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# Complaint go: an online complaint registration system using web services and android

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**Abstract** In numerous nations, there are city bodies that are the nearby representing bodies that help keep up and run urban communities. These administering bodies are for the most part called MC (Municipal Cooperation). The MC may need to introduce edit cameras and other observation gadgets to guarantee the city is running easily and productively. It is imperative for an MC to know the deficiencies occurring inside the city. As of now, this must be for all intents and purposes conceivable by introducing sensors/cameras and so forth or enabling nationals to straightforwardly address them. The everyday operations and working of the city are taken care by administering bodies which are known as Government Authorities. Presently keeping in mind the end goal to keep up the huge city requires that the Government Authority should know about any issue or deficiency either through (sensors/CCTV cameras) or by enabling the nationals to grumble about these issues. The second choice is generally granted on the grounds that it gives the best possible substantial data. The GA by and large enables its residents to enlist their grievance through a few mediums. In this application, the citizens are facilitated to send the complaints directly from their smartphone to the higher officials. Many APIs are functioning as the web services which are really essential to make it easier to register a complaint such as Google Places API to detect your current location and show that in Map. The Web portal is used to process various complaints well supported with different web services.

## 1. Introduction

A great deal of research has been focussed on incorporating e-administrations for the utilization of Municipal bodies representing a city. The ultimate goal of the administrative bodies is to give a peaceful and reliable society. There have additionally been reviews which address the ease of use point of view of e-administrations for a physically tested resident portion. While e-administrations have been being used in Europe for some time, they have been getting up to speed in India in huge urban communities, just as of late. To make things all the simpler these offices are additionally partitioned into the wards. Each ward inside a city handles protests of a specific issue. As of now, Mumbai has around 24 wards. Each ward has a ward officer who has an expert to deal with grievances identifying with or beginning from that specific ward. Dynamic national cooperation resembles a fuel that keeps the city body running. Because of dynamic national interest, an MC can witness productive working of the considerable number of utilities and administrations in the region under it. Dynamic national investment can happen when an MC will enable them to voice their issues and grievances.



Along these lines, protests ought to be speedily taken care of by the concerned departmental specialist or ward. Already there is an official website which is provided by the Indian Government to log the complaints by the citizens. But the problem is that it is a web application, so the user has to go their website and fill up forms before registering a complaint. Hence it becomes a tedious task to lodge a complaint on the go. The complaint tracking system is also not available right at the moment. So, to make the user signup and complaint registration process easier android application is developed. Because 95% of the smartphone users in India are using Android phones only. Later, IOS variant of this application can be created. The user is not needed to enter the Location details of the complaint like locality, city/district, state etc. Instead of that, we are using various Google APIs to make the working of our application users easier. The user is asked to select a location, by default the GPS location of the phone is tracked and used as the complaint location. If the user wants to specify some other location, he/she can scroll the Google map to get the required location or search the name of the location in the search bar which is provided at the top.

## 2. Related work

This portion of the paper briefly describes the existing systems which are of similar category and the effects of portability on data administrations and applications and the new standards of customer server processing expected to manage these effects. The worldview of versatile - mindful adjustment covers different methodologies and strategies in how frameworks and applications react to the ecological changes and the asset prerequisites [3]. It additionally proposes the vital framework benefits that could be used by versatile - mindful applications.

Full Client Architecture: Mobile customers must have the capacity to utilize systems with rather upsetting qualities: discontinuity, low transfer speed, high dormancy, or high cost. The network with at least one of these properties is alluded to as frail availability [5]. In the extraordinary case, portable customers will be compelled to work under the detached mode. The capacity to work in separated mode can be valuable notwithstanding when the network is accessible. For instance, detached operations can broaden battery life by keeping away from remote transmission and gathering [5]. It can diminish arrange charges, a critical component when charge rates are high. It enables radio hush to be kept up, an imperative ability in military applications. Subsequently utilizing Android we tend to consolidate data from the web with information on the telephone, for example, contacts or geographic area to make new client encounters [1,2]. The SDK helps us to run the Android application, including a genuine gadget emulator and progressed investigating apparatuses.

Through our reviews, we found that the online interface framework is an as of late propelled activity that gives a superior component to dispatch protestations [6]. We see from the interface the accompanying data. The interface seems, by all accounts, to be easy to use which seems to demonstrate the accompanying fields should have been filled by the client who needs to enlist the grumbling.

Once the data has been surmised by the server, it sends the data to the govt. bodies taking care of framework in a good arrangement as an HTTP call [3]. The reaction of the government bodies' protestation taking care of gateway is gotten and is parsed to decide the complaint number. This complaint number is then gotten by the client on his cell phone. In the occasion, the grievance is fragmented in the feeling of not having all the data that is compulsorily required to produce an objection number at the govt. entrance; the server gets into an association. In this mode, the framework creates an arrangement of powerfully produced questions to look for the required data from the client through menu decisions [1, 5].

