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Integration of Microsoft MapPoint Location Server for Criminal Movement Tracking

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Abstract:

This research paper highlights the importance of Microsoft Location Server [MMLS] to keep a watch on criminals so as to reduce crime incidences under the Police Station Jurisdiction [PSJ]. 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 MMLS to keep watch on the movements of suspects and criminals, which can be useful in prevention of crimes and thereby bring down the crime rate.

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

1. 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. The Motto of Maharashtra Police is 'राष्ट्राणाय रवलोनिग्रहणाय' it means that Maharashtra Police is committed to <u>PROTECTING THE RIGHTEOUS AND CONTROLLING AND ANNIHILATING THE EVIL</u>. 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.

In 1986 Govt. of India created National Crime Record Bureau (NCRB). 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, The CIPA and CCIS systems are useful for data storage, data sharing and accessing data. There is no system under which one police station can talk to another directly. There is no record of crimes or criminals that can be accessed by a Station House Officer, except the manual records relating to that police station. Realizing the gross deficiency in connectivity, the Central government is implementing an ambitious scheme called "Crime and Criminal Tracking Network System (CCTNS)". The goals of the system are to facilitate collection, storage, retrieval, analysis, transfer and sharing of data and information at the police station and between the police station and the State Headquarters and the Central Police Organizations. Still the CCTNS is under development phase, however the purpose of effective prevention of crime does not serve purpose, therefore it need to be advancement in existing system such as integration of MMLS Technology along with CIPA & CCIS system.

2. OBJECTIVE

    a. To study the use of MMLS in location tracking
    b. To implement the model for criminal and suspect location tracking

3. CURRENT STATUS OF IT INFRASTRUCTURE

The prime motive behind introduction of Information Technology in the police has enhance their productivity.. In order to making use of information technology, The Gov of India designed Crime Criminal Information System [CCIS] to store and retrieve criminal records. To provide the input to CCIS, the Common Integrated Police Ap [CIPA] was also designed.

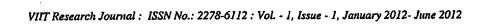### a. COMMON INTEGRATED POLICE APPLICATION [CIPA]

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

b. CRIME CRIMINAL INFORMATION SYSTEM [CCIS]

In 1986 Government of India created National Crime Record Bureau [NCRB] Un the State Crime Record Bureau [SCRB] for States and District Crime Record Bur for Districts has been created. In order to make use of Information Techno Government of India has designed Crime Criminal Information System [CCIS] retrieve crime and criminal records. This system has been upgraded to CCIS M web-enabled (CCIS MLe) in the year 2005 with facility for 5 regional language Gujarati, Tamil, Kannada and Gurmukhi, besides English and Hindi. Featu analysis through data warehousing has also been added. The application h enabled so that the field level investigating and supervisory officers can acce MLe database at National and State Levels through internet; anywhere - anytime.

Information Technology audit of computerization in Police Department notice and Criminal Information System and Common Integrated Police Application crime data storage and retrieval did not deliver the desired output. The deficien controls and supervisory checks have resulted in incomplete and incorrect datab the systems unreliable and thus not useful. No tangible benefits have thus accrue the computerization.

c. **CRIME CRIMINAL TRACKING NETWORK SYSTEM [CCTNS]**

The prime motive behind introduction of Information Technology in the police, has been to enhance their productivity by doing away with bureaucratic red tape. Though a web-based networking system, CIPA according to many police officers has certain limitations. "A major flaw is that it is a standalone system. The police stations are not interconnected and one police station has no access to records of the other. Consequently they cannot instantly share inputs on criminals and their modus operandi." The CCTNS purportedly aims at creating a comprehensive and integrated system for enhancing the efficiency and effectiveness of policing through creation of a nationwide networking infrastructure for evolution of IT-enabled state-of-the-art tracking system around investigation of crime and detection of criminals. The project is expected to interlink 14,000 police stations across the country and 6,000 higher offices at various levels, scientific and technical organizations having relevant databases. The project aims at making police functioning people-friendly and transparent, providing essential tools and information to facilitate investigations and detection of criminals, facilitating real-time sharing of information among police stations and at various levels, enabling tracking of the progress in cases, including in courts, and doing away with avoidable manual record-keeping.

