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MOBILE PHONE ANTI THEFT SYSTEM

(PROJECT DOCUMENTATION)

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# Preliminary Information

# Title Page

## Certificate

## Dedication

## Acknowledgement

## Table of content

## List of tables

## List of figures

## List of abbreviations

## Abstract

# Chapter 1

## Introduction

## Problem Statement

## Background of Project

## Project Scope

## Architecture

## Significance

## Chapter Organization

# Chapter 2 (Literature Review)

# Chapter 3

## Objective, Activities and Methods, Deliverables

# Chapter 4 (Requirement Analysis)

## Introduction

## Existing System

## Proposed System

## Feasibility

## Technology

## Hardware

## Software

## Economical

# Chapter 5 (Design Techniques)

## Introduction

## Use Case Diagrams

## Class Diagrams

## Enhanced Entity Relationship Diagrams

**1.1 Introduction**

Today, we live in a world of virtual reality. It makes sense to say that none of us can live without our computers and mobiles and other gadgets. With mobile devices becoming more and more essential to survive with, people have started storing more and more confidential data and information on their mobile devices. In most cases, it is the information that happens to be more important than the computer or mobile itself. So, what happens if your mobile or laptop gets stolen or is lost? Wouldn't it be terrible to know that an unauthorized user has complete access to your information? Taking all of this in mind, Mobile Anti-Theft system is developed.

While some stolen mobile phones will wind up in pawn shops, sold on the street corners or in online classifieds, the vast majority of stolen devices are now being shipped internationally. International markets (particularly countries in Africa, Latin America, and Asia pacific) pay a premium for Smartphone’s, with the high demand pushing the prices way up made nearly $4 million in 8 months as middleman selling phones to Hong Kong, where they can fetch as much as $2000 per phone. (Arieanna Schwebber).

Even in Nigeria and Ghana most Mobile users are alarmed at the rate of GSM phone theft in the country, the experience pales into nothing when compared with happens in South Africa. South Africa easily qualifies as the headquarters of telephone theft on the African continent. In the average, Vodacom and MTN receives about 10,000 phone theft a month, no thanks to the activities of GSM phone thieves in down town Johannesburg, Lagos and Accra who make life difficult for cell phone subscribers. [1]

MATS will consist of a number of essential anti-theft features that many other devices do not contain. It will use android built in feature to retrieve the information about the change of SIM on your mobile phone incase its get lost or stolen; this project will also help in tracking down your stolen mobile with GPS and GPRS technology built in most of the smart phones to identify the location of your mobile phone.

**1.2 Problem Statement**

Mobile anti theft system is a project which helps us to track the location of the mobiles, when the mobile user loses his mobile phone. In Africa as well as in many parts of world there are no mechanisms in place which can help the owner of the mobile recover his mobile phone. Herein I propose to develop a system which is autonomous and intimates with the owner via SMS when it detects SIM change.

**1.3 Background of Project**

Currently, Africa now has more than 650 million mobile phone subscribers: that’s more than either the United States or the European Union. And it’s a market that has seen explosive growth. Since 2000, the mobile phone market has grown 40-fold, from 16.5 million, according to the World Bank Ref link: [2]. It is now making sense to say that none of us can live without our computers, mobile phones and other gadgets. In most Africa countries, with Project Topic: Mobile Phone Anti Theft System

mobile devices becoming more and more essential to survive with, people have started storing more and more confidential data and information on their mobile devices. In most cases, it is the information that happens to be more important than the computer or mobile phone itself. So, what happens if your mobile or laptop gets stolen or is lost? Wouldn't it be terrible to know that an unauthorized user has complete access to your information? Taking all of this in mind, the Mobile Anti-Theft system is developed.

**1.4 Project Scope**

1. The Mobile Anti-Theft System will be installed on only mobile phones with Google android operating system.
2. Further on SIM change SMS can be received only if the thief’s SIM has enough currency in it.
3. To get the location of the mobile phone it needs to have GPS built in it. To get the postal address the mobile should have GPS as well as GPRS and be connected to the internet.

**1.4.1 Further improvement of the system can perform the following functionalities.**

1. Functionality of the Mobile Anti Theft system can be extended so that when requested it sends the recent call log through which the owner can contact the recently dialed numbers of thief and get to know more about the thief.
2. I proposed to add functionality later wherein the owner of the mobile can retrieve his data stored on the mobile via internet and can add or delete his personal data on the phone or even lock the phone.
3. Also, I will add functionality for taking the snapshot of the possessor and send it over to the owner.
4. In addition I proposed to make the application accessible in other mobile platforms like iPhone, Symbian, Blackberry and Windows Mobile phones.

