Advanced Immediate Crime Reporting to Police in India

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Abstract

One of most important area in Crime investigation is efficient way of reporting crime. Till now, crime reporting system in India is online FIR system or manual reporting in Police stations. If any incident happens in any area, then crime reporting can be done via telephone or in person. No actual scene reporting is possible till date. People should be able to seek help in case of emergency on time. A large number of incidents happen in front of people but people are unable to report those incidents to police immediately. India must focus on inculcating an automated system for immediate crime reporting to police surpassing all controllable and uncontrollable factors responsible for unreported crimes. Hence, this paper proposes a smart system that can be implemented for immediate crime reporting to enhance crime reporting which is highly required in today’s scenario.

Keywords:

1. Introduction

India is a victim of high crime rate. However, not all cases are reported immediately to the police due to various factors. Thus, there must be a system that can help a person to contact the police in emergency situations immediately. In today’s scenario, most of the people use smartphones which could serve as a means for crime reporting. Smart phone is a relatively new technology but radio was developed by Marconi in 1895 is a means of communication since a very long time [1] as shown in fig 1. Radio waves are used by mobile phones and their base station transmits and receives the signals. Frequencies are widely used in telecommunication which includes television, broadcast radio which operates at different radio frequency bands having range between 30 kHz and 300 GHz.
Private organisations operate in the frequency range between 87.5 MHz and 108.0 MHz and police works at frequency between 76 MHz to 86 MHz. Any organisation which needs to work within the police frequency band needs to have a licence otherwise it is an offence under the Indian Wireless Telegraphy act[2].

Mobile communication takes place using intermediate base stations (towers). Signals from mobile travels via different intermediate stations to reach the destination and finally signal is delivered to the receiver. This follows relay which states that information can be transmitted from source to destination via intermediate nodes (devices/towers/base stations).

What will happen if there is no network or in adverse situation, the towers are absent at consecutive places. In such cases, the relay concept can be opted wherein the Wi-Fi enabled devices in absence of network will able to communicate with each other via radio frequency [3] as shown in figure 2.

2. Issues with current crime reporting system

The current crime reporting system includes victims/witnesses informing the police officer either in person at reporting counter of police station or by telephone, informing police at police control rooms. Nowadays, reports are also placed online as Online FIR.

The crime reporting system used by police agencies has several drawbacks which are discussed below.

2.1 Whom to contact
In case of emergency, there are some questions that arises in a person’s mind
(1) Whom to contact.
(2) Which police station to contact.
(3) Area of police station.

2.2 A Lot of Helpline Numbers
There are many helpline numbers such as child helpline, women helpline, accident helpline etc. In case of an emergency, a person does not get an appropriate number to contact on unless he remembers all of them.
2.3 No response on Helpline Numbers
For seeking help, when a person dials a helpline number, usually that number seems to be busy or not responding.  

2.4 Communication gap
The police do not get the exact information about the incident. So they are not able reach on time. Due to communication gap between police and user/victim the appropriate information is not delivered to police on time.

3. Proposed System
Issues mentioned in Section 2 can be resolved using proposed Automatic Immediate Crime Reporting (AICR) system. The user/victim has to install the AICR system onto their smartphone. On registering with the system, they can take the benefit of it. In case of emergency when user/victim will start the system, GPS will start automatically and captures the location which will be matched with the location wise frequency database. The system along with this database also contains the destination address of centralized database (server) which will be installed along with the AICR system in the user’s smartphone encrypted form at the backend.

The user/victim can record the voice message, capture image or video and this information along with the location is transmitted to the matched police frequency and simultaneously to the destination address of centralized database (server) as shown in figure 3.

![Figure 3: Working of AICR System](image)

The proposed AICR system consists of four modules: the user module, the centralized database, the police station module and the patrolling cab module. AICR system has to be installed on all the three sections i.e. user, police station and patrolling cab.

