A Step Towards Smart City: A Pocket Size Solution For Traffic Police

Payal Raut[1], Priyanka Garad[1], Charul Patel[1], Ashwini Fake[1] and Shailaja Jadhav[2]

[1]Department of Computer Engineering, Marathwada Mitra Mandal's College of Engineering, University of Pune, Pune, India

[2]Assistant Professor, Department of Computer Engineering, Marathwada Mitra Mandal's College of Engineering, University of Pune, Pune, India

Abstract- **Now-a-days, Traffic Management is a severe issue faced by the city. Unfortunately traffic violations are rampant especially when police men are not present. Everyday there are more than thousands of traffic rule violations. To solve this problem this paper discusses an application designed in Android. This application will store the data like number plate and license number of the convicted person. It works on client-server application model to map Traffic Police to RTO Server model. All this data will be stored on server side in the database. Further, the category of the crime committed is selected. This will generate an automatic amount of the fine. The main aim is to automate the traditional process. Using this technology we can track the traffic police location to check whether they are present in their respective allocated areas. Since, the proposed system is digitalized and Android based, it will serve as handier tool and convenient alternative means for Traffic Police to register complaints on the server side against the people who violate the traffic rules. Thus, these error-free records could be addressed as and when needed.**

Keywords—**Android, JAVA Technology, Google Maps, SQL Database, Global Positioning System (GPS), INTERNET**

I. INTRODUCTION

Since past few years the number of vehicles is increasing exponentially. Increase in population and lack of good public transport system are the main causes of burst in number of vehicles. Along with increase in number of vehicles, the related problems have started to rise which includes pollution, violation of rules, etc. The problem of violation of rules has increased but the details such as fine amount collected, the user details and vehicle details are not stored anywhere. This paper aims to tackle this problem of maintaining collected fine amount and other related data in an efficient manner. Also it aims to replace the traditional ways of paper based receipts with digital records.

The current system of tackling the traffic rules violation has many flaws and loopholes. It is paper-pen based system. The traffic police officers have to constantly carry the receipt book to register the complaints. Hence, this system is not handy. If we use the android application the system will be feasible to maintain the records and easily accessible to the system user. Also, the System will provide user-friendly interaction to the end-user.

The Proposed System consists of Human Computer Interaction (HCI), Information and Communication Technology (ICT) devices interaction due to which it comes under Pervasive Domain leading it towards Smart City Project. The Proposed System will contribute towards the development of Smart City Project.

RTO department has to face many cases of corruption. So, providing a digitized solution will also help to make the system more clean and transparent. Thus, keeping in mind these two objectives our paper proposes a solution which will not only be economic but will also have a practical approach in Smart City Project.

The traditional system consumes more time to generate report and perform statistical analysis. The proposed system will help to generate quick report as this process is fast and automated. This paper is organized as follows. In section 2,3,4,5,6 and 7 literature survey, methodology, system software design, result, future scope are described respectively and finally we go to conclusion.

The following table consists of comparison between the existing scenario and proposed scenario.

TABLE I. Present v/s Proposed System Scenarios

Sr. No.	Conventional Paper Pencil Method	Android based Application Method
1.	Records are not maintained efficiently	Records are maintained
2.	Less Transparent	More Transparent
3.	Improper Fine Amount Collection	Automatic Fine Generation
4.	Cost Effective	Requires Setup charges

II. LITERATURE SURVEY

There are few projects[1] which have implemented traffic police assistance system. However, the system only helps to track the location of other traffic police officers. It offers no assistance regarding the violation of rules and fine collection details maintenance.

The second paper[2] has discussed regarding the android application, but it is more user-oriented. It discusses a breadth of applications which range from towing vehicles, location of police station and traffic rules. However, it has no provision to generate e-receipts (notification to the user).

The third paper[3] discussed the use of GPS technology to locate the potholes and further lodge the complaint. This concept has been implemented in the given paper. The analogy can be seen between the location of potholes and the location of traffic police officers. The area of concern has been divided in blocks for ease of administration. The officer's location can be monitored using the GPS location technology. A feedback has also been implemented to alert the officers regarding their positions.

The main aim of this paper is to bring ease in detecting the violations in traffic rules. For this the data needs proper organizing. Hence by using the feedback from the Global Positioning System, the complaint lodged will automatically be saved in the required location.

The fourth paper[4] gives the complete knowledge of how to build an android application on eclipse and get it run on emulator. Android has now become the most popular mobile operating system in the world. It has more users, more smartphones and more tablets worldwide than any other mobile operating system. The Google Play Store provides various applications supported by android operating system. The basic idea of building an android application on eclipse and making it available to the end users through Google Play Store has been in the given paper.

