Municipal Corporation Mobile Application for Complaint Resolver

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Abstract— the idea behind this project is to help the citizens of a municipal corporation to register their complaints about day to day problems in their ward through a mobile application. The application will provide a common man to deliver his complaints and problems to municipal authority as well as let the municipal authorities to address the issue as soon as possible. This application provides an interface to register one’s complained and follow it up. This interface provide a camera module which help clicking up a picture of any generalized problem that people are facing and will upload this photo along with the complaint. The location of complaint is tracked by Global Positioning System (GPS), this module provides exact location of that particular issue. This complaint, once registered, will be redirected to specific department of Municipal Corporation for example; a complaint about damaged road will be redirected to PWD department. This application is a state of art complaint management system tuned for organizations across a wide spectrum of Government departments. Public sector enterprises and private establishments. It is a single point web and mobile based complaint management system linking all departments in an organization could take administration efficiency to the next level. One of the key features in this is the provision for citizens/customers/employees to lodge complaints / grievances using their mobile phones with a software application specially designed to file complaints. Complaint can also be filed through a web complaint, telephone and traditional writing letters can be integrated in this application.

Key words: Peoples Corner, Natural Language Interface, Smart complaint feature, Enhanced Digitized System

I. INTRODUCTION

There has been extensive research in the area of e-services for municipal use. The idea is to understand the usability and utility of services that are provided by a Municipal corporation (MC) using newer and better technologies. There have also been studies which address the usability perspective of e-services for physically challenged citizen segment. While e-services have been in use in Europe for a while, they have been catching up in India in a big way in large cities, only recently. The MC of Mumbai takes care of the upkeep of the city is one of the more tech savvy MC. There are several departments within the MC to handle different aspects of the city upkeep. It is important for the MC to know about the problems as and when they occur or come into existence in the city, so that the problem areas can be dealt with quickly and efficiently. For efficient control of managing the city, the city is divided into various wards. The city of Mumbai has about 24 wards. Any complaint relating to or upcoming from a specific ward is only handled by an officer associated with that ward. Complaint redressal gets significantly delayed if the complaint corresponding to one ward is routed to a different ward. Efficient functioning of all the utilities and services in the area under MC depends on active citizen participation. Mumbai MC allows the citizens to voice their complaints using various interaction mechanisms. And a correctly routed complaint is handled promptly by the concerned departmental authority in that ward. Once a complaint is registered by the citizen, an appropriate departmental authority is notified about the complaint for action. The person complaining is notified of the status of the complaint. The major channels of complaint registration mechanisms available to a person are (a) a personal visit to the local ward office, where a person in charge listens to the complaint and asks for some personal details and put it across into an electronic form which is stored in a central database (b) through a contact centre over a telephone, where the complaint is registered by a call centre agent by typing the complaint into the system and more recently (c) through a web portal interface where the user fills in the necessary details by logging onto the portal. In all the cases the complaint is stored in a central database which is accessible to the concerned ward officer to handle. The ward officer can update the status of the complaint. The status of the complaint is available to the person who has placed the complaint through the portal to see 24 x 7.

This Application is a state of art complaint management systems tuned for organizations across a wide spectrum of Government departments, Public Sector enterprises and private establishments. It is a single point web and mobile based Complaint management system linking all departments in the organization could take administration efficiency to the next level. The system benefits the organization, employee and the citizens.

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II. RELATED WORK (LITERATURE REVIEW)

