IMPORTANCE OF LOCATION AWARE ARCHITECTURE FOR CRIMINAL WATCH: A CASE STUDY OF POLICE STATIONS IN SATARA DISTRICT

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Abstract: This research paper highlights the importance of location aware application to keep a watch on criminals so as to reduce crime incidences under the Satara District Police Station Jurisdiction [SDPSJ]. The police system in any country has to play a very significant role in crime investigation and prevention. Crime and criminal record is stored and retrieved using CIPA and CCIS at the Police Station (PS) and the District Police Office (DPO) levels respectively. This initiative by the Police is useful for getting the criminal data & information but it does not serve the purpose of designing an action to prevent the crime. It has become a major challenge for the police system to detect and prevent crimes and movements of criminals. There is no information of any kind that is available before the occurrence of criminal acts. This results in the increase of crime rate. This paper highlights the use of location aware application technology to keep watch on the movements of criminals, which can be useful in prevention of crimes and thereby bring down the crime rate.

Keywords: Mobile, GPS, Crime, NCRB, Investigation, CCIS, CIPA, CrPC.

INTRODUCTION

Police plays an important role in civil administration in India. The Constitution of India assigns a responsibility to maintain the law and order in the country. Police force is in insufficient ratio as compare to population. [1], it leads to increasing graph of crime in nation, another reason is lack of use of information technology in investigation and in prevention. Keeping these things in mind govt. of India designed G2G model. In 1986 Govt. of India created National Crime Record Bureau (NCRB). [2] Under NCRB the state crime record bureau [SCRB] for state and District crime Record Bureau [DCRB] for districts has been created. In order to making use of information technology, The Government of India designed Crime Criminal Information System [CCIS] to store and retrieve crime and criminal records. To provide the input to CCIS, the Common Integrated Police Application [CIPA] was also designed. CIPA software install in every police station, CIPA is only limited to the informative purposes only, therefore it need to be advancement in existing system such as use of Location Enable [LEA] and Location Aware Application [LAA] Technology along with CIPA & CCIS system.

SATARA DISTRICT POLICE CURRENT SCENARIO

Satara District Police System

The motto of Maharashtra Police is. **'सद्रक्षणाय खलनिग्रहणाय'** It means that Maharashtra Police is committed to PROTECTING THE RIGHTEOUS AND CONTROLLING & ANNIHILATING THE EVIL. The Head of state police is Director General of Police [DGP]. The state is divided into administrative units called as Districts. A group of districts called as a region and Head for each region is Deputy Inspector General of Police [DIGP]. Superintendent of

Police [SP] is head for district and is assisted by Additional Superintendent of Police [Addl. SP] and Deputy Superintendent of Police [DySP] in each district.
Satara District police is headed by Superintendent of Police supported by an Addl. Superintendent of Police with 7 Deputy Superintendent of Police, 20 Police Inspector, 78 Asst. Police Inspector and Police Sub Inspector and adequate number of Constable are working.

COMMON INTEGRATED POLICE APPLICATION

CIPA is aimed at building the basic infrastructure and mechanisms for the Crime and Criminal Information System, based on CrPC, which is uniform across the country, from Police Station level onwards. CIPA being a National project is to be implemented in a time-bound manner from police station level onwards for computerization of police records and use of IT in their functioning on a uniform basis throughout the country.
The national level Central CIPA Implementation Committee comprising of Director, NCRB and representatives from the Ministry of Home Affairs (Police Modernization and Union Territories Divisions), NIC, National Institute of Criminology and Forensic Science and States, has been constituted to monitor the implementation.
State Crime Records Bureau and State Police Training Academies are conducting State Specific courses in this connection with the assistance of NIC. NCRB has introduced two advanced courses on CIPA in its training calendar for resource persons, who in turn will impart training and attend to trouble-shooting in the States. [5]

Crime Criminal Information System [CCIS]

In 1986 Government of India created National Crime Record Bureau [NCRB]. Under NCRB the State Crime Record Bureau [SCRB] for States and District Crime Record Bureau [DCRB] for Districts has been created. In order to make use of Information Technology the

Government of India has designed Crime Criminal Information System [CCIS] to store and retrieve crime and criminal records. This system has been upgraded to CCIS Multi-Lingual web-enabled (CCIS MLe) in the year 2005 with facility for 5 regional languages i.e. Marathi, Gujarati, Tamil, Kannada and Gurmukhi, besides English and Hindi. Feature of crime analysis through data warehousing has also been added. The application has been web-enabled so that the field level investigating and supervisory officers can access the CCIS MLe database at National and State Levels through internet; anywhere - anytime.

