



# FORUS

## Focused Operational Response Unified System



**PRESENTED BY:**  
THREADRIPPERS

# Agenda

- Problem Statement
- Challenges during disaster
- Proposed Solutions
- SWOT
- Competitive Analysis
- Industrial Analysis
- Business Model
- Team Overview

# Problem Statement

Craft innovative solutions for disaster relief by efficiently matching donations to needs, validating requirements, broadcasting needs effectively, ensuring timely delivery, and adapting to evolving circumstances.

## Challenges during Disasters



No/Low  
internet



Supply Vs  
Demand



Validation of  
donations



Real-time  
updates



Lack of  
centralized  
agency



Timely  
fulfillment  
of delivery



Broadcasting  
to potential  
donors

# Idea Overview and Rationale

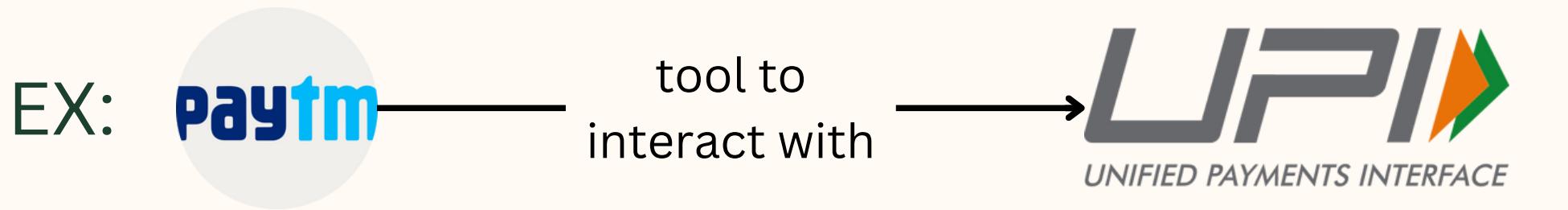
- Developing a comprehensive disaster management system to address challenges during natural calamities.
- Components: Rescuer App, Public App, Inventory Management App, Camp App module, Precautionary Disaster Response System (PDRS) and Validation System.

## **Impact:**

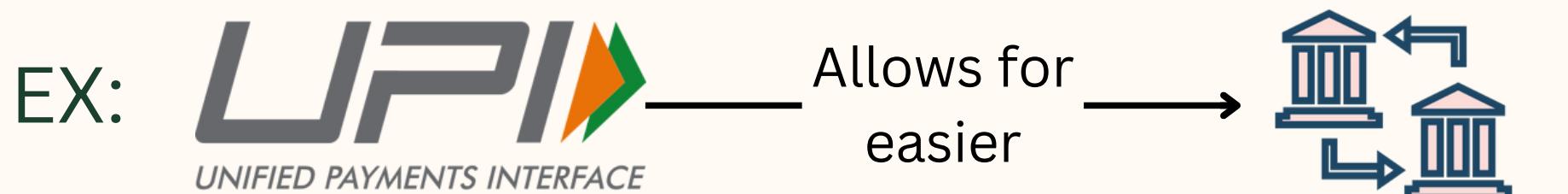
Enhance preparedness, streamline response efforts, and minimize impact on affected communities.

# Why choose this idea?

An **app** by itself is just - an app. Not the ultimate solution to a problem



**Systems** help in overcoming the **interconnected challenges** and complexities inherent in disaster management, compared to apps



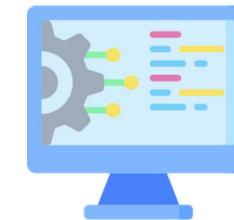
Unlike standalone applications, systems encompass a **holistic approach** to problem-solving.



# OVERALL ARCHITECTURE

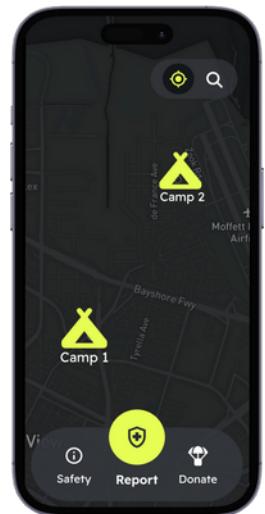
## PDRS System

PDRS system for proactive disaster identification and resource allocation.



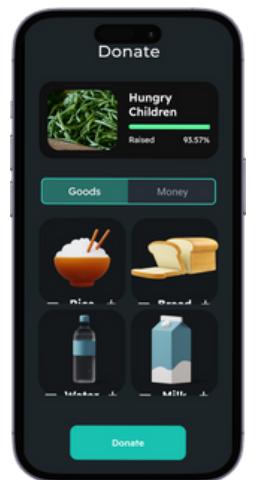
## Public App

An app with predictive features for natural disasters, alerting users alongside other functions.

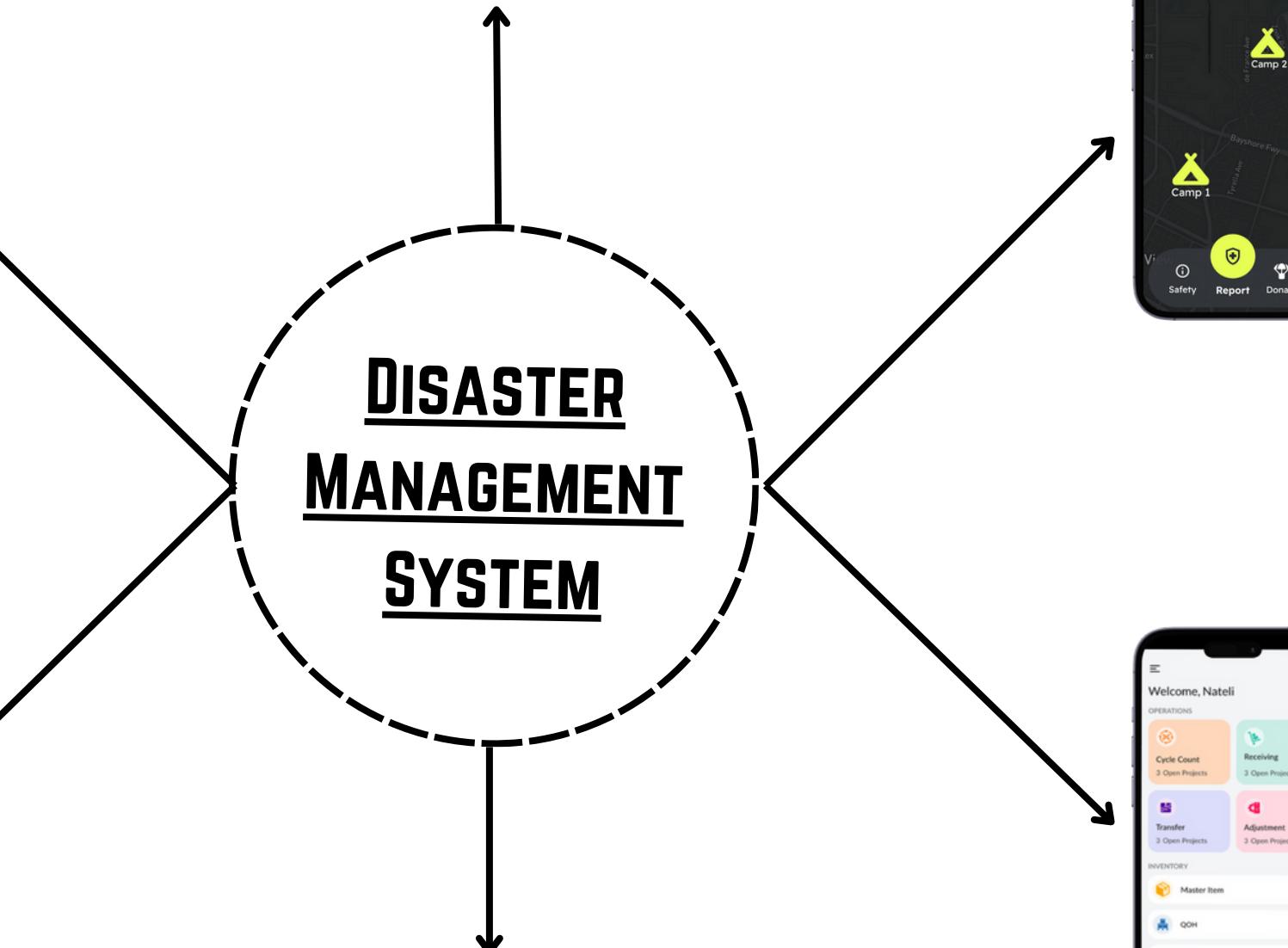


## Camp App

App for disaster relief camp communication and coordination app for inventory stakeholders.



## DISASTER MANAGEMENT SYSTEM

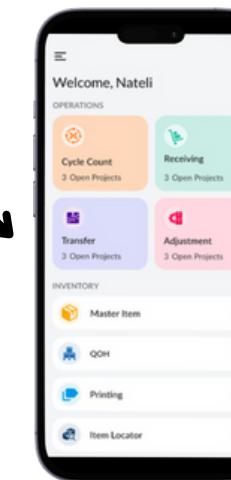
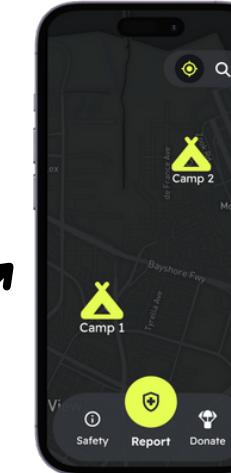


- Validation system to validate all systems within the disaster management system

## Validation System

## Rescuer App

App for streamlining communication and tracking for disaster response teams.

