BANNARI AMMAN INSTITUTE OF TECHNOLOGY

Stay Ahead

BANNARI AMMAN INSTITUTE OF TECHNOLOGY

Autonomous Institution, Accredited by NAAC With 'A' Grade

INDOOR LOCATION TRACKING APP

Name	DHINAKAR S
Roll No	7376221EE110
Seat No	386
Project ID	26
Problem Statement	Indoor Location Tracking App for BIT campus navigation
Domain	Special Lab

Technical Components

Stack	MERN
Front End	React (JS Library for building user interfaces)
Back End	Node.js with Express.js
Database	MongoDB (NOSQL Database)
API	OpenAPI

Implementation Timeline

Phase	Deadline	Status	Notes
Stage 1		Under review	Planning and Requirement Gathering
Stage 2		In progress	Design and UI/UX Prototyping
Stage 3		Not started	Backend Development
Stage 4		Not started	Database Design and Implementation
Stage 5		Not started	Integration and Testing
Stage 6		Not started	Deployment

1. Introduction:

1.1. Purpose:

The purpose of this document is to outline the development of an innovative indoor location tracking app tailored specifically for the faculty, staff, parents, and students of BIT campus. The app aims to provide real-time navigation assistance within campus buildings, integrate campus events, and prioritize user safety.

1.2. Scope Of Project:

The indoor location tracking app will enable users to navigate various campus buildings seamlessly, including special labs, classrooms, seminar

halls, faculty cabins, and administrative offices. Despite challenges such as signal interference and multi-level structures, the app will accurately track users' locations and provide optimal routes. Additionally, the app will integrate campus events, ensuring users stay informed. Scalability and reliability are key considerations to accommodate the dynamic nature of the institution and diverse campus environments.

2. System Overview:

2.1. Users:

1. Faculty: Utilize the app for efficient navigation between classrooms, offices, and seminar halls.
2. Staff: Access real-time navigation assistance to fulfill administrative tasks across campus buildings.
3. Parents: Use the app for visiting campus and attending events, ensuring a smooth experience.
4. Students: Benefit from the app's navigation features for easy access to labs, classrooms, and other campus facilities.

2.2. Features:

1. **Real-time Navigation:**
    - Accurate tracking of user locations within campus buildings using mobile device sensors and Wi-Fi signal strength.

- Seamless navigation assistance provided through an interactive map interface, taking into account challenges like signal interference and multi-level structures.
- Route planning functionality to generate the shortest path between two points on the map, optimizing for efficiency and convenience.

2. **Safety Measures:**
    - Implementation of safety features to prioritize user well-being, including:
        - Emergency exit indicators on the interactive map, guiding users to the nearest exits in case of emergencies.
        - Alerts for construction zones or maintenance areas within campus buildings, ensuring users are aware of potential hazards.
3. **Admin Access:**
    - Faculty members designated as administrators will have access to additional administrative features, including:
        - Updating campus maps with new buildings, rooms, and facilities.
        - Adding new locations or updating existing ones to reflect changes in campus infrastructure.
        - Managing user accounts, including student and faculty registrations, password resets, and access permissions.
        - Monitoring app usage statistics and user feedback to continuously improve the app's functionality and usability.

4. **Scalability and Reliability:**
    - Designing the app's architecture to accommodate the institution's growth and evolving needs.
    - Implementing robust backup and recovery mechanisms to ensure the app remains operational even during network disruptions or structural changes.
    - Regular performance testing and optimization to maintain reliability and responsiveness, especially during peak usage periods.

3. Technical Components:

3.1. Stack:

- **Front End:**
    - React: JavaScript library for building dynamic user interfaces.
- **Back End:**
    - Node.js with Express: Server-side development for handling requests and logic.
    - MongoDB: NoSQL database for storing location data and user information.
- **API**:
    - OpenAPI: Standard for documenting and designing APIs, ensuring interoperability and ease of integration.

