

Use of Data Analytics Technology in the Reduction of Crime Rate *To Analyze the Crime Records for the Prediction of Future Crimes and Crime Zones*

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Abstract : Data analytics is a subfield of computer science which is the most demanding and interesting technology in the current World. Data analytics enables a conclusion out of the data available in the form of facts and structured format and the analysis can be done using python the Open-Source Language. This same technology can be applied in the field of crime where the predictions can be made for safety of citizens and to educate citizens. In our country some crimes go unreported but remains as a fact and on the same side many crimes are reported which is the structured data, these both types are two forms of data but of huge importance with which reports can be generated and many upcoming crimes can be stopped and therefore the decrease in rate of crime can be observed.

So the paper focuses for the decrease in crime rate. It will enhance the safety of citizens of our Country and reduce the future crimes. In addition it will ease the cops to be active in the sensitive areas and areas of high chances of crime and easily stop the wrong, also to educate people in such areas for not to involve in such offenses and work hard for bread and cops can deliver a crime free state.

Keywords: *Data Analytics*, Crime Records, Educate Citizens and Crime-Rate Reduction

I. INTRODUCTION :

Data analytics can be simple, today the term is most often used to describe the analysis of large volumes of data, which presents unique computational and data-handling challenges. The data analytics requires a strong expertise in statistics, as statistics is the mathematics of estimating parameters based on the data available.

Statistician John Tukey defined data analysis in 1961 as: "Procedures for analyzing data, techniques for interpreting the results of such procedures, ways of planning the gathering of data to make it easier, more precise and all the techniques and results of statistics which apply to analyzing data".

Data analysis is rooted in statistics, it is said that the beginning of statistics was marked in ancient Egypt as it took a periodic census for building pyramids. Throughout history, statistics has played an important role for governments all across the world, for the creation of censuses, which were used for various governmental planning activities (including, of course, taxation). With the data collected, we moved on to the next level, which is the analysis of that data. Data analysis is a process that involves the retrieving of data from various sources and then analyzing it with the goal of discovering beneficial information. For example, the analysis of population growth by district can help governments determine the number of hospitals that would be needed in a given area. Similarly through this paper the motive is to bring out the good out of the records which everyone think that these exist only to punish the wrong and dump them in corner after they punish the culprits, but these records will help us to build a better environment to live in and to stop the criminal activities and mainly to educate people of such areas to lead better lives.

II. WHAT IS DATA ANALYTICS :

Data Analytics refers to breaking a whole into the separate components for individual examination. It is the qualitative and quantitative techniques and processes used to enhance productivity and business gain. It is the process for obtaining raw data and converting it into information useful for decision-making by users, the data is extracted and categorized to identify and analyze behavior and patterns to answer questions, test hypothesis. This data analytics technology is not only useful for an organization to enhance its profits but also can be used for developing the environment as profits are not the only criteria in the world. The technology's main criteria is to make the world a better place to live in.

The Data Analytics work with the data and its patterns as these gives the output to make better decisions, firstly the data is collected for the problem to be worked on then this data is arranged in a proper format mostly by giving a time-stamp i.e., arranged in the format of a proper order. The data is the collection of raw facts these need to be arranged in the correct format to make it meaningful and to comply with the problem statement and deliver better solutions. It works on the past data and gives the future predictions about the problem so as to take decisions according to that predictions. These predictions are made for the improvement of the organization and for its benefit, for example if sales are less then an analysis can be made and depending on that the manufacturing unit can be made better or the prices can be adjusted or EMI can be introduced or payment issues can be solved.

It is not an over-night process so it requires a series of works to be done to achieve the outcome, the techniques involved in the analytics are the data requirements, data collection, data processing and cleaning, data modeling, analyzing and data interpretation.

- **Data Requirements :** The data is necessary as inputs to the analysis, which is specified based upon the requirements of those directing the analysis. Data may be numerical or categorical (i.e., a text label for numbers).

