

HISTORICAL ANALYSIS TO IMPROVE THE EFFICIENCY OF POLICE DEPARTMENT

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Abstract— this research paper highlights the importance of Police-I-Watch system to spotlight the crime committed in particular year, police station, crime category etc. the system plays an important role in increasing efficiency of the police personnel. In order to have effective civil administration the personnel must understand what happened previous which can be effectively shown using this police-I-watch system. Manual system had limitation of intelligence of personnel; with the help of technological innovation police personnel may control the staff activity. In this scenario Police-I-Watch system is very useful.

Index Terms—CCIS, CIPA, Data Mining, SSRS,

I. OVERVIEW OF POLICE-I-WATCH SYSTEM

The Police-I-Watch system enables Police officer to conduct statistical analysis on criminal activity; in addition, data mining methods are implemented to identify possible crime patterns. A CCIS database contains information on incident occurred over the last fifteen years. It is anticipated that data mining methods will assist police department in anticipating possible criminal activity.

The system is divided into four major parts: Predictive analysis, Historical analysis, Suspect Identification and Movement plotting of suspect or criminal. The system designed doesn't create database of its own, rather it uses the existing database of operational Crime and Criminal Information System (CCIS). We have incorporated the reusability of the database. As Application Executes first time, creates blank CCISUnicode database and required stored procedure, temporary table, and then restore the data from existing CCISUnicode database. Data restoration process we keep manually.

II. RELATED WORK

Christopher Westphal Corporate security offices and law enforcement agencies are applying data mining technologies to analyze all sorts of data sets including telephone toll calls, narcotics operations, financial crime enterprises, criminal organizations, border crossings, street crime patterns, gang relationships, terrorist activities, tax evasion,

embezzlement, insider trading, and a wide range of other activities.

Jiawei Han, MichelineKamber, In the chapter Applications and Trends in data mining author given the data mining applications in Business and in Science. Data mining Application can be used for Financial Data Analysis, Retail Industry, Telecommunication industry, Biological Data Analysis, Intrusion Detection etc.

ZhaoHui Tang, Jamie MacLennan Microsoft Time Series consists of series of data collected over successive increments of time or other indicator of sequence. A sequence of values of a variable over the time forms a time series, the time increments in a time series can be discrete or continuous. The main purpose of collecting time series data is to forecast, or make prediction about, future values. The Microsoft time series algorithm is a novel forecasting algorithm. It is a hybrid of auto regression and decision tree.

Auto regression process is one in which the value of x and time $t(x_t)$ is a function of the values of x at previous time.

$$X_t = f(X_{t-1}, X_{t-2}, X_{t-3}, \dots, X_{t-n}) + \epsilon_t$$

Where X_t is the time series under investigation, and n is the order of Auto Regression, which is much less than the length of the series. The last term, epsilon represents the noise. The key step of Auto Regression Tree (ART) is to transform single cases of a time series into multiple cases internally.

Colleen McCue, Data Mining is an information extraction activity, whose goal is to discover hidden facts contained in databases. Using data mining the valuable relationship between and within data can be identified and used proactively to categorize or anticipate additional data through the use of exploratory graphics in combination with advanced statistics, machine learning tools, and artificial intelligence.

LenkaNováková, (2009) produced his Ph.D. work on the "Visualization data for Data Mining" This thesis deals with analysis of the possibilities offered by the visualization method Radial Coordinate Visualization for support of Data Mining processes.

Visualization makes it possible to map data from n dimensional space into a plane.

The thesis reviews those specific properties of this method that are important for identification of clusters in the original multidimensional data. Attention is given to the influence of normalization, estimate of distance and design of new RadViz projections. There is described an artificial data set which clearly points to a certain drawback of the original RadViz mapping, namely data overlapping and data blurring near the origin of the space. To resolve the identified problem there are suggested 2 minor modifications of the RadViz algorithm.

III. EXISTING SYSTEM

CIPA: CIPA focuses on the functional and the day-to-day work requirements of various PSs which includes the Registration of various cases in form of FIR's including Unclaimed Properties, Missing persons reported at the Police Stations, their investigation by recording the information about the progresses form time-to-time in the case including coordination of lost and the recovered properties, Disposal/Charge Sheetting by Police, Prosecution which results in Disposal of Case by the Court etc.

The ultimate goal of the computerization would be an integrated networked system with state-of-the-art hardware and software in place for Police to access, and use the Information in their day-to-day work and to take decisions.

CCIS: CCIS version 2k.1 is a Windows based application that stores records related to crimes and criminals, and lost and recovered property. The application resides at the NCRB office in New Delhi, and runs in district headquarters across the country. Records fed in at the district level are periodically threshold at the center through the Offline/ Online system of data transfer, in the absence of an active online system.

CCIS is in the process of standardizing the way criminal records are maintained across the country, allowing efficient sharing of information and facilitating greater coordination at a national level. The application is partially available on a nationwide network today, and provides access to more than 5,300,000 records that are centrally located at NCRB. Apart from English, CCIS application has been implemented in 6 Indian regional languages: English, Hindi, Tamil, Marathi, Kannada, Gujarati, Punjabi (Gurmukhi). NCRB plans to extend to other regional languages in a phased manner.

MVCS: MVCS has been implemented in all States/UTs. The main objective of the software is to provide information to public, police and other agencies regarding the recovered/lost motor vehicle. The modified version has already been released to all

States/UTs/MV counters in the month of December 2006. As and when request received from any States/District/UT for opening of MV Counter, NCRB provide all procedural and technical help. Besides, NCRB team visits the location for installation of the software and necessary training of operation staff. SIB also provides solution as and when States/UTs/MV counters face any technical and other problem.

