Dsense.AI

(Pre-disaster tracking of Human Resource)

Background.

Before and during the occurrence of any Mass-scale disaster, there is a huge problem of Management and Estimation for an effective rescue process due to extreme hustle. There is no basis for early preparation as such. This is because there is no real time-detection and tracking of the scale of impact of any calamity.

We aim to predict the Scale of Impact of any calamity affected region by generating a Heat Map of the concerned region. With the availability of the estimated human entrapment density on the heat-map, medical and rescue agencies can prepare accordingly in prior. With the prediction of the regions with maximum impact we can then map them to give rescue agencies a heads up to where to start from with the rescue job or how much resources do we need to commit to any particular place.

Also, with the availability of this dynamically evolving data, one can take better actions for the future disasters with smarter insights.

Dsense.AI

The Idea

- Whenever there's a high probability of an occurrence of any disaster, the cellular/mobile devices in that region, would be triggered to accept the location based tracking. The usage of this location based tracking would be strictly restricted to the duration of disaster. The Cellular towers in the area will start tracking the locations of all the cellular devices in that region. The obtained location data would then be utilized by the application to estimate the density of people trapped in a particular region. Also, the application would suggest the viable rescue plans keeping into record the statistics of that region. These plans would help the concerned rescue and disaster relief agencies to allocate the resources (food, medicines; etc.) accordingly.

Trigger.
Accept data from the operators.

Monitor.
View live statistics of the area stuck with calamity.

Take action.
Allocate resources in a judicial manner.

Maturity and feasibility

- The idea is mature enough to be implemented in the real world at the current time. The implemented solution showcases a basic structure setup, upon which a full fledged solution can be implemented improving upon the security, scale and increasing support for many more such mass calamities.

- The solution also needs cooperation from telecom companies agreeing to the data provision terms in the required format (Only in the hour of any such mass calamity).

- Our solution can further include many more intuitive solutions into itself and expand itself as the sole dependency is the availability of data related to a disaster.

- Our application is more or less advance enough to be put to actual conditions. The only simulation that we did for this demo is the dummy server which sends the updated location data files at regular intervals. In real life situation, Carrier services would actually be sending the data which is to be collected from the cellular devices and to be transmitted to the Dsense Dashboard.
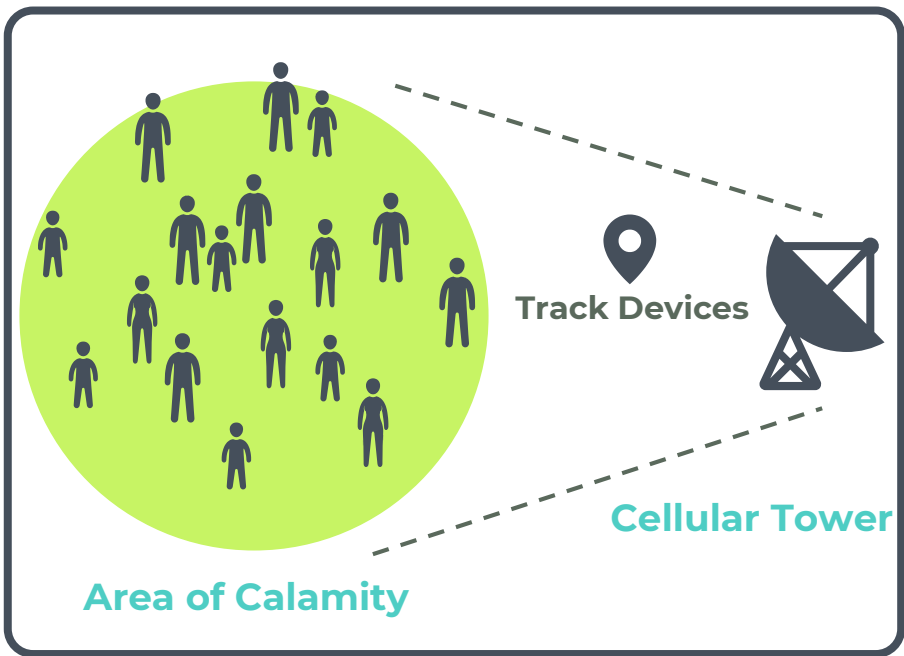
Future Aspects