Municipal Corporation (MC) of a city is a local governing body which takes care of the functioning of the city. Including many other things one of the major responsibilities of an MC includes addressing the complaints that the residents of the city might have. Maintaining a large city requires that the MC be aware of any shortcomings either through surveillance (sensors/cameras) or by allowing the citizens to report them. Citizen’s reporting the complaint is usually preferred because there is a sense of belonging. A mechanism to accept complaints from citizens 24 x 7 would be the expectation from both the citizens and the MC. The Mumbai MC allows its citizens to place their complaints through several channels as mentioned above. While all of these modes have been made available for the citizens to lodge their complaints, the participation by the citizens has
been poor in the case of a personal visit or over a telephone contact center because of the amount of time involved in lodging a complaint for different reasons. But these modes of complaints bare the web based complaint registration system have poor active citizen participation because of the difficulty in using the forum to lodge complaints. The web portal (Figure 1) has had a large number of users though the penetration of computers with Internet connectivity is not very high in India. On the contrary the mobile phone penetration is very high and is growing in India in general and significantly more in the city of Mumbai. It makes sense to provide an easy to use mobile phone based interface to lodge complaints using their mobile devices. The most straightforward way to enable use of mobile devices to file a complaint is to port the web interface into Wireless Markup Language (WML) so that it can be browsed by the WAP browser on the mobile phone. While this is not difficult, it is expensive in two ways (a) WAP enabled mobile phones are more expensive and (b) citizens need to pay the telecom. In this paper, we propose a natural English enabled mobile interface which can be used to lodge complaints. The essential idea is to make use of the existing web portal infrastructure and provide an easy, cheap and quick (complaint as you see) mode of complaint registration around the clock. The proposed system enables and assists citizens to lodge complaint and seek redressal through their mobile phone in natural language.

Fig. 1: System Architecture

The advantage of this system is
- There is no change in the already existing web portal to lodge complaints,
- Citizen’s does not need to remember any specific information to lodge their complaint
- Interaction with mobile makes active citizen participation possible because of the higher craze and penetration of mobile phones in India.

III. EXISTING SYSTEM

The web portal interface [6] to help people lodge complaints is a recent initiative of the Mumbai MC. The interface consists of essentially two types of information’s (a) a set of drop down boxes where the user needs to choose from a select list of predefined options (see Figure 1 and (b) text box where the user is required to type in the complaint or the message (see Figure 1). The interface consists of six mandatory fields that need to be filled. The mandatory fields are:

1) Department (drop down menu; example, Drainage, Road and Traffic etc).
2) Complaint type (drop down menu which is based on the department selected; typically there are 9-14 complaint types for each selected department).
3) Details (a text-box where the user needs to write the actual complaint).
4) Location (name of the region where the complaint is applicable).
5) Landmark (a description of location, for example, near church).
6) Ward (drop down menu, user need to choose from a list of 24 wards).

Here the user needs to be aware of the ward name before lodging the complaint. Usually, people are unaware of the ward name and are only aware of the location name. The optional inputs required by the system are (a) name of the person lodging the complaint, (b) address of the person lodging the complaint, etc. Once all the mandatory fields are filled up the system generates a complaint number and displays on the web page. This complaint number can be used to query the status of the complaint at a forward date. The web portal while allowing the user to lodge complaints has some major constraints and limitations. The user is restricted to choose from among the list of predefined drop down menus list. This poses a major problem in the sense that the user tries to fit his complaint into one of the predefined drop downs. This results in a wrong fit and the complaint being directed to the wrong department which in turn affects the time taken to resolve the problem. The second major constraint is the need for the user to be aware of the ward number, additionally 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 use interface. The need for a networked computer is removed by facilitating lodging the complaint through a mobile phone; the need to select the correct complaint type and Department is removed by enabling the user to pose a complaint in natural English; 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 require a higher end phone with camera facility plus an ability to download a small application on to the phone.

IV. PROPOSED SYSTEM MODEL

The proposed mobile natural language based interface system emulates the functionality of the web portal based complaint filing system. The architecture of the system is shown in Figure 4. The users use the mobile phone and do not need to access the web portal interface directly to file their complaint. The user downloads an application onto his mobile phone [4]. The user runs the application on his phone to get a welcome screen. The complaint in natural English is routed using the SMS channel to the system Natural Language Complaint processing system block. The NL based complaint processing system then interpret the users complaint using natural language processing (NLP) techniques to determine the nature of the complaint (the
Department and the Complaint Type) and other details (location, landmark, ward number) which are mandatorily required to lodge a complaint at [6]. Once these information has been inferred by the system, it sends the information to the MC complaint handling system in a compatible format. The response of the MC complaint handling portal is fetched and is parsed to determine the complaint number. This complaint number is then received by the user on his mobile phone. In the event the complaint is incomplete in the sense of not having all the information that is mandatorily required to generate a complaint number at the MC portal; the system gets into an interaction mode. In this mode, the system generates a set of dynamically generated queries to seek the required information from the user through menu choices or as a text input. Once the system has all the required information, it sends to the MC complaint handling. The complete block diagram of the system is shown in the system makes use of the already available web portal interface to complaint filing platform and assist citizens to file their complaint using their mobile phone. The system enables the user to send his complaint in natural language. The input to the system is a free format English text. The system internally analyzes the complaint text using a set of natural language processing techniques to determine if the complaint has all the information required. If yes it sends the information in a form understandable by the MC portal. The information received from the portal is then sent back to the user, else; the complaint sent by the user is such that a complaint number cannot be generated using the MC web portal interface system, the application intelligently generates queries and gathers the required information from the user interactively. The user responds to the system generated queries. This interaction can happen more than once. All the information gathered, in addition to the free form complaint sent by the user is used to lodge the complaint with the web-based MC complaint registering portal and the generated complaint number is sent back to the user for his reference and tracking of his complaint in the future.

