

# Smart Application for Complaint Registration

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**Abstract** – Each and every country have civic bodies that are the local governing bodies which help in maintaining general functionalities of cities. These civic bodies are called as Municipal Corporations. This android application will help citizens under the jurisdiction of Municipal Corporation to register grievances in their ward through an android application. Also the application provides an interface to register one's complaint and view the status of the complaint. It helps a common man to report his problems to the respective ward corporator who then asks the municipal authorities to address the problems in a short period of time. It provides a camera module which is used to click pictures of the problem that people are facing and upload it along with the complaint. The location of complaint is fetched automatically through Global Positioning System (GPS) unit and sends the complaint to the respective ward corporator. Corporator application displays the list of complaints registered which are approved by the system admin. Once complaint is resolved the corporator can upload back the images of work done which can be seen by the complainant.

**Key Words:** Android app, Complaint Registration, Google API's, Cloud storage, Global Positioning System (GPS).

## 1. INTRODUCTION

Direct and common communication between the local corporators and the citizen of that ward is an efficient way in solving the issues related to that ward. In India unfortunately there is no such way for getting a problem solved as one has to go through the hassles of registering the complaint to respective departments which in turn forward to the concern officers and then the problem may or may not get solved and also takes a lot of time. Allowing every citizen of a city to register complaint is the main purpose of the application so that they can effectively participate in the process of building a better city in smarter way. Now people are used to manage their daily work on internet, and with satisfaction. So we are using various applications in our life for fulfilment of our daily work. The application is very user friendly and consumes small amount of memory space. The android app helps in connecting municipal corporators with their ward citizens dynamically. Complaints can be registered by ward citizens by uploading of image through the camera module. Similar to the citizens, corporators will also be provided with a separate app where he can view complaints regarding his ward. System admin uses a web

portal where he checks the complaints and approves the complaints which will be then forwarded to the respective corporators. He acts as a cleansing medium of irrelevant complaints and makes sure integrity of contents in app is maintained. Also the events in and around the city can be uploaded by the corporators which can be viewed by the users through the mobile application.

## 1.1 LITERATURE SURVEY

In our country we have the government bodies which helps in addressing the issues of common people. Coming to the smallest partition of governing bodies comes the ward which is represented by that ward corporator. Now the ward's issues are taken to the respected corporator to solve the problem. The location of complaint will be fetched through GPS tracking system it will make use of Google API's and camera module is used to embed complaint images [1]. The android application is used to get compatible with mobile and tablet, MySQL for the database holdings and ASP.NET for the purpose of server in webpages [2]. After the complaint is uploaded or registered then the GPS-SMS service for providing confirmation of complaints, web page to register the complaint, SQL for the database quarry process [3]. The admin module has the google map for tagging the complaint area web-based system HTML5 and JavaScript along with c# and sql server, AJAX for displaying dynamic content in map. GEO tagging the image to get current location [4]. Android UI, GPS for tracking, analysis of complaints through pie chart, stats of score given by citizen, SQL for backend database, by this the public would get to know the percentage or the number of complaints that were done correctly and which were done but was fake [5].

## 1.2 EXISTING SYSTEM

Currently Mysore City Corporation has a website for getting any information regarding the city and for any complaint registration and also we have swachhata app for sending any queries.

## 1.3 PROPOSED SYSTEM

The app is built on normal client - server architecture with Android App as client and Web App as server part. This App is divided into three sections: Citizens (Android App), Web Page (Admin), and Corporator (Android App). An android app where end user gets registered and logs to app. Here

the end user can access details of nearby corporator details and upload an images for grievances in the area. This uploaded image will be reported to Mysore city corporation office and it will be accessed by web app and approve it after confirming the image is fake or real. Once it is confirmed it will be reported to concerned corporator where he can view the image, region and complete details. Corporator can take immediate action by communicating with the respective people and after the issue has been resolved, he has to update the compliant by uploading issue solved pictures. This information can be viewed by end users in their android apps. The end user app also provides information like nearest corporator access using GPS technology and also it will be displayed on google maps. Corporator can also update information regarding his ward development activities and upcoming programmes through android app. All these ward information can be viewed citizens in their apps.

