

Citizens Corner

Grievance Registration and Tracking system using Natural Language

Nitish Parab
Computer Engineering
ACE
Mumbai, India

Rutuja Jadhav
Computer Engineering
ACE
Mumbai, India

Remya Nair
Computer Engineering
ACE
Mumbai, India

Ajeet Ghodeswar
Computer Engineering
ACE
Mumbai, India

Abstract—Municipal co-operation is the local governing body that looks after the welfare of the society. The main objective of this body is to address the complaints of the citizens to gain their trust and assurance. They can install surveillance cameras or sensors to ensure smooth functionality of the town and know the shortcomings of the city. Practically installation of cameras is not possible. As for now there are three ways for lodging a complaint from citizens' side. Firstly, a citizen can personally go to MC ward office and register his/her complaint to the concerned ward person. Second through a web portal system. Lastly through some contact center over a helpline number. Here our system we provides an easy way of solving the problems faced by the public by saving time and to eradicate corruption simultaneously. The objective of the complaints management system is to make complaints easier to coordinate, monitor, track and resolve, and to provide MC with an effective tool to identify and target problem areas, monitor complaints handling performance and make appropriate improvements in present management system. The proposed system enables and assists citizens to lodge complaint and seek redress through their mobile phone in natural language. Android being the major market gainer these days it makes our system working more convenient. It is a management technique for assessing, analyzing and responding to customer complaints and grievances in given time frame. The essential idea is to make use of the existing web portal infrastructure and provide an easy, cheap and quick mode of complaint registration [6].

Keywords—Android; web server; complaint system; municipal co-operation; sensors; cameras; web portal infrastructure; mobile interface; complaint system;

I. INTRODUCTION

In order to include e-services into practice for MC a lot of research work has been conducted [9]. To make citizens aware of the services provided by MC a number of researches have been conducted to make use of e-services. Even though these services are available in foreign countries from a long time they are come into use recently in large Indian cities like Mumbai. Mumbai MC has many different departments to handle citizens welfare which are further divided into wards. Each ward helps to keep up with the issues and each ward has a head that looks after daily affairs and its smooth functioning. Keeping an eye on everyday problems is not that easy. This is where the citizens come into picture. Generally we as a citizen face many problems related to governance in our daily life. Complaining about the same requires personal visit to respective government office, that is time consuming, and work may still not be done. Thus this

application aims at providing a platform to register any complaints regarding the governance, on the go. The proposed system is based on android enabled smart phone UI interface system emulates the functionality of the web portal based complaint filing system at end user level. The users use the mobile phone and do not need to access the web portal interface directly to file their complaint with some identity document. It consists of a web portal and an android app to register the complaints online, from anywhere, at any time. This will minimize time as well as money to go to an office for complaint registration. Once the complaint gets registered a department from the MC is notified about it, the person complaining is notified and kept updated about the status of the complaint.

Ease of registering a complaint is the main focus and objective of the system along with active participation from citizen's side. The priority of the complaint would be raised if the numbers of them are considerably more in an area. This application is basically created to help the people to solve the problems which they face in their day-to-day life. It is user friendly application. It takes less time to post their complaints. The main idea is to provide essential, cheap and easy complaint registration redress system

The essential idea is to make use of the existing web portal infrastructure and provide an easy, cheap and quick mode of complaint registration around the clock. The proposed system enables and assists citizens to lodge complaint and get the issue resolved through their mobile phone in natural language. Mobile phones are owned by everyone around the globe. Each day number of people using mobile phone is increasing [7]. Three related concepts are involved in this system. The first pertains to the replacement of personal visit to the office and registering complaints on paper, the second relates to a complementary electronic strategy for the handling of a customer's complaint and the third surrounds the process of taking actions by the government bodies against the complaints registered by the citizens. So in this paper we propose a android based complaint lodging system using NLP. Advantage of this system is that mainly no changes are needed to be done into existing web portal infrastructure, hassle free registration process for the complainant and use of a mobile phone which ensures active participation from citizen's side. In section II we will have a look at existing systems, in III section we will have a look at the architecture of the proposed system then we will conclude along with future scope in section V.

II. REVIEW OF LITERATURE

Here, we briefly examine the impacts of mobility on information services and applications, and the new paradigms of client-server computing needed to deal with these impacts. Through our studies we found that the web portal infrastructure [6] is a recently launched initiative that provides a better mechanism to launch complaints. We have found out that the web portal infrastructure [6] is an initiative that provides a better mechanism to launch complaints. From the interface the following information is noticed by us a) text box where user is required to fill complaints and other details b) a drop down menu where a department needs to be selected before user registers a complaint. The interface used in the web portal infrastructure is user friendly which shows the following fields that are to be filled by the user who needs to register the complaint.

