

# Loke (Locate EarthQuake)

## Introduction

Imagine a situation where there are only earthquakes around and no technical solution exists. Without the technical solution, life would be extremely difficult and rather it would be difficult to locate any information about earthquakes. One solution would be to not visit such place earthquake hit place. But we cannot run from the problem, can we? Therefore, we need a technological solution to identify earthquake hit areas around the world.

William Wordsworth has rightly said on earthquake that, “*All things have second birth; the earthquake is not satisfied at once.*” The challenge for developers and engineers is that we need to find technical solution to the real problem such as earthquake. If we look at the data of only 2010, there are more than two million casualties only in 2010. The figure below demonstrates the data for the number of earthquake hit areas around the world from 2000-2010 onwards. The rounded circle in the red illustrates the number of casualties; we are in end of third month of this year.

**Number of Earthquakes Worldwide for 2000 – 2010**

Magnitude	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
8.0 to 9.9	1	1	0	1	2	1	2	4	0	1	1
7.0 to 7.9	14	15	13	14	14	10	9	14	12	16	3
6.0 to 6.9	146	121	127	140	141	140	142	178	168	142	48
5.0 to 5.9	1344	1224	1201	1203	1515	1693	1712	2074	1768	1725	558
4.0 to 4.9	8008	7991	8541	8462	10888	13917	12838	12078	12291	6956	1285
3.0 to 3.9	4827	6266	7068	7624	7932	9191	9990	9889	11735	2897	339
2.0 to 2.9	3765	4164	6419	7727	6316	4636	4027	3597	3860	3007	512
1.0 to 1.9	1026	944	1137	2506	1344	26	18	42	21	26	7
0.1 to 0.9	5	1	10	134	103	0	2	2	0	1	0
No Magnitude	3120	2807	2938	3608	2939	864	828	1807	1922	20	5
Total	22256	23534	27454	31419	31194	30478	29568	29685	31777	* 14791	* 2758
Estimated Deaths	231	21357	1685	33819	228802	82364	6605	712	88011	1787	223140

(Source: Located by the US Geological Survey National Earthquake Information Center)

We are just in the beginning of the year!

Figure 1: Number of earthquake hit areas around the world.

## 1. The Idea

The idea was conceived as a result of a discussion in the team because of the news breaking situation taking place in Haiti and we all thought for a moment, how devastating for a human being to be an illusion from medical help because of an absence of a link and that is software, and with the help of us the developers we can create real-time technical solutions for the same. The one liner statement for the idea would be:

*To identify the location and information about “earthquakes” hit areas around the world and share the information with millions of people by using android enabled mobile devices.*

In 2010 only, there were more than ten earthquakes around the world. Two of the biggest earthquake hit areas were Haiti and Chile, which we learned in the News & Media. However, our primary target is not to predict the earthquake but to find locations & casualties' information, where earthquake has been hit.

Today in this internet world, there are many sources from where we can get the information about earthquakes. However getting information along with its location in Globe Map can be more illustrating. So we came up with the idea to develop an application using Google map that provides location and information about the earthquake around the world. Such information can be input by a user. So the information about the earthquake is based upon the user input.

This application is useful for any kind of user who wants to have more in depth knowledge about earthquake hit area around the world with reference to Map.

### **A Scenario:**

*Johnny is a professor. He is travelling for a conference trip to Okinawa, Japan. He carries Android enabled phone and uses Google maps to find location of different places. However, he does not have any information regarding "earthquakes". On the same day, an earthquake happens in Okinawa but Johnny has already planned the trip and is ready to drive to Okinawa in the rented car. What will happen to Johnny? Is Johnny alive or dead? Johnny survives .... He checks the information regarding earthquakes about Okinawa at the very last moment using our application: LoKe*

## **2. Our Solution**

We know our solution is not the best solution however; we came up with few ingredients to solve the current challenges of world.

- LoKe (Locate earthquake hit areas around the world)
- Develop an application that includes overlay in Google Maps.
- Provide information about severity of quake via, casualties, magnitude, and location of the earthquakes.
- Mobile based application for locating major earthquakes around the globe.

The central idea maybe big and broad but we do not guarantee to provide complete solution to everything. We are rather focused on providing just the information regarding the earthquake hit areas which in itself is not very big. It is obvious that we are very passionate about our work. Our motivation stimulates from following features being implemented.

## **3. Features Implemented**

LoKe solution with list of features, priority and mission is shown in the table below. Many of the features were implemented in the project. The most critical feature has been given the highest priority (1) and the least features have been give lower priority (5). The mission was "accomplished" fully during the project

implementation for given time period. Few of the features were left for future work which would be extremely difficult to implement without sufficient resources.

### 3.1. Features & Mission

S/N	Features	Priority	Mission
1	To retrieve the exact location coordinates by clicking the respective location on Google map	1	Accomplished
2	To input the disaster information through Map	1	Accomplished
3	To create Database and Table through SQLite	1	Accomplished
4	To store and retrieve data from table	1	Accomplished
5	To get location and description about earthquake through database and populate in Google Map	1	Accomplished
6	Show the location by putting flag on Map	1	Accomplished
7	Can have different view in Map( Map or Satellite)	2	Accomplished
8	To implement different layouts	3	Accomplished
9	To share the information about earthquakes on social-networks	4	Ongoing...limited time
10	To predict the earthquake information based on different sets of data	5	Future work...(Needs couple of years of extensive research)
11	To develop a system for collaborative environment to predict next earthquake happenings around the world	5	Future work...(Needs large research funding)
12	To create user management for 'personalized earthquake hit areas'	5	Future work... (Needs time, energy and money)

### 3.2. Conceptual Design

Our conceptual design is shown below: The conceptual model consists of major components: The application first starts and the map is loaded. After the map is loaded, the user has rights to either search for the specific location or user can insert “information” about the earthquake hit areas. The user information is synchronized with latitude and longitude information in SQLite Database. A user can simply search location and the LoKe system will display the location of earthquake hit area. The user shows the location information (e.g. xyz, this place is not earthquake hit areas) Once this information is shown, the LoKe system automatically

stores the latitude and longitude of the user location. Thus, the basic information about the user and its location hit areas is shown using LoKe System.

