REAL TIME LOCATION SHARING & THREAT NOTIFICATION SYSTEM

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1.INTRODUCTION

In the context of wide usage of smart phone among the students, "Real-time location sharing service" can be employed in the education system to track the location of students, especially to ensure the safety of girls. Such a service can enable user to share the location in real-time and also to broadcast the location as well as emergency message. In addition, the threat notification system can help in avoiding the places involving high amount of risk.

Now more than ever, women all round the world are being the poor victims of various atrocities, ranging from something as simple as mugging to something as gruesome as being raped. There is a crucial requirement of an App which is both effective & reliable, using which the people, especially women can feel safe. We believe that our Project/Idea, if implemented can be a worthwhile attempt in achieving such a goal.

Could a Mobile Application working on "Real Time Location Sharing" provide a Sense of Safety & Security for women all around the world, and if so how Precise and Reliable could it be?

OBJECTIVES

1. To develop a Location Tracking & Sharing System which includes a Reliable & Secure Server – Client System for exchanging Location Data.

2. To Develop Threat Reporting Feature that can be used to collect various Threat Reports from the users which might have occurred in different locations & this information can be used to flag those particular locations Unsafe. Using the same Informationa1 Warning/Notification is sent to the other Users in proximity of Unsafe Locations.

3. To Ultimately Develop a Windows Application this is both Reliable and Precise. Will be using Crowdsourcing, as it is a very reliable means to obtain data related to unsafe locations directly from the Service Users.

2. LITERATURE REVIEW

The Concept of Crime mapping has begun a short time ago and gain significance as a crucial tool in crime and justice. Going back 10 years, very few criminal justice agencies had potential for creating crime maps and few investigators had the resources or the tolerance to study the spatial distribution of crime. However, today, crime mapping has become an explosion of curiosity among both students and Analysts. The Occurrence of Crimes is not organized uniformly or randomly in space as well as time. Accordingly, the crime mappers can decode these spatial patterns and lead for a better understanding of how geography could play a part in materializing Real Time crime prevention technologies that focus on particular places. The development of crime mapping has started a new generation in spatial criminology 2 The Distribution of Crime varies significantly when we consider two diversely occupied and maintained places like an upcoming town and a hugely developed city. If not for the problems such as poorly lit streets, lack of protective surveillance, unsecured vehicles and steady inflow of wealthy tourists, many convicts would not be as encouraged to commit crimes.

EARLY STUDIES

The earliest studies that notably studied the role of natural science at intervals the distribution of crime currently place into thought varied abstraction relationships. Both Quetelet (1842) and Guerry (1833) studied the nationwide statistics for France, everywhere that higher property crime rates were in the main reportable in affluent locations. Shaw and McKay (1942) resolved this issue by mapping juvenile offenders by hand for town, Chicago and different major cities. The time and energy that went into every info assortment and address verification for the creation of their map showing individual dots for the distribution of 5,859 lawbreakers in town (1942) is just too hard to gestate even today. As a gift for his or her diligence, McKay, Shaw and their students checked that samples that they had discovered earlier in Chicago city. The samples confirmed that crime rates altered by zones of region properties, and were the direct results of city enlargement and migration patterns at intervals varied cities.

Crime hindrance needs criminal justice agencies to be proactive instead of being reactive, and therefore the undeniable fact that it needs the flexibility to predict crime hotspots and concentrations of a similar. this kind of Prediction isn't potential from separate events, so there's an immediate link between hindrance and patterns of Page 8 of 46 guiltiness, within the kind "prevention needs proactivity needs certainty needs patterns" and therefore the importance of characteristic patterns as a forerunner to effective crime hindrance has been determined by analysts United Nations agency acknowledge the flexibility of crime mapping to spot patterns and hotspots, taking advantage of Tobler's 1st rule of earth science that states "Everything is expounded to everything else, however close to things additional connected than distant things"

