Volume 71 Number 2 December - 2021

Contents

E-Malkhana: Digital Case Asset Management System for Police

Ashish Tiwari, IPS* & Adarsh Kumar Singh**

Abstract

Proper maintenance of Police Station records is a pre-requisite for the smooth operation of a Police Station. These records help in the prevention and detection of crime and to keep track of Managing records of seized case assets is one of the major problems in police stations. The conventional method involves manual record-keeping through the Malkhana register which lacks proper accountability and transparency. This improper management may confine the smooth functioning of police stations. To overcome this issue, a digital case asset management system is proposed. This paper suggests the implementation of project E-Malkhana[1] which puts handling of case properties more professionally and digitally. This innovative project consists of a web-based application that modernizes and digitizes the Malkhanas of police. On one hand, it has a thana dashboard section for Malkhana management of every separate thana whereas on the other hand admin section is used for management and controlling of these thanas. This is an integrated cloud system and has multiple features.

* IPS (2012), SP Railways Jhansi, UP
** B.Tech, IIIT DM Jabalpur

Introduction

Malkhana is a room in the police station for keeping seized arms, ammunition, and other case properties. Proper maintenance of malkhana records is a major issue in police stations. It causes a lot of manual paperwork in absence of an automated system. Keeping track of records through the malkhana register is also a complex challenge. Since these records are of prime importance, a Police Station officer has to ensure that these records are safely kept and do not get degenerated from dampness and other causes. It has always been a top priority to keep the case property in safe custody and its retrieval for presenting before the court and keeping it back safely. After the digitization of Malkhana records, it would be easy to retrieve proper and accurate details about case assets. This would also reduce the valuable time and energy of policemen involved in the maintenance of Malkahana. That's why this project E-Malkhana is implemented in some districts of Uttar Pradesh to digitize all the case property records. Under the project, case properties have been digitized by providing unique QR code IDs and appropriate packaging. This project is being implemented in almost all police stations of Ayodhya and some other districts of Uttar Pradesh, which is an online system where senior officials can monitor everything with a single click.

Literature review

E-Malkahana is suggested to digitize case property records and management more digitally and professionally. In 2018, Delhi police implemented E-Malkhana[2,3] in 11 police stations which consist of desktop-based software. This also uses bar codes for the unique identification of case property. Bar code is the representation of data in visual and machine-readable form which can only be scanned by special optical scanners. Optical scanners are costly and increase the extra

burden on the budget. This project is system-dependent rather than person-dependent.

Figure 1: Data entry screen of Existing E-Malkhana software

Proposed solution

This paper suggests the implementation of a cloud-based E-Malkhana application in police stations. This uses QR code for easy identification of case property as bar code scanner is costly. Details related to the case property are first entered manually into the software, followed by uploading of its photograph and other necessary documents. After this process, it generates a printable slip containing a QR code and unique item id. Then case property is packed in a box and a slip is pasted on it for easy tracking. The box is then placed at a specified location whose details are entered into the software. This mechanism easily locates the case property.

Features

- It has 3 dashboards one for Super admin, one for district admin like SP/SSP office, and one for each police Thana.
- It is a web-based application. Once the police station is registered by the district admin they can start using E-Malkhana.
- Existing Malkhana details can be imported directly by excel import.
- It generates a printable label with a unique QR code.
- E-Malkhana automatically generates a log for every issue and return of case property and also for the disposa of the property.
- District admin can monitor Malkhana of every police station from anywhere on the internet.
- It has an advanced search feature through which every case property can be searched based on multiple parameters.
- E-Malkhana is an integrated system i.e all districts of a state can be onboarded on this system independently.
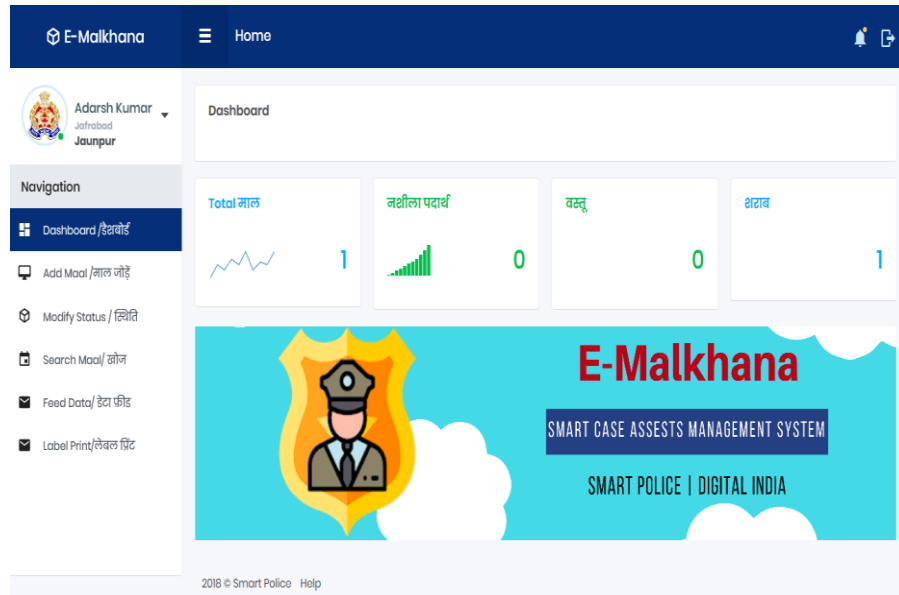
Figure 2: Web-based E-Malkhana Dashboard
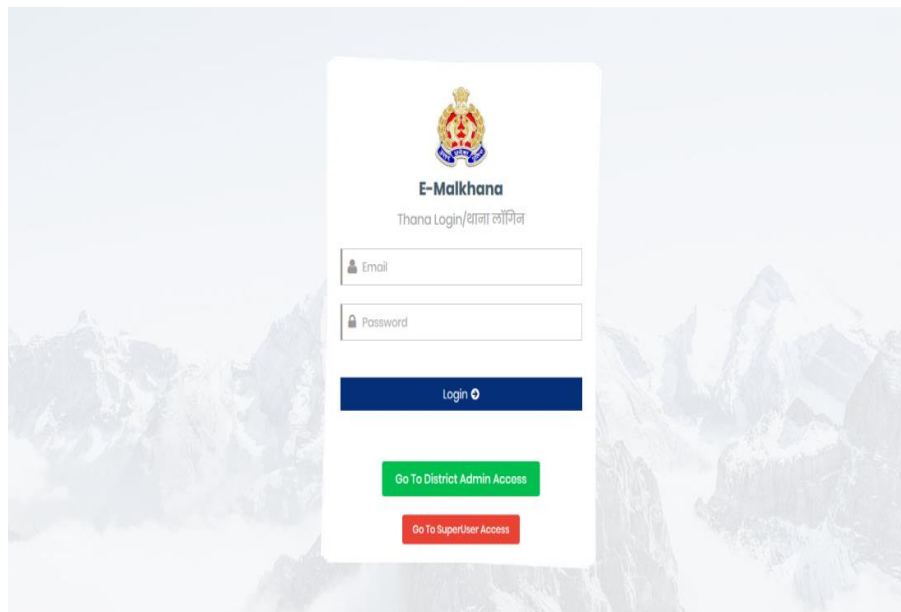
Figure 3: Web-based E-Malkhana Login Panel

Figure 4: Data Entry Screen of Web-based E-Malkhana

Implementation Methodology

This E-Malkhana system is implemented online and can be accessed from anywhere on any internet-enabled system. The process starts by complete the registration of Thana by the district admin. After registration, every Thana operator will able to use the E-Malkhana application. Every new entry can be created for case property and saved in the database. After every entry, a printable label is generated which is pasted on the box for easy tracking of property. For existing case property there is a feature in the application to directly import details using an excel sheet. In case of a property issue or return to someone, the operator can search records and update the status. This will generate the log of the issue and return details. The headquarter can monitor every Malkhana on the system and have the right to edit details. The figure below depicts the process flow of E-Malkhana.
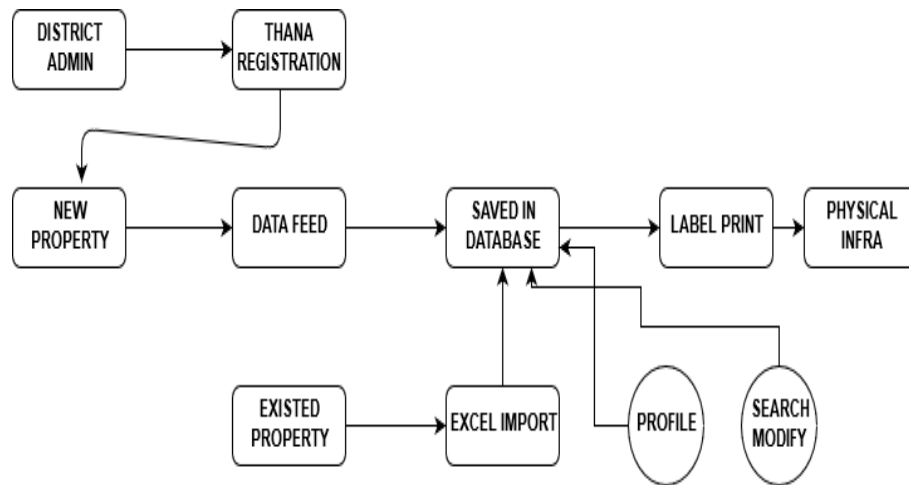
Figure 5: Process Flow of E-Malkhana Project

Figure 6: Registered Thana View

Figure 7: Case Property Profile View

Results

E-Malkhana is implemented as a pilot project at the Jaunpur and Ayodhya districts of Uttar Pradesh. More than 30 police Thana are onboarded on the E-Malkhana system with approximately 6000 case property records digitally stored. E-Malkhana allows the handling of case property in a more professional way. We hear a lot of stories of theft happening especially of liquor from police stations[4]. It reduces the extra burden of manpower as well as financial expenditure in malkhana management. The efficiency, as well as productivity of staff, also increases. The table below shows some results after ground-level implementation.

Parameter	Before E-Malkhana	After E-Malkhana
Avg. time taken to register case property	25 min	10 min
Avg. time taken to locate case property	20 min	7-8 min
Man involved	5 person	2 person
Budget		
Material Requirements	Register	Computer,internet, packing boxes etc.

Before Emalkhana

After Emalkhana
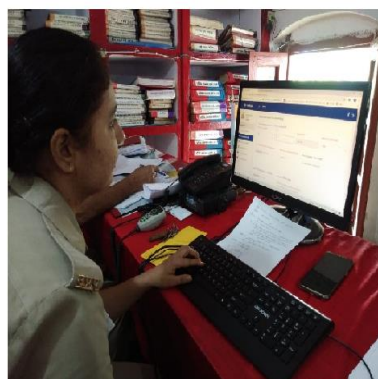
Before Emalkhana   After Emalkhana

Figure 8: Field Trial Results after E-Malkhana implementation

Conclusion

The problem of improper management of case property records in police stations is solved by project E-Malkhana. It proves that technology plays a vital role in making the police smart. E-Malkhana brings complete transparency and accountability in the flow and disposal of case property. This project assists in the overall improvement in the working style and conditions of the Malkhana as well as extending the clean India initiative. Thus, this well-organized and efficiently monitored Malkhana system is a step towards SMART Policing, which includes the dimension of Techno Savvy and Trained Police, as predicted by Hon'ble PM of India.

Moreover, this project can also be coupled with IoT systems in the future to bring more automation to the hardware infrastructure of Malkhana.

References

1. *https://emalkhana.in/*
2. *http://delhipolice.nic.in/Best_practices.pdf*
3. *https://www.indiatoday.in/mail-today/story/southeast-district-malkhanas-go-digital-1304939-2018-08-04*
4. *http://bprd.nic.in/WriteReadData/userfiles/file/1930072729-Maintenance%20of%20Police%20Station%20records.pdf*
5. *https://www.indiatoday.in/india/story/uttar-pradesh-liquor-cartons-missing-police-strong-room-1552717-2019-06-20*

Author's Profile

Sh. Ashish Tiwari, IPS 2012 Batch, Present Working SP Railways, Jhansi, Uttar Pradesh Ashish.tiwari@ips.gov.in

Sh. Adarsh Kumar Singh, B.Tech, IIITDM Jabalpur
2016008@iiitdmj.ac.in

Crime Analysis and Prediction by Machine Learning

Ashok Juneja, IPS*

Abstract

Machine learning methods have become important for detection of crime and its prevention. In this paper, various machine learning methods have been described briefly and also the purpose for which they can be used for crime analysis and prediction. Crime Data of Chhattisgarh has been taken and its prediction has been done for next two years. The goal of this study is to see how well machine learning algorithms used in data mining analysis can anticipate crime tendencies.

Keywords:

Artificial intelligence, Machine learning, Data pre-processing, Linear regression, Aggregation, Smoothing, Polynomial fitting, Differencing, Decomposition, Auto regression, Moving Average, ARIMA, SARIMAX, Forecasting, all by using software Python.

1. Crime Analysis

Crime is a well-known social concern and it is unpredictable. The rise in crime has a variety of consequences for our society. It disturbs not only normal life, but also a society's socioeconomic progress.

*DGP Chhattisgarh

As a result, crime data must be analysed in order to apprise law enforcement authorities about individual and general crime trends and patterns so that the department can make the greatest use of its limited people and material resources to address the issue.

Traditional policing methods for preventing and detecting criminal components have not proven to be effective in deterring or preventing the increase of crime in a region. Law enforcement officials can perform a better job if they have a clear grasp of the trend and pattern of criminal behaviour in a certain region. This may be performed by utilizing machine learning and a variety of algorithms to detect illegal behaviour patterns.

Law enforcement organisations have access to a vast amount of data relating to crime as a result of rapid advancements in computerization and digital technology. Data mining techniques can be useful for analysing data and extracting knowledge from it. Classification, grouping, assessment, prediction, and trend analysis can all benefit from data mining. Data analysis knowledge can aid law enforcement authorities in predicting current crime. Data mining is utilised in a multidisciplinary way to interpret and analyse large amounts of data. Data mining techniques can be useful for analysing data and extracting knowledge from it.

We report crime in order to give law enforcement with up-to-date information on general and specific crime trends, patterns, and series. Criminal data can be used by law enforcement agencies for decision making for better use of the limited resources available at their disposal.

To have an objective way to access crime concerns within and across law enforcement authorities on a local, regional, and national level. To detect and prevent crime in a proactive manner. To address the evolving needs of law enforcement and to gain a better understanding of criminal behavior. There are four main ways for studying crimes in general, which are described below:

1. Statistical Analysis
2. Linkage Analysis
3. Profiling

4. Spatial analysis

Each of the strategies listed above has its own set of benefits and downsides, and can be employed in different situations.

Data collection: The data set used is a list of crimes committed in a specific area.

Following are the essential steps involved in Data analysis:

a. Data extraction: Every entry in our dataset is about a particular crime, and may contain the following information

- Data/time of incident
- Day of the week that the crime occurred
- Name of place
- Name of District
- Address
- Latitude
- Longitude
- Category
- Description
- Resolution

    Data extraction may be done in file formats like CSV/JSON/XML.

b. Data cleaning: Its done to find missing values, eliminate incorrect and invalid values and also outliers and non-relevant data.

c. Data analysis: Applying algorithm on the crime data and obtain the pattern of data, building statistical models and statistical analysis

d. Action: Forecast the data, building machine learning models and decision making.

Machine learning is a sort of artificial intelligence that uses data analysis to recognise patterns. Machine learning is an Artificial Intelligence application in which a system is given the power to learn and improve on its own, depending on previous experience. In essence, machine learning is a computer system's technique to learning from examples. Machine learning helps us learn, predict, decide. It also

categorises t remember better, analyse and recognize (facial recognition and Vehicles recognition).The data needs to be transformed into the form understandable by the tools, the training and testing samples are selected. After that various algorithms are applied. The various classification and regression models are used depending upon the type of data available and the type of output we need. Users get access to a variety of machine learning techniques that can be used on datasets. Various Machine learning methods available are:

- **Linear Regression**
- **Decision tree classification**
- **Random forest classification**
- **Bayesian network Algorithm**
- **Artificial Neural Network**
- **K means clustering**
- **Time series analysis using ARIMA models**

1.1 Linear Regression

The linear regression model is straightforward and adequately describes how the input influences the outcome. This regression method is straightforward and provides a sufficient and understandable account of how the input influences the output. A variable Y (response value) is represented as a linear function of another variable X (called a predictor variable); Predictive expression can be expressed as $Y = \alpha + \beta X$, where α and β are regression coefficients. The equation predicts a target variable (Y) as a linear function of input variable(X).

1.2 Decision Tree

A decision tree is a tree-like structure that is used to choose a course of action. Each branch of the tree represents a possible decision, event, or response. It helps with data prediction.

We can determine the characteristics that cause a criminal to commit a crime. The decision tree method is used to find approximations of

discrete valued targeted functions. The learned function is represented by a decision tree. These trees can be represented in a graphical if-then manner to make them more human-friendly. The method can do regression or classification (based on mean-squared error) (based on entropy). The values that aren't present are treated as independent. Decision trees are durable, allowing them to work with large datasets and aiding algorithms in reaching more accurate judgments regarding variables.

As an example, Show a partial decision tree in the figure. All data instances that arrive at a leaf node (rectangle) receive a final categorization (REPORT_NO or REPORT_YES). A decision node (oval) is the location where a specific variable is evaluated. When VICTIM AGE is greater than 23, the classification changes to REPORT_YES, indicating that the crime was reported. If the value of VICTIM AGE is less than or equal to 18, the classification will be REPORT_NO.
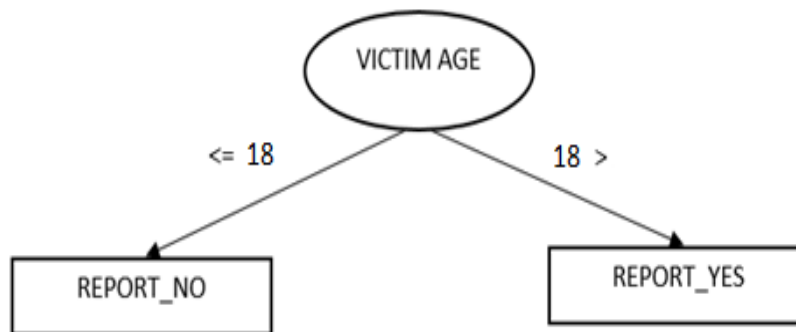
Fig.1: Decision Tree

1.3 Random Forest

Decision Forest are used to create random forests. It combines the flexibility of decision trees with the simplicity of decision trees, resulting in a significant increase in accuracy. We must generate a bootstrap

dataset and select samples from the original dataset at random, avoiding selecting the same sample twice. Create a decision tree using a bootstrapped dataset and simply a random selection of variables at each stage. As a result, a diverse range of trees will emerge. Random forests are more successful than individual decision trees because of their variety. It's named Random Forest because we use random sampling. Many Decision trees are combined to create a Random forest. It combines all of these decision trees and then trains each one separately. After all of the decision trees have been processed, the final forecast will be the average of each tree's predictions.

It is made up of an ensemble, which is nothing more than a large number of decision trees. Random forest makes extensive use of a technique known as Bootstrap aggregation, sometimes known as Bagging. It's a straightforward but effective ensemble method. An ensemble technique is a way for combining predictions and outcomes from various machine learning algorithms, i.e. from various decision trees, to generate more accurate forecasts than a single model. When highly flexible data is memorised and processed, it perfectly fits into the training data. The model is learning not just the actual numbers, but also any noise that may be present, as seen above. To circumvent this problem, a random forest classifier is utilised. The use of the decision tree is extremely delicate. It changes rapidly in response to changes in the input.

An example will most likely make understanding how a decision tree works much easier.

Assume the numbers at the top of the image to the left make up our 900-number dataset. We have 1's and 0's (1's and 0's are our classes) and want to distinguish them by their characteristics. Color (red vs. blue) and whether or not the observation is underlined are the distinguishing characteristics. So, what are our options?

Color appears to be a simple aspect to separate by, since all but one of the 0's are blue. As a consequence, we may query, "Is it red?" to distinguish our first node. In a tree, a node may be thought of as the point where the route splits in two: Observations that meet the criteria are

placed on the Yes branch, while those that do not are placed on the No branch.

We've finished with the No branch (the blues) because it's now all 0's, but our Yes branch can still be split. To make a second split, we might use the second feature and ask, "Is it underlined?"

When the two underlined 1s go down the Yes sub branch and the ununderlined 0 goes down the right sub branch, we're done. Our decision tree was able to precisely separate the data by combining the two attributes.

A random forest is made up of a large number of individual decision trees that operate together as an ensemble, as the name indicates. Each tree in the random forest generates a class prediction, with the highest votes being our model's forecast.
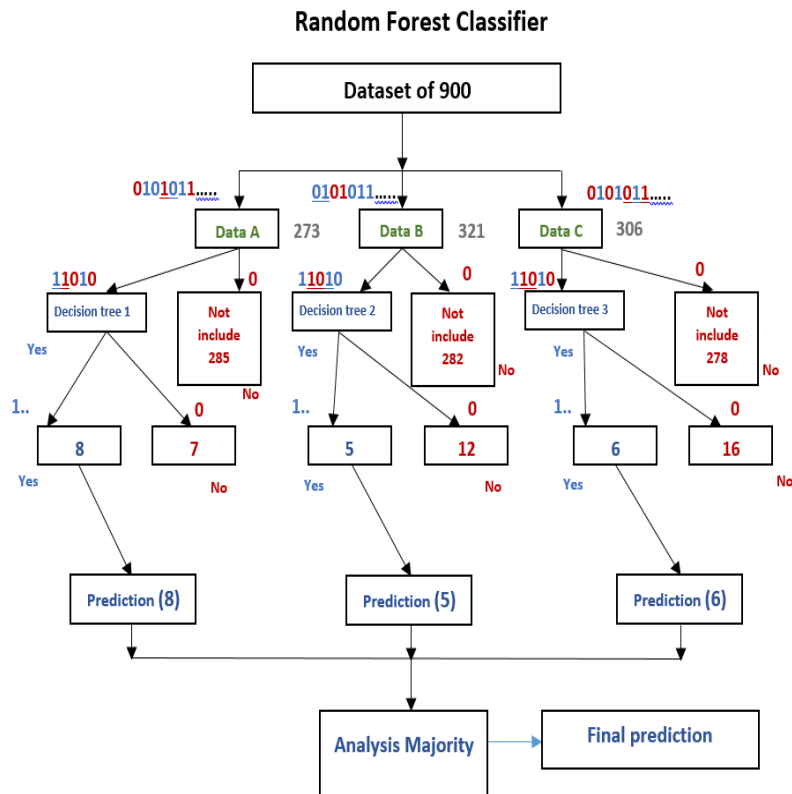
Fig.2: Random forest

1.4 Bayesian Network Algorithm

Bayesian network are used in Artificial intelligence when the data available if uncertain. It is a directed Acyclic Graph containing set of random variables. It is based on the Bayes Theorem's concepts of conditional probability. The Bayes theorem calculates the conditional probability of an event "A" given the occurrence of another event "B."

$P(A/B) = P(B/A) P(A)/P(B)$ Where:
P(A/B)- Conditional probability of A given B.
P(B/A)- Conditional probability of B given A
P(A)- Probability of event A
P(B)-Probability of event B

A Bayesian network, also known as a Bayes network, is a probabilistic graphical model (a type of statistical model) that describes a set of random variables and their conditional interactions using a directed acyclic graph (DAG). For example, a Bayesian network might be used to show the likelihood relationships between crime and its causes. The network might be used to predict the presence of certain type of crime based on locations. To link a specific crime scene to a known criminal, a Bayesian network approach might be employed. This is done by comparing all data from the crime scene to data from all offenders in custody's related crime scenes; based on this, a Bayesian network model is built, followed by an inference system, and if they match, the criminal's profile and the specific crime scene are connected.

1.5 Artificial Neural Networks

Neurons are little units or nodes that make up a neural network. These neurons are connected by a synapse, which is a type of connection. A synapse allows a neuron to transfer a signal or information to another neuron nearby. Receiving, analysing, and signalling the next signal are all capabilities of the receiving neuron. This technique is done until a signal is obtained as an output.

It's a computer system, after all. Artificial intelligence is a subset of it. Artificial neural networks (ANNs) are a type of machine learning model inspired by biological neural networks (e.g., the central nervous systems of animals, notably the brain) and used to estimate or approximate functions with a high number of inputs and unknown parameters. Artificial neural networks are frequently shown as a network of interconnected "neurons" that communicate with one another.

With varying degrees of effectiveness, neural networks may be utilised for prediction. This has the benefit of enabling for autonomous association learning based just on measured data, without the requirement for further data (such as type of dependency like with the regression). The neural network is trained with previous data in order to uncover hidden links and use them to forecast the future. To put it another way, a model is not the same as a neural network. It's more of a black box with the ability to learn

Cluster analysis and Artificial Neural Network perform the crime mapping. Neural networks are also used for forecasting Time-series also. It has advantage over Regression analysis. It can handle nominal/ordinal variables and non-linearity also.

Neuron Net Architecture
Neuron = derived variable
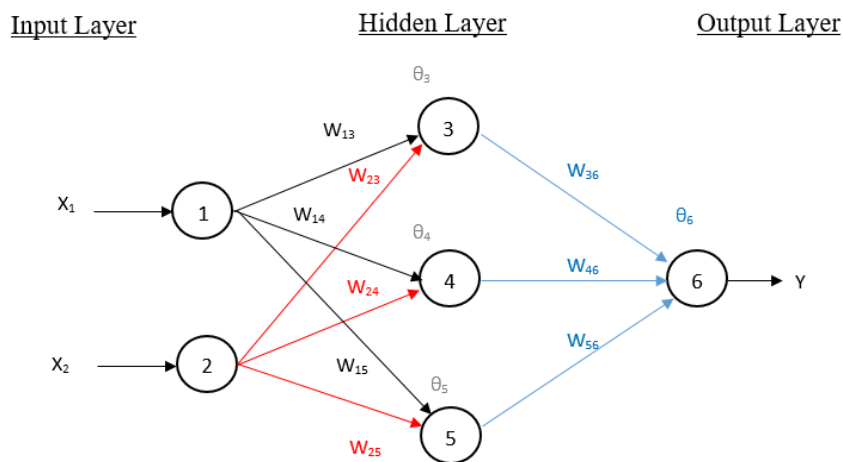
Fig.3: Neuron Net Architecture

Neuron 3 $= \theta_3 + W_{13}X_1 + W_{23}X_2$ (Similarly Neuron 4 and 5 can be described)

<u>Single hidden layer</u>

Output from one layer is input into next layer

$$\text{Output of neuron } j = g \left(\theta_j + = \sum_{j=1}^{p} {}_{ij}X_i \right)$$

Where, g = Activation function (common: linear, exponential s-shaped)

θ_j = bias (Control contribution of neuron j

j = weights

Forecasting with Neural networks

Steps for using a neural network for forecasting

```
┌─────────────────────────────────────┐
│  1.   Preprocess Data                │
└─────────────────────────────────────┘
                  │
┌─────────────────────────────────────┐
│  Explore the data + domain knowledge │
│  trend, seasonality, lags, external  │
│  series                              │
└─────────────────────────────────────┘
                  │
┌─────────────────────────────────────┐
│  Choose predictors and create needed │
│  derived variables                   │
└─────────────────────────────────────┘
                  │
┌─────────────────────────────────────┐
│  Identify and address                │
│  Errors/outliers/unusual periods     │
└─────────────────────────────────────┘
                  │
┌─────────────────────────────────────────┐
│          For numerical forecasts         │
│  -  Transform (eg. log) skewed variables │
│  -  De-seasonality, De-trend             │
│  -  Scale to [0,1] Logistical or [-1,1]  │
│     tanh                                 │
└─────────────────────────────────────────┘
                  │
┌─────────────────────────────────────────┐
│  2.   Specify network architecture       │
│  -  Number of hidden layers              │
│  -  Number of neurons in hidden layers   │
└─────────────────────────────────────────┘
                  │
┌─────────────────────────────────────┐
│  3.   Specify algorithm parameters   │
└─────────────────────────────────────┘
                  │
┌─────────────────────────────────────┐
│  4.   Output                         │
└─────────────────────────────────────┘
```

1.6 K Nearest Neighbour: it is a method of classification which is based on its neighbor. We use KNN when the data is labeled/noise-free and the data is small. The Nearest Neighbour Index (NNI) is a spatial crime distribution analysis tool. NNI is a point pattern data set distribution statistic that indicates the degree of clustering of the points. The analyzed crime will be useful in predicting the hotspots if analysis is done by cluster analysis by applying K Nearest Neighbor. The pattern that predicts the crime rate at different areas or places where the odds of crime happening are high is the output of ANN.

A data point is categorised by KNN depending on how its neighbours are classified. The KNN Algorithm is based on feature similarity. The process of selecting the appropriate value for K is known as parameter tuning, and it is critical for improved accuracy. KNN is used when the data is small, labeled and noise free. Significance of NNI is that it a too which tells us about crime patterns in space i.e. whether it is distributed in clusters, randomly or evenly depending upon its numerical value[7].

Nearest Neighbor Index (NNI)

To look into the distribution of crime:

$$NNI = \frac{\bar{d}}{\delta}$$

$$\bar{d} = \sum_{l=1} \frac{d_{ij}}{n}$$

$$\delta = 0.5 \sqrt{\frac{A}{n}}$$

$\bar{d}$ = mean nearest neighbor distance

d = distance between point 'i' and its nearest neighbor 'j'

n = number of points in data sets

δ = expected mean distance between nearest neighbor

$\frac{A}{n}$ = point density

Significance of NNI:

- If $NNI < 1 \rightarrow$ Clustering distribution
- If $NN1 = 1 \rightarrow$ Random distribution
  If $NNI > 1 \rightarrow$ Even distribution

Time series Analysis: A time series is a collection of observation tables with time intervals that are generally equal. It's used to predict values based on past observations. It varies with the passage of time. The basic assumption of a linear regression model, that the observations are independent, is invalid in this case. Most Time series feature a seasonality trend in addition to a growing or decreasing trend. i.e. variations that are exclusive to a single time period.