- The solution can be expanded to include more type of mass scale calamities like Floods, Wildfires, Hurricanes; etc. The only need is that of the data.
- Also, currently the data used for simulation purposes is generated by our team and is not real. Implementation of this system will help in producing more precise data and thus better analytics.
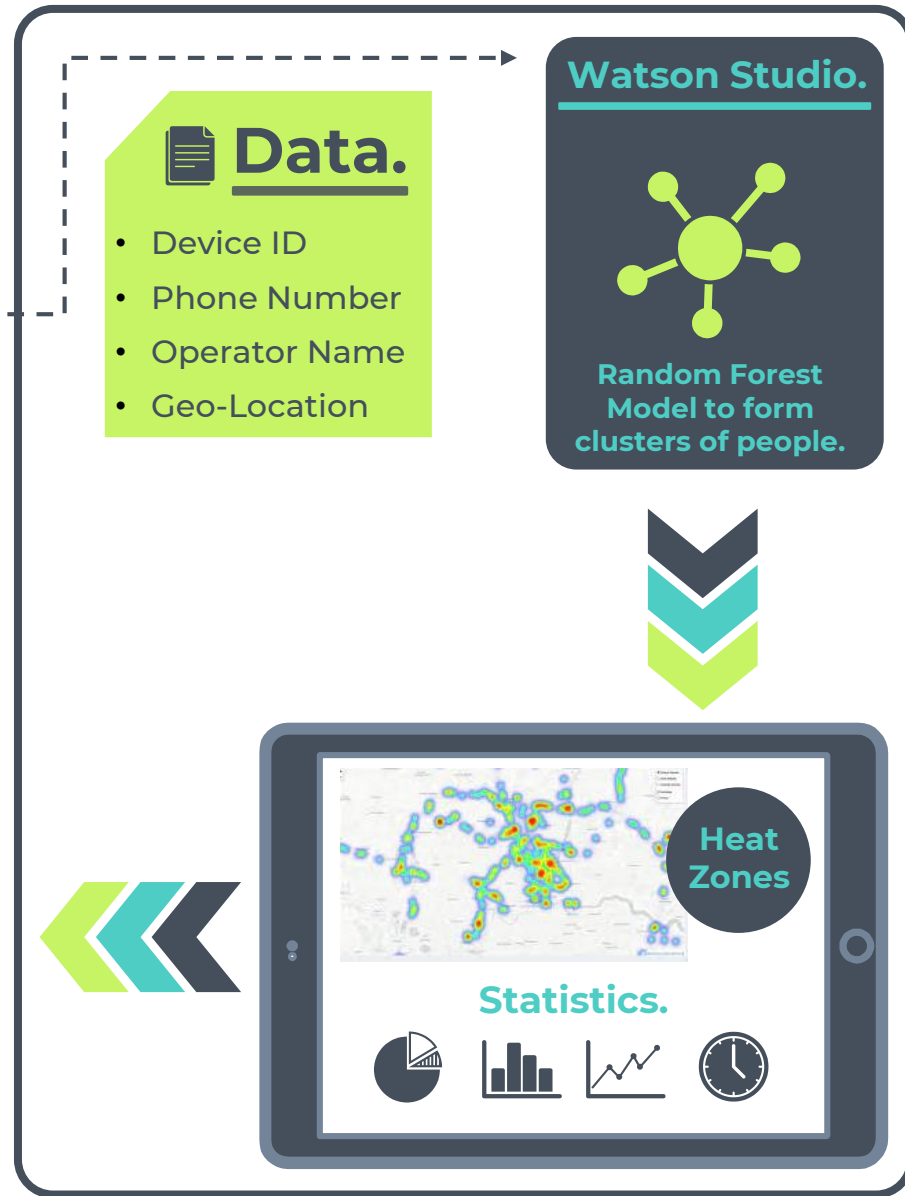
FLOW

How this will work?

Track Devices

Cellular Tower

Area of Calamity

Currently Simulated by Dummy Carrier Server

📄 **Data.**

- Device ID
- Phone Number
- Operator Name
- Geo-Location

Watson Studio.

Random Forest Model to form clusters of people.

Heat Zones

Statistics.

Take Action.

Predication of major impact zones.

Suggestion of optimum Rescue plans.

{ **DSENSE Boundary** }

Explanation for the Flow.

Step 1

In the case of some mass-scale disaster, the concerned agencies, using Dsense dashboard, will trigger the carriers to start tracking the mobile devices in the affected region.

Step 2

Carriers will collect this Human Position data and transmit it back to Dsense (According to the Format specified in the Flow Diagram). In case of crashing of Mobile towers, Carrier drones could be sent to collect this data.

Step 3

Dsense will perform some analysis on this data and generate region-wise statistics.

Step 4

Using this analysis, Dsense will also produce a Heatmap of the affected regions leveraging the location density of Human entrapment.

Step 5

Through visual severity indication, the authority can plan the rescue actions accordingly. Also, they could reserve important resources like Hospital Bedding and food packets precisely.

1.

Success Prediction

Our main objective is to make an estimate of number of people trapped in a calamity struck place and give a brief information to agencies in a intuitive way so that the agencies can take actions accordingly.

2.