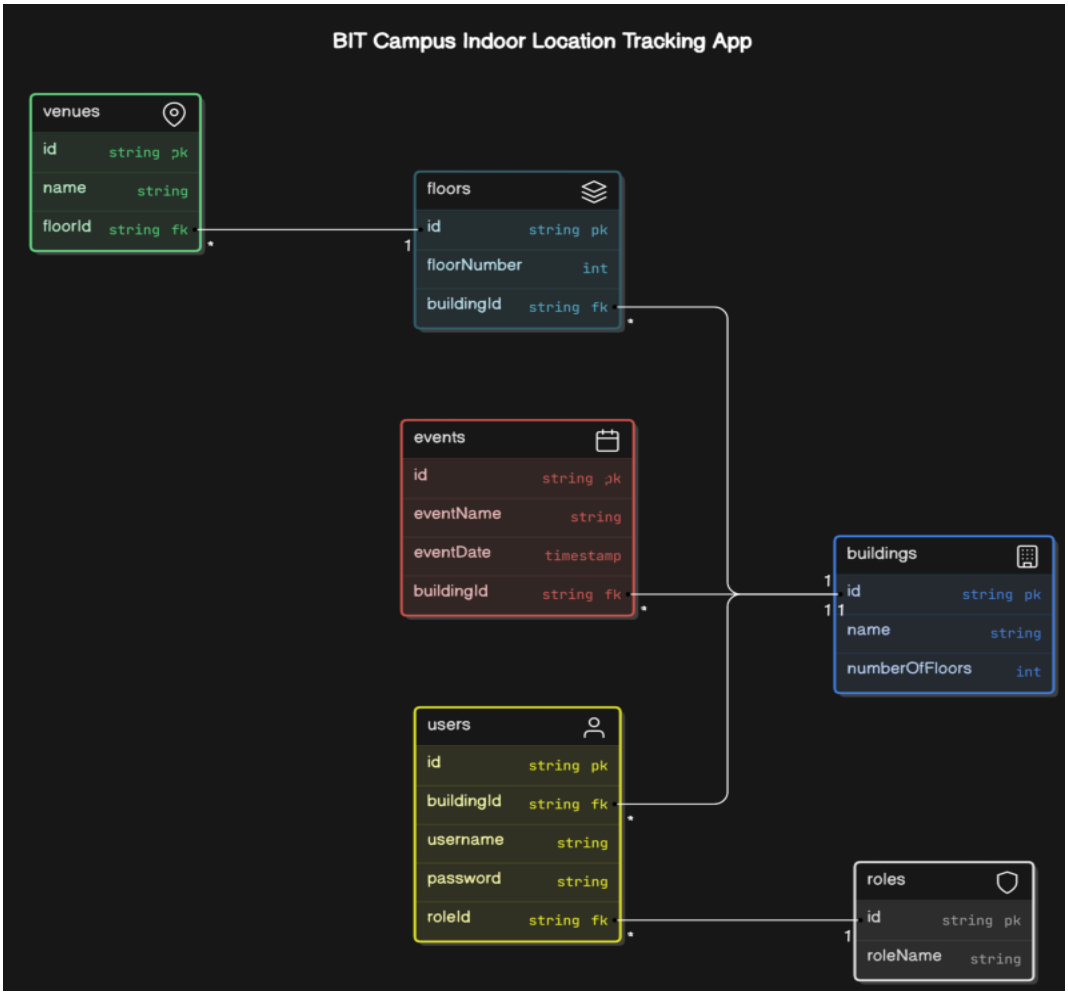
3.2. Navigation System:

- Signal Interference Handling & Multi-level Navigation: Techniques to navigate multi-level structures within campus buildings effectively.