The next paper[5] discussed the basic idea of client-server architecture. With the development in technology, web based system are becoming most popular in our daily lives. Moreover, the web based applications are not only limited to computers but also opened to different kind of intelligent devices like smartphones. The client-server architecture involves the communication among the clients and the server through some communication channel. The client is a requestor whose request is satisfied by the server which stores the data in its database storage system. The basic implementation of client-server architecture is used in the given paper using this reference paper which speed ups the performance of the system.

III. METHODOLOGY

The architecture of this system is client-server architecture. The server side is managed by the administrator of the system which consists of database manager, communication manager, user interface, notification manager and Google Maps. The administrator has the right to add the traffic police, delete the entry of any traffic police and keep the track of their locations. The admin interacts with the system through Graphical User Interface (GUI) and provides the login identifications and passwords to any newly added traffic police. The server keeps the track of the location of traffic police through Google Maps using the Global Positioning System (GPS). The notification of the fine collected is provided by the server to respective user through message. The database keeps the complete records of any user who violated the traffic rule along with the required details. The complaints provide the details of the list of rules and the fine details for respective rule violation.

The client side consists of communication manager, notification manager, local database, complaints and user interface. The client side is for the end-users i.e. the traffic police officers. The traffic police uses an android application to communicate with the server. The server gives the details of fine to be collected based on the rule violation registered for that user by the traffic police.

The user is notified through message by the server after successful collection of fine by the client. In case of any communication failure between client and server the client can store the record of the user in its local database. The complete system architecture is shown in figure below:
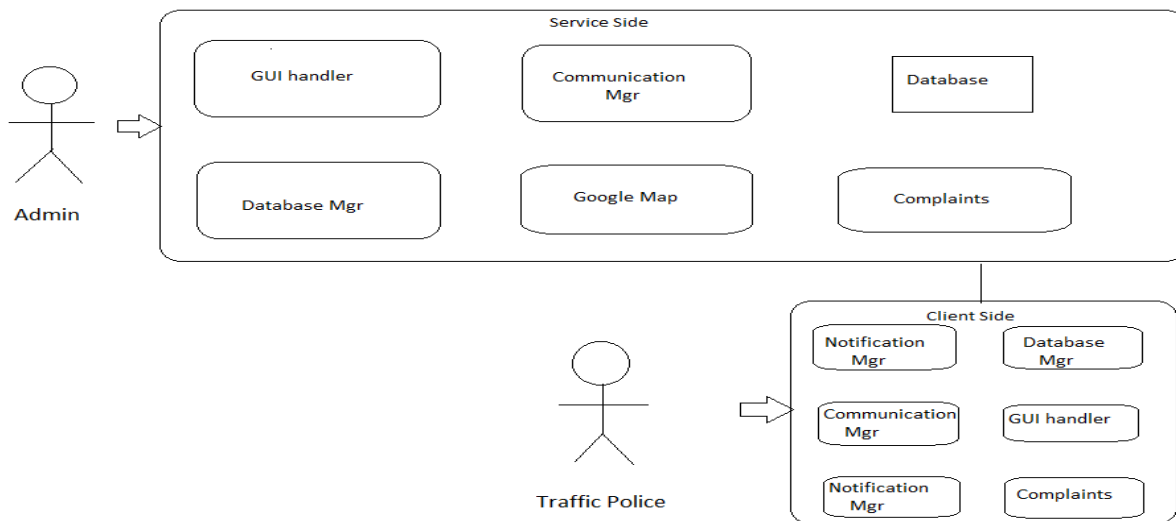

Fig. 1: System Architecture Diagram

IV.   SYSTEM SOFTWARE DESIGN

System consists of two user roles: Administrator (RTO) and Traffic Police Officer.

Administrator (RTO) accesses the server via a web application. The RTO has the right to add and delete any traffic police. It provides login identifications and passwords to every valid traffic police officer. The server receives the complaint from the clients. The system calculates the fine details based on the rule violated and sends the details to the respective client. The server has a database manager which keeps all the records of the users who violated the rules as well as the complete details like license number and vehicle number in the form of images. It also provides notification to the user after the collection of fine by the clients. The server keeps track of the location of traffic police using Google Maps. The administrator can broadcast any message to all the system users and even message the client personally if needed.

The second user is the Traffic Police which is the client accessing the system through android application via Smartphone. The role of the client is to register the user's details on the server along with the violation details. The server will generate the fine based on the type of rule violation selected by the client. The client will collect the fine generated by the server and will update the details on the server. The server will notify the user about the fine collection through message. The client's real-time location will also be sent to the server to keep the track of traffic police duty.