EARLIEST APPLICATIONS

DEVELOPED:
STAC Program: The spatial and Temporal Analysis of Crime (STAC) program is of the widely used hotspot mapping applications. It utilizes "standard deviational ellipses" to show crime hotspots on a map and doesn't pre-set spatial limitations. However, some studies shows that STAC might not be as correct as they claimed, the rationale being hotspots don't naturally follow the form of ellipses. The construct of thematic mapping is one more notable hotspot illustration technique. Boundary square measures are used because the basic mapping components in thematic mapping. Compared to purpose mapping, spatial details and combination information is employed by thematic mapping. Kernel density estimation (KDE) aggregates purpose information within a user-defined radius and produces an eternal surface to denote the thickness of points. This prevail the limitation of geometric shapes however yet need applied mathematics strength that may be valid within the map created.

Esri ArcGIS: Esri ArcGIS is the highest utilized Geographic info Systems (GIS). It contains a Hot Spot Analysis tool cabinet that gives users the power to investigate the existed hotspot Page 9 of 46 within the input spatial dataset. Specially, Hot Spot Analysis can compute a data point and result z-scores and p-values for the spatial areas (polygons within the map) tell the applied math importance of the spatial areas. A plane figure can have a high worth of the target attribute and be enclosed by different polygons with high values so as to be a statistically important hotspot. The native total of attribute values for a plane figure and its neighbors are equate proportionately to the total of attribute values of all polygons. Once the native total is extremely totally different from the expected native which distinction is simply too giant to be the results of random probability, the plane figure is taken into account as a hotspot.

Global Positioning System Technology:
The Global Positioning System (GPS) consists of 3 sections: The area segment (that is that the GPS satellites themselves), the system section, and therefore the user section. The area section (GPS satellites) incessantly broadcast their info victimization radio signals. The radio signals travel at the speed of sunshine. It's shown that GPS signals right down to -155 dBW might be non-heritable with none help information or the necessity for a posh FFT (Fast Fourier Transform) post-processing. Any device with a GPS receiver is ready to access the GPS satellites, and it is used for any application that needs the situation coordination.

Graphic Information Systems
GIS (Graphic data System) is employed to look at the hotspot of any sort of crime activities. It's terribly economical software package for distinctive the crime hotspot in a straightforward manner. Victimization this read the local department will establish areas with high crime concentration and in future may offer higher protection in those specific areas.

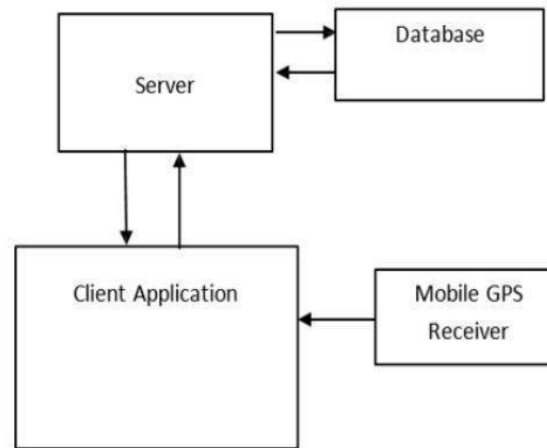## 3.   OVERVIEW OF THE SYSTEM PROPOSED SYSTEM

The planned system aims to alert users on this crimes standing and crime trends and to allow them insights on once and wherever crimes of times happen. This method relays on the period of time and crowdsourcing information and uses cloud computing to investigate and determine the potential crime hotspots. This data is directly integrated with mapping solutions for geocoding. "Microsoft call Trees Algorithm" is employed for classification of crime hotspots. The Microsoft call Trees algorithmic rule may be a classification and regression algorithmic rule provided by Microsoft SQL Server Analysis Services to be used in prognosticative modelling of each distinct and continuous attributes.

We use various APIs present in current mapping applications such as Google Maps to implement the core maps feature to provide the most accurate data what we can obtain regarding the geographical location mapping. We provide dynamic location tracking as opposed to the static location mapping that is present in other services such as Google maps and Here maps.

