Project
On

M-CCTNS
MOBILE PLATFORM
FOR
SMART POLICING

Prepared

By

National Police Mission

Micro Mission: 05
New Processes (Process Re-engineering)

M-CCTNS

MOBILE PLATFORM FOR SMART POLICING

CONCEPT PAPER, IMPLEMENTATION DETAILS & IMPACT ANALYSIS

1. Project Identification

1.1 **Title:** Mobile - CCTNS

1.2 **Submitted by: Shri** Santosh Babu K, IPS (KN:11)

1.3 **Date of Compliance :** 20.03.2023

Contents

2. Introduction

In this digital era, technology is ever-evolving and is becoming powerful and useful day by day. After only about a decade, smartphone technology is so successful that it has become a powerful portable computer in everyone's hand. Besides making phone calls, nearly all smartphones today have capabilities to process data, connect to devices, natively provide directions through GPS, take pictures, communicate data over the internet securely and much more. Through the invention of apps, the list of possible smartphone uses multiplied by tens of thousands and grows longer every day.

Modern-day criminal activities are giving rise to the demand for the modernization of the Police Force through **Smart Policing**. **'M-CCTNS'** is a mobile-first solution that contributes to the techniques, technologies and methods which is a step towards adopting the next generation of policing by using Information and Communication Technology and Smart Mobility to increase the efficiency of operations. MCCTNS consists of **Mobile Application** for Officers on the ground and a **Web Application Backend** for Senior Officers to view Crime Analytics and Geographic Analysis of Crimes. System Administrators can make use of the admin dashboard to manage and control the application.

Wherever applicable, the MCCTNS Mobile App backend accesses the data from the CCTNS database through APIs.

3. MCCTNS Modules

Below are the modules of MCCTNS:

1. Crime Mapping and Analysis Module
2. Person of Interest Module (Criminal DB)
3. Fingerprint Identification Client Module
4. Crime Involved Vehicle Search Module
5. Arrest Coordination Module
6. UDR and Missing Persons Module
7. Resource Library Module
8. Face Recognition Client Module

3.1 Crime Mapping and Analysis Module

The crime Mapping and Analysis module provides a smart and efficient way for the officers to perform Crime Mapping directly from the spot of crime. This helps in populating crime activities database mapped with jurisdiction and exact GPS location of the crime. Police departments will get a bird's eye view of crime hotspots.

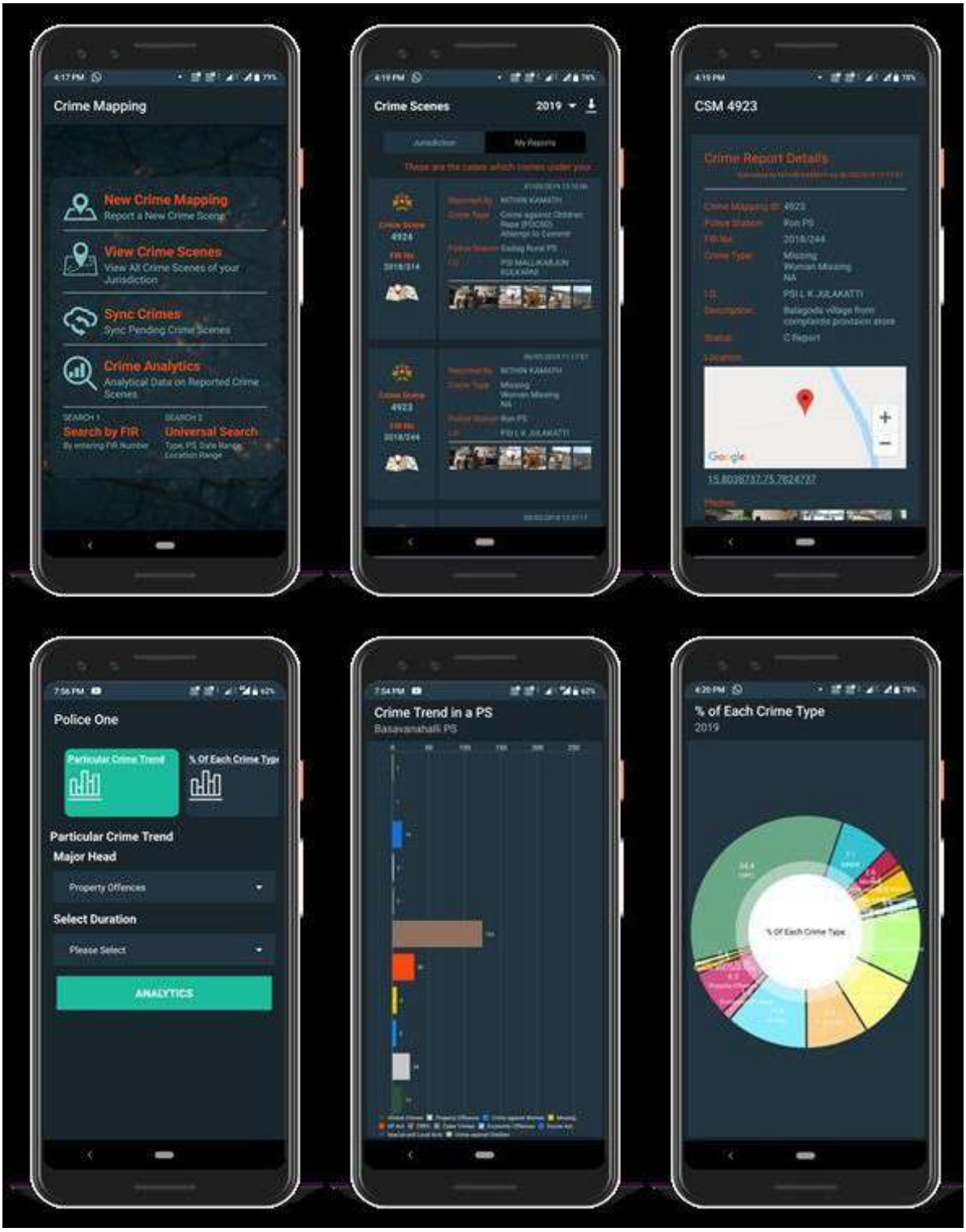
This module enables officers to map, visualize, and analyze crime incident patterns. An Officer or his representative visiting the Crime Scene submits a Crime Report from the exact location of the crime using the app. The crime report is submitted to the centralized server. The report contains the exact date and time, Latitude - Longitude, Crime Type, I.O Name and Crime Scene photos. Once all the crime scene reports start accumulating in the server, these data can be used for instant analysis and monitoring purposes on the ground using the app.