The model described here is ARIMA model:

ARIMA (Autoregressive integrated moving average) model

An extension of an autoregressive moving average (ARIMA) model is an autoregressive integrated moving average (ARIMA) model. These models are used to analyse and anticipatefuture points in time series data in order to gain a better understanding of the data (forecasting).

```
┌─────────────────────────────────────────┐
│ NCRB/ SCRB/ State Police/ Other sources  │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│                 Raw data                 │
└─────────────────────────────────────────┘
                    ↓
┌─────────────────────────────────────────┐
│             Data cleaning                │
│             Data integration             │
│             Data Reduction               │
└─────────────────────────────────────────┘
        ↓           ↓              ↓
 Auto Regression  Difference   Moving Average
        ↓           ↓              ↓
┌─────────────────────────────────────────┐
│            Prediction Crimes             │
└─────────────────────────────────────────┘
```
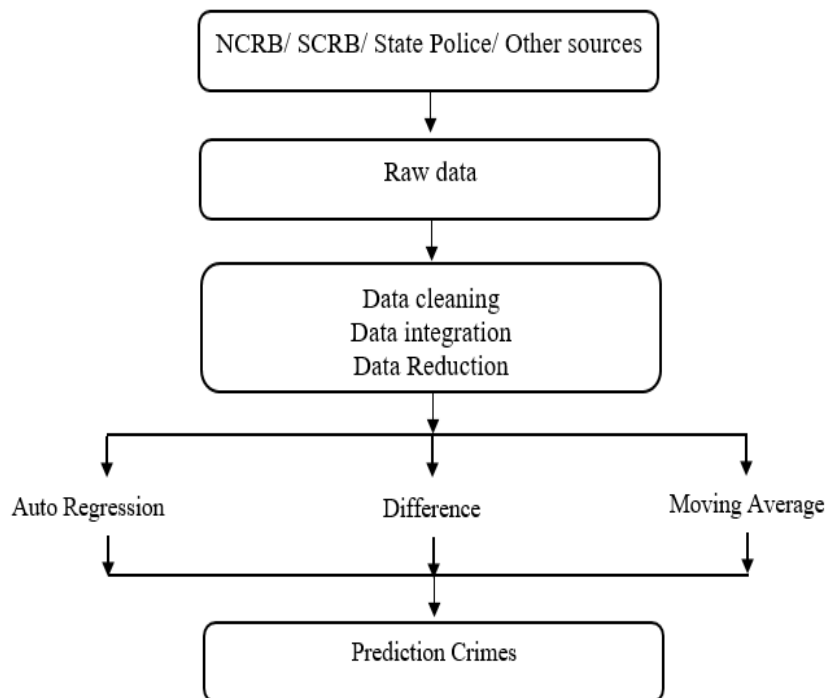
I will try to explain analysis of time series in Python by taking an example of crime in Chhattisgarh from date 2015.01.01 to 2019.12.01 and forecast for 2020 and 2021
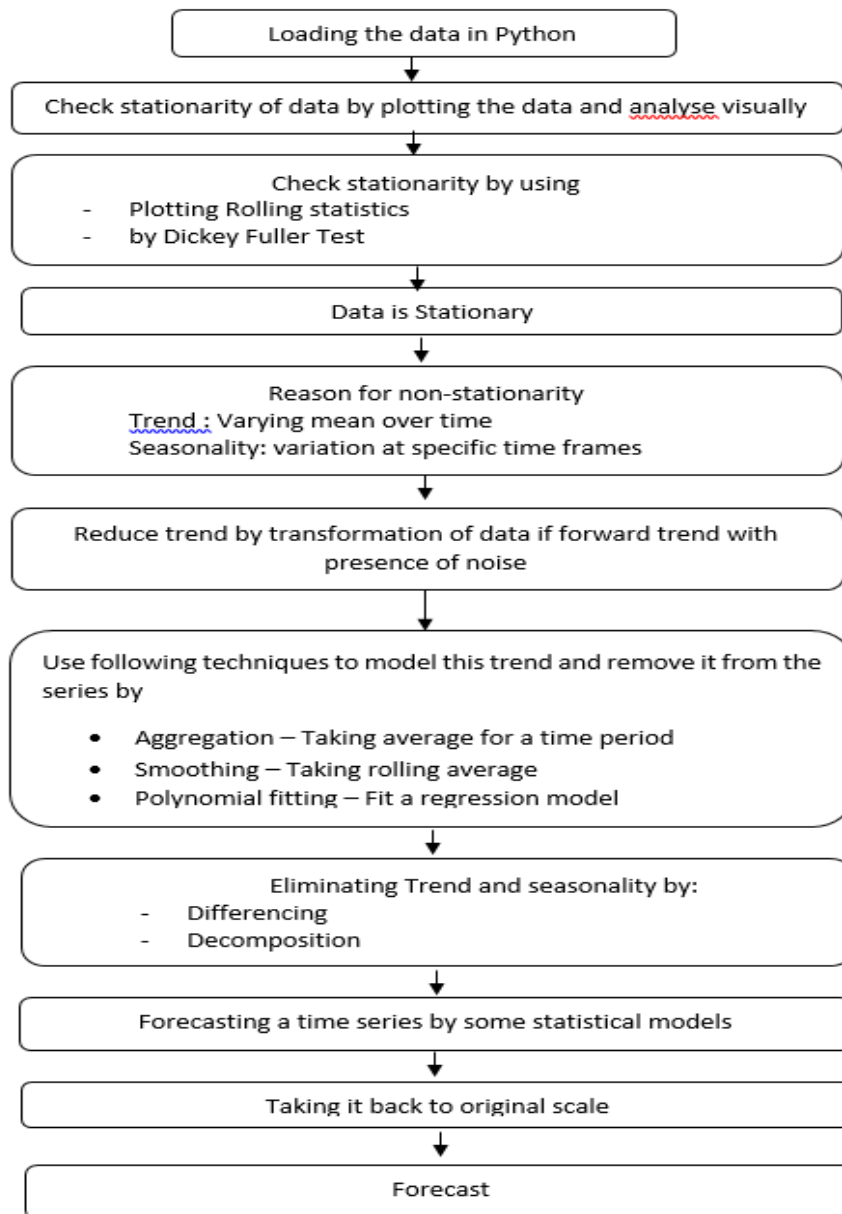
2. Data Analysis

Steps involved in Time Series forecast of Crime Data

2.1 Imported the data state IPC crime data year 2015 - 2019 by using pandas. We set our data by function of 'read' in bundle represented with PD. We have substituted this in a variable data set and then passed those strings in date time format.

```python
import numpy as np
import pandas as pd
import matplotlib.pylab as plt
%matplotlib inline
from matplotlib.pylab import rcParams
rcParams['figure.figsize'] = 10,6
```

```python
dataset = pd.read_csv("E:/IPC 15 - 19E.csv")
```

In time series we have the data from 01.01.2015 – 01.12.2019. Print the top five values for head and tail of the data. I have month as my 'index' and 'number of crimes' as my second column.

```python
dataset['Month'] = pd.to_datetime(dataset['Month'], infer_datetime_format = True)
Dataset = dataset.set_index(['Month'])
```

```python
from datetime import datetime
Dataset.tail(5)
```

Month	state
2019-08-01	5484
2019-09-01	5413
2019-10-01	6183
2019-11-01	5034
2019-12-01	4387

Month	state
2015-01-01	4789
2015-02-01	4420
2015-03-01	4896
2015-04-01	4516
2015-05-01	4830

2.2 Plot the data and analyse visually, Dates on 'X' axis and, state as crime in Chhattisgarh on Y axis.

```python
plt.xlabel("Date")
plt.ylabel("Month wise crime in Chhattisgarh 2015 - 2019")
plt.plot(Dataset)
```
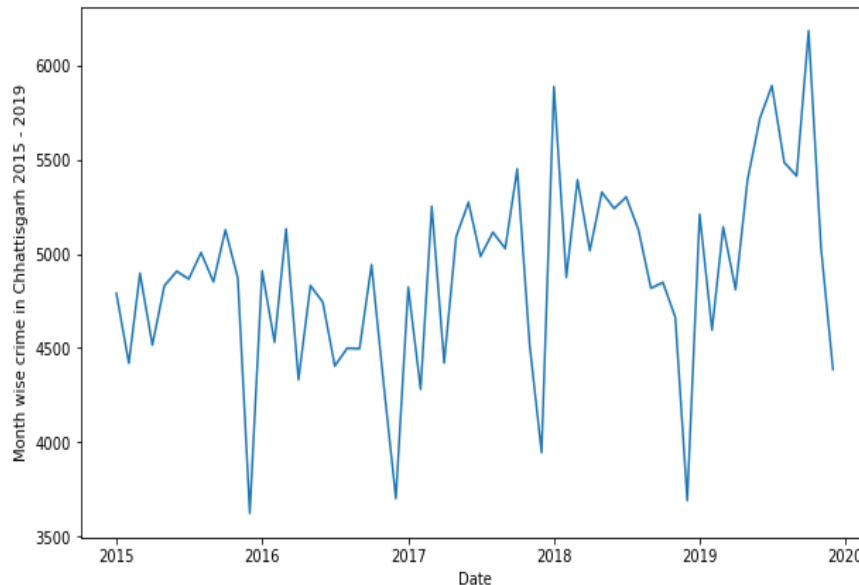
2.3 Check the stationarity of Data: If the data is stationary then it will fulfill the following three conditions:

- Constant Variance
- An auto variance that does not depend upon time
- Constant mean

2.4 The graph shows a general increasing trend in the data as well as seasonal variations. Next step is to check the Seasonality of the data. Basically there is two steps to check the seasonality of the data.

1. Rolling statistics
2. Dickey Fuller Test

Rolling statistics: To examine how the moving average or moving variance changes over time, plot it on a graph. This indicates that at any given moment, 't' will take the average of the previous year, i.e. the previous 12 months.

First we check the rolling mean and rolling standard deviation. We use window for 12 month at a yearly level.

```
rolmean = Dataset.rolling(window=12).mean()
rolstd = Dataset.rolling(window=12).std()
print(rolmean, rolstd)
```

	state				
Month		2018-12-01	5015.166667	2017-11-01	505.087631
2015-01-01	NaN	2019-01-01	4958.750000	2017-12-01	458.373871
2015-02-01	NaN	2019-02-01	4935.500000	2018-01-01	547.092335
2015-03-01	NaN	2019-03-01	4914.666667	2018-02-01	507.777533
2015-04-01	NaN	2019-04-01	4897.416667	2018-03-01	516.012773
2015-05-01	NaN	2019-05-01	4902.916667	2018-04-01	483.001568
2015-06-01	NaN	2019-06-01	4942.750000	2018-05-01	489.619116
2015-07-01	NaN	2019-07-01	4991.916667	2018-06-01	488.453303
2015-08-01	NaN	2019-08-01	5021.833333		
2015-09-01	NaN	2019-09-01	5071.500000	2018-07-01	492.266250
2015-10-01	NaN	2019-10-01	5182.750000	2018-08-01	492.322534
2015-11-01	NaN	2019-11-01	5213.666667	2018-09-01	498.554334
2015-12-01	4725.333333	2019-12-01	5271.583333	2018-10-01	487.519044
2016-01-01	4735.333333		state	2018-11-01	475.768533
2016-02-01	4744.583333	Month		2018-12-01	531.117319
2016-03-01	4764.250000	2015-01-01	NaN	2019-01-01	461.614582
2016-04-01	4748.916667	2015-02-01	NaN	2019-02-01	473.099547
2016-05-01	4749.000000	2015-03-01	NaN	2019-03-01	456.378697
2016-06-01	4735.333333	2015-04-01	NaN	2019-04-01	456.071059
2016-07-01	4696.916667	2015-05-01	NaN	2019-05-01	462.067972
2016-08-01	4654.666667	2015-06-01	NaN	2019-06-01	511.705726
2016-09-01	4625.166667	2015-07-01	NaN	2019-07-01	573.830583
2016-10-01	4609.750000	2015-08-01	NaN	2019-08-01	590.515312
2016-11-01	4561.916667	2015-09-01	NaN	2019-09-01	596.752195
2016-12-01	4568.416667	2015-10-01	NaN	2019-10-01	671.105347
2017-01-01	4561.250000	2015-11-01	NaN	2019-11-01	653.293938
2017-02-01	4540.416667	2015-12-01	395.925001	2019-12-01	524.177183
2017-03-01	4550.333333	2016-01-01	399.181283		
2017-04-01	4557.750000	2016-02-01	392.439100		
2017-05-01	4579.333333	2016-03-01	406.382741		
2017-06-01	4623.500000	2016-04-01	419.849206		
2017-07-01	4671.916667	2016-05-01	419.866862		
2017-08-01	4723.166667	2016-06-01	416.915150		
2017-09-01	4767.416667	2016-07-01	424.942447		
2017-10-01	4809.750000	2016-08-01	416.539277		
2017-11-01	4828.333333	2016-09-01	413.897623		
2017-12-01	4848.666667	2016-10-01	396.589810		
2018-01-01	4937.250000	2016-11-01	396.699442		
2018-02-01	4986.750000	2016-12-01	380.231618		
2018-03-01	4998.500000	2017-01-01	373.987877		
2018-04-01	5048.166667	2017-02-01	382.688209		
2018-05-01	5067.833333	2017-03-01	400.537215		
2018-06-01	5065.083333	2017-04-01	396.934647		
2018-07-01	5091.333333	2017-05-01	419.541164		
2018-08-01	5092.250000	2017-06-01	463.890759		
2018-09-01	5074.666667	2017-07-01	469.300729		
2018-10-01	5024.500000	2017-08-01	482.106520		
2018-11-01	5036.333333	2017-09-01	483.826501		
		2017-10-01	521.266312		
		2018-04-01	483.001568		
		2018-05-01	489.619116		
		2018-06-01	488.453303		

You notice first 11 rows NaN that is 'not a number'. Because we're averaging the past twelve values, the rolling mean for the first 11 isn't defined. To test stationarity, remove the NaN values and examine the charts.

```
orig = plt.plot(Dataset, color='blue',label='Original')
mean = plt.plot(rolmean, color='red', label = 'Rolling Mean')
std = plt.plot(rolstd, color='black', label = "Rolling std")
plt.legend(loc='best')
plt.title('Rolling Mean & Standard Deviation')
plt.show(block=False)
```

Plotting rolling statistics

Rolling Mean & Standard Deviation
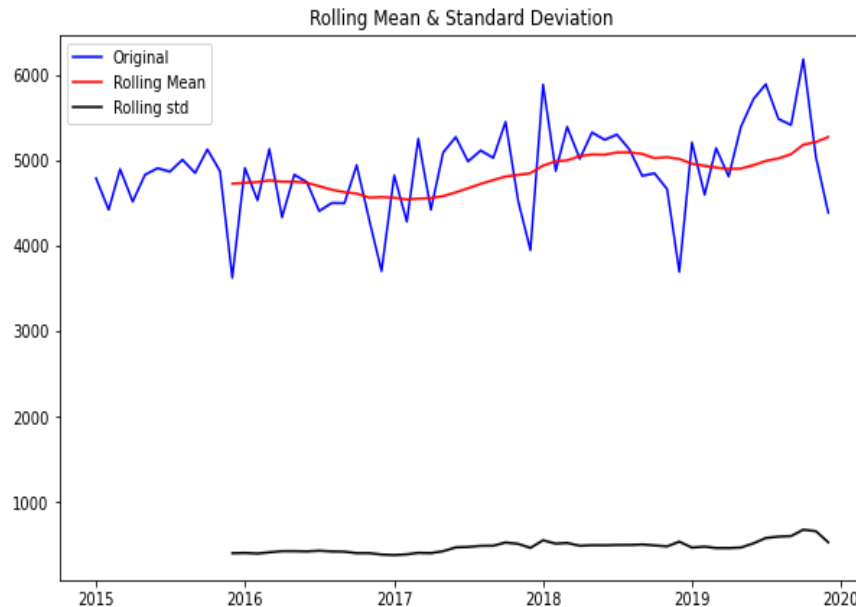
As you can see the mean and standard deviation are not constant. So our data is not stationary. This is visual technique to check the data stationarity.

Dickey Fuller Test:

```
from statsmodels.tsa.stattools import adfuller

print ('Results of Dickey-Fuller Test:')
dftest = adfuller(Dataset['state'], autolag='AIC')

dfoutput = pd.Series(dftest[0:4], index=['Test Statistic','P-value', 'Lags Useed', 'Number of observati
for key, value in dftest[4].items():
        dfoutput['Critical Value (%s)'%key] = value
print(dfoutput)
```

```
Results of Dickey-Fuller Test:
Test Statistic              -0.274984
P-value                      0.928973
Lags Useed                  11.000000
Number of observations Used 48.000000
Critical Value (1%)         -3.574589
Critical Value (5%)         -2.923954
Critical Value (10%)        -2.600039
dtype: float64
```

According to our null hypothesis, our p-value should always be smaller. Our p-value is 0.92, which is rather high. Our data is not stationary, according to the Dickey Fuller Test.

2.5 Data transformation: Data transformation might help to lessen the trend. In this scenario, for example, we can plainly observe that there is a considerable upward tendency. As a result, we may perform a transformation that penalises larger values more than lower values. Taking a log can be one of them. For the sake of simplicity, we'll use a log transform.

```
Dataset_log = np.log(Dataset)
plt.plot(Dataset_log)
```
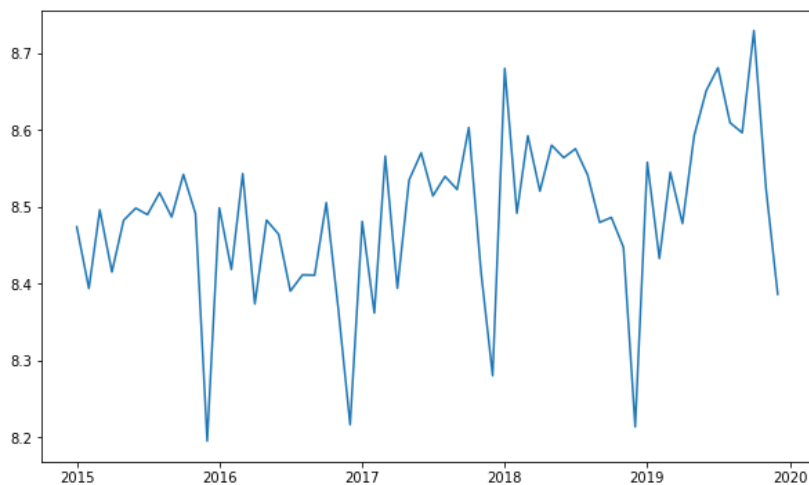

Number on Y axis has change because the scale itself has change. We have taken the log but trends remain the same where has the values of y has been changed.

Calculating the Moving average:

```
movingAverage = Dataset_log.rolling(window=12).mean()
movingSTD = Dataset_log.rolling(window=12).std()
plt.plot(Dataset_log)
plt.plot(movingAverage, color='red')
```
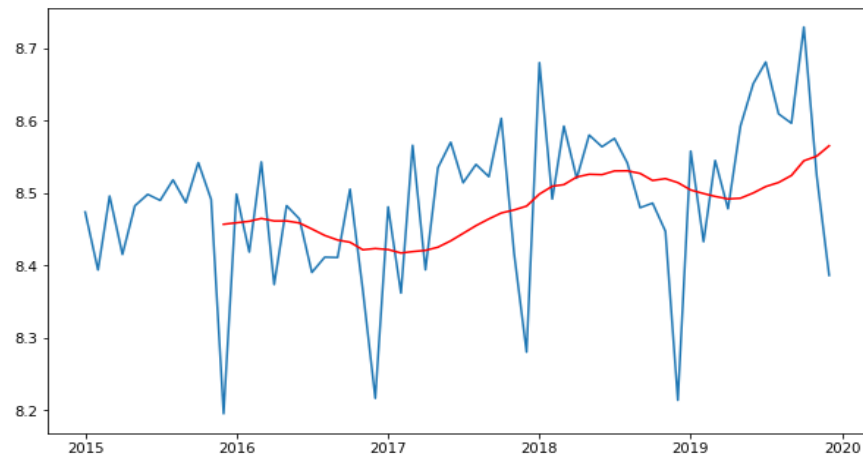
From figure you can conclude that mean is not stationary. But it quite better than the previous one.

Finding the difference between the moving average and the crime reported in state by using log scale for the first 10 months.

```
datasetLogMinusMovingAverage = Dataset_log - movingAverage
datasetLogMinusMovingAverage.head(12)

datasetLogMinusMovingAverage.dropna(inplace=True)
datasetLogMinusMovingAverage.head(10)
```

	state
Month	
2015-12-01	-0.261731
2016-01-01	0.039698
2016-02-01	-0.042496
2016-03-01	0.078134
2016-04-01	-0.087866
2016-05-01	0.021141
2016-06-01	0.005590
2016-07-01	-0.060045
2016-08-01	-0.030032
2016-09-01	-0.024162

2.6 Now, using the function test stationary, determine if the time series is stationary or not using rolling statistics.

```
test_stationarity(datasetLogMinusMovingAverage)
```


Rolling Mean & Standard Deviation
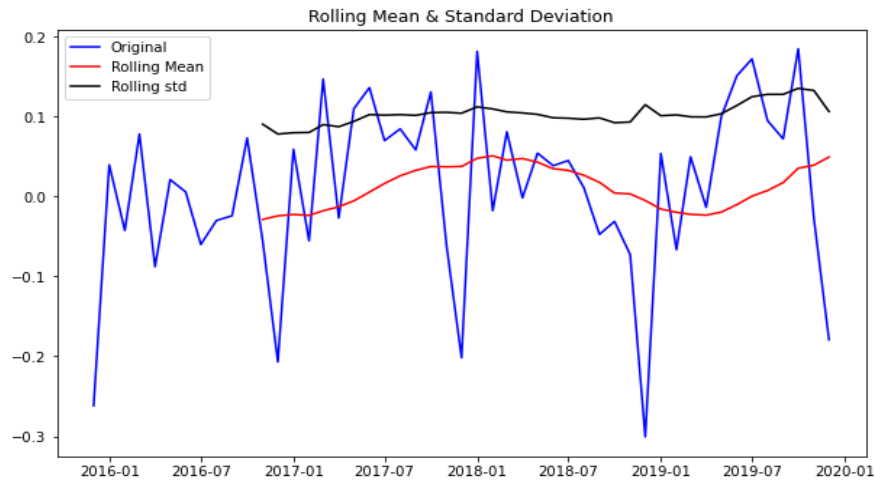
From the figure visually notice that there is no such trend or you can say it is much better what we saw earlier.

2.7 Calculation of weighted average by seeing the trend inside the time series.

```
exponentialDecayWeightedAverage = Dataset_log.ewm(halflife=12, min_periods=0, adjust=True).mean()
plt.plot(Dataset_log)
plt.plot(exponentialDecayWeightedAverage, color='red')
```
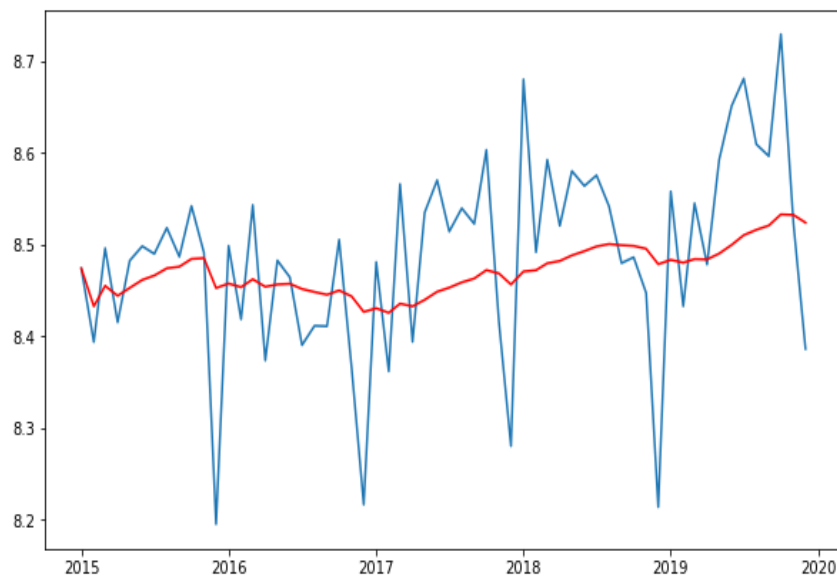
As we can see the time series is progressive, the average is also progressing towards the higher side. So there is upward trend and keeps on increasing with respect to time.

Another transformation checking by using log scale and then we subtract the weighted average and pass the variable in the test stationarity function.

```
datasetLogMinusMovingExponentialDecayAverage = Dataset_log - exponentialDecayWeightedAverage
test_stationarity(datasetLogMinusMovingExponentialDecayAverage)
```
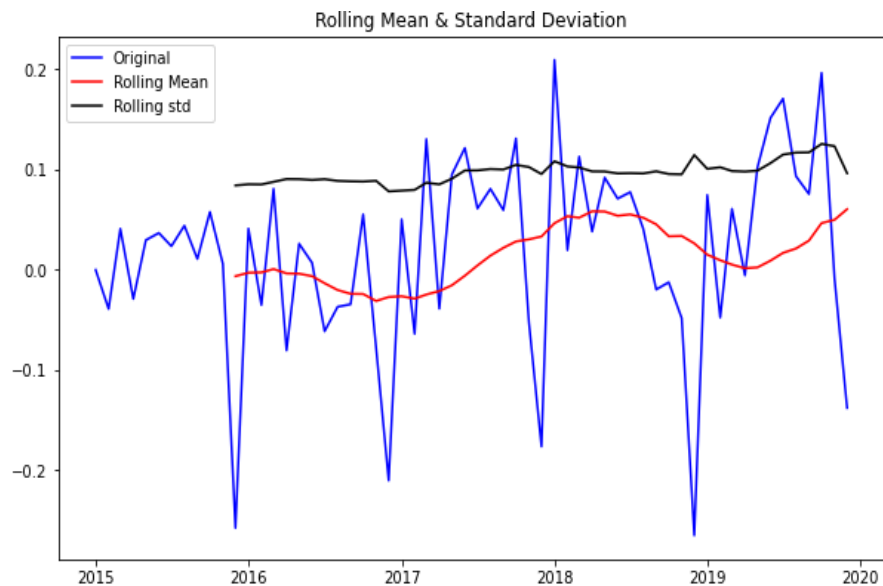

Standard deviation is quite flat, it is not moving and we can say that this doesn't have any trend. Rolling mean is quite better than the previous one. So time series is stationary.

2.8 Differencing: It is one of the most frequent ways for dealing with both trend and seasonality. In this technique, we take the difference of the observation at a particular instant with that at the previous instant. This mostly works well in improving stationarity. First order differencing can be done in Python as:

```
datasetLogDiffShifting = Dataset_log - Dataset_log.shift()
plt.plot(datasetLogDiffShifting)
```

```
[<matplotlib.lines.Line2D at 0x21859e9cf40>]
```
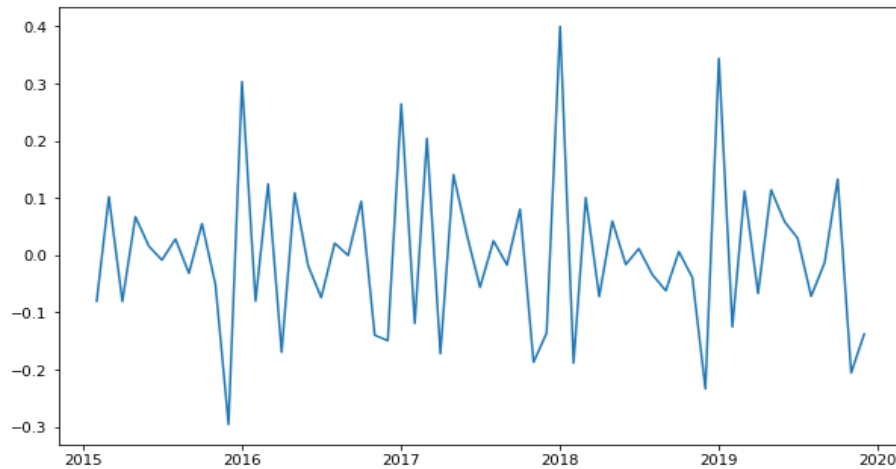
We have taken a lag and just shift the values by 1 or can say the difference the time series by 1. Now drop the NaN values the output is :

```
datasetLogDiffShifting.dropna(inplace=True)
test_stationarity(datasetLogDiffShifting)
```
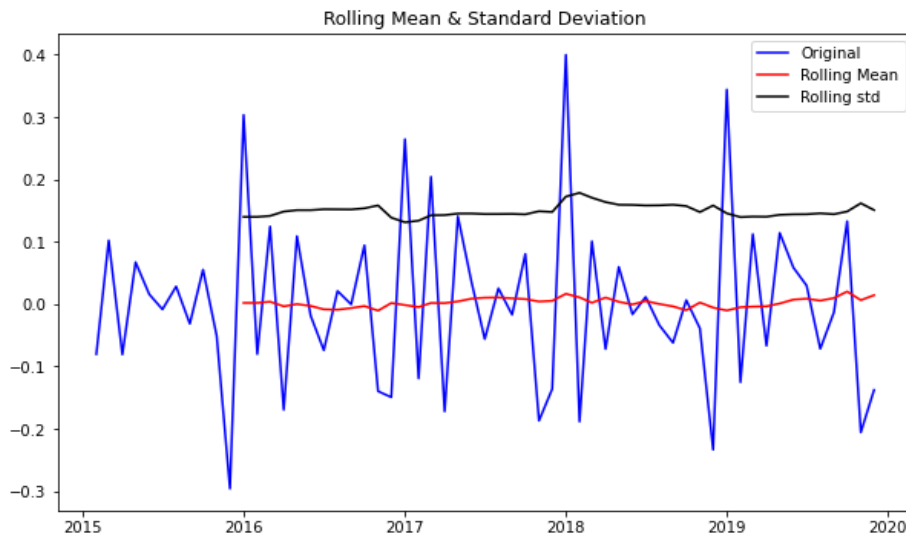

2.9 Decomposing: The remaining half of the series is returned after both trend and seasonality have been modelled independently. We decompose the data by using seasonal decomposition. Seasonal decomposition segregates three components – Trend, seasonal and residual.

```python
from statsmodels.tsa.seasonal import seasonal_decompose
decomposition = seasonal_decompose(Dataset_log)

trend = decomposition.trend
seasonal = decomposition.seasonal
residual = decomposition.resid

plt.subplot(411)
plt.plot(Dataset_log, label='Original')
plt.legend(loc='best')
plt.subplot(412)
plt.plot(trend, label='Trend')
plt.legend(loc='best')
plt.subplot(413)
plt.plot(seasonal,label='Seasonality')
plt.subplot(414)
plt.plot(residual,label='Residuals')
plt.legend(loc='best')
plt.tight_layout()

decomposedLogData = residual
decomposedLogData.dropna(inplace=True)
test_stationarity(decomposedLogData )
```
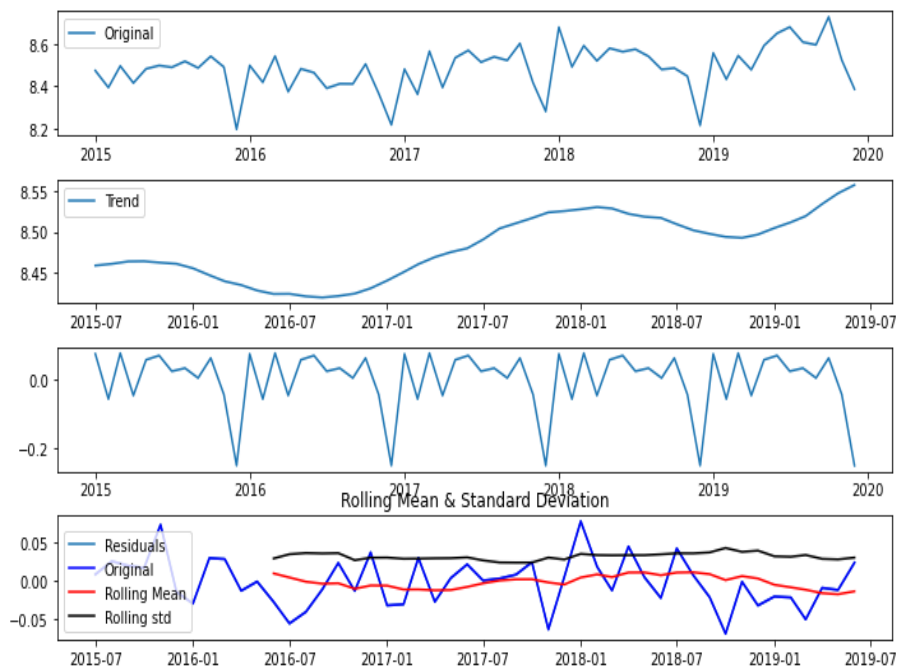

The first figure represents the original data which saw that there was a trend which is going upward and can say it's quite linear in nature along with we have seasonality also present and the last graph represent the residuals as well. Residual is the irregularities that is present in our data.

```
decomposedLogData = residual
decomposedLogData.dropna(inplace=True)
test_stationarity(decomposedLogData )
```


Rolling Mean & Standard Deviation
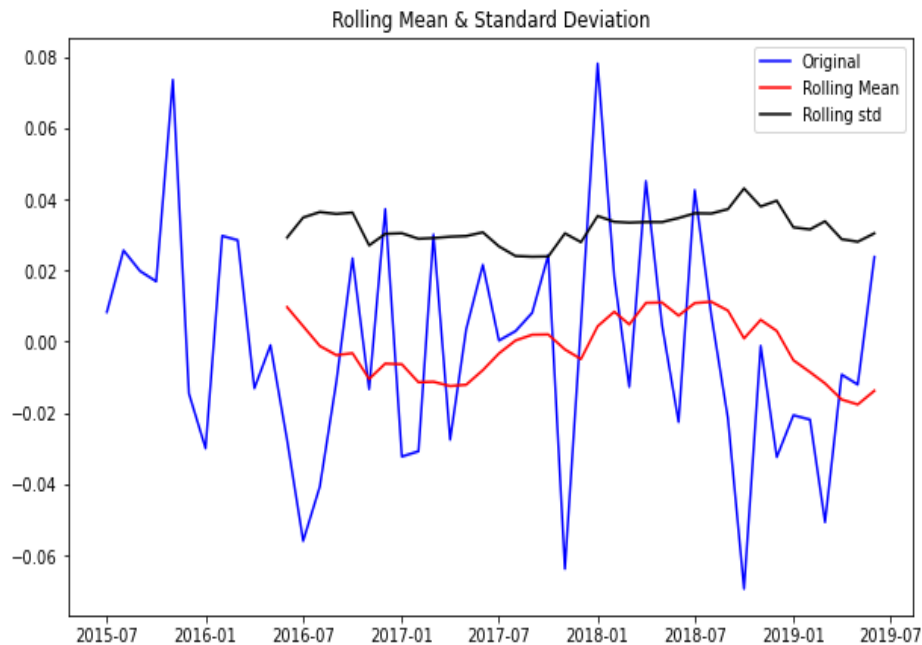
2.10. **Forecasting**: There can be two situations after performing the trend and seasonality estimation techniques.

    i.   A strictly stationary data set with no value dependency, which is rare.

    ii. A set of variables that is heavily reliant on one another. We use statistical models like ARIMA to forecast the data in this case. The abbreviation for Auto-Regressive Integrated Moving Averages (ARIMA) is Auto-Regressive Integrated Moving Averages. The ARIMA model's parameters define the predictors (p, d.q). Calculating 'p' and 'q' values may be done using ACF and PACF charts.

    a.   **Autocorrelation Function (ACF):** This is a measure for how well the TS correlates with a delayed version of itself. ACF would compare series at time instants 't1'...'t2' with series at time instants 't1-5'...'t2-5' at lag 5. (t1-5 and t2 being end points).

b. **The partial autocorrelation function (PACF):** After eliminating the variations previously described by the prior comparisons, determines the correlation between the TS and a lagged version of itself. The correlation will be tested at lag 5, but the effects previously stated by delays 1 to 4 will be erased.

