

Traffic Police Systems should be Digitized ?

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Abstract:- Nowadays a lot of traffic violations are observed in cities. In order to attend these violations in an efficient and digitized manner we have presented this system. The current police system has only a few digitized options. In this paper we are presenting a system that will help the police system to get the information about the traffic violations in a proper manner and to examine them. This will in turn reduce the manpower required otherwise. Digitizing these systems will help to increase their efficiency. Digitizing reduces most of the paperwork. Also, the exact description of crimes can be made available, due to which communication gap in common people and police department will be reduced. This paper explores the concepts of data mining and location based services. Data mining techniques used are clustering and searching algorithms. For clustering k-means is used. LBS are used to provide location of person or object.

General Terms:- Data Mining, Location Based Services, Criminal Records, Cloud Storage.

Keywords:- LBS- Location Based Services, K-Means Clustering.

I. INTRODUCTION

In this digital world, police systems have very few digitized features. With the increase in crime and corruption, digitization and bringing smartness in police workforce has become a necessity. Digitizing this system will improve the efficiency. Digitizing can even provide numerous benefits like reducing previous file work, detailed description of crimes, ease of communication between common people and police, efficient access of criminal details, ease of police. Here we are using data mining for analyzing criminal records. Data mining turns an oversized group of data(of information) into knowledge [5]. It is the computed method of discovering patterns in massive knowledge sets. Data mining is used to extract information from a data set and to use it for required purpose. Nowadays various technologies are brought up which can be used in our system as well for easy storage, access and analysis. We are developing a system which has many advanced features. We have devised a system using data mining to store and get records and location-based services for some more functionality such as to get the current exact location.

Location-based service (LBS) is a service that is used to get the exact location by the GPS features. It is software-level service to identify a location of a person or object. In this system, we use LBS to work from any location and more efficiently. This gives remote access to users and thus eliminates the need of the files, records and managing the paperwork.

The android application used will help to store individual data. The verification of similar types of violation can also be done as well as to collect the data of the violators. Among various tasks and techniques of data mining, basically Clustering algorithm and some searching techniques are used.

II. LITERATURE SURVEY

There are many papers which implement similar techniques of data mining. A lot of papers have been overviewed for their advantages to implement in our system. As per the paper presented by (Zhaojian Li, Dimitar P. Filev, Ilya Kolmanovsky, Ella Atkins and Jianbo Lu) road anomalies can be recognized by use of Mahalanobis distance, also a new clustering algorithm is used to process these reports. Two clusters are used i.e. main and outlier. The Mahalanobis distance is used to analyse a new report and the existing clusters. . The projected cluster algorithmic program will determine isolated anomalies and compress data for densely distributed anomalies. Some data mining techniques are used to find the crime reports suggested by (Arunima S. Kumar, Raju K. Gopal).This paper focuses on analysing the crime information by data mining techniques. This provides digitization of the complete investigation process. The major data mining methods used are clustering and classification. The location-based services and the GPS modules are well explained by (SeokJu Lee, Girma Tewolde, Jaerock Kwon).This paper uses the GPS modules for vehicle tracking system and get geographic coordinates at fixed time intervals. The GSM/GPRS module is employed to transmit and update the vehicle location to an information. The android based location services are properly given by (Manav Singhal, Anupam Shukla).Here a system is proposed using LBS for web Services and Transit APIs on Android Phone to give multiple services to the user based on the provided services.

References	Data mining	Android	Location based services	Clustering	Criminal record system
1) A New Clustering Algorithm for Processing GPS-Based Road Anomaly Reports	Yes	Yes	Yes	Yes	No
2) Design and implementation of vehicle tracking system using GPS/GSM/GPRS	No	Yes	Yes	No	No
3) Implementation of location primarily based services in android uses GPS and internet services.	No	Yes	Yes	No	No
4) Data mining-based crime investigation system	Yes	No	No	No	Yes
5) A web based Criminal Record System Using Mobile Device	No	Yes	Yes	No	Yes

Table 1:- Literature Survey

III. PROPOSED ARCHITECTURE

The system comprises of a web application, an android application and a database for storing all the data. The web application is for the higher authorities, this is the first step in the complete process. First the admin will add own details then as needed other users can be added. Based on the later added users the login credentials will be generated for the app. This android application would provide the user easy access and analysis of the respective crimes. It allows traffic police to report incidents and get it

verified by the higher authorities. This application, for police officials performs various database operations such as add, delete, update on criminal record, allowing efficient retrieval of required information. The application focuses on to manage the crime violations for traffic police and higher authorities without consuming much time. This proposed system is divided into three main sections.