## 2. SYSTEM MODELLING AND DESIGN

This implementation is aimed at a real time usage of Smart Application of Complaint Registration system and does not compromise on the security. It guarantees us that the proposed system will be user friendly and transparent.

### A. Problem Definition

There are a number of reasons why android has been picked for this project because most of the mobile phones run on android.

### B. Methodology

Android application are becoming more of connecting medium for people these days with technology being better day by day. Our Android application helps people to take picture of the complaint and then upload it to corporator to get solved. Using reverse geocoding we track his corporator and send it to admin where he has the authority to accept or decline the complaint. If accepted it is forwarded to respective corporator tracked is geocoding. Then the corporator after completion of complaint work he will send a picture of the work done send to the complaint giver with the help of cloud backing.

### C. Cloud Storage

Cloud storage is defined as "the storage of data online in the cloud" wherein a company's data is stored in and accessible from multiple distributed and connected resources that comprise a cloud. There are many benefits to using cloud

storage does have the potential for security and compliance concerns that are not associated with traditional storage systems. Cloud storage can provide the benefits of greater accessibility and reliability; strong protection for data backup, archival and disaster recovery purposes; overall storage costs as a result of not having to purchase, manage and maintain expensive hardware.

## 2.1 SYSTEM MODELS

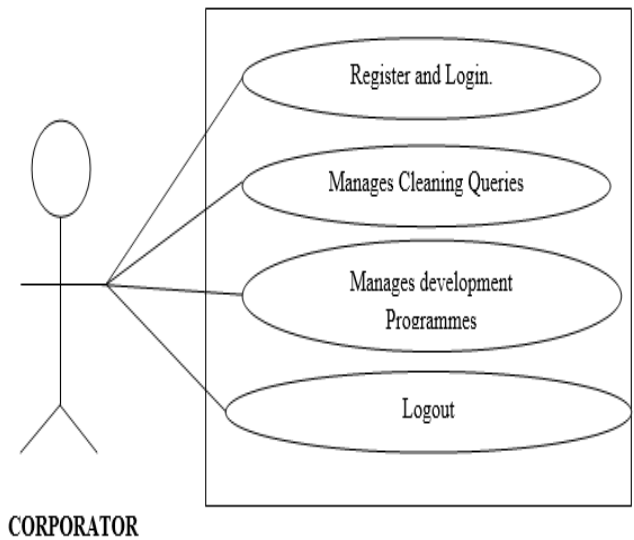


Fig: Use case diagram for Corporator