Autocorrelation and Partial Autocorrelation: Some Final Thoughts

- The PACF is frequently the greatest tool for identifying an AR model.
- After the model's command, the theoretical PACF for an AR model "shuts off." The term "shuts off" implies that the partial autocorrelations are theoretically equal to 0 beyond that point. In other words, the number of non-zero partial autocorrelations determines the AR model's order. The "order of the model" refers to the most severe delay of x that is used as a predictor. The ACF, rather than the PACF, is frequently used to identify MA models.
- An MA model's theoretical PACF does not turn off, but rather tapers toward 0 in some fashion. For an MA model, the ACF includes a clearer pattern. The ACF will exhibit non-zero autocorrelations only at the model's lags.
- p,d,q p AR model lags d differencing q MA lags

```python
from statsmodels.tsa.stattools import acf, pacf

lag_acf = acf(datasetLogDiffShifting, nlags=20)
lag_pacf = pacf(datasetLogDiffShifting, nlags=20, method='ols')

#plot ACF:
plt.subplot(121)
plt.plot(lag_acf)
plt.axhline(y=0,linestyle='--',color='gray')
plt.axhline(y=1.96/np.sqrt(len(datasetLogDiffShifting)),linestyle='--',color='gray')
plt.axhline(y=1.96/np.sqrt(len(datasetLogDiffShifting)),linestyle='--',color='gray')
plt.title('Autocorrelation Funtion')

#plot PACF:
plt.subplot(122)
plt.plot(lag_pacf)
plt.axhline(y=0,linestyle='--',color='gray')
plt.axhline(y=1.96/np.sqrt(len(datasetLogDiffShifting)),linestyle='--',color='gray')
plt.axhline(y=1.96/np.sqrt(len(datasetLogDiffShifting)),linestyle='--',color='gray')
plt.title('Partial Autocorrelation Funtion')
plt.tight_layout()
```
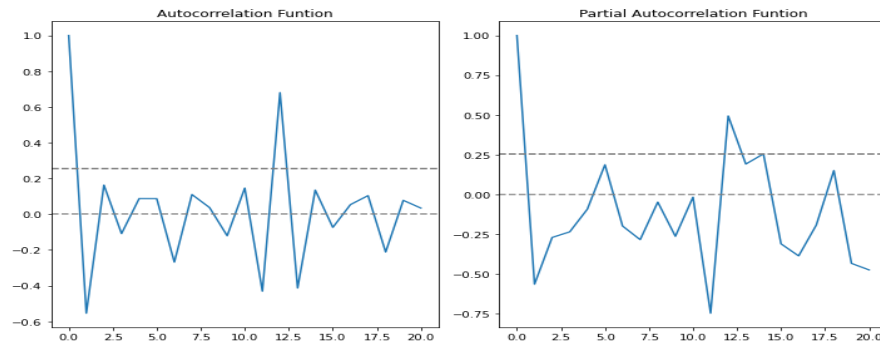
To compute the value of P and Q, you must first determine the point at which the graph cuts off or dips to zero for the first time. As you can see from the graph, it almost reaches the confidence threshold or p value of 1.

Let's now create three separate ARIMA models that account for both individual and combined impacts. Print the RSS feed for each as well. Please note that RSS refers to residual values rather than actual series. First, we must load the ARIMA model.

The order argument of ARIMA, which takes a tuple, can be used to provide the p,d,q values (p,d,q). Consider the following three scenarios:

AR Model
order=(1,1,0)

```
#AR MODEL
model = ARIMA(Dataset_log, order=(1,1,0))
results_AR = model.fit(disp=-1)
plt.plot(datasetLogDiffShifting)
plt.plot(results_AR.fittedvalues, color='red')
plt.title('RSS: %.4f'% sum((results_AR.fittedvalues-datasetLogDiffShifting["state"])**2))
print('Plotting AR model')
```
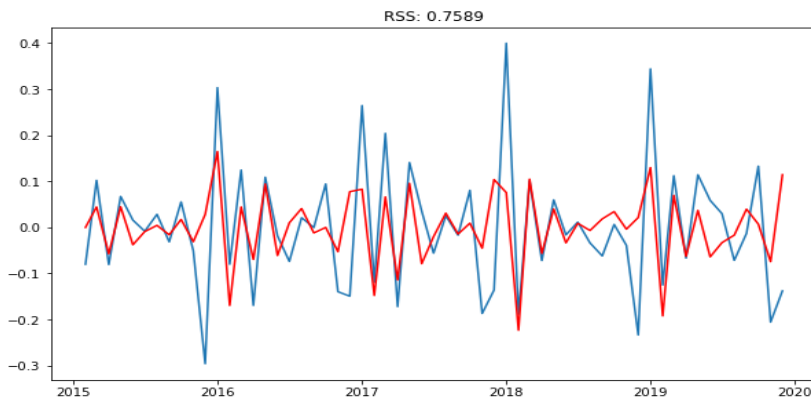
MA Model
order=(0,1,1))

```
model = ARIMA(Dataset_log, order=(0,1,1))
results_MA = model.fit(disp=-1)
plt.plot(datasetLogDiffShifting)
plt.plot(results_MA.fittedvalues, color='red')
plt.title('RSS: %.4f'% sum((results_MA.fittedvalues-datasetLogDiffShifting["state"])**2))
print('Plotting MA model')
```

Plotting MA model
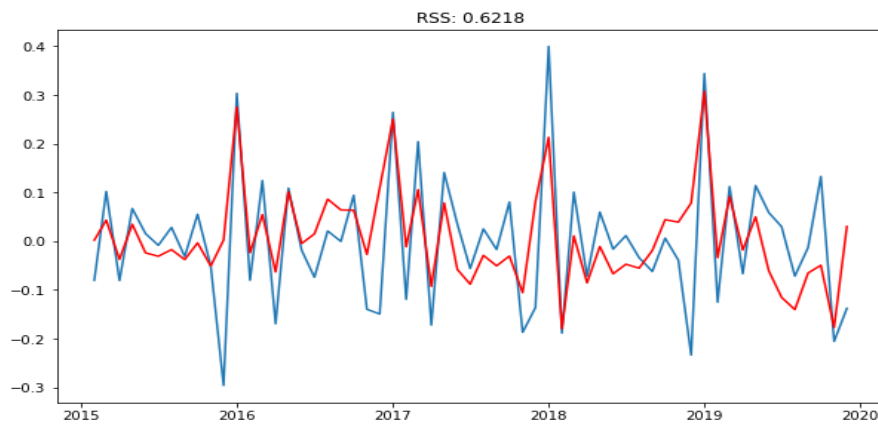
Combined Model
Order = (1,1,1,)

```
model = ARIMA(Dataset_log, order=(1,1,1))
results_ARIMA = model.fit(disp=-1)
plt.plot(datasetLogDiffShifting)
plt.plot(results_ARIMA.fittedvalues, color='red')
plt.title('RSS: %.4f'% sum((results_ARIMA.fittedvalues-datasetLogDiffShifting["state"])**2))
print('Plotting ARIMA model')
```

Plotting ARIMA model
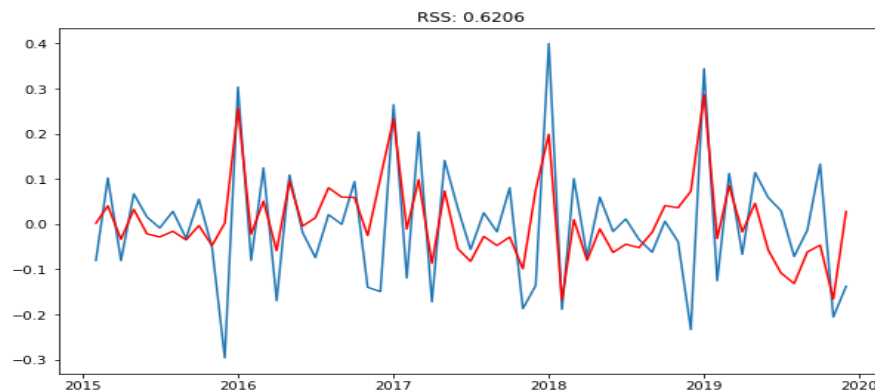
The Residual sum of square is 0.6206 which is quite good

2.11 Returning to the original scale

Since the combined model gave best result, lets scale it back to the original values and see how well it performs there. First step would be to store the predicted results as a separate series and observe it.

Now we need to exponentials of the whole data so that it comes back to the original form from where we have just using it to exponent of it.

```
predictions_ARIMA_diff = pd.Series(results_ARIMA.fittedvalues, copy=True)
print(predictions_ARIMA_diff.head())

Month
2015-02-01     0.002108
2015-03-01     0.040603
2015-04-01    -0.033459
2015-05-01     0.032662
2015-06-01    -0.021529
dtype: float64
```

```
predictions_ARIMA_diff_cumsum = predictions_ARIMA_diff.cumsum()
print(predictions_ARIMA_diff_cumsum.head())

Month
2015-02-01     0.002108
2015-03-01     0.042711
2015-04-01     0.009252
2015-05-01     0.041914
2015-06-01     0.020384
dtype: float64
```

```
predictions_ARIMA_log = pd.Series(Dataset_log["state"], index=Dataset_log.index)
predictions_ARIMA_log = predictions_ARIMA_log.add(predictions_ARIMA_diff_cumsum,fill_value=0)
predictions_ARIMA_log.head()

Month
2015-01-01     8.474077
2015-02-01     8.396003
2015-03-01     8.538885
2015-04-01     8.424634
2015-05-01     8.524516
dtype: float64
```

```
predictions_ARIMA = np.exp(predictions_ARIMA_log)
plt.plot(Dataset)
plt.plot(predictions_ARIMA)
plt.title('RMSE:%4f'%np.sqrt(sum((predictions_ARIMA-Dataset)**2)/len(Dataset)))
```
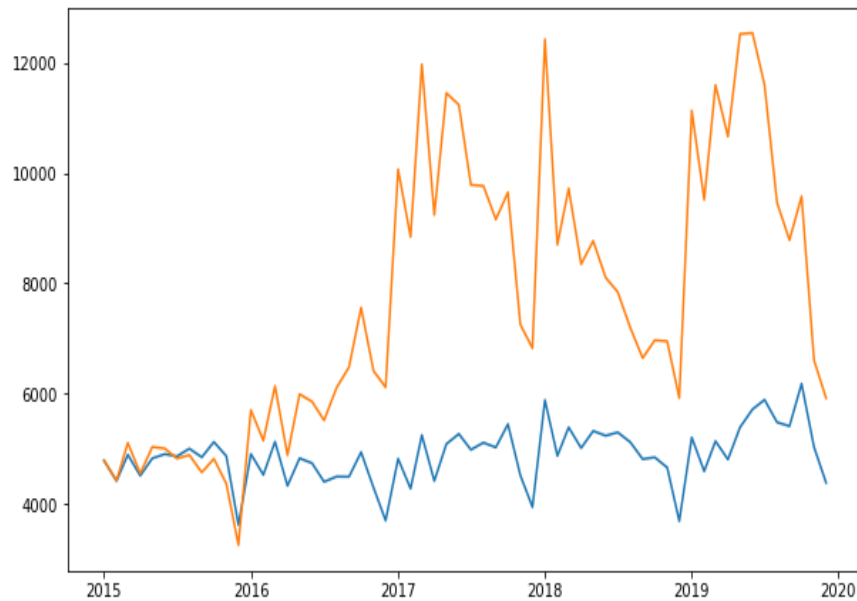
As we can see there is a present of seasonality in data. We going to use SARIMAX method to forecast the data.

2.12   SARIMAX ARIMA is distinguished from SARIMAX by seasonality (exogenous factors). SARIMAX requires a separate set of p, d and q inputs. For the seasonality element and an input named's' that represents the seasonality cycle's periodicity.

```
import statsmodels.api as sm
```

```
model=sm.tsa.statespace.SARIMAX(Dataset['state'],order=(1, 1, 1),seasonal_order=(1,1,1,12))
results=model.fit()
```

Here we created some additional data set for 24 months

```
from pandas.tseries.offsets import DateOffset
future_dates=[Dataset.index[-1]+ DateOffset(months=x)for x in range(0,24)]
```

Now we forecasted the data for the next two years 2020 and 2021

	forecast
2020-01-01	5,929
2020-02-01	5,287
2020-03-01	5,907
2020-04-01	5,385
2020-05-01	5,856
2020-06-01	5,936
2020-07-01	5,875
2020-08-01	5,791
2020-09-01	5,650
2020-10-01	6,016
2020-11-01	5,385
2020-12-01	4,599
2021-01-01	6,112
2021-02-01	5,475
2021-03-01	6,084
2021-04-01	5,589
2021-05-01	6,075
2021-06-01	6,189
2021-07-01	6,161
2021-08-01	6,032
2021-09-01	5,900
2021-10-01	6,322
2021-11-01	5,620
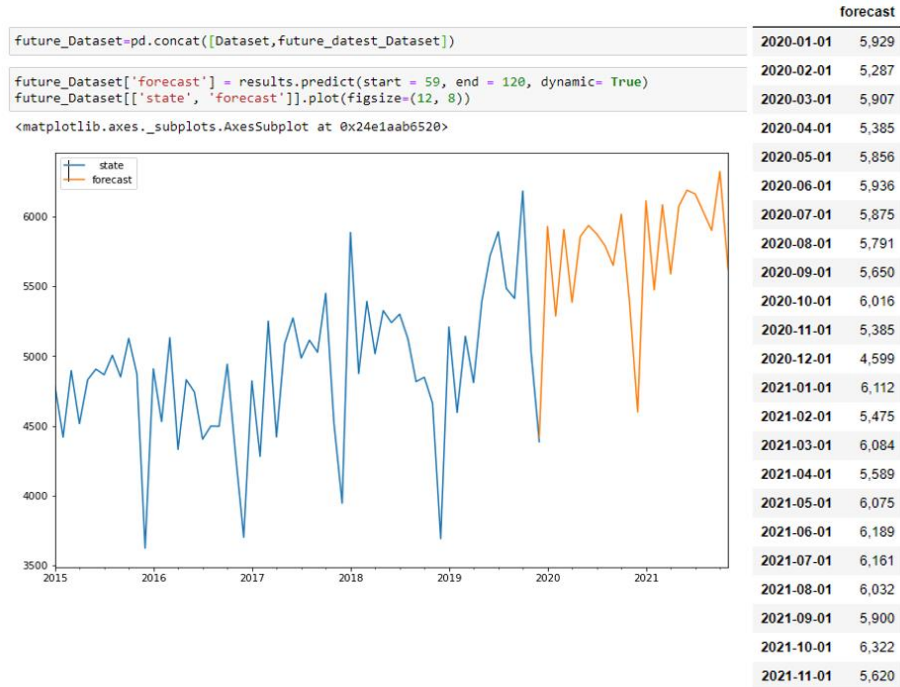
3. **Conclusion**

Crime is continuous growing on process, which is dependent upon socio- economic, Criminological factors etc. Law enforcement agencies takes active initiative in investigating crimes and apprehending criminals. Models should be used by investigating authorities to assess crime rates in the future as well. The comparison of historical and predicted crime rates works effectively, and this statistical data analysis may be applied to real-world circumstances. For forecasting crimes, we need data and for data, we need appropriate variables which can be fit in various software available for analysis. Our basic data comes from format of 'FIR'. It is quite an exhaustive document as far as extracting data is concerned, but can be improved further to match international standards by amending it to allow it run on various software available like 'Crime Stat' and 'Arc GIS' etc. by incorporating following additions:

> ➢ All the crime should have a unique identification number ('UIN').
> ➢ Geographical Data (Longitude and Latitude)

Data mining helps in detecting and preventing criminal activity. It may also be used to identify 'hot spots' creating criminal profiles and learning crime pattern and trends by law enforcement agencies, which will help in prevention of crime thus ensuring public security. More data can be acquired via platforms like CCTNS in the future, allowing for the development of more efficient models. It is obvious from the research that machine learning will use fundamental aspects of criminal activities to classify a criminal action given a place and date. This article offers a crime data prediction by taking crime data as input and producing an output using Python as the main language, with Python's inherent libraries pandas and numpy speeding up the process. Prediction results change depending on the algorithm.

4. Limitation

Time series model consists of four components: Trend, seasonality, cyclic and Random variation. While prediction of the above data, Random variation which are caused by Natural disaster(s) and strikes/ lockouts have not been taken into account. Since we are going through irregular variation in the form of 'Pandemics' ,the forecast data will be different from the actual data of 2020 and 2021 because of not factoring irregular variation in crime data due to 'Pandemics'.

Reference:

- *Research on the Impact of Technology on Policing Strategy in the 21st Century - Kevin Strom*
- *AlkeshBharati, DrSarvanaguru RA.K - Crime Prediction and Analysis Using Machine Learning*
- *Riya Rahul Shah - Crime Prediction Using Machine Learning*

- *Md. Abdul Awal, Jakaria Rabbi, Sk. Imran Hossain, and M. M. A. Hashem - Using Linear Regression to Forecast Future Trends in Crime of Bangladesh.*
- *Emmanuel Ahishakiye, Elisha OpiyoOmulo, Crime Prediction Using Decision Tree (J48) Classification Algorithm*
- *Professor Raj Chetty, Using Big Data to Solve Economic and Social Problems.*
- *Crime Data Analysis Using Machine Learning Models - Telugu Maddileti1 ,Vaddemani Sai Madhav, K V Sai Sashank ,G. Shriphad Rao.*
- *Gerard Biau - Analysis of a Random Forests Model*
- *Crime Detection using Data Mining -VineetPande, VirajSamant, Sindhu Nair.*
- *PAOLO DELL, AVERSANA - ARTIFICIAL NEURAL NETWORKS AND DEEP LEARNING*
- *Classification using Artificial Neural Network Optimized with Bat Algorithm - SelvaStauba, EminKaramanb, SeyitKayaa, Hatem Karaponara, ElcinGuvena - Artificial Neural Network and Agility*
- *Narender Kumar, Dharmender Kumar.*
- *Peng Chen, Tao Chen, Hongyong Yuan - GIS Based Crime Risk Analysis and Management in Cities*
- *M.Akhiljabbar, B.LDeekshatuluaPriti Chandra - Classification of Heart Disease Using K- Nearest Neighbor and Genetic Algorithm*
- *Khawar Islam, Akhter Raza - Forecasting Crime Using ARIMA Model*
- *Ayodele A. Adebiyi., 2 Aderemi O. Adewumi, 3 Charles K. Ayo - Stock Price Prediction Using the ARIMA Model*
- *S.R.Deshmukh, Arun S. Dalvi, Tushar J .Bhalerao, Ajinkya A. Dahale , Rahul S. Bharati, Chaitali R. Kadam, Crime Investigation using Data Mining.*
- *Akshay Kumar, Neha Prasad, NohilNarkhede, and Siddharth Mehta. "Crime: Classification and pattern prediction." International*

Advanced Research Journal in Science, Engineering and Technology
3, no. 2 (2016)

Author's Profile

Name   : Ashok Juneja
Service :IPS
Cadre   :Madhya Pradesh/Chhattisgarh
Year of allotment:1989
Place of postings: SSP/SP in Rajgarh/Raigarh/Bilaspur/Durg/Raipur
                    IGsP(Range) at Bilaspurand Durg
                    ADGP looked after
ANO/Admn./CAF/STF/CID/Training
                    On deputation to Government of India as
Commandant CISF, Head Security Functional at CWG (2010),
DDG(NR) NCB
Present posting: DGP Chhattisgarh

Decoding Radicalisation and Halting its March

Rashi Agarwal and Divyam Garg*

Abstract

9/11 has truly globalized terrorism and has resulted in shifting the focus of Law enforcement agencies to the "pre-attack" process of building terrorists called Radicalisation. By discussing Staircase Model given by notable psychologist and applying it to the Indian context, this article is an attempt to decode this process and to understand the various factors responsible for it. Explaining, how the simple religious indicators like growing beard and wearing skull cap become indicators of the process, this article highlights the challenges faced by Law Enforcement Agencies in dealing with it vis-à-vis upholding the human rights and secularism. Policy Recommendations of Counter-radicalisation and De-Radicalisation initiatives are alternatives to "hard" policing approach in tackling this menace.

Keywords

Radicalisation

Terrorism

Terrorist

* Executive Officer, IB

Violent Extremism

Staircase Model

Pyramid Model

Ummah

Religiosity

ISIS

Wahhabism

Salafism

Deobandi School

Quran

Islam

Muslims

Sufi

Waqf

Madrasa

Community Policing

Counter-Radicalizaiton

De-Radicalisation

Anti-Radicalisation

Intelligence

Counter Narratives

Coexistence

Law Enforcement Agencies

Jaish-e-Mohammad

Hizb-ul-Mujahideen

Decoding Radicalisation and Halting Its March

Scientists like Galileo to politicians like Mahatma Gandhi have been branded as radicals at some point of time, whereas, today the term has come to describe the terrorists, their sympathizers and supporters. A major difference is that the latter are disrupting the peace and harmony of modern democratic societies. Understanding Radicalisation has been a matter of debates and discussions in global strategic circles. There is no set definition of the term and different agencies have defined it differently (Textbox 1).

In simple terms, Neumann defined it as **"What goes on before the Bomb goes off"**

To quote a well-known incident, on February 14, 2019, Jaish-e-Mohammad (JeM) backed suicide bomber drove his car laden with explosives into a convoy of CRPF personnel on Jammu-Srinagar Highway near Lethpora, in Pulwama district of Jammu & Kashmir. 40 CRPF personnel were martyred in one of the deadliest suicide attacks, likes of which returned to the valley after nearly 2 decades. The attacker, Adil Ahmad Dar, was a local boy and was once a die-hard fan of Indian cricketer

United Kingdom's Home Office (MI5) [N] - "The process by which people come to support terrorism and violent extremism and, in some cases, then join terrorist groups."

Canada's Police [4] – "'the process by which individuals—usually young people—are introduced to an overtly ideological message and belief system that encourages movement from moderate, mainstream beliefs towards extreme views."

European Commission [N] – "the phenomenon of people embracing opinion, views and ideas which could lead to acts of terrorism".

Textbox 1: Definitions of Radicalization

MS Dhoni[4]. What changed his ideology from an Indian cricket team supporter to killing his own countrymen is worth decoding i.e. process of radicalisation.

1. Process of Radicalisation

Understanding how the process of radicalisation passes through different stages is crucial for Police to halt its march and develop a counter-narrative. It is only after 9/11, that the focus shifted to research on violent radicalisation. There are a few researches available in this regard. One of the most notable models is worth mentioning.

Staircase Model

This was proposed by social psychologist *Fathali M. Moghaddam* in his paper "*The Staircase to Terrorism*" (2005)[5]. There are six floors in the metaphorical staircase where each floor is representing a specific psychological process as shown in the chart below

FLOOR 5: The Terrorist Act and Sidestepping Inhibitory Mechanisms

FLOOR 4: Solidification of Categorical Thinking and the Perceived Legitimacy of the Terrorist Organization

FLOOR 3: Moral Engagement

FLOOR 2: Displacement of Aggression

FLOOR 1: Perceived Options to Fight Unfair Treatment

GROUND FLOOR : Psychological Interpretation of Material Conditions

Figure 1: Moghaddam staircase to terrorism model

At the *bottom* of the staircase lie all members of the society who evaluate their living conditions. The ones who perceive injustice climb to the *first floor*. Here, they start exploring options to turn their discontentment into some tangible actions like protests, and demonstrations. People unsatisfied even at this floor climb to the *second floor*. Here, they start to find "enemy groups" to direct their discontentment and anger which can be government or any religious-ethnic group. People ready for violence against the "enemy" then climb to the *third floor*. Now they start seeking moral justification for violence and get morally engaged with a violent organization, like insurgent groups or terror organization. People who are now transformed into potential recruits climb to the *fourth floor*. Here the recruits are imbibed with the ideology of "us" vs "them" and consider their organization's view to be the only legitimate view. It is now a matter of time that the person climbs to the *fifth floor* where any inhibitions about carrying violence are sidestepped and the person becomes a full-fledged violent extremist or terrorist.

It is clear that radicalized individuals are very less as compared to the individual/group of individuals in earlier stages like *second floor*. It is these stages from where a person actually starts moving away from the mainstream society. It is at this stage where we have to halt the march towards radicalisation. For this, it is important to know early signs of radicalisation in a potential recruit.

2. Signs of Radicalisation

While passing through different stages as discussed in the previous section, an individual depicts behavioral changes in daily life. These are signs of radicalisation that families, society, and law enforcement agencies (LEAs) need to be aware of. From the investigations in cases of ISIS returnees [6][7], some common behavioral patterns were found.

Increased frustration from perceived alienation and discrimination makes the individual turn towards intense religious activities. He might come in contact with a radical religious cleric through a friend or during

Khutbah (after Friday namaz) in a mosque or through a teacher in a madrassa or may even land on a site of a firebrand preacher. This increased religiosity led to change in behaviors which can be listed as follows:

- From wearing denim to black turban.
- Growing long beard.
- Wearing of skullcap.
- Asking females in house to dress in appropriate way (covering of body parts, wearing hijab etc).
- Going on frequent pilgrimages.
- Spending more time in mosques even after the namaz and khutbah.
- Increased isolation from family members and reading of religious literature published by the radical fundamentalist organisations.
- Increased watching of TV channels with Islamic overtones on PTV or Gulf based TV channels etc.
- Increased online time chatting – can be a member of chatroom of a radical organisation.
- Watching videos posted by radical organisations which can encourage them to either join the organisation or even carry out Lone-Wolf attacks.

These indicators may look normal signs of religiosity but they become significant when shown by people who have not been showing such behaviors initially. This is where one of the major challenges for policing also exists.

3. Factors exacerbating radicalisation

Various Socio-Political and Cultural factors act in unison towards radicalisation.

Table 1: Push and Pull factors for radicalization

Push Factors	Pull Factors
Socio-economic discrimination	Seeking of "higher purpose" by individuals
Political and Cultural marginalization	Romanticized pull of 'better life' under the Caliphate
Religious/Communal tensions	Political motivations to defend the glory of religion/religious identities.
Revenge/ Retaliation feeling against perceived or real discrimination	Personal relationship with leaders/influencers.

As mentioned in staircase model, an individual has to perceive a sense of injustice to climb to floor one. In Indian context, the partition of the country, followed by insecurity among minorities and communal riots in post-independent India has created a sense of divide in the society. Further, socio-economic marginalization of India's largest religious minority i.e. Muslims was brought to notice by Sachar and Mishra committee report. Sachar committee report highlighted that very often Muslims are looked at with suspicion due to the markers of Muslim identity like burqa, skull cap, beard etc. Such socio-political factors create a breeding ground for terrorist recruiters.

In such a scenario, Internet provides anonymity and wide reach to radical preachers. A report [8] published by RAND corporation in 2013 found that the Internet created more opportunities for people to become radicalized. It provided the people with an echo-chamber or confirmation

of their beliefs by others; and facilitated the process of radicalisation, if not accelerating it; although it iterated that the Internet was not a

Attack on Dhaka's Holey Artisan Bakery (2016)[9]

The attack killed 29 people and was a warning call in many ways for Subcontinental countries. Two of the five attackers, who were well educated and young, were following Zakir Naik, the controversial Islamic preacher and founder of the Islamic Research Foundation (IRF). Another attacker, Nibras Islam, was also following a Twitter account of an Islamic State propagandist, Mehdi Masroor Biswas, arrested in Bangalore in late 2014. But Naikwas wildly popular in Bangladesh through his Peace TV that aired from Dubai even when he was banned banned in the UK and Canada for hate speech against other religions. While India and Bangladesh had banned the TV channel, Naik's IRF functioned relatively freely out of Mumbai. And of course, his speeches were widely distributed online. Power of the firebrand preachers can't be undermined.

substitute of in person radicalisation but complementary to it. It has come to the notice of National Technical Research organization (NTRO) and Intelligence Bureau (IB) that traffic on websites posting radical content increases during Hindi-Muslim tensions.

In recent times, through the study of ISIS social media posts, it was analyzed that the terror organization is trying to project a sense of relatedness with western mores and traditions to attract Europeans. They further create a 'romanticized life' in the Caliphate to be desired by individuals. A case here is posting of pictures[10] by ISIL fighters with Nutella jars, usage of modern beats in background music etc which attracts millennial. A Twitter user "Bint Emergent" - an ISIS fan-girl wrote on her blog that "Jihadis, like Ninjas, look cool – like ninjas or video game warriors – gangster and thuggish even – the opposition doesn't."[11] Analysis by Deccan Chronicle[12] of one of the most influential IS Twitter account holder, Mehdi Masroor, written under the name of @Shamiwitness revealed strategies to attract youth to IS (Refer Figure 2).

The innocent individuals are recruited by interpretation of Qur'an in literal sense resulting in an exclusivist, hateful and intolerant mindset towards Non-Muslims and those Muslims who don't subscribe to this literal interpretation. These interpretations have led to rise of various schools in Islam as depicted in Figure 3. Out of these schools, Wahhabism, Salafism and Deobandi School are of particular concern.

A screen garb of the now suspended twitter account of the MNC executive.

TWITTER TERROR

CHANNEL 4 NAMED THE PRO-JIHAD TWEETER @SHAMIWITNESS AS "MEHDI", BUT DID NOT REVEAL HIS FULL NAME AS HE SAID HIS LIFE WOULD BE IN DANGER.

NOT POOR OR UNEDUCATED

On his Facebook pages he regularly shares jokes, funny images and talks about superhero movies, posting pictures of pizza dinners with friends, and Hawaiian parties at work.

The IS militant group has made extensive use of social media for propaganda and recruitment, as well as for disseminating grisly execution videos.

■ The twitter handle eportedly went on air last year

■ He has been posting photos and videos of IS aggression.

■ Posted IS updates from the front lines.

■ His tweets were seen two million times each month

■ Mehdi reportedly tweeted in November "May Allah guide, protect, strengthen and expand the Islamic State Islamic State brought peace, autonomy, zero corruption, low crime rate."

■ He has over 17,700 followers.

■ Two thirds of all foreign fighters on Twitter followed him.

■ He spoke to British jihadis regularly, before they leave to join the Islamic State, after they arrived, and if they died he praised them as martyrs.

"IF I HAD A CHANCE TO LEAVE EVERYTHING AND JOIN THEM I MIGHT HAVE.. MY FAMILY NEEDS ME HERE."

Figure 2: Analysis of Mehdi Masroor Twitter account

Wahhabism emphasized that there is no need of intercession between Allah and devotee including that of Prophet Muhammad. They denounced the pilgrimages to saints and even supported the idea of destroying the tombs and domes of saints. They demanded conformity over the view that all Muslims must pledge their allegiance to a single Muslim leader-Caliph. Those who would not conform, should be killed, their wives and daughters violated, and their possessions confiscated.

Salafism: According to a former U.S. National Security Advisor Michael Flynn, the "ideology" of Salafism is what unites Islamic terrorists around the world. Another senior US official also described Salafism as a "fundamental understanding of Islam" that justifies terrorism.

