

Smart Anti-Theft Solution for Android Devices

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Abstract - His request suggested an Android-based method for setting up a practical smart phone anti-theft system that can be used to reveal information about Supporter Identity Module (SIM) cards, transportability and region data via the Global Positioning System (GPS), send the obtained range using Brief Message Service (SMS), pass the guilty party as flexibility information to the comparing versatile chairman to provide the convenient number, take pictures of the guilty party using the camera of the stolen phone or the picture of the blameworthy party taken by the portable chairman, and exchange the information with the police/appropriate master to identify the guilty party of a smart phone burglary. SQLite database, Java programming language, and Android Studio IDE were used to create the system. The system evaluation was conducted using an outline that was integrated into the developed anti-theft system. On average, almost 80% of the participants thought the framework was fundamental and necessary.

Key Words: Global Arrangement System; Endorser Character Module; Anti-Theft System; Brief Message Advantage; Smart phones.

1.INTRODUCTION

A smart phone may be a multipurpose personal computer with a highly adaptable operating system and features that are useful for portable use. These days, smart phones are arguably the most coveted possession. They are becoming more innovative and provide a greater number of features than landlines [1]. One can use a smart phone to send and receive incite messages, as well as to make and receive audio and video conversations. Among its features are digital assistants, event planners, media players, computer simulations, a geological positioning system, front and rear cameras, and updated camcorders. The ability to communicate with anyone via video conferencing, email, and other means is a benefit of smart phones. Additionally, it allows the office to keep phone numbers, which reduces the need for the record structure to store contact information for individuals [2]. Undoubtedly, it is possible to steal a smart phone and successfully uncover the secret data stored on its memory. Perhaps the most wellknown criminal skill in developing nations is smart phone robbery. Customers of these smart phones can take a few precautions to reduce the risk of their device being stolen,

and in the event that the most worst scenario occurs, the hacker will not be able to access the sensitive information stored on the device. An anti-theft system could be a tool or technique to prevent unwanted access to one's assets. It increases the likelihood of recovering stolen devices and reduces smart phone burglaries. This term paper suggested an Android-based method for creating a portable smart phone anti-theft system that can be used to locate Endorser Character Module (SIM) cards, locate an area using the Worldwide Situating Framework (GPS), take pictures, transfer the images to a different email address, and send the obtained location to the relevant authorities to track down the perpetrator of smart phone robbery. The remainder of this term paper is structured as follows: The writing evaluation was examined in Section 2; the anti-theft system strategy is depicted in Fragment 3; the development and discussion of the suggested system are contained in Portion 4: and the show work's findings and future work headings are included in Portion 5.

2. LITERATURE REVIEW

Within the anti-robbery application inquiry range, several investigations have been conducted. A clever method was developed by the creators [3] to monitor the Android operating framework area. The inquiry provides a fantastic overview of how Google Maps can be synchronized with a global positioning system designed to track devices using latitude and longitude data. These values were then used to determine the Android device's current location. This interaction offers the overview of the predetermined location where customers can choose their starting place by writing the area's title and locating the Android device's run from the starting position. Using location-based administrations (LBS), researchers [4] developed a flexible following system for locating companions and obtaining messages when companions are nearby. Crossover area plans that coordinate network-based and satellite-based signals are combined in this article. With the help of the framework chairman, this framework enables area following by using the distance maintained between the devices. In a sense, this utility operates in open areas. A smart phone application that uses a brief message service (SMS) was designed for a comparative research by [5]. This app assisted by informing the smart phone's unique owner of the current SIM number that the criminal had entered.

The application will alert the new number registered when the subsequent smart phone application is installed following the replacement of the SIM card. A modern, high- tech global positioning system device locator that updates the location of the stolen smartphone every ten minutes and notifies the owner via email if the location changes was also suggested by the newspaper.

The researchers also developed a location-based advantage mobile application for Android smartphones [6]. The program used satellites or the vendor structure of the smart phone to retrieve smart phone areas. Using location supervisor, area supplier, and area audience, the study also demonstrates some Android regions application programming interfaces (API). According to the researcher, there are a few issues with the LBS, including the country's network congestion and the absence of a wi-fi network extension.

An area-based Android advantage application was proposed by authors in [7]. Among the many components of the application are outline view, outline movement as well as an application programming interface that is based on areas. Additionally, the program features a multi-layer overlay that enables users to take pictures, draw tools, and add strings to the outline. Networks and record structures of the application base are used in the outline. Based on the outline movement, a movement life cycle is developed that is in charge of monitoring and managing every string in the program. [8] proposed an anti-theft system based on Android.