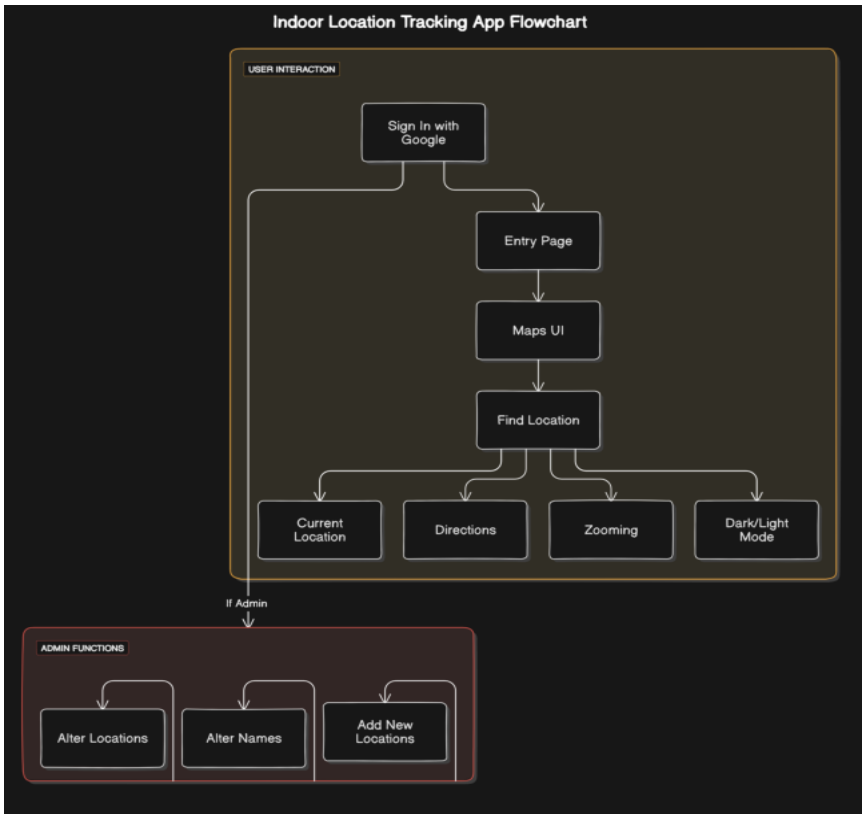
3.3. Safety Measures:

- Emergency Alerts & Construction Zone Notifications: Automated alerts to notify users about ongoing construction zones within campus buildings.

