

# Reliefchain

## Overview:

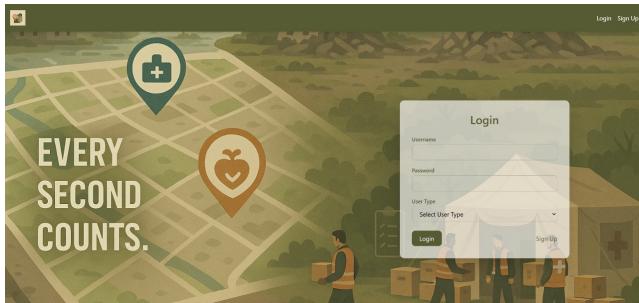
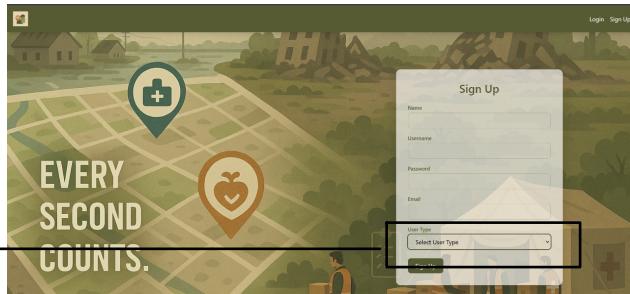
ReliefChain is a full-stack web application designed to streamline humanitarian aid logistics by intelligently allocating demands to NGOs and optimizing delivery routes. Built with the MERN stack (MongoDB, Express.js, React.js, Node.js), the platform features a real-time map interface, automated NGO assignment logic based on geospatial data, and delivery route optimization using greedy TSP algorithms.

By leveraging distance-based heuristics and real-time communication via Socket.IO, ReliefChain significantly reduces delivery delays and improves operational efficiency. The system achieves approximately 59% reduction in assignment distance and 37% improvement in delivery route efficiency compared to traditional, non-optimized methods. Designed for scalability and responsiveness, ReliefChain enables better decision-making and resource utilization in disaster response and aid distribution scenarios.

## User Interface:

### Signup and Login:

Role-based authentication



## Admin Panel:

The Admin Dashboard serves as the central control panel for managing and overseeing all aid demands within the ReliefChain platform. It provides a comprehensive view of ongoing relief operations, combining real-time data monitoring with powerful decision-making tools.

- **Demand Management:** All aid requests submitted by users are displayed in a tabular format, including essential details such as location, item type, urgency level, and current assignment status.
- **Basic Analytics Overview:** At-a-glance metrics show the number of total, fulfilled, and pending demands, distribution by region, NGO activity, and demand urgency breakdown — giving the admin clear visibility into overall system performance.
- **Manual Allocation:** Admins have the flexibility to manually assign any listed demand to a specific NGO. This is useful for handling edge cases or ensuring special demands are routed appropriately.
- **Auto-Assignment Logic:** A dedicated function enables automatic mapping of unassigned demands to the nearest available NGO using the Haversine formula. This logic ensures efficient, unbiased, and scalable allocation, reducing manual workload and improving responsiveness.
- **Real-Time Syncing:** All actions and updates on the dashboard are synchronized in real-time using Socket.IO, ensuring the admin always sees the latest data without refreshing.

This dashboard empowers the admin to coordinate relief efforts with both strategic control and automation, bridging operational gaps and ensuring timely resource delivery.

The screenshot displays the Admin Dashboard interface. At the top, there is a navigation bar with icons for Dashboard, Map, and Logout. Below the navigation bar, the main content area is titled 'Dashboard'.

**Analytics part of dashboard:** This section contains several summary statistics:

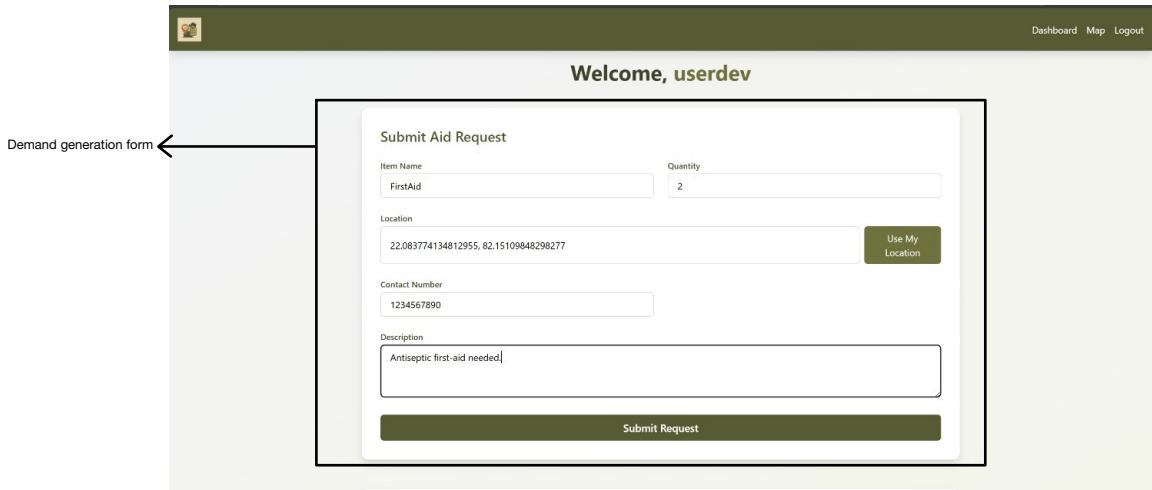
- Deliveries:**
  - 3 Total Active Deliveries
  - 3 Pending for NGO Assignment
  - 0 Request in Last 24 Hours
  - 0 Average Response Time (Hours)
- NGO Overview:**
  - 2 Total NGOs
  - 0 Number of NGOs with no active deliveries
  - 2 Active NGOs
  - 1.5 Average Aid Fulfillment per NGO