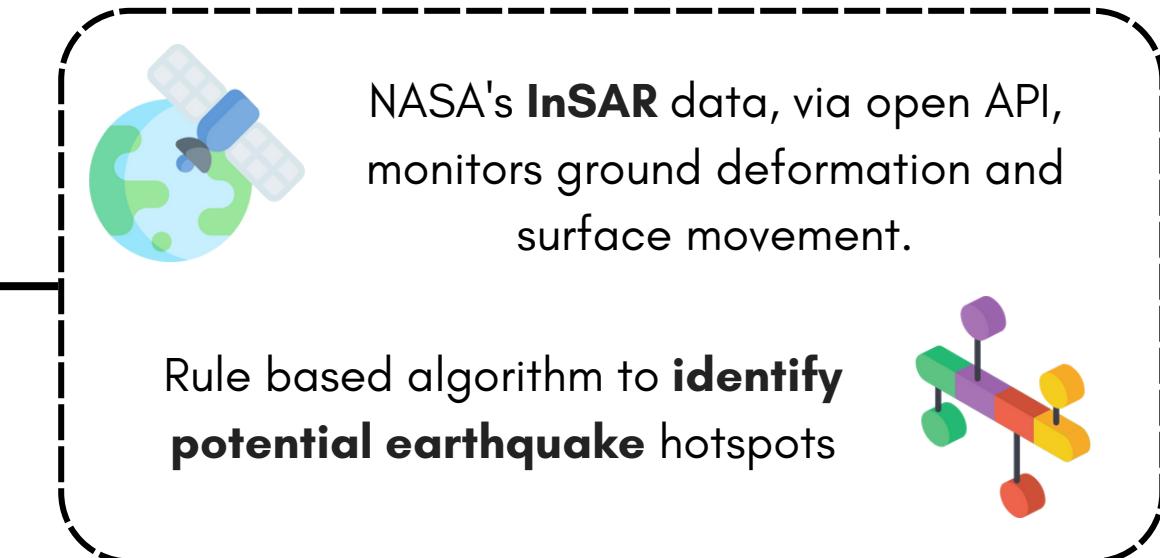
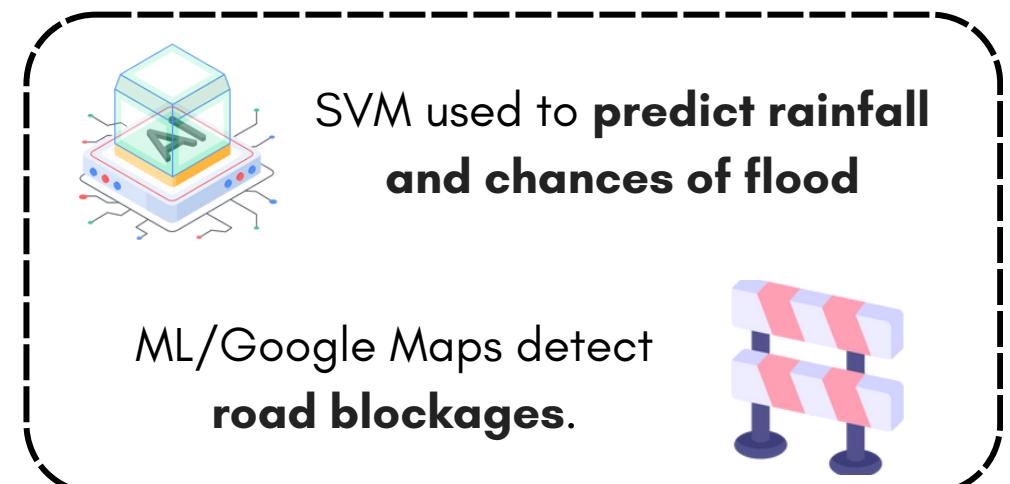
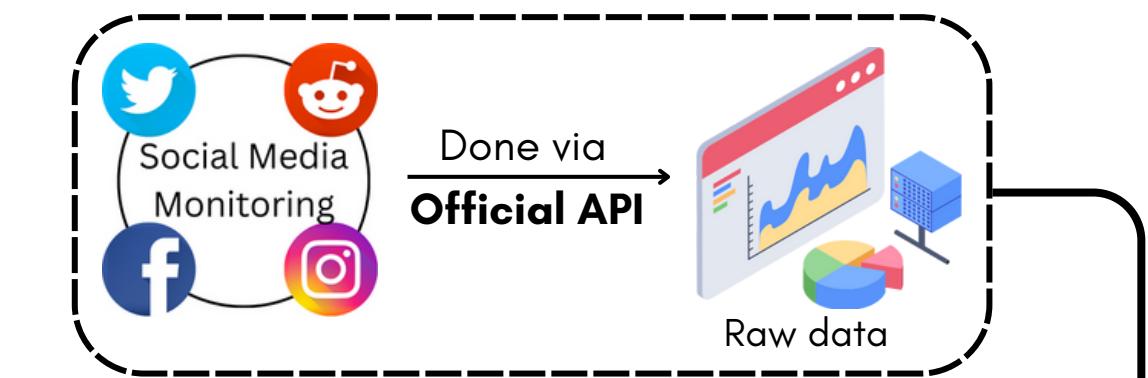


## Inventory App

App for data-driven inventory management for informed resource allocation during disasters.

**Four layer fallback  
for network connectivity**

# PDRS ARCHITECTURE

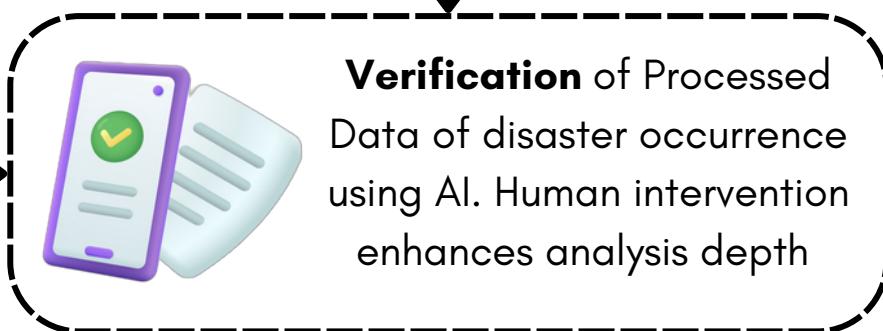


API called 144 times per day

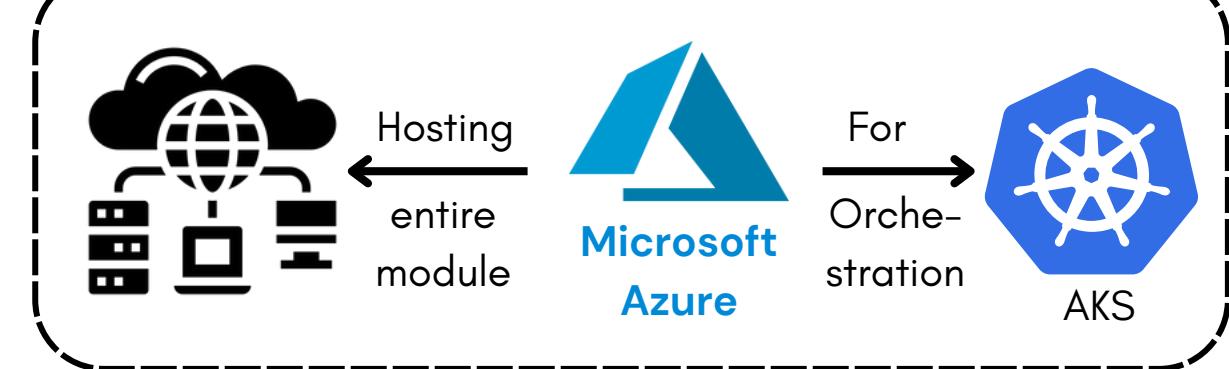
Automated to run every 10 mins

Automated to run every 2 months

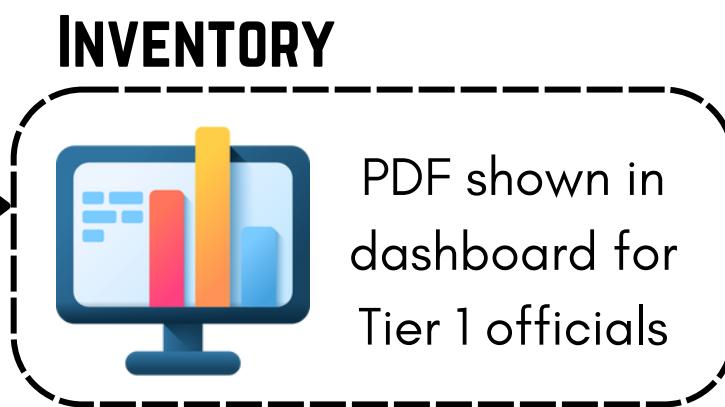
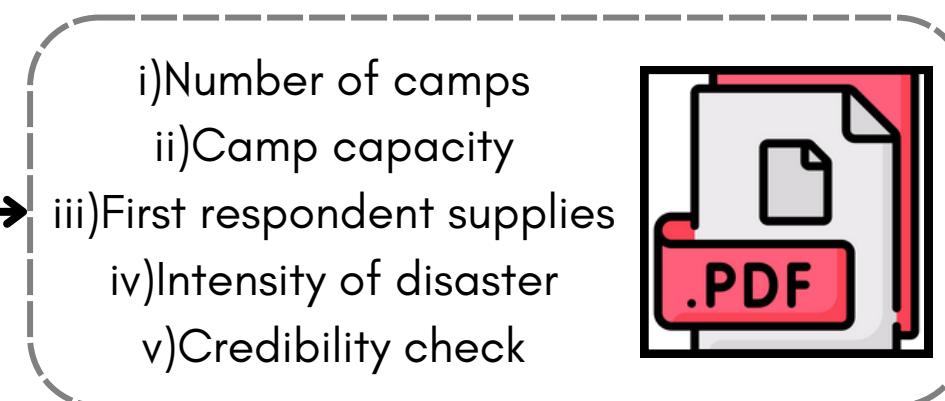
Automated to run every 24hrs