V. FUTURE SCOPE

The system will provide efficient maintenance of the fine records as well as user's details. The user's details stored in the form of images on the server database can be further used if required by extracting the data through image processing. For implementing purpose we need to make sure whether the user is aware of this automated system. Further modules may be added into the system for awareness purpose to promote traffic awareness amongst them.

VI. RESULTS

Server side web page-

Fig. 2: View table list of traffic police

:8080/TrafficPoliceServer/traffic_police_add.jsp

Traffic Police Register Form

FirstName*:

LastName*:

Gender*:   MALE ▾

Address:

Email ID*:

Mobile NO.*:

UserName*:

Password*:

Re Password*:

Register Latitude*:

Register Longitude*:

Add   Reset

Fig. 3: Adding new user (traffic police)

Client side mobile application:

Fig. 4: Home Page

Fig. 5: Starting the Server connection

VII. CONCLUSION

The applications of traffic information have become more popular with improvement of the condition of the wireless network, mobile devices and so on. Analyzing the system architecture, the research realized the functions of the searching real-time traffic information, location and police's location by making use of the Google Map or GPS technology. It realized the functions of data searching, data importing and modifying through the SQL database. The traffic police mobile office system based on Android can provides easy communication between traffic police working information and the traffic information. It also can get the real time traffic information, which improving the efficiency of traffic service and management. Also it provides an information source for managing the traffic. It is very important for security of the society. It also maintaining the complete information about the user who committed the crime and fine generated.

ACKNOWLEDGEMENT

REFERENCES

[1]. Pune traffic app – https://play.google.com/store/apps/details?id=com.punetrafficpolice.punetrafficapp
Hyderabad Traffic App –
https://play.google.com/store/search?q=hyderabad%20traffic%20police%20app&c=apps&hl=en

[2]. Muhammad Baqer Mollah, Kazi Reazul Islam, Sikder Sunbeam Islam, "E-Police System for Improved E-Government Services of Developing Countries" MAY-2012

[3]. Anand Kulkarni, Naved Khan, Ajinkya Modak "Voice Enabled Android Application for Traffic Complaint and Pothole Notification System Using GPS and GSM-GPRS Technology" International Journal of Advanced Research in Computer and Communication Engineering Vol. 3, Issue 3, March 2014

[4]. Garima Pandey, Diksha Dani, "Android Mobile Application Build on Eclipse" International Journal of Scientific and Research Publications, Volume 4, Issue 2, February 2014 1 ISSN 2250-3153

[5]. Haroon Shakirat Oluwatosin, "Client-Server Model" IOSR Journal of Computer Engineering (IOSR-JCE) e-ISSN: 2278-0661, p-ISSN: 2278-8727Volume 16, Issue 1, Ver. IX (Feb. 2014), PP 67-71

[6]. Deepa V. Jose, Lakshmi Priya C, G. Priyadarshini, Monisha Singh, "Challenges and Issues in Android App Development- An Overview" International Journal of Advanced Research in Computer Science and Software Engineering Volume 5, Issue 1, January 2015 ISSN: 2277 128X

[7]. Mumtaz Al-Mukhtar, Sarmad Hadi, "Developing A Three-Tier Web Data Management Application For Higher Education Admission Environment", International Arab e-Journal of e-technology, Vol. 2, No 4, June 2012

[8]. Suhas Holla, Mahima M Katti, "Android Based Mobile Application Developement and its Security", International Journal of Computer Trends and Technology- volume3 Issue3- 2012

[9]. J.Parthasarathy, "Positioning And Navigation System Using GPS", International Archives of the Photogrammetry, Remote Sensing and Spatial Information Science, Volume XXXVI, Part 6, Tokyo Japan

[10]. Jerry Yao Deku, Mohammad Sarrab and Hamza Aldabbas, "Three Tier level Data Warehouse Architecture for Ghanaian Petroleum Industry", International Journal of Database Management Systems (IJDMS) Vol.4, No.5, October 2012

[11]. Li Ma, Lei Gu and Jin Wang, "Research and Development of Mobile Application for Android Platform", International Journal of Multimedia and Ubiquitous Engineering Vol.9, No.4 (2014), pp.187-198 http://dx.doi.org/10.14257/ijmue.2014.9.4.20

[12]. Sumit R. Farsole, Shreyas B. Kene, "E-Police Police Record Management System", International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169 Volume: 2, Issue: 3, 497 – 500

[13]. Book Name: Software Engineering: A Practitioner's Approach Author: Roger S. Pressman

[14]. Book Name: Software Engineering Author: Ian Sommerville

[15]. Book Name: The Definitive Guide to SQLite Author: Grant Allen, Mike Owens