Interactive media information services, which are limited to short-term information services, are among the variety of services used by the architecture. The architecture is supported by the hardware of the Android- based smart phone, including cameras as well as mixed- media communications capability. By keeping track of SIM changes over time and storing the unused SIM number in a variable, the application runs on the basis of the gadget foundation. The application used GPS to track a lost or stolen mobile phone in a covert way, even though it lacked the crucial anti-theft feature of automatically erasing sensitive data. Every time the portable device's SIM card is changed, the software records a video and takes pictures. After that, it sends an MMS containing the previews to the email address and backup mobile number that were provided during setup. The fact that the program only works when there is internet connectivity makes it restrictive.

A portable terminal anti-theft following mechanism for Android smart phones was also developed by [9]. The tool follows the whereabouts of stolen smart phones and naturally destroys disengaged data. Advances are used in this paper to realize the further SMS and backstage observation. The tool follows the whereabouts of stolen smart phones and naturally destroys disengaged data. This article uses developments in SMS and backstage observing to implement the anti-theft following framework's further SMS management work. There are three modules in the framework.

3. PROBLEM STATEMENT

The expansion of portable gadgets has revolutionized communication and efficiency, but it has moreover driven

to a critical rise in portable burglary occurrences. Each year, millions of smart phones are stolen, coming about in money related loss, compromised individual information, and potential security dangers to clients. Existing security measures like Stick locks and gadget following apps offer restricted security and regularly fall flat to anticipate burglary or encourage gadget recuperation effectively. There's a basic require for an progressed Anti-Theft Versatile Framework that gives comprehensive security highlights, such as farther locking, GPS following, and information wiping, to discourage burglary, secure touchy information, and increment the probability of recuperating stolen gadgets.

4. METHODOLOGY

The anti-theft framework comprises of different components that work together to fulfill the system's destinations. These components incorporate a Supporter Personality Module (SIM) card, a portable phone, a database, a versatile camera, and a Worldwide Situating Framework (GPS).



Figure 1: Android-Based Framework for Anti-Theft

Features like SIM card exchange detection, GPS location retrieval, camera capture and email transmission to an exchange email address, and Brief Message Service (SMS) location transmission in the event of a compromised web connection are all included in the platform's anti-theft software. Additionally, it has tools for tracking the smartphone that is connected to the software. Figure 1 shows the design of the anti-theft system.

The proposed anti-theft application for Android gadgets requires starting setup counting the enrolment of the user's portable number, an substitute portable number (not put away on the smartphone), client secret word, e- mail personality, and an interchange e-mail ID. These client subtle elements are securely put away within the application's database. The framework utilizes three strategies to track the area and recognize the culprit of smart phone theft.

The to begin with strategy includes utilizing the special number of the SIM card to distinguish unauthorized utilize. In case the SIM card is changed, an SMS caution is sent to the enlisted interchange phone number. This caution is activated by a jumble between the unused and already enrolled SIM card numbers, utilizing



the Coordinates Circuit Card ID (ICCID). This occurs promptly after the smart phone's proprietor reports the robbery through the application's web interface.

The moment strategy utilizes GPS to find the stolen smart phone based on its special Worldwide Versatile Equipment Personality (IMEI) number. The area information is at that point sent to the interchange mail ID indicated amid registration. Clients are prompted to get to this mail account from a gadget other than their smart phone. Additionally, the thief area facilitates (scope and longitude) are given to the versatile administrator to assist identify the thief's portable number inside a certain run. This data can be utilized by police or significant authorities to track down both the smart phone and the thief.

The third strategy includes capturing pictures of the cheat utilizing the stolen phone's front and raise cameras. These pictures are at that point sent to the user's interchange enlisted mail ID or to the police, utilizing pictures captured by the versatile administrator at the time of SIM card enrolment. The combined information of the area, the thief's versatile number, and the captured pictures are sent to the police or fitting specialists to help in securing the smart phone thief.

4.1 Haversine Algorithm

One effective method for determining the distance between two points on a circle's surface is the Haversine equation. In this study, the smallest distance between two locations using their GPS capabilities is found using the Haversine calculation. The deliberate elimination of the inputs—the scope and longitude of the two foci—is the strategy's yield.