Using the app, officers can also search and view the details of all the crimes reported in their respective jurisdictions. They can also perform various in-app analyses, search nearby crime scenes and generate graphical representations of the crime reports which can be interpreted accordingly and acted upon.

Crime mapping and analysis help Police Department to make better decisions, target resources and formulate strategies. This gives officers the ability to share actionable intelligence across jurisdictions, helps in Geographic Profiling of crimes and Predictive Policing by analyzing patterns and trends which is vital in taking further steps in crime prevention.

Key Points

- App-based crime mapping and analytics
- Various in-app Crime Analytics are accessible anytime during the investigation. Desktop web application for advanced geographic analysis and graphical representation of statistics about crimes based on various criteria
- Instant Search of Crime Reports based on crime type, date range, location range, Police Station and FIR number
- Offline storage and synchronization of crime mapping reports in case the internet is not available at the crime location
- Case Status reminders for investigating officers. Disposal reminders, Status reminders about reported cases
- Identify Crime Black Spots, Accident black spots, vulnerable areas easily over the map
- Instant Push Notifications to Officers along with a picture
-


Crime Mapping
New Crime Mapping
Report a New Crime Scene
View Crime Scenes
View All Crime Scenes of your Jurisdiction
Sync Crimes
Sync Pending Crime Scenes
Crime Analytics
Analytical Data on Reported Crime Scenes
Search by FIR
Universal Search
Crime Scenes
2019
CSM 4923
Crime Report Details
Police One
Particular Crime Trend
% Of Each Crime Type
Particular Crime Trend
Major Head
Property Offences
Select Duration
Please Select
ANALYTICS
Crime Trend in a PS
Basavanahalli PS
% of Each Crime Type
2019

3.2 Person of Interest Module

The person of Interest module provides smartphone-based access to the criminal database anytime, anywhere. The Criminal Data in app can be accessed based on various categories like HBT offenders, Local, Non-Local, Rowdy Sheeters, History Sheeters and My Watchlist. The complete criminal profile of a person with a photo, along with a Case History can be accessed from the app. The same criminal database module of the app can be integrated with Fingerprint and Face Recognition modules if implemented in future.

At any point of time, the officer can search a person by name, alias, address/place, father's name, category etc., The application is also spelling agnostic and can perform a search even if there are any considerable changes in the spelling of name entered by the user.

This instant dissemination of information for officers on the ground will increase their productivity and also helps in apprehending criminals in a much faster way.

Key Points

- App-based criminal database access and search
- Criminal data is categorized based on various categories in the app
- The option to display a complete criminal profile along with a photo will be available in-app.
- Access to criminal history, case details, court case and prison details
- Option to add any person to the officer's watchlist to get notifications when apprehended or identified

3.3 Fingerprint Identification Module

This module helps to instantly perform fingerprint identification of any person to check whether a person’s fingerprint is present in a criminal database. The module acts as the mobile app client for the Automatic Fingerprint Identification System of the Fingerprint Bureau. Portable Fingerprint Scanners are provided to the officers, the app will communicate with the portable fingerprint scanner connected to the mobile phone and provides an interface to scan the fingerprint of the person being checked.

The app will communicate the scanned fingerprint to the Automatic Fingerprint Identification System and gets the result instantly. The fingerprint result will be linked to the criminal profile present in the Person of Interest module and instantly displays the result on the officer's phone.

The portable fingerprint identification solution helps officers to verify whether the person has any criminal background anytime, anywhere. The results of fingerprint identification will be displayed on the officer's phone instantly. This instant solution helps officers on the ground to save a lot of time and effort which helps to speed up the identification and verification process.

Key Points

- App-based fingerprint identification feature for police officers
- Check whether the person has any criminal history
- Instant fingerprint identification results in the mobile phone
- Complete criminal profile along with the photo will be available in app
- Crime history, case details, court details will be available with fingerprint results

3.4 Crime Involved Vehicle Search Module

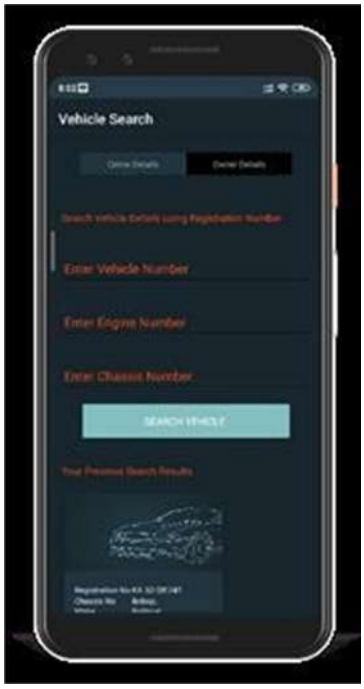
Crime Involved Vehicle Search module enables officers to instantly check the details of a particular vehicle if it is involved in any previous crime. Officer enters the vehicle registration number of the suspected vehicle in the app and he instantly gets the result which contains the case details if any on that particular vehicle. Stolen, Recovered, Crime Involved, Abandoned etc., can be the categories.