The **Dar-ul Uloom**, popularly known as **Deobandi School** is today the largest institution for dissemination and propagation of Islam in the sub-continent. Even though Deobandi School has disassociated itself from terrorist groups, it is still widely believed to be the fountainhead of Taliban, Harkat-Ul-Mujahideen, Harkat-Ul-Jihad Islami and Jaish-e-Mohammed.[13]

Islamic Sects
major schools, notable branches

80%
of all muslims

15%
HANBALI

20%
HANAFI

20%

Salafist Jhadism

WAHABI/SALAFIST•

Alawites

29%
SHAFI

Taliban

BARELVI

DEOBANDI

TWELVERS 12%

ISMAILI ● 2%

15%
MALIKI

SUNNI

SHIA

ALEVI-BEKTASHISM ● 0.5%

Ahmadi

ZAIDI ● 0.5%

>1% • UNORTHODOX

• believe Muhammad's cousin
& son-in-law Ali succeeded him
• slightly different beliefs
& prayers to Sunni's

• orthodox school
• believe Muhammad's true
successor was father-in-law
Abu Bakr

SCHISM 632 CE

IBADI

SUFI
• mystical form.
• focus on direct inner
experience of God
• pervade all Muslims
• numbers unknown

QURANISTS

hold the Qur'an
to be the only
authentic source of
Islamic faith, reject
different recorded
oral traditions
(hadith)

KHARIJITE

extreme sect, initially
supported Muhammad's
cousin Ali, then rejected him

CHRISTIANS

HINDUS

BUDDHISTS

JEWS

375m   600m   900m   1,600m   2,100m   100m   ☪ 20m

FOLK

MUSLIMS

NON RELIGIOUS
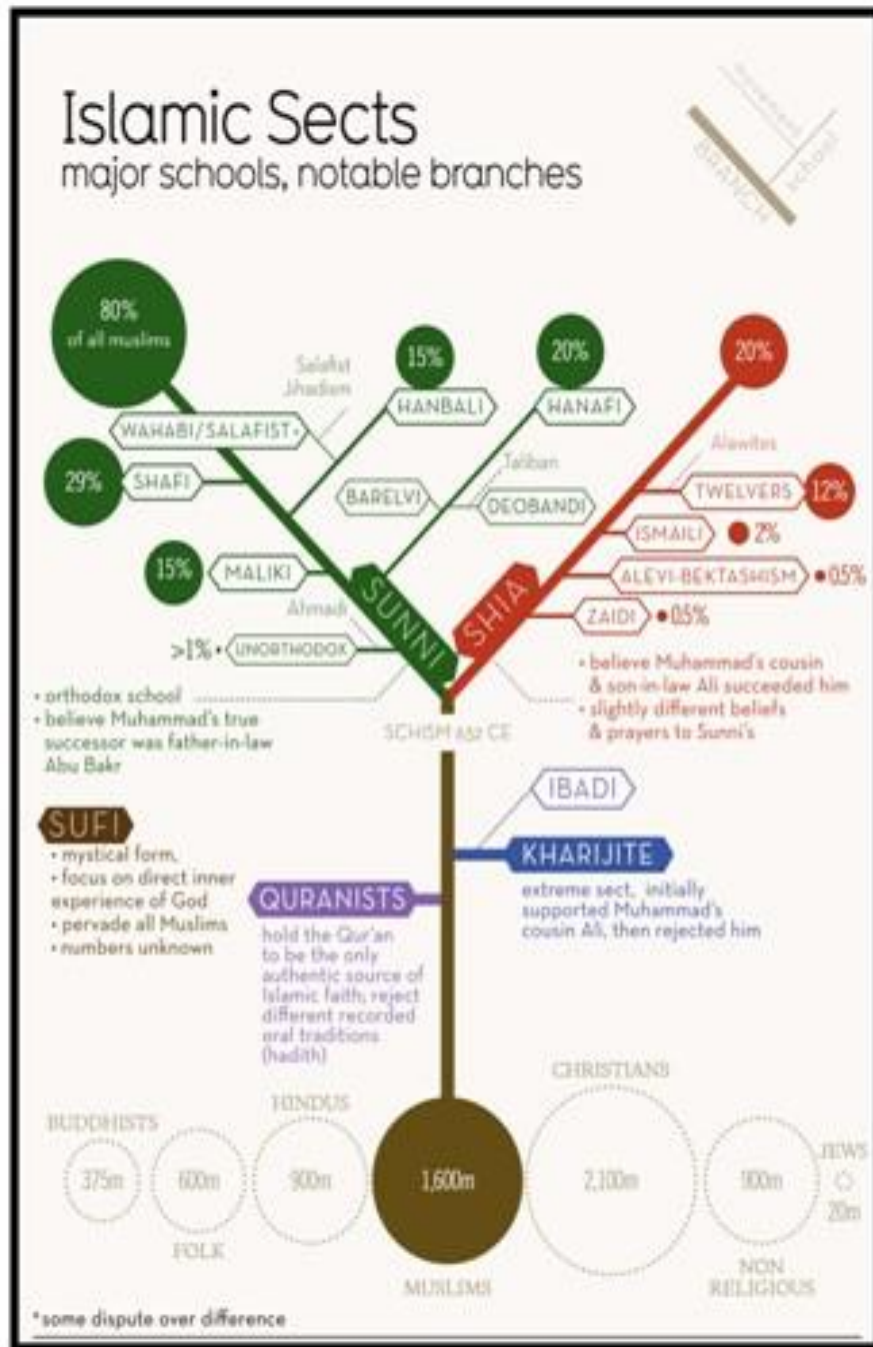
*some dispute over difference

Figure 3 Schools of Islam

The role of modification of religious concepts which gives legitimization to the beliefs of radicals cannot be ignored, as it provides moral justification to an individual while climbing stairs of radicalisation. Of particular concern are the interpretations which are inculcated in individuals at floor four and five of staircase model where they do not hesitate to take lives of innocents. Here, examples of 'Hijrah' & 'Takfiri' can be cited. Originally, '*Hijrah*' meant that Muslims facing trouble in practicing Islam are obligated to migrate to Dar al-Islam (Land of Islam). ISIS propagates & showcases persecution of "true believers" all over the world, including Muslim countries. So, it has given new distorted militant meaning to it and calls for Hijrah to Islamic safe havens in Iraq and Syria- the Islamic state. This has justified the rise in geographical spread of terrorist havens. Further, it has obliged that those unable to perform Hijra should carry out Lone-Wolf attacks in their resident country. Another concept is that of '*Takfiri*', which means that followers of Wahhabi doctrine can declare fellow Muslim infidels if they do anything which encroaches on the sovereignty of the absolute authority (Caliph, as modified these days). Now, killing of those not pledging allegiance to the Caliph is justified and even confiscation of their properties is encouraged. The issue is aptly highlighted by *DC Pathak*[14], ex-Director Intelligence Bureau, "For better understanding of radicalisation, there is urgent need to study religious texts and interpret its true spirit rather than a selective approach which is used to propagate extremist ideologies."

4. Challenges faced by the agencies

Radicalisation, as we have seen, is a potential precursor to terrorism. But, it is much easier to define and identify the reasons behind it when the bomb has blown off. For a LEA, identifying an individual who is in the process of radicalisation is in itself a challenge. The visible changes at preliminary stages of radicalisation, like, strict adherence to religion, or voicing of opinions is within the rights guaranteed to an individual by Constitution. A person experiencing a transition to radicalisation or even a radicalized individual is guaranteed a right to hold such a view until he,

under the influence of radical ideology, oversteps the boundaries created by law. In both the cases, person cannot be sent to detention centre.

It has also come to notice that many times religious radicalism is taught in madrasas as well. In words of Uttar Pradesh's Shia Waqf Board Chairman Waseem Rizvi[15] , "If Madrasas are not shut down, the ISIS/IS influence will grow and in [next] 15 years, more than half of Muslim population in India will be influenced by the IS ideology". But here, the challenge is how to separate wheat from chaff.

There is no control over the radicalisation that happens offshore. Many Indian Muslims travel to Gulf for work and pilgrimage (Haj/Umrah) but get in touch with the radical elements.

The neo-challenge is posed by modern day technology i.e. Internet and Social media. Apart from Anonymity, easy availability and accessibility of radical content furthers the propaganda and religious indoctrination. ISIS uses VPN, and not GPS. They can select an IP address for a country outside India, thus bypass email or phone verification. Jaish-e-Mohammad, Hizb-ul-Mujahideen and Laskhar-e-Taiba have also started making intensive use of the internet for radicalisation. AQIS has strong presence on the internet. Internet also aids in terror financing through crypto-currencies & imparts training in making weapons (Improvised Explosive Devices (IEDs)) from materials available in daily life which makes it easy to carry out "Lone-Wolf Attacks". Moving on to the "dark net"[16] for recruitment, training and religious indoctrination is another modern era challenge that faces LEA.

Echo-chamber: Due to personalized algorithms of social media platforms, an environment is created in which a person encounters only beliefs or opinions that coincide with their own, so that their existing views are reinforced and alternative ideas are not considered. In a study [17] by George Washington University, it was found that of the 71 Americans charged with crimes relating to ISIS, almost all spent time in ISIS's insular online communities. After seeing hundreds of memes with Islamic State ideology superimposed, the ideas suddenly didn't seem so extreme.

Further, monitoring social media has become an albatross around LEA's neck. Though social media platforms have strict policies of prohibiting terrorist content but they are not immune to it. Most social media accounts and posts use metaphors which are not direct expression of their radical views. As can be seen in the Instagram account description in Figure 4[17], 'coconut' refers to anyone who is not 'true believer' in Islam, and 'ukhtis' refer to 'sisters', so she is encouraging other interested women to message her privately.
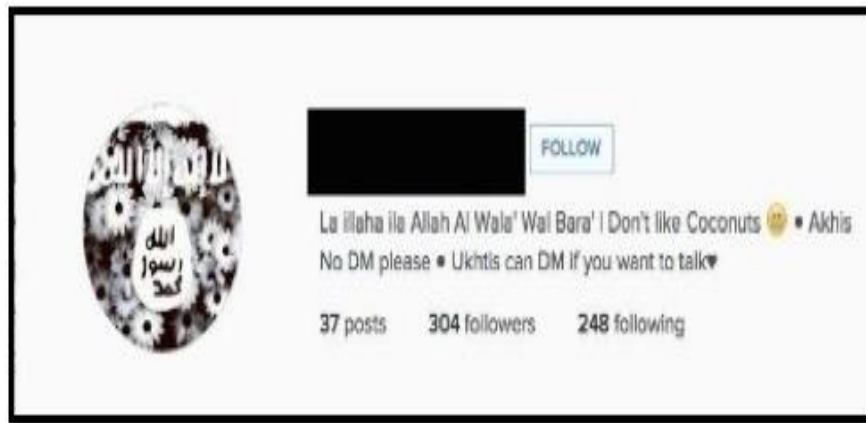
Figure 1 Social media account of ISIS member

Moreover, even if LEAs identify such accounts and take them down. These users create new accounts giving reference to previous accounts. In no time, they gain back their online support and also, the taking down of their account is looked as 'badge of honour'.

5. Way Forward

In order to halt the march of Radicalisation, a multi-faceted approach is needed depending upon the stage of Radicalisation we confront. The two main pillars of this strategy are: *Counter-Radicalisation* and *De-Radicalisation*. (Refer Table 2).

A. <u>Counter-Radicalisation</u>

Pro-active initiatives taken at pre-conviction and/or pre-detention stage to reduce the potential risk of a radical transforming into a terrorist is counter-radicalisation. The initiatives which can form part of a Counter-Radicalisation Policy are:

*Rebuilding Capacity of Police for Correct Diagnosis***:** Minor details and differences in ideologies and concepts of different schools of Islam (Deobandi, Barelwi, Wahhabi, Salafi etc) should be known to the policemen for distinguishing between a religious Muslim and a Muslim under radicalisation.

Community Policing: Early signs of radicalisation are easier to be noticed by the Family and local society where the individual lives. Community policing envisages a partnership-based collaboration between the police and the community like Janmaithri Suraksha Project [18] of Kerala Police or Prahari scheme [19] of Delhi Police.

For instance, Maharashtra's ATS has created a video [20] to create awareness about online radicalisation showing how family can help in curbing radicalisation. For this to be successful,the police need to be trained specifically in soft skills, cultural sensitivity and Human Rights. However, this approach needs to be very cautiously implemented as in conflict theatres like Kashmir, many members of the community are themselves acting as spies for the terrorists.

*Intelligence led Policing & Multi-Agency Cooperation***:** Intelligence should be at the core of all "preventive radicalisation strategies", as it improves the response time. However, there is a need for reinvigoration of tradition of 'khabri'. Moreover, it becomes imperative to have cooperation among multiple agencies like IB, NIA, and/or ED whose potential target overlaps for effective outcome. The institution of Multi Agency Centre (MAC) at National level and SMAC at state level are already present and should be best utilized.

*Building Counter-Narratives***:** Counter-Narratives targeting incorrect interpretation of religious concepts need to be disseminated. For instance,

emphasis should be given to "*Misakh-e-Madina*" – constitution written by Prophet Muhammad in which he declared that all those who lived in Medina were part of his *Ummah*, which included Jews and non-Muslims too. This document should form the basis of Islam in the 21st century as it established the most original principles of coexistence with non-Muslims. To develop such robust counter-narratives, engagement of psychologists, criminologists, counsellors and prominent religious leaders is essential.

*Education Reforms & Regulation of Madrassas***:** The curriculum needs to promote peace, stability, tolerance and social syncretism, while ridiculing stereotyping, prejudice and discrimination. It should imbibe rational thinking in children and youth. Sports are one of the best ways for intermingling of children from different backgrounds and learn coexistence. Maharashtra's program [21] to tackle with home-grown extremism is a fine example and it envisages teaching principles of democracy and demerits of dictatorship in Urdu schools along with opening up of vyayam shalas in minority schools. Further, madrassas need social surveillance. Their curriculum should include "*saleeqa e iqlaq*" which is a method to resolve differences in opinion amicably. They can be brought under the supervision of boards of education to bring standardization.

*Building Cyber Capacity***:** With the growing challenge of online recruitment and virtual jihad, there should be a cyber-wing in deradicalisation cell in each district. Keeping an eye for certain hashtags, and monitoring screen time, Kerala Police in "Operation Pigeon"[22] targeted around 350 vulnerable youths and brought them back to mainstream through collective counselling sessions involving officials of NIA, IB, community leaders and parents of the youth.

B. De-Radicalisation

The reactive initiatives taken to bring back a radicalized terrorist into the mainstream by changing his belief system and rejecting the extremist ideology is De-radicalisation. Since here, we are dealing with the

hardcore radicals, all the steps of Counter-Radicalisation might not work. Hence, there is a need for specific focus on De-Radicalisation.

First of all, it is needed to confirm that there is scope for the person to feel remorse of his actions. Once the accused is arrested and sentenced to prison, he needs to undergo intense counselling and religious re-education, preferably by "reformed radicals", for more credibility. This program needs to be developed in close collaboration with the psychologists, religious leaders, community leaders and criminologists. If, upon completion of this program, the accused expresses guilt, then he can be taken on path of de-radicalisation. On the other hand, if still the person doesn't feel remorse, then justice should be served as per the law.

In the former case, where accused has expressed guilt, he may be further sent to "*reform center*". Religious re-education should continue with broadening of ideological perspectives. Sufi preachers, if roped in here, will be of great help. Comfortable environment which includes sports, TV, music and limited internet will not create further psychological stress. Skilling and re-skilling of the young Overground workers or "Facebook Mujahids" of Kashmir will help them secure gainful employment.

Tihar Jail's program [23] of rehabilitating the inmates back to society via Job Placement Program is a good example. The inmates land a job between Rs. 1-4 lakh/annum which, by the standards of economic hardships majority of them have faced, is pretty decent. The ones who are already well-educated will find it even easier to land a well-paid job. This will help in improving their self-worth.

2.Table 2: Characteristics relevant to de-radicalization, anti-radicalization and counter-radicalization strategies

Types of Program Required	Types of Behavior Targeted	Main aims of the Program	Main objective of the Program	Conditions under which program is implemented
De-radicalization	Insurgency	Rehabilitation	Cessation of Violence	Post Surrender
	Terrorism			Post Detention
			Re-integration	Post Conviction
Counter-Radicalization	Transition to Terrorism	Mitigation	Disengagement	Pre-Conviction
	Violent Extremism		Re-integration	Pre-Detention
			Rehabilitation	Active Radicalization
Anti-Radicalization	Vulnerability to risk from radicalization and violent extremism	Prevention	Detection	Pre-Radicalization
			Deterrence	Early Radicalization

Another aspect of this program should be re-establishment of relationships with *family* members. This has been successful in Saudi Arabia[24] and Singapore[25] and has very good potential to be successful in India because the institution of family is very strong here. They should be made to visit the bereaved families of other dead jihadis to gauge what grief their families has to go through because of their actions. For unmarried ones, provisions can be made to get them married and start a family as this can very much work to pull them away from radicalisation.

Another pillar of tackling Radicalisation is Anti-Radicalisation (refer Table 2) which refers to creation of such an environment that Radicalisation doesn't happens in the first place. This is a long term strategy which derives its initiatives from counter-radicalisation and de-radicalisation for a prolonged period of time.

6. Conclusion

India needs a policy against radicalisation and it needs it sooner than later. While we proceed to frame such a policy, apart from the above recommendations, it becomes prudent to learn from some of the innovative practices in this regard around the world. One of these is "Operation Trojan T-Shirt"[26] by EXIT Germany (a civil society initiative in de-radicalisation in Germany). Germany suffers from right-wing extremism and in 2011, EXIT donated T-Shirts to the biggest German right-wing rock music festival organiser anonymously. They had the slogan "Hardcore Rebels – National and Free" on them. They were distributed for free at a music festival. The T-Shirt Slogan changed to "What your t-shirt can do, you can too – we help you to leave the right-wing scene. EXIT Germany", after the first wash. This reached around 250 people directly and got ample German and European media attention. It even went on to become one of the most shared topics on social media that year. It claimed that post campaign, the people wanted to leave right-wing extremism was three times more than before.

Another case is the use of AI driven media-intelligence platforms[27], such as used by Zignal Labs (a cloud computing based media intelligence software service company based in US), to combat civil unrest and terrorism online, before it evolves offline. They segment out the far-right groups to better understand their behaviour and likelihood of taking arms in the real world. It filters the content and is able to separate the wheat from the chaff.

This brings us to another question – "How much radical is radical enough?". What might be radical in western societies might not be as much of a radical person in Indian society. Hence, it is needed that we devise an India centric approach instead of copying what's worked abroad. In India, where the family and community relation are interwoven at deeper level, the Police and other Law Enforcement Agencies need to move to WHAM (Winning Hearts and Mind) strategy. Police officers must be empathetic and compassionate, women police officers can take lead in this respect as also highlighted by the executive head of the country recently[28].

Surely, India can draw some comfort from the fact that ISIS's sway and hold is on decline lately and also the way NIA, IB and other agencies have been busting the sleeper modules on a regular basis. However, it can't afford to take a breather as emergence of groups like Harkat ul Harb-e-Islam (HuHI)[29] and Umaat-e-Mohammadiya (UeM)[30] and persistent efforts by groups in Kashmir point to continuous process of radicalisation & jihadi ideology. It has to be kept in mind that by just alleviating poverty and providing employment we can't curb radicalisation as the process and reasons are too complex. It is not a disease that a punishment can cure; it is actually a malaise which requires professional handling with a human touch. To conclude, "War on terror is to be waged more in the human mind than on a battlefield".

Footnotes:

1. *Behavioural Science Operational Briefing Note: Understanding radicalisation and violent extremism in the UK. Report BSU 02/2008. Retrieved at:*
   http://www.guardian.co.uk/uk/2008/aug/20/uksecurity.terrorism1

2. *Royal Canadian Mounted Police. Radicalisation: A Guide for the Perplexed. National Security System (NSS). June 2009*

3. *Commission of The European Communities (2005) Communication from the Commission to the European Parliament and the Council concerning Terrorist Recruitment: addressing the factors contributing to violent radicalisation.*

4. *FayazWani, "Adil Ahmad Dar: Diehard Dhoni fan turned Pulwama suicide bomber" (February, 17, 2019) available at https://www.newindianexpress.com/thesundaystandard/2019/feb/1 7/adil-ahmad-dar-diehard-dhoni-fan-turned-pulwama-suicide-bomber-1939908.html(Last visited on September 23, 2020)*

5. *Moghaddam, Fathali (Feb–Mar 2005). "The Staircase to Terrorism". American Psychologist. 60 (2): 161–169. doi :10.1037/0003-066x.60.2.161*

6. *Shaju Philip, "To Mosul and back, Kerala ISIS man's extraordinary brush with terror" (September 30, 2020) available at https://indianexpress.com/article/india/to-mosul-and-back-kerala-isis-mans-extraordinary-brush-with-terror-6636096/(Last visited on September 30, 2020)*

7. *Shashank Shekhar& Arvind Ojha, "Meet Shahjahan Velluva Kandy: PFI activist and suspected ISIS sympathizer" (November 02, 2017) available at https://www.indiatoday.in/mail-today/story/kerala-nia-shahjahan-velluva-kandy-1077415-2017-11-02(Last visited on September 23, 2020)*

8. *Von Behr, Ines, Anais Reding, Charlie Edwards, and Luke Gribbon, "Radicalisation in the digital era: The use of the internet in 15 cases of terrorism and extremism". Santa Monica, CA: RAND Corporation, 2013. Available at*

https://www.rand.org/pubs/research_reports/RR453.html(Last visited on September 23, 2020)

9. *Maya Mirchandani, "Countering Violent-Extremism: Lessons for India" (September 14, 2017) available at https://www.orfonline.org/research/countering-violent-extremism-lessons-india/ (Last visited on September 23, 2020)*

10. *Hunter, S. T., Shortland, N. D., Crayne, M. P., &Ligon, G. S. (2017). "Recruitment and selection in violent extremist organizations: Exploring what industrial and organizational psychology might contribute". American Psychologist, 72(3), 242–254. https://doi.org/10.1037/amp0000089*

11. *Simon Cottee, "The Challenge of Jihadi Cool" (December 24, 2015) available at https://www.theatlantic.com/international/archive/2015/12/isis-jihadi-cool/421776/(Last visited on September 23, 2020)*

12. *"ISIS' Twitter 'jihadi' has Bengali antecedents, believes senior linguistic expert", (December 13, 2014) available athttps://www.deccanchronicle.com/141213/nation-crime/article/isis-twitter-jihadi-has-bengali-antecedents-believes-senior-linguistic (Last visited on September 23, 2020)*

13. *Behera A (2013),"The Student Islamic Movement of India: The story so far." Journal of Defence Studies 1-7(1): 213-228.*

14. *https://www.vifindia.org/event/report/2018/october/22/talk-by-shri-dc-pathak*

15. *"Ban madrasas or ISIS influence will grow in India: Shia Waqf board chief", Hindustan Times, 22 January 2019, Available at: https://www.hindustantimes.com/india-news/ban-madrasas-or-isis-influence-will-grow-in-india-shia-leader/story-PM06Uss3vrQayeCEcLgEgN.html(Last visited on September 23, 2020)*

16. *https://www.policyforum.net/the-deep-web-and-recruiting-radicals/*

17. *www.theverge.com/platform/amp/2015/12/9/9879308/isis-instagram-islamic-state-social-media*

18. *https://keralapolice.gov.in/page/janamaithri-suraksha*

19. *https://www.business-standard.com/article/pti-stories/delhi-police-launches-community-policing-scheme-in-southwest-delhi-118121401238_1.html*

20. *Anurag Sharma, "The Islamic State Foreign Fighters Phenomenon and the Jihadi Threat to India", MPhil thesis, Dublin City University, 2019. available at http://doras.dcu.ie/22558/1/Anurag_Sharma_MPhil_Thesis_FINAL.pdf*

21. *Sharad Vyas, "IS threat: Maharashtra rolls out deradicalisation plan" (February 04, 2016) available at https://www.thehindu.com/news/national/other-states/islamic-state-threat-maharashtra-rolls-out-deradicalisation-plan/article8189391.ece(Last visited on September 23, 2020)*

22. *Zee Media Bureau, "How 'operation pigeon' helped Kerala police counsel 350 youth against joining ISIS", Zee News, 30 June 2017, Available from: https://zeenews.india.com/kerala/how-operation-pigeon-helped-kerala-police-counsel-350-youth-against-joining-isis-2020033.html*

23. *https://timesofindia.indiatimes.com/india/Recruitment-drive-in-Tihar-jail-Inmate-offered-Rs-35000-per-month/articleshow/34745638.cms*

24. *The increasing use of unconventional, "soft" measures to combat violent extremism in Saudi Arabia is bearing positive results, leading others in the region, including the US in Iraq, to adopt a similar approach. Roughly 3,000 prisoners have participated in Saudi Arabia's rehabilitation campaign. Saudi authorities claim a rehabilitation success rate of 80 to 90 percent, having re-arrested only 35 individuals for security offenses. http://carnegieendowment.org/2008/09/22/saudi-arabia-s-soft-counterterrorism-strategy-prevention-rehabilitation-and-aftercare-pub-22155.*

25. *SabariahHusin, "Preventing and Countering Violent Extremism: The Singapore Approach" (June06,2018) available at https://www.kas.de/documents/288143/288192/Terrorism_Hussin.pdf/6011defa-efb0-b368-87cf-baefa815a87b(Last visited on September 20, 2020)*

26. *Dafnos, Andrea, "Narratives as a Means of Countering the Radical Right; Looking into the Trojan T-shirt Project"(2014), Journal EXIT Deutschland, available at http://journals.sfu.ca/jed/index.php/jex/article/view/98/126*

27. *Brian Hubbard, "Can Media Intelligence Prevent Online Radicalisation?" (Oct 13, 2020) available at https://medium.com/digital-diplomacy/can-media-intelligence-help-prevent-online-radicalisation-da9051983054(Last visited on October15, 2020)*

28. *"Women police officers can play big role in preventing J&K children from taking wrong path, says Modi", The Hindu, September 04, 2020.*

29. *PTI, "IS suspects were planning mass casualty attacks using chemicals, claims ATS", The Week, 23 January 2019, Available from: https://www.theweek.in/news/india/2019/01/23/is-suspects-planned-massive-attacks-was-kumbh-mela-in-target-list.html(Last visited on October15, 2020)*

30. *"NIA bursts ISIS-inspired terror module, nabs 10 accused", United News of India, 26 December 2018, Available from: http://www.uniindia.com/nia-bursts-isis-inspired-terror-module-nabs-10-accused/india/news/1449657.html(Last visited on October15, 2020)*

Other References

Books:

1. Abhinav Pandya, " Radicalisation in India – an Exploration", Thomson Press, 2019
2. Stephen Chan, "Spear to the West: Thought and Recruitment in Violent Jihadism", Hurst, 2019
3. Mona Siddiqui, "50 Islam Ideas You Really Need to Know", Quercus, 2016
4. Nicholas Henin & Martin Makinson, "Jihad Academy: The Rise of Islamic State", Bloomsbury India, 2015
5. Zidane Mériboute, "Islam's Fateful Path: The Critical Choices Facing Modern Muslims", I.B. Tauris, 2009

Articles ,Reports & Papers:

1. Bajpai GS, Kaushik A, "Thwarting Radicalisation in India: Lacunae in Policy Initiatives", (2017) available at https://www.longdom.org/open-access/thwarting-radicalisation-in-india-lacunae-in-policy-initiatives-2375-4435-1000166.pdf (Last visited on September 23, 2020)
2. Maya Mirchandani, "Countering Violent-Extremism: Lessons for India" (September 14, 2017) available at https://www.orfonline.org/research/countering-violent-extremism-lessons-india/ (Last visited on September 23, 2020)
3. Sajid Shapoo, "Understanding Radicalisation is Key to Effective Countermeasures" (September 23, 2020) available at https://www.orfonline.org/expert-speak/understanding-Radicalisation-is-key-to-effective-countermeasures/ (Last visited on September 23, 2020)
4. Prithvi Iyer, "Mind games behind terror recruitment" (February 03, 2020) available at https://www.orfonline.org/expert-speak/mind-games-behind-terror-recruitment-61001/ (Last visited on September 23, 2020)

5. Anurag Sharma & Brig Vinod Anand, "India's Approach to Countering Violent Extremism: Issues and Prospects" (January 01, 2020) available at
 https://www.vifindia.org/article/2020/january/01/india-s-approach-to-countering-violent-extremism-issues-and-prospects(Last visited on September 30, 2020)

6. Anurag Sharma, "Counter-Terrorism Framework of the United Nations and India's Approach of De-Radicalisation" (September 26, 2019) available at
https://www.vifindia.org/article/2019/september/26/counter-terrorism-framework-of-the-united-nations-and-india-s-approach-of-de-Radicalisation (Last visited on September 30, 2020)

7. Institute for Strategic Dialogue in cooperation with RAN Centre of Excellence, "Counter Narratives and Alternative Narratives" (October 01, 2015) available at https:/ec.europa.eu/home-affairs/sites/homeaffairs/files/what-we-do/networks/radicalisation_awareness_network/ran-papers/docs/issue_paper_cn_oct2015_en.pdf (Last visited on September 23, 2020)

Newspaper Articles:

1. UpneetLalli, "The challenges of de-Radicalisation in India", The Tribune (January 30, 2020) available at
https://www.tribuneindia.com/news/comment/the-challenges-of-de-Radicalisation-in-india-33238 (Last visited on September 30, 2020)

2. GS Bajpai & Ankit Kaushik, "How does India deal with Radicalisation? An official de-Radicalisation policy is urgently needed.", The Times of India (March 09, 2019) available at
https://timesofindia.indiatimes.com/blogs/toi-edit-page/how-does-india-deal-with-Radicalisation-an-official-de-Radicalisation-policy-is-urgently-needed/
(Last visited on September 30, 2020)

3. "Govt putting up robust system to counter radicalisation", The Economic Times (July 14, 2018) available at https://economictimes.indiatimes.com/news/defence/govt-putting-up-robust-system-to-counter-Radicalisation/articleshow/48309749.cms   (Last   visited   on September 30, 2020)

Author's Profile

Divyam Garg, is an Officer at Ministry of Home Affairs, Government of India, currently serving in Jharkhand. Academically, he is an Engineer (B.Tech), from Netaji Subhas Institute of Technology (NSIT, Now NSUT), University of Delhi. He has direct experience in the field of Islamic radicalization at ground level, and has analyzed multiple interrogation reports of radicals associated with ISIS, Lashkar-e-Taiba, and even related to LWE theatre in India. Interest in Islamic affairs and phenomenon of terrorism, within the subcontinent and abroad, have coaxed him to take up Language Studies in Urdu. He has a penchant for reading and loves experimenting on how to link theory to practice.

Rashi Agarwal, is an Officer at Ministry of Home Affairs, Government of India, currently serving in Bihar. Academically, she holds a Post-Graduation (M.Tech) degree in the field of Biotechnology from Amity University, NOIDA (UP). She has experience in ground level observations pertaining to Islamic Radicalisation and has analyzed multiple interrogation reports of radicals associated with ISIS, Lashkar-e-Taiba, SIMI. She is an avid reader, having a research interest in the field of Islamic Radicalisation, cyber-security and social engineering.

Scientific Criminal Investigation: Optional Trend or Obligatory Approach?

Vikas Katheria, IPS*

Abstract:

When we say the 'Art' of 'Scientific' Criminal Investigation (SCI), would there be an apparent contradiction of terms? Will clubbing Art and Science be a futile endeavour? These are the questions that might confuse and quite understandably be considered by some as apparent contradiction in terms. The first attempt to explain the reason behind calling Criminal Investigation as 'Art' and 'Science' is therefore necessitated. At the same time, the SCI is not an attempt to make a casual observation or an exercise in 'literature review'. SCI is a scientifically oriented fact-finding enquiry for ascertaining the facts involved in a criminal transaction. This article is an attempt to find that via media between the two opposing directions that exist in the same continuum and to make a case for its obligatory adoption as the model for all criminal investigations.

---

* *Nagaland Cadre 2009 Batch*

Scientific Orientation, Criminal Transaction (CT), Ex-Post Facto Research.

Main Body of the Article:

Investigation of crime demands fairly advanced knowledge and skills set for finding things out. Put simply, the investigator needs to connect the dots in the alleged criminal transaction to find out *What* happened, *How* it happened and *Why* it happened. There are no qualms to claim here at the outset that the field of criminal investigation is not going to be fully automated or 100% standardised in the foreseeable future. Any field of study involving humans belies full automation. Case in point is undisputed scientific robustness of medical science. A medical doctor regardless of diagnostic tools and other advanced scientific methods is bound to use his individual judgement before pronouncing detection or absence of a disease. The art is inherent therefore in any research endeavour.

Similarly, a Criminal Investigator uses his skills, knowledge, and accumulated experience (including hunches, gut feeling, and several other experientially evolved psychological faculties) combined with the technology to connect the dots in the puzzle that a criminal transaction leaves. There is an inherent advantage in turning criminal investigation as a scientific journey. However, as a practitioner one knows the pitfalls of straight jacketing the process of investigation. Strict scripts do not work in criminal investigation since no two crimes are the same and criminal transactions can never repeat themselves in the exact same way.

Suffice is to say that employment of scientific process is necessitated by the advantages that it provides. Standardization is required in collection of evidence, recording of testimonies, evaluating the validity of evidence and many other investigating tasks. Nevertheless, the goal is to make the investigative process as scientific as possible but still keeping the scope for the individual judgement of the investigator. It is like waiting for the time when we would not

require doctors for diagnosis or treatment of diseases, and everything will be taken care by an AI enabled supercomputer. Experienced investigators have a very keen sense of sensing patterns, an experientially acquired ability that they sometimes cannot explain. This acquired ability is what makes an investigator useful. Those of us who have worked in the field of investigation nevertheless recognize our limitations and also acknowledge that the specialization in this field actually never entitles you to be an expert. This abdication of entitlement is the humility with which I would like to begin.

Scientific Criminal Investigation (SCI).

What is Scientific Criminal Investigation and how it is similar to investigations conducted in scientifically oriented domains of knowledge? I refer specifically to 'scientifically oriented domains of knowledge' here because reams of papers have been used by experts to proclaim their domain areas of knowledge as 'Science'. The spectacular success of empirical method of investigation in natural philosophy (the ancient and much more inclusive term for 'Science') in terms of material progress of western civilization prompted many domains of knowledge to employ empirical method and subsequently this method became somewhat synonymous with the tag called 'Science'. Hereinafter, it almost became customary to proclaim one's domain as either 'science' or 'scientific'. Hence, we had theoreticians and practioners of even the most fundamental of humanities subjects like Politics also renaming themselves as 'Political Science', etc. Humanities for all practical purposes has been renamed as 'Social Sciences'. Consequently, the second part of 20th century saw virtually every domain of knowledge proclaiming itself a 'Science'.

It is one thing to proclaim being science and quite another to actually be scientific. This apparent contradiction being based upon incorrect interpretation of the pre-requisites of adherence to the rigours of scientific method. What is this rigour that if scrupulously followed earns the epithet of being 'Scientific'?

Although there are no clear-cut codification of rules or regulations that are universally applied and no one institution that works at the apex. Despite the handicap, scientific community recognizes adherence to principles of scientific exploration and technology by following:

a. Objectivity, Ethical Neutrality and Systematic Enquiry: any conclusions that are drawn from the enquiry must be based on objective facts. Interpretations must follow from objectivity and establishment of facts from evidence and nothing else. Inductive and deductive reasoning is involved in the process of connecting gaps in knowledge. The SCI generally starts as an inductive process. The processes in science are invariably iterative, involving collaborations between different domain experts requiring synergy and convergence rather than strictly scientific divergent mode of enquiry. An SCI investigator does not have the luxury of time and his efforts must be concerted and proceed in a timebound fashion. The SCI requires teamwork between specialists that are domain experts and have required experience in the collection, processing, evaluation and validation of evidence. Realizing the value of scientific method investigation agencies nowadays employ full time domain experts in fields that have relevance to criminal investigation. Some of these domains are chemical, biological, information technology and certain emerging areas such as artificial intelligence. Traditionally scientific method advocates stepwise process which can be summarised as follows:

- Observation and Data Collection:
- Formation of Hypothesis:
- Testing of the Hypothesis:
- Interpretation of the Results and Forming Conclusions:
- Presentation and Publication of Findings.

SCI proceeds in an orderly fashion wherein observations are made very carefully and data and evidence are collected following rigorous procedures. However, strict and serially invariable processes and

methods cannot be used in criminal investigation since no two criminal transactions are same. Nevertheless, data collection and observation are the necessary first step. It starts from the inspection of the scene of crime and collection of the first set of data. Analysis of the first data set and observation should proceed to the generation of leads.