- **Data Collection** : First collect the data from existing databases or sources on hand. It can also be from the other sources like sensors, cameras, recording devices etc. The discussions and meetings conducted for the project can also be a part of the data required.
- **Data Processing** : Determine a file storing and naming system to ease the task. Keep your collected data organized in a log with collection dates and add any source notes as you go.
- **Data Cleaning** : The first step in data analysis is to improve data quality. Data scientists correct spelling mistakes, handle missing data, delete duplicate data and weed out nonsense information. This is the most critical step in the data value chain even with the best analysis, junk data will generate wrong results and mislead the business.
- **Data Modeling** : This is where the experience of data scientists becomes critical to business success correlating the data and building models that predict business outcomes. Data scientists must have a strong background in statistics to build scientifically accurate models and avoid the meaningless correlations and models that are build on existing data that their future predictions are useless.
- **Analyzing** : The analysis begin by manipulating the data in a number of different ways, such as plotting it out and finding correlations or by creating a pivot table. A pivot table lets you sort and filter data by different variables and lets you calculate the mean, maximum, minimum and standard deviation of your data.
- **Data Interpretation** : After analyzing the data it's time to interpret the results. As we interpret the analysis, we have to keep in mind that we cannot ever prove a hypothesis true: rather we can only fail to reject the hypothesis. Meaning that no matter how much data is collected, there is a chance of some contradiction with the results in real-time.



Fig 2.1 Process of Data Analysis

III. USE OF ANALYTICS IN CRIME DETECTION :

The data is everything, so the crime also has its own data & can be of distinct types. So the criminal is not the person who commits the crime for the first time, instead he commits some small crimes and makes it a routine to earn his bread. Every crime has a reason and has to be figured out to understand the psychology of the whole crime, there may be change in reason but the nature will be same. The criminal psychology plays an important role as Gandhiji said "All crime is a kind of disease and should be treated as such-- All criminals should be treated as patients and the jails should be hospitals as no one commits crime just for fun of it". For example, The Maoists commits the crime to revolt against wrong doing of the government and believe in absolute Communism. So the every crime has an organized plan and structure, all these reasons combine to become the data and can be used for crime detection and reduction.

We need to focus on the crime related issues and the need to decrease the crime rate, the records and complaints on the crime will serve as an important factor on which the whole idea is based. The old records will pave a way for the analysis and will be the base for the predictions, the crime which has been committed has to be studied carefully and generated data which will include the nature and motto behind it. This will become the data out of which reports can be generated and conclusions can be made, the predictions and actions can be carried out.

These type of data including the records of investigation of that particular crime, for predicting the future crimes and crime zones the past records will serve as the base. The data of criminals helps us to analyze and design a pattern to get through, this will lead to a model after analysis on the collected data and able to generate reports for stopping the future crimes. This will also make the prediction of future criminals and the future crime zones, so that we can educate and bring awareness to the people in those areas.

So keeping this in mind we must create this kind of data the analysis which must benefit the society and the predictions must be able to stop the future crimes and also educate criminals and stop them from committing any future crimes. Similarly, counseling can be done to stop new crimes. The crimes to be committed can have special attention and arrangements can be made to knock it out, in this way we can reduce the crime rate and stop people from committing crimes.

IV. CURRENT SCENARIO FOR CRIME DETECTION :

The current crime detection techniques follow much more manual intervention methods, (1)the most common one is of the informers of the criminal organization. This informer network is widely spread and important for the news, as they inform about the criminal activities during its planning. (2)Then also it is observed by the under-cover agents of the “crime department” who primarily work for GOVT but mix-up in the criminal organization to catch them red-handed. (3)Keeping a tap on small criminals as they are connected with big organizations for initiating the crime at lower levels. (4)The intelligence wings and Anti-Squads are the special teams involved in crime detection. (5) The most common is the Surveillance of the areas to note suspicious activities. (6)The tapping of phone of suspected persons.

After all these also there is a less chance of stopping the crime, it requires a very large manual intervention and the best men on the job and to follow it. But, it can lead to the loss of lives and what not of the people involved in the teams of crime detection. Usually, the under-cover agents if suspected by the criminals are killed and these unsung heroes loses their lives. So, it is of high risk and takes a lot of time to study and gather information and make reports.

V. CRIME RECORDS – THE KEY :

The crime records play an important role they serve as the base the prediction and analysis, as these are the official information on which we can rely on and it contains the whole information of where the crime has occurred and accused information. As FIRs and Complaints are the first information reports, that were reported in the beginning of the crime and the charge-sheets submitted in the court, some of the crimes which go unreported then a part of mass-media can be considered.