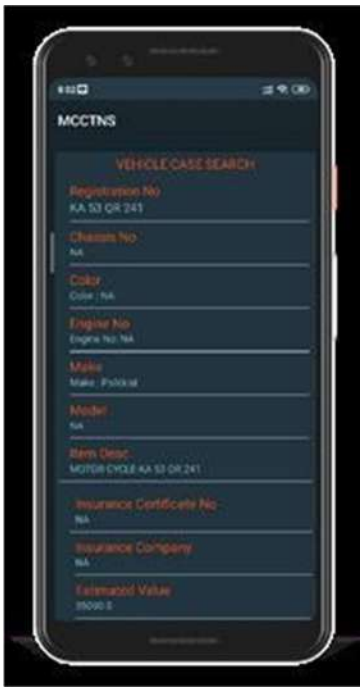
This helps the officer to speed up the investigation process as the officer will get the required information instantly in time.

In this module, the app will communicate with the CCTNS APIs to fetch the crime involved vehicle details.

Key Points

- App-based vehicle details search feature for Police Officers
- Instant Search results of crime involved vehicles will be available in the app within seconds
- Speeds up the investigation process





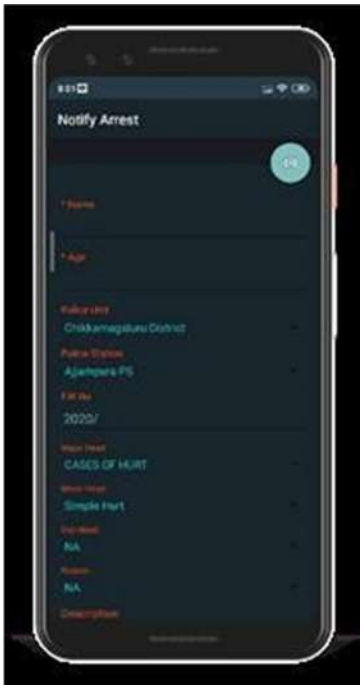
3.5 Arrest Coordination Module

The arrest coordination module helps officers to coordinate and communicate details of arrested persons. Whenever a criminal is arrested in any of the police stations, the officer notifies the arrest using the app. As soon as the officer notifies the arrest, all other officers will get an instant notification on their phone along with the photo of the arrested person and the crime details for which he is arrested. If the arrested person is wanted in some case by the recipient officer, they can coordinate with each other and proceed with the investigation.

This instant dissemination of arrest information solves the problem of missing coordination between the jurisdictions when a criminal is wanted in multiple cases and multiple jurisdictions.

Key Points

- App-based arrest coordination feature for Police Officers
- Instant cloud-based push notifications in the app about arrested persons
- Improves coordination
- Speeds up the investigation process



3.6 UDR and Missing Persons Module

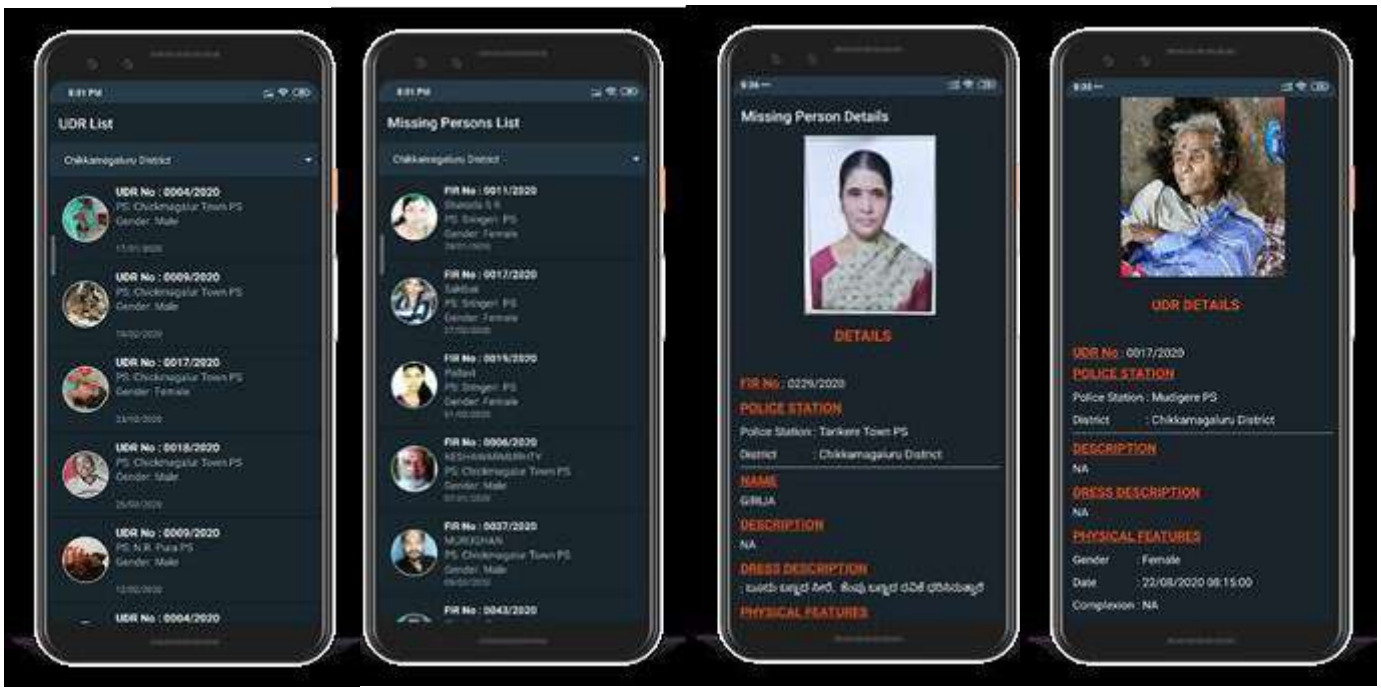
This module helps officers access, search and notify UDR and Missing persons through the app. All officers can access UDR and Missing person databases across jurisdictions on their phones themselves. All the concerned officers will get push notifications with photos and details of the person when any UDR or missing person case is registered. Officers can also search the database based on various parameters and can perform cross-search between UDR cases and Missing Person Cases by selecting physical features/appearances of the person.