## PDRS MODULE

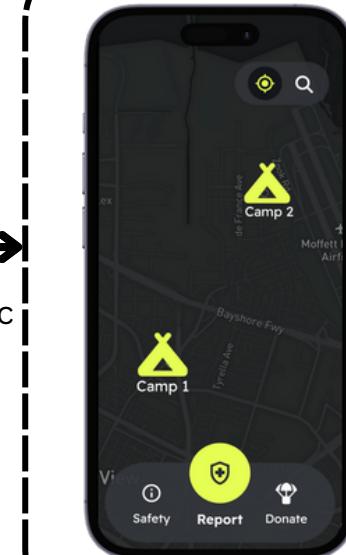
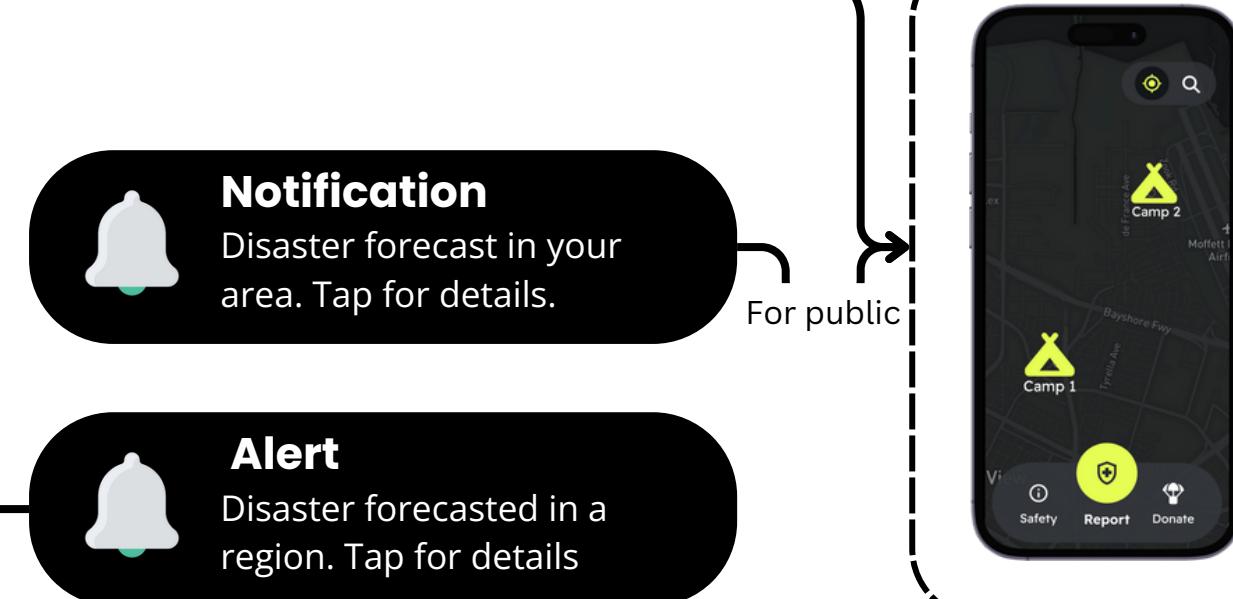


If verification turns false, then no action taken



For Govt

## PUBLIC APP



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# Disaster Relief Inventory Management System

Streamlining resource allocation

## Dashboard:

- Centralized monitoring integrates PDRS results, camp details, and supply status.
- Heat maps and visualizations optimize camp setup and goods allocation.

## Data Entry:

- Manual Entry to track warehouse supplies

## Supply Management:

- Monitors camp requests and capacities.
- Supply allocation - Demand and demographics
- Validation & encrypted communication for data transfer of approval

## Request Supplies:

- Posts supply requests to public apps and social media for enhanced visibility.

## Money Manager:

- Manages financial donations, adapting allocation based on camp needs.
- Provides a money planner tool for efficient procurement and distribution.
- Supports aid distribution based on real-time requirements.

## Stakeholders:

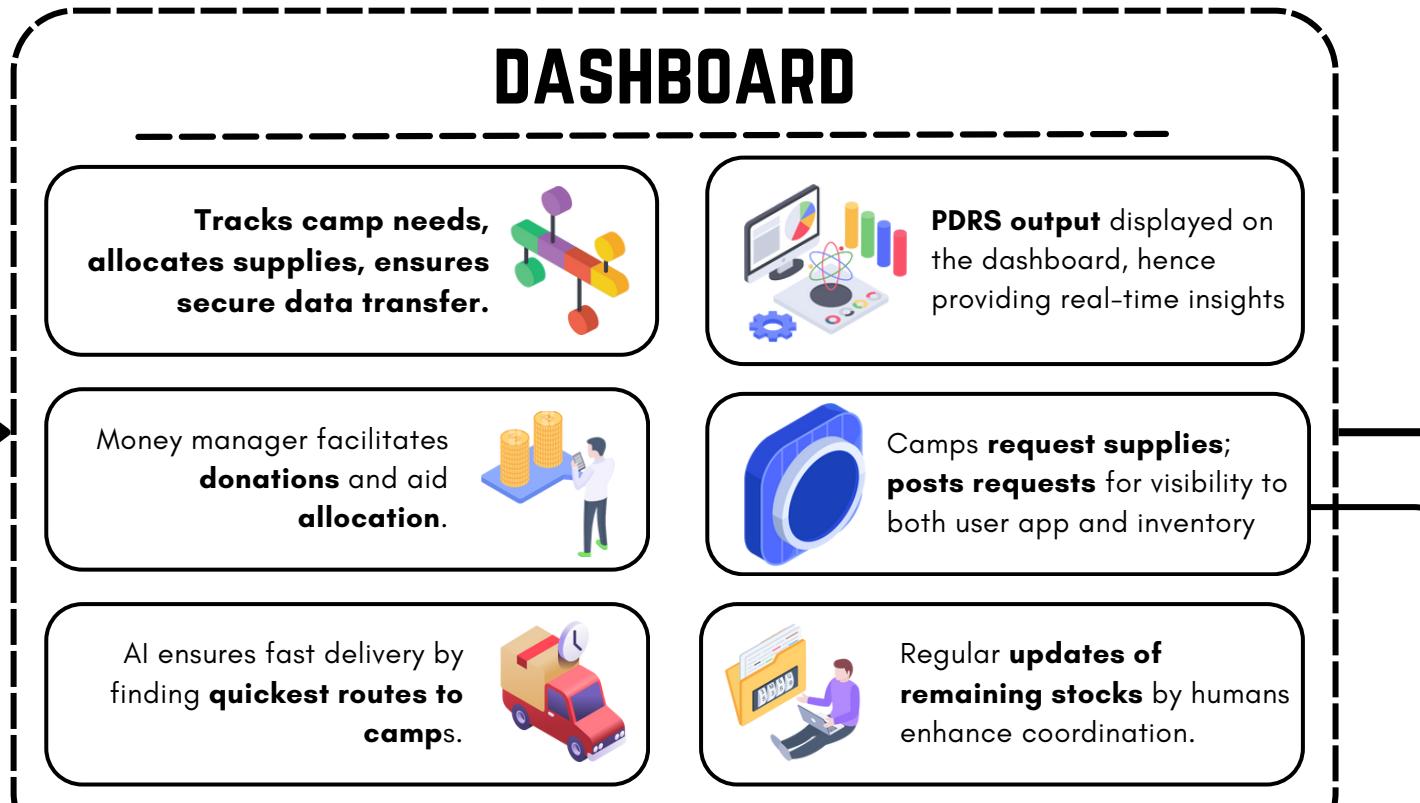
- Inventory Managers: Manage and allocate resources.
- Government and NGOs: Coordinate disaster response efforts.
- Tier 1 Operators: Assist in resource distribution.