We provide notification pop up service when the user triggers or remains ambiguous in a certain location for extended periods of time. We also provide the option to enable the location sharing options to certain users that the user can trust and

make the data available for the specified period of time. One of the main motivations behind this system is crime prevention, this can be achieved by a crowd sourced data or danger zones and unsafe areas that can be maintained in a main database and alerted when suspicious activity takes place regarding a certain user

System Architecture:

Mobile GPS Receiver:
Upon request from client application, mobile GPS receiver traces the location of the user and the corresponding longitude and latitude is forwarded to the client application. The GPS module uses 3 methods to retrieve the user location.

1. Wi-Fi network

2. Mobile network

3. Satellite

Client application:
It receives the GPS coordinates from the mobile GPS receiver and sends the information to the server. Likewise, it also receives the location information from other users via server. It provides user friendly interface to accept input from the user such as login information and various controls to interact with maps.

Server:
The server acts a mediator between different client applications. It receives the location data from client application and stores in a database. It also forwards the location data to the client application on request of the user. It provides user authentication and secure data transmission. Furthermore, it acts as the platform for system administration and provides appropriate insights from the gathered data.

Database:
Database and servers interacts with each other for storage and retrieval of data. The database stores the data in a unified schema. Alongside the location data, other user related information is also stored in the database.

4. METHODOLOGY

A software development life cycle (SDLC) also known as application development process is a structure which is used to develop a software product. It describes the process of planning, analysis, design, implementation, testing and maintenance. We can apply this concept to software configuration, hardware configuration or combination of both. The software development process which we used in this project is waterfall model. This model consists of different stages which are as follows:

1. System requirements or system analysis:

2. System design

3. Implementation and Integration

4. Testing

5. Deployment or Installation

6. Maintenance

5.RESULT AND DISCUSSIONS

Let us consider 4 test cases in this scenario. Those scenarios being Enter invalid login details, Location service is disabled, User is in block list, User enters invalid details for registration. Now let us consider each case individually.

Test Case 1: When the invalid details are entered, the system asks the user to re-enter the login details because the user authentication has failed.

Test Case 2: In the case of location service being disabled, the system prompts the user to enable the location service which is carried by an error message pop up.

Test Case 3: The system has successfully hid the location details of the user who had been added to the block list.

Test Case 4: In the case of invalid details provided for registration the user is prompted to check the information again.

Test Case for client application

Test Case #	Test Case Description	Expected Result	Pass/ Fail	Actual Result
01	Enter invalid login details	User authentication fails and asked to re-enter the login details	Pass	User is not authenticated
02	Location service is disabled	Prompts to enable location service	Pass	An error message is shown and asked to enable location service
03	User is in block list	User cannot access the location formation	Pass	The location information is not shown
04	User enters invalid details for registration	The entered details should be validated before send them to the server	Pass	User is prompted to check the entered information

6. CONCLUSION & FUTURE SCOPE

Thus this project helps to share location of a user in real-time. This system ensures the safety of women and children. By using this application, the user can track the status of the shipment or the delivery to be received. Thus it is very helpful in e-commerce as well. This system can also be helpful to share an address or location with friends, contacts or delivery crew to reach us without a hassle. As there is a wide usage of smart phone among the youth especially the students, this service can be introduced in the education system to track the location of students, most importantly to ensure the safety of girls. The client application is installed on the student's mobile and set to track the location and is seamlessly uploaded to the server using advanced real-time communication techniques. A user can also share location periodically with few time gaps and also with a certain group of users. The user can trigger emergency threat message that has location information in order to broadcast to the college management, parents and to the nearby police station. In the near future we can also use this system to provide relevant information regarding nearby emergency services such as police station, hospitals etc. The data stored on the server can be mined and used in the future to solve such cases if reported. Police department can use this data to identify the locations with high frequency of threats and incidents in order to increase the security in those particular locations.

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