This instant dissemination of UDR and Missing Persons information helps the officer to solve the corresponding cases faster and the instant access to the database on the phone keeps officers well informed about such cases in their vicinity.

The module will be integrated with CCTNS through APIs and linked to the cloud-based push notifications module of MCCTNS to notify the officers.

Key Points

- Instant access to UDR and Missing person data using the app
- Various Search features for Police Officers to search cases
- Cross-search functionality between Missing and UDR cases
- Cloud-based push notifications about Missing Persons and UDR cases
- Speeds up the investigation process and assists in solving Missing and UDR cases
- Improves coordination between jurisdictions



3.7 Resource Library Module

This module consists of a wide variety of resource materials useful for Police Officers which come in handy whenever required. All these materials are integrated into one comprehensive section for easy access.

- Around 180 important Acts and Sections
- Court Judgments
- Circulars
- Police Manuals
- Standing Orders
- Standard Operating Procedures (SOPs)

Various other important resources essential for the efficient operation of Police Officers can be accessed even without an internet connection. All acts and sections can be searched based on any keywords. All the resources are updatable at any point of time. Admin can put any new content like Circulars, Standing Orders etc.,

3.8 Face Recognition App Client Module

This module helps to perform face recognition of any person to check whether a person is present in criminal database.

The application is developed to consume the API of any existing Face Recognition Systems which provides REST APIs. The Application does not provide face recognition functionality inherently. The APIs must be provided by existing Face Recognition Solution providers of projects like Smart City or Safe City.

The face recognition solution helps officers to verify whether the person has any criminal background anytime, anywhere. The results of face recognition will be displayed in the officer's phone instantly. This instant solution helps officer on ground to save a lot of time and efforts which helps to speed up the identification and verification process.

Key Points

- App based Face Recognition feature for police officers
- Check whether the person has any criminal history
- Instant Face Recognition results in the mobile phone
- Complete criminal profile along with photo will be available in app
- Crime history, case details, court details will be available

4. Major Components of the System

There are three major components of the Solution:

1. MCCTNS Server
2. Web Application along with Mobile App backend
3. Android Mobile App

4.1 MCCTNS Server

The MCCTNS Server will be located in the Data Center that the department identifies. The server hosts the Web Application Software along with the Mobile App Backend. The Server with recommended specifications should be deployed in the data center.

The MCCTNS Server also interacts with the CCTNS server through REST APIs whenever it needs to access data from CCTNS.

4.2 Web Application Software & Mobile App Backend

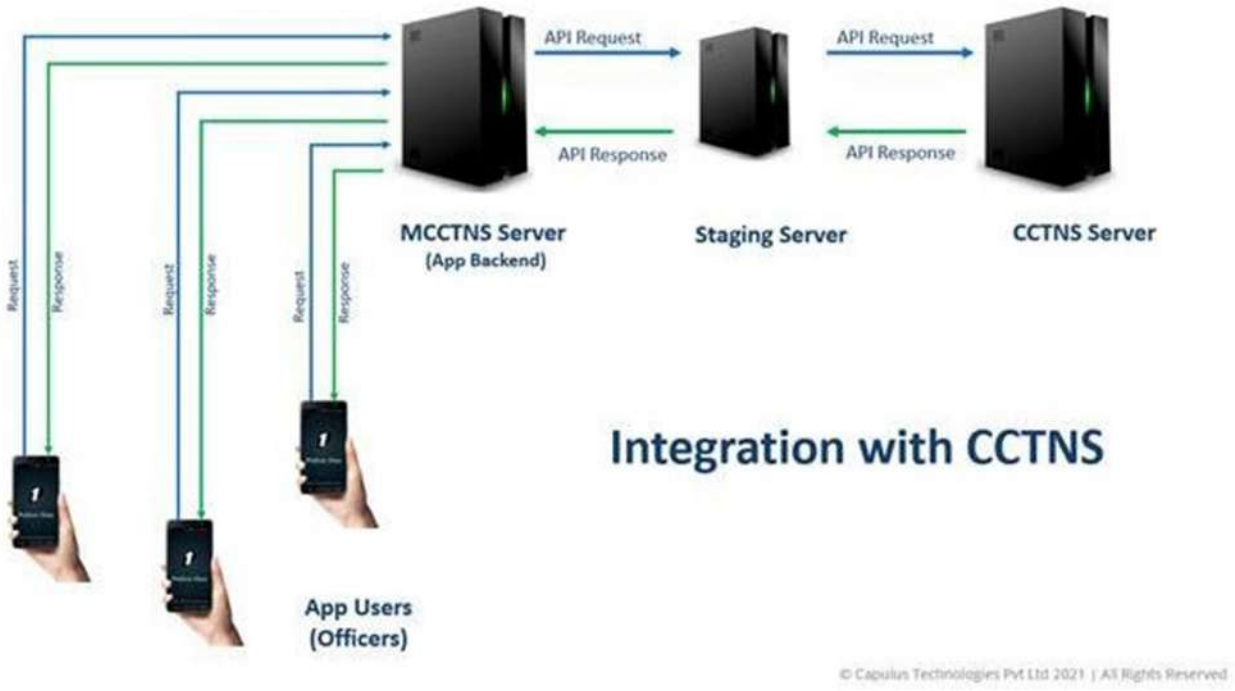
The Web Application Software can be accessed through any desktop computer using a web browser by entering a URL. It provides access to several admin features. Only authorized staff will be able to log in to the web application using their Government ID and Mobile Number.