IV. PROPOSED WORK

The Police-I-Watch system enables Police officer to conduct statistical analysis on criminal activity; in addition, data mining methods are implemented to identify possible crime patterns. A CCIS database contains information on incident occurred over the last fifteen years. It is anticipated that data mining methods will assist police department in anticipating possible criminal activity.

The components of the system designed as follows

a.Predictive analysis:

Predictive analysis is designed using Microsoft Excel 2007 which uses data mining time series for crime forecasting and Crime Clustering using Microsoft SQL Server 2008.

b.Historical Analysis:

The historical data has been reported using SQL Server Reporting Service 2008

c.Suspect Identification: Drill Through method of SQL Server 2008

d.Movement plotting of Suspect / Criminal : Used Google API

These all four parts are integrated using Microsoft Visual Basic.Net 2010

Requirement specification:

Software Specification:

1.Microsoft SQL Server 2008

a.Database Engine

b.Analysis Service

c.Reporting Service

2.Internet Connectivity

3.Data Mining Add-ins for Microsoft Excel 2007

4.Microsoft .Net Framework 4.0

Historical Analysis:

Historical analysis shows the Graphical presentation of crime act

1. Yearly FIR registered in the district

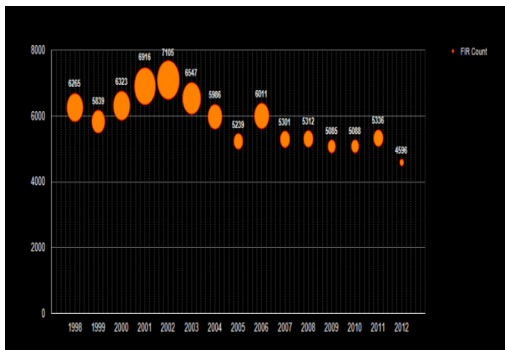


Image 1: FIR registered yearly Bubble Chart

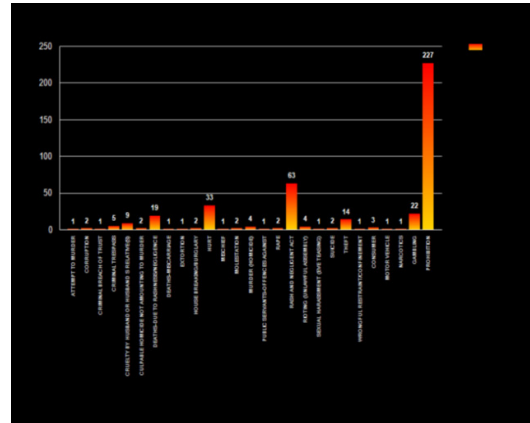


Image 4: FIR registered Crime Head wise

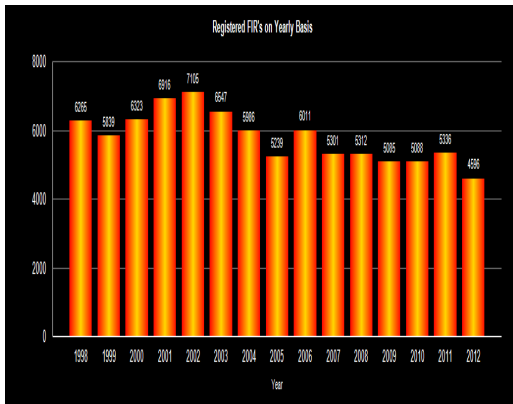


Image 2: FIR registered yearly bar chart

Monthly FIR registered in the district of selected year

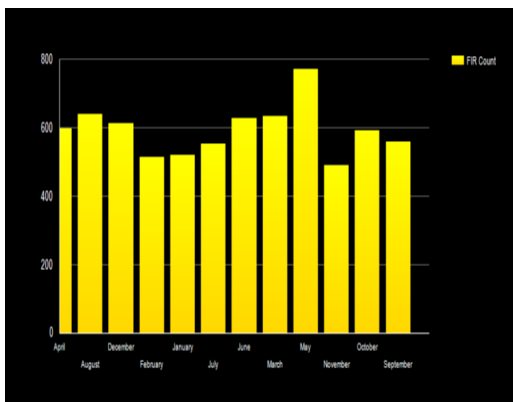


Image 3: FIR registered Monthly in the selected year

1. Crime Head wise FIR registered in the district of selected Year and Month

2. Police station wise FIR registered

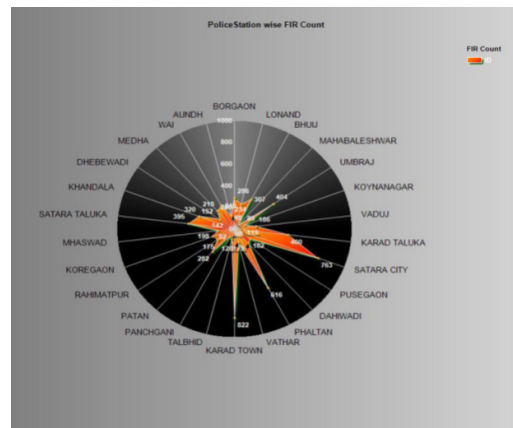


Image 5: Police station wise FIR Register of the selected year RADAR Chart

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