching a destination. AR mode allows real-world viewing of event details.

The Navigation System

The navigation system provides detailed directions, indoor floor-level changes, bookmarking for frequently visited places, search features with filters and autocomplete, and accessibility options like elevators and wheelchair pathways.

Real-Time Event Integration

- Geofenced event notifications.
- Category-based filtering and personalized recommendations.
- Time-aware event displays



TECHNICAL STACK



Frontend

- React Native: Single codebase for both iOS and Android
- Mapbox GL JS: Open source map rendering with customization support
- Redux: State management

Backend

- Node.js with Express: Lightweight and efficient API server
- Socket.io: WebSocket implementation for real-time updates

API Integration

- iCalendar: Standard protocol for calendar event import
- OAuth 2.0: For authentication with university systems
- Webhook listeners: For real-time event updates

Database

- MongoDB: Flexible document database with excellent geospatial support
- Redis: For caching and real-time features

Maps & Navigation

- OpenStreetMap: Free geographic data source
- OSRM: Open Source Routing Machine for pathfinding
- Estimote/AltBeacon: Open beacon protocol for indoor positioning

DevOps

- Docker: Container management
- GitHub Actions: Simple CI/CD pipeline
- Grafana/Prometheus: Monitoring stack

Feasibility and Viability

- Highly feasible using established open-source technologies (React Native, MongoDB, OpenStreetMap)
- Low-to-moderate development costs with minimal infrastructure requirements
- Can be maintained by a small development team with periodic updates
- MVP can be developed in 3–6 months with phased feature rollout

Potential challenges

❖ Operational & Functional Challenges

Real-Time Data Maintenance

Outdated or incorrect event data can confuse users.

- ✓ There will be a live admin dashboard for event updates and set data expiry rules.

Dependence on Event Organizers

- ✓ Automate reminders or integrate with existing college portals.

🚧 Technical Challenges & Risks

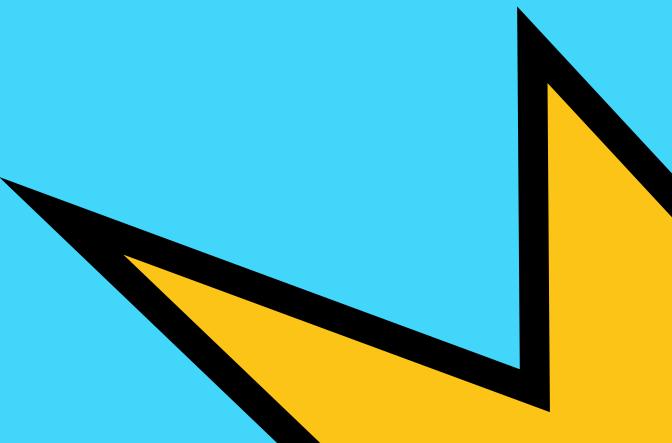
Inaccurate GPS Location

- ✓ We will use geofencing, location smoothing, or fallback to Wi-Fi-based positioning.

Indoor Navigation Difficulty

GPS doesn't work well inside buildings.

- ✓ QR-based floor identification or Wi-Fi/Bluetooth beacons if available.



Thank You