The Mobile App backend provides all the data needed by the MCCTNS App through the APIs and also interacts with third party services like cloud-based push notifications, SMS gateways etc.,

4.3 Android Mobile App

Only pre-registered or authorized users/officers will be able to log in to the app using their Government ID and Mobile Number. The mobile application communicates with the MCCTNS server to facilitate all features.

5. Proposed Integration Architecture with CCTNS



- MCCTNS mobile app communicates with the app-backend deployed in MCCTNS Server.
- The MCCTNS backend in turn interacts with CCTNS Server through APIs, with a staging server in between. The staging server has the scheduled data dumps from the live CCTNS database.
- The app authentication and access restrictions are taken care of by the MCCTNS backend
- The app backend communicates with APIs exposed by CCTNS for fetching data.
- The app backend also exposes APIs to be consumed by Mobile App and CCTNS (if required)
- The MCCTNS Server also hosts a web application that provides a front-end interface for admin features, user management and several analytics and visualization features.

6. Security

Security is one of the important aspects of a Software System. There are three major areas of consideration in this system. Application Security, Network Security and Server Security.
The security of the proposed application is considered at most important and security compliance is according to OWASP Top 10.

The application has been VAPT Security Audited by multiple CERT-IN empanelled vendors and Security Clearance has been issued for the application.

6.1 App Security

All necessary measures are taken during application development to prevent data theft. Through role-based access features, only authorized users with proper roles are allowed to view the data in the application.
The security considerations include anti-injection, authentication, prevention of sensitive data exposure, access control, security configuration, blocking cross-site scripting, preventing insecure deserialization, preventing usage of components with known vulnerabilities, sufficient logging and monitoring.

The app will not be published to the public and can only be accessed by officers with CUG numbers assigned by the department and Government ID.

The app access is provided if all the following criteria are fulfilled:

- Government ID
- CUG/Official Mobile Number verification using OTP
- The mobile device is also mapped using the IMEI Number on first use so that a user can access the app using only one device.

6.2 Network Security

The communication between the application(client) and the server takes place over a secure SSL line with proper HTTPS Certificates and the data is encrypted during transmission, thereby providing security against man in the middle attacks.

6.3 Server Security

Necessary steps will be taken on the server end to prevent all forms of attacks. Regular updates of anti-virus and anti-malware, regular updates and patches to the operating system and software platforms and making sure the latest software versions are used.

* If required, A third-party Security Audit of the application can be performed by any CERT-IN empanelled vendors before Go-Live.

7. Implementation Details

Initiated in Chikmagalur District of Karnataka in 2016 as **Police One** with Crime Mapping and Person of Interest Module when I was SP Chikmagalur.

Police One was deployed in Gadag District of Karnataka in 2016 and was Officially Launched in 2017 with several other modules when I was SP Gadag.

The Application was upgraded to state-level implementation along with CCTNS integration. The application was named **M-CCTNS.** It was in Pilot Stage for one year from 2020 to 2021 and was launched in February 2021 by the Chief Minister of Karnataka.

BangaloreMirror
MUMBAI MIRROR | AHMEDABAD MIRROR | PUNE MIRROR

KARNATAKA: SMART POLICING INITIATIVE LAUNCHED IN GADAG DIST

By Deepthi Sanjiv, Bangalore Mirror Bureau | Updated: Oct 9, 2017, 04.00 AM IST

Police One initiative was launched by IGP Ramachandra Rao in Gadag

Police One, which has a mobile and a web application, will modernise policing

The Gadag district police have launched a mobile application called 'Police One'. Brainchild of Gadag Superintendent of Police (SP) Santosh Babu, the app for police officers was launched by Inspector General of Police (IGP) Northern Range Ramachandra Rao on Wednesday.

Speaking to Bangalore Mirror, SP Santosh Babu said this is an initiative towards smart policing. "Modern day criminal activities have given rise to the demand of police modernisation. Police One contributes the techniques, technologies and methods which is a step towards adopting to the next generation of policing," Santosh Babu said.

"I started working on it when I was the SP in Chikkamagaluru. It has been developed by Capulus Technologies and we have tested it for a year. It will be upgraded with a few more features and is for the internal use by the department," he said.

Police One is a comprehensive software system which helps in various aspects of policing by using Information and Communication Technology to increase efficiency of operations. The software system consists of mobile application for police officers and a desktop web application for senior officers. The mobile application will be installed in the mobile phones of all officers including constables and the web application acts as controlling back-end as well as viewing and analysing platform for senior officers.

Crime scene mapping gets a modern touch with the app.

"Henceforth, an officer visiting the crime scene can use his mobile phone and submit a crime report from the exact location of the crime using the app. The crime report is submitted to the centralised server. The feature has been developed in such a way that it is fast, simple and efficient. The option displays the crime reports with all the details. The various search options such as FIR number, date range, crime type, location, range and so on makes it easy to search the crime scene within seconds," Santosh Babu said.