Some of the cases are interlinked as the burglary may be linked with money-laundering and also land-litigation with murder of owner. The data must also include the psychology of criminals, For Example: A crime was committed by a group of people on March 1987 in the name of CBI- Raid which was fake but an organized robbery posing as CBI (fake), and a film was broadcasted in the name of “Special 26”. In which Akshay Kumar acted as the leader of the gang(Fake CBI), actually leader has grudge for not getting selected in the CBI. Later complaints was lodged by police for robbery, it is the case of interlink between depression and robbery over system. These kind of incidents urge to keep a tap on such candidates.

The crime records also involves statements of the suspects, victims and witnesses, which are important for analysis as these people were present on the crime spots. The “Crime Spots” are also important as mostly the cases of murder occur in the isolated places and the bombing occur at public places. This will help us to keep a tap on such kind of places.

The records of the criminal’s background are also of huge importance, from which area he is hailing and the family background and literacy rate in his area. It will help us in deeper analysis and predict the future criminals and crimes. These all will help us to take initial steps to spread awareness and Govt. can concentrate on the education of such areas and can spread awareness about the criminal life to make them better citizens.

So, all these records form base of the data and important factor for predicting crimes and crime zones.

Table 1: Crime types at different levels

Type	Local Level	National Level
Traffic violations	Driving under influence (DUI), fatal/personal injury/property damage traffic accident, road rage	-
Sex crime	Sexual offenses, sexual assaults, child molesting	Organized prostitution
Theft	Robbery, burglary, motor vehicle theft, stolen property	Theft of national secrets or weapon information
Fraud	Forgery and counterfeiting, frauds, identity deception	Transnational money laundering, identity-fraud,transnational financial fraud
Drug offenses	Narcotic drug offenses (sales or possession)	Transnational drug trafficking
Violent crime	Criminal homicide, armed robbery, aggravated assault, other assaults	Terrorism(bioterrorism,bombing,hijacking, etc.)
Arson	Arson on buildings, apartments	-
Cyber crime	Internet frauds,virus spreading, hate crimes,cyber-piracy, cyber-pornography	Illegal-trading,network intrusion/hacking,cyberterrorism, theft of confidential information

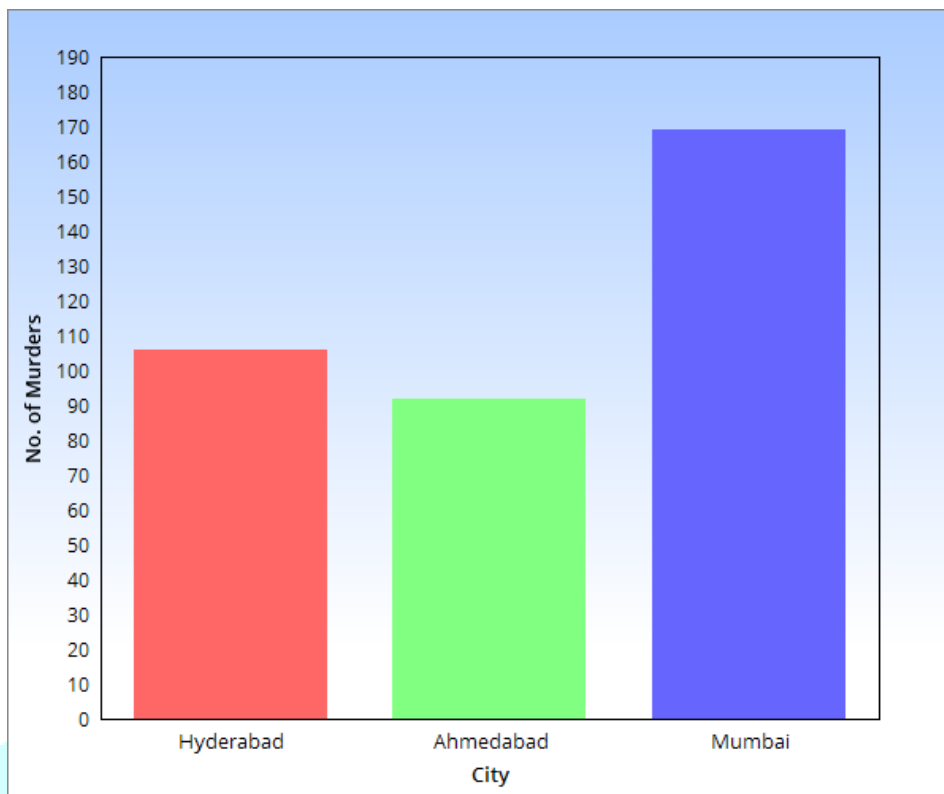


Chart 1: Number of Murders in the year 2015 of Hyderabad, Ahmedabad, Mumbai.