4. ER Diagram:

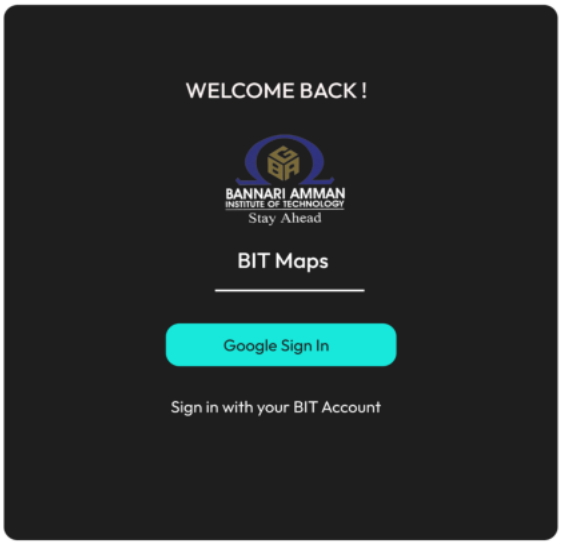


5. Flow Diagram:



6. PROTOTYPE:

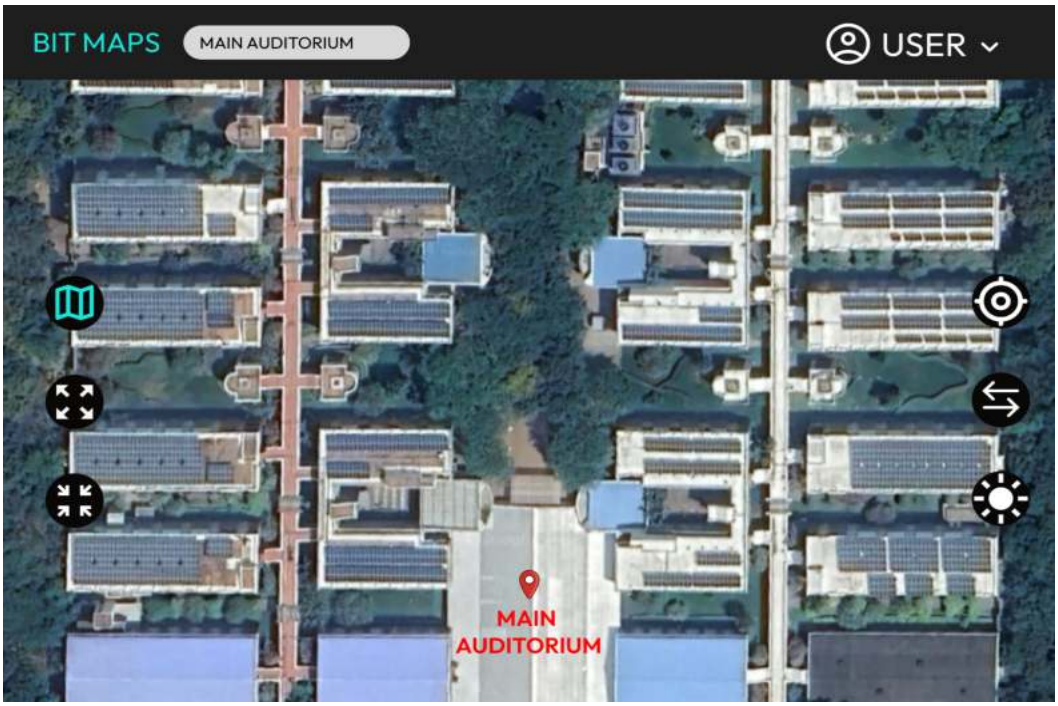
6.1. LOGIN PAGE:



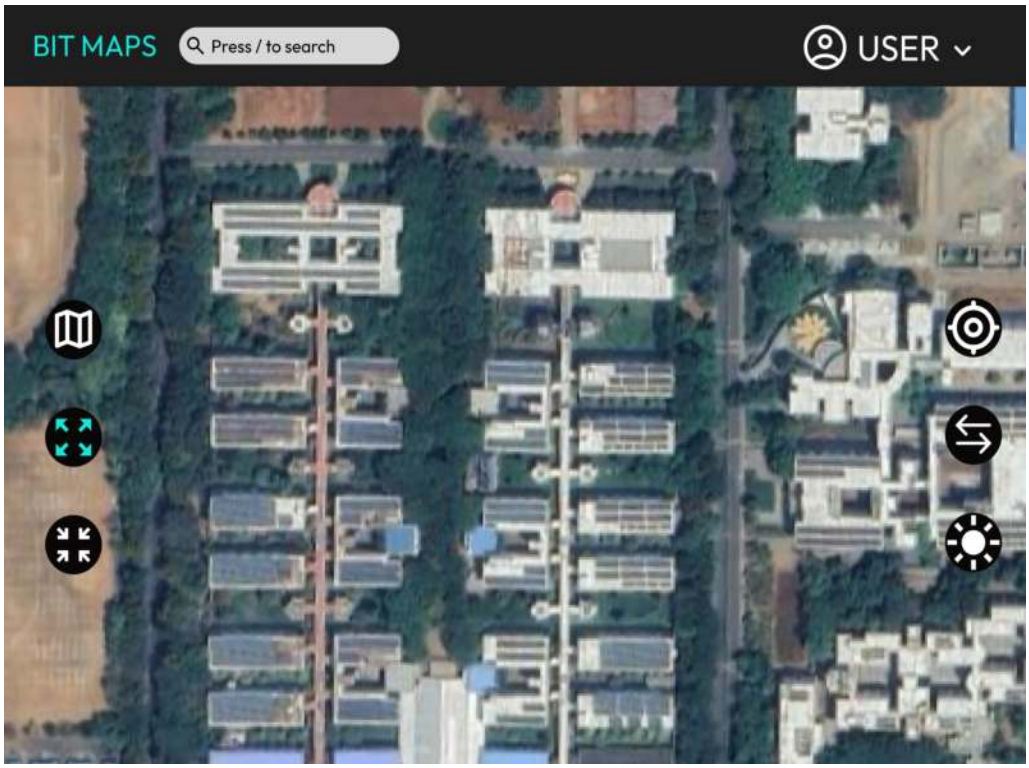
6.2. MAIN PAGE:

