**Title: Resource allocation analysis during calamity**

**Abstract**

With advent of Information technology, lives around the world are getting easier, making the world a better place. However, in spite of the great leaps in technology, we still struggle to save lives of thousands in an event of a disaster and the recent earthquake in Nepal stands a testimony to that. Our motivation that a single life is worthy of every human effort to be saved and that there is a tremendous potential for increasing the efficiency and effectiveness to cope with a disaster drove us to take up this project.

In this project, we list down the requirements and give an overview for developing an integrated disaster management communication channel by scheduling and managing data for response and recovery.

The disaster management communication system as of now is not designed to organize the data and to transfer the information to government or other concerned agencies. The concept of realistic demand vs supply of humanitarian aid is missing in the existing model. A foolproof mechanism of data transfer from affected area to the agencies will fill the void and better the model.

We approach the problem by designing a communication channel between the effected locality and the concerned organizations. People will build a consensus on the needed demand, so that the information becomes more credible. The communication channel will be established by designing a device working on the radio frequency and mesh network, as opposed to using a GSM frequency, thereby eliminating the chances of channel congestion.

This will result in successful delivery of the resources and humanitarian aid on need basis, so that the mismatch of need vs supply can be avoided.

**Team Information**

1. List each member role and responsibilities; List each member key background and expertise-
2. Hari Charan Panjwani
3. Sankalp Jadon
4. Tarun keswani
5. Sammer Goel
6. Cuican Wang

**Project Objective, Scope and Deliverables**

The objective of the project is to design a communication channel to enable the communication between the effected locality and the concerned organizations more efficient and credible. We propose to do so by building a consensus on the needed demand, so that the information becomes more credible. The communication channel will be established by designing a device working on the radio frequency and using the principle of mesh network, as opposed to using a GSM frequency, thereby eliminating the chances of channel congestion.

The proposed implementation will result in a working model which will improve the efficiency and fill the problem of realistic supply vs Demand of the resources during a disaster.

**Assumptions and Constraints**

**Assumptions**

1. Effected people have access to the designed device and knowledge how to use it.
2. By the word ‘disaster’, we assume earthquake
3. The government/ agencies have enough resources.

**Constraints**

1. The constraint is that we are considering only earthquake and hurricane for our model. The other disasters can be included for our future scope.

**Example of Current Scenario**

**Summary**

* The earthquake devastated Kutch. Practically all buildings and structures of Kutch were brought down.
* Ahmedabad, Rajkot, Jamnagar, Surendaranagar and Patan were heavily damaged.
* Nearly 19,000 people died. Kutch alone reported more than 17,000 deaths.
* 1.66 lakh people were injured. Most were handicapped for the rest of their lives.
* The dead included 7,065 children (0-14 years) and 9,110 women.
* There were 348 orphans and 826 widows.

**Problems in Current Scenario**

* Integration and linkage of information
* Availability of communication, redundancy of links
* Fast data access
* Timeliness and updating of information
* Standardization of information

**Solution**

We propose a solution which consists of two part.

First part is designing a device which would help volunteers to send the data over it even if there is no phone connectivity and electrical supply. The device would use the concept of mesh network that will make it independent of power and network

The second part of the solution will consist of gathering the data and performing the analysis over it thereby helping the concerned organization in allocating the resources to different calamity affected areas.

**SEQUENTIAL FLOW DIAGRAM**

**Integrated Master Schedule/Milestones**

List of key schedule tasks-

1. Research about technology to be used for communication during disasters.
2. Find the shortcomings of the technology, grey areas where we can improve.
3. Gathering data which would be entered by the volunteers present in those calamity affected area. This will help in deciding the entities of the database.
4. Analyze the data from the gathered data by running queries on new and old data. Old data would comprise of how the resource allocation was done in previous circumstances.
5. Analysis based on the damage level, people in that area (gender, age), connectivity, electricity, distance from the resource providing organization.
6. Suggesting the resource allocated to each area based on supply and demand.
7. Drawing the relationship between device, volunteers, organization and resource allocation. This will be shown through EER.
8. Submission of the final report.

**Proposed Timeline**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Activity** | **Duration of Activity** | | | | | | | | |
| Research about current devices |  |  |  |  |  |  |  |  |  |
| Collect past resource allocation data |  |  |  |  |  |  |  |  |  |
| Analyze the data and design initial ER diagram |  |  |  |  |  |  |  |  |  |
| Conduct a survey for collecting the data or take a recent scenario |  |  |  |  |  |  |  |  |  |
| Conduct a survey for collecting the data or take a recent scenario |  |  |  |  |  |  |  |  |  |
| Run the analysis on the collected data |  |  |  |  |  |  |  |  |  |
| Creation of the EER diagram based on the analysis |  |  |  |  |  |  |  |  |  |
| Final report submission |  |  |  |  |  |  |  |  |  |
|  | Oct13 | Oct19 | Oct26 | Nov2 | Nov9 | Nov16 | Nov23 | Nov30 | Dec7 |

**HIGH LEVEL ENTITY RELATION DIAGRAM**

**Address**

**Position**

**Location**

**PlaceIdentifier**

**PlaceIndicator**

**Service**

**LocationTrajectory**

**LocationInformation**

**Emergency**

**Resource**

**Capability**

**AffectedGroup**

**UnaffiliatedPerson**

**AffectedPerson**

**ContactPerson**

**PrivateContact**

**PublishedContact**

**Person**

**ContactDetails**

**Organization**

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