Information Technology audit of computerization in Police Department noticed that Crime and Criminal Information System and Common Integrated Police Application meant for crime data storage and retrieval did not deliver the desired output. The deficiencies in input controls and supervisory checks have resulted in incomplete and incorrect database, making the systems unreliable and thus not useful. No tangible benefits have thus accrued so far from the computerization. [6][7]

LOCATION BASED APPLICATION IN CRIMINAL WATCH

Map represents many complex relations and data. Map tells the story of the past, record the present, and reveal the future. The real world provides a commonly understood framework for the endless fields of digital data on desktops, mobile, corporate network or on the internet. The conventional map is changing into digital map and it will have life through its vibrant contributing community of experts that fulfill the dream of access to local knowledge.

Now a day's power of location technology not limited to companies with inelastic needs and ample resources but it can be used in real time world like Real Estate, Motor Transport and many more.

Location-Based Applications are applications that are either know how to process location-based information or make the use of their location for other processing; these are divided into two categories

a) Location-Enabled Application [LEA]. b) Location-Aware Application [LAA]. LEA understands location and knows how to process it whereas LAA are similar to LEA except that they are aware of their own location. A simple Map and direction with GPS Device or Mobile can provide you direction based on your current location. This can be implemented to criminal those are MOST WANTED. Both LEA and LAA Application can be builds using Disconnected or Connected Architecture.

LEA Connected location-based application architecture

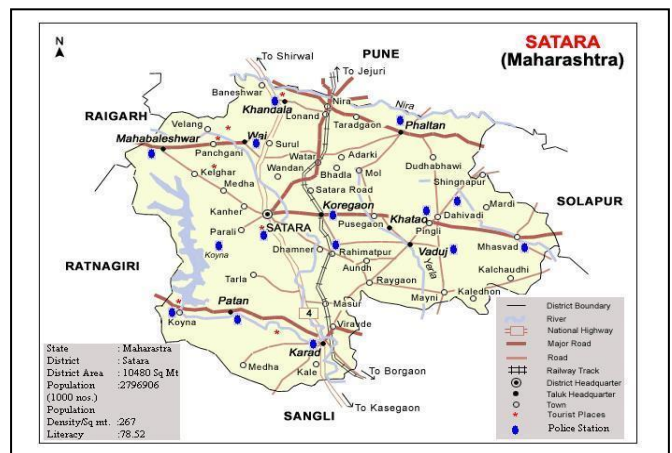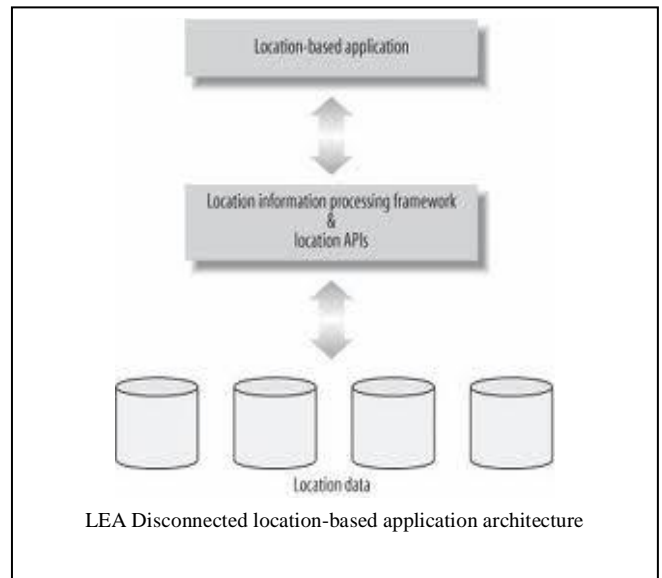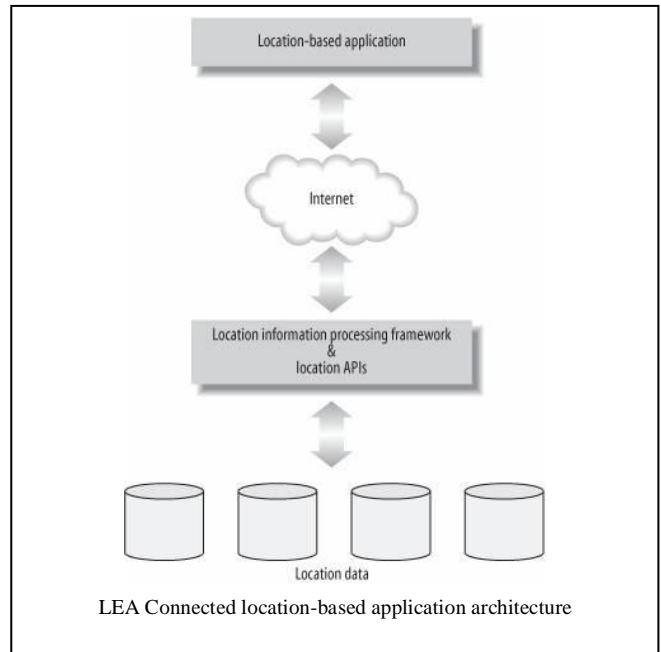LEA Disconnected location-based application architecture