The fields are mandatory and are as follows:

- 1) Department-wise login
- 2) Users Landmark
- 3) Users Location
- 4) Detailed description of the complaint and the complaint type
- 5) Ward (here the user is required to know the ward name else the complaint will be routed in a wrong ward)

Some optional inputs are also required by the system like name of the person lodging the complaint, address of the person lodging the complaint, etc. Once all the mandatory fields are filled up the system generates a complaint number and displays to the complainant. This complaint number can be used to query the status of the complaint later in future and even for reference purpose. In the web portal while lodging the complaint there are some constraints. The user is supposed to choose from among the list of pre-defined drop down menus list. Sometimes a complaint can be more than one type or not even mentioned in the list or the person might not be sure of the complaint type at times. This may create a major problem in the sense that the user might try to fit his complaint into one of the predefined type. This results into the complaint being directed to the wrong department which affects the time taken to resolve the problem. The second major issue is the need for the user to be aware of the ward number; on top of that the user needs to have access to a networked computer. The mobile interface system proposed in this paper tries to overcome these issues to provide an easy to user interface. The need for a networked computer is removed by facilitating lodging the complaint through a mobile phone; the need to know the ward number is removed by the system determining the ward number based on the location and landmark details entered by the user. More recently, we have provided a provision for the user to send in the photograph captured using their mobile phone camera. This however requires a higher end phone with camera facility plus an ability to download a small application (in Android) on to the phone.

III. METHODOLOGY

Here when a citizen register complaints, the system generates a contact number (actually generated by the backend system) and displays the complaint number to the user on his mobile phone. This complaint number will help the citizens to query the status of the complaint in future. In the case when system fails to register complaint, the system will ask the mandatory information to user. The proposed system also allows mobile users to send photograph of the scene which adds the authenticity in the proposed system and in some sense makes the complaint details complete. Along with the image the GPS module will also sends the real-time location information (which consists of longitude and latitude information) of the complaint site which provides accurate determination about the location of site.

The theoretical analysis of the methods here comprises of three phases or steps. The summarized detail about the phases is as follows:

A. First phase- Communication and Requirement Gathering Phase

Here all the required data for project initialization was collected. The data collection instruments used were, Interviews. This was used to solicit information from citizens, the municipal officers and staff.

B. Second Phase- Manual Planning and Modelling Phase

DFD, Use Case Diagrams and Sequence diagrams were used to model the existing and proposed system.

C. Third Phase- Content Construction Phase

PHP and MySQL were the tools used to develop the system. Android app for user would be developed using JAVA.

IV. SYSTEM ARCHITECTURE

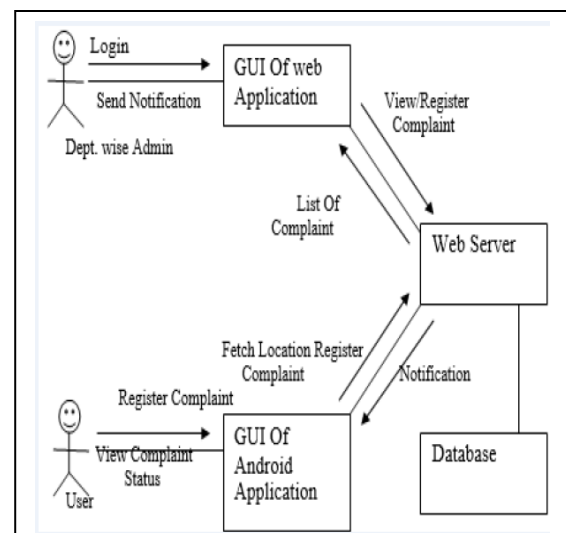


Fig 1 Block Diagram of Proposed System

Below are the phases included in the system for its working. The proposed system for complaint redressal has been broadly divided into three broad steps:

A. Complaint Registration and Recording

This is the first interaction between citizens and municipal authorities, wherein the citizen registers the complaint. The relevant complaint details should be included by the citizen while registering it. Once the complaint is registered the system generates:

- 1) A unique complaint registration number.
- 2) Complaint registration date and time.
- 3) Stipulated resolution time.
- 4) Name of concerned officials.

As soon as the complaint is registered, the system generates an acknowledgment containing the above details for reference of the citizen. This will also help him to track the complaint.

B. Complaint Resolution

After the complaint is allocated to the concerned officials, the relevant data is made available to the official. For this purpose each official is provided with unique login ID and password which can be used to access the details of the complaint to resolve the problem at the earliest.