## INVENTORY MANAGEMENT APP ARCHITECTURE

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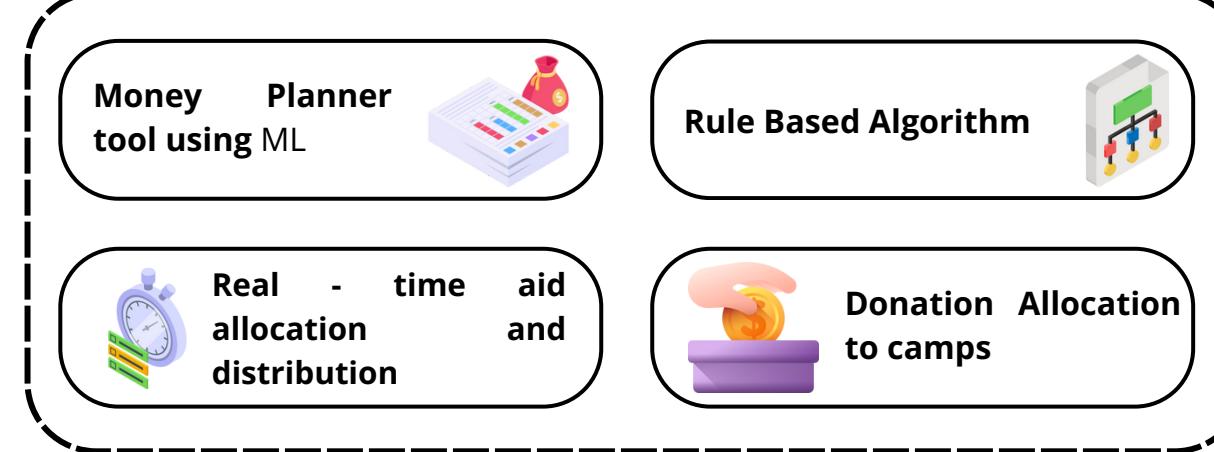


Inventory automated

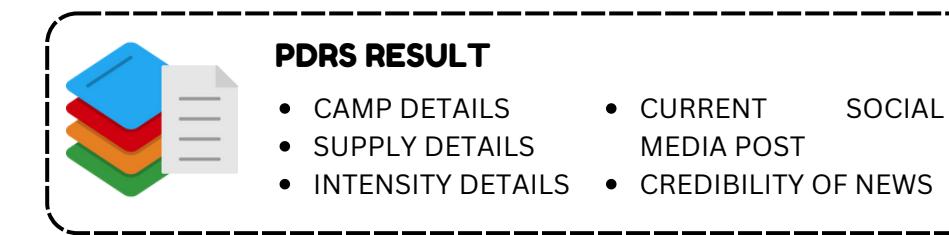
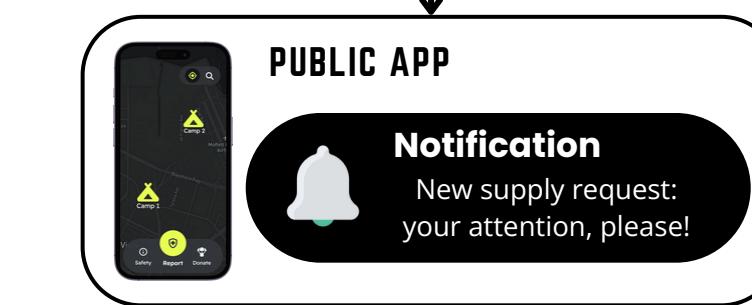


Feature to increase productivity

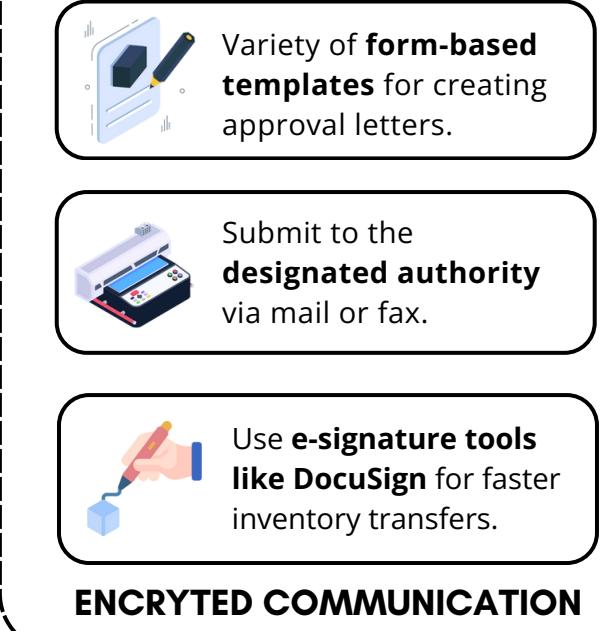
### MONEY PLANNER



Notification sent to Public app



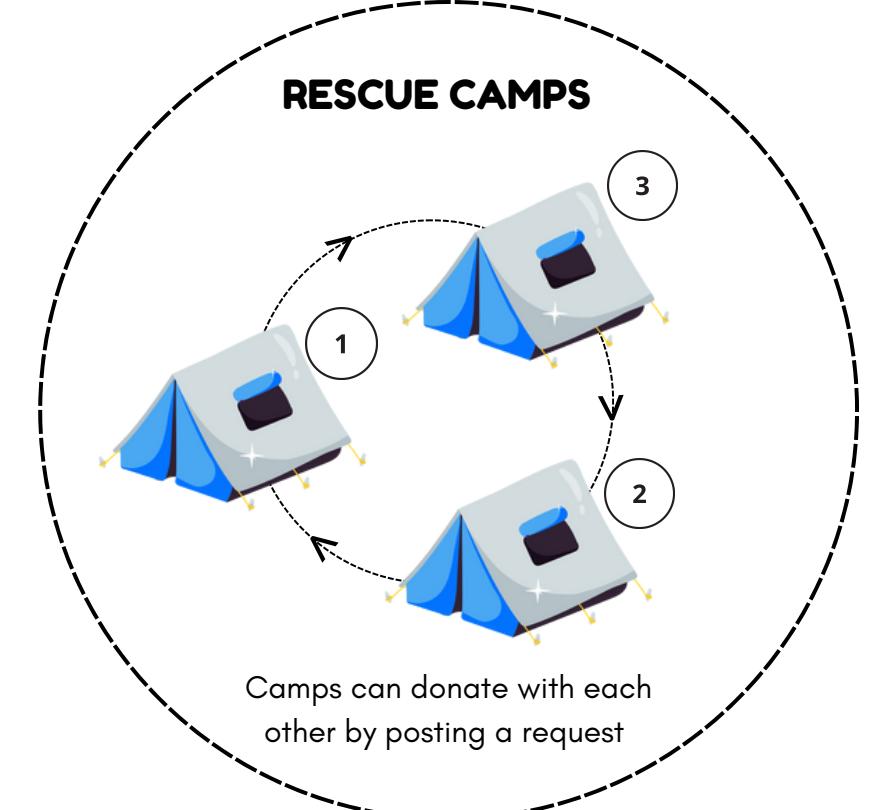
### BUREACRATIC APPROVAL



Inventory sending supplies to camps

### SECURITY

Bluetooth utilizes AES symmetric-key encryption for data and API communication.



The Inventory Management System streamlines disaster response efforts by optimizing resource utilization and ensuring transparency in supply chain operations.

# Introduction to Camp Management System:

Optimizing disaster response through camp management.

## Dashboard :

- Provides an overview of camp capacity, needs, and critical updates.

## Data Entry :

- Supervisors input real-time data on camp conditions, including population, health status, and resource requirements.

## Supply Management :

- Manages inventory supplies within camps, including food, water, medical supplies, and shelter materials

## Send Supplies:

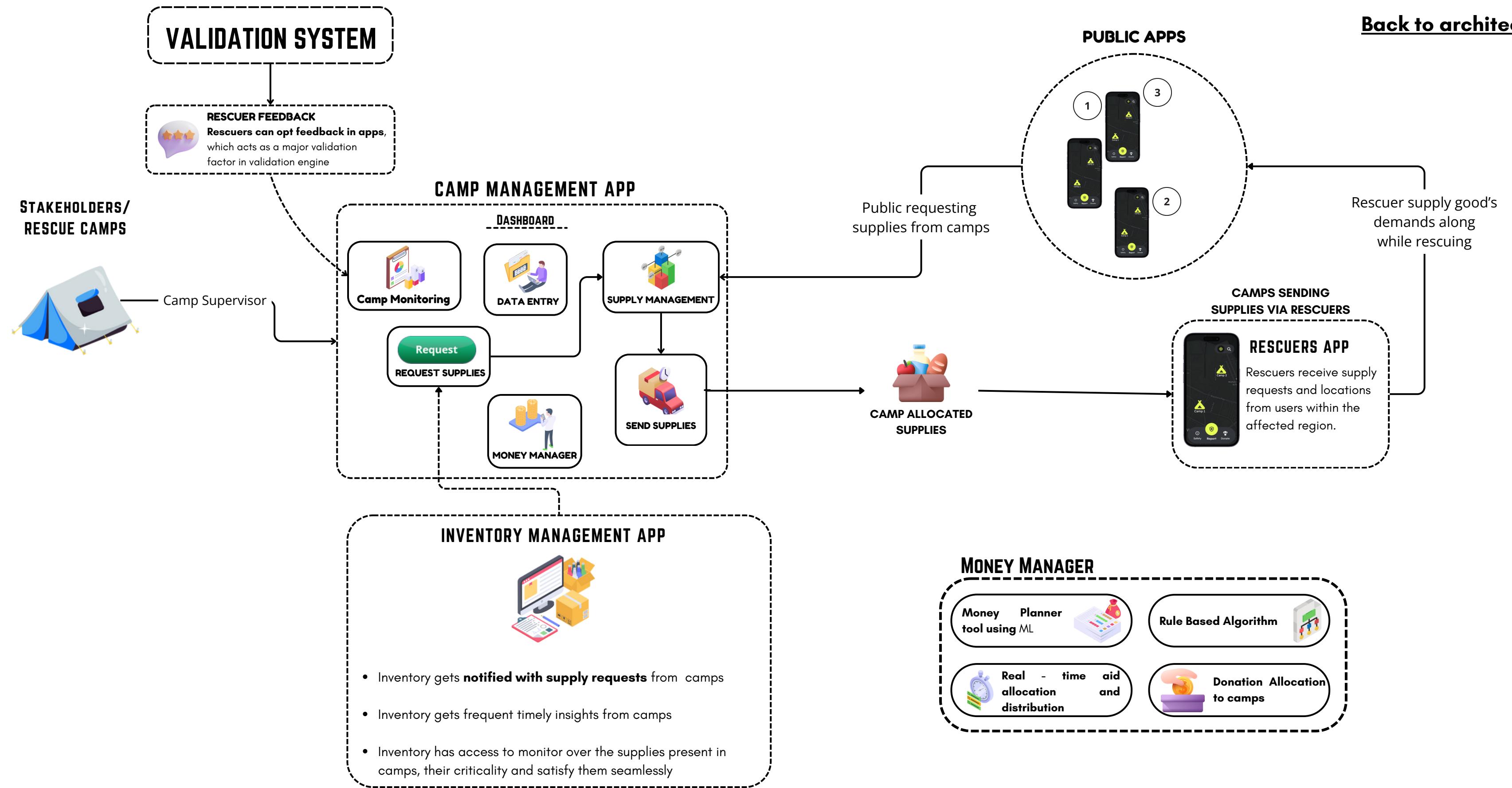
Facilitates equitable supply distribution within and between camps.