In existing systems, there is not a facility to send the notification to the client device once the complaint registered by the client is processed. So, the user has to check the application every time to get the status of the application. But in our Application, once the app is installed on the user's phone then and the unique token will be generated for the device and sent immediately to the web server. Later when the request is processed this token id which is stored in the web server is used to send the cloud notification targeting the particular device. We can also send the image notification to the user, which includes the pictures attached by the user when he/she registers the complaint.

### 3. Google API Integration

#### 3.1. Google Places API

The Google APIs are for the most part Google Places API, Geocoding, Maps, pin code, Firebase cloud informing. The Place picker gives a UI exchange that shows an intelligent guide and a rundown of close-by spots, including places comparing to land locations and nearby organizations. Clients can pick a place, and your application can then recover the points of interest of the chose to put. The place picker gives the accompanying preferences over building up your own particular UI gadget.

The place picker highlights autocomplete usefulness, which shows put forecasts in view of client hunt input. This usefulness is available in all place picker reconciliations, so you don't have to do anything additional to empower autocomplete.

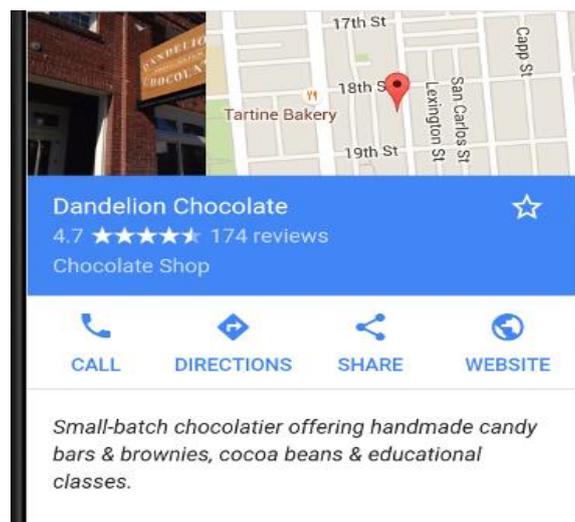


Figure 1. Google Maps API

Google Maps API helps in delivering a good web service with accurate latitude and longitude geolocal values. It is becoming one of the Google's biggest assets. Complaint Go uses this API to extract the exact location of the user from his/her Android device.

#### 3.2. Firebase Cloud Messaging(FCM)

FCM usage incorporates two primary segments for sending and getting:

- A trusted condition, for example, Cloud Functions for Firebase or an application server on which to construct, target and send messages.
- An iOS, Android, or Web (JavaScript) customer application that gets messages.

You can send messages by means of the Admin SDK and HTTP Request. For testing or for sending advertising or engagement messages with capable implicit focusing on and examination, you can likewise utilize the Notifications author.



Figure 2. Firebase Cloud Messaging

The biggest strength for the Complaint Go is the FCM from Google Inc. It delivers notifications to the Android users about the complaint status and other sensitive information.

#### 4. Complaint Go

In the present day world, the general population can't generally go to the police headquarters and give a protestation, so we can make utilization of the innovation to enlist the dissension. The most straightforward approach to enlist an objection is utilizing our advanced cells to enlist a dissension. And every one of the grumblings enrolled from the Android telephones can be seen and handled in the head online interface [6]. Once the grumbling is prepared by the executive then the notice is sent to the person who enrolled the consistent.

The client utilizes their telephone number as their login id and secret key. In the event that the client joins, then the required information is gathered specifically from the client, for example, name, Phone number, email address and so on. But while entering the address in the following segment, the client is asked for just to give his/her present address pin code. At that point we can utilize our Pin code API to get subtle elements, for example, territory, area, State, nation, and so on from the pin code provided by the client. In the home screen, the client is given chiefly two functionalities, for example, Register complaint, and View complaint Status [1].

##### 4.1. Complaint registration

In the drop down menu for type of the complaint, later the client ought to give a short portrayal for the complaint. Later the area is not given in content field; it is made simple utilizing the Google Place Picker. Once the place is picked in the Google place picker expectation, the required latitude and longitude esteem are passed on to the activity. At that point utilizing the Geo-Coding API, we can get the address, pin code, Locality name from the latitude and longitude provided by the user. If the agreeable is submitted, it will get put away in the online database for survey reason [1]. On the off

chance that the protestation is sufficiently valid, then it will prepare from their [3]. Once the protestation is handled the User will get the warning in their cell phone despite the fact that the application is in shut state.