MICROSOFT MAPOINT LOCATION SERVER 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.

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 MapPoint Location Server [MMLS]. MMLS 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. MMLS locates provisioned user's mobile device by communicating with a mobile/Pager Operator. The MMLS Architecture shown as below
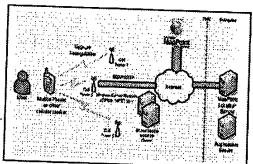
Figure 1: MMLS Architecture

MapPoint Location Server provides this functionality by working in conjunction with mobile operators, which provide location information, and MapPoint Web Service, which provides maps, proximity search functionality, and driving directions. To use MapPoint Location Server, you need a MapPoint Web Service account and a contract with a mobile operator that provides real-time location data.

a. Benefits of MapPoint Location Server

MapPoint Location Server provides the following benefits:

- **End-to-end solution** – Two client applications are included with MapPoint Location Server: MapPoint Mobile Locator for PC and MapPoint Mobile Locator for Pocket Phone Edition.

- **Security** – All personally identifiable information about users remains within the enterprise. Communication between MapPoint Location Server and MapPoint Web Service and between MapPoint Location Server and mobile operators takes place over connections that use Secure Sockets Layer (SSL).

- **Programmability** – MapPoint Location Server includes APIs that developers can use to build both location-enabled client applications and server-management administration applications.

b. MapPoint Location Server Working

MapPoint Location Server consists of three main components:

- **MapPoint Location Server Web Service** – A Web service, installed within enterprise, that works with both mobile operators and MapPoint Web Service to provide location services, render maps, find points of interest, and supply driving directions.

- **MapPoint Location Server Database** – A Microsoft SQL Server 2000 database that stores information about users, Find Nearby categories, and other information related to MapPoint Location Server.

- **MapPoint Location Server Management Console** – A Microsoft Management Console (MMC) snap-in that administrators use to administer MapPoint Location Server.

MapPoint Location Server acts as a middle-tier between location-enabled applications, a mobile operator's location service and notification service, and MapPoint Web Service.

MapPoint Location Server handles logons, maintains security and privacy settings, and accesses location information from a mobile operator and cartographic information from MapPoint Web Service. MapPoint Location Server then manages the tasks required to fulfill location and direction requests from clients.

MapPoint Location Server is integrated with Microsoft Active Directory, which is used as the master store for users and for authentication and authorization. Users who are provisioned for MapPoint Location Server must already exist in the Active Directory domain for the enterprise. Once a user is provisioned for MapPoint Location Server, Active Directory information about the user, such as domain and alias, display name, and e-mail address, is retrieved from Active Directory and stored in the MapPoint Location Server database.

MapPoint Location Server communicates with mobile operators through providers, software plug-ins that are specific to each mobile operator. In general, each mobile operator has two providers:
- A location provider, which is used to communicate with a mobile operator that provides real-time location data.
- A notification provider, which is used to send Short Message Service (SMS) messages to user's devices.

c. **Location accuracy**

Cell Sector: Urban areas: 1 – 3 kilometers, Suburban areas: 3 - 20 kilometers
Assisted GPS (AGPS) : 10 – 50 meters
Time Difference of Arrival (TDOA) : 100 meters
Angle of Arrival (AOA) : 100 meters

In order to reduce the crime Police officers has taken few steps Such as building Mohalla Committee, Mahatma Gandhi Tanta mukt Gaon, Community Group, Student Police friend etc. in addition PS's are using CCIS and CIPA software which are insufficient. As the part of policy the MOST WANTED Criminals are banned in the PSJ 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

5. 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.

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

 ii) 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.

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

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

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