4.2 Putting the Anti-Theft Framework into Practice

The Android Studio IDE was used to create the Android application for the smart anti-theft system. The client UI was modified using Java, and information obtained from the front conclusion is stored in a SQLite database. Serverside scripting was conducted with PHP, and compatibility of data was promoted with JSON. The application was hosted in an Android smart phone environment.



Figure 2: Utilize Case Graph of Versatile Smartphone Anti-Theft System.

The utilize case chart, appeared in Figure 2, outlines the method for an authorized client to enlist and log in, providing points of interest such as title, e-mail, and secret word. After enrollment, the framework prompts the client to enter an alternate phone number, which is set to get SMS notices for account exercises and SIM changes Additionally, the authorized client gets reports containing GPS arranges and depictions to their enrolled email address.

- 1. Essential strategy :- Within the Essential strategy, the framework utilizes the special SIM number to recognize the authorized user. A Endorser Personality Module (SIM) is an coordinates circuit designed to safely store the Worldwide Mobile Supporter Personality (IMSI) number and its key, which authenticate subscribers on portable gadgets like phones and computers. Each SIM card incorporates a special ten-digit number. In case a phone is stolen and the SIM card is replaced, the modern SIM number will not coordinate the enrolled number, activating an alarm message and enacting a background benefit that sends a notice to an substitute number. This strategy encourages the simple area of the stolen smart phone. The Anti-theft Versatile Security application informs the client when such an occasion occurs.
- 2. GPS Area :- The moment strategy includes utilizing the mobile's interesting Universal Portable Gear Identity (IMEI) number to track its area through GPS administrations. On the off chance that the portable phone is misplaced or stolen, the application activates GPS and the versatile arrange to send the area to the user's mail at one-minute intervals. This permits the client to physically find and recover the misplaced mobile.
- **3.** Cheat Depiction :- When a phone is stolen and the SIM card is supplanted, the jumble between the modern and old SIM numbers triggers an alarm. This alarm actuates the phone's cameras to capture pictures and recordings, which are at that point sent to the enlisted substitute contact and e- mail ID. This strategy improves the capacity to recuperate a stolen mobile phone by giving visual prove of the thief's identity.

Functional Modules :-

The framework comprises a few useful modules:

- Registration Module: Clients can enroll with their title, phone number, e-mail ID, and password.
- Login Module: Permits clients to get to their account securely.
- Location Tracking: Tracks and overhauls the area of the portable gadget utilizing GPS.
- Picture Capturing: Captures pictures and recordings through the front and raise cameras upon unauthorized SIM change.



• Status Upgrade: Informs the client of any changes or occasions related to the security of their portable device.

User Interaction :-

- Clients must enroll on the application to set up their profile.
- Within the occasion of a misfortune, users can log into the net application and report the phone as missing.
- The application will then automatically take photographs and send GPS arranges to the internet app, empowering the client to track the phone.
- The application will automatically activate and update the phone's status if the SIM card is replaced.

This all-encompassing strategy ensures that customers have various tactics to protect their device and recover it in the event that it is stolen.

5. EXISTING SYSTEM

There are numerous accessible frameworks that give security for smart phone clients to secure their phone from being stolen and it can be effectively recoup in case it is stolen. One of the available frameworks is "Where is my Android", clear see of my app will assist you discover your gadget. When your phone is misplaced, it'll send a uncommon command to create your phone ring, indeed on the off chance that you keep it in noiseless mode, you'll get numbers from that phone and will give your phone with GPS. You'll be able control your phone by interfacing it to the chosen chief. You can effectively erase or bolt your imperative information to anticipate it from being abused. The advantage of this app is that it ensures private data and makes misplaced phone ring mode indeed in quiet mode. Be that as it may, they cannot allow exact data around the cheat. Another app is "Android Misplaced", not only is the perfect for finding a misplaced phone, it moreover makes the cheat hopeless. You'll empower the alert to sound and tap the screen, empower GPS, WiFi association and delete the SD card and it'll grant you a modern cheat list. The great thing approximately this app is that it provides unused contacts, but on the off chance that the phone makes a cheat, the app will moreover be erased.