The screenshot shows the 'Compliant GO' app interface. At the top, there's a yellow header with the app name. Below it, the section is titled 'ADD YOUR LOCALITY'. A text input field labeled 'Pincode Here' contains the value '600028'. Below this, there's a section titled 'Select your area' with a dropdown menu showing 'Raja Annamalaipuram'. Underneath, the 'City / District' is listed as 'Chennai' and the 'State' is 'TAMIL NADU'. At the bottom of the form, there is a grey button labeled 'NEXT'.

Figure 3. Fetching location

The user functionality is much reduced at the client side. He/she has to simply input the PIN code of the locality, like in figure 3. The corresponding area, city, district, and state is being identified and notified to the authority. The Google web services API plays the key role in the background.

The screenshot displays the 'Compliant Registration' app. The top header is yellow with the app name and navigation icons. The main content is divided into three sections:
 

- Details of the compliant:** Shows 'Compliant Type: crime' with a dropdown arrow. Below it, a text field contains the description: 'opened near VIT 3rd gate. And no police came.'
- Compliant Location:** Includes a 'CHANGE' button. The address is 'Address: Madras Salai, Madras Salai, VIT College, Katpadi, VIT University, Vellore, Tamil Nadu 632014, India'. The pincode is '632014' and the coordinates are 'LatLng: 12.9674444,79.15860239999999'.
- Attachments:** Includes another 'CHANGE' button. It shows a thumbnail of a hand holding a small object. Below the thumbnail, the filename 'IMG-201704313-WA006.jpeg' and size '1.2 MB' are displayed, along with a close icon (X).

Figure 4. Complaint Registration

The complaint is being lodged by the user from his/her locality. The details of the complaint are being recorded and the automatic location identification is being carried out. If the user prefers to attach any multimedia content such as an audio or video file, the corresponding provision is also available in the work, see in figure 4.

#### 4.2. View complaint status

It is used to check the status of the previously registered complaints where they are processed or still remaining in the pending state [5]. Each complaint is assigned a complaint number and the status message, refer figure 5.

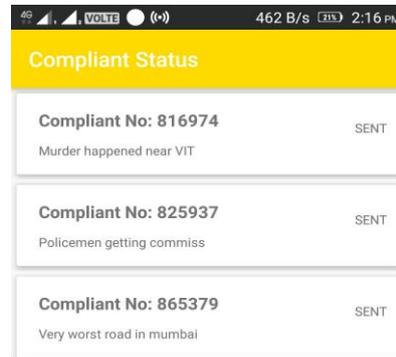


Figure 5. View Complaint Status

#### 4.3. Complaint processed Notifications

Once the complaint is processed by the Administrator in the Web portal, then the device token id which is previously stored in the web server can be used to send a Firebase Push Notification. The difficulty in this process is, a new token will be generated for the application device in the following scenarios:

- The user reinstalls the app / clears the cache / kills the app by clicking the Force Stop button
- The user clears the internal storage of the application

Another scenario which we have to consider is that, when the user has logged out and another account is used to sign in, then the token id won't be erased in the web server. So, it may lead to a problem; send the complaint status notification to the wrong user. To overcome this issue, we have to generate a new token whenever a user logs into the system. So that, the latest token will be updated in the web server and which can be used to send the notification to the user correctly.

The another feature in this notification part is when the User receives the notification in the system tray, then the user no need to open the app and go to complaint status section. The user can click the notification, which will directly take the user to the details of the complaint which is currently being processed.

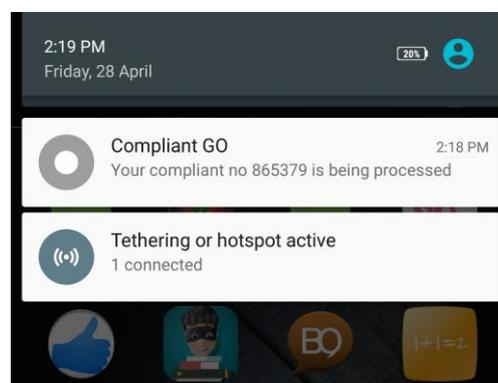


Figure 6. View Complaint Status Notifications

### 5. Experiments and results

The Complaint GO stands tall in the location accuracy and the complaint lodging from the particular region when compared to all the literature, surveyed works.

