SMART PATROLLING APP

INTERNSHIP REPORT

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1. Introduction

The use of technology in law enforcement and crime prevention is developing rapidly, from drones and predictive analytics to biometrics, they are all helping to keep our cities and rural communities safer. Much of crime mapping is devoted to detecting high-crime-density areas known as hot spots. Hot spot analysis helps police identify high-crime areas, types of crime being committed, and the best way to respond. Along with the police it is also important for each and every citizen of a country to be able to respond to crimes in such a way which would help make a country crime free.

2. Project Strategy

The project strategy that was followed was to first study crime patterns and come up with a way to display hotspots. Along with that, build a platform for community volunteers to come ahead and report crimes that occur in their vicinity along with that come up with a helpline service that would cater to almost all sorts of emergencies.

3. Step-by-Step Process

- Taking Indore as study area and doing research on crimes in Indore.
- Building a platform for police to see crime hotspots and deployment plan so that patrolling can be performed at times when crimes are high.
- Building a platform for all citizens to report crime and give feedback regarding how their complaint was handled in a discrete manner
- Providing a helpline and list of police stations to both police and citizens for quick access during emergencies

4. Project Objectives

The main objectives of this project are-

1. To determine hot spots to identify the density of crime and based on that deployment of police will take place.
2. To keep a record the incidents which will help in further investigation and crime prediction and will help the administrator to take specific steps at right time.

3. To utilize volunteer force to fight of crime and act as patrollers when police is not at crime location.

Object Hierarchy	Overall Outcome/Output
Overall Objective	To contribute to smart patrolling, determination of hot spots, deployment of police force and use community volunteers to reduce crime.
Specific Objective	To prevent crime in a suspected area by deploying police force at right place and at right time and make use of community volunteers to fight crimes
Results	1. Effective planning of patrolling 2. Using community volunteers to report crimes ncy of Police 3. Providing victims a discrete way to give feedback as to how their complaint was handled
Activities	Conducting research on various crimes and at what time they occur.

5. Evolution

Mapping law enforcement report data can be an effective way to analyse where crime occurs. In 1829, Adriano Balbi and André Michel Guerry produced maps showing the relationships between educational level and violent and property crime in France. This is often cited as the first instance of crime mapping. In India, crime mapping is still at its preliminary stage. According to the 2016 report of the National Crime Record Bureau, Government of India, the number of recorded crimes in India was 48,31,515, which was 2.6% more than its preceding year.

The Geographic Information System, or GIS, is one of the most widely used technologies in the modern world. The basis for the first usage of GIS technology, however, is rooted in the 1854 cholera epidemic that ravaged London. By using GIS mapping to define areas in which crime or traffic accidents are prevalent, DDACTS allows participating law enforcement agencies to deploy their resources in a more efficient and effective manner.

6. Recent Works

In the field of crime mapping a lot of work has been done outside India. Here in India research is still being done as too how can we use GIS for smart patrolling. A study had been done for the Chennai city police where they took crimes such as theft, house breaking (day and night), chain stanching and automobile theft, and made a database. Then crimes were spotted on the map after which crimes and criminals were divided into clusters and these results were observed over the years and a suitable solution was implemented. [2]

Another research was done that looked at the possibility of utilizing GIS for crime mapping and its analysis for effective law enforcement and crime management. This option was explored by showing the procedural method of creating–

a) A hierarchal system of location data collection which previously didn't exist
b) Creating database with all spatial and non-spatial data
c) Creating heat map based on temporal and spatial analysis such as query and KDE using QGIS software and GPS.

Faridabad was taken under study and applying crime mapping showed major change in the reduction of crime. [3]

Similar research was carried out in Maharashtra to help analyse criminal activities in Akola city using GIS A lot of work has been done in the field of crime mapping. Here the maps were plotted using thematic method. [1]

7. Existing Software/Tools

PredPol is an online website that uses machine-learning algorithm to calculate predictions. It takes in crime type, crime location and crime date/time to predict crimes. It helps with proactively patrol to help reduce crime rates and victimization. [4]

IBM also offers a solution by combining powerful analytical and cognitive capabilities with a rich set of integrated data sourced from your established applications. It uses both structures and unstructured data to -Optimize resources and how they are deployed, Monitor, measure and reduce crime, Improve situational awareness by delivering information to the field where and when it's needed ,Improve budgeting and planning by knowing what's likely to happen tomorrow, next week or next month. [5]

8. Challenges

The traditional method of recording crimes failed to communicate the pin point address of crimes over a map. By being able to do so, one could easily spot clusters and hotspots that are constantly affected by crimes and come up with strategies that are best suitable for patrolling. A challenge that comes with crime mapping is lack of data that specifies the location of a crime. Then comes the police boundaries since it is not possible to visit police station it is difficult to understand their patrolling boundaries. Now the challenge that comes with determining hot spot at a particular time is that the difficulties of using data mining tool. Last challenge is how to deploy Police Officers and community volunteers on a crime scene based on the type of crime and availability of people.

9. Probable Solutions

After studying various methods of crime distribution we can use those methods to come up with proactive policing where we deploy police and volunteers in a way that would eliminate crime.

10. Proposed Solution

The proposed solution is divided as follows-

Creating a home page for both police and volunteer that would have a help button and SOS button, which would lead to the sign in and sign up each of which would lead to captcha.

The Volunteer module would have a Home page explaining the reason why smart patrolling is necessary. Next, it would have the crime page that would allow volunteers to look at crimes that occur around them. Then they have an option to report crimes as a witness and as a victim. In case of a them reporting as a witness they would have to enter their name, phone number, crime id that would be displayed, they will have to enter the latitude and longitude of that area which they can get with the click of a button along with that they can upload the picture of the crime scene. If they want to report as a victim, they have all the features as above as well as they have a feature to provide feedback as to how they feel about the way their case was handled by using a QR code. Next, they have a platform where they are provided with all possible helplines

catering to all sorts of emergencies and they are also provided with police station numbers in which they can directly make a call through the app.

