Development of Smart Complaint Portal based on

Geotagging and Proximity Search

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Abstract - *The paper aims in developing a next-generation Android-based mobile app and a website named as "Save me" based on Proximity search and Geotagging for addressing public issues faced by a citizen or an area such as street light damage, water leakage, traffic, dangerous roads etc. With the advancement of technology, several ways are introduced by the government to solve social problems but it is time consuming and not much user-friendly. By using the "Save me" application a citizen can directly involve in solving public issues and can take part in building a better society. By using Geotagging, the complaint will be registered to the respective departments automatically. The proximity search facilitates the officials to narrow down the complaints to their convenient operational range. We can upload a photo, video, audio, etc. from the site of complaint which makes the procedure seamless. Smart mobile devices include inbuilt Global Positioning System (GPS) which helps in determining the exact location of the complaint. The complaint information will get forwarded to the department via Internet to the server and the concerned departments can access through the web portals.*

Key Words: **Android, GPS, Geotagging, Proximity search, Web portal**

1. INTRODUCTION

In our country, it is the government, which is responsible to address the complaint of citizens. Generally, many unsocial activities seen by the public will not reach to corresponding departments due to many reasons like lack of time and ignorance [8]. For this they have 2 ways, first cameras or other surveillance devices have to be installed and the second way is that citizens could report their problem to the government authorities. The second way is mostly used because it is cheaper as compared to first one [2]. But it takes paperwork and time too because the citizens have to visit the corresponding departments and report problem faced by them. Due to the emergence of the internet and its various capabilities, there has been a rise in the number of complaint sites which provides citizens a platform to lodge a complaint online [2]. As a mobile application is most convenient, Save me app will help people to lodge a complaint through it and can attach a picture or video of the same and location will be tracked using GPS (Global Positioning System). Along with the evidence of the complaint, geographic information such as longitude,

latitude and altitude can be added. Integrating the location information along with the image is termed as Geotagging. Geotagging can be done in 2 ways: 1. By adding information via Exchangeable Image File Format (EXIF) of an image [5]. 2. By adding information via web service [5]. The user will be able to lodge the complaint which he will witness in our day to day surroundings. In this application, there will be a login and verification of the user [6]. This is a simple, easy, user-friendly application for complaint registration. The complaints will be of various types related to electricity, roads, water leakage etc[6]. A keyword has to be mandatorily entered by the user in order to figure out the corresponding department easily such as fire, water, food for fire and rescue department, water authority, food and health department respectively. The system will recognize the keyword and forward the complaint to the corresponding departments. The department will give a proper acknowledgement to the user upon receiving the complaint, this will be done by updating the status of the complaint and it will confirm that the complaint has been registered successfully and the complaint will be tracked time to time.

2. PROPOSED SYSTEM

The proposed system aims at providing citizen a better way to lodge their complaints. Nowadays mobile phone plays an important role in everyone's life, everyone want all the services in a single click. Here comes use of the proposed system. The system is a website and an android based mobile application that serves common people in registering their complaints in a more convenient way.

2.1 System Working

The user has to download the mobile application in his/her mobile phone and run the application after signing up to start with a welcome screen. Then he can lodge his/her complaint in the raise issue page. He/she has to give certain information regarding the complaint along with the image/video of the problem from the complaint site as an evidence. The image will be geotagged, it contains the information about the location of the complaint site in the form of longitude and latitude that helps in finding the exact position of the site. In addition to this the user has to provide a keyword related to the nature of the problem, which will be helpful in determining the corresponding department.

The department officials can login to the application using their credentials and can see the complaints registered to their department. They will see to the problem, take necessary actions and update the status of the problems registered. The system can also send daily notifications about day to day activities of the department in particular locations in the city in the form of alert. So it is easier to the citizens in knowing about the status of the complaints by these alerts. And at the server side there is a part of report generation about the complaints which are lodged into the server. So it will be helpful for the department authorities to know about the complaints solved or being solved.

2.2 Features included

- ➢ OTP based login
- ➢ Multiple department login
- ➢ GPS assisted complaint registration
- ➢ Area/range based content filtering
- ➢ Activity based user management
- ➢ Complaint status updation
- ➢ Email notification
- ➢ Media management
- ➢ Keyword based department allocation

2.3 System modules

2.3.1 Admin Module

The admin has the right to control the overall activities that are happening in this application. The Admin can view the details about the user, department and the complaints that are made by the user. Also he has the privilege to block the users who generate invalid complaints for more than 3 times. A new department user can register only after the approval of the admin. The admin can only access this application through the corresponding website of this application. Admin can add new keywords for department.