A. Flow Chart:

![Flowchart Diagram](image)

Fig. 3: Flowchart Diagram

(This is a sample of a general action flow sequence)

- User can easily register as a new member on the site through an android application.
- By using this application, user can complain for any particular area they wish in an easy method.
- Users have the ease to complain in any natural language using the smart interface.
- Using smart complaint feature, user can complaint at a click reducing their valuable time.
- The complaint is forwarded to the specific departments for processing.
- Once the user has registered a complaint, they can view the status of the complaint; whether it is processed or not.
- When the users complaint is processed the admin closes the complaint updating its status and the user is notified at the next login.
- Finally, there is a feedback process from the users which is taken into account for further improvement.

V. TECHNOLOGIES TO BE USED

A. Android:

Android is an operating system for mobile platforms such as smart phones and tablets. It is developed by the Open Handset Alliance, an approach by Google. Google purchased Android Inc. in 2005. The revealing of the Android distribution on November 5, 2007 was announced with the founding of the Open Handset Alliance, a corporation of 84...
hardware, software, telecommunication companies devoted to progressing open standards for mobile devices. Google released most of the Android code under the Apache License, a free software license. The Android Open Source Project (AOSP) is tasked with the maintenance and further development of Android. Android consists of a kernel based on the Linux kernel, with middleware, libraries and APIs written in C. Android a virtual machine also known as Dalvik and a just in time compilation to run a Java code. Developers write primarily in a customized version of Java. There are currently more than 520,000 apps available for Android. Apps can be downloaded from third-party sites or through online stores such as Android Market, the app store run by Google.

B. MySQL:
MySQL is the world’s most widely used open-source relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases. We intend to use MySQL because it’s a fast and easy-to-use RDBMS being used for many small and big businesses. MySQL is developed, marketed, and supported by MySQL Database, which is a Swedish company. MySQL is becoming so popular because of many good reasons: It’s released under an open-source license, so one has to pay nothing to use it[13]. MySQL is a very powerful program in its own right and it manages a large subset of the functionality of the most expensive and powerful database system packs.

C. ASP.NET:
ASP.NET is more than the next version of Active Server Pages (ASP); it is a unified Web development platform that provides the services necessary for developers to build enterprise-class Web applications. While ASP.NET is largely syntax-compatible with ASP, it also provides a new programming model and infrastructure that enables a powerful new class of applications. You can migrate your existing ASP applications by incrementally adding ASP.NET functionality to them. ASP.NET is a compiled .NET Framework-based environment. You can author applications in any .NET Framework compatible language, including Visual Basic and Visual C#. Additionally, the entire .NET Framework platform is available to any ASP.NET application. Developers can easily access the benefits of the .NET Framework, which include a fully managed, protected, and feature-rich application execution environment, simplified development and deployment, and seamless integration with a wide variety of languages.

VI. SUMMARY
User can take a snap shot of the particular activity i.e. water leakage, power cable hanging around, tree fall, unsocial activity etc. The application will augment the current position where the picture is taken. The above augmented picture is sent to the concerned authority.

The priority of the complaint would be raised if the numbers of them are considerably more in an area. Statistical information is maintained such as the no. of complaints received ward wise, no, of them solved, a graph to provide The pictures are also displayed to the general public on a discussion forum, where they can post their comments.

VII. FUTURE WORK
In Future we shall develop IOS app for Apple phone users.

REFERENCES