In addition, the application can perform various analysis and graphical representation of crime reports which can be interpreted accordingly and acted upon. The app also acts like a library. Resource material including 180 important Acts and Section, Supreme Court judgments, KAR police manual, Standing Orders, circulars, Standing Operating Procedures have all been included.

The app also features a section called 'Person of Interest'. Under this, details of all MOBs, rowdy sheeters and history sheeters of the district and their details are easily accessible and searchable. At any point, an officer can access the data base. They have also collected the fingerprints and in case of doubts or person found under suspicion, an officer on spot can scan the fingerprint to check if the suspect has previous records. While data for this page is being compiled, it also has a section called photo comparator, where an officer can compare photos of criminals with pre-selected photo or even show the photos to the person who is brought to identify the suspect.

"Senior officers like the SP can get the crime overview of whole district. Various analysis reports on crimes can be generated and exported. Graphs and statistics make it easy to analyse crime trends through the web app for monitoring and analysis," Santosh Babu added.

8. Impact Analysis

Since the implementation of the app, the accessibility of the data on crime and criminals has been widely appreciated. There have been several instances where criminals were nabbed utilizing the data and results obtained using the mobile application in time. Also, the Missing Persons and UDR modules have helped solve several cases with the efficient utilization of the search features.

Since Five months of distribution of Portable Fingerprint Scanners to be used with the M-CCTNS mobile app, 220 persons with a criminal history have been positively identified during routine checks.

Conclusion

As a whole, MCCTNS is a comprehensive Mobile App solution which is a collection of several useful modules integrated with each other that supports smart and effective police. Several important data points will be available to the officers at their fingertips during the investigation. Data available securely at the right time and at the right place can make a difference in investigation and solving cases in a timely manner.

Printed from
THE TIMES OF INDIA

Bengaluru: App helps trace suspects' history by scanning fingerprints on spot

TNN | Mar 10, 2022, 03.48 AM IST

BENGALURU: Three habitual offenders were arrested recently for breaking into locked houses. A quick examination of the trio's fingerprints revealed they were involved in 14 unsolved burglaries.

Each was also found to have been part of three burglaries that they had committed individually and for which they'd been arrested before being released on bail.

According to ground-level staff and investigating officers, they crosschecked the trio's fingerprints with their database that is now hosted on M-CCTNS (Mobile-Crime and Criminal Tracking Network System) app, which is available on their mobiles. Within no time, the reports were out, confirming that the same fingerprints had been found in 14 unsolved and nine solved burglary cases. The app can scan the suspects' fingerprints once they place their fingers on the phone screen.

News Report Links:

1. https://timesofindia.indiatimes.com/city/bengaluru/app-helps-trace-suspects-history-by-scanning-fingerprints-on-spot/articleshow/90110998.cms
2.
3. https://government.economictimes.indiatimes.com/news/digital-india/criminal-tracking-network-system-app-helps-trace-suspects-history-by-scanning-fingerprints-instantly/90128061

Criminal Tracking Network System app helps trace suspects' history by scanning fingerprints instantly

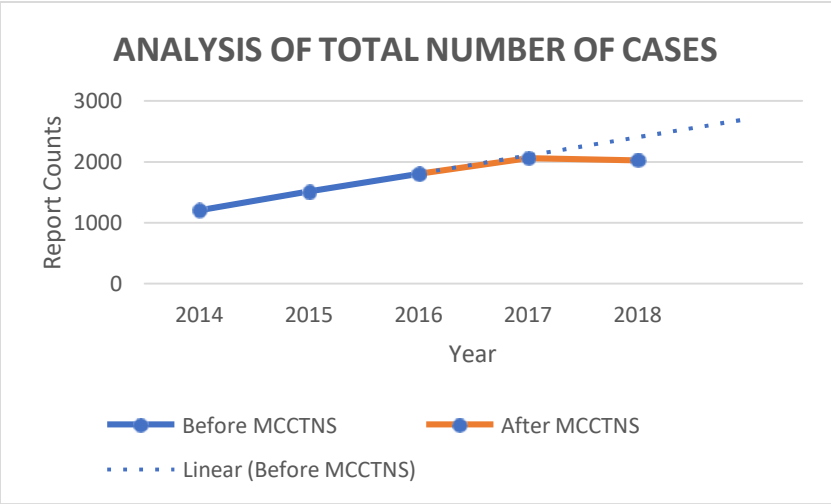
Earlier, fingerprints of suspects would be sent to bureaus in the city or district headquarters. On average, the bureaus took around 10 days to announce the suspects' history.

ETGovernment • March 10, 2022, 19:00 IST

Three habitual offenders were arrested recently for breaking into locked houses. A quick examination of the trio's fingerprints revealed they were involved in 14 unsolved burglaries. Each was also found to have been part of three burglaries that they had committed individually and for which they'd been arrested before being released on bail.