## Alert & Notification:

Receives urgent alerts via People App for validation and response.

## Validation Engine:

Validates user requests, prioritizes responses based on urgency.



Camp Management Systems streamline rescue camp operations, facilitating communication, resource allocation, and coordinated crisis response.

# Solution System Architecture

**Cloud-Based Approach:** For scalability, reliability, and accessibility.

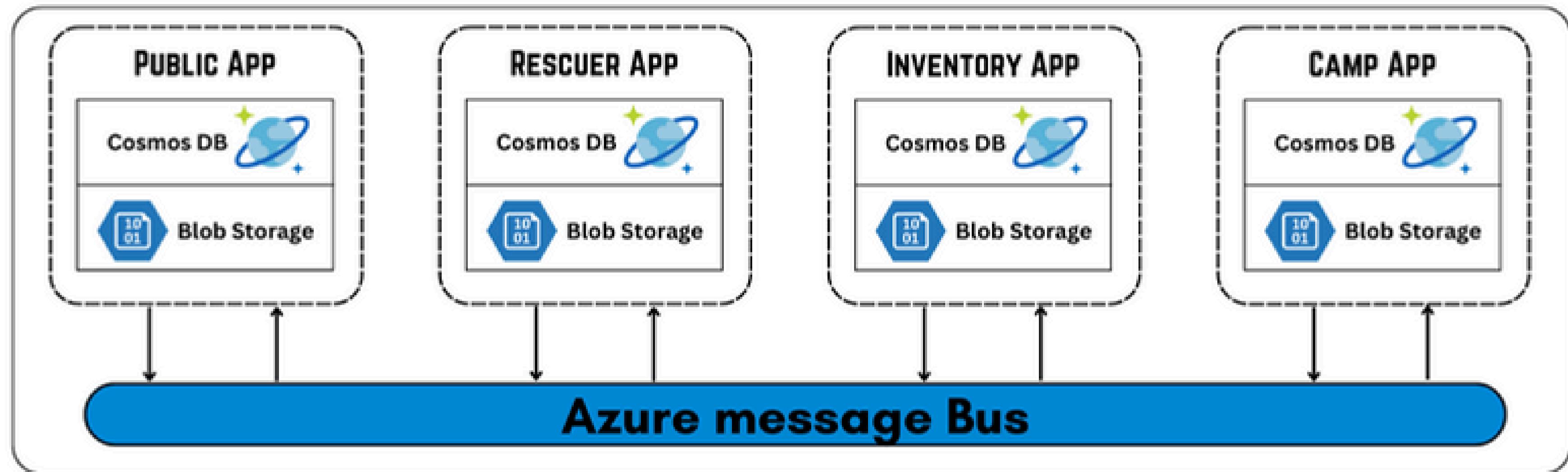
**Modular Monolithic Approach:** Microservices and monolithic architecture combined for fall - back protocols.

**Data Management:** Cosmos DB and Blob for streamlined DB and local DB respectively

**Analysis and Insights:** Google analytics connected via data lakes for identifying patterns.

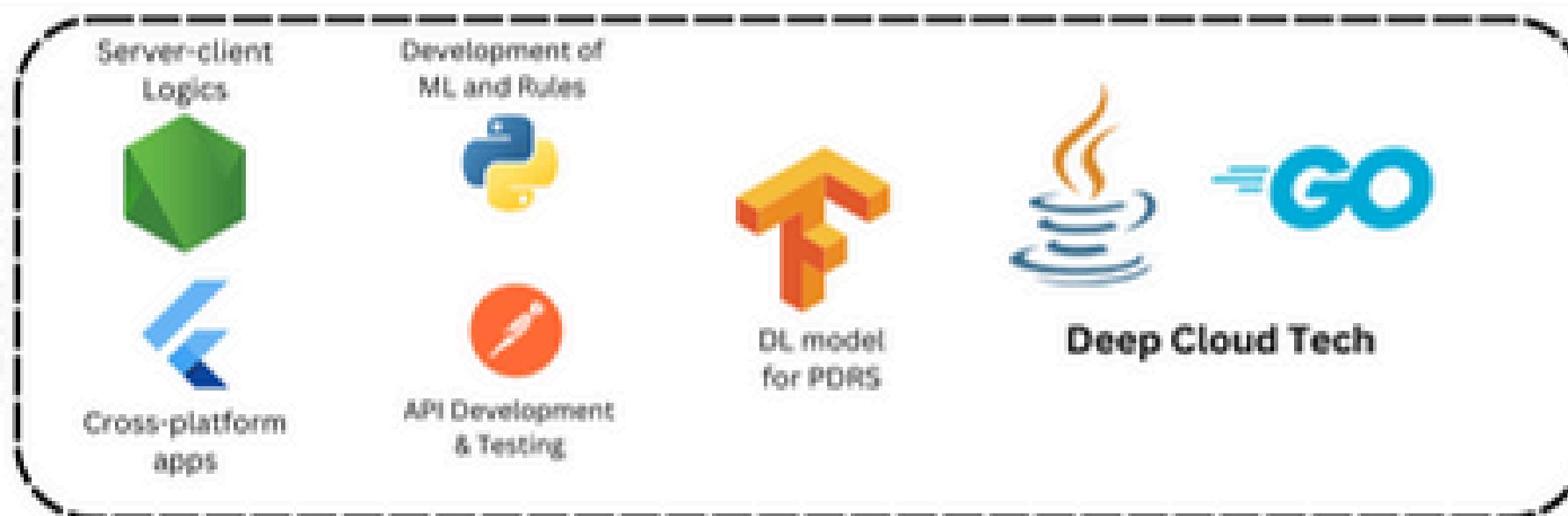
- **Communication and Integration:** Azure App Service combined with Flask for API Development
- **User Experience (UX):** Responsive and intuitive interface developed using Flutter
- **Scalability and Reliability:** Cloud scalability and reliability for fluctuating loads.
- **Security and Compliance:** Implement robust security, adhere to compliance for data privacy.

## MODULAR MONOLITHIC ARCHITECTURE



Connected via →

## TECH STACK



# Validation Engine Overview

The Validation Engine is our system's backbone, ensuring process and data accuracy.

## Data Sources

- Utilizes demographic data, historic disaster records, and population statistics to assess the risk and severity of disaster-prone regions.

## Feedback Integration

- Integrates feedback from inventory and camp management systems to validate resource allocation decisions.

## User Feedback Analysis

- Incorporates feedback from rescuers and users to validate current conditions and assess ongoing needs.

## Algorithm Framework

- Utilizes APIs, AI, and rule-based algorithms to process and analyze data efficiently

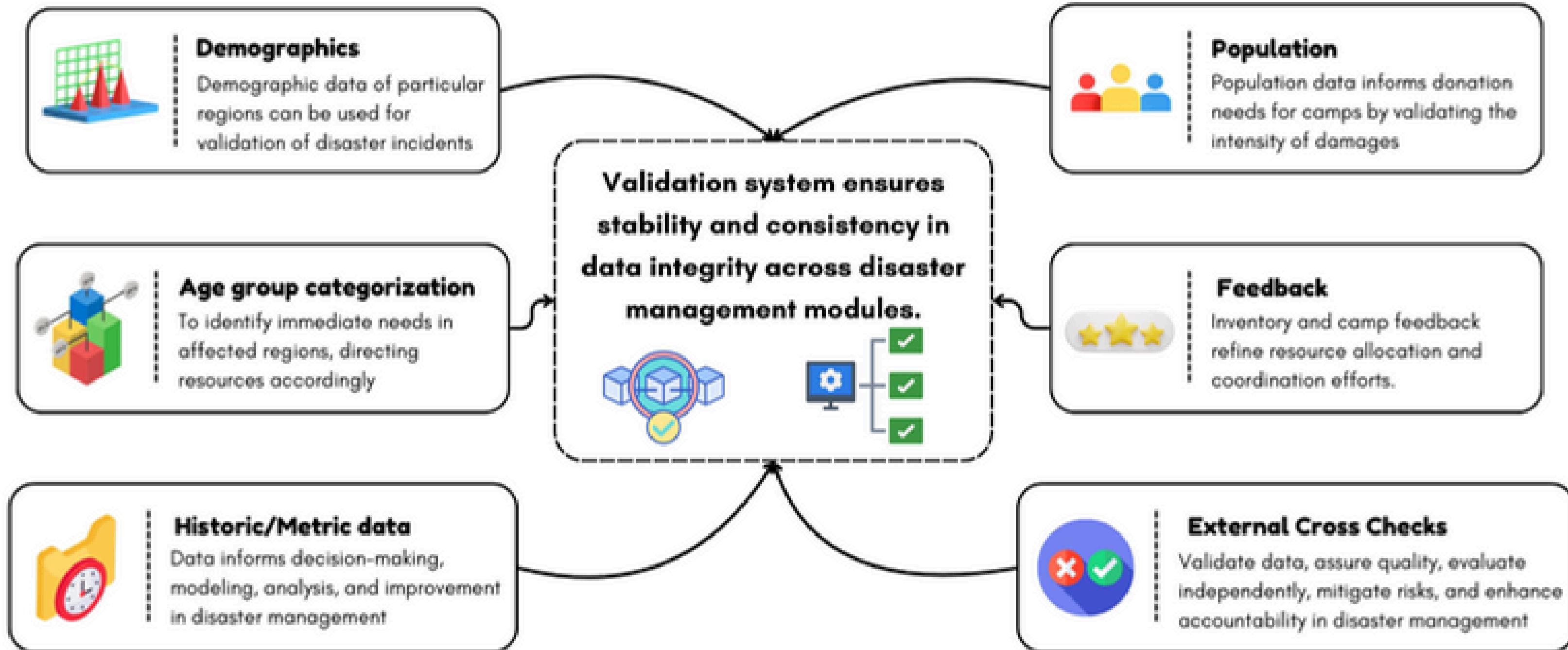
## External Cross-Checking

- Conducts external validation through social media platforms and other sources to verify reported data.