**1.5 Architecture**

Project Topic: Mobile Phone Anti Theft System



**1.6 Significance**

Almost every owner of a costly mobile handset fears the nightmare of losing his mobile phone. I have come across many middle class people losing costly mobiles and unable to get back the same even with the help of police officers. And in AFRICA there is no system in place to help such people. Seeing their plight and the upcoming android platform which promises to be present on ever upcoming handset

**1.7 Chapter Organization**

In this report I have briefly described about the introduction of our project. How it works, its limitations, future enhancements. I have also explained about system problem statement and description in which I have specified the issue and the impact of the mobile theft. I have also explained the project background that is the needs for implementing the project. Also, the project scope, objective activities and deliverable were also been elaborated for how the project will work. The system architecture was also explained which shows the diagrammatic pictorial of how the system will interact. I have taken time to explain some literature review of the objective, activities and deliverables on this project.

**2.1 Historical Background about Technology**

Android is a new and very user friendly operating system for mobile devices which includes key applications, middleware and even uses Linux Kernel modified version. (Android, 2013)

Initially developed by Android, Inc., which Google backed financially and later bought in 2005, Android was unveiled in 2007 along with the founding of the Open Handset Alliance: a consortium of hardware, software, and telecommunication companies devoted to advancing open standards for mobile devices. The first Android-powered phone was sold in October 2008 Ref link: [3]

Android is open source and Google releases the code under the Apache License. This open-source code and permissive licensing allows the software to be freely modified and distributed by device manufacturers, wireless carriers and enthusiast developers. Additionally, Android has a large community of developers writing applications ("apps") that extend the functionality of devices, written primarily in a customized version of the Java programming language. In October 2012, there were approximately 700,000 apps available for Android, and the estimated number of applications downloaded from Google Play, Android's primary app store, was 25 billion. A developer survey conducted in April–May 2013 found that Android is the most popular platform for developers, used by 71% of the mobile developer population. [4]

These factors have contributed towards making Android the world's most widely used smartphone platform,[5] overtaking Symbian in the fourth quarter of 2010,[6] and the software of choice for technology companies who require a low-cost, customizable, lightweight operating system for high tech devices without developing one from scratch.[7] Project Topic: Mobile Phone Anti Theft System

As a result, despite being primarily designed for phones and tablets, it has seen additional applications on televisions, games consoles, digital cameras and other electronics. Android's open nature has further encouraged a large community of developers and enthusiasts to use the open-source code as a foundation for community-driven projects, which add new features for advanced users [8] or bring Android to devices which were officially released running other operating systems.

Android's share of the global smartphone market, led by Samsung products, was 64% in March 2013. [9] The operating system's success has made it a target for patent litigation as part of the so-called "smartphone wars" between technology companies. [10][11] As of May 2013, 48 billion apps have been installed from the Google Play store, [12] [13] and as of September 3, 2013, 1 billion Android devices have been activated.

**2.2 Major Android Technology Application Component**

Application components are the essential building blocks of an Android application. Each component is a different point through which the system can enter your application. Not all components are actual entry points for the user and some depend on each other, but each one exists as its own entity and plays a specific role—each one is a unique building block that helps define your application's overall behavior.

There are four different types of application components. Each type serves a distinct purpose and has a distinct lifecycle that defines how the component is created and destroyed.

Here are the four types of application components:

***Activities***

An activity represents a single screen with a user interface. For example, an email application might have one activity that shows a list of new emails, another activity to compose an email, and another activity for reading emails. Although the activities work together to form a cohesive user experience in the email application, each one is independent of the others. As such, a different application can start any one of these activities (if the email application allows it). For example, a camera application can start the activity in the email application that composes new mail, in order for the user to share a picture.

An activity is implemented as a subclass of Activity and you can learn more about it in the Activities developer guide.

***Content Provider:***

A *content provider* manages a shared set of application data. You can store the data in the file system, an SQLite database, on the web, or any other persistent storage location your application can access. Through the content provider, other applications can query or even modify the data (if the content provider allows it). For example, the Android system provides a content provider that manages the user's contact information. As such, any application with the proper permissions can query part of the content provider (such as ContactsContract.Data) to read and write information about a particular person.

Content providers are also useful for reading and writing data that is private to your application and not shared. For example, the Note Pad sample application uses a content Project Topic: Mobile Phone Anti Theft System

provider to save notes.