Leads are the indication of relevant facts that can be observed by further collection of relevant data. In criminal investigation, leads are information about hidden material that can prove the culpability of accused, hidden weapons, incriminating documents and anything than can reveal pertinent facts about the criminal transaction.

b. Publication and Scrutiny: of scientific method employed, techniques used and claimed results. Here the scientific community puts utmost emphasis on reliability and replicability of results of experiments and findings. A scientific discipline must therefore be able to produce verifiable results that can be demonstrated as facts upon examination by following similar conditions as claimed by the researchers. It simply means that your experiment or research must be replicable and thus verifiable. If not the community disregards and disproves your theory. In SCI, this publication is done by the prosecuting agency that investigated the crime and then scrutiny of the evidence is done by the judicial courts and public at large. Courts are the laboratory where the results of an investigations are put to rigorous test of reason and factual consistency.

c. Verification and Replicability: generally, in any scientific discipline, it is required that the research that one has conducted should be verified by members of scientific community and when parameters defined in the published research are followed, similar results should be obtained. This verifiability is formally termed as as *Falsifiability*. It is simply vindication of your hypothesis when other researchers have significantly validated your findings. In other words, it is a proof of your theory or the establishment of facts that lend credence to your theory. Replicability on the other hand is that the

research that one has conducted can be conducted or is conductible by any member of the scientific community. It simply means that your theory and research methods must be plausible in the first place.

d. Facts are be established only from evidence: any scientific domain places the utmost reliance on the evidence to establish facts. While evidence has not been defined in the Indian Evidence Act, the SCI necessarily follows rigours of scientific enquiry. This requires that any facts must be substantiated from the evidence gathered during the process of research. While testimony has been held in high esteem in the judicial systems in most countries, now a heavy reliance is placed on the substantiation of these testimonies by corroboration with evidence in conjunction with testimony. With the advancement of technology and its application in criminal matters an investigator now has very wide net for collecting relevant evidence. The requirement of evidential backing to substantiate the guilt cannot be substituted by assumptions or other unscientific assertions.

Why Scientific Orientation in Criminal Investigation has become a necessity?

a. Availability of tools and technology: connecting the dots in the criminal transaction requires painstaking efforts by investigators to connect events, responsibility and involvement of in individuals and for bolstering the testimonial validity of statements collected. Analysis of phone records, employment of forensic methods to collect and to validate material evidence and other similar tasks require usage of latest technology and tools that are invariably supplied by men of science. Today, the criminal investigation has become a highly skilled domain and requires fairly wide experience and learning of tools and technologies to detect and investigate crime. The availability of tools and technologies is not optional but has become necessary.

b. Recognition of advantages of scientific methods and rigour by judicial forums: experts working in various domain have always been invited to assess evidence in various judicial forums. Due to the

necessity of expert evaluation in assessment of evidence the courts have duly recognized the superiority of scientific vigour over the frailty of common wisdom. Scientific method provides solutions that can be tested following the same method and are open to public scrutiny. An expert's testimony flows out of his specialized domain knowledge, his wide experience in the field and practical skills in evaluating the evidence that is placed upon for his opinion. An opinion based upon 'expertness' is qualitatively different from 'testimony from witness' and is placed on a much higher pedestal by courts than an ordinary witness testimony.

c. Requirement of proving facts beyond 'reasonable doubt': Assertions and claims made in charge-sheets/reports must be backed by findings that are scientifically verifiable. The findings claimed in such reports must be proved beyond reasonable doubt: bedrock of scientific enquiry is substantiation of claims by proof that can be verified (falsifiability). Any assertion that is not substantiated by proof or for which a corroboration with facts is not readily available should not be made. Oftentimes, reports under Section 173 CrPC are full of assertions based on testimonies of 'reliable witnesses' that do not stand the scrutiny of the court process. SCI ensures that allegations are substantiated based on evidence and that there is a healthy mix of testimonies, material-documentary evidence and corroborations in the report. A good SCI would go a bit further, it would ensure that every testimony taken is further corroborated by evidence that would further bolster the verifiability of that testimony. Verifiability is the core ingredient of the SCI.

It is one thing to proclaim that investigation is a scientifically oriented research process and quite another to achieve the rigour with which such research is conducted. It must be remembered that SCI is conducted with statutory powers and responsibilities. It is because of the empowerment of the investigator with the statutory powers that the SCI is research with legal authority. Data collection is therefore sometimes statutorily enforced. However, this may oftentimes lead to

unintended consequences when the persons that are called as witness by the Police officers are afraid to come and then are not naturally inclined to deposit their testimonies or to otherwise truthfully express themselves. Subsequent articles will throw adequate light on this aspect of data collection and observation procedures in SCI and how truthfully the data sets can be acquired.

2. Theory in criminal investigation is commonly the complaint/report that discloses commission of a crime. This puts in motion the momentum of investigation. This theory generally has the description of events, circumstances and persons that constitutes the 'criminal transaction'. Theory is what sets the stage for the investigative journey. Theory has three components:

- Description of the Events/Circumstances describing how a crime has happened.
- Criminal Transaction/Allegation of violation of a statutory provision that has penal consequences.
- Names of victim(s), perpetrator of the crime, and other significant individuals.

Unlike the formal models of scientific inquiries, theory construction in criminal investigation initially does not involve the investigator since the initial hypothesis (an idea of how a criminal transaction took place) is seldom envisioned by the investigator himself. Instead, the theory is generally coded in the statutory format of a First Information Report. In Indian criminal justice system, the FIR has a long history of judicial pronouncements resulting from entire cases fought on the legal validity of the FIR. It is therefore extremely important that the FIR is appropriately worded and details that should be included are never to be left out and it should not be vague as to prove lethal to the entire investigative process. FIR (read 'theory') like in any scientific investigation is the foundation on which the entire edifice of the investigation is subsequently built. Material incongruities, incorrect names and identifiers, incorrect or vague factual details can best be avoided.

3. **What is a Criminal Transaction?** The primary aim of the investigation is to establish ex-post facto causative factors and involvement of individuals in the entire Criminal Transaction. Simply defined, a Criminal Transaction is the situation/circumstance in which an overt behavioural instance by certain individual(s) has resulted into violation of a statutory provision. These individual(s) are then arraigned as accused for the purpose of prosecution. At the most basic there are two points in the continuum in a Criminal Transaction. Point A to Point B. Point A is the time when the criminal transaction starts. The criminal transaction usually starts just before the actual crime occurs (the overt behaviour that has caused violation of a penal provision). Point B is the point when the transaction has been cognized and the crime has been reported. Point B is the time from where the investigation usually starts. The investigation process is then a research endeavour to understand causality, facts and circumstances within the Point A and Point B unless the investigation is for the crime in continuation. Even the investigation where crime is in continuation, several criminal transactions have to be probed and hence investigation must clearly delineate several criminal transactions.

An Example of Continuing Offence: To illustrate, lets understand by the example of a case of alleged rape. Victim 'X' has alleged that while she was returning from office a colleague named 'T' offered her lift in his car, and when they were heading towards the home of X, T took a detour and took her to a nearby jungle where he overpowered her and committed rape. After the rape, T threatened X of dire consequences if she reported this to anyone, T also used abusive language and hit X on head with the butt of a pistol that T was carrying. After X reported the matter to the police T came to know of it and escaped. Police investigating the crime found out that T had forged his credentials to take employment in the company in which he was working since last two years. Two similar instances have occurred since his escape and the police investigating the rape of X is still on the lookout of T. Here two criminal transactions are clear,

involving offence of rape, and subsequent transaction where the victim was threatened, and criminal force was used by T. Another criminal transaction is potential violation of Arms Act (highly unlikely that T was using a licenced firearm), another transaction would be usage of fake/forged documents to gain employment. T being still at large is another transaction.

Another example of continuing offence is financial crimes involving penal offences. Chit fund and *Ponzy* scams are good example of continuing offences. The criminal transaction(s) generally involves extended period, the offences are still being perpetuated and the victims are coming one after another to report the crime. If each report of criminal transaction is treated afresh, the investigation agency will have to register thousands of FIRs.

4. **Criminal Investigation in majority of the cases is necessarily an Ex-Post Facto Research:** the investigation process starts after the criminal transaction has occurred. However, there are significant exception to this rule. These may occur in certain cases where a criminal transaction such as abduction, a terrorist crime or a case wherein the offence is of a continuing nature.Suffice would be to say here that in majority of the cases, the criminal investigation starts after the termination of the criminal transaction making the entire criminal investigation endeavour necessarily Ex-Post facto research.

5. **Why Ex-Post Facto design of the Criminal Investigation process is different from Empirical Research?** In Empirical research designs, the transactions/circumstances can be stimulated by the researcher by controlling variables that have determining effect on the transaction under study. This means that a scientist is able to introduce variables such as chemicals, persons, things etc to alter the effect of one variable over the variable(s) under study. Ex-Post facto design is both qualitatively and quantitatively different from the experimental models. In most of the criminal investigation the investigator does not have any control over the variables that had an effect over the criminal

transaction since the criminal transaction has ceased to exist, in other words, the crime has already occurred.

6. **Does that mean that criminal investigation suffers from a flaw and thus not truly scientific?**the rigours of empirical scientific model has been under debate among the philosopher of science who regard the requirement of subjecting empirical qualifiers of any subject of study to accept the title of 'Science'. One example is Psychology which is the study of human cognition and behaviour. For a long time, experimentation was considered the bedrock for any field of human knowledge to be considered for the coveted title of science. Psychology was always considered a grey area when it claimed to be science. Today, no one would doubt the scientific commitment of Psychology as it has committed itself to the rigours of scientific methods of enquiry. However, the journey of scientific progress has proved that there is a qualitative difference between 'Science' and being 'Scientific'.

It is the commitment of a field of study to the rigours of values and methods of science that makes it scientific, not adherence to a particular straightjacketed, dogmatic and etched-in-stone pro-forma conception of science. Here the word 'commitment' is crucial, since mere employment of scientific tools and claims of following the vigour would not make a research process scientific. It is uncompromising pursuit of following the scientific process to establish facts from evidence that would prove the guilt of an accused beyond reasonable doubt that would satisfy the most stringent yardstick that a judicial court will impose on the prosecuting agency. Seeing from this angle, the criminal investigation is necessarily a scientific endeavour and one must never lose sight of the fact that it is the commitment of the investigator to the values of science that would make the entire investigation process scientific and not a mere adherence to statutory regulations.

7. A question might arise in the readers mind as to the apparent necessity of making the investigation process scientific. This is a valid

question since the entire edifice of scientific enquiry is almost always starts from a doubt. During the historical time, extraction of confession was the most standard form of investigative process and for most of the human history it worked. The ruling class and the community were happy, and the retribution was swift. This kind of retributive justice suited a society in which premium was placed upon class differentiation, prejudices, stereotypes against certain communities, and various other considerations suited to the prevailing *zeitgeist*. Besides, criminal justice system was always looked through the prism of local affairs unless of course the crime was against the state.

It is the firm establishment of scientific principles and employment of reason in the study of nature during the late eighteenth century that affected criminal justice system as one of the domains that human partakes. Resultantly, today, criminal investigation process has a remarkably high congruence with the ex-post facto model of research in any rigorous scientific discipline. Mass media has popularised this investigation process in the TV series like X-files, CID and scores of other dramatized depictions of detectives using fairly high-tech tools to solve crime and prosecuting the guilty. The necessity of following scientific rigour is therefore an obligation of every investigator to commit to scientific values and processes while conducting an investigation so that the facts are established beyond reasonable doubt and the guilty are punished expeditiously and justice is served. Scientific Criminal Investigation would therefore be not an option but rather an obligation.

Author's Profile

Sh. Vikas Katheria is an officer of the Indian Police Service of 2009 Batch borne on Nagaland Cadre. He started his career in corporate sector and moved to public sector in 2006 when he joined Ministry of Labour and Employment as an Assistant Provident Fund Commissioner. After training in the IPS he worked in Nagaland from 2011 to 2015 in

various capacities at the sub-division and District level in the insurgency affected districts of Mon, and Tuensang. As District SP Tuensang he was credited with resolving inter-tribal clashes and was praised by the Government of Nagaland for his close interaction with tribal bodies ensuring peace and harmony between warring factions.

He is presently working as the Deputy Inspector General of Police, (Range/NAP), Dimapur, Nagaland. He has worked with National Investigation Agency from January, 2015 to January, 2020 as Superintendent of Police (Intelligence & Operations) supervising Operations and Special Unit for lawful interception and thereafter from January 2020 to March 2021 as Joint Director (Investigations) in the Serious Frauds Investigations Office.

He has extensive experience of field investigations, operations, and intelligence related work. He has personally investigated 5 cases as a Chief Investigative Officer and supervised over 40 cases involving national security ramifications besides supervising 6 high-profile corporate frauds cases in the SFIO. His investigations of ISIS Conspiracy Case, and investigation against Kashmiri terrorist organization Dukhtaran-E-Millat headed by separatist leader Aasiya Andrabi were praised by Hon'ble Home Minister of India. Some of his work areas include Cyber Monitoring and Tracking, lawful interception, Fugitive Tracking, Contact Chaining, Corporate Fraud Detection/ Investigation, Assimilation/Analysis of large databases, and validation of evidence procured through electronic means.

CyTrain: Cybercrime Training Portal with Simulated Learning

Ram Phal Pawar, IPS et al*

1. Introduction

Cybercrime is becoming a worldwide phenomenon and therefore a global concern. As it is a borderless crime, the traditional law enforcement approach will not be useful, as identifying, investigating and prosecuting cybercriminals across boundaries are becoming huge challenges.

Cybercrime is predicted to inflict damages totaling $6 trillion USD globally in 2021 and in comparison terms it would be the world's third-largest economy after the U.S. and China. With global cybercrime damages predicted to cost up to $10.5 trillion USD annually by 2025 up from $3 trillion USD in 2015, cybercrime is now a subject that poses a very real and present danger to most businesses. While greater connectivity via the world wide web promises large-scale progress, it also leaves our digital societies open to new vulnerabilities.

With the second-largest internet population in the world, India also faces a serious problem in cybercrime. Each year, the number of cybercrime reported across the country continues to increase at a

*Director, NCRB
Sanjay Mathur,IPS Joint Director, NCRB
Dr. Prashun Gupta, Deputy Director, NCRB
Anupam Karmakar , Sr. Technical Officer, NCRB
Lovely Sharma, Jr. Technical Officer, NCRB

significant pace. The nature of crimes, on the other hand, ranged from petty online frauds to lottery scams and sexual harassment. The sector most targeted though, seems to be in the banking and finance segment. With the onset of the coronavirus pandemic and most services moving to the online space, a higher risk extends to other sectors as well.

Digital India may have become a soft target for criminals as country recorded a huge increase of 63.5 percent in cyber crime cases in the year 2019, showed the National Crime Record Bureau data. The NCRB's data stated that 44,546 cases of cyber crimes were registered in 2019 as compared to 28,248 in 2018. The data showed that fraud was the motive in 60.4% of cases followed by sexual exploitation (5.1%) and causing disrepute (4.2%).

Realising the enormity of the problem, Ministry of Home Affairs, Govt. of India, launched Indian Cyber Crime Coordination Centre (I4C), a scheme which aims to assist state law enforcement agencies in all aspects regarding cybercrime reporting, training, forensics, research, and also by facilitating the exchange of information and cooperation amongst various law enforcement agencies. The scheme was approved in October 2018 and currently it has a total outlay of rupees 340 Crores. It has following seven components:

1.   National Cyber Crime Threat Analytics Unit (TAU)
2.   National Cyber Crime Reporting Portal (NCRP)
3.   National Cyber Crime Training Centre (NCTC)
4.   Cyber Crime Ecosystem Management Unit (CCMEU)
5.   National Cyber Crime Research and Innovation Centre (NCCRIC)
6.   National Cyber Crime Forensic Laboratory (NCFL)
7.   Platform for Joint Cyber Crime Investigation Team (JCIT)

Out of the above seven components, two namely NCRP and NCTC have been given to NCRB for establishment and monitoring.

In the current scenario where number of cybercrimes are increasing, it is important that the state law enforcement agencies have cyber intelligence, investigation, and forensic units that are fully prepared both

from the equipment and the knowledge point of view to face cybercriminals and their destructive actions. The LEAs constantly need to acquire critical new skills and build capacities among investigating officers and prosecutors.

Capacity building for cybercrime investigation is critical given the rising trend of such crimes. Under the NCTC therefore, NCRB has developed a Massive Open Online Courses (MOOC) platform, namely the CyTrain portal for imparting training to law enforcement agencies at mass scale on cybercrime investigation related matters. It offers professional-quality e-learning resources to all law enforcement agencies, prosecutors, judges and other stakeholders. The key feature of this facility is to provide a simulation based environment for learning on cybercrime investigation.

2. CyTrain: The MOOC platform for Simulated Learning

NCRB has developed a MOOC platform called the CyTrain portal using the open-source MOODLE framework. Presently, the platform is based on the latest version of MOODLE 3.9 and supports 10,000 user concurrency. The portal supports both English and Hindi languages.

User can register himself/herself in any online course with his Government email ID and undertake the course at his own convenient pace. At the end of training, he has to undergo an online test, passing of which will entitle him to a Certificate.

CyTrain Dashboard has two types of course display:

   a. Recently Accessed Courses: Courses which are recently accessed by user.
   b. Course Overview: Courses in which user is enrolled.

User can access a course by just clicking on the Course icon or course name, after which the user will see the following screen:
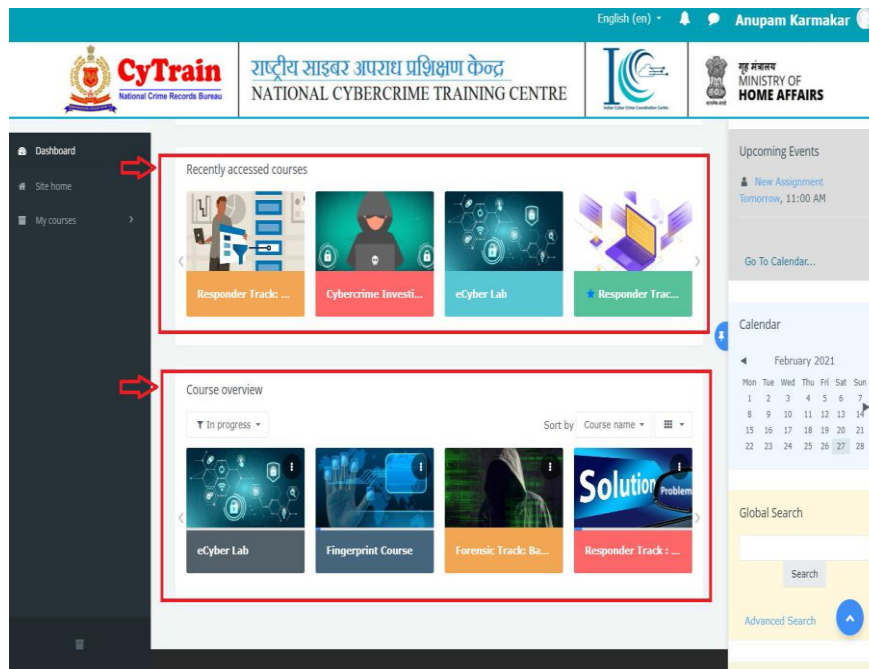
3. e-CyberLab

NCRB has also established a State of the Art Cyber Lab through C-DAC at NCRB Hqrs, New Delhi. The Lab is equipped with more than 25 latest Digital Forensics tools from industry and more than 50 open source cybercrime detection and forensics tools. The Cyber Lab is also integrated with the MOOC platform (CyTrain portal) and called as e-Cyber Lab which was launched on 13.10.2020 for providing virtual experience on experimentation on the latest modus operandi on cybercrime. The officers can log into e-Cyber Lab and learn about and use any tool on pre-arranged use cases or by importing their own problem statement.

4. Current Courses under NCTC

The CyTrain portal has the following six tracks under which course modules have been clubbed:

    a.   Responder Track (For First Responder and Duty Officer)

b.   Forensic Track (For Digital Forensics Specialist)
c.   Investigation Track (For general Investigator and Cybercrime Investigator)
d.   Intelligence Track (For Cybercrime Intelligence Officers /Analysts)
e.   Management Track (For Cybercrime /Digital Forensics Head of Unit and Heads of Police Forces)
f.   Judiciary / Prosecution Track (For Judges / Prosecutors)

Each track will have courses available under Basic, Intermediate and Advanced categories.

NCRB has signed MoU with Consortium for Educational Communication (CEC) and also with National eGovernance Division (NeGD) of MeitY for sharing resource material. CEC has shared many useful contents (videos, pdf etc.) on Cybercrime investigation. These contents have been uploaded in the NCTC MOOC platform. The portal has now more than 850 videos and e-Books available for trainees. Currently CyTrain is providing three courses namely,

- Cyber Crime Basic Awareness Course,
- Cyber Crime First Responder-Basic and
- Forensics Track-Basic.

5. Registration Procedure

The registration process on this portal is very simple and free of cost. Any user who has email id in the Government domain (viz. email id having gov. in or nic.in etc.) can instantly register on this portal by providing some basic information like name, designation, present posting, contact number, etc. This registration process is completely automatic and the user can register by validating his/her email id through OTP. The police officers/judges/prosecutors who do not have Government domain email can also get registered on this portal by forwarding their offline registration forms through their State nodal officer. The list of such nodal officers is also provided in the portal.

The complete flow starting from registration to generation of online certificate after completing a course can be depicted as in the following picture:

6. Simulated Environment

CyTrain Portal — **Course Content** — **Cyber Lab** — **Online Exam** — **Certificate**
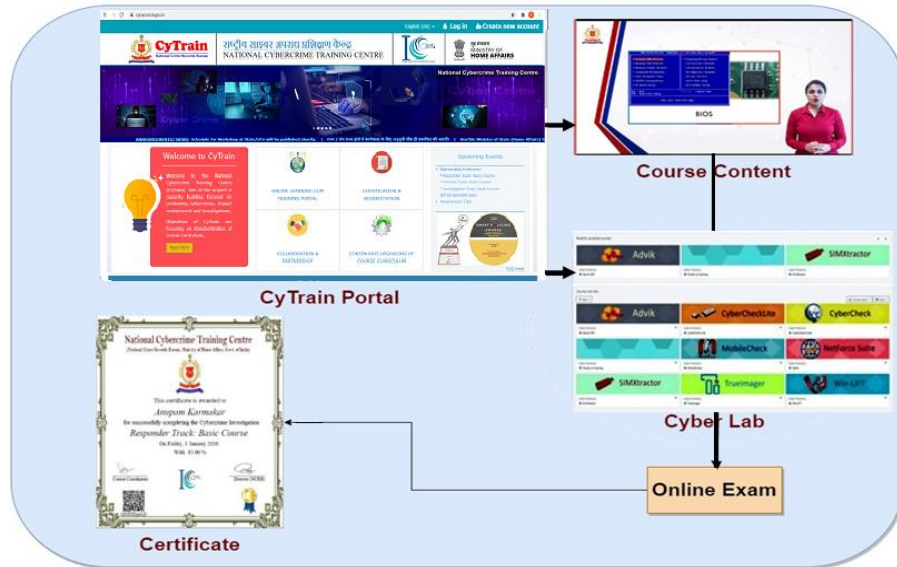
Besides preparation of traditional training modules like books, boards, PowerPoint/PDFs, there is a strong need for simulated environment based modules. This would mean the creation of scenarios, including digital exhibits (logs, etc.) for extraction by trainees using forensic tools preloaded on the infrastructure. To develop world-class interactive e-learning content with simulation and gamification activities, M/s PwC has been engaged as a Course Content Developer for one year. Till date, CyTrain has more than 850 e-learning modules including videos, eBooks, PDF, PowerPoint Presentations, etc.

M/s PwC recently delivered contents for three courses (basic courses of Responder, Investigation and Forensic Tracks) in Shareable Content Object Reference Model (SCORM) format. Union Home Secretary Sh Ajay Kumar Bhalla released the three new courses on 21st October 2021 and these courses have been uploaded on CyTrain porta.l

7. Current Usage

As on 01-11-2021, total number of trainees registered on CyTrain portal for self-paced sources is around 7500. During various online training sessions with State Police, it is understood that most of the Police Officers/Officials at field level do not know about NCTC/CyTrain portal. Some of the Officers/Officials who knew about CyTrain but do not have govt domain email id (which is mandatory requirement) for self-registration on this portal. Alternatively, for offline registration, most of them were also not able to forward their details (with private email id) through State CCTNS nodal officers.

8. Popularization Steps and Training Workshops

To remove the above discussed difficulties and to popularize the CyTrain portal among all level of Police Officers/Officials, need was felt for introducing 'Sensitization Campaign' of CyTrain portal across all the States/UTs by demonstrating various features and highlight its course content. These workshops would also include live lecture/hands-on sessions from experts on cybercrime investigation. The objective of these workshops is to produce a good number of registrations on CyTrain portal in a short span of time.

To organize these workshops at States/UTs, NCRB on boarded a Training Co-ordination Service Provider (TCSP). The TCSP includes the resource manpower like capacity building expert cum course coordinator, Cyber forensic experts and technical assistants for imparting live lectures and hands-on training on cybercrime investigations. TCSP by itself under the guidance of NCRB, has planned and designed courses, co-ordinate with States/UTs for getting nomination of trainees, arranging and assigning instructors for live lectures/hands-on, assessment of trainees, issuance of certificates, trainees feedback analysis and overall supervision as well as budgetary requirements of conducting courses etc.

As part of a pilot run, seven such workshops were conducted on online mode and it was observed that more than 2500 trainees participated from different States and UTs.

NCRB has also printed a poster as shown below on CyTrain and distributed it to all the police stations in the country with a request to prominently display it so as to popularize the portal among all ranks of police officers.

9. Conclusion

The keen focus of NCTC is to provide, world-class training on Cybercrime related courses for all Officers dealing with Cybercrime Investigation across the country. More than 5000 users are currently registered in the CyTrain portal and around 1500 certificates have been

issued to those who have successfully completed the courses. NCTC is the first initiative in the country to provide massive open-source online training for cybercrime-related investigation. Further, a virtual Cyber lab that is associated with the CyTrain portal is the best add-on for hands-on experience. A team of experts associated with NCTC regularly updates the course contents as per the latest trends in cybercrimes. The main objective of NCTC is capacity building and to create a team of experts in every unit across the country in the field of cybercrime Investigation who can effectively deal cybercrimes in the country.

Author's Profile

1. Sh. Ram Phal Pawar, IPS Director, NCRB
2. Sh. Sanjay Mathur, IPS JD, NCRB
3. Dr. Prashun Gupta, DD, NCRB prshun@ncrb.gov.in
4. Sh. Anupam Karmakar, Sr. Technical Officer, NCRB
5. Sh. Lovely Sharma, Jr. Technical Officer, NCRB

Re-imaging and Re-imagining of Indian Policing During the Corona Pandemic

Md. Shadan Zeb Khan, IRPFS*

Abstract

For many like me in India, one of the most loved sights during the calamitous times of corona pandemic was when Indian police personnel were being hailed by common Indian masses with showering of flower petals on them. Who in India would have ever imagined that we would be witness to such an unprecedented spectacle. Presumably this must have happened for the first time in the history of Indian policing since it came into existence in 1861; of course for a host of reasons that this paper seeks to discuss later. Undeniably it was long overdue on Indian policing organization to reconstruct its image among common masses. The onus of reconstructing its image was entirely on the police personnel. The unseemly part is that it took arguably the biggest human crisis in the recent history of human civilization to bring about a change in the perception of Indian masses about the Indian police personnel and its organization. This article is written from two viewpoints: 1. From the view point of police personnel and 2. From the view point of a common man. This paper sets out to explore how the corona pandemic has changed the common man's perception about the Indian police personnel. It also aims to delve deeper on the rationales which helped the police personnel bring about this mammoth change in the outlook of

* Commando Battalion/RPSF, Jagadhari Workshop, Yamuna Nagar, Haryana

common masses about the police personnel. Generally, research articles are supposed to be objective study, but in this case, this paper is written from two viewpoints, one that of police personnel which constitutes largely a subjective study and the other one from the view point of a common man which would rather be an objective analysis.

Keywords: *India, Police, Pandemic, Corona Warriors, Covid-19, Indian Railways.*

For constructing an image or a perception there are two important variables and they are expectations and delivery/performance. The image is disfigured and perception is repulsive when there is an abysmal gap between the expectations and the performance. This paper seeks to foreground the incidents and causes that bridged that gap between the expectations of Indian common masses from the Indian police personnel and Indian police's performance during the Covid-19 times. It can be argued that no Indian had ever expected that the Indian police would ever bring the household things for a common man and deliver them at their door-steps. It is a matter of compelling investigation that what is so unique about this crisis that brought to limelight such a humane face of Indian police personnel which the Indian masses had never seen or even imagined. It is not like that that India had never seen any crisis before. India has borne the brunt of many crises in its long history and many a time police personnel were deployed to tackle the situation, but their involvement and dedication never evoked such positive reactions and emotions from the Indian public. It is in common parlance that when a common Indian imagines a police officer what come to his mind is an unprofessional force, and a government employee lacking ethics. For such perception about the police, there is a counter argument extended by Bawa (2019), who says, "There is a general lament that since police is under control of politicians, it is unable to deliver its best by functioning according to law". It is also of great importance to investigate whether that tainted image was a true representation of Indian police personnel or a fractured image created by the erroneous narratives. By no means, this paper wants to obscure the role of some rotten fish among the Indian

police personnel who have played a vicious part in making such despicable perception of Indian policing among the Indian masses, but at the same time one cannot afford to ignore the fact that Indian police officers mostly work in hostile environments and have to face many constraints, as asserted by Gupta & Mishra (2019), "police is confronted with various operational issues which decreases(sic) the level of ability and which need to be addressed to make the police more efficient and effective."

Indian public or a common man from any country wants the police to be sympathetic in listening to their problems. An indifferent attitude and a high-handedness approach of police personnel may spoil the show for both of them. The person who comes to the police is already distressed, for sure, the unresponsive and imperiousness of police personnel augment the distress level in the common man. Consequently, the distressed man forms an unpleasant opinion about the police personnel, that leads to the distrusts of a common man on the police. It must be noted that this distrust is not only the result of the wrongdoings of police personnel, but can also be attributed to negative media coverage. Many a time it has been observed that media find it lucrative when they paint the people in power in bad light. Conceivably, it helps them in their business and spoils for others. One of the reports published in the USA on Public Opinions of Police notes:

> Police officers and their supervisors know that news coverage about a citizen's negative encounter with the police, particularly coverage that erupts to the level of a public scandal, can quickly destroy their efforts to nurture a positive relationship with the public. (Miller, et al., 2004)

It can be reasoned that imbalanced media coverage of negative encounters of public with police gives potency to the impression of inconsiderateness of the police which leads to etching a discord between the public and the police. The media may take into account that they are supposed to be little more responsible in highlighting the good deeds of

police personnel which had largely been overlooked for a long time. In the same report it was observed:

> Police executives today broadly agree that public support for the police is important for successful policing. Not only is public support fundamental to the legitimacy of the police, but it is also important for enlisting the public in efforts to reduce crime. Moreover, there is growing evidence that public support depends on the public's perception that police treat people fairly and professionally. (Miller, et al., 2004)

This report gives credence to the idea that the police have to earn the trust of public, as it is very important for the smooth functioning of the whole system. In one of the researches conducted in the UK, Bradley concluded:

> The police are more likely to influence the public's views of and demand for policing if, first, there is in place a strong working relationship between the police and the public". (Bradley, 1998)

The favorable image of the police in the minds of the common masses cements the public's faith in the system. It is the sheer responsibility of the police personnel not to let go any opportunity to change the distorted image of policing to make it a congenial perception in Indian masses.

There have been many incidents in which the public has taken the law in their own hands because of the trust deficit. This trust deficit, because of the unfavorable image, has proved to be detrimental to the representation of the police force as a unit. The recent Bengaluru incident in which an unruly mob torched a police station and injured 38 police personnel, is a glaring outcome of the same trust deficit. The hysterical group ran amok in the city and vandalized many properties inside the police station (Bhardwaj, 2020). Another unfortunate episode occurred in Bulandshahr where a group of angry villagers chopped off the thumb of a police inspector named Subodh Singh and later killed him (Raju, 2019). These incidents arguably transpired because of the negative portrayal of

police system and somehow the police personnel too are responsible for such negative image they have among the common masses. However, the police do not have an entirely disapproving image among the common masses. In first of its kind, a study conducted by Common Cause, an NGO, and the Centre for the Study of Developing Societies (CSDS) on the "Status of Policing in India Report 2018-A Study of Performance and Perceptions", it was observed:

> While underlining the inadequate quality of the public service . . . that the people are sympathetic and understanding: 78 per cent of the respondents who had contacted the police are "very satisfied" or "somewhat satisfied" with the police and only 16 per cent are "completely or somewhat dissatisfied". (Singh, 2018)

The matter of concern is another finding of the same study which is that the "upper and middle classes trust the police more compared to lower and poorer classes. Men have higher levels of trust in police compared to women, and the educated tend to trust the police more compared to the less literate. At the aggregate level, trust is correlated to satisfaction with police services, no matter whether the police are corrupt or not" (Singh, 2018). This conclusion clearly shows the lack of professionalism in the Indian policing. There have been multiple cases of custodial violence, and police brutality that emerge from the abuse of police powers, the recent Chennai case, reported in *The Indian Express* by Arun Janardhanan, being one of them. Such maltreatment gives fillip to the already existing relentless fear of the police, and is most certainly counterproductive to good police-public relations. These fears are exhibited in the form of apprehension of being questioned by the police, distress of being wrongfully arrested, fear of being beaten up by the police.

