



Enhancing the System Intelligence to Prevent Crime using Mobile

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Abstract— *This paper proposes an algorithm to locate the mobile or telephone device with the current technology which can give exact whereabouts of the device in order to prevent crime. To detect any threat caused to anyone and act at the appropriate time so that any mishappening that may be caused can be prevented. Also, algorithm will broadcast caution message to all mobile numbers in the tower range of criminal's mobile (it can be customized through database according to the danger posed by criminals).*

Keywords- *Mobile Network, Message Broadcasting, Criminal Location, Positioning Methods, Database Architecture.*

I. INTRODUCTION

The ability to locate a mobile device is crucial for providing geographically dependent information, and it has been indicated in some studies [1], [3] as a key factor for the development of new wireless services. In this paper, an algorithm is proposed which will locate the criminal and will broadcast caution message to all mobiles within a particular area where the criminal is present. The algorithm can be used by the cellular companies, police cyber cell and individuals to detect any threat caused to anyone and act at the appropriate time so that any mishappening that may be caused can be prevented. It serves to the society as we come across daily with so many rape cases prevailing in India. Also, it may also serve from any kind of threat that any person may face like attempt of murder, abduction etc.

Whenever a particular number is dialed (say 100) by the mobile or telephone, the tool designed as per the algorithm activates and automatically the sends warning to the numbers registered in the database (with the cellular company at the time of activating this service) associated with the incoming mobile or telephone number. Moreover, it tries to locate the mobile or telephone device with the current technology which can give exact whereabouts of the device.

There are varieties of methods available to locate the user services as GPS-based solutions, GPS Locations and Non-GPS locations such as Cell-ID, Angle of Arrival, RX power levels, Wireless LAN based, Time of Arrival and solutions observed time difference on Arrival (OTDOA) [4]. The mobile location can be granulized based on the tower reachable. Hence, an approximate area can be pointed out where crime could happen and hence it will benefit the police to locate and prevent the crime.

Moreover, a central database can be maintained for the criminal record with their mobile number which can be leveraged with the cellular companies in order to track the activities of the criminals. We can generate a general warning message to all the mobile holders of a particular network as and when if any criminal runs away after doing some crime based on the network locality of the criminal mobile number. Also, the criminal can be tracked down with a specific area using this functionality.

II. METHODOLOGY

Functions of mobile devices have evolved from merely making calls to performing complex computations over the past three decades [5], [6], [8], [9].

The flow chart of the algorithm can be depicted as follows:

The algorithm is designed as a medium to activate the services already present with the cellular companies like device locator, automated voice calls. Basically, the algorithm automates the whole process and works if any number is missed by the police control, that is, say, the emergency call cuts before it could be picked up by the police control room. The algorithm automates the job of identifying the person, locate the person and send the proper information to the designated numbers to take action in time.