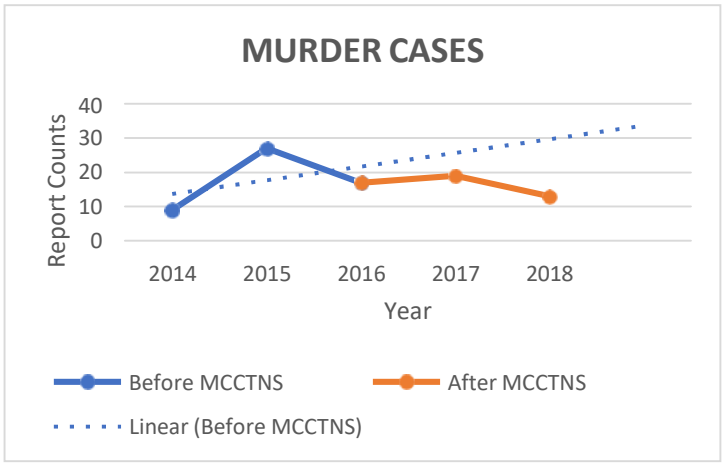
Impact Analysis based on Crime Statistics

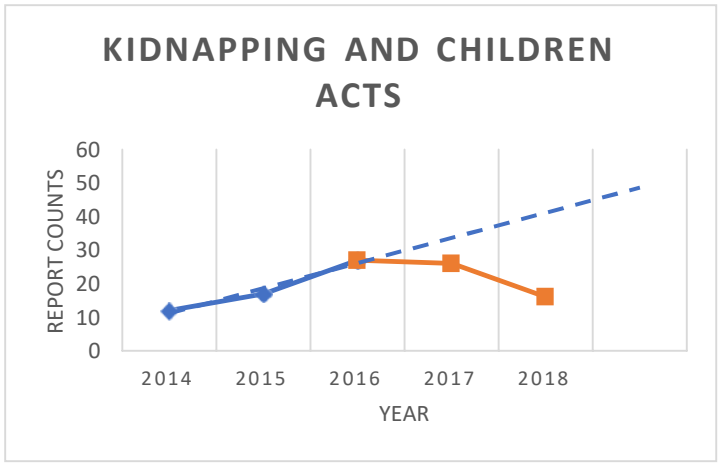
after the implementation of MCCTNS in 2017

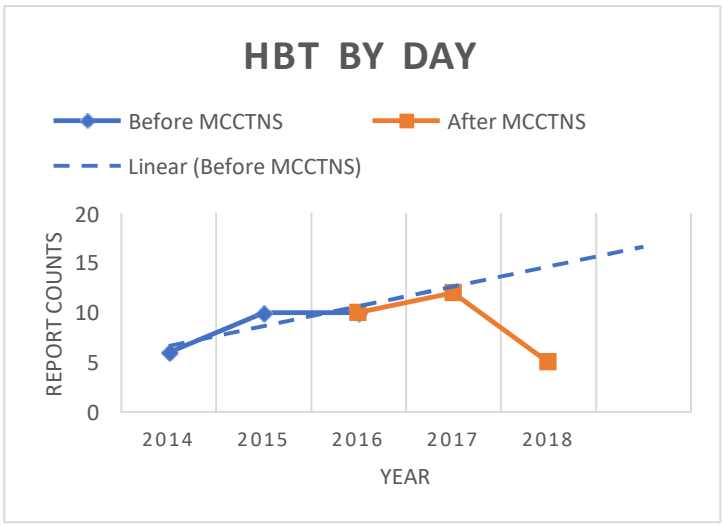


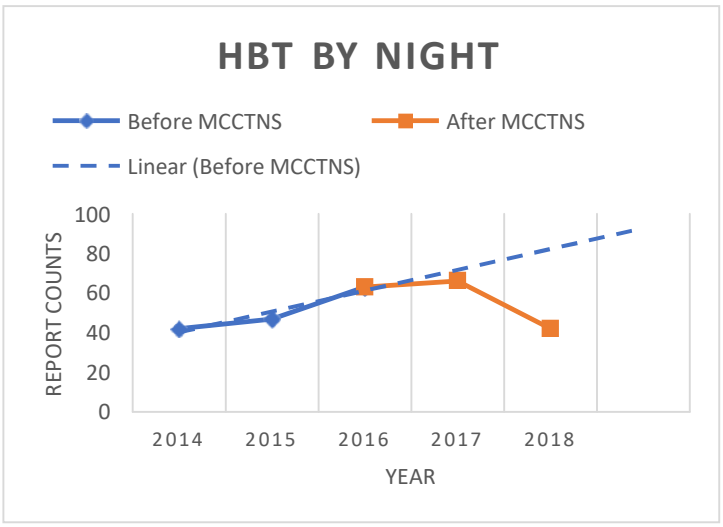
The graph trend shows the total number of cases reported every year before and after MCCTNS implementation.