It is a matter of an absorbing enquiry that what has changed all of a sudden that one sees a totally different side of the Indian police during the corona pandemic which is one of the most distressing times in the recent history of human race, that has engulfed the whole globe.

Unquestionably, this is an extraordinary situation and it demanded extraordinary efforts to mitigate the cataclysmic effects of the pandemic in India. What makes the situation worse for India is that there are many other variables that are not in favour of India such as, India's huge population, lack of proper sanitation, near impossibility of social distancing in many cases, high density of population, and patchy primary health services. In this never seen before situation, the Indian police personnel have played a historical part in not only containing the coronavirus, but also in assuaging the psychological hazards that this pandemic is inflicting on those who have been infected as well as on those who are in the fear of being infected. To enumerate a few instances: in Punjab, police officers are responding to even children's calls for assistance, asking migrants to stay put without worrying about their daily needs, and also preparing and distributing food among the poor. In Maharashtra, officers are distributing umbrellas to street vendors (Yadav, 2020). At many places, the police personnel showed a doting humane side by singing songs for the masses, sometimes to educate them, on other occasions to entertain them. In the same article Yadav observes:

> India's police is mostly criticised for its high-handedness and bribery. It generates little trust in the eyes of the common people. But corona virus crisis and the subsequent lockdown have brought out a less seen, compassionate side of them. It is this combined image of personnel in uniform singing and dancing for the troubled public that can help change people's perception of them. (Yadav, 2020).

The true character of a man comes out in dire situations. In 2020, there would hardly be any human being who is not afraid of being infected with the coronavirus. It is not surreptitious that there is a greater risk of being infected when you meet too many people or go in a huge crowd. Among all the corona warriors in India, it was only two set of forces that by and large often encountered the huge crowds, sometimes to control them, and sometimes to manage them. The two forces are namely: Indian police personnel and Railway Protection Force. On the top of it, almost on every occasion they had to handle an unruly crowd,

let us face the reality of Indian crowd and their public behavior. These forces have performed their duties with illustrious efficiency without even thinking about their own safety. In one such situation that may be seen as evidence to the kind of efforts and professionalism Indian police personnel demonstrated, in Ghaziabad where all of a sudden the local police had to handle hundreds of thousand migrant workers who were dropped by the DTC buses on the Delhi-Ghaziabad border on 27th March, 2020. The then Deputy Superintendent of Police of Sahibabad, Dr Rakesh Mishra is my personal acquaintance who narrated the whole story of the herculean task his team performed in not only controlling the crowd, but also making sure they reach their destinations safely. The efforts of the police personnel of Sahibabad, which is a Delhi-Ghaziabad circle, is more than commendable, as managing such a huge crowd is no less than an ordeal.

There are inexhaustible cases that highlight humane aspect of these two forces. Some credit must also be given to the media that helped in bringing out such news items that showed compassionate and creative side of Indian police personnel. The two forces tried to make light of even most erratic demands of some people during the lockdown. In one such incident which was reported in Lucknow that an elderly person called the police to bring him *rassogulla*. Interestingly enough, the police brought him *rassogullas* (*Hindustan Times*, 31 March 2020). This was undoubtedly a great effort by the police of Lucknow. Such episodes were not only confined to Lucknow, but several incidents were reported from different places and in all the cases Indian police have invariably acted more than considerately. Their large-hearted attitued earned them huge respect among the common masses. There were some irritating demands also that were made by the public to the police. One such incident which was reported in the same article in *Hindustan Times* occurred in Rampur (Uttar Pradesh) where a person made repeated calls to the police helpline number to request for *somosa* with *chutney*. Surprisingly, the police met his demands and brought him *samosa* with *chutney*. In a motivating article in BBC, it was reported that:

> Inspector Munish Pratap Singh was about to finish his shift around 22:00 when a helpless father called him with an unusual request.
>
> "Could you please get a birthday cake for my son? It's his birthday and he is really sad," the father said.
>
> Insp Singh is not used to dealing with such requests, but these are no ordinary times.
>
> All shops were shut in his area, but he called a baker he knew and - luckily - a cake was available.
>
> "The happiness on the boy's face made everything worthwhile. My team and I forgot how tired we were," he says. (Pandey, 2020)

It is rare to see a human being act so compassionately in such distressing situation, and more so when he is involved in a stressful mission of effecting the stringiest lockdown in the world. In many cases, the police personnel chose not to meet their family members lest the family members contract the virus because the police personnel have to meet and tackle the crowd all the time.The police force was not only involved in implementing the administrative orders, but at the same time they were also providing humanitarian aid to the people in distress. It was reported that at many places "the police coordinated with several NGOs like the Vivekananda Kendra to distribute relief material among those hit by the closure of economic activities. Patrol cars, whenever not otherwise engaged, were utilised to transport the sick to hospitals or bring succour to senior citizens. There were even cases of policemen donating their blood and plasma to patients in critical conditions. What is disheartening to see is that even though they were performing duties under such hazardous conditions, there were few incidents in which some people attacked and threw stones at them" (Prakash Singh, 2020). Even after such demoralizing incidents of being attacked, they never went astray from their responsibilities, instead performed their duty with utmost sincerity. The world is incomplete if there is no mention of the role of women in any system. This paper would not be able show a larger picture if contribution of lady police officers during corona pandemic is not

cited. There were umpteen incidents that can be narrated here to showcase lady police officers' great efforts during the lockdown, but for the lack of space, this paper cherry-picks particularly three incidents to mention that were fairly heartening. It was reported in *The Times of India*, that four lady officers, posted at the South-West Delhi police station, along with their usual duties were running a makeshift kitchen to make *puri*, *sabzi* and *halwa* for the needy people, especially migrant workers. These four police officers would reach the police station early in the morning to cook fresh food for almost 1000 people in three-four hours (Chand, 2020). Another laudable act of Delhi police is worth mentioning here. Three lady constables posted at Greater Kailash police station were stitching masks during the lockdown for the needy people in slum clusters (*The Times of India*, 11th April 2020). The third incident was a visual treat for perhaps all the people in the country. The incident was reported on 12 May 2020 in *Hindustan Times* with a picture in which a lady police officer posted at Malkangiri police station in Odisha was seen feeding an elderly woman on the streets (Mohanty, 2020). These three instances reinforce the idea that police personnel are "full of milk of human kindness". Similar efforts were replicated by the Railway Protection Force also. According to the data received from Security Control Room of Railway Board, from 10 May 2020 to 26 May 2020, RPF distributed 764765 food packets prepared by IRCTC, 625833 food packets prepared from its own resources, and 882487 food packets prepared by NGOs. With passenger trains services suspended during the lockdown, the workload of the RPF had relatively gone down. Thus, the Pune Division of the Railway Protection Force had deployed some its personnel, conversant with the craft of basic tailoring, to make masks in their free time for the underprivileged (Bende, 2020). In a similar initiative of stitching masks for the poor was also reported from Odisha also where RPF constables were sewing over 50 masks per day during the lockdown. Such stories of RPF revealing its humane face are rife during the corona pandemic. The RPF personnel along with other station staff of Vasco were able to develop a food distribution system that ran like clockwork. They decided to provide food to the migrant workers

with their own contribution from their meagre salaries (Philipose, 2020). In an opinion piece, Mangla and Kapoor deem that "these examples of social service are not meant to celebrate the police, but to bring to light a core aspect of their work. Situating the law and order and social service functions side by side broadens our understanding of police behaviour and performance, especially when it comes to managing complex problems. With regard to the conventional law and order function, there is evidence that the police's drive to control public spaces can lead some officers to use heavy-handed tactics" (Mangla &Kapoor, 2020).

During the lockdown in India, people were forced to stay home to keep the novel coronavirus in check, whereas the country's police force came out with innovative ways to enforce the national lockdown and also to educate the public on novel coronavirus. These methods range variedly from posting a rap song on social media accounts, singing a song, walking with helmet with corona-like spiky structure, or strutting on a white horse painted with "virus" art. Biswas and Sultana observed:

> The role of the police has helped in trust-building measures among the people in India. Taking cue from the police of other countries, the police in some of the states like West Bengal, Maharashtra, Assam, Nagaland, and Goa sang some of the famous Bollywood songs to keep the public in good humour.

The social media accounts of police stations across the country are buzzing with corona-related cartoons, songs, dances and videos of police requesting people not to worry and panic to leave a particular state, their promise that they would provide all the safety and food for the migrant workers, and pictures of police handing food to the poor. In an article published in USNews, it was recounted that Ashok Lalla, a digital marketing consultant based in Bengaluru, asserts that "Social media has … helped give the police a softer, more human voice and face, unlike the stern enforcers of law and order that they were seen as earlier". (Anand, 2020)

The role of Railway Protection Force enthralling for many more reasons. Indian Railways managed one of the biggest reverse mass migrations in the world during the corona pandemic. India is a distinct country in a sense that there is an internal migration of more than 500 million people! According to the data provided by the Ministry of Railways, Indian Railways ran 4,621 Shramik Special trains that were operated between May 1 and August 31, carrying 6,319,000 passengers to their home states. It must be noted that no less than a super human effort was required in this heroic mission of the Indian Railways to ferry more than 6 million people during the pandemic and further, it made sure the migrant workers reach their destinations safely. What is charismatic about performance of RPF in managing passengers' crowd at stations, ensuring queue formation with social distancing, handling panic/distress calls related to Covid-19 and manning the Shramik specials, is that not only they showed an extremely professional attitude, but they also exhibited an unseen compassionate facet of the force. It is imperative that this paper enlists few of the laudable efforts by the personnel of RPF. In one such incident that throws light on the kind of efforts made by the Railway Protection Force, constable Inder Singh Yadav was performing shift duty on 31st May 2020 at Bhopal Railway Station. During his duty, a lady passenger, who was traveling with her 4 months old baby girl, asked for help from the above RPF constable by requesting that her baby girl was crying for milk and she did not get milk to feed her baby from stations passed back. On hearing this constable Inder Singh Yadav immediately rushed outside the station, took a milk packet and returned when he noticed that the train had started running. The constable with his rifle on his shoulder ran fast chasing the said train with commitment to hand over the milk packet to the lady passenger. This act of humanity was applauded by the entire country (India Today, 4 June 2020).

In a report that describes the enthusiasm for the commitment of the Railway Protection Force during the corona pandemic, it was narrated that corona warriors from Railway Protection Force are in the forefront be it regulating passenger's entry in stations or guarding of railway assets or busting the touts. Now they have stepped up their fight against

coronavirus by donating plasma. Another inspiring account that highlights the commitment of the RPF personnel was reported from Mazgaon where a 38- year old RPF head constable who is corona survivor volunteered to educate, as soon as he got the fitness certificate, the passengers and the railway employees to maintain hygiene to fight the coronavirus (Ahmed, 2020). There is a long list of good deeds of the Railway Protection Force during the corona pandemic, which ranges from distributing food to stranded and underprivileged persons to arranging immediate medical help to pregnant women travelling during lockdown who suddenly went into labour.

Most certainly corona pandemic has redefined the world in which children grow and develop. Covid-19 had caused many disruptions to families, friendships, daily routines and the wider community which can have negative consequences for children's well-being, development and protection. Atul Karwal, Director, National Police Academy, announced the plan to establish a dedicated Center for the Protection of Children's Rights, saying "The police together with the community can act as a force multiplier to enhance the effectiveness with which they support children during COVID-19" (Datta, et.al., 2020). The establishment of a centre dedicated to the protection of child is a step forward in the re-imagining of police role in the society.

Prakash Singh, Chairman of Indian Police Foundation, acknowledges that "perhaps, a new chapter is opening— which reveals a police that is more sensitive and humane, people-friendly and committed to the rule of law. This transformation would, however, need the support of the people, of the media and, above all, the legislators and parliamentarians" (Prakash Singh, 2020). Most certainly it is a gamechanger as far as imaging and imagining of Indian policing is concerned. Now, there is a greater responsibility on the police personnel not to let this imaging go to oblivion once again after having earned it after losing so many lives from their cadre. Since the Indian police personnel were hailed as messiah during the lockdown, now they have to live up to this new-found image.

This article may also be considered as an ode to those police personnel and Railway Protection Force officers who have laid their lives in saving the lives of many Indians during the corona pandemic.

References

1 Ahmed, A. (2020, June 29). Covid survivor RPF staff guards others against infection.
Hindustan Times.
https://www.hindustantimes.com/mumbai-news/covid-survivor-rpf-staff-guards-others-against-infection/story-D0pICaOPUVqmnk07iDsY2L.html

2 Anand, S. (2020, April 15). India's Police Galvanize Public to Follow Lockdowns. USNews and World Report.
https://www.usnews.com/news/best-countries/articles/2020-04-15/police-across-india-get-creative-to-educate-about-the-coronavirus-pandemic

3 Bawa, P.S. (2019). Transfer - Bane or Boon. *Sardar Vallabhbhai Patel National Police Academy Journal*. Vol. LXVIII, No.2, 2019, p. 90.

4 Bende, A. (2020, April 16). RPF Pune making masks for the poor. *Pune Mirror*.

5 https://punemirror.indiatimes.com/pune/civic/rpf-pune-making-masks-for-the-poor/articleshow/75166485.cms
Bhardwaj, A. (2020, August 12). 2000-strong mob goes on rampage in Bengaluru; 3 killed as police open fire. *The Hindu*.
https://www.the   hindu.com/news/national/at-least-three-killed-in-police-firing-as-riots-break-out-over-fb-post-in-bengaluru/article32331790.ece

6 Biswas, D., Sultana,P. (2020).Policing During the Time of Corona: The Indian Context. *Policing: A Journal of Policy and Practice*. Oxford University Press.

7   Bradley, R. (1998). Public Expectations and Perceptions of Policing. Home Office, Policing and Reducing Crime Unit, Research, Development and Statistics Directorate.
http://library.college.police.uk/docs/hopolicers/fprs96.pdf

8   Chand, S. (2020, April 14). Duty by choice: Delhi cops cook for needy. *The Times of India*.
https://timesofindia.indiatimes.com/city/delhi/duty-by-choice-cops-cook-forneedy/articleshow/75131550.cms

9   Datta, T., et. al. (2020). Re-imagining the role of the police in COVID-19 times. UNICEF.
https://www.unicef.org/india/stories/re-imagining-role-police-covid-19-times

10 Gupta, K. & Mishra, M. (2019). Public Private Partnership in Police Administration- Need of the Hour. *Sardar Vallabhbhai Patel National Police Academy Journal*. Vol. LXVII, No. 1, 2019, p. 34.

11 Janardhanan, A. (2020, July 4).Explained: How Tamil Nadu Police's brutal act of revenge claimed lives of a father and son. *The Indian Express*.
https://indianexpress.com/article/explained/explained-tamil-nadu-police-custodial-torture-father-son-killed-thoothukudi-6479190/

12 Mangla, A., Kapoor, V. (2020, June 2). How Policing works in India in Covid-19 times. *The Hindu Business Line*.
https://www.thehindubusinessline.com/opinion/columns/how-policing-works-in-india-in-covid-19-times/article31729922.ece

13 Miller, Joel, et al. (2004). Public Opinions of the Police: The Influence of Friends, Family, and News Media (Document no. 205619). US Department of Justice.
https://www.ncjrs.gov/pdffiles1/nij/grants/205619.pdf

14 Mohanty, D. (2020, May 12). Odisha woman cop praised by superstar Chiranjeevi for going beyond the call of duty. *Hindustan Times*.

https://www.hindustantimes.com/india-news/odisha-woman-cop-praised-by-superstar-chiranjeevi-for-going-beyond-the-call-of-duty/story-aznI9vE9cfOlbl1dY7qWzN.html

15 Pandey, V. (2020, May 12). India coronavirus: How police won hearts with cakes, songs and sacrifice. BBC News.
https://www.bbc.com/news/world-asia-india-52586896

16 Philipose, R. (2020, July 10). How RPF constables' bid to feed migrant workers brought all of Vasco on one track. *The Indian Express*.
https://indianexpress.com/article/facebook-stories-of-strength-2020/governing-the-crisis/how-rpf-constables-bid-to-feed-migrants-brought-vasco-one-track-6497895/

17 Raju, S. (2018, December 28). Thumb chopped off: Inspector killed in Bulandshahr first faced axe blows on hand, head. *Hindustan Times*.
https://www.hindustantimes.com/india-news/thumb-chopped-off-inspector-killed-inbulandshahr-first-faced-axe-blows-on-hand-head/story-mLys2r8oc50NxbyfRbxqlK.html#:~:text=Police%20inspector%20Subodh%20Kumar%20Singh,being%20shot%20dead%2C%20police%20said.&text=%E2%80%9CInspector%20Subodh%20Singh%20reached%20the,tried%20to%20pacify%20the%20mob.

18 Singh, A., et. al. (2018). Study of Policing in India Report 2018: A Study of Performance and Perceptions. Common Cause and Lokniti- Centre for the Study of Developing Socities.
https://www.commoncause.in/pdf/SPIR2018.pdf

19 Singh, P. (2020, May 6). The making of a polite, people-friendly police. *The Indian Express.*
https://indianexpress.com/article/opinion/coronavirus-india-lockdown-police-6396636/

20 Yadav, J. (2020, April 11). Covid lockdown shows Indian police isn't all brutal. Some officers can sing for us, feed poor. *The Print*.

https://theprint.in/opinion/pov/covid-lockdown-shows-indian-police-isnt-all-brutal-someofficers-can-sing-for-us-feed-poor/399845/

21 The Times of India (2020, April 11). Delhi: How women cops are sewing the way with masks for poor.
https://timesofindia.indiatimes.com/city/delhi/how-women-cops-are-sewing-the-way-with-masks-for-poor/articleshow/75088831.cms

22 Indo Asian News Service. (2020, March 31). From rasgulla to samosa, check out these weird requests to UP police helpline. *Hindustan Times*.
https://www.hindustantimes.com/it-s-viral/from-rasgulla-to-samosa-check-out-these-weird-requests-to-up-police-helpline/story-JJTNZIf7MtqsSx10kZxbSL.html

23 Indian Today. (2020 June 4). RPF constable chases moving train to deliver milk packet to famished infant
https://www.indiatoday.in/india/story/watch-rpf-constable-chases-moving-train-to-deliver-milk-packet-to-famished-infant-1685538-2020-06-04

24 Pukar News. (29 July 2020): Mumbai: RPF Corona Warriors donate plasma
https://www.punekarnews.in/mumbai-rpf-corona-warriors-donate-plasma/

Author's Profile

Md. Shadan Zeb Khan started his career as assistant professor of Political Science at Aligarh Muslim University. Later on he cleared Civil Services in 2001 to join as an Indian Railway Protection Force Service officer. He is presently holding the position of Senior Commandant of 9th Battalion in Jagadhari, Haryana. During his celebrated career he has received many accolades from his superiors as well as various institutions. There are several innovative initiatives to his credit in his illustrious career of more than 2 decades such as first FM Radio campaign for creating awareness

among railway passengers, popularizing helpline number, creating WhatsApp helplines and community policing. His deep interest in academics has encouraged him pursue many academic courses during his employment. His areas of interest and research are security issues, policing, sustainable development, and contemporary social issues. He has published extensively in international and national journals on varied topics ranging from Theory of Development to Security Issues in Railways.

Road Safety: The Solutions!!!!

Bhushan Gulabrao Borase, IPS*

Speeding can take you away from your loved ones.
Don't over-speed.

Abstract:

We all, as a Nation, need to improve road safety as every year so many precious lives are lost and life never remains the same for those who are

* *Assistant Director, Sardar Vallabhbhai Patel National Police Academy, Hyderabad*

grievously injured in road crashes. Million dollar question is __how to do it?__ This paper is an attempt to narrate actionable points at State Level as well as at District Level by police officials in collaboration with other concerned departments. In last four years, three courses on "Traffic Management and Road Safety" and one workshop on "Road Safety: National Consultation of Stakeholders" were conducted at SVPNPA, Hyderabad. Speakers from police department, MoRTH, PWD, NHAI, research institutes took sessions in these courses. Learning from all those sessions is incorporated into this paper. A lot of efforts have been taken in different parts of the country and many times it has given good results too. The idea of this paper is to club necessary knowledge together so that it becomes handy for officers involved in the field of road safety.

Keywords: *Road furniture, road safety audit, black spots, golden hour*

Introduction: -

About 1.5 lakh precious human lives are lost in road crashes every year in India and about a million people get injured. Various agencies responsible for Road Safety are: MoRTH, NHAI, Transport Department of all States, Police, Research Institutions, PWD, Ambulance Services and Trauma Care Centres etc. The Supreme Court Committee on Road Safety has been monitoring the progress on the front of road safety in States and Union Territories.

A lot of efforts have already been made by almost all the agencies but still much is desired in enhancing inter departmental communication.

Economic Cost of Accidents and national loss –

As per the study on socio-economic cost of road accidents in India conducted by IIT Delhi in 2019, in case of a death in road crash, the cost to the nation is between (90 lakhs -1.23 Crores) and in case of grievous injury the cost is 4.88 lakhs and in case of minor injury the cost is 24,598[2]. Considering the average statistics of about 1.5 lakh deaths in road crashes and 5 lakh grievous injuries happening every year, the total

cost of accidents in India comes to around **2 lakh Crore rupees**. It's a great loss to the nation in addition to psychological trauma to the concerned families.

A) State Level Initiatives that can make the difference

1. State Road Safety Authority

A State Level Road Safety Authority having officials from Transport Department, PWD, Police Department, Health Department, Researchers etc can channelize the State efforts in one direction. Kerala State does have a Kerala Road Safety Authority having following key functions[3]

a) Advising the Government on Road Safety Policies
b) Prescribing and enforcing Road Safety standards and procedures
c) Formulate and implement schemes projects and programmes relating to Road Safety
d) Co-ordinating the functions of all the agencies and Government Departments discharging the duties related to Road Safety
e) Implementing Road Safety awareness programmes
f) Administration of the fund
g) Sanctioning expenditure for the implementation of Road Safety schemes and programmes
h) Sanctioning expenditure for Road Safety projects and for purchase and installation of equipment and devices connected with Road Safety
i) Sanctioning expenditure for the conduct of studies ,projects and research on matter relating to road safety
j) Sanctioning expenditure for trauma-care programmes or activities
k) Sanctioning administrative expenditure of the Authority
l) Sanctioning expenditure on matters connected with road safety measures
m) Formation of self help groups, under the leadership of the Authority for the rescue operation in the place of accident
n) Discharging such other directions as may be prescribed having regard to the objects of this Act

2. State Police HQ Road Safety Control Room

a) A dedicated control room can serve as a focal point for data collection, analysis, planning, implementation and review.

b) Additional SP of every district can be nodal officer for road safety.

c) A monthly meeting of all road safety nodal officers with PHQ can help in monitoring the progress of initiatives taken.

d) Good work in road safety may be rewarded either by additional marks in PAR of officers or by instituting State Level awards for same.

3. Ensuring quality of road furniture and road maintenance

Indian Road Congress is the agency that proposes all the standards for construction and maintenance of roads, bridges, tunnels and transportation. The standards for road furniture like signboards, road markings, speed breakers, road studs, delineators, hazard markers, guard rails etc can be made available on police websites so that if any SP is floating any tender for purchase of road safety equipments, these standards are readily available.

Also names of agencies that can test and certify if the road safety material like sign boards, road marking, road studs etc are as per specification or not, can be made available on State Police website so that SP can send some samples for checking.

Section 198A of amended Indian Motor Vehicle Act 2019 mentions following

Failure to comply with standards for road design, construction and maintenance.--(1) Any designated authority, contractor, consultant or concessionaire responsible for the design or construction or maintenance of the safety standards of the road shall follow such design, construction and maintenance standards, as may be prescribed by the Central Government from time to time.

(2) Where failure on the part of the designated authority, contractor, consultant or concessionaire responsible under sub-section (1) to comply with standards for road design, construction and maintenance, results in death or disability, such authority or contractor or concessionaire shall be punishable with a fine which may extend to **one lakh rupees.**

Thus testing of road furniture can help in preventing low quality work by contractor or any such agency.

4. The Integrated Road Accident Database (iRAD)

This Project is an initiative of the Ministry of Road Transport and Highways (MoRTH), Government of India and is funded by World Bank, with objective to improve road safety in the country. To achieve this, establishment of an accurate and uniform road accident data collection mechanism from all over India, is required. For this purpose iRAD mobile & web application is developed.[4] Use of this app in State/UT can ensure uniform data collection.

While analyzing data points, one should give equal importance to fatal accident, non fatal accident and near miss/minor accident. Spot of minor accident in day time has potential to become spot of fatal accident in night time or during rainy season. Many times, people do not report near miss or minor accidents. A mechanism needs to be evolved by which these data points are also collected and to be kept in mind while formulating road safety strategy.

5. Road Database district wise

Roads in India are classified as given below
  a) Expressway
  b) National Highway
  c) State Highway
  d) District Roads
  e) Rural Roads
  f) Urban Roads
  g) Project Roads

State level team can take a responsibility of making **individual maps** of these roads police district jurisdiction wise. Each map can also have the details of agency responsible for construction and maintenance of these roads and the budget provision of repairs every year. Road accident database can be superimposed on these maps instead of having one single accident map because unlike police, these different roads are looked after by different agencies.

Details can also be collected as to –

Which time of the year, the concerned agency collects data for repairs? What is the format in which they desire accident information? Is there any provision of emergency budget to address immediate repair? Nodal officers name, contact details etc.

Usually for field officers, these details are not readily available. If a formal mechanism is evolved for annual one meeting of all these stakeholders, it can be very beneficial. Young SP may not be aware of the fund provisions with local urban body or ZP or district road safety committee as the procedures vary from State to State. A centralized database creation can help in bridging the communication gaps and having better co-ordination.

B) District Level Initiatives that can make the difference

District or Commissionerate is the policing unit where micro planning, implementation, analysis and review happen. First and foremost need is to get road safety as priority work among the police officers and staff. District level initiatives can be divided as following

1) Engineering – Very few police officers have requisite knowledge or training about road design and engineering aspects that make road safer or dangerous. Hence it is best to outsource this work. District SP can contact local Indian Institute of Technology/ National Institute of Technology/ Government College of Engineering / Reputed Private College of Engineering / Road Safety Research agency and request them to do road safety audit if it is not done by the agency responsible for its

construction and maintenance on annual basis. This road safety audit can become very handy while communicating with road maintenance agencies. If there are any prescribed formats in which road maintenance agencies want this data, then same may be given to audit team. Punjab Police has signed MoU with many such agencies for road safety work.

2) Enforcement – This is core policing work and where police ensure strict compliance of helmet, seat belt, no use of mobile , no drunk driving and no over speeding, it directly culminates into reduction in accident deaths. The Supreme Court Committee on Road safety has issued direction to suspend driving license for a period of not less than three months under Section-19 of the Motor Vehicle Act, 1988 read with Rule 21 of the Central Motor Vehicles Rules, 1989 for offences of over speeding, overloading, drunken driving and use of mobile phone while driving[5].

Tamil Nadu police had suspended 1.56 lakh driving licenses in year 2018[6]. It shows strong commitment of police towards enforcement component of road safety. This strict enforcement had direct result of reduction in road crash fatality.

Earlier the task of suspension or cancellation of driving license was time consuming. Now MoRTH website parivahan.gov.in gives the option to send request for suspension or cancellation of driving license in online format. In a district, one PI can be made nodal officer for such data entry in portal. Chhattisgarh Police is using parivahan.gov.in portal for sending requests for suspension of driving license for traffic violations. A screenshot for the same is given below.

3) Education

a) <u>**Protection of Good Samaritan –**</u> IMV Act ,2019 gives protection to Good Samaritans under section 134 A

"134A. (1) A Good Samaritan shall not be liable for any civil or criminal action for any injury to or death of the victim of an accident involving a motor vehicle, where such injury or death resulted from the Good Samaritan's negligence in acting or failing to act while rendering emergency medical or non-medical care or assistance.

(2) The Central Government may by rules provide for the procedure for questioning or examination of the Good Samaritan, disclosure of personal information of the Good Samaritan and such other related matters.

Explanation.

For the purposes of this section, "Good Samaritan" means a person, who in good faith, voluntarily and without expectation of any reward or compensation renders emergency medical or non-medical care or assistance at the scene of an accident to the victim or transports such victim to the hospital."[7]

Many State Police are spreading awareness about helping accident victims and protection to Good Samaritans. Punjab Police gives "Bhai Ghanaiya ji Good Samaritan Certificate". Thus they have linked the name of the certificate with a great humanitarian and benevolent personality. Kerala Police has also started a project called "SOFT" – Save Our Fellow Traveler Project. Under this project they provide awareness and training to citizens in first aid and in rushing the road accident victim to hospital. [8]

b) Golden Hour Concept

The concept of "golden hour" is derived from the French military's World War I data. The doctors then believed that there is a golden hour between life and death. If an injury had caused potentially irreparable damage to the body, it needed to be taken care of within the 1-hour time frame, or the person would die in the next few days or weeks. [9] Awareness about protection to Good Samaritans and concept of Golden Hour should go together as these concepts are interlinked.

Salem City Police Commissioner had implemented a project of awareness about "Golden Hour" concept among citizens that led to increase in number of citizens bringing accident victims to hospital in time[10]. It led to saving of many lives. In urban areas, auto drivers play a major role in shifting of road accident victims. If they can be roped in by means of motivation, reward and recognition, it can help in saving many lives.

Awareness about "Golden Hour" also needs to be given to police officers and staff so that they also can shift road crash victim in police vehicle if ambulance arrival is delayed for any reason.

All highway patrol vehicles of police, NHAI, government ambulances can be fitted with GPS and their deployment can be made based on the nearest vehicle to the accident spot. Usually these vehicles are parked either near police stations, out posts, highway toll gate or nearby health centre. Ideally they should be located based on the black spots and black lengths in the district so that response time to reach road crash victim is minimum. An effort in this direction was made by IIT Madras by developing an algorithm for ambulances deployment.

District control room can also alert the health centre or emergency ward about arrival of accident victim and time since first report of accident so that they are mentally prepared for treatment.

Control room can maintain a chart in following format

Date	Time of Intimation to control room about accident	Time of highway patrol / ambulance reaching the spot	Time of arrival of accident victim in nearest medical facility	Result of treatment Victim alive or not	Remarks

This chart can be reviewed weekly by control room inspector and he can submit the report to SP/ additional SP in following format

1. Number of accidents in given week
2. Fatal - number & Non Fatal - number
3. In how many cases, control room received the intimation (%)?
4. On reporting what was average time of police vehicle reaching the spot?
5. Who shifted the victim to hospital? (Highway patrol/ police vehicle/ government ambulance/ private ambulance/ auto/taxi/ private vehicle)
6. Efficacy of highway patrol vehicles?
7. In how many cases first aid was given by highway patrol staff to stop bleeding?
8. Learning and suggestions for betterment

This exercise can go on till the time response time is within 20 minutes and share of private citizens shifting the victims increases to at least 40%. Other than these three E's, different action plan of road safety is needed for different type of road user

Pedestrian Safety:

Of all the road users, most vulnerable and most deprived user is pedestrian. Even the bike users, car users, bus users etc are pedestrians at some point of time during their commute. Hence, focus on road safety of the pedestrian can definitely reduce the pedestrian fatalities.

Problem is absence of good quality footpaths for pedestrians to move. India has 22 cars per 1000 individuals[11]. It means 2.2 % population owns the cars and car user occupies 90 % of the road. This undue preference to car user need to go down. We need to have quality footpaths on all roads in cities so that for short distances, people prefer walking. Electricity poles, transformers, telephone cable poles, dust bins etc have traditionally been dumped on footpaths depriving the pedestrians of quality footpath. The IRC 103 -2012 clearly mentions that the height of kerb should not be more than 150 mm and the gap between paving slabs should not exceed 5 mm to facilitate movement of people using sticks or wheelchair.

Footpaths that are not continuous are not preferred by pedestrians. Hence a continuous stretch of footpath is desirable as shown in figure below
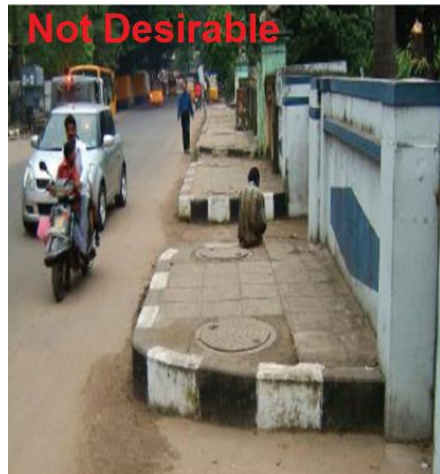
IRC 103-2012 clearly prescribes the minimum width of the footpath depending on adjacent land use and based on pedestrian traffic as mentioned below.

The minimum width of footpath varies with type of adjacent land use

Type of facility	Footpath width (m)
Residential/mixed land use	1.8
Commercial	2.5
Shopping	3.5 to 4.5
Bus stops	3
High intensity commercial areas	4

Side walk width (m)	Design flow in number of pedestrians/hour			
	In both directions		In one direction	
	LOS B	LOS C	LOS B	LOS C
1.5	1350	1890	2025	2835
2.0	1800	2520	2700	3780
2.5	2250	3150	3325	4725
3.0	2700	3780	4050	5670
3.5	3150	4410	4725	6615
4.0	3600	5040	5400	7560

Implementation of these guidelines can assist in shifting pedestrians from roads to footpath.