1. Web application
2. Android application
3. Cloud database.

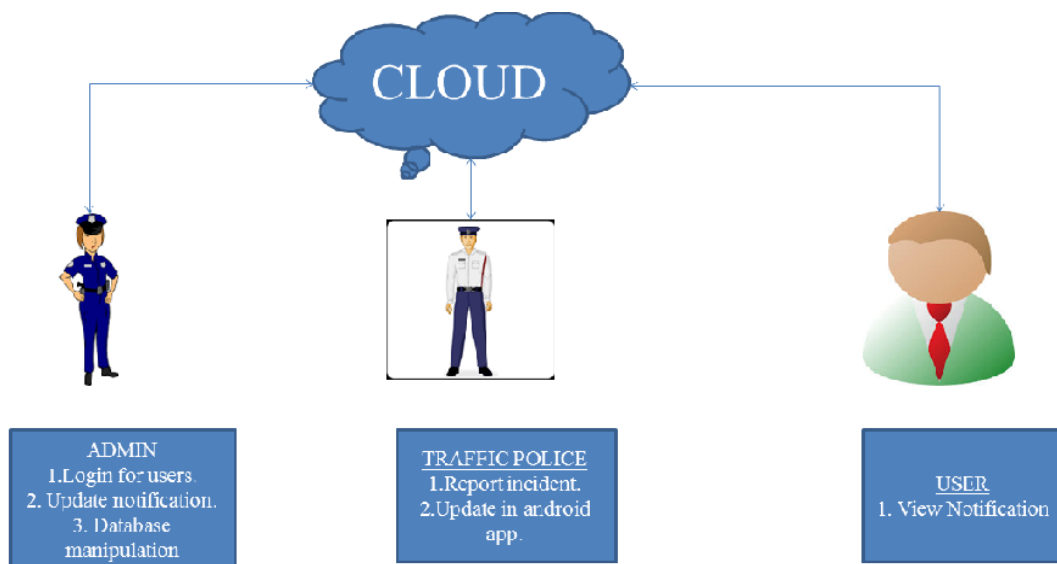


Fig 1:- Architecture of the System.

As shown in the above diagram, every actor has their own responsibilities. Admin has the following responsibilities:

- Add the login details for the surveyor i.e. the traffic police.

- Add personal data in fields that further are visible on to the android application.
- Generate the graph analysis report (most crime in particular area).
- Modify login credentials.
- Show the Crime report on map.

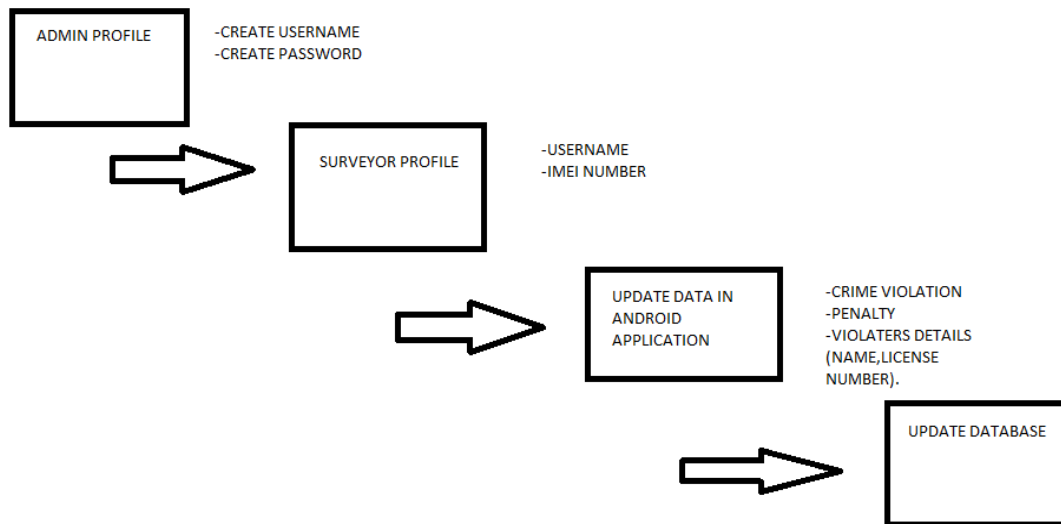


Fig 2:- Working of System: Module 1

Surveyor has the following responsibilities:

- Fill all the crime details.
- Sync all the details using sync control.
- Update the crime details if required.
- Store the data offline and when connected all the offline data will be synced with the database server.
- Assign the priority to the crime records.
- Update latitude and longitude after 5 seconds.