**Active delivery details:** This section shows a table of active deliveries with a button labeled 'Auto Assign NGO'.

Item	Description	Quantity	Location	Contact	User	Status	Assigned To	Actions
121	weqgvids	2	View on Map	3214	userdev	pending	ngodev1	<input type="button" value="Update"/>
stvb	yn swwrn	2	View on Map	eqtbwn	userdev	pending	ngodev2	<input type="button" value="Update"/>
ahglbb	qebtqeqnrbt	2	View on Map	fbaba	userdev	pending	ngodev1	<input type="button" value="Update"/>

**Auto-assign button:** A button labeled 'Auto Assign NGO' is located in the top right corner of the active delivery details section.

# User Dashboard:



Welcome, userdev

Demand generation form

Submit Aid Request

Item Name: FirstAid

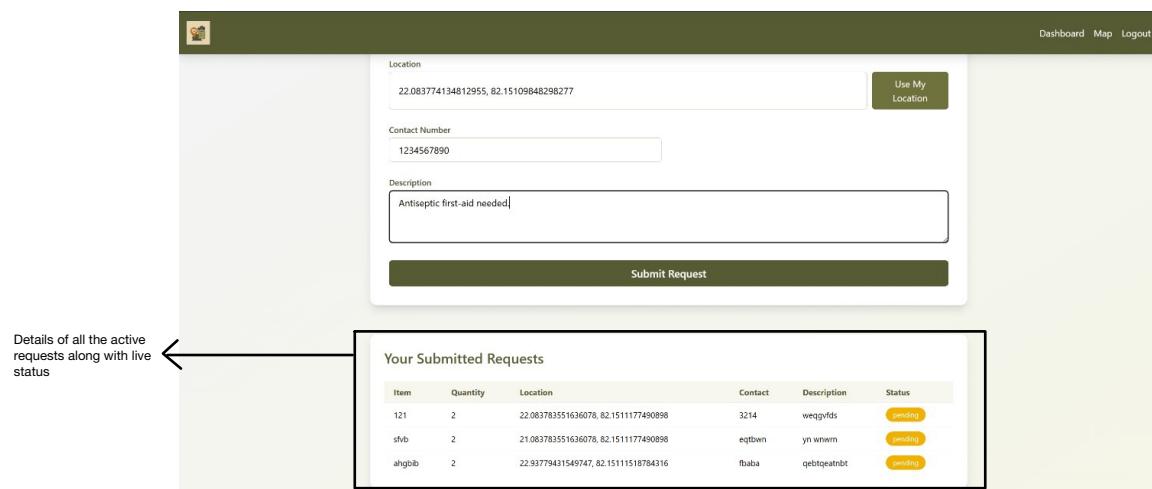
Quantity: 2

Location: 22.083774134812955, 82.15109848298277

Contact Number: 1234567890

Description: Antiseptic first-aid needed

Submit Request



Dashboard | Map | Logout

Location: 22.083774134812955, 82.15109848298277

Contact Number: 1234567890

Description: Antiseptic first-aid needed

Submit Request

Your Submitted Requests

Item	Quantity	Location	Contact	Description	Status
121	2	22.083774134812955, 82.15109848298277	3214	weqqvfd	<span>pending</span>
svb	2	21.083783551636078, 82.1511177490898	eqtbew	yn wmem	<span>pending</span>
ahgib	2	22.93779431549747, 82.15111518784316	fbaba	qebtqeqatnbt	<span>pending</span>

Details of all the active requests along with live status

## NGO Dashboard:

Dashboard Map Logout

Active status for NGO

NGO Dashboard

Active

List of all allotted deliveries

Assigned Deliveries

Item	Description	Quantity	Location	Contact	User	Status	Action
121	weqyfds	2	22.083783551636078, 82.1511177490898	3214	userdev	Pending	<input type="button" value="Update"/>
ahgbib	qbiteqnlbt	2	22.93779431549747, 82.15111518784316	fbaba	userdev	Pending	<input type="button" value="Update"/>
FirstAid	Antiseptic first aid needed.	2	22.083774134812955, 82.15109846298277	1234567890	userdev	Pending	<input type="button" value="Resolved"/>

Button to get optimal route

Optimize Route

Dashboard Map Logout

UI showing the optimal path

Optimize Route

1. Stop 1

Item: ahgbib  
Location: 22.93779431549747, 82.15111518784316  
Description: qbiteqnlbt  
Contact: fbaba

2. Stop 2

Item: 121  
Location: 22.083783551636078, 82.1511177490898  
Description: weqyfds  
Contact: 3214

3. Stop 3

Item: FirstAid  
Location: 22.083774134812955, 82.15109846298277  
Description: Antiseptic first aid needed.  
Contact: 1234567890

Total Distance: 224.12 km

## Map page:

Details and location of all the active demands