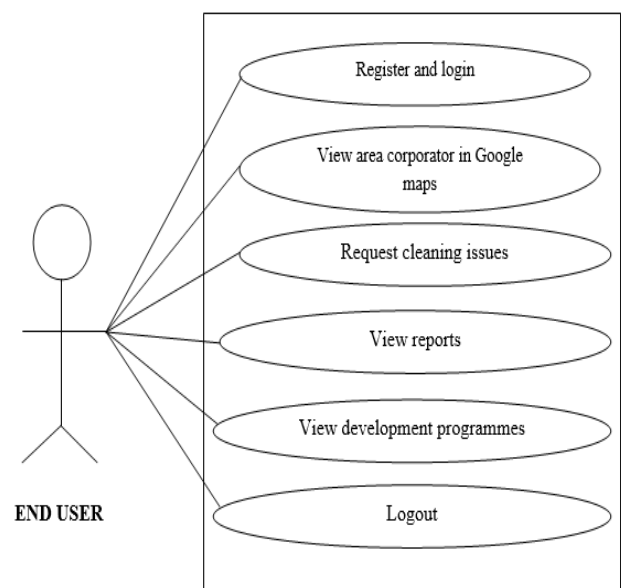


Fig: Use case diagram for End User

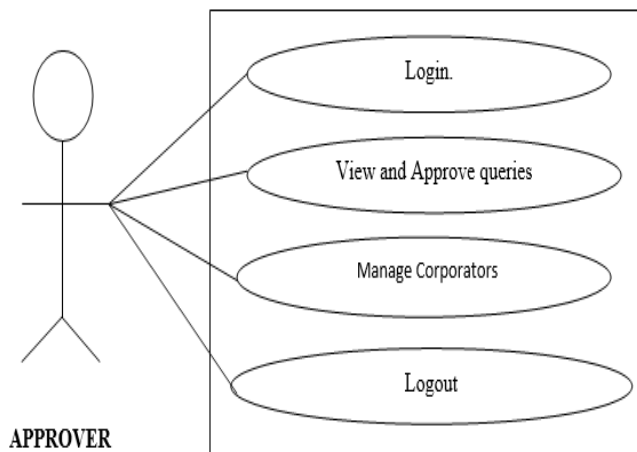


Fig: Use case diagram for Approver

Fig 1. Use case diagrams

## 2.2 SYSTEM ARCHITECTURE

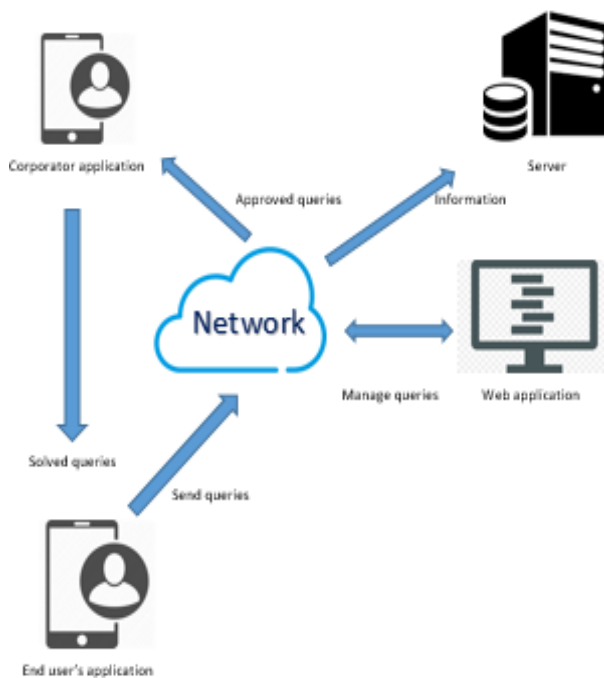


Fig 2. Architecture diagram

## 2.3 ALGORITHMS

We are using three algorithms

- Haversine algorithm
- Reverse Geocoding algorithm
- FCM algorithm

### 2.3.1 Haversine algorithm

This algorithm is used to calculate the distance between two latitude and longitude in two steps {1} to evaluate the straight line i.e. Euclidean distance between the given points {2} to convert this measured distance to the human understandable form.

- The origin is at the Earth's centre;
- The x-axis passes through the Prime Meridian (0 longitudes);
- The xy-plane contains the Earth's equator (and so the positive z-axis will pass through the North Pole)

Note that the angle  $\theta$  is the measurement of latitude, and the angle  $\varphi$  is the measurement of longitude, where  $0 \leq \varphi < 360$ , and  $-90 \leq \theta \leq 90$ . Negative values of  $\theta$  correspond to points in the Southern Hemisphere, and positive values of  $\theta$  correspond to points in the Northern Hemisphere. When we use spherical coordinates which is typical for the radial distance R to vary; however, here we may fix it to be the average radius of the Earth:

$$R \approx 6,378 \text{ km}$$

Thus, we assume that we are given two points P and P determined by their respective latitude-longitude pairs: P ( $\theta, \varphi$ ), P ( $\theta, \varphi$ ). In Cartesian coordinates we have P = P (x, y, z) and P = P (x, y, z), where x, y, and z are determined by the spherical coordinates through the familiar equations:

$$x = R \cos \theta \cos \varphi$$

$$y = R \cos \theta \sin \varphi$$

$$z = R \sin \theta$$

The Euclidean distance d between P and P is given by the three-dimensional

Pythagorean Theorem:

$$d = \sqrt{(x - x)^2 + (y - y)^2 + (z - z)^2}$$

The much of our work will be in computing the distance in terms of the spherical coordinates. Converting the Cartesian coordinates to spherical coordinates, we get  $d/R = \sqrt{(\cos \theta \cos \varphi - \cos \theta \cos \varphi)^2 + (\cos \theta \sin \varphi - \cos \theta \sin \varphi)^2 + (\sin \theta - \sin \theta)^2}$ .

### 2.3.2 Reverse Geocoding algorithm

Reverse geocoding is the process of back (reverse) coding of a point location (latitude, longitude) to a readable address or place name. By Combining geocoding and routing services, reverse geocoding is a critical component of mobile location-based services and Enhanced 911 to convert a coordinate

obtained by GPS to a readable street address which is easier to understand by the end user. This permits the identification of nearby street addresses, places, and/or areal subdivisions such as neighborhoods, county, state, or country. Reverse geocoding can be carried out by services which process a coordinate which are similar to the geocoding process. For example, when a GPS coordinate is entered the street address is interpolated from a range assigned to the road segment in a reference dataset that the point is nearest to. If the user provides a coordinate near the midpoint of a segment that starts with address 1 and ends with 200, the returned street address will be somewhere near 100. This approach to reverse geocoding does not return actual address, but based on the predetermined range it only returns estimates of what should be there. Alternatively, coordinates for reverse geocoding can also be selected on an interactive map, or extracted from static maps by geo referencing them in a GIS with predefined spatial layers to determine the coordinates of a displayed point.

### 2.3.3 FCM (Fire Cloud Messaging) algorithm

Firebase Cloud Messaging (FCM) is a cross-platform messaging solution that lets you reliably deliver messages at no cost. Using FCM, notification are sent to a client app regarding new email ,messages or other data is available to sync. Notification messages are send, to drive user retention and re-engagement. For use cases like instant messaging, a message having payload of up to 4KB can be send to a client app.

An FCM implementation includes two main components for sending and receiving:

1. A trusted environment such as Cloud Functions for Firebase or an app server on which to build, target, and
2. Send messages.
3. An Android, IOS, or web (JavaScript) client app to receives messages.

Messages can be sent via the Admin SDK or the HTTP and XMPP APIs. For sending marketing or for testing or engagement messages with powerful built-in targeting and analytics, along with these one can also use the Notifications composer.

## 3. TECHNOLOGIES USED

- ❖ Android Web API's
- ❖ GCM Technology
- ❖ GSM Modem

### 3.1 Android Web API's

The android web API's are the API used in the android application to get the information of some JavaScript or

other web design languages from it. The API can be used to get some information from the websites and any other medium in the internet. These API are the one which connect the android application to these mediums and helps to get the desired information from it. The best example is that when we need to connect the application we built to the localhost runned pages that also designed by us to get those information. This is the technology used by to retrieve the information of the admin part where he accepts the complaint sent by the corporator and send to the corporator application.

### 3.2 GCM Technology

GCM is advanced push technology developed by Google for Android platform. This GCM technology of push notification has many limitations. Push notification are important because if the notifications are sent to a person then that is an indication of the message given to you of something. This where we incorporate it to our system to send a message to corporator when a new query has sent to him.

### 3.3 GSM Modem

A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem is similar to dial-up modem. The main difference between them is that a wireless modem sends and receives data through radio waves while a wireless modem sends and receives data through radio waves. Like a GSM mobile phone, a GSM modem requires a SIM card in order to operate.

## 4. CONCLUSION

The smart application for complaint registration allows the citizens of a ward to make sure that their problems reach their ward corporators and it also ensures that there will be transparency between the people and their corporators.

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