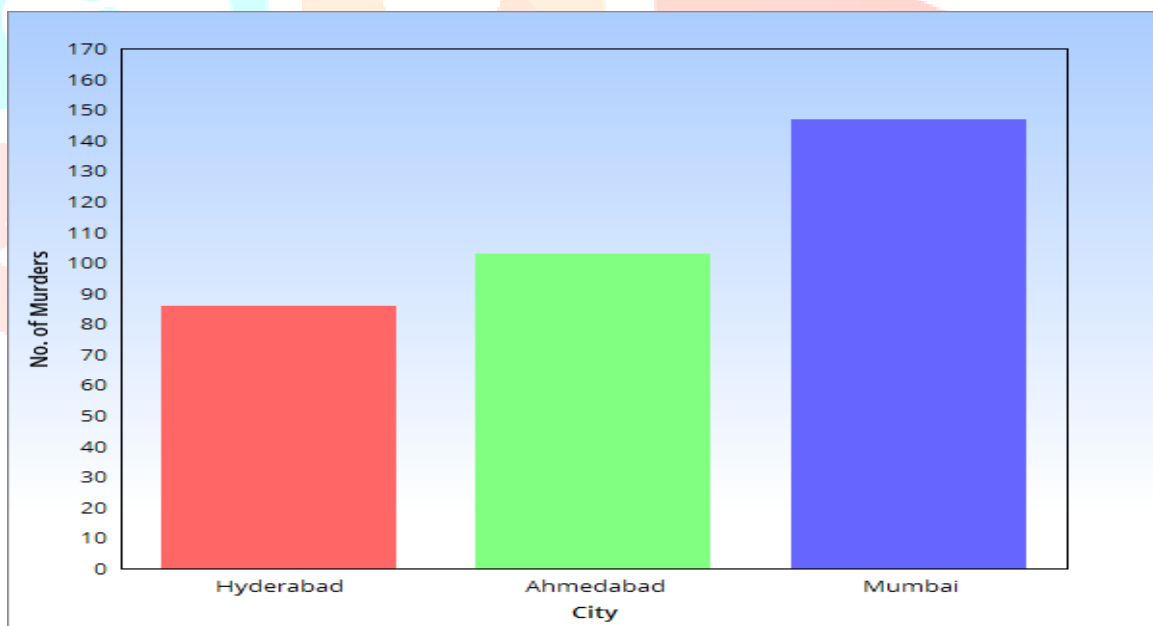


Chart 2: Number of Murders in the year 2016 of Hyderabad, Ahmedabad, Mumbai.

The above bar graphs show how the prediction could help us as the murders in Mumbai is high for both the years so there is a chance of same rate in the next year, so the police must take steps to reduce it.

VI. CONCLUSION :

Therefore it can be concluded that:

- The crimes are the disease which can be stopped by the analysis of the previous data available.
- The records play a major role in the crime-analysis.
- The data analysis technology is not only limited to the field of business but also for the betterment of environment, so that it can make a better place to live in.
- The crime rate can be reduced and the citizens can be educated and there can be crime detection and reduction in crime rate.

VII. REFERENCES :

- 1) <http://www.oracle.com/us/corporate/profit/big-ideas/052313-gshapira-1951392.html> --- the data analysis steps
- 2) <https://dataingovernment.blog.gov.uk/author/davidwilks/> --- the data-modeling processes
- 3) <https://data.gov.in/resources/city-wise-murder-cases-metropolitan-cities-2014-2016> --- the government's open data portal
- 4) <http://www.gandhiashramsevagram.org/voice-of-truth/gandhiji-on-police-crimes-and-jails.php> --- Gandhiji's book on criminals
- 5) https://www.researchgate.net/publication/2870463_Crime_Data_Mining_An_Overview_and_Case_Studies?enrichId=rgreq-9ad5cfb4b41f578f9507e2fcd566954-XXX&enrichSource=Y292ZXJQYWdlOzI4NzA0NjM7QVM6OTc2NTgyMTk3OTQ0NDZAMTQwMDI5NDk0Mjk2MA%3D%3D&el=1_x_2&_esc=publicationCoverPdf --- paper on Data Mining on Crime records.