Figure3. The Satara District Map using Disconnected LEA

In order to build LAA it is necessary to use connected architecture. There are number of service provider to provide Map services such as Microsoft MapPoint, Microsoft Location Server, Google API, Yahoo API and Many more. For this

research paper we are considering Microsoft Location Server [MLS]. MLS is and enterprise hosted server that enable real time location scenario using locatable device, such Mobile Phone, Pager etc. it doesn't requires GPS Device. MLS locates provisioned user's mobile device by communicating with a mobile/Pager Operator. The MLS Architecture shown as below
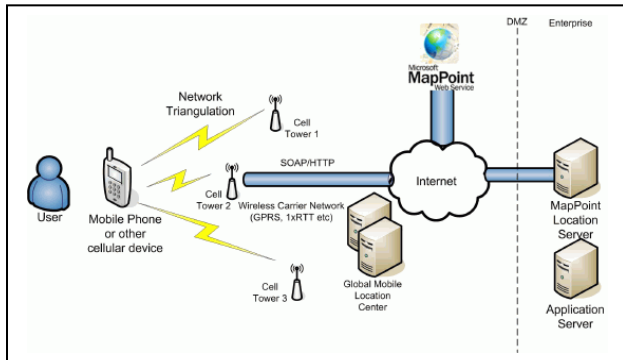

Figure 4. MLS Architecture

In this scenario user request his position using a mobile device equipped with a client that communicate with MLS. When MLS receives request from the client it identifies the mobile operator for the user and send a location request to mobile operator, which responds by sending back the real time location of the user, expressed as latitude and longitude coordinates. MLS then requests a MAP from MapPoint Web Service [MPWS] to process user's real time location. All communications specific to a mobile operator are hidden from en user and developer.

In order to reduce the crime SDP has taken few steps Such as building Mohalla Committee, Mahatma Gandhi Tanta mukt Gaon, Community Group, Student Police friend etc. in addition SDPS are using CCIS and CIPA software which are insufficient. As the part of policy the MOST WANTED Criminals are banned in the SDPSJ on certain occasional festival such as Diwali, Ramjan, Voting Period etc. even though these criminal comes in into area and commit the criminal act. Such MOST WANTED Criminals mobile number are registered with Police Station [PS], using their mobile phone Crime Investigation and Prevention Officer keep watch on the criminals.

Presently these services are provided by few organizations such as Google, Yahoo, and Microsoft using Web Services, Web API's, in order to avail these services you need to pay some amount to these service providers.

Today many organizations are preparing database for Point of Interest [PoI] such as Restaurants, Coffee shop, Malls, Theaters , Petrol Pumps , Trekking, Gardens and many more , already Crime and Criminal database is in operation so there is need to concentrate on these area that could be helpful to crime investigation and prevention officer

Following map shows the location of banned criminal in the police station jurisdiction. As soon as the criminal enter into banned region the investigation office will come to know and necessary preventive action may be taken within time and further happening crime can be prevented
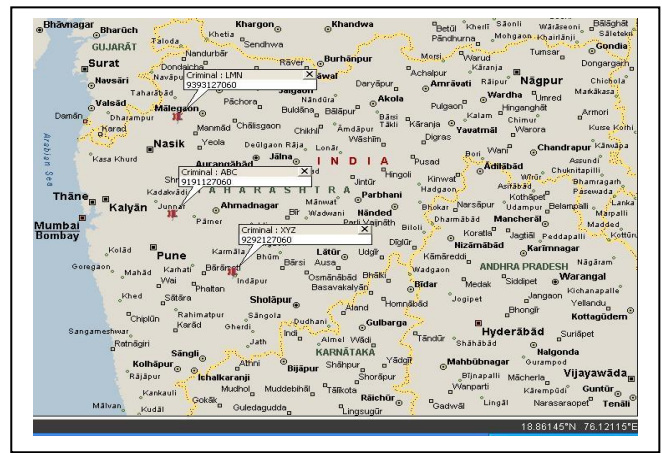

Figure 5. Map of current location of the Banned Criminal

CONCLUSIONS

Crime Investigation is one of the important tasks of police organization in the India. In today's IT enabled era many techniques are available for crime prevention and investigation.

There is huge gap between number cases registered and completion of investigation, due to many reasons which are stated below.

Integrated Mechanism for Investigation: The Common Integrated Crime Analysis Cell [CICAC] must be formed to help the investigation officer on requirement.

Technology Usage: Police must use the intelligence technology for investigation. As on today they are mostly investigate with traditional way, on contrary criminals are using very sophisticated technology and often finds the loop hole, due to which, there is tremendous increase in crime ratio.

Intelligence failure is an important issue, and it requires improving intelligence.

Innovative Practices Training [IPT] must be provided to the investigation personnel on regular basis.

ACKNOWLEDGMENT

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