3.1 The User Module
The user downloads the AICR system into his smartphone. After downloading, the user registration takes place wherein the user’s personal details such as name, phone number, emergency phone and the information sent by the user as shown in figure 4 such as voice message, image, video and location will be stored at centralized database (server). Initially, only user’s personal details will be present in the database and remaining attributes will be empty, they will be filled at the time when user will sent the information.
The smartphone on which AICR system is installed consists of location wise frequency database which maintains the police frequency as shown in table 1.

<table>
<thead>
<tr>
<th>Location</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Munnar</td>
<td>98.3</td>
</tr>
<tr>
<td>Agra</td>
<td>91.1</td>
</tr>
<tr>
<td>Varanasi</td>
<td>101.6</td>
</tr>
<tr>
<td>Darjeeling</td>
<td>155.0</td>
</tr>
<tr>
<td>Bhuleshwar</td>
<td>96.4</td>
</tr>
</tbody>
</table>

As it is illegal to use police frequency publicly, so this paper does not mention about the police frequencies. The proposed AICR system will only be implemented after acquiring the license from the Indian government.

The user can use two techniques simultaneously in order to inform the police to report the incident as soon as possible, so that police gets information about the incident from either way.

By using the first technique, when user will start the system; the GPS will start automatically and captures the location. This identified location will be matched with its corresponding frequency present in the location wise frequency database. Now to that frequency, the captured information by the user/victim such as voice message; image or video will be sent to the patrolling cab which will be nearby to that frequency.

By using the second technique, the user when starts the system, GPS captures the location. This location will be forwarded along with the captured information such as voice message, image or video to the centralised database (server) . The centralised database will again forward this information to the particular police station and from that police station finally information will be sent to the patrolling cab. The forwarding of information along with location takes place using relay[3].

3.2 Patrolling Cab Module

On transmitting the information by the user/victim, the patrolling cab receives the information through two approaches.

First approach incorporates the method as mentioned in the user module, the location corresponding to the police frequency will be acquired and the information captured by the user will be sent onto the acquired police frequency. The patrolling cabs tuned to that frequency will receive the information. This case will be valid only in the presence of the mobile carriers.

If there are no mobile carriers present, then through second way the information will be transmitted.

In second approach, the patrolling cab will receive information through police station which is explained in police
station module, this will work in absence of mobile carriers.

3.3 Centralized Database

Centralised database is maintained in order to have information stored at a particular place which serves many purposes such as (1) police station provides immediate help to the user in case information is not sent to the patrolling cab (2) It helps in police investigation. (3) Police can refer this database for any future work. (4) The prank call can be traced easily as user IMEI number is present in it. (5) It serves as digital evidence for police. This database will be accessed only by the head of police station so that the database cannot be altered by anyone.

The centralised database will have two sections: first section will have the user details as shown in table 2 and the second section will have the destination addresses of each police station so that the information could be forwarded to the particular police station from the centralised database as shown in table 3.

![Centralized Database and its sections](image)

Table 2: User Details (An illustration)

<table>
<thead>
<tr>
<th>Sno</th>
<th>Name</th>
<th>Phone no</th>
<th>Emergency no</th>
<th>Location</th>
<th>IMEI no</th>
<th>Voice message</th>
<th>image</th>
<th>video</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>John</td>
<td>2378921782</td>
<td>3070712323</td>
<td>Kalindi</td>
<td>126383846372934</td>
<td>Message1</td>
<td>Image 1</td>
<td>Video 1</td>
</tr>
<tr>
<td>2</td>
<td>Rohit</td>
<td>8963836234</td>
<td>3531357535</td>
<td>Jasola</td>
<td>374618274967273</td>
<td>Message2</td>
<td>Image 1</td>
<td>Video 1</td>
</tr>
<tr>
<td>3</td>
<td>Carl</td>
<td>9911043761</td>
<td>5598126350</td>
<td>Panaji</td>
<td>871008431892652</td>
<td>Message 3</td>
<td>Image 2</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Aarav</td>
<td>8813409541</td>
<td>2209841936</td>
<td>Cherapunji</td>
<td>576113217609236</td>
<td>Message 4</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 3: Destination Addresses of Area Wise Police Stations