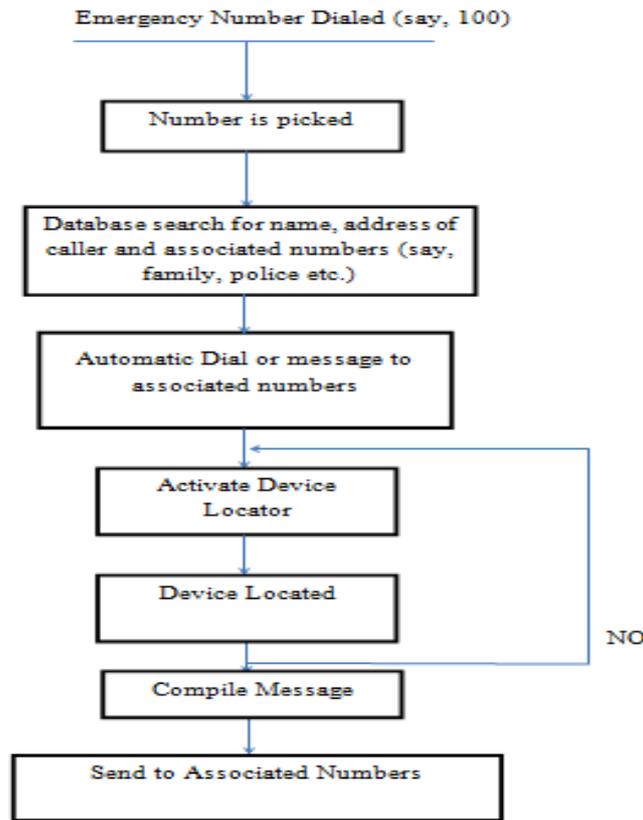


Fig. 1 Flow chart of algorithm for crime prevention

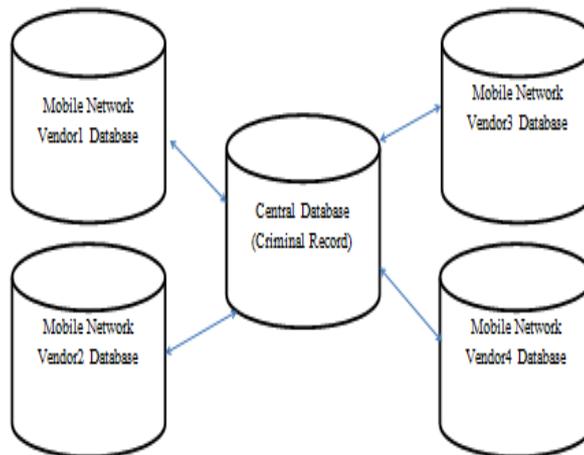


Fig. 2 Tracking Criminal

Central Database (Criminal Record): This will be read-only by mobile network vendors and when the criminal buys new mobile number, a request will be sent out to append the criminal record in the central database.

If and when some criminal activity happens and the criminal is justified, the criminal number can help in tracking if the mobile is held with him/her. Moreover, a message can be issued in public safety by all vendors to the area where the device of criminal is currently located. The device can be tracked down in similar way as explained earlier.

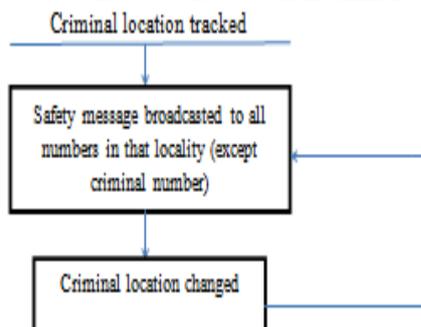


Fig. 3 Message broadcasting algorithm

III. MOBILE DEVICE POSITIONING TECHNOLOGIES

The common positioning technologies that are broadly used today:

A. Global Positioning System:

The most commonly used positioning system used today is Global Positioning System (GPS). It has 32 satellites which broadcasts its signals continuously from the space segment. It's available in our smartphones today, which receives the signals and those signals can be used to calculate the 3-dimensional location and the current time.

B. Wi-Fi Based Positioning System:

The Wi-Fi based positioning system uses the wireless access points MAC address or network address to uniquely identify the hotspots. The position of the hotspot has a reference position like GPS location fix which is saved in the database. For positioning the MAC address location, the hotspot signal received is looked up in the database.

C. Cellular Network Positioning:

Cellular Network Positioning (Cell-Id positioning) uses a unique identifier of base stations, which have the mobile country code (MCC), id of the cell tower, mobile network code (MNC) and its related location area identifier (LAI). The id has a reference position like GPS location fix. With the unique id's, the current received base stations can be looked up in the database for the location, via an IP-based network connection.

IV. ARCHITECTURE & ALGORITHM

Recent researchers have identified mobile handheld devices as a possible tool for effective crime detection and reporting [12], [13].