At any point of time the complaint status can be either:

- 1) *Pending complaints*: one which cannot be rectified in stipulated time as it requires major repairs. Remarks for the reason why a complaint is pending should be updated by the concerned officials and should also communicate with the complainant.
- 2) *In process complaint*: If the complaint is not closed by the official as explained above, the system will show the 'In Process' status.
- 3) *Closed complaints*: Once the complaint is rectified by the official the status of complaint is updated as 'Closed complaint'. This is done by communicating with the complainant.

C. Monitoring and Reporting

- I. *Monitoring*: If the complaint is not resolved within stipulated time, it is automatically escalated to the higher authorities. Also the complainant is communicated to inform about the reason for delay.
- II. *Reporting*: The system should generate periodic reports on the number of complaints registered in particular time period, department wise, zone wise, complaints allocated to various officials, pending complaints, resolved complaints, etc.

• ALGORITHM USED FOR SYSTEM

NLP lays the foundation of this complaint redress system. Natural Language Processing NLP refers to AI method of communicating with an intelligent system using a

natural language such as English. Processing of Natural Language is required when you want an intelligent system like robot to perform as per your instructions, when you want to hear decision from a dialogue based clinical expert system, etc.

The field of NLP involves making computers to perform useful tasks with the natural languages humans use. The input and output of an NLP system can be – Speech Written Text NLP refers to the automated methods for converting free text data into computer-friendly format. This conversion is necessary so that the stored free text information can contribute to detection and characterization outbreaks. The following algorithm is used for the proposed system for purpose of free text recognition.

a) Hidden Markov Property:

HMM is a system where a variable can switch between several states, generating one of several possible output symbols with each switch. The sets of possible states and unique symbols may be large, but finite and known. We can observe the outputs, but the system's internals are 'hidden.'

V. CONCLUSION

We have proposed and introduced a novel mobile application interface for the citizens to register their complaints about the city. The system is targeted to every citizen who can own mobile phone and is available all the time. The proposed system can use the existing web portal infrastructure of MCGM in the proposed complaint registration system. Thus the main idea of the proposed system is to provide the mobile application which will facilitate the citizens to register their complaint about day to day complaints in their locality through a mobile application. The web application at the other end will efficiently track and monitor the complaints thereby generating a quick response to the citizen. Thus the proposed system provides an easy, cheap and quick mode of complaint registration around the clock. The entire system proposed, learning and application has been improved over period of time and we are looking forward of putting this whole system into practice someday for all android and IOS app users.

ACKNOWLEDGMENT

We would sincerely like to express our gratitude to all the people who have helped us in gathering information for this paper. We would like to thank our proposed system guide Prof. Ajeet Ghodeswar for his help and support throughout the paper without whom our initiative would have been rather incomplete. We would also like to thank our college staff, faculty and friends for their motivation and support while writing the paper.

REFERENCES

- [1] Dhaval Gherwada, Vipul Shah, Deep Shah, and Prof. Harsh N. Bhor, Mobile Application Interface to Register Citizen Complaint, (IJREAM) Vol-01, Issue 03, June 2015.

- [2] Ronan Collobert, Jason Weston, Leon Butou, Michael Karlen, Koray Kayukcuoglu & Pavel kuksa Natural Language Processing (Almost) from Scratch, *Journal of Machine Learning Research* 12, (2011).
- [3] Sunil Kopparapu, Natural Language Mobile Interface to Register Citizens Complaints, *IEEE Technical paper*, 2008.
- [4] Gobinda G. Chowdhury, Natural language processing, *Annual Review of Information Science and Technology*, Volume 37, Issue 1, Page 51-89, 2003.
- [5] Real Time Grievance Registration And Tracking System Application Dr. Swapna Borde, Gavari Erkar, jyoti Kaushik, Raminderkaur Gabrhi.
- [6] MCGM
<http://portal.mcgm.gov.in/irj/portal/anonymous/q1complaintreg>, accessed June 2016.
- [7] <http://wirelessfedration.com/news/category/mobilepenetration/>, accessed Dec 2015.
- [8] Sunil Kopparapu, Akhilesh Srivastava, and PVS Rao. A natural language interface for a railway website. In Second National Conference on Innovations in Information and Communication Technology 2006, 7-8July, PSG College of Technology - Coimbatore, 2015.
- [9] IST World. In Electronic Municipal Information Services- Best Practice Transfer and Improvement Proposed system, accessed Jan 2015.
- [10] The Municipal Corporation of Greater Mumbai. <http://portal.mcgm.gov.in> accessed Jan 2015.