2.3.2 User/Department Registration and Login

Individual login facility is there for every citizen and department officials so that the citizen can register as well as see the status of the registered complaint and the officials can go through the complaints in their department and take necessary action thereby solving them. The procedure of forwarding the complaints and solving the same will not be visible to the user. They only have the privilege to see the status.

2.3.3 User/Department Complaint Registration

In this module user can launch their complaints and officials can go through the registered complaints in their department. The complaint form will be simple enough to be filled by common people. The user can provide a keyword of

the department instead of giving an entire description thereby the complaint will get directly forwarded to the corresponding department. In complaint form user can upload photos/ videos which will be geotagged so that it will provide the exact location of the complaint site and it will be visible to the admin in the server side.

2.3.4 Complaint Resolution Portal

After getting the complaint from the user, the officials came to see that and take necessary action for the same. A proximity search facility is provided so that the officials can select his convenient operational range in order to effectively solve the problems. After solving the problem, they will update the status of the complaint as completed.
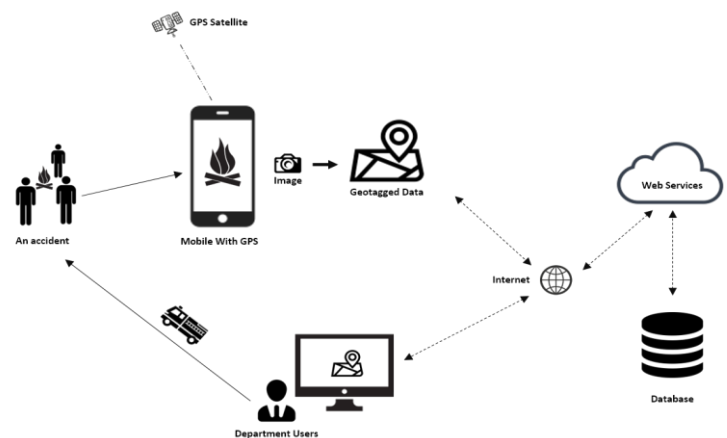
2.4 System Architecture

Fig-1 System Architecture

2.5 Geotagging Method

Capturing GPS information at the time the photo is taken or attaching the photograph to a map after the picture is taken are the 2 main options for geotagging images/videos. The two geotagging methods include

Insertion of information via EXIF [5]

EXIF data contains the information that can be stored in an image file which include the date and time, model of the camera, location of the image etc. of the image taken. Even though the smart phones have the facilities such as GPS, location based services, the geotagging of an image is quite widespread. Any modern phone can include a Geotag in a photo , it is not enabled as default the user have to give permission to enable the geotagging.

Insertion of information via web service [5]

Adding information via web services is different from EXIF, first of all the EXIF file of the image should be removed and then take the existing coordinates, add the same into an image and upload it to the server. Geotagging via web

services is time consuming since it takes two more additional steps to insert

2.6 Geo/Proximity Search

Proximity search uses trigonometry to display the results. Google uses this technique to find ATMs, and restaurants nearby. Save me app uses the same technique to find the issues based on operational range for example the department can choose the range for their operation so that the issues will be addressed instantly. The user, in our system the department official will specify a distance in kilometers. The system will look for the issues registered within that specified distance. The known information includes the table in the database, location and the kilometers specified by the user. The distance between location and the complaint site can be calculated using the Harversine formula.

2.7 Advantages

- One-time registration is needed
- Complaint can be registered independent to the place where we are.
- Less time consumption
- User will get notified with the complaint status thereby he came to know about the processing of complaint is done /not.
- When the user's complaint is resolved the admin closes the complaint and update it as completed and the user will get notified.
- Geotagging make the procedure of registering complaint more convenient by providing exact location of the site.

3. RESULTS

Welcome   Sign in

Signup

Register Complaint

Solved Issues   All Issues

4. CONCLUSIONS

A system that provides a solution for the lack of an effortless communication method to notify the authority about the public complaints was developed, which reduces the complex procedure to be followed in complaint registration process. The developed mobile application brings all the departments under the same and the user can lodge their complaints in the respective departments. The user who is lodging the complaint will be verified as a real user and the information will be stored at the database. Also the complaint form with its type and images/videos will be sent to the server. The geotagged images /videos will help to track to the location and the user will be getting an acknowledgment of the registered complaint

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