6.3. CURRENT LOCATION:

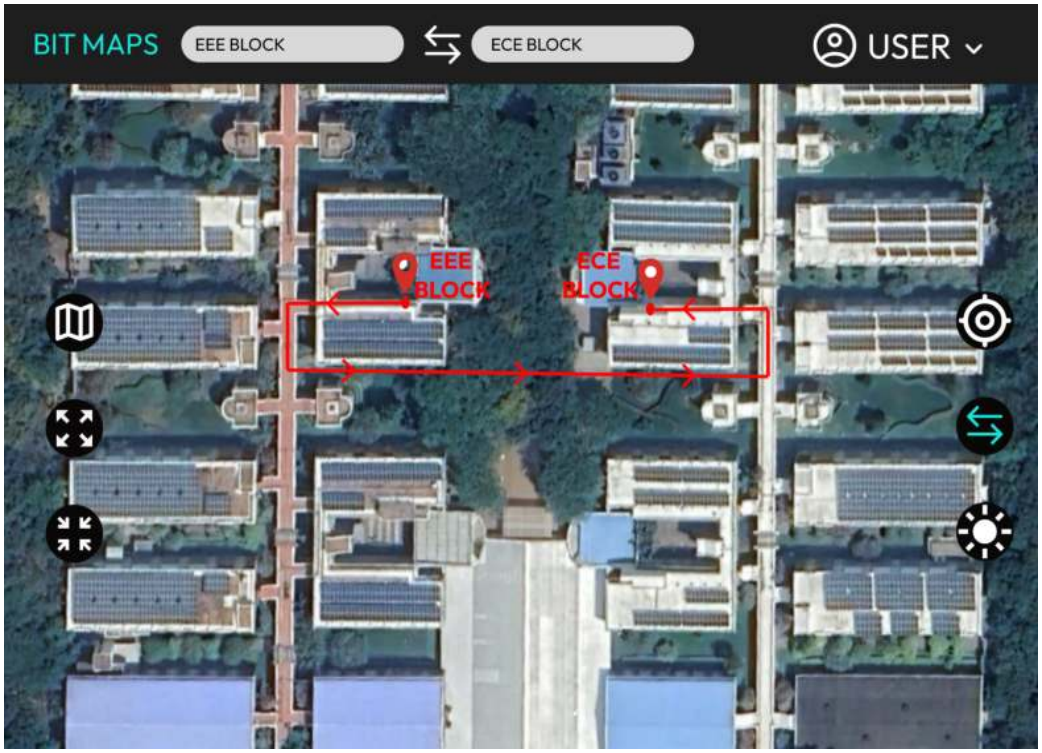
6.4. SEARCH FUNCTION:



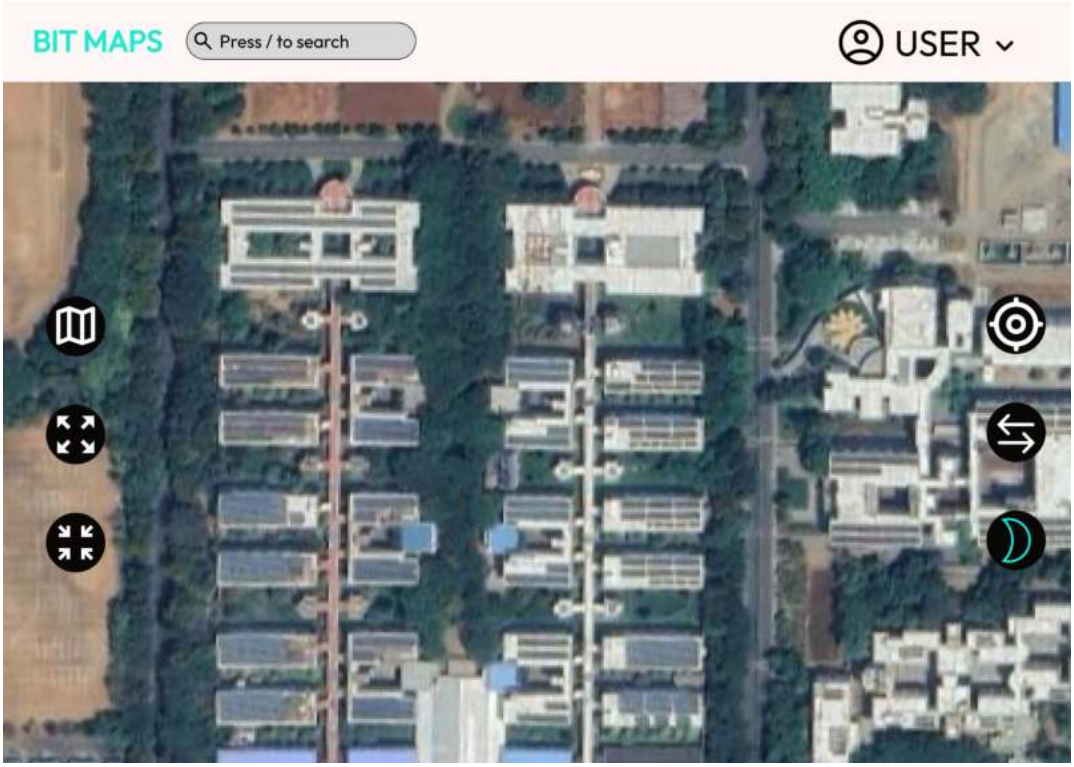
6.5. ZOOMING:



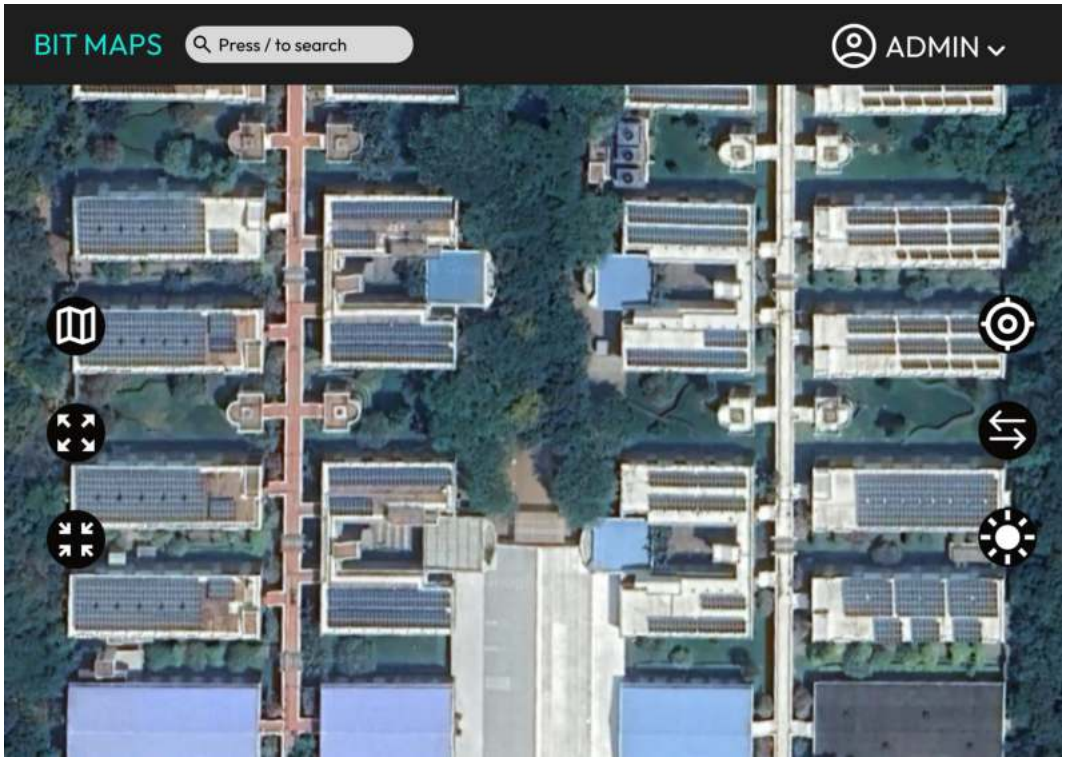
6.6. DIRECTIONS:



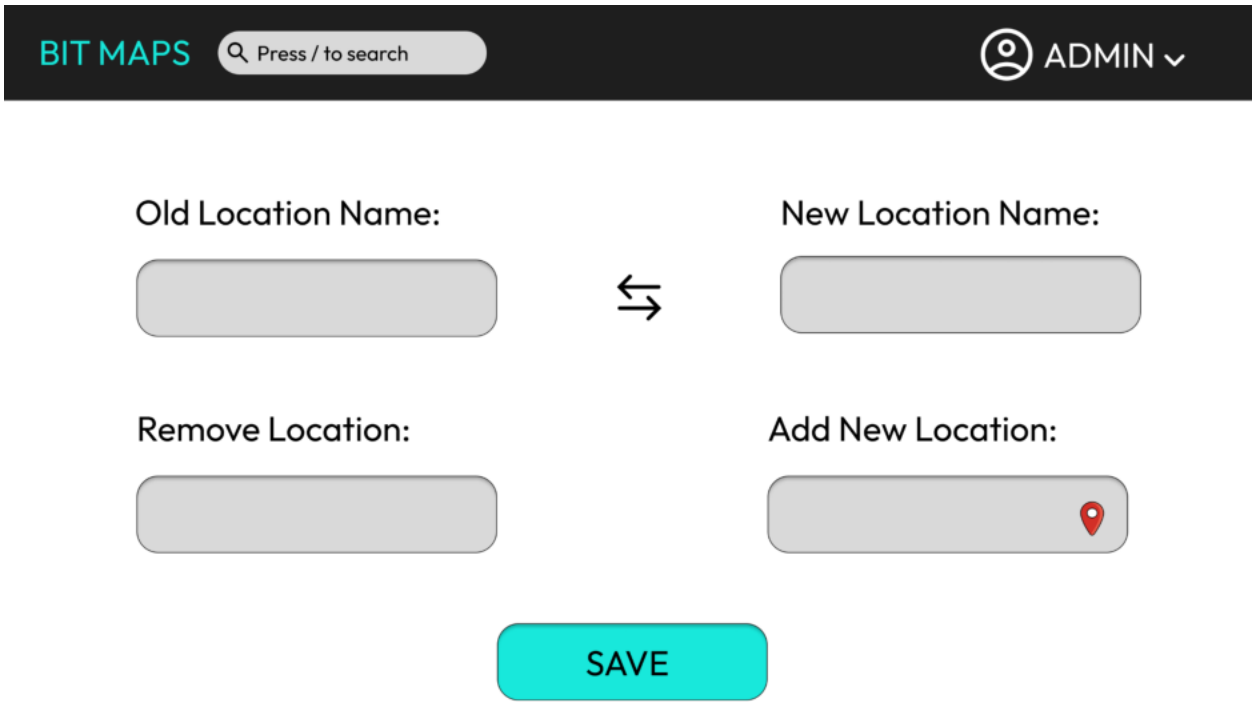
6.7. LIGHT MODE:



6.8. ADMIN PAGE:



6.9. EDIT PAGE:


BIT MAPS
Press / to search
ADMIN
Old Location Name:
New Location Name:
Remove Location:
Add New Location:
SAVE