Improvement at Intersections: -

Pedestrian accidents frequently happen at the intersections. Studies have proved that the intersections with roundabout are safer than the intersection without roundabouts.

Haryana Vision Zero road safety program that was launched by Haryana government in 2016 has been attempting for improvisation of intersection.

a) Existing Intersection   b) proposed intersection

In the above shown drawings, to cross the existing intersection, it takes lot of time for pedestrians. Hence in the proposed intersection, the medians have been widened at intersections so that pedestrians can wait there safely.

This modified intersection will be very safe and easy for pedestrians to use.

Actionable points for police to enhance road safety of pedestrians

a) Three years road accident data may be analyzed for fatal as well as non fatal accidents involving pedestrians.

b) Black spots and black stretches may be identified for pedestrian accidents.

c) Traffic cops needs to be sensitized about importance of speed of 30 Km/hr at junctions. At these black spots/ stretches traffic cops may be asked to ensure implementation of speed limit of 30 Km/hr by means of fine. Contactless fine by means of CCTV camera only for speed limit at such junction can also be thought of and it can be given publicity.

d) Scientific speed breakers or rumbler strips are the alternative ways of reducing speed at these junctions.

e) Identification of damaged/small footpaths near such black spots and bringing it to the notice of civic agencies to get them repaired/ widened. Old electric poles, defunct transformers etc

may be removed from such footpaths. If footpaths are not continuous, then they may be made so.

f) Vulnerable intersections may be identified. Possibility of use of roundabout may be explored in consultation with experts. For intersections with the roundabouts, medians widening as shown in the figures above can be proposed to make the intersections safer for the pedestrians.

g) Traffic Signals allowing free left put pedestrians at risk. Such practices may be avoided wherever possible.

h) During awareness campaigns, use of bright color clothes in night time may be promoted among the pedestrians, bicyclists and two wheeler drivers.

i) Among police fraternity, use of reflector jacket during night duty may be promoted for all the ranks to ensure their safety during duty at check posts, patrolling on motor cycle etc.

Safety of Two Wheeler Drivers:

Two wheeler drivers are next most vulnerable lot on the roads. Two wheeler users are less in developed world as compared to developing world.

Two wheeler drivers fatality in road accidents happens due to following reasons

1. Lack of proper infrastructure
2. Lack of lane discipline
3. Use of mobile while driving
4. Lack of awareness about helmet use
5. Unscientific speed breakers
6. Unlicensed and unqualified people using two wheeler
7. Drunken driving
8. Visibility problem in night

Countries like Vietnam and Cambodia have shown remarkable progress in use of helmets among the two wheeler drivers through enforcement and awareness.

Actionable points for police to enhance road safety of two wheeler drivers

a) Three years road accident data may be analyzed for fatal as well as non fatal accidents involving two wheeler drivers.

b) Black spots and black stretches may be identified for two wheeler accidents.

c) Dedicated enforcement against drunken driving, use of mobile and not using helmet at these black spots and stretches can be very helpful in reducing fatalities.

d) Unscientific speed breakers may be identified and they may be made scientific with proper design, sign boards, paint, cat eyes etc with the help of civic bodies/ PWD/NHAI

Black spots and black stretches where maximum accidents are reported may be identifies and arrangements for better illumination may be made to avoid future accidents.

Technology driven traffic enforcement

Developed countries have far better traffic enforcement than our country. Use of technology is their tool. Traffic violator always has this fear that he/she will be definitely caught if an offence and number plate has been recorded by camera.

Use of CCTV cameras, Automatic Number Plate Recognition Cameras, Facial Recognition Camera at major junctions across the country will have major advantage of capturing the evidence of any traffic violation. Automatic Challans generation is used in many major cities. Nonpayment of fines is a major problem with contactless Challans. But if the entire country starts using e-Challan app developed by NIC, then there will be a central database of people who have violated the traffic rule. Whenever he/she is caught by traffic police and vehicle data is entered into the app, it can provide data of all the Challans issued in the name of the vehicles and payment of fine. Bengaluru City Police has been using this method very successfully but only with database of Karnataka Registered Vehicles.

Further the database of traffic violators can also be shared with Transport departments across the country and when the transport vehicle comes for transport permit or fitness certificate, no dues certificate from e-challan app can be made mandatory.

Insurance renewal can also be linked to clearance from e-challan app. Thus every vehicle driver across India will have this fear that even if they commit a traffic offence in Kanyakumari and vehicle transport permit is to be taken in Delhi, the challan pendency will be visible to Delhi Transport authorities, it will bring an intrinsic discipline among the drivers. All challans must have an image of vehicle with visible number plate. This can bring much desired road discipline as seen in western world.

Road Safety Week

Every year, National Road Safety Week is celebrated across India in the month of January.

The activities involved are

1. Road Safety Awareness rallies on roads

2. Awareness sessions in schools and colleges

3. Poster, painting, slogan and essay competitions in schools and colleges

    So far no one has conducted a study of efficacy of this program trying to calculate the accidents happening before awareness program and accidents happening after the program.

This road safety week may be redesigned to achieve specific tasks like

1. Calculating % of population using Helmets on a given road.
2. Creating awareness among bike riders for using helmets and then measuring % rise in use of helmet after one week.

3. Videos of general maintenance of vehicles, brakes, indicators can be shared with drivers so that accidents do not happen due to vehicle error.

4. Private as well as public drivers can be imparted training about defensive driving and best practices in driving by professionals in the field.

5. Measuring the percentage of car drivers' population that do drunken driving so that selective roads can be identified for drunken driving cases enforcement.

6. Knowledge of our own policemen can be checked with regard to first aid, golden hour, black spot identification. If any knowledge gaps are found, same can be filled up with suitable e-learning material.

Road Safety Education as part of school curriculum

School curriculum varies from State to State. Few habits if corrected in tender age become permanent habits for lifetime. Road Traffic education and road safety education can be made an integral part of the school syllabus for 10th standard students. It can go a long way in producing better educated drivers for future.

Use of Social Media

In last one decade, social media has become a potent tool of mass communication. Use of little humor to spread right message has lasting impression on minds of people. Some examples of use of humor and traffic messages via social media re given below.

Conclusion:

This paper mentions about initiatives that can be taken at State level and District level to reduce the road accidents and road fatalities. None of the initiative mentioned is just theoretical. All the solutions proposed have been tried in different parts of the country. It is high time that we put together all these solutions to have a comprehensive road safety strategy involving all stake holders. Better communication and co-ordination is the key. Let's save the precious lives ….

References

1. *https://k3lh.com/2016/04/08/poster-on-road-safety-week-campaign/ dated 24.11.2021 (image)*
2. *http://tripp.iitd.ac.in/assets/newsimage/SBPaul_Road_Accident_costing.pdf*
3. *http://roadsafety.kerala.gov.in/road-safety-authority#functions*
4. *https://irad.parivahan.gov.in/downloads/iRAD_User_Manual_V_2.0_draft.pdf*
5. *https://transport.delhi.gov.in/content/suspension-driving-licence-direction-supreme-court-committee*
6. *https://www.thehindu.com/news/national/tamil-nadu/over-15-lakh-driving-licences-suspended-in-tamil-nadu-in-2018/article24938557.ece*
7. *https://egazette.nic.in/WriteReadData/2019/210413.pdf*
8. *https://old.keralapolice.gov.in/media/pdf.annoucenments/2016phq/s oft.pdf*
9. *https://www.medicinenet.com/what_is_the_golden_hour_in_medicine/article.htm*
10. *https://bprd.nic.in/WriteReadData/userfiles/file/2016098021155462266645GoldenHourTraumaCare.pdf*
11. *https://auto.economictimes.indiatimes.com/news/passenger-vehicle/cars/india-has-22-cars-per-1000-individuals-amitabh-kant/67059021*

Author's Profile

Batch – 2009, Karnataka Cadre

Education – BE, M Tech, Masters Degree in Police Management

Experience – ASP, Gulbarga, SP – Mandya District and Dakshina Kannada District, SPCyber Crime, CID, Karnataka, DCP, Bengaluru City

Current Posting- Assistant Director (MCTP), SVPNPA, Hyderabad

Awards & Recognitions –

1 Director's Commendation and Insignia (Gold Plated)) – 2021 at SVP NPA, Hyderabad.
2 He has received National Award for e-Governance in 2015 for Use of ICT in Citizen Centric Services.
3 He was also awarded with Best Probationer in co-curricular activities in SVP NPA in 2009 Batch.

Interests - He is a keen learner in the field of Road Safety and Blockchain Technology. He maintains a blog on road safety called as https://improveroadsafety.blogspot.com

Publications –

1. SVP NPA Journal Vol. LXIX No.2 December 2020 Article: "Blockchain Technology and Cryptocurrencies Part-1: Basics for Police Personnel"
2. The Bureaucrat Express, February 2015, Volume 2, Issue 2, Page Number 24 – Article:- "Effective Vehicles Database Management to dispose vehicles lying unclaimed in the police stations".
3. Defense and Security Alert, June 2015, Volume 6, Issue 9, Page Number 64 – Article:- "Effective Vehicles Database Management to dispose vehicles lying unclaimed in the police stations".
4. IIB Bulletin published by Insurance Information Bureau of India Volume 2 Issue 2 Q2, FY 2015-16 published case study with title "The Mandya Miracle" about unclaimed vehicles disposal by Mandya Police.
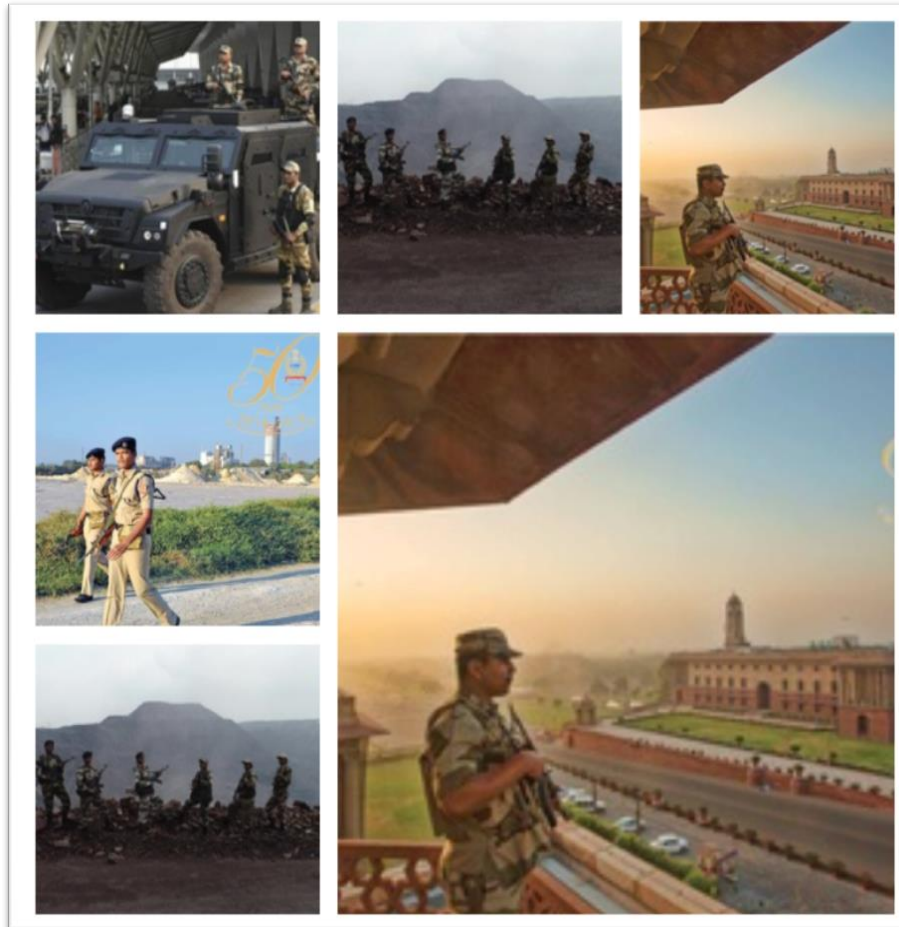
Industrial Security: An Evolving Paradigm

Atish Kumar*

* *Assistant Commandant/Exe CISF*

Abstract

For the New India, industries are the engine which will propel the country and citizens towards higher horizons of quality of life, projection of power and realization of dreams of our forefathers. While the focus on industrialization emerged during early days of the country's independence, the advancement of industrialization has gained extraordinary pace in current times with disruption and breaking new barriers becoming the new norm. At the same time the threat to the industries are ever present and increasing with both external and internal components of threat multiplying at a fast pace.

The article lays focus on industrial security as a specialized discipline, the evolution of the concept of industrial security,the existing and upcoming challenges before the industrial security setup in the country and how to overcome these challenges.

Industrial security can be concisely defined as the state of an industry being secured from all threats and dangers. Industrial Security is a challenges to the economic security of an aspiring global leader like India with incidents like the attack in Mumbai in 2008, attacks by extremists in the East and North East, Maruti plant vandalism in Haryana and more recently vandalism of Winstron plant in Karnataka and attacks on Jio towers in Punjab posing a dent on the image of country in eyes of investors.

For long, the term industrial security was associated with physical security of the industrial infrastructure consisting of men, material, and machinery (vital installations). Globally, billions of dollars are invested in security systems including manpower to protect the assets of an organisation especially in the industrial sector.

Evolution of industrial security

Earlier industrial Security was not an organized discipline. It was only a watch and ward operation needing simple alertness. The procedures adopted for enforcement of security were not codified and consisted of simple verbal orders issued as and when required. There were no

gadgets or equipment available. In Fact, no need was felt for these gadgets or equipment as a necessary component of Security. In such a scenario it is needless to say that security failed to emerge as a specialized discipline. Moreover in those days till late sixties and seventies the management of Industrial undertakings viewed security as a nuisance which raised the costs and considered security expenditure as a burden. There was no coordination of Security with managerial Decision Making of a particular unit. Generally Security was seen as an extraneous function to be clubbed with sundry housekeeping jobs such as doing the household chores of senior management official. In such a context Security became reactive in nature. A Security man was thought of only when there was an attempt to Theft or physical threat to the officials of the undertaking.

Emergence of industrial security as a specialized discipline

Industrial security today has become systematic in its approach. It has a well-defined role like access control, surveillance, handling of industrial disputes, supplying timely and advanced intelligence input to the senior management, which becomes an important component of management decision, use of technical gadgets for proper screening and sanitation of the physical area of the Industry. The security has become professional also. Now a days we find that the personnel providing industrial Security are well trained and well conversant with the Industry in which they are operating. Security has become a specialized discipline like other functions of the Industry. Coordination between industry and security wing has improved in a significant way. Thus, we can say that Security has been integrated with the industrial process.

Information security as new area of focus

Of late the term industrial security is widened to cover security of information within its ambit as in many cases industrial process and information have much higher values than the product and in other

cases the information itself is the end product.The dynamics of Industrial Security has accordingly changed from reactive and passive Security to proactive and dynamic Security.   With increasing automation and IOT taking over manual operations in the industry the threat of cyber-terrorism has increased many folds.

According to the findings of the global survey 'The State of Ransom ware 2021' conducted by cyber security firm Sophos about 67 per cent of Indian organisations whose data was encrypted paid a ransom to get back their data–a slight increase on the previous year when 66 per cent paid a ransom. In fact, Indian entities were the most likely to pay a ransom of all countries surveyed: the global average was just under a third (32 per cent). The survey also found that 86 per cent of Indian organizations believe cyber-attacks are now too complex for their IT team to handle on their own, compared to a global average of 54 per cent.

In the coming days industrial Espionage is developing to be a matter of concern for the Security managers. With the Communication revolution and development in IT, it is possible to transmit Information of all kinds in a matter of seconds. There is a greater threat therefore of an Industry losing its competitive edge by its rivals pilfering its trade secrets. Therefore Security systems have to think of steps to safeguard Information so that valuable trade secrets are not passed away.

Hence, Information Security will become a major key area of industrial Security in the coming days. The critical installations such as Atomic energy plants, Space stations, Power stations, Airports, oil and gas installations will come under closer scrutiny because of their greater vulnerability to attack and the magnitude of damage likely suffered by these industries. The increased role of technology as an aid to security will be another area of importance in the coming days. This is because new technologies will be emerging in the areas of industrial Security which will make them more cost effective and more efficient. In the coming days greater managerial orientation will

also come into place as Security will be integrated with the basic industrial processes like production, marketing and Procurement.

Emerging areas of focus

Apart from the conventional threats that industries face there has been emergence of several non-conventional threat perceptions in the form of:

- Emergence of transnational terrorism using UAV's (drones) as was seen in the recent attack on ARAMCO in Saudi Arabia.
- Shift from traditional economy to knowledge economy which increases the vulnerability of institutions and organisations vital to knowledge economy.
- New forms of terrorism like Bio-terrorism & Nuclear terrorism with threats from both state as well as non-state actors.
- Widening economic gap among blue and white collar workers which my pose threat from under privileged sections if their aspirations are not met
- Rise of supra national entities like MNC's and NGO'S which have significant control over day to day lives of people may pose a threat as seen in questions raised on electoral interference by social media
- Shift from man power oriented security system to technology oriented security systems

Never before in the history of independent India has Industrial security faced such grave danger as it is facing now. Vital installation and critical infrastructure are very vulnerable to conventional/non-conventional attacks. Apart from the public sector undertakings major private sector industries like Reliance Industries, Infosys, Bharat biotech are availing services of CISF which is an indication of the growing threat to the industrial security. However still most industries do not feel the need to invest in security since return on security are

not in quantifiable terms and it is often classified by industries as a "non-essential" operation.

Growth of private security and its limitations:

India after independence chose a socialistic model of development with public sector industries at centre stage, however succeeding the economic reforms of 1992 private sector has played a bigger role in advancement of countries economy. Private enterprises in this era are the chief agents in creating employment, providing funds, building competitiveness and driving innovation - all essential instruments for growth. While the Public sector undertakings are vital for the strategic sectors, non-strategic PSU's are being privatised with the mantra of minimum government maximum governance. With the advent of the Fourth Industrial Revolution, India is at the cusp of a technology revolution that could transform manufacturing and industrial production in the country. India has emerged as a significant player when it comes to converging technology and entrepreneurship. It is the second-largest start-up nation in the world, with more than 14,000 start-ups recognized under the Startup India scheme.

The PSU'S in India enjoyed a greater degree of security after the birth of CISF based on the recommendations of Mukherjee Commission from 1969. However as private players gained importance in the growth story of India the strategic value of private sector industries was recognised and an amendment to the CISF charter in 2009 enabled CISF to protect the strategically important private sector undertakings too.

However the nature and security needs of the PSU'S and Private sector is different owing to various factors primary among them is the core concern on profitability. The private sector undertakings require a leaner model of security which can be less burden on the finances.
This focus on cost based approach to security gave a fillip to private security agencies who are more flexible in their approach and provide services at a fraction of what the CISF would cost.The industry presently provides employment to nearly 10 million people. The

private security industry in India is estimated to be some INR 800 billion, and is expected to grow exponentially at a CAGR of 20 per cent. While these agencies can aid in the security they lack appropriate authority, training and standardization to be credible stakeholder in providing security.

For anindustrial security setup to be effective various factors are required:

- Industrial security should also be the responsibility of the management: Planning for security starts from the blue print stage, construction of the plant and building is designed keeping in view the security mind and interested in improving the security measures. If the management is lax, then the security set up also tends to become lax
- Security should have authority: The security force has to impose a number of checks and controls laws and rules should be framed to empower the security personnel to implement them otherwise security measures become ineffective.
- Security should be independent: The security department should be independent of all other departments of the undertaking and function directly under the Chief Executive. Otherwise departmental loyalties or jealousies are likely to interfere with security of the undertaking
- Security should be cost effective: All Industries are profit oriented and therefore unless the expenditure on security is commensurate with the value of the property to be protected, it becomes counterproductive.
- Relations between the workers and security personnel must be cordial: Co-operation of the workers can solve a majority of the security problem. The workers should be made security minded and their co-operation should be encouraged
- Collection of Intelligence: There must be an efficient system of collection of intelligence. Good intelligence ensures good

preventive action both for crimes as well as law and order. Vigilance should be maintained on the activities of the security

- Firm implementation of decisions: Once a decision to implement any rule is taken by the management it must be scrupulously carried out even if there is resistance from the workers

- There should be meticulous planning: All preventive measures should be planned meticulously. Measures taken for prevention of theft, pilferage, sabotage, riots and calamities should be planned in advances to avoid any loopholes.

- Controls should be effective: All the controls exercised by the security department over access to installations, movement of materials and vehicles, regulation of processions and demonstrations etc., should be effective and the security force should not be merely ornamental.

Way ahead

The above mentioned principles of industrial security are already incorporated in the working of CISF and the agency has proved its mettle time and again and has emerged as one of the most professional and adaptive agency. The only inhibition for private sector that remains is that of cost considerations of CISF. This gap may be filled by adopting leaner models of providing security such as Quick response team based securitywhere CISF handles the major threats while day to day security operations are taken care by private players. With adequate changes in the charter of CISF imaginative approaches to security can be realised including raising a cyber-counter force tuned to cater to the needs and challenges of industrial undertakings .Also with automation aiding the security architecture costs may be reduced by implementing techno based solutions in non-core areas of security and taking aid of gadgetry to rationalise manpower.

Industrial security will be a cornerstone in India's quest to become an economic powerhouse. In a competitive world where emerging

economies are competing with each other for share of economic pie in terms of investment and with global geopolitics increasingly becoming combative a truly professional and future-vulnerability proof security is the need of the hour. This will require commitment from both government and the industry to recognise the importance and invest in industrial security. As a member of force I believe CISF is well placed and always ready for the new challenges that come its way and future proofing of the Indian industrial security is in good hands.

References

1. *American Society of Industrial Society (ASIS) Protection of Assets 2012, Volume 1-8*
2. *NISA Academy, Hyderabad: Notes from various lectures*
3. *Dey and Kaushal: Essays on Industrial Security*
4. *K Nityanandam IPS : Standards for physical security management in industry*

Author's Profile

Sh. Atish Kumar, Assistant Commandant/Exe CISF, Namrup, Assam
Email:atish.kumar@cisf.gov.in

Predictive Policing with CCTV Optimisation

Rohit Malpani, IPS*

Abstract

Closed Circuit Televisions (CCTVs) have become an integral part of technical surveillance for security objectives across the world as well for both predictive and preventive policing. However, CCTV installations are being done without adequate research. There is little focus on regular maintenance also due to lack of adequate skilled manpower within the police units. Since CCTV technology is still very costly there is a need to install them rationally to derive maximum results. In this context, this paper tries to assess the frequency of CCTV footages in the period 2019-21 at different locations in Police District Baddi, District Solan, Himachal Pradesh during investigations and presents deeper insights towards routes taken by criminals before and after commitment of crime. It also suggests that enhanced patrolling in such areas can help in better detection of crime and reduction in the long run. With its limited manpower, police can strategise CCTV maintenance also on such critical routes and even supplement surveillance in such routes. The method can be of great help for police deployed in big cities/towns, Police Commissionerates and inter-state bordering districts.

Keywords – CCTV, crime, predictive policing, public safety

* SP CID, Cyber Crime, Shimla, HP

1. Introduction

While research supports the utility of CCTV in providing surveillance over affected areas; crucial evidence in the investigation of crimes; increasing the risks to the offenders and general diffusion of benefits in safety issues the impact has been modest. There are two reasons for not utilizing the full potential of cctv system. First, the location of camera positions is based upon general understanding of hot spots and public demand and even display for citizen assurance. Second, maintenance is neglected resulting in several cameras malfunctioning and failing to provide needed evidence when required. There is also evidence that placement of cameras leads to displacement effect and offenders move to other nearby regions to commit their crimes outside the range of the cameras. Accordingly, it is necessary for police officers to constantly evaluate the impact of CCTV system and make suitable changes to keep them effective as preventive and investigative methods. This paper seeks to address these issues based upon a case study of CCTV system installed in Police District Baddi, Solan HP from 2019-21 and predict entry/exit routes taken by criminals while committing the crime. The research also concludes in the end with suggestions to increase police visibility on such strategic routes with an aim to quickly solve crime and reduce it in the long run.

The study is structured as follows: Section II does literature review with regard to the existing criminological theories associated with CCTVs; Section III explains the methodology including the data sources, approach followed in the study and assumptions; Section IV discusses the results and analysis done in the study; Section V discusses the conclusion made in the study.

2. Literature Review

Surveillance through CCTVs has been an important tool to both prevent and solve the crime happening in the society [1]. India has witnessed a 17.5 times increase in installation of CCTVs from 2016-19 with more than 4.27 lakhs CCTVs available to the police across the country [2].

However, mere installation of CCTVs cannot serve the full purpose of public safety. A wholesome approach is required regarding installation of CCTVs with respect to their locations, technical aspects in maintenance, predicting criminal routes and taking steps to strengthen field policing, etc. [3]. The rational choice theory implies that criminals are rational in their decision-making while committing crime and they pick the route where there is least opportunity cost of getting apprehended before or after the commitment of crime [4]. Heightened surveillance on these routes can help in quick nabbing of criminals.

3. Research Methodology

Data Source: Crimes related to accidents, property offences and bodily offences were extracted from the CCTNS for the year 2019-21 for the entire district. Simultaneously, data regarding access of CCTV footage from different locations was taken on record from the CCTV Branch, Office of the Superintendent of Police, Police District Baddi.

Methodological Approach: Police Station wise raw data related to the concerned offences was plotted on Google My Maps with their precise coordinates. Existing digitised boundaries of the District and its Police Stations were used on Google My Maps. During investigation of criminal FIRs, footages from several CCTV locations were studied on a need basis. Every time CCTV footagewas retrieved during a particular case investigation, the log book of every CCTV location was updated. This data related to accessing CCTV locations was later compiled in MS Excel. Thus, to find out which cameras were located on the most crucial locations and were being accessed repeatedly, individual record of every case was studied for the duration 2019-21 and CCTV usage data was further analysed using Gephi software.

Assumptions: There were several assumptions in this study that imposed some limitations upon the results. Variations in the technology and features of CCTVs installed at different locations were not taken into account. Often, investigating officers didn't choose to access the CCTV footage from many locations in various cases where accused were

already identified. They often used to study footage from various possible CCTV locations only till the case was unsolved. Once, the CCTV footage of any location used to give any clue, they used to discontinue the CCTV analysis even if the other untouched locations had better coverage. Thus log books of such CCTV locations could not be updated in spite of them carrying an evidentiary value in the particular case.

4. Results and Analysis

Network Analysis of access of CCTV locations: Total 80 FIRs from the year 2019-21 and 180 CCTV locations were analysed in the study. These comprised 260 "Nodes" in the Network Graph (Fig. 1). CCTV footage analysed at a particular location in every corresponding FIR was represented as "Edges". Total 322 Edges were studied in the graph. In Fig. 1 nodes named after alphabet "C" represent the CCTV locations and other nodes represent the criminal cases. E.g. Nl 2/20 represents FIR no 02/20 of Police Station Nalagarh, Br 3/19 represents FIR no 03/19 of Police Station Barotiwala and Bd 04/20 represents FIR no 04/20 of Police Station Baddi.

CCTV nodes ("C" nodes) were grouped based on their in-degree to find out which locations were accessed more in the study period to solve the crime. If a particular CCTV location / node has been accessed more in various cases (in-degree for that node is high) than the size of that node has been increased & colour of that node has been made darker comparatively. It was found that few nodes are more strategically important than the others. 43 CCTV locations out of 180 were accessed more than once while investigating the cases (Fig. 2). Average in-degree of CCTV nodes was 1.238. K-means clustering algorithm was applied on the CCTV locations access data to find optimal clusters using elbow method as K=2.
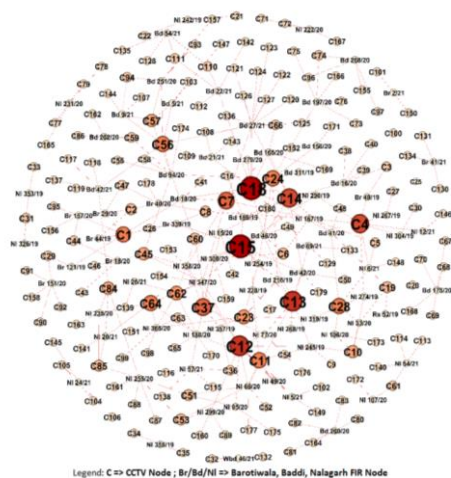
Fig. 1. Analysis of CCTV and crime nodes in Gephi Software
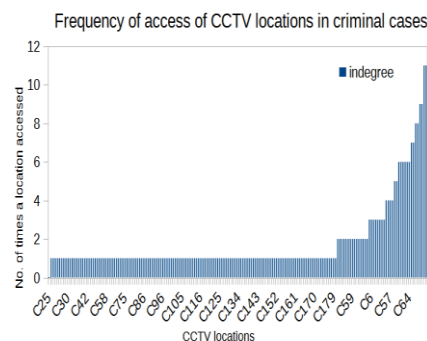
Fig. 2 Frequency of access of CCTV locations

Nodes / CCTV locations which were found strategically important (in-degree > 1) were further tabulated in Table 1. All these CCTV nodes were further plotted on Google My Maps vis-a-vis crime hotspots in the Baddi district [5].

In-degree of the node	Node	Location	Type of Location	Remarks based on inputs received from the field units
11	C15, C18	Manpura, Baddi Barrier	Inter-state barrier & National Highway	Manpura located midway between Baddi and Nalagarh towns. Baddi barrier was gateway to Baddi district.
9	C12, C13	Rajpura, Dherowal	Inter-state barrier & National Highway	Rajpura is focal point on NH-105 for exit from Nalagarh town towards Punjab. Dherowal is inter-state barrier with Punjab.

8	C4, C14	Nalagarh T Point, Bhud Barrier	National Highway	Nalagarh T point was focal point for entry in the Nalagarh crime hotspot. Bhud barrier located midway between Baddi and Nalagarh towns.
7	C7, C37	Red Light Chowk Baddi, Shrinivas Company Baddi	National Highway	Red Light Chowk is located on tri-junction leading to Baddi hotspot and gateway to crimes happening on NH 105 (Pinjore – Nalagarh). Shrinivas company is midway between Baddi and Nalagarh towns on NH 105.
6	C1, C11, C24, C28, C56, C64	Barotiwala Chowk, Chowkiwala, Vardhaman, Kalka Chowk, Phase 1&2 Baddi, TVS Company	Heart of crime hotspot, National Highway, Inter-state barrier, cross-road	Barotiwala Chowk is located very near to the Barotiwala inter-state barrier. Chowkiwala and Kalka Chowk are located on NH 105 and very near to the Nalagarh hotspot. Vardhaman is located on cross-junction and very to Baddi hotspot. It is an exit towards towards remote hilly areas of Baddi. TVS Company is located at exit going towards inter-state Dabhota barrier and further towards Ropar, Punjab. Phase 1 & 2 lie in the middle of Baddi hotspot.
5	C23, C62	Dabhota barrier, Dhana	Inter-state barrier & National Highway	Dabhota is inter-state barrier with Punjab. Dhana is located on NH105 and exit from Nalagarh hotspot towards rural areas of Punjab.
4	C10, C45, C57, C84	Ropar Chowk, Aliana company, Laj Kanta, Penguin	National Highway, promixity to inter-state arrier and	All were located near the crime hotspots or on National Highway

		company	crime hotspot	
3	C2, C6, C8, C19, C51, C53, C60, C85	Barotiwala barrier, Kharuni, Kuranwala, Ramshehar chowk, Truck Union Baddi, Onyx Biotech company, SP Office, Diversey company		Barotiwala barrier was inter-state barrier towards Haryana. Kharuni, Kuranwala, Onyx Biotech, Diversey & Truck Union Baddi were located on National Highway SP Office was located near proximity to Haryana border. Ramshehar chowk was located as central point of hilly area of Ramshehar.
2	C110, C111, C94, C74, C66, C63, C61, C59, C47, C44, C36, C31, C29, C5, C3	Crompton Greaves, RCI Indus, Phase 3 Baddi, Alpla, Cadbury, Behal Dhaba, Hanuman Chowk, Haripur, United Biotech, GSB company, PS Barotiwala, Hotel Harison, Microturner		All the locations were either located on cross-roads, tri-junctions, proximity to hotspots and exit towards rural areas

Table 1. Nodes / CCTV locations which were found strategically important

It was also observed that most of the CCTVs which were accessed time and again were Automatic Number Plate Reading (ANPR) cameras. CCTVs which were of poor resolution or whose view was not of very good with respect to investigation point of view were often left out by the investigative officers.
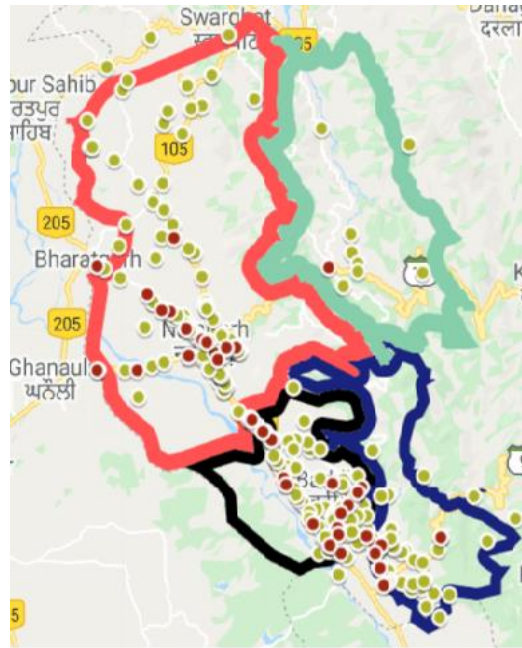
Fig. 3. Strategic CCTVs (in-degree > 1) vis-a-vis crime in Police District Baddi

As depicted in Fig. 3 all the CCTV nodes with degree (> 1) were plotted on Google My maps along with the crime and boundaries of the respective police stations. CCTVs at inter-state barriers and its proximity, ANPR cameras installed on National Highway and inter-sections near the hotspots were found to be most strategic regarding investigation of crime.