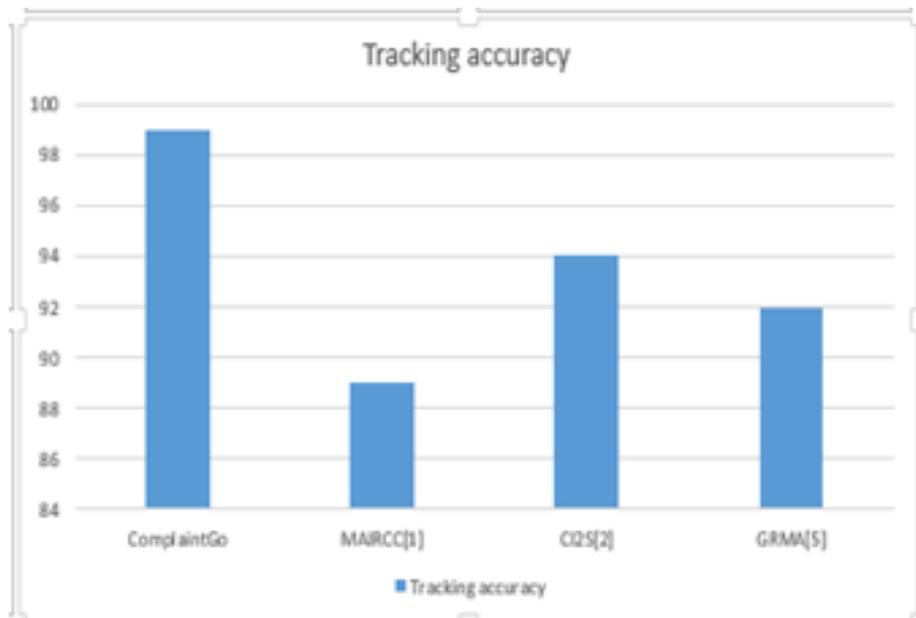


Figure 7. Tracking accuracy

In Figure 8, Error margin, App misbehavior, and Complaint Details are being plotted among various literary works. The Complaint Go has clearly very low error margins.

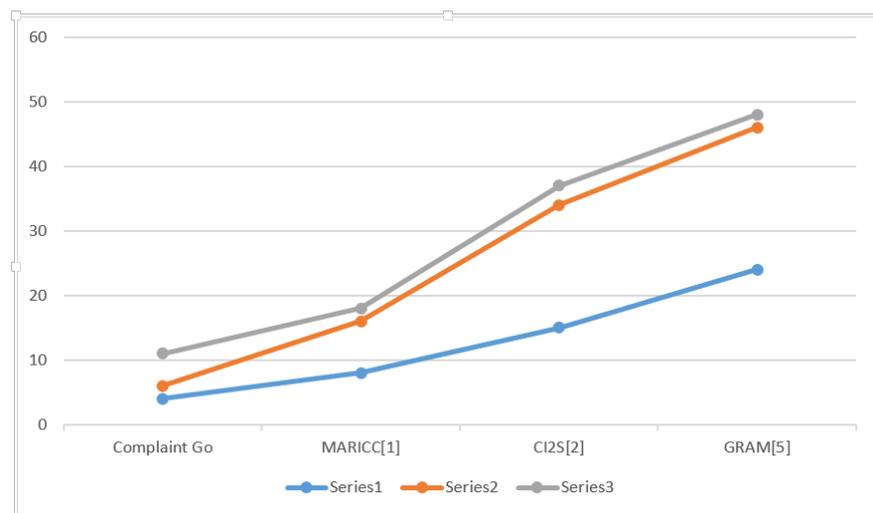


Figure 8: Error margin, App misbehavior, and Complaint Details

In figure 9 shows that predominantly ComplaintGo uses the more number of web services free of cost from Google, planning to improve more in the future work.

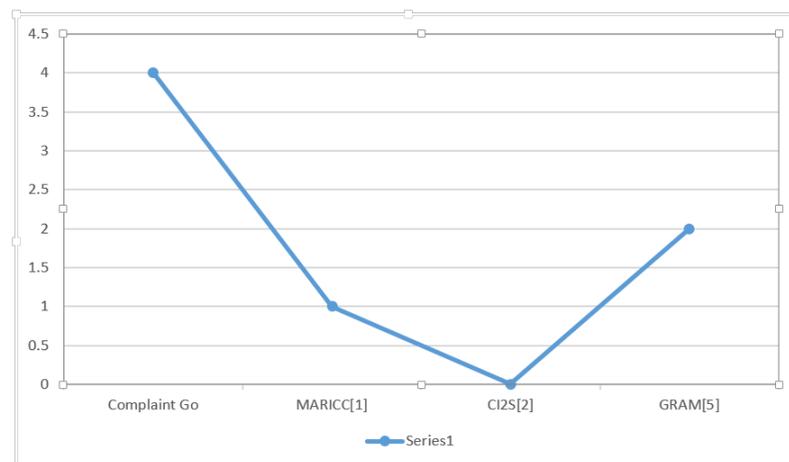


Figure 9. Web services employed

## 6. Conclusion and future enhancement

Complaint GO Android Application and Web Portal is used to register a complaint efficiently through the internet to Higher Government bodies directly. In future, this project can be enhanced using Big data technology to get the analytics and stats of the complaints like how often they are happening, in which place this similar kind of problems are occurring can be obtained.

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