## Collaborative Approach

- Collaborates with other system components to validate requests, allocations, and feedback effectively.

## VALIDATION SYSTEM



**The Validation Engine is vital in our system, ensuring reliable information and decision making, hence optimizing resource allocation during disaster response.**

# Rescuer App Overview:

The Rescuer App aids field workers in disaster response operation

## Rescue Allocation System:

Allocates tasks based on real-time updates, optimizing resource utilization.

## Alerts & Notifications:

Receives urgent alerts, notifies immediate needs for timely assistance.

## Safety Monitoring:

Tracks workers' locations, enabling quick response to emergencies.

## Camp Monitoring:

Monitors activities, provides insights for resource allocation in camps.

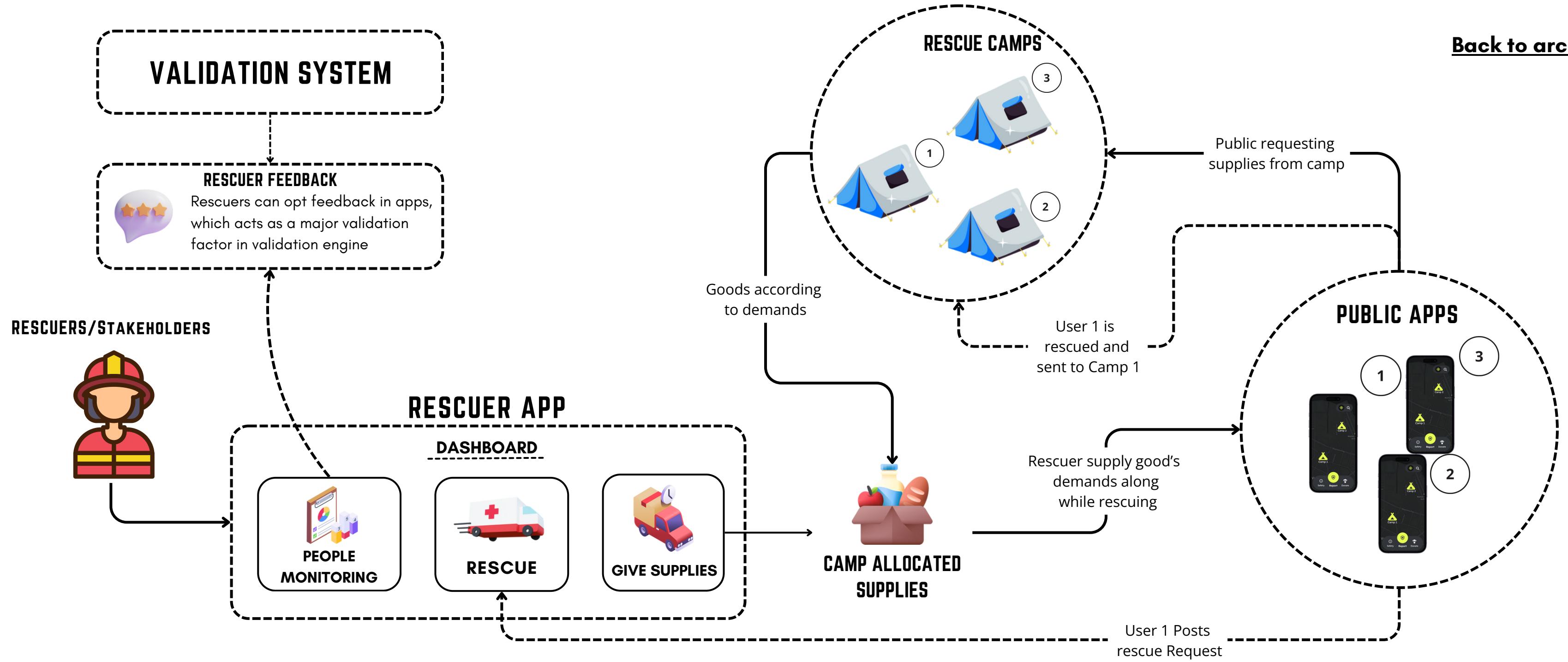
## Feedback Mechanism:

Allows feedback on operations, enhances data accuracy for decision-making.

## Integration with Validation Engine:

Validates donation needs, optimizes resource distribution based on feedback.

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## SAFETY MONITORING



Safety Monitoring feature keeps track of all rescuers and alerts when the system senses irresponsiveness are any dangers by using the validation engine to check if the rescuer was attacking in intense areas

The Rescuer App coordinates rescue efforts, ensures field workers' safety, and optimizes resource allocation during disaster response.

# Public App

The Public App, also known as the People's App, facilitates disaster relief efforts with key features

## **Donate Option:**

Allows secure monetary donations.

## **Request Option:**

Enables requests for essential goods or assistance.

## **Information & Updates:**

Provides frequent disaster updates.  
Pro version offers real-time updates.

## **Feedback Mechanism:**

Collects user feedback for decision-making.

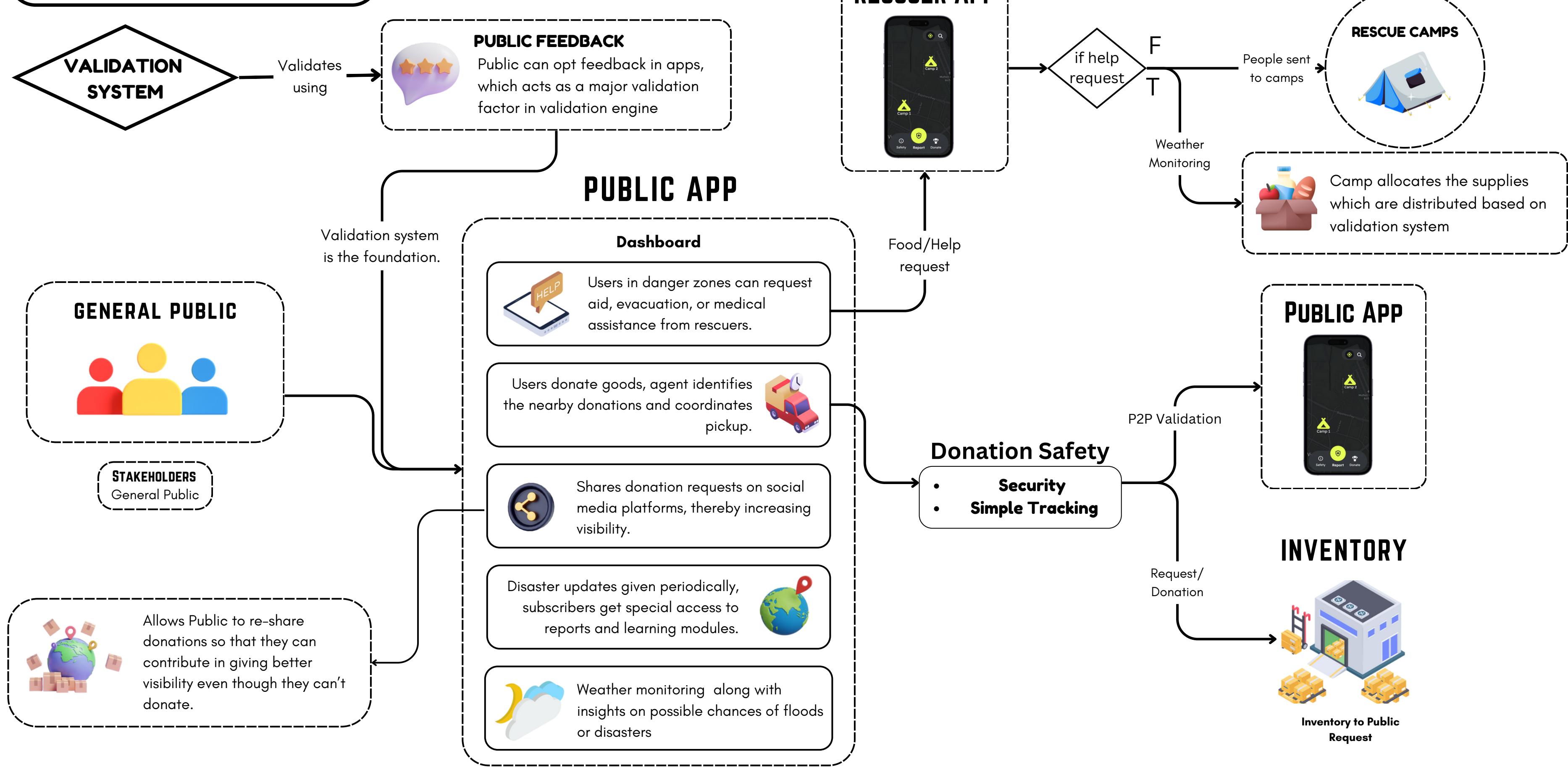
## **Re-share Option:**

Shares donation requests on social media.