5. Conclusions

CCTVs located near the crime hotspots and located on the National Highway from where criminals could have a safe entry prior to crime or speedy exit post crime were found to be very strategic from a police investigation point of view. Based on their strategic value, authorities can supplement the number of CCTVs andinstall ANPR cameras at such locations ensuring coverage from all view angles and also increase the field patrolling on such routes to increase the visibility of police. Police can also increase the maintenance frequency of such CCTVs over others

installed at less important locations, thus rationalising its manpower usage. CCTVs with high in-degree of access could be maintained every few days whereas others with less usage could be visited occasionally. Police can also consider sending reminder SMSes/phone calls regarding maintenance to the owners of those CCTVs which were accessed very less by police.

Based on the location of crime, police can study the footage of such strategic CCTV locations parallely while studying the other nearby ones thus maximising the opportunities to identify the criminals in the 'Golden Hour'[6]. As part of preventive strategies also these CCTVs could be monitored more frequently to keep a general watch over the movement of criminals in the area.

References

[1] Ratcliffe, J.H. (2011). Video surveillance of public places. Problem-oriented guides for police response guide series. Washington DC: Centre for Problem-Oriented Policing.

[2] Report on "Data on Police Organisations", Bureau of Police Research and Development (BPR&D), New Delhi, 01 Jan 2019.

[3] Adrienne Isnard (2001), "Can surveillance cameras be successful in preventing crime and controlling anti-social behaviours?" in The Character, Impact and Prevention of Crime in Regional Australia Conference, Australian Institute of Criminology.
http://www.antoniocasella.eu/nume/ISNARD_2001.pdf

[4] Gok, Ozkan (2011). "The Role of Opportunity in Crime Prevention and Possible Threats of Crime Control Benefits". Turkish Journal of Police Studies. 13: 97–114.

[5] Rohit Malpani, Madhav Chablani (2021). "Impact of CCTV surveillance on crime". Occasional Paper Series, Centre for Criminal Justice Research, IIT Kanpur.
https://ccjr.cse.iitk.ac.in/opapers/Impact%20of%20CCTVs%20on%20Crime.pdf

[6] Lerner, EB; Moscati (2001). "The Golden Hour: Scientific Fact or Medical "Urban Legend?"". Academic Emergency Medicine. 8 (7): 758–760. doi:10.1111/j.1553-2712.2001.tb00201.x. PMID11435197

Author's Profile

Rohit Malpani is a 2012 batch IPS Officer borne on HP cadre. He is currently posted as SP CID Cyber Crime Shimla.

Towards an Improved Role Allocation to the Child Protection Institutions of Police

K.P.A Ilyas*

Abstract

Changing times pose new challenges in Child Protection and Police is increasingly involved in Child Protection. The article examines the two statutory institutions of Police for Child Protection, viz. Child Welfare Police Officer (CWPO) and Special Juvenile Police Unit (SJPU), both mandated under the Juvenile Justice (Care & Protection) Act, 2015. It is found that functional mandate of these important institutional roles are not yet defined clearly. This article explores the legal prescription for of the two roles (a) proposes a clearer exposition of their roles and (b) a mechanism that will enable the Superintendents of Police to better monitor their performances.

Key Words

Child Protection. Child Welfare Police Officer, Special Juvenile Police Unit, Children in Need of Care and Protection, Children in Conflict with Law, Child Care Institutions.

* Assistant Director, Sardar Vallabhbhai Patel National Police Academy, Hyderabad

Introduction

For the mother or a father children undoubtedly are their most treasured possessions. For the state too children are arguably her most treasured possessions ,constituting 40 percent of the population and, as the saying goes, 100 percent of her future.

The great minds that conceptualised and shaped our Republic over the years attached substantial importance to children, a fact borne by the text of our Constitution and the number of statutes and institutions later created to attend to children.

Yet, despite all those commitments and efforts, we encounter with an alarming frequency the fate of yet another toddler trapped in the horrifying depths of a tube well; we come across the umpteenth dead body of a little girl raped and ravaged. It is time we reviewed with a sense of urgency the machineries we are implementing to safeguard our children and their efficiency.

Children and Policing

As children were expected to be and are generally taken care of by the close watch and care by the institution of Family, apparatuses of the state conventionally did not concern themselves with the safety and security of the child, except for particular and rare situations. Hence Police, traditionally, did not consider children as an important constituency to be served by it (except for dealing with juvenile offenders).

With the changes in social and economic organisation of society perhaps the situation has changed significantly. The increasing role for institutions other than family as care givers for children, the advances in Information Technology that makes access to children easier for criminals preying on them are some of the important changes in this regard. In the changed scenario, State, and by extension Police and other agencies, cannot leave the duty and responsibility of securing children to family and parents alone.

An important milestone in configuring Police as an agency for securing the lives of children was achieved when the Juvenile Justice Act

was enacted where it identified roles for Police in protecting what the Act defined as 'Children in need of Care and Protection'.The role was further refined by the judgements of the honourable Supreme Court. Roles such as Child Welfare Police Officer and bodies such as Special Juvenile Police Unit came into being.

Securing Childhoods-The Varied Dimensions

However, the commonplace understanding of institutionalised roles for Child Welfare Police Officer and Special Juvenile Police Units fall into two categories.

1. Deal with cases of children in need of care and protection, reported to Police
2. Deal with cases of children in conflict with law (who also needs care and protection*)

A vast variety of crucial roles that pertains to securing the lives of our children fall outside of these two categories, such as

1. Acting upon crimes against children; Proactive and responsive roles
2. Acting upon unsafe surroundings that poses threats to the physical safety of children
3. Rescuing Missing Children
4. Collecting Intelligence on Persons and nexuses preying on children.
5. Mounting surveillance on places frequented by child traffickers
6. Monitor the vast governmental machinery of childcare for pilferage and corruption
7. Watch out for Child Abuse, especially in places where children are living separated from family such as Childcare homes, Orphanages and Hostels.
8. Ensuring safety for Children in the cyberspace
9. Prevention of juvenile delinquency
10. Studying and acting upon factors and agents that push juveniles to crime

It may be mentioned in passing that the collective anxiety of public regarding the safety of children is often very high and occasionally result in reactions going to the extremes, such as public lynching of suspects in recent times.Savage and unacceptable these are, the glaring vacuum in roles that can instil sense of security in the minds of parents is perhaps the inference we must derive from these disturbing occurrences.

Two Distinctive Roles

Role conflict may arise the roles of taking care of children in conflict with law and acting upon crimes against children are given to the same entity.Juvenile Justice Act created a special unit 'Special Juvenile Police Unit(SJPU)' composed of 'Child Welfare Police Officer(CWPO)' presumably to cater to the needs of Children in Conflict with Law as well as Children in Need of Care and Protection. It does not make much sense to entrust a four year old child in need of care and protection to a Unit that caters to juveniles in conflict with law.The roles have to be separated and given to different entities, especially in the aftermath of amendment to the Juvenile Justice Act that provides for adult-like treatment to juveniles in conflict with law of the age group 16-18, in certain cases. A ready solution may be that the first role be undertaken by a Child Welfare Police Unit (CWPU) composed of Child Welfare Police Officers and the second by the Special Juvenile Police Unit(SJPU) composed of Special Juvenile Police Officers.

CHILD WELFARE POLICE OFFICER AND CHILD WELFARE POLICE UNIT

It is suggested that Child Welfare Police Officers (CWPO) and Child Welfare Police Units (CWPU) may deal with children in need of care and protection and that they engage in proactive measures to improve the safety and quality of childhood in her/his area of responsibility and proactively identify Children in Need of Care and Protection and safeguard them.

The following Functions, Duties and Responsibilities may be defined for them for enhancing their roles as per the changing environment with regard to children of the country and for the sake of clarity of their existing mandate.

Functions

1. Proactively identify Children in Need of Care and Protection. This would entail collecting intelligence on nexuses that prey on children, mounting surveillance on places (such as Railway Stations, streets) and industries (where child labour is frequently employed) and places where abused children are likely to be found.
2. Be the guardian of the Child in need of Care and Protection, identified by Child Welfare Police Officer or produced before him, till such time the child is entrusted to safe hands.
3. Monitor all aspects of life of children in his area of responsibility that might affect the safety of children. A list of activities in this regard is given in Appendix-1
4. Act as a facilitator and coordinator for the welfare and well being of children and childhood in his area of responsibility by ensuring periodical and sustained interaction with other agencies and officers concerned with the safety and welfare of children such as District Child Protection Officer, Child Welfare Committee, Juvenile Justice Board, Childcare Institutions, Schools, Integrated Child Development Programme, as well as communities and civil society organisations.

Duties

1. Investigate the immediate details of cases registered and study the case from an organised crime perspective to rule out and if present to act upon the involvement of organised rackets.
2. Address the immediate needs of the Child in need of Care and Protection, including emotional support, suitable food, privacy, shelter, cloths and medical care wherever necessary till such time the child is entrusted to Child Welfare Committee. Also, the earliest possible access to family shall be ensured.

3. Identify and update the list and contact details of all the offices, institutions, persons and organisations that may be of help in the rescuing of lost children or rehabilitation of found children.

4. Establish close linkages with all the Child Care Institutions in her or his Area of Responsibility and monitor their performance periodically. See Appendix 2 for a format that the Child Welfare Police Officers and Child Welfare Police Unit may use to monitor the Childcare Institutions.

5. Establish working relation with all the educational and allied institutions and enterprises catering to the needs of children in her or his Area of Responsibility and visit such institutions/enterprises at least once in six months.

6. Prepare a list of all the hostels in her or his Area of Responsibility that cater to the needs of children and ensure hostels are running in consonance with the rights and requirements of children.

7. Collect details of Parks, melas etc where Entertainment services are provided commercially to children and ensure suitable safety protocols are set in such places.

8. Collect intelligence/ information on persons or shops selling tobacco products/ pan products/ drugs / alcohol to children. Emphasis to be given to areas around Educational Institutions (The School Protection Group Initiative of Kerala Police can be a useful model to emulate in this regard). Collect Intelligence/ information regarding industries or enterprises employing Child Labour. Liaison with the office of the Labour Commissioner in the district shall be established in this regard.

9. Study and monitor Government schemes for children to prevent pilferage of money or items meant for children. Powers under S.160 of CrPC or Right to Information Act or any other legal means shall be employed to collect correct informations in this regard.

10. Look out for trafficking rackets. Mount surveillance on Hotels, Motels, Known Red Light areas, pimps, suspicious vehicles, previously arrested / convicted traffickers and transit points such as

Railway Stations, Bus terminals. Necessary coordination with personnel of Railway Protection Force, Taxi Unions, Transport Authorities, National Aids Control Organisation, Civil Society Organisations and respected women leaders must be established for the beginning.

11. Identify and prepare a list of qualified, willing, persons who can provide counselling to child victims to help them weather post traumatic stress syndrome in cases of physical, emotional or sexual abuses.

12. Thoroughly and properly understand what it means to be The Best Interest of the Child, an eloquent erm used by the Juvenile Justice Act, in as many contexts and situations.

13. Acquire and constantly update knowledge, skills and attitudes that would help her or him to serve children better. The appropriate demeanour and language for dealing with children shall be given particular emphasis

14. Monitor the working of The Orphanages and other Charitable Homes Act,1960 as relevant to the welfare of child inmates if any.

15. Understand the working of The Right of Children to Free and Compulsory Education Act, 2009 so that suitable intervention can be made when warranted.

16. Monitor compliance to The Women's and Children's Institutions (Licensing) Act, 1956.

Responsibilities

1. Prepare Social Background Report on rescued children.

2. Produce all rescued/ found children before Child Welfare Committee.

3. Inform all cases of offences against children to Child Welfare Committee.

4. Prepare a detailed profile of Missing Children in order to facilitate rescuing them.

5. Prepare a Possible Profile of Found Children in order to facilitate tracking their parents.

6. Upload Details of all Missing and Found Children in track the missing child portal expeditiously, in no case not within more than 4 hours of receiving the information.

7. Ensure prompt Registration of FIR whenever cases where the children are victims are reported.

8. Invoke S. 188 of Indian Penal Code whenever Directions issued by authorities with regard to welfare of children are disregarded. This can vary from registering cases against school authorities that violate norms on maximum weight for school bags to orders with regard to safety protocols in school buses.

9. Ensure cases are registered as per the amended provisions of Juvenile Justice Act against persons selling tobacco products to children.

10. Ensure Specific Responsibilities of Police with regard to POCSO Act,2012 are carried out

11. Ensure Specific Responsibilities of Police with regard to Child Labour are carried out

12. Ensure Specific Responsibilities of Police with regard to Young Persons (Harmful Publications)Act,1956 are carried out

13. Ensure Specific Responsibilities of Police with regard to Juvenile Justice Act,2015 are carried out

14. Ensure Specific Responsibilities of Police with regard to Child Marriage(Restraint)Act,1929 are carried out

15. Ensure Specific Responsibilities of Police with regard to Immoral Trafficking Prevention Act are carried out

16. Submit periodic returns to Superintendent of Police through proper channels on the monthly activities of the Officer (a model format is given in Appendix-3)

It can be thought of that Child Welfare Police Officers be given a distinctive badge on their uniform or even a differently coloured uniform. Over time, a separate Police Unit may be constituted in each Police Sub Division and complete with a separate building and impressively designed Child Friendly Vehicles.

SPECIAL JUVENILE POLICE OFFICERS AND SPECIAL JUVENILE POLICE UNIT

It is suggested that Special Juvenile Police Officers and Special Juvenile Police Units may deal with juvenile delinquency and Children in Conflict with Law and not with child victims. As noted above, Child victims shall be dealt with by Child Welfare Police Officers and Child Welfare Police Units. However, it should be made abundantly clear that Children in Conflict with Law are also Children who needs care and protection; the objective of law as enunciated clearly in Juvenile Justice (Care &Protection) Act, 2015 is not to punish children them but to care for them empathetically and reform them into productive individuals.

The objective if the functional differentiation should not be to castigate the children in conflict with law in any manner but to

1. Care for them more effectively and adhere to the special provisions for them (for example, Police can and should give bail to any child involved in any offence irrespective of they being bailable or non bailable, except for the benefit of the child, and need not produce her or him before the Juvenile Justice Board for giving bail) more punctiliously.
2. Act pro actively to prevent juvenile delinquency including acting firmly on those criminal elements who induct children into crimes, misusing their mental and physical vulnerability

The following Functions, Duties and Responsibilities may be defined for them for enhancing their roles as per the changing environment with regard to children of our country and for the sake of clarity of their existing mandate.

Functions

1. Study the scenario with regard to juvenile delinquency in her or his Area of Responsibility
2. Undertake measures to prevent and reduce juvenile delinquency; coordinate with other agencies in efforts in this regard.

3. Apprehend, secure and bail out/ produce before Juvenile Justice Board juvenile offenders.
4. Enquire into cases of juvenile crimes registered.
5. Maintain active coordination with the Observation Homes in the Area of Responsibility or catering to the Area of Responsibility.
6. Facilitate juvenile delinquents' Right to Fresh Start

Duties

1. Collect details of juvenile crimes in her or his Area of Responsibility and adjacent Area of Responsibility in the previous years, at least previous five years and study patterns if any. Emphasis should be given to areas or situations or gangs that predispose or encourage juveniles to commit crimes.
2. Collect and maintain a data bank of all agencies and agents working for the prevention of juvenile delinquency and the general welfare of juvenile delinquents.
3. Act upon agents and entities and situations that predisposes juvenile to commit crimes. Collect, update and maintain a data bank of persons/ outlets selling in tobacco, drugs, obscene materials (including electronic resources) to children and come down heavily on such actors.
4. Actively liaise with Educational Institutions to gather information on agents that invite/ encourage children to commit crimes.
5. Try to understand the wider social settings if any that might predispose juveniles to take up crime such as family disorganisation, parental conflict, social disorganisation, insurgency, smuggling rackets, etc.
6. Acquire and constantly update knowledge, skills and attitudes that would help her or him to serve children better.

Responsibilities

1. Apprehend juveniles involved in offences fully understanding the objective of such apprehension. Juvenile Justice Act makes it clear

that the objective of apprehending juvenile offenders is not to punish them but to keep them away from bad influences and reform them. Hence, it shall be ensured that no physical or emotional measures are employed on the juvenile apprehended, neither by the Juvenile Police Officer or anyone from Police, to threaten or extract information. Further, it shall be ensured that Police Uniform is not worn during occasions when a juvenile is being engaged.

2. Ensure that all juveniles apprehended are bailed out from Police Station itself except in cases a) where it is felt that bailing out the juvenile will be harmful to him or her, b) cases of extreme grievous nature.

3. Conduct thorough and timely investigation to cases registered where a juvenile is the offender

4. Details of juvenile offenders are kept with extreme secrecy so that her or his right to Fresh Start is safeguarded meticulously.

5. Submit periodic returns to Superintendent of Police through proper channels on the monthly activities of the Officer (a model format is given in Appendix-4)

APPENDIX 1

PROACTIVE MEASURES TO BE INITIATED BY CHILD WELFARE POLICE OFFICERS AND CHILD WELFARE POLICE UNITS

NEIGHBOURHOODS

1 Patrol neighbourhoods and watch out for unprotected pits, wells, ponds or water bodies that might pose a threat to the safety of children passing by.

2 Watch out for shops or persons dealing in articles unsuitable for children in places accessible to children.

CONVEYANCE

Monitor School buses or other vehicles carrying children for safety considerations.

1 Ensure there is/are no overloading, unsecured doors/openings.
2 Ensure drivers and handymen are properly vetted by schools

SCHOOL/ EDUCATIONAL INSTITUTIONS

1 Monitor adherence to proper building code
2 Look out for sale of pan/ tobacco or other illegal items around educational institutions.
3 Watch out for corporal punishment, super heavy bags, ragging, bullying etc.

CHILDCARE INSTITUTIONS, HOSTELS

1 Ensure no unauthorised Childcare Institutions are functioning and that the authorised ones adhere to set standards(See Appendix 2 for details)
2 Ensure Hostels lodging children are registered with authorities and they adhere to set standards.

SHOPS, MARKETS, INDUSTRIES, RESIDENTIAL AREAS, PUBLICSPACES

1 Ensure that children are not employed for child labour.
2 Watch out for children being trafficked, traffickers posing as parents at Railway Stations, Bus Stations, Check posts etc.
3 Watch out for trafficked children in known Red Light Areas.

APPENDIX 2

PROACTIVE DUTIES OF CHILD WELFARE POLICE OFFICERS IN ENSURING CARE FOR CHILDREN BY CHILD CARE INSTITUTIONS (CCIS)

REGISTRATION, FUNDING

1   Ensure the Childcare Institution is registered with the authorities.
2   Know the funding sources of the Childcare Institution and ensure that there is no pilferage. Also ensure that photoes of children are not used for soliciting funds.

INMATES.

1   Ensure family of all the children are traced and they have access to their children
2   Ensure details of all children whose families are still untraced are uploaded in the track the missing child portal

MANAGEMENT AND STAFF

1   Ensure that the Childcare Institution has sufficient no of care takers and that all the staff are qualified and that all the personnel having access to children (such as driver of school bus, cook) are properly vetted by the management for their character and suitability.
2   Ensure no unauthorised person has access to children staying in the Childcare Institution

BASIC NEEDS -FOOD, SHELTER, CLOTHS, EDUCATION, MEDICAL CARE

1   Ensure the building is safe (especially for fire safety), and secure (access, exit control).
2   Ensure children get sufficient food, cloths.
3   Ensure children are sent to school and are provided with medical care when required.

ACCESS TO CHILD WELFARE COMMITTEE AND GRIEVANCE REDRESSAL

1. Ensure inmates of the Childcare Institution has sufficient avenues for grievance redressal and access to Child Welfare Committee.

Appendix 3

monthly return by the child welfare police officer(CWPO) of each police station to the district superintendent of police/deputy commissioner of police

1	NAME OF THE POLICE STATION	
2	NAME AND CONTACT DETAILS OF THE CHILD WELFARE POLICE OFFICER	
3	APPROXIMATE SIZE OF CHILD POPULATION UNDER THE AREA OF RESPONSIBILITY	
4	NUMBER OF SCHOOLS	
5	NUMBER OF SCHOOLS WITH AN INFORMATION/COMPLAINT BOX	
6	NUMBER OF INFORMATION/COMPLAINTS RECEIVED IN THE BOXES	
7	NO OF CHILDCARE INSTITUTIONS IN THE AREA	
8	TOTAL NO OF CHILDREN SHELTERED INCHILDCARE INSTITUTIONS IN THE AREA, AS ON THE LAST DAY OF THE MONTH	
9	NO OF CHILDREN WHOSE DETAILS ARE NOT UPLOADED BY THE CHILDCARE INSTITUTION TO THE TRACKTHEMISSINGCHILD.GOV.IN PORTAL ACTION INITIATED AGAINST	

monthly return by the child welfare police officer(CWPO) of each police station to the district superintendent of police/deputy commissioner of police

	THE CHILDCARE INSTITUTION IN THIS REGARD	
10	CURRENT CUMULATIVE NUMBER OF UNTRACED CHILDREN WHO ARE MISSING FROM THE AREA	
11	IS THE TRACKTHEMISSINGCHILD.GOV.IN ACCESSIBLE TO THE CHILD WELFARE POLICE OFFICER;	
12	TOTAL NO OF CHILDREN IN CONFLICT WITH LAW APPREHENDED BY THE POLICE STATION DURING THE MONTH NUMBER OF CHILDREN BAILED OUT FROM THE POLICE STATION REASON(S) FOR NOT GIVING BAIL FROM THE POLICE STATION IN CASE OF SUCH INSTANCES	
13	TOTAL NO OF CHILDREN IN THE OBSERVATION HOMES, SPECIAL HOMES AND PLACE OF SAFETY IN THE AREA	
14	NAME AND CONTACT DETAILS OF THE DISTRICT CHILD PROTECTION OFFICER	

monthly return by the child welfare police officer(CWPO) of each police station to the district superintendent of police/deputy commissioner of police

15	NAME AND CONTACT DETAILS OF THE CHAIRPERSON OF CHILD WELFARE COMMITTEE (CWC)	
16	NAME AND CONTACT DETAILS OF CWC MEMBER 2	
17	NAME AND CONTACT DETAILS OF CWC MEMBER 3	
18	NAME AND CONTACT DETAILS OF CWC MEMBER 4	
19	NAME AND CONTACT DETAILS OF CWC MEMBER 5	
20	NAME AND CONTACT DETAILS OF THE PRINCIPAL MAGISTRATE OF JUVENILE JUSTICE BOARD (JJB)	
21	NAME AND CONTACT DETAILS OF JJB MEMBER 2	
22	NAME AND CONTACT DETAILS OF JJB MEMBER 3	
23	NAME AND CONTACT DETAILS OF DIRECTOR, CHILDLINE IN THE AREA	
24	NAME AND CONTACT DETAILS OF DISTRICT PROBATION OFFICER	
		MISSING CHILDREN-NUMBER OF MISSINGCHILDRENREPORTED AND NUMBER OF CHILDREN

monthly return by the child welfare police officer(CWPO) of each police station to the district superintendent of police/deputy commissioner of police

		RESCUED OUT OF THEM: NUMBER OF MISSING CHILDREN REPORTED TO THE POLICE STATION FOR THE MONTH WHOSE DETAILS HAVE BEEN UPLOADED ONTO THE TRACKTHEMISSINGCHILD.GOV.IN PORTAL NUMBER OF CASES REGISTERED WHERE A CHILD IS THE VICTIM: NUMBER OF CASES UNDER THE PROTECTION OF CHILDREN AGAINST SEXUAL OFFENCES ACT, 2012 REGISTERED:
25	DETAILS OF ACTIVITIES CARRIED OUT THE CHILD WELFARE POLICE OFFICER DURING THE MONTH	NUMBER OF CHILD LABOUR CASES REGISTERED: NUMBER OF CHILD TRAFFICKING CASES REGISTERED: NUMBER OF CHILD MARRIAGE CASES REGISTERED:

monthly return by the child welfare police officer(CWPO) of each police station to the district superintendent of police/deputy commissioner of police

		NUMBER OF CASES REGISTERED UNDER CHAPTER IX – OTHER OFFENCES AGAINST CHILDREN OF THE JUVENILE JUSTICE (CARE AND PROTECTION OF CHILDREN) ACT, 2015: TOTAL NUMBER OF CHILDREN IN NEED OF CARE AND PROTECTION REPORTED TO POLICE: NUMBER OF CHILDREN IN NEED OF CARE AND PROTECTION REPORTED DURING THE MONTH WHOSE PARENTS HAVE BEEN IDENTIFIED:
25	DETAILS OF ACTIVITIES CARRIED OUT THE CHILD WELFARE POLICE OFFICER DURING THE MONTH (CONT..)	NUMBER OF CHILDREN IN NEED OF CARE AND PROTECTION IDENTIFIED PROACTIVELY AND HANDED OVER TO CHILD WELFARE COMMITTEE: NUMBER OF CHILDCARE INSTITUTIONS VISITED:

monthly return by the child welfare police officer(CWPO) of each police station to the district superintendent of police/deputy commissioner of police

		NUMBER OF SCHOOLS VISITED:
		ANY SIGNIFICANT ACTIVITY UNDERTAKEN OR POINTS NOTED DURING VISIT TO NEIGHBOURHOODS, MARKETS, PUBLIC PLACES, VEHICLE CHECKING ETC.
		SIGNIFICANT DETAILS IF ANY OF SURVEILLANCE MOUNTED / INTELLIGENCE COLLECTED ON PERSONS/ GANGS PREYING ON CHILDREN:
		ANY SIGNIFICANT INFORMATION OBTAINED REGARDING PILFERAGE/ CORRUPTION IN THE WORKING OF GOVT. SCHEMES FOR CHILD:

monthly return by the child welfare police officer(CWPO) of each police station to the district superintendent of police/deputy commissioner of police

25	DETAILS OF ACTIVITIES CARRIED OUT THE CHILD WELFARE POLICE OFFICER DURING THE MONTH (CONT..)	NON-COMPLIANCE OF GOVT. ORDERS WITH REGARD TO SAFETY OF CHILDREN NOTED IF ANY: OTHER RELEVANT ACTIVITIES:

Appendix 4

monthly return by the Special juvenile police unit to the district superintendent of police/deputy commissioner of police

1	NAME OF HEAD OF THE UNIT	
2	NAME AND CONTACT DETAILS OF THE PRINCIPAL MAGISTRATE OF JUVENILE JUSTICE BOARD (JJB)	
3	NAME AND CONTACT DETAILS OF JJB MEMBER 2	

monthly return by the Special juvenile police unit to the district superintendent of police/deputy commissioner of police

4	NAME AND CONTACT DETAILS OF JJB MEMBER 3	
5	NAME AND CONTACT DETAILS OF DISTRICT PROBATION OFFICER	
6	DETAILS OF OBSERVATION HOME	LOCATION, ADDRESS: CONTACT NUMBER:
7	DETAILS OF SPECIAL HOME	LOCATION, ADDRESS: CONTACT NUMBER:
	DETAILS OF THE PLACE OF SAFETY	LOCATION, ADDRESS: CONTACT NUMBER:

monthly return by the Special juvenile police unit to the district superintendent of police/deputy commissioner of police

9	MAJOR REASONS OF JUVENILE DELINQUENCY IN THE DISTRICT OBSERVED DURING THE MONTH	
10	DETAILS OF MEASURES UNDERTAKEN TO PREVENT AND REDUCE JUVENILE DELINQUENCY IN THE DISTRICT/ZONE	1. 2. 3.
11	DETAILS OF SURVEILLANCE/ INTELLIGENCE COLLECTION WITH REGARD TO FACTORS PREDISPOSING TO JUVENILE DELINQUENCY	
12	NO. OF CASES REGISTERED WHERE A CHILD IN CONFLICTS WITH LAW	
13	NO. OF CASES REGISTERED WHERE A CHILD IN THE AGE GROUP 16-18 YEARS IS IN CONFLICT WITH LAW	

monthly return by the Special juvenile police unit to the district superintendent of police/deputy commissioner of police

14	TOTAL NO OF CHILDREN IN CONFLICT WITH LAW APPREHENDED BY THE POLICE STATION DURING THE MONTH	
15	NUMBER OF CHILDREN BAILED OUT FROM THE POLICE STATION REASON(S) FOR NOT GIVING BAIL FROM THE POLICE STATION IN CASE OF SUCH INSTANCES	
16	DETAILS OF SUPERVISORY /REVIEW MEETING HELD WITH THE CHILD WELFARE POLICE OFFICERS DURING THE MONTH	

Author's Profile

K.P.A. Ilyas.
IPS officer of the 2011 Batch (Nagaland Cadre), currently faculty at the Sardar Vallabhbhai Patel National Police Academy, Hyderabad.

Book Review:

After The Fact: The Art of Historical Detection

Vol ii, Third Edition
By James West Davidson and Mark Hamilton Lytle

Naazneen Bhasin, IPS*

I tentatively extracted this book from a pile donated to our Training Centre library. The cover bespoke an era even before Sherlock Holmes. I was excited: I was going to discover a new detective and unearth an unknown piece of sublime crime fiction. As I ran the pages through my fingers, I felt, with increasing dismay that this is going to be a wordy, complicated and pedantic tome. But once I got to reading the Introduction, I was completely drawn in. The authors, seemingly historians, speak more in the line of contemplative philosophers.

"Perhaps if lay readers and students understood better how historians go about their work-how they examine evidence, how they pose questions, and how they reach answers-history would engage them as it does us." Thus, muse the authors. And if the central objective of this book seems to hold relevance only for truth seekers within the strict confines of the subject of History, its only because investigators and cops didn't yet read chapter two.

In it, the authors tell us about Silas Deane, an ordinary, prosperous merchant who later, as opportunity afforded, rose to some eminence in

* *DIG, Recruit Training Centre, Bhondsi, Haryana.*

London politics. He was thought to have committed suicide. Reasons unknown. Enter the authors with their set of tools for historical detection and Silas's death by suicide is no longer an undisputed fact. One could forgivably argue that the authors have 'plugged in', a common mathematical trick whereby we arrive at the inference by plugging in data to a set of equations rather than solving to arrive at the correct equation itself. Therefore, the first few accounts seemed a trifle contrived, designed to create a mystery, where there may be none to begin with. But get in deeper, and it all does become rather strange. Without a clear motive for suicide and the access to poison of a man with a motive, how indeed did Silas die? It is at this point that the reader thanks the lord for that wonderful tool of our times known as: chemical forensic analysis. The reader will also get a peek into the art of logic and deduction to narrow down the possibilities

Move to Chapter seven, and one wonders if there are any further insights to be gained relevant to the scope of this journal. Chapter seven takes us to the freeing of the slaves by the Americans in 1861. It drives a groove in the soul. An old Georgiacouple greet the Sherman soldiers with an apparent lack of interest. As the soldiers prepare to leave since there doesn't seem to be anyone here who needs to be liberated, the old lady speaks to her husband with vehemence:"what you sit dar for? You s'pose I wait sixty years for nutten? Don't yer see the door open? I not stay. Yes, anudder day I goes 'long with dese ; yes, sar, I walks till I drop in my tracks." For anyone placed in the delivery chain of justice, chapter seven will feel very relevant.

Chapter eight: Jacob Riis suffers the humiliations of poverty and the horrific conditions of the immigrantslum cluster. Finally, he is reduced to begging crumbs outside police lodging houses. Perhaps the only thing that prevents him from suicide is a felicity of language and a crushing sadness for his fellow beings. He lands a job as a crime reporter and relentlessly publishes expose after expose on wretched slum conditions. However, no vivid account could shock the authorities into action. Riis quits and devotes himself to writing *How The Other Half Lives*, a book

liberally peppered with telling photographs (the camera had just arrived). Historians believe that before Riis there was no broad understanding of urban poverty that could lead to political action. This narration galvanizes the reader into shaping the sensibilities of our young police recruits, many of whom are courageous, sensitive persons. If for these few chapters alone, this book is a must-read.

The next few pages are pure gold as we dive into the examination of historical films in the context of war heroism, models of decision-making against the backdrop of the dropping of the atom bomb and the infamous Sacco and Vanzetti trials. Sacco and Vanzetti, both men, ostensibly, poor immigrant Italians, living on the fringes in New York were charged for sensational murder and robbery, and eventually sentenced to die. Their case became an international cause celebre in the early 1920s, a feeding frenzy for the media, criminal lawyers, spokespersons, legal experts and prominent leaders from all walks. The prosecution presented the murder weapon, a confirmed ballistics report and eye witnesses. Yet the unprecedented uproar, that too in an era where accused persons had yet no rights. A racy and gripping account, that eventually soars—to raise questions of divisiveness, equality, freedom and human rights. Questions that we can only answer for ourselves.

Author's Profile

Sh.Naazneen Bhasin, IPS 2007 Batch, DIG, Recruit Training Centre, Bhondsi, Haryana. E-mail:naazneenbhasin@gmail.com