SOP on the Use of Videography/ Photography for the Crime Scene and Statement of Witnesses

1. Background

In the SLP No. 2302 of 2017 filed by Shri Shafi Mohammead vs. State of Himachal Pradesh before the Supreme Court, the Hon'ble Court had on the 12th of October 2017 ordered the constitution of a Committee of Expert (COE) to facilitate and prepare a report to formulate a road map for use of videography in crime investigation and to propose a Standard Operating Procedure (SOP). The court also asked BPR&D to prepare a Guidance Manual for the investigating officer for crime scene photography and video recording of statements of witnesses. Pursuant to this order, MHA had directed BPR&D to prepare the Guidance Manual.

2. The Supreme Court consideration of the report of Committee of Experts (CoE)

On 21st March, 2018 the Hon'ble Supreme Court took up the issue for further consideration and agreed with the report of the Committee of Experts that videography of crime scene during investigation is of immense value in improving administration of criminal justice since it helps in capturing crucial evidence and presenting in a credible manner. It further agreed that as of now investigation agencies in India are not fully equipped and prepared for the use of videography that time is right that steps are taken to introduce videography in investigation, particularly for crime scene as a desirable and acceptable best practice to strengthen the rule of law. The Supreme Court directed that with a view to implement the plan of action prepared by the Committee, a Central Oversight Body be set up by the MHA forthwith. The Supreme Court approved the centrally – driven plan of action prepared by the Committee and the proposed timelines.

3. Role of BPR&D

In order to comply with the Hon'ble Supreme Court's directions and MHA order, BPR&D a committee of the following officers was created-

1. Pawan Kumar Srivastava, Director CAPT, Bhopal- Chairman
2. Pramod Verma, DIG (TRG) BPR&D
3. Dr P Vijay Kumar, SP (CA) BPR&D

BPR&D also organized a "Consultative Workshop on Preparation of SOP on the Use of Videography/ Photography of Crime Scene and Statement of Witnesses" on the 6th of June 2018. In this consultative workshop with the States, UTs and other investigating agencies, important points related to technical aspects of equipment emerged. The workshop also spelt out the procedural and training aspects of photography/ videography of crime scenes and statements of witnesses.

The committee deliberated on the issue at Bhopal and New Delhi on different dates.

4. BPR&D's Committee on developing the SOP

The committee perused the Hon'ble Supreme Court order in the SLP 2302/2018 which reveals the following as the important factors to be incorporated in the SOP –

- Production and admissibility of evidence
- Securing and storage of data/ evidence
- Making the use of videography and photography mandatory
- Quality and resolution of the data/ evidence for appropriate forensic analysis
- Secure portals for e-mailing the evidence for storage
- Storing the evidence as permanent record in order to ensure authenticity and prevent manipulation
- Use of Smartphones until specialized cameras are selected
- Funding the endeavor on a sustained basis

The committee has attempted to incorporate the above concerns and guidelines of the Hon'ble Supreme Court in its deliberations and suggestions while preparing the SOP. Attempts have been made to provide an easily available technology to the investigating officers in aiding them in photography/ videography of the crime scene.

The committee firstly deliberated on the utility of the photographs and videographs of any crime. It was agreed that the photographs and videographs are universally accepted best practices and was essential for the appreciation of the scene of crime and evidence by the Hon'ble trial court. It is accepted that there is limited strength of forensic science experts in the districts, they are stationed at the district headquarters and hence they are unable to reach all scenes of crime and even if they reach the scene of crime the delay causes disturbance of scene of crime. Therefore, the committee is of the opinion that chronicling the scene of crime via videography and photography for appreciation by the trail court should be done by the first responder itself. Specific and expert photography for better erudition of the evidence should be done by the forensic science experts who have to undergo a distinct training.

Police IOs are the first responders in any crime scenario. They must have access to simple technology alongwith appropriate training to inspire confidence in them to preserve and record the scene of crime authentically and faithfully. Once this initial important response is ensured, the detailed videography / photography may be ensured, if required, by the specialized forensic evidence collection teams. The availability of simple instructions for videography/ photography ensures the appropriate immediate response of the IO and appreciation and collection of evidence.

The Committee recommends the SOP may be made mandatory for the offences wherein the punishment is 7 years or above which are classified grave / serious / heinous offence. Later it may be extended to all criminal offences. The Committee of Experts has also observed that crime scene videography was a "desirable and acceptable best practice" since various States had expressed concerns / problems related to lack of training, funding,

forensic facilities, operational difficulties and legal issues of admissibility of electronic evidence in the absence of 65 (b) certificate under IT Act, 2000.

5. Proposed solution

The committee not only is suggesting the ways to go about the photography and videography of the scene of crime, available evidence and statement of the witness but also providing the means to attain this objective.

The advent of technology by way of smartphone which is infact a small computer in itself that has an operating system, RAM, input and output devices and is connected to internet and a network and which is easily carried in almost everyone's pocket offers a handy tool in achieving the above objective. Almost everyone is using applications like Whatsapp to send videos and photographs to their near and dear ones and police officers are one of them. Some police officers are using Whatsapp for understanding the scene of crime remotely.

It is also worthwhile to mention that technology enables us to record certain data (called the metadata) in the file itself. We are proposing the usage of metadata to record critical investigation information as metadata in the files. The metadata will automatically record the latitude and longitude, date and time from the GPS and will have the crime number and other details that has to be manually entered by the IO.

The smartphones being powerful pocket computers are capable to make complicated calculations in split seconds. We are using the smartphones to calculate the hash values of each file.

In view of the above, this committee proposes the solution of providing smartphones with good resolution cameras to record the evidence with the help of sophisticated software with geo-tagging and time-stamping. These photos/ videos and their meta-data would immediately be provided a Hash

value and sent to secure servers for storage as permanent record and for later retrieval for investigation purposes.

For this, an android (and iOS- under development) based application supported by a web application has been developed by CAPT to be used by the IOs at the scene of crime for videography/ photography and recording of statements of witnesses. These pictures and videos will have unique Hash values stored in their respective properties hence maintaining their data integrity and authenticity. The android application is available on trial basis at http://captbhopal.in/capt-track.apk

The app can be installed on any android smartphone that has an inbuilt GPS as the time and date stamp and latitude and longitude are extracted in realtime from the GPS data and is embedded in the metadata. Each file (whether photograph or video) has the data of photograph and videograph with associated metadata stored in the file itself. The HASH value of each individual photograph/video is also calculated in realtime and embedded in the metadata and the file(s) will immediately sync to the server or can be emailed to a specific email id. Even the address of the server and the email id are stored in the metadata.

The tool thus addresses the authenticity of the photograph/video by way of storing the crime details in the metadata, calculating the hash values and even printing them on the individual photo/video and sending them to the secure server thus maintaining the chain of custody. The tool is extremely easy to use, secure and foolproof.

6. Technical specifications of the application

- Service layered application for web and android/iOS mobile platform.
- The whole application has simple user interface which is easy to understand by all types of users and can be installed at any basic android smart phone having GPS facility.

- The features of Operating Software are -
    - Easily downloadable from secured server
    - One click installation
    - Easy login
    - Enter / Select – Metadata such as District , Police Station and Crime Number
    - Take pictures / videos
    - Selecting the pictures / videos
    - Auto upload to server / send e – mail

- Admin Panel (Headquarters)
    - Login
    - Dashboard
    - Administrator / User Management
    - Search / Query – Date wise, Crime wise, Police Station Wise, Case wise, District wise

- Design
    - Vertical oriented
    - Standards compliant, responsive design for all display devices
    - Flexible layout of dynamic content via the CMS

- Security and Encryption

  The App uses Open SSL to provide AES – 256 and AES – 128 encryption. All of App's encrypted values are singed using a message authentication code (MAC) so that their underlying value cannot be modified once encrypted.

- Platform – MAMP (Macintosh, Apache, MySQL & PHP)
    - Scripting Language – PHP
    - Backend Database – MySQL, XML
    - Security

- Hardware Requirement
    - Android smartphone with GPS facility

- Other Requirements
    - Domain name & web server hosting (cloud based)
    - SMS Gateway

- The Android application shall be used by Investigation Officers at the crime scene and recording statement of the witnesses for taking pictures or recording videos.
- These pictures or videos will have a unique hash value stored in the respective properties

7. **Limitations-** The tool alongwith the SOP can be used to record photos, videos of the scene of crime but also can be used to record the statement of the witness. However, if an IO takes 10 pictures of the scene of crime, a 2 minute video of the scene of crime and statement of the witnesses as a 5 minute video for 10 witnesses the total storage requirement of each case is calculated below-
    a. 10 photos x 5 MB each = 25 MB
    b. 2 minute video of Scene of Crime = 200 MB
    c. 5 minute statement x 10 witness = 5 GB

Thus a modest estimation as per the calculation above would be about 5.5 GB for each case. Madhya Pradesh has an estimated crime of 2.5 lakhs per year. Thus the storage requirement for the cases if photographed and videographed will be 1.375 Petabyte or 1375 Terabytes. Even though the storage capacity is increasing per unit price the estimated price for this kind of storage and archival will require an estimated expenditure of about Rs 5 to 6 Crores per year. It is therefore suggested that in the first phase this capacity and infrastructure should be built only for the heinous offences. As and when the capacity is increased and each individual of the criminal justice system appreciates the utility of the system, the states will endeavor in storage capacity enhancement.

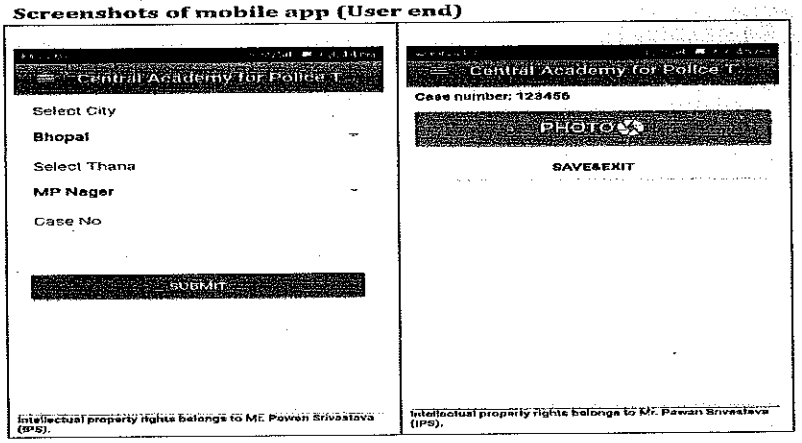
8. **Process Flow – Steps to be taken by the IOs**
    1. Log into the app after reaching the crime scene.

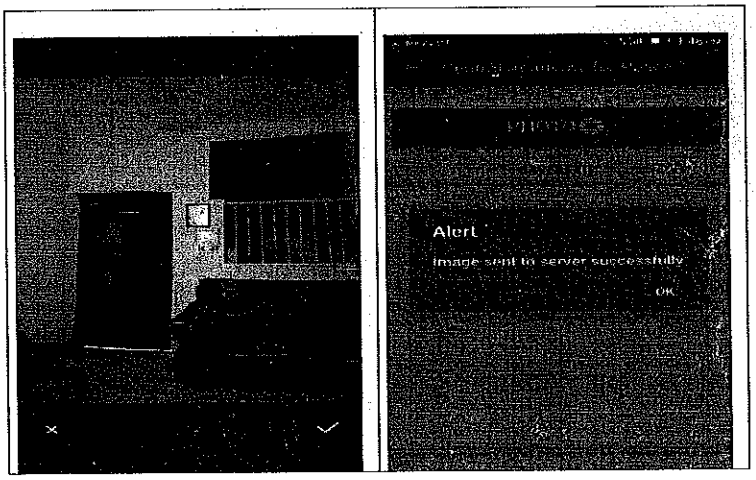
2. Check if the GPS coordinates are properly displayed with time stamp.
3. Enter metadata related to the case - crime number, police station name, district name (without this metadata the app will not work; the metadata will automatically link the video / photo evidence with the concerned crime).
4. Record the necessary photograph / video footage.
5. Save the same, if satisfied.
6. Immediately upon saving, the hash value of the photo / video footage will be embedded and displayed in the original picture / video footage.
7. Simultaneously the metadata of the photo / video footage is merged with the original photo / video footage and the new hash value is generated; this data with its hash value is stored and transmitted to the central secure server for storage and retrieval (data integrity is maintained and checked through hash value).
8. The IO can retrieve the required digital evidence at any time from the Secure Central Server for the purpose of investigation
9. The Secure Central Server may be located at either the State Headquarters or in the concerned district.
10. The same steps are automatically followed by the application for further photo / video footage in the course of investigation.
11. The IO shall download the digital evidence from the Secure Central Server and submit the same along with certificate under 65 (b) IT Act, 2000 to the jurisdictional court either as printouts or as an electronic device like pen drive / CD.
12. The admissibility of the digital evidence is ensured through the 65(b) certificate under the IT Act and the data integrity and chain of custody is maintained through the hash value of the original picture and the metadata).
13. For recording statements of the witnesses the same procedure may be followed either with mobile phone or any other instrument having this app installed.

14. The GPS coordinates are displayed in the smartphone through the standalone software which connects to the satellite directly and does not need data connectivity.
15. In case, the GPS signal is not available due to the location of the scene of crime in an enclosed space with roof and GPS coordinates are not displayed on the screen in the crime scene then the IOs shall go to an open space (open to the sky- and as you enter the scene of crime) and take a picture with the GPS lock. All following pictures (when the scene of crime is in an enclosed space) in the same transaction will record the first GPS coordinate.

Screenshot of the App (User End)

Screenshots of mobile app (User end)





9. End – users of the SOP

This SOP is meant to be followed primarily by the Investigating Officers and their team members assisting in the investigation and responsible for crime scene videography / photography. The members may include Sub –Inspectors or any other police officer, official photographers of the District / Police Station and professional photographers engaged by the Investigating Officer. The ambit of the SOP is restricted to IOs and the forensic scientists and other experts are not included in this since detailed SOPs on photography and videography of the crime scene are already available for them. However, they may also use the same SOP and application as per their requirement, if any.

10. Advantages of using the SOP and the application

i. Conventional methods of marking the photographic and video graphic evidence and linking it with the crime scene is cumbersome and requires the presence of independent witnesses.

ii. The application ensures that the metadata (Crime No., Police Station, District etc.) is linked with the photo / video evidence and GPS coordinates and time stamp. All this data is stored with a specific hash value which cannot be tampered. With this, the requirement of witnesses can be dispensed with.

iii. Therefore, the application and SOP replace the manual aspects of linking of crime scene; it is made automatic and in – built in the chain of custody.

iv. The use of the application makes available a host of authentic data such as crime no., police station, district, name and contact details of IO and supervising officer, GPS coordinates, time stamping and timing of transferring of data, timeline of access of the data, dimension of the image, the file size and location, model of the camera, focal length and ratio, exposure time and last modified etc. This data may prove useful during investigation and trial.

v. With the feature of storing the data in a secure server and its later retrieval in investigation purposes, the same can be examined simultaneously by both the supervising as well investigation officers. This strengthens the monitoring and investigation mechanism.

vi. It is easy to see the entire log of who handled the photographic and digital evidence and for what purpose.

vii. Instrument used in taking the photographs / video evidence need not be submitted in the jurisdictional courts for the purpose of trial and certificate under Section 65 (b) IT Act, 2000 shall suffice

viii. Investigation process become more credible and transparent

11. Steps to be followed by the IO to record photographic and video evidence on the scene of crime

1. Use the safe route when moving through the scene, avoid disturbing the scene.
2. Take photographs with scale when appropriate.
3. Take photographs of the crime scene before and after the alteration.
4. Take a complete set of pictures including aerial, long - range, mid - range and close-ups.
5. The photographs should include entry and exit routes, victims and evidences as far as possible.
6. Take photograph of crime scene objects such as blood stains or fingerprints or footprints as soon as possible.
7. Take photographs from exterior to the interior of the crime scene and from general to the specific focus.
8. Close-up photography is preferred when taking footprint, fingerprint, shoeprint, tyre track, injuries etc.
9. Hash value of the individual image/ video footage to be mentioned in the panchnama.
10. Ensure admissibility of the digital evidence, by following the procedures demanded by law including the certificate under 65-B

and maintain the authenticity and data integrity through the hash values in different places of transmission and storage.

11. The above said is not exhaustive, the IO should try his level best to present the original crime scene to the competent court through every mode and tool possible including digital photograph and video footages
12. Don't disturb the crime scene before taking photographs.
13. Don't submit unclear photographs to the court of law.
14. Don't submit the digital evidence without certificate under 65B
15. Don't forget to mention the hash value of the individual photograph in the case diary

This SOP is a guideline for the functional and operational part of crime scene photography and recording the statements of the witnesses to ensure the admissibility of the same in the court of law. The technical aspect including photographs taken by forensic experts, contents and analysis is not dealt with.

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