Crime trends before and after implementation of MCCTNS









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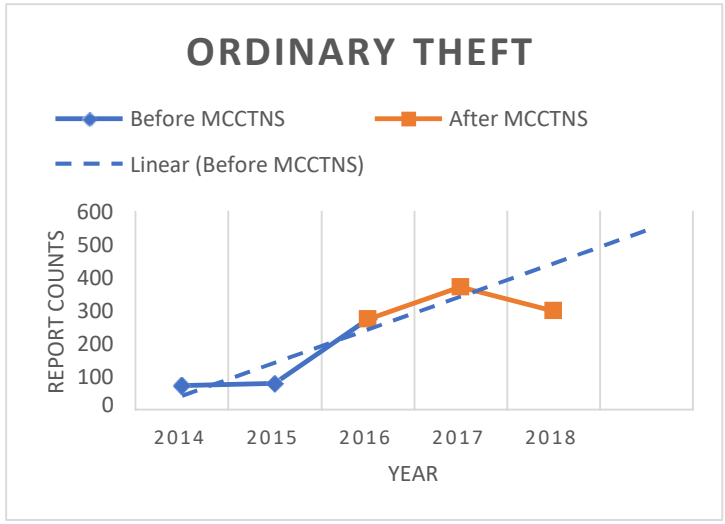
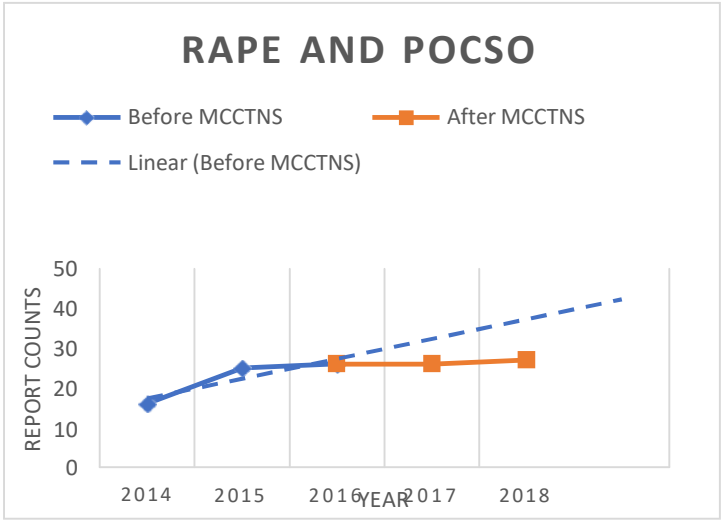
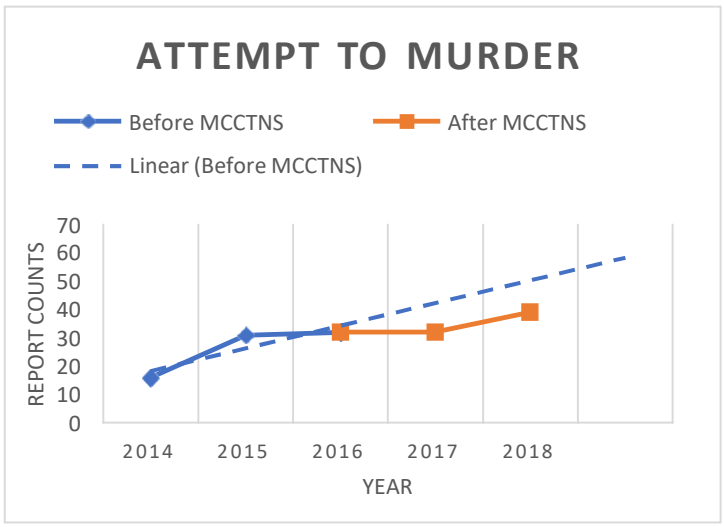
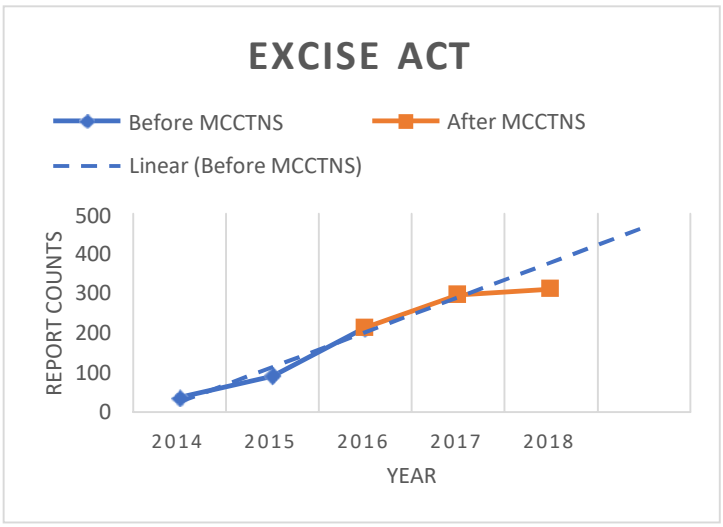





ATTEMPT TO MURDER
Before MCCTNS
After MCCTNS
Linear (Before MCCTNS)
REPORT COUNTS
70
60
50
40
30
20
10
0
2014
2015
2016
2017
2018
YEAR


EXCISE ACT
Before MCCTNS
After MCCTNS
Linear (Before MCCTNS)
REPORT COUNTS
500
400
300
200
100
0
2014
2015
2016
2017
2018
YEAR

Annexure

Estimated Cost (Approximate)

Estimated cost for the state-level implementation of MCCTNS:

Sl.	Particulars	Amount	Instances	Line Total
1	**Development of MCCTNS Android App with backend Web Dashboard** Modules: 1. Crime Mapping and Analysis Module 2. Person of Interest Module (Criminal DB) 3. Crime Involved Vehicle Search Module 4. Arrest Coordination Module 5. UDR and Missing Persons Module 6. Resource Library Module	₹ 35,00,000	1	₹ 35,00,000
2	**Server Space Procurement and Setup for hostingthe application – per year** (In case of Private Cloud Hosting)	₹1,50,000	1	₹ 1,50,000
3	**SMS Gateway integration for OTP -** 1,00,000 SMSs	₹25,000	1	₹25,000
4	**HTTPS SSL Certificate Procurement and Setup**	₹ 25,000	1	₹ 25,000
5	**Fingerprint Scanners**	₹ 5,000	100	₹ 5,00,000
6	**Face Recognition – API Integration (optional)** • Mobile App client for Face recognition • Integration with existing Face RecognitionAPI • APIs for Mobile App	₹ 5,00,000	1	₹ 5,00,000
7	**Fingerprint Recognition – API Integration (optional)** • Mobile App client for Fingerprint recognition • Integration with existing AFIS API • APIs for Mobile App	₹ 5,00,000	1	₹ 5,00,000
			Grand Total	**₹ 52,00,000**

Note:

- All costs are exclusive of taxes.
- Above prices can vary based on database size and number of users.
- Annual Maintenance Charges will be charged at the rate of 15% of the project cost.