Demographic study

Our application provides an easy way to get to know about the demographics of any calamity before it actually occurs and that too in real time so that the immediate action is adopted.

3.

HeatMaps for impact study

Heat zones on maps will provide an convenient and more effective way of visualizing the actual condition of the disaster activity.

4.

Resource allocation & Better Preperation

The Location and movement data obtained will be useful in training a predictive model for the better future preparations. Example - Building of Safe zones; etc.

5.

Location preferences

Our model is smart in a way that it also takes into consideration the existence of several locations such as Schools, Markets (High Priority Zones) or Forests (Low Priority Zones) etc.
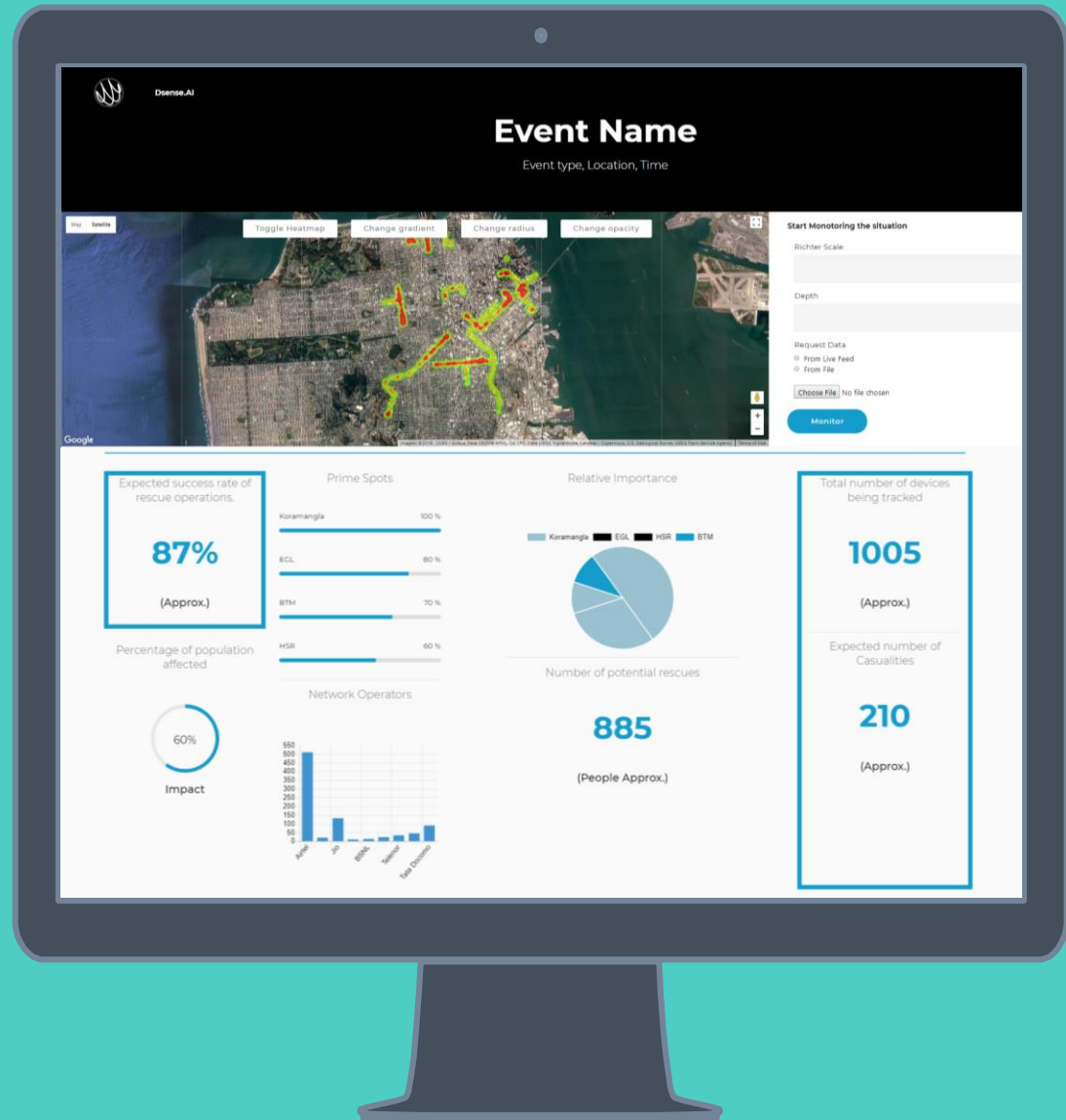
6.

Post-disaster relocation

With the availability of the last traced location of any victim, it would be easier to find the person post-disaster.

Web App Snapshot

Event Monitoring dashboard

Thanks!

Any questions?