The Police module will have a home page next they would have a crimes page, where in they can enter a location and choose time slot to see the crimes in that slot. Under the map they can see the deployment plan according to a particular hour, as in which area requires patrolling the most as they would be marked wit a scale between 1 to 10, 1 being the least and 10 being the most. Then if they attend to a crime, they can enter the data under the report section where in they enter details of the victim, accused, crime scene, and upload a picture of the QR code that is generated in the victim's phone. Along with that, they have an SOS button to call for back up and again they have the helpline and police station numbers to make calls directly.

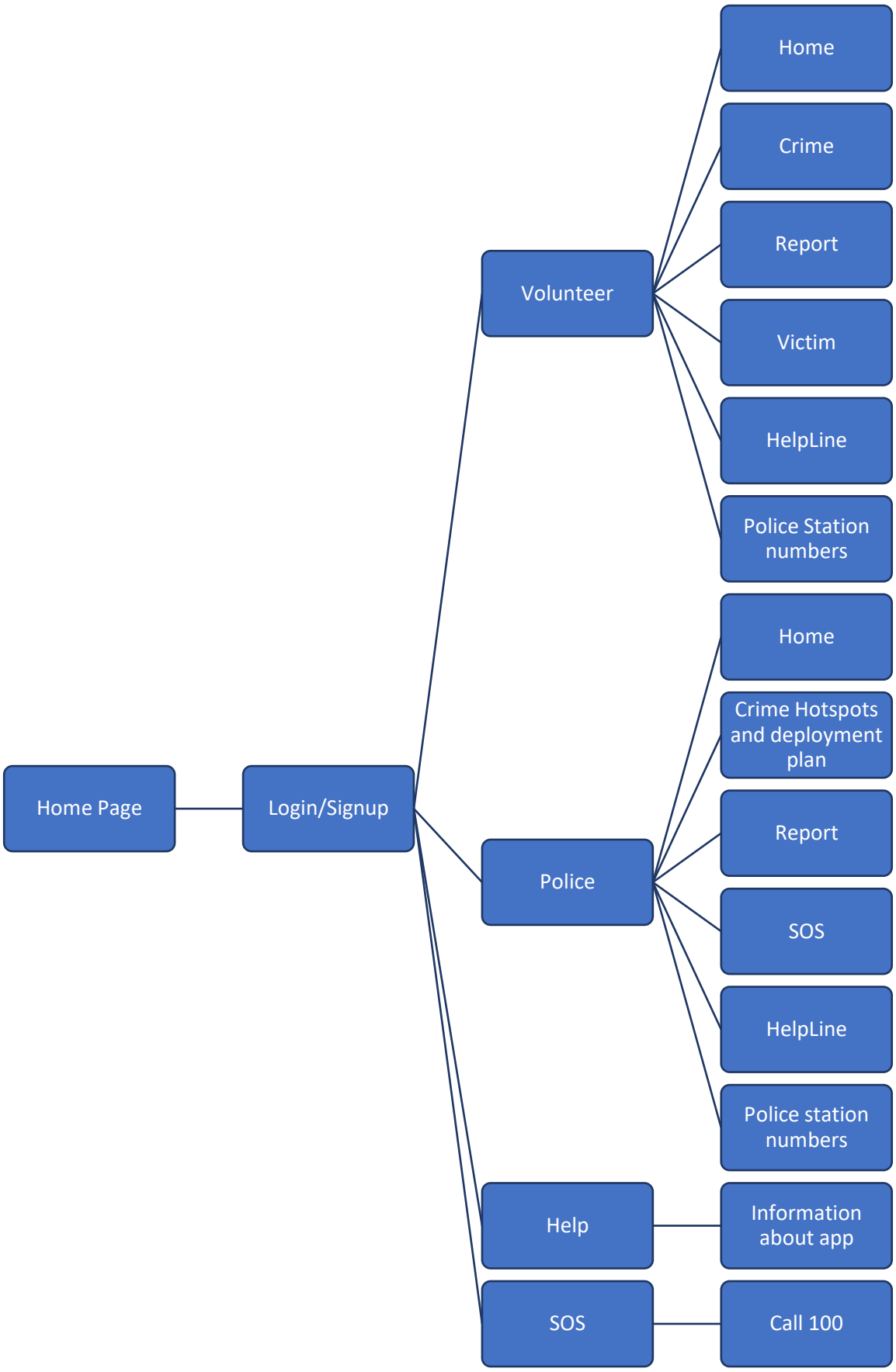
11. Future Enhancements

- Adding Aadhar verification, login without password.
- We also want to use AI to study photos uploaded through this app to help get more information.
- It would also include predicting future crime spots by using historical data that gets entered in this app.
- Making a system that would detect any sudden change in behaviour and using facial recognition to predict if someone would commit a crime.

12. Conclusion

The idea behind this project is that most crimes are predictable thus using a mechanism that would help turn structed and unstructured data into data that can be used to determine crime would turn out to be extremely useful in reducing crime. The more we manage to classify crime the better will be our chances of eliminating crimes.

13. Flow Chart


Home Page
Login/Signup
Volunteer
Home
Crime
Report
Victim
HelpLine
Police Station numbers
Police
Home
Crime Hotspots and deployment plan
Report
SOS
HelpLine
Police station numbers
Help
Information about app
SOS
Call 100

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[3] https://www.researchgate.net/publication/309125859_Crime_Mapping_and_Analysis_using_GIS

[4] https://www.predpol.com

[5] https://www.ibm.com/industries/government/public-safety/crime-prediction-prevention