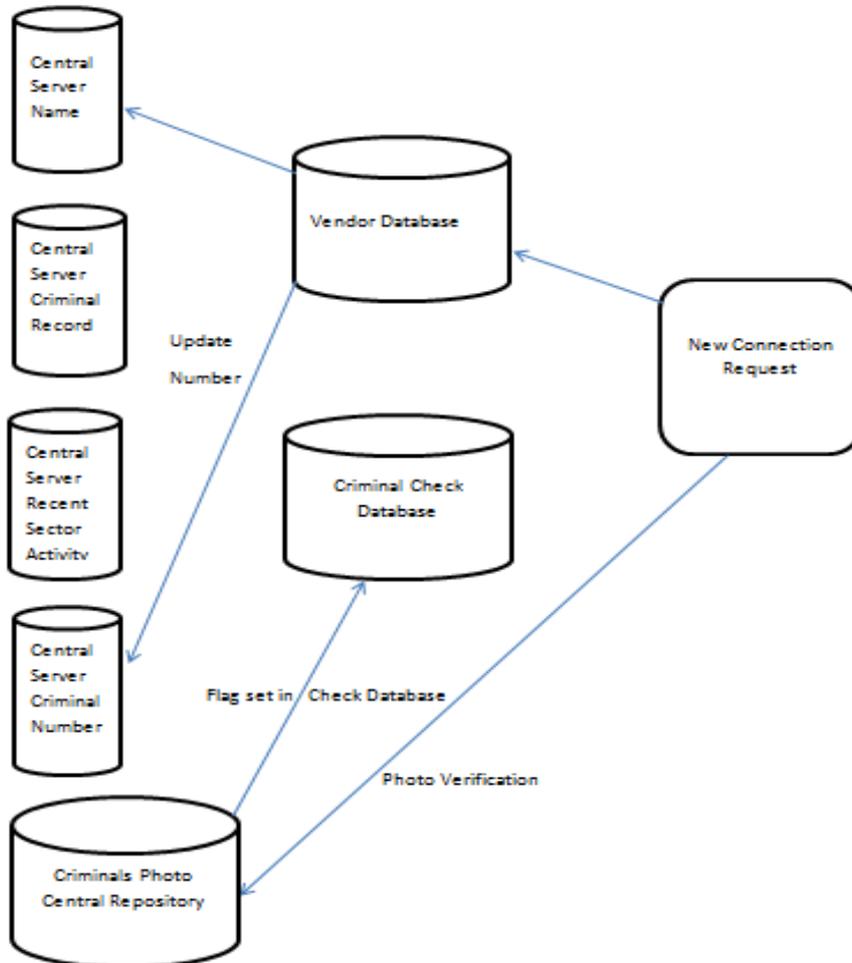


Fig. 4 Service Provider Database Architecture

```
NewConnectionRequest()
{
    PicMatchFunc(customer Pic)
    {
        return true/false
    }
    UpdateDatabase()
}
```

```

{
    if PicMatchFunc is True
    {
        Set true in CriminalCheckDatabase()
    }
    Update VendorDatabase()
    Update CentralServerCriminalNumber()
}
}

```

Whenever new connection request comes, the vendor uploads the details of customer who has come for new number and the pic is matched with central database where all criminals photo is kept. If the match id found, there is a vendor database kept which sets flag to true. Moreover, the central server database is searched and the number of criminal is updated so that the database is up to date. Also, the vendor database is updated with the new customer number and details.

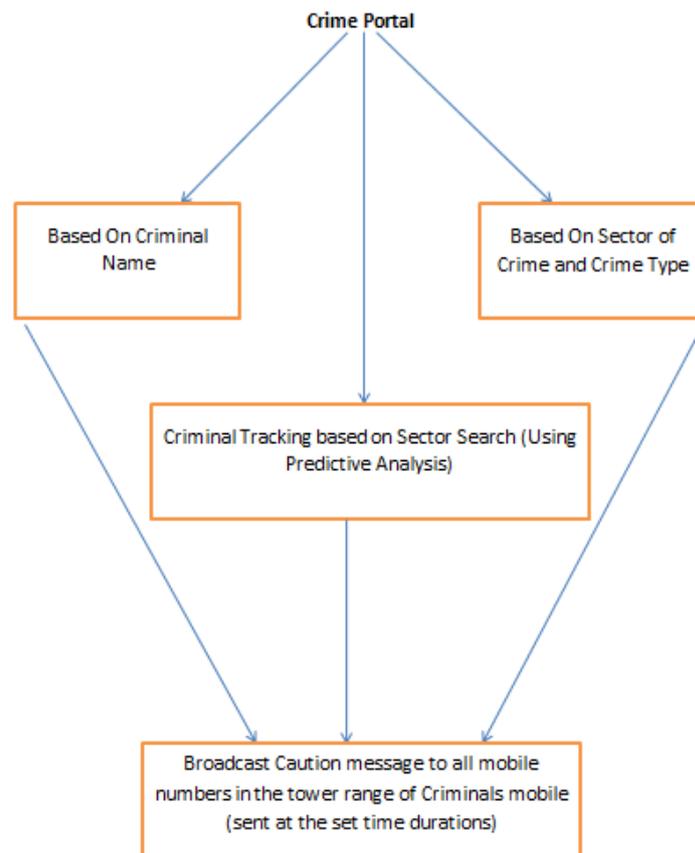


Fig. 5 Crime Portal

```

CrimePortal()
{
    Search based on CriminalName()
    Search based on SectorOfCrime_CrimeType()
    Search based on SectorSearch()
    CautionMessageBroadcast()
}
SOS message to all customers within tower range
}
}

```

The search based on CriminalName() is done directly by taking the number of criminal directly from the central server once the criminal name is reported by someone on the special number as message. The criminal number is tracked and SOS message is sent by all vendors to all customers falling within the range of criminal's number.

Moreover, the search based on Crime Type and Sector of Crime is done using predictive analysis in which we refer to the central server database to identify which criminals do a particular type of crime which has taken place and where generally have they done the crime. Now, area of mobile devices of particulars is identified and upon identification the message is broadcasted after refining the search.

V. CONCLUSION

This paper, tries to solve the big challenge of fighting crime in a more innovative way where the application runs on server side and confidentiality of individuals will be maintained. Since the algorithms run on server side therefore any individual can make use of this using any phone.

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