The module-1 of the working shows the data entering process by the traffic police and that data is further reflected in the database.

The second module shows when the data is entered then how it is further filtered and stored. Then this data can be modified or updated by the admin. This can also be searched by using proper searching algorithm.

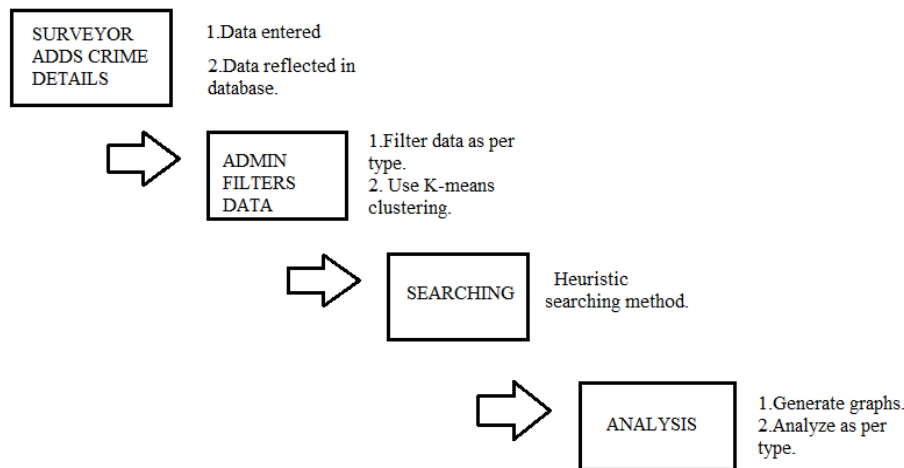


Fig 3:- Working Module-2

The result of the system is supposed to be the reports as per the crime type, through which analysis can be performed. This data is used for further investigation of crimes and violations.

➤ *K-Means Algorithm*

k-means is one of the simple algorithms in order to form clusters. This is a simple procedure to form clusters as per the similarities between objects. For this, cluster centers

are found for a data set. These centers are placed at almost equal distances from data objects. The algorithm can be stated as:

Let $X = \{x_1, x_2, x_3, \dots, x_n\}$ be the set of data points and $V = \{v_1, v_2, \dots, v_c\}$ be the set of centers.

1. Arbitrarily choose k objects from X as the initial cluster centres.
2. Repeat

- a. Reassign each object to the cluster to which the object is the most similar based on the mean value of the objects in the cluster.
- b. Update the cluster means, that is, calculate the mean value of the objects for each cluster.
3. Until no change [5].

IV. ADVANTAGES AND DISADVANTAGES

Digitization of the system provides many features and improves the efficiency of the systems. It reduces file work and increases the transparency between common people and police. Also, it is very flexible to use. With this application the common people can easily and immediately report a crime taking place or has taken place. This ensures faster reporting of crime which further helps police to attend the crime faster thus making a city much safer. Also, it gives the police system a better and an efficient interface for convenient working, which is faster than the current system as it takes a lot of time for the investigation. Also, human errors are reduced due to digitization. Reporting crime via ancient communication system is extremely agitated. Hence the proposed system is efficient and convenient.

As every system developed is not perfect and has some flaws, this system also has some disadvantages as; all the information is not readily available at some point in investigation and also causes an economic and social inequality with regard to access to or use of information and communication technologies.

V. CONCLUSION AND FUTURE SCOPE

We have devised a method for creating a system for ease process of managing traffic violations. Our system is based on the principle of using Location Based Services and various techniques of data mining. LBS are used to get the location of the surveyor after regular intervals. The advantages of our method have been clearly mentioned in the paper. This is complete digitization of current process.

This field of study will always have a future scope and can be implemented in different fields as well further enhancements can be made to make it more suitable and viable.

VI. ACKNOWLEDGEMENT

➤ With due respect and gratitude, we take the opportunity to thank all those who have helped us directly and indirectly. We show our sincere gratitude towards co-operative department which have provided us with valuable help and necessities for the system development. We would prefer to take this chance to give thanks my internal guide faculty member Prof. Gauri Ansurkar for giving all the help and guidance I needed. We are also grateful to Mrs. Divya, Head of Information Technology Department, Keraleeya Samajam's Model College, Dombivli. for her indispensable support and suggestions. This

acknowledgement will remain incomplete if we do not mention sense of gratitude towards our esteemed Principal who provided us with the necessary guidance, encouragement and all the facility available to work on this project.

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