## **Volunteer Option:**

Posts volunteer requirements for relief operations

# PUBLIC APP ARCHITECTURE



# Four-Level Fallback Layer Approach

## Internet Availability

- Utilize online services and communication protocols.

## SMS Communication

- Switch to SMS communication in the absence of Internet but with cellular network coverage.

## Bluetooth-Hopping Ad-Hoc Network

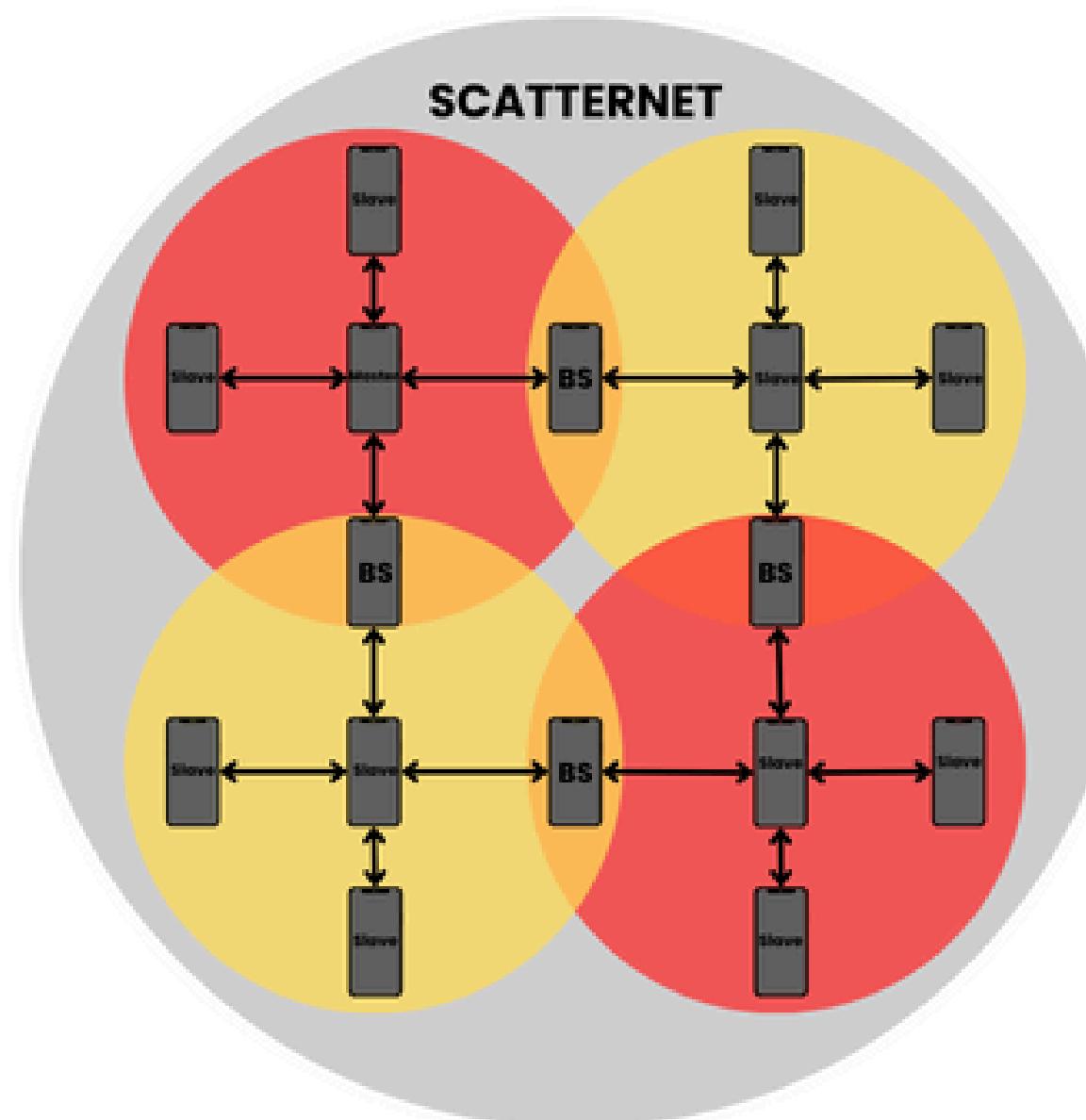
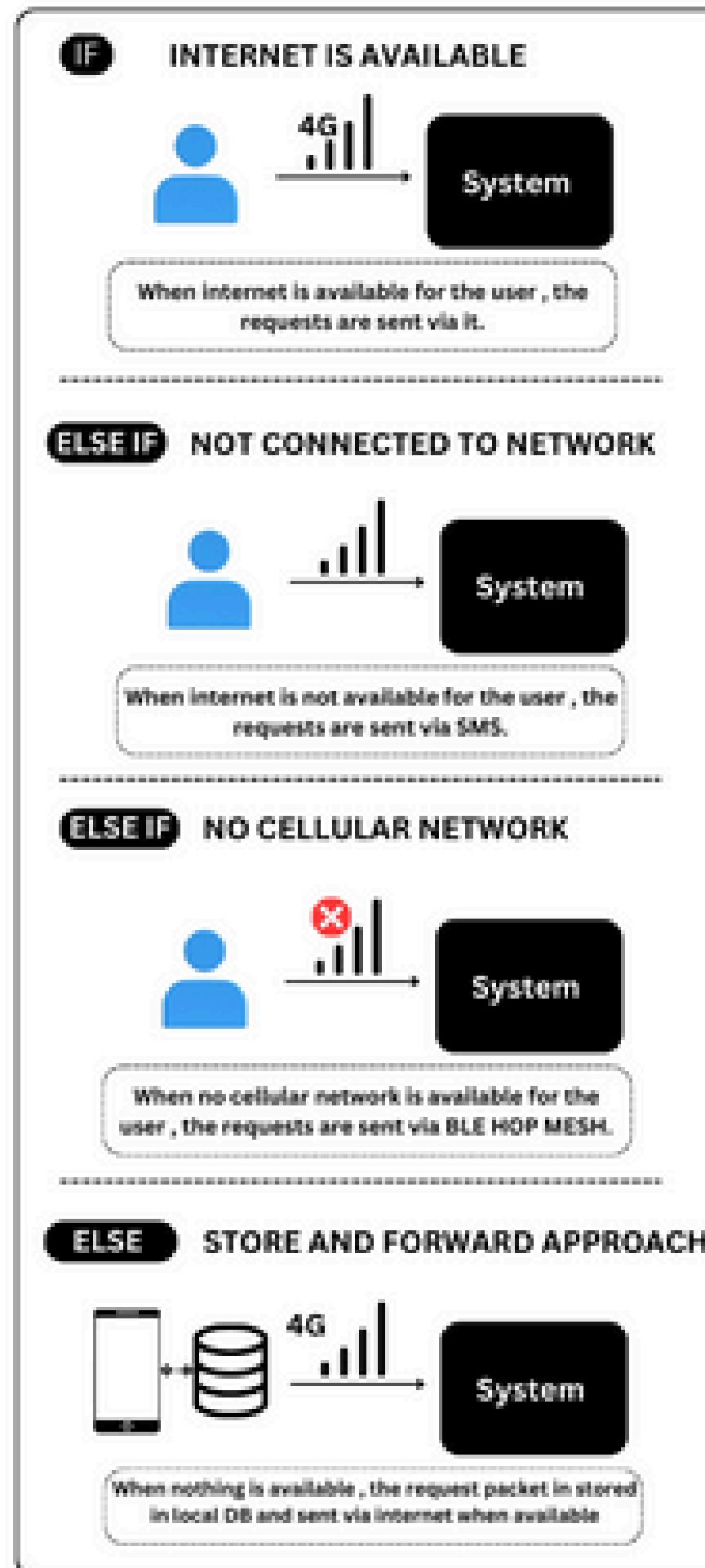
- Create a decentralized ad-hoc network using Bluetooth Scatternet technology.

## Satellite Antenna Attachment

- Attach satellite antennas to enhance Bluetooth-hopping capabilities.

## Additional Points

- CAMs utilize radio antennas for walkie-talkie communication and store-and-forward approach using local databases.
- CAMs ensure continuous connectivity via Azure cloud hosting and message bus.