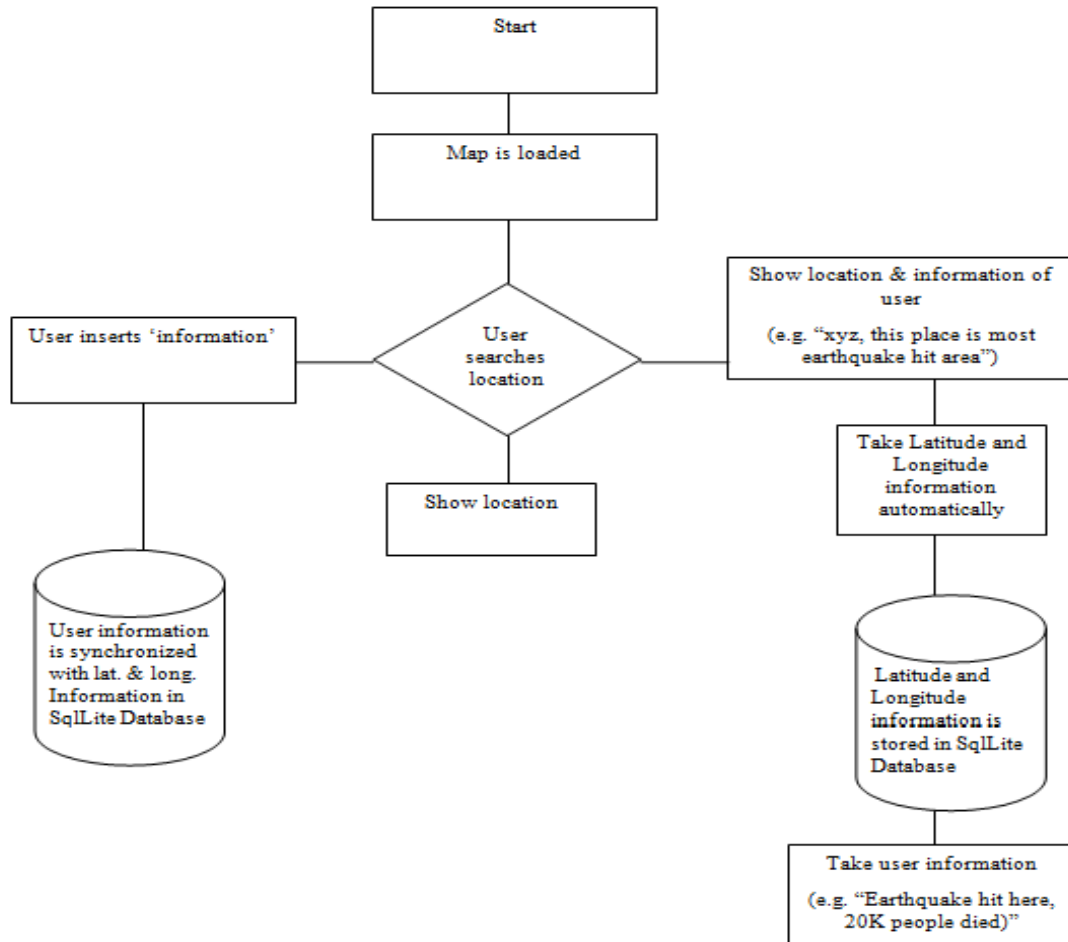


Figure 2: Conceptual model for determining location hit areas around the world using LoKe System.

#### 4. LoKe Major Features

- Load Google map
- Mark Earthquake hit areas around the world by placing flags
- Store Location(latitude, longitude), and description of the quake in the database
- Retrieve the information from database and display in corresponding flags.
- Display Satellite and Terrain View of the world.
- Zoom in and Zoom out

#### 4.1. Technology/Software Used

1. Eclipse IDE
2. Google Map SDK
3. Android 2.1
4. Activity, Views
5. Layouts
6. SqlLite
7. Window XP Operating System

#### 4.2. Code Camp Spirit

1. We learned how to program in Android Enable Phones.
2. We also learn from our peers about Maps, XML Manifest Files and Sql Lite Database.
3. We are thankful to all those who helped us for successfully completing the project and all those who gave us useful advice, suggestion and feedback for the same.

### 5. Conclusions

Before the Android Code camp was launched, we were discussing on the idea of implementing some kind of service/application on mobile device for natural disaster. We came up with idea that, *How about some kind of system using Android + Google Maps to locate the earthquakes around the globe?* We can save casualties by reporting about 'various information' regarding the earthquakes. The 'various information' includes but is not limited to: Number of casualties, On ways to volunteer and provide help, Based on news and media, user can put the information, User can also make 'personalized earthquake hit areas' & share among friends or family using social networks and Any information about 'Natural Disasters' is very significant which can save a life.

In Conclusion John Muir has rightly said, *"Nature chose for a tool, not the earthquake or lightning to rend and split asunder, not the stormy torrent or eroding rain, but the tender snow-flowers noiselessly falling through unnumbered centuries."*

### References

- [1] US geological survey, Available at: <http://www.usgs.gov/>
- [2] Code camp Home Page, Available at; <http://www.codecamp.fi>  
(Look for Android Code Camp --> Group 11)