A content provider is implemented as a subclass of ContentProvider and must implement a standard set of APIs that enable other applications to perform transactions. For more information, see the Content Providers developer guide***.***

***Broadcast Receiver:***

A broadcast receiver is a component that responds to system-wide broadcast announcements. Many broadcasts originate from the system—for example, a broadcast announcing that the screen has turned off, the battery is low, or a picture was captured. Applications can also initiate broadcasts—for example, to let other applications know that some data has been downloaded to the device and is available for them to use. Although broadcast receivers don't display a user interface, they may create a status bar notification to alert the user when a broadcast event occurs. More commonly, though, a broadcast receiver is just a "gateway" to other components and is intended to do a very minimal amount of work. For instance, it might initiate a service to perform some work based on the event.

A broadcast receiver is implemented as a subclass of Broadcast Receiver and each broadcast is delivered as an Intent object. For more information, see the Broadcast Receiver class

***Intent:***

System messages which run inside the device, various applications notification such as hardware changes like SD card inserted, notifications of incoming data like SMS arrived and even application events are called as Intents. It doesn’t only allow you to respond to such intents but also to initiate other activities or let know when particular event occurs such as suggest WIFI availability when in range.

***Services:***

A service is a component that runs in the background to perform long-running operations or to perform work for remote processes. A service does not provide a user interface. For example, a service might play music in the background while the user is in a different application, or it might fetch data over the network without blocking user interaction with an activity. Another component, such as an activity, can start the service and let it run or bind to it in order to interact with it.

A service is implemented as a subclass of Service and you can learn more about it in the Services developer guide.

**2.3 Services Available under Android Technology**

***2.3.1 Network***

Android based devices are generally with Internet ready. I can take benefit of internet as I wish in any level from raw java sockets to built-in Web browser which is based on Webkit.

***2.3.2GPS***

Most of the android devices have access to GPS which can tell where the device is exactly located on the earth using Google Maps. GPS also helps in locating the desired location where I want to travel and even shows the places around us where I commonly go in everyday life which Project Topic: Mobile Phone Anti Theft System

makes it easy to travel otherwise can be to locate the device and its movements in case the device is stolen

***2.3.3 Phone Services***

Android devices are similar to other phones which are typically used to make calls, send SMS and can be used for multimedia applications to download music anytime anywhere and games and everything else what I expect from a modern telephonic technology.

**2.4 Why I Chose Android Platform and Technology over Others**

1. ***Zero start-up cost to begin development with***

The tool required to develop any android applications is free of cost and Google charge very small fee deal out application in the market. [15]

1. ***Freedom to innovate***

Android OS is an open source platform which is based on Linux kernel and other open source libraries. Moreover are free to build applications which runs on android devices and even free to extend platform as well. (Grell, 2010)

1. ***Freedom to collaborate***

Android developers are encouraged to share code with others and they don’t even have to sign an NDA to do this. According to a survey conducted by Black Duck Software, the amount of open source libraries and mobile applications grew at a rate of 168% faster on Android compared to any other platform from year 2008-2009. (Grell, 2010)

1. ***Multi-platform support***

Android OS are supported on several different hardware devices including various phones and tablets.

1. ***Multi-carrier support***

Android powered smart phones are offered by most of the carrier services.

**2.5 Tracking Record on the Black Market constitute in Mobile Theft**

An insatiable appetite for smartphones has turned the black market into a global enterprise, efficiently sending ill-gotten gadgets wherever demand is greatest. But no one has a complete picture of the size or scope of the black market. One can only catch it in glimpses. In a report for NYPD, Timlin found stolen phones changing hand all over the city. "We saw bodegas, we saw local Laundromats, and we saw back-alley sales," he says. In March, the California attorney general announced the arrests of two individuals who allegedly paid homeless people to buy discounted phones on a two-year contract, and then shipped the devices in bulk to Hong Kong. There, phones can sell for $2,000 each — 10 times as much as in the states. The accused allegedly took in almost $4 million in less than a year.

I hate the guys who do this type of stuff," says Marc Rogers of the online security firm Lookout. He is a hacker who frequents forums where information on the black market for cellphones is exchanged. Project Topic: Mobile Phone Anti Theft System He says that in the global game of cat and mouse, the mouse is usually faster. For example, some European authorities created blacklists, where users could report stolen phones and block them from being used again on other networks.

But Rogers says criminals quickly realized that by shipping devices to foreign countries, they could sidestep the blacklists and probably sell for close to retail price.

Law enforcement tends to focus on thefts on the street and in subways. But Rogers believes police will only make progress when the black market itself is squeezed.

He says the security features in Apple's new operating system, like fingerprint ID and the requirement that you enter a password before resetting the phone, are a good start.

"Ultimately, it would be fantastic if I could get it set up so once a device is stolen, the only value there is from the parts," he says.

New York police will be on high alert when Apple's new iPhone goes on sale Friday. Since the first iPhone debuted six years ago, they've noticed that every new Apple product comes with a spike in street crime.[16]

* 1. **OBJECTIVE**

To research on the issues faced with mobile theft, the growth rate of mobile phone usage as compare to PCs and Laptops, Physical and data Security issue with Mobile phone.

**3.1.1 Activities:**

1. Investigate the trend of World black market activities relating to mobile phone Document the number of stolen mobile phones that wind up in pawn shops, sold on the street corners or in online classifieds.
2. Investigate the number of stolen mobile devices that are shipped to international markets (particularly countries in Africa, Latin America, and Asia pacific).
3. Document the trend of Anti-theft mobile response activities in Africa.
4. Evaluate the use of mobile SMS as an integral part of mobile devices and mobile applications.

**3.1.2 Deliverables:**

1. Data showing the trend of mobile phone theft and re-sale on the world black market
2. Data map showing the number of stolen mobile devices that appear on international markets
3. Information on Anti-Theft Mobile responses in Africa
4. Documentation on the use of mobile SMS by mobile device users

**3.2 OBJECTIVE**

To build an Android client application which will automatically send SMS when SIM card is changed and also when user needs to know the location of the lost or stolen mobile phone.

**3.2.1 Activities:**

1. In this project I am going to examine how SMS technology via the APIs provided by Android can help us in track the location of the stolen or lost phone.
2. This project will get information from the user at phone installation; this information will be used to capture all the information about the phone; like the IMEI which is unique per phones.
3. Get the user relative phone number for receiving SMS in case the phone get lost
4. SMS function which will send automatic SMS text message to an alternate phone number immediately when SIM is swapped on the registered for phone.
5. This app will take the relative phone number at first registration on the platform and store in a database,
6. When the user phone get lost or stolen, then the application will launch the SMS automatic process from the lost or stolen mobile phones with the number the user entered during the registration
7. Finally it will send a “report of a stolen or missing phone” message to the alternate phone.

**3.2.2 Deliverables:**

1. Users registered with unique identification on the application
2. SMS messaging services in the MATS for sending and receiving SMS in a stealthy mode incorporated into application
3. The Application is able to sends Automatic SMS as soon as SIM swap happened the lost or stolen phone in a stealthy mode
4. When requested the application sends the location of the lost or stolen phone via SMS

**3.3 OBJECTIVE**

To design an application by means of which I can track the location of the mobile phone of the desired user when it been stolen or lost.

**3.3.1 Activities:**

1. To track the location of the smart phones.;
2. The project will consist of Android client application which will send an SMS when user requested for the phone location.
3. I am going to use position tracker functionality which works on GPS (Global PositioningSystem) and GPRS on any smart phones. This will be used to fetch the latitude and longitude satellites of the location of the mobile
4. Send the location information and send it as a SMS to the requestor phone from the stolen phone
5. Moreover if mobile is connected to the internet it will retrieves the postal address from Google maps.(ZHANG Hao, 2011) .

**3.3.2 Deliverables:**

1. Use goggle or yahoo position tracker to get the location of the stolen or lost phone
2. Get the location through google map in case the stolen or lost phone has internet connections.
3. Project Topic: Mobile Phone Anti Theft System
4. The application retrieves the location of the lost or stolen

**CHAPTER 4**

**4.1 Introduction on Requirement Analysis**

The Requirement Analysis Documentation is nothing but a method of communicating what the whole project is about. Objective, realistic and complete are the important factors kept in mind while writing satisfactory documentation. The whole process of implementation, operation of system and development is based on a proper documentation. Therefore, the whole idea behind this project requirement analysis document is to represent the bounded physical representation of the body of information what I am trying to design will have the capacity to communicate the intended design of the project. This document produces an artifact by collecting and representing information. This document helps my supervisor to understand about the project in a lucid manner. Its gives an overview of the existing system and how the proposed system will leverage on the existing system and also add its own functionality which is not available on the existing system. In addition, its contains the technology used and the hardware and software use in developing the application. finally, its justify the feasibility of designing the project as relate the economical , technology, behavioral aspect of the entire project, in conclusion it contain the requirements specification document which will be used in designing the prototype of the implementation of the project.

**4.2 Existing System**

There are lot of Mobile Anti Theft software available in the market today, and all comes with their targeted functionality and platform, most effective mobile