GIS based emergency management

Ministry Category: Government of Arunachal Pradesh
Problem statement: GIS Based Mobile application for Emergency Response System for Disaster Situation
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Description of Idea:

- The mobile app is developed on Android platform using JAVA and XML.
- List of possible disaster situation will be displayed as options.
- Messages posted by client are tagged with unique identifier and device location (longitude and latitude from GPS)
- User anonymity maintained using Secure sockets layer (SSL)
- **In absence of internet**: the GPS location (latitude and longitude) is sent to the webserver (Apache HTTP) via SMS using SMS gateway: OZEKI NG (.NET framework)
- PHP interacts with database PostgreSql with PostGis to store and retrieve the data to be displayed on website. Hosting PHP on webserver
- PHP script using a database server for data storage and setting up SMS gateway for sending and receiving SMS messages.
- Receive SMS messages on Web server over HTTP requests
- A website is developed (HTML, CSS) for notifying the control rooms. User login and password will be created so that only officials are able to access it.
• **With Internet**: Mobile internet connection will be exploited to send the current location to the server.

• The application procures data(geo-events) from the backend and overlays the information on the google map.

• The user will be made known about the status of the help provided such as their contact information and current location status.

• Data exchange between client and server is done using **JSON**. **Payload** contains all the parameters including the GPS location(latitude and longitude).

• **GeoServer** (uses **REST** protocols) software is used to integrate with google maps for quick map generation. This will be displayed on the website which will be used by disaster responders.

• To host GeoServer, we need the PostgreSQL database extended with PostGIS. This spatial extension adds support for geographic objects, allowing location queries to be run in SQL.
Three main departments when comes to disaster handling situations are Police, Ambulance and Fire brigades.

The control rooms of these departments will use the website. The control room will be notified based on their relative location with respect to the location of disaster.

The victim can place a call or send SMS using this app (to server via SMS gateway).

According to the requirement of the emergency situation, one or more departments will be notified.

Database of NDMA (containing the contact details and places where this organization is present is available) can be uploaded on the server which will help in sending the information of emergency, depending on their location.

TECHNOLOGY STACK:

- Application: Android platform. Languages used will be Java, XML.
- Database server: Postgresql with PostGIS (adds support for geographic objects)(dbms).
- Webserver: Apache HTTP server
- Geospatial server: GEOSERVER (for generating, sharing and managing geospatial data).
- SMS gateway: OZEKI NG(.NET framework)(when offline)
- PHP interacts with database Postgresql to store and retrieve the data to be displayed on website.
- Website: Developed using HTML, CSS.
- Web API’s receives and return data in form of JSON(JAVA script object notation)
USE CASE:

• Victim of disaster situation will be benefitted by using this app

• Various commonly occurring emergencies will be displayed as options in the application. (Included with regional language facility)
  
  o Natural calamities
  o Road accidents *(Dilemma occurring due to interstate border related issues will also be taken care)*
  o fire accidents (wildfire, building fire)
  o Terrorist activity, Mob rage
  o Personal safety (robbery)/women safety.
  o Requirement of Blood of particular blood group. (info sent between users of this app)
  o Nuclear powerplant leak.

• The user will convey the extremity of the hazard through the app so that required actions can be taken.

SHOWSTOPPER:

• Android versions - lollipop (5.1 and above versions)
• Google maps key can be obtained free of cost and interfaced with the mobile application.
• Google maps Java Script API key for web based interfacing.
• GeoServer 2.12.1
• The app along with the website helps to establish a to and fro communication between the victim and help providers.
• It is interfaced with Google maps to obtain spatial data of the location of the victim which leads to quick response by emergency responders.