**Each level represents a progressive fallback mechanism to ensure connectivity and data transfer under low or no Internet scenarios.**

# SWOT

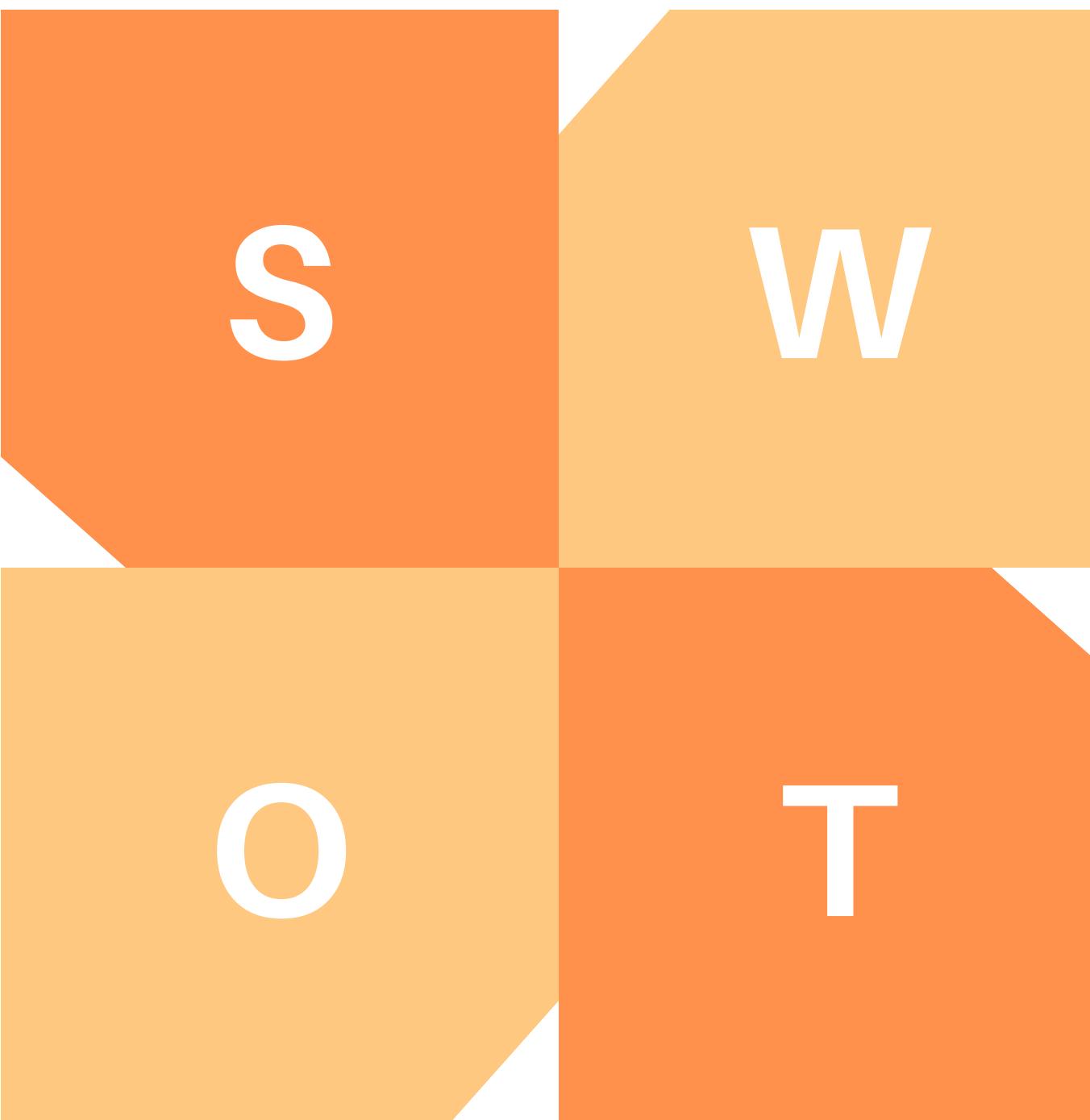
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## STRENGTHS

- Low/No internet optimized
- Advanced system connecting multiple tiers
- Covers various aspects of disaster management

## OPPORTUNITIES

- Scalability for adopting both man-made and natural disasters
- Partnership and collaboration with GOVT and NGOS



## WEAKNESSES

- Language and cultural barriers
- User adoption and training
- Data security concerns

## THREATS

- Resources constraint like manpower and infrastructure
- Socio and political concerns on lack of trust of authorities
- Legal and Data Compliance

# Competitor Analysis

**Esri, Palantir Technologies, Everbridge, OpenGov, CrisisTrack** offer software solutions and platforms for disaster response.

**Team Rubicon, UPS, FedEx** work at the ground level

- No single perfect system available
- Combination can help people in need during disaster



Yearly Profit : \$86000000



Yearly Profit : \$3,972,000

## **Open-source options**

**Ushahidi** - An open-source platform for crisis mapping and information sharing during emergencies using user generated data whose annual profit is \$52.2 mil

## **Closed-source options**

**Blackline Safety** - Their software helps organizations identify potential hazards, assess risks, develop emergency plans, and train employees on how to respond effectively in case of a disaster mainly for unpredictable disasters like gas leak, fire accidents etc whose annual profit is \$72 mil

**AlertMedia** - Focuses on mass notification systems.

# Industry Analysis

## Market Size:

NGOs, Government and others do not have access to an overall system to predict, identify and

## Growth Potential:

Projected to grow at 10% CAGR over five years, driven by increasing disasters.

Market size to increase annually by 15%.

## Regulatory Environment:

Over 100 global regulatory frameworks cover emergency protocols, data security, and procurement. Compliance crucial for market entry, costing \$500,000 per organization globally

## Technological Advancements:

AI, IoT, and cloud computing innovations are pivotal, with blockchain and virtual reality driving progress.

## Key Players:

This market thrives on collaboration between established players, innovative startups, research institutions, and government agencies

## Consumer Behavior:

Trust, ease of use, and accessibility heavily influence consumer behavior. Social media and mobile apps significantly impact decision-making for 80% of users.

# BUSINESS MODEL CANVAS

<p><b>Key Partners</b></p>  <ul style="list-style-type: none"> <li>• NGO - Support in both infrastructure and services</li> <li>• Government - Infrastructure and coordination for response</li> <li>• Public-Volunteer help and services</li> </ul>	<p><b>Key Activities</b></p>  <ul style="list-style-type: none"> <li>• Precautionary Disaster Response System</li> <li>• Verification and prioritization</li> <li>• Automated AI and ML processes</li> <li>• Volunteer management</li> <li>• Partner with NGOs and government agencies</li> </ul> <p><b>Key Resources</b></p>  <ul style="list-style-type: none"> <li>• Technology Infrastructure</li> <li>• Collaboration Tools</li> <li>• Emergency Response Expertise</li> <li>• Delivery vehicles</li> <li>• Temporary network equipment</li> <li>• SAP S/4 HANA</li> </ul>	<p><b>Value Propositions</b></p>  <ul style="list-style-type: none"> <li>• Real-time Disaster Alerts</li> <li>• Comprehensive Emergency Resources</li> <li>• Personalized Safety Plans</li> <li>• Community Support and Collaboration Tools</li> <li>• Enhanced situational awareness</li> </ul>	<p><b>Customer Relationship</b></p>  <ul style="list-style-type: none"> <li>• Responsive Customer Support</li> <li>• Feedback Gathering</li> <li>• Effective Tracking system</li> <li>• Customer satisfaction rate calculated through the feedback given</li> </ul> <p><b>Channel</b></p>  <ul style="list-style-type: none"> <li>• User app</li> <li>• Rescuer app</li> <li>• Resource Camp app</li> <li>• Social media</li> </ul>	<p><b>Customer Segments</b></p>  <ul style="list-style-type: none"> <li>• Individual Users</li> <li>• Families and Households</li> <li>• Businesses and Organizations</li> <li>• Emergency Response Agencies</li> <li>• Gives Emergency alerts and reports to both public and government</li> </ul>
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## Cost Structure



- Development Costs - Annual Cost may vary
- Maintenance Expenses - Cost of cloud services - From Rs.2000 up to Rs. 40000 depending on scalability.
- Satellite Data for InSAR - Rs. 10000
- Legal and regulatory compliance cost - Rs. 20000
- API Integration: Rs. 10000 (Rs 0.50 per SMS)

## Revenue Stream



- Subscription Fees
- Data Sharing
- API for Developers
- Partnerships
- Data Analytics Services
- Premium Content or Features

**Total Product Cost =200000**

# Team Overview

**RAKHUL PRAKASH S B** SYSTEM DEVELOPMENT RESCUER & PUBLIC APP DEVELOPMENT  
CROSS PLATFORM DEVELOPER CLOUD SERVICES BACKEND SERVICES

**SHANTHOSH S** PDRS VALIDATION SYSTEM  
AI & ML DEVELOPER CLOUD SERVICES SYSTEM DEVELOPMENT

**ARUNACHALAM T** PUBLIC APP DEVELOPMENT RESCUER APP DEVELOPMENT  
BACK-END DEVELOPER & IOT 4-LVL FALL BACK BACKEND SERVICES

**KANNAL A S** INVENTORY DEVELOPMENT CAMP APP DEVELOPMENT  
FULL STACK DEVELOPER BACKEND SERVICES

**FAZIL S** INVENTORY DEVELOPMENT CAMP APP DEVELOPMENT  
FULL STACK DEVELOPER BACKEND SERVICES

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# How we solved the Problem Statement?

In disaster scenarios, the surge of support often leads to an **imbalance between donated goods and actual necessities** on the ground, exacerbated by challenges like **limited electricity and mobile networks**. This results in excess supplies of certain items while critical needs remain unmet. To address this, hackfest participants are tasked with devising innovative solutions to:

1. **Balance supply and demand** by efficiently matching donated resources with the specific needs of affected areas.
2. **Validate and verify requirements** to ensure donations align with the most pressing needs.
3. **Effectively broadcast identified needs to potential donors**, considering limited electricity and mobile networks.
4. Facilitate **timely delivery of resources** to affected regions, minimizing delays and bottlenecks.
5. Maintain **up-to-date information** on evolving needs for dynamic adjustments to donation efforts.