6. SYSTEM PROPOSED

The essential objective of our procedure is to pinpoint the area of a lost phone utilizing GPS technology and to watchfully capture pictures and recordings of the cheat utilizing the device's front and raise cameras. The gathered areas, photographs, and recordings are at that point transmitted to another phone and mail address. The area of the misplaced phone can be seen on the foremost later form of Google Maps, which is sent from the reinforcement number. When this application is introduced on a versatile phone, it records your mail ID and reinforcement phone number and continues to function within the foundation. It too stores the SIM number. In the event that the SIM is supplanted, the app compares the unused SIM number with the one enlisted, recognizes any alter, and sends a light ruddy caution to start tracking services. These administrations at that point begin capturing previews and recordings of the cheat and send this information together with the location to the enlisted mail ID. Within the occasion of a SIM alter, the user's information is sponsored up, and their confidential data is safeguarded.

7. RESULT AND DISCUSSION

The app transmits the device's area to a preregistered interchange number, encouraging the recovery of the device. It moreover starts an programmed information reinforcement, permitting clients to get to their information remotely. Also, the app captures pictures through the device's camera, helping within the distinguishing proof of thieves.

The improvement and sending of the Anti-Theft Versatile Framework (ATMS) have appeared promising comes about in improving the security of portable gadgets and helping within the anticipation and recuperation of robberies. Through comprehensive testing and criticism from clients, a few key experiences have been accumulated, highlighting the system's viability and user- friendlines.

A noteworthy finding from the consider was the successful execution of inaccessible ringing and volume enhancement highlights inside the ATMS application. Clients acknowledged the capacity to remotely enact a boisterous ring on their stolen gadgets, indeed in case the gadgets were set to noiseless or vibrate modes. The include that continuously increments the volume was especially valuable in finding gadgets that were lost or stolen in boisterous settings, such as crowded regions or active city situations. These functionalities enormously made strides the chances of recouping stolen devices, in this manner lessening the burden and money related misfortunes related with theft.

Additionally, the integration of GPS innovation given exact, real-time following of stolen gadgets. The ATMS application was able to precisely decide the areas of stolen gadgets, helping provoke recuperation endeavors by both clients and law requirement. This capability was particularly profitable in circumstances where cheats moved or concealed the gadgets, advertising clients vital data to rapidly recoup their property and possibly capture the thieves.

The consider too demonstrated a positive relationship between the selection of additional security measures, such as remote information wiping and camera enactment, and the in general victory of the ATMS in discouraging robbery and securing sensitive data. Clients felt consoled by the system's capacity to ensure their individual information and anticipate unauthorized get to, in this way moderating dangers related to personality robbery and protection violations.

Overall, the comes about emphasize the significance of coordination progressed security highlights and user-centric functionalities in arrangements for versatile gadget antitheft. The ATMS appears critical



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potential in tending to the expanding concerns around versatile gadget robbery and security, giving clients with a vigorous and comprehensive instrument to secure their gadgets and individual data. Future inquire about may point to advance move forward the system's features, broaden its compatibility over diverse portable stages, and survey its longterm viability in reducing episodes of versatile burglary and improving client security and certainty.

8. PROJECT SCREENSHOT



AntiTheft Security	Þ
DND Mode Do not distrub mode	
System Setting Controls the brightness level	
Read SMS Read sms for secure code listening	
Send SMS Send sms for providing emergency services	
Flash Light Needs camera permission for flash light toggle	
Get Location Location permission for getting current location	
Set Code Do not share this code with anyone	
START	

9. CONCLUSION

One of the most common and well-known crimes is burglary. To the detriment of the legitimate owner, people can claim items for their own use without identification. This study proposes an inexpensive and easy-to-use Android-based antitheft system to help recover lost or stolen smartphones. The system detects SIM card mismatching by using the SIM's unique number, location, and mobility data acquired through GPS. If there is no Internet connection, it sends the location via SMS. It also gives the mobile operator the offender's mobile number within a certain range and takes pictures of the offender using the stolen phone's front or rear camera. As an alternative, In order for law enforcement and other relevant authorities to track the smartphone and offender, it uses the offender's photo that was taken by the mobile operator at the time of SIM card registration and sends it to the user's second email address. An online survey that was integrated into the developed system was used to test it. The system's novelty in detecting theft, accuracy, responsiveness, and ease of use were evaluated. While 68.57% and 16.19% of respondents rated the anti-theft system as "Very Good" and "Good," respectively, 11.43% of respondents said it was very easy to understand. A few respondents gave the system fair and mediocre ratings. Future research could focus on adding more security features to the application, even though system testing showed that it could identify smartphone thefts. Moreover, the application is ineffective if the lost smart phone is switched off.

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