<table>
<thead>
<tr>
<th>Location</th>
<th>Police station destination address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjabi Bagh</td>
<td>00-1E-37-18-50-DB</td>
</tr>
<tr>
<td>Aligarh</td>
<td>00:0a:95:9d:68:16</td>
</tr>
<tr>
<td>Jodhpur</td>
<td>48:2C:6A:1E:59:3D</td>
</tr>
<tr>
<td>Kutch</td>
<td>00:OB:85:23:D0:52</td>
</tr>
</tbody>
</table>

The above table stores the destination addresses of each police station of a particular location/area. So user will transmit the information to the centralized database forwarding it to the police station of a particular area. The above process will take place in the absence of mobile carriers using relay concept [3].

The user when needs help from police he will send the information (voice message, video or image) from his smartphone along with the location to the centralised database. The process of reaching the information to the centralised database in absence of mobile carriers is explained below.

The user’s smartphone will search for the Wi-Fi enabled devices nearby. When any Wi-Fi enabled device is found, it will check whether it is the destination (centralised database) or not. This process is repeated until it reaches its destination (centralised database). Once the destination is found the information sent by the user will be stored in the centralised database, following relay concept [3].
3.4 Police station module

The police station receives the information sent by the user via the centralised database. The database as shown in Table.3 stored in the centralised database has the destination addresses of area wise police stations. The location sent by the user to the centralised database matches with location in the database stored in table.3. The information (voice message, image or video) will be sent to the destination (police station) matched as described below.

The centralised server will search for any Wi-Fi enabled devices nearby. When any device is found it will check whether it is destination (police station) or not. This process continues until the destination (police station) is found. Once the destination is found the information sent by the user is forwarded to destination address of the police station. In this way police station receives the information. The process followed is relay [3].

Each police station has its area wise patrolling cab database stored as shown in Table.4 in the police station so that it can forward the information to the patrolling cab.

<table>
<thead>
<tr>
<th>Patrolling cab number</th>
<th>Destination address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>00:1A:3B:9M:00</td>
</tr>
<tr>
<td>2</td>
<td>3V:00:1K:8H:9O</td>
</tr>
<tr>
<td>3</td>
<td>6J:9U:4G:89:B0</td>
</tr>
</tbody>
</table>

The information when received by the police station, the database shown in Table.4 will search to find the destination address of patrolling cab in that particular area so that the information can be forwarded to the patrolling cab and help can be provided to the user as soon as possible. The forwarding of information from police station to patrolling cab will be done by the relay concept [3] as explained in above modules. The destination in this case will be the patrolling cab.

4 Issues Resolved by the AICR System

With the introduction of above AICR system, the following problems would be resolved

4.1 Immediate help to the victim
User can inform police about the incident immediately so that police can reach at that place as soon as possible and can provide help to the victim.

4.2 Digital evidences
As our system will also be providing images and videos of the incident captured by the user so police will have the evidences that will be stored digitally and also cannot be altered by anyone.

4.3 Overall minimising the process
User can directly inform police about the incident. So the process becomes simple and easy if compared with earlier processes where user has to have helpline numbers, information of nearest police station, mobile signals should be there, user should have balance in his mobile phone to call police station etc. These all problems are now resolved with this system.

4.4 Extending reach of people
This system will inform the nearest police station as well as nearest patrolling cab so this extends user reach ability if in case patrolling cab is not there, the information will also be sent to police station. This implies someone will surely listen user’s voice.

4.5 No prank calls
IMEI number of user stored in the database here plays an important role in identification of user. So no user can do a prank call.

5 Conclusion and Future work

The above system once implemented will help in providing immediate help to the victim. Further work is to be done to communicate in the areas where Wi-Fi enabled devices lack. Even work should be done making the system more secure in respect to eavesdropping as user’s information has to travel through various devices. We can even include
helicopters along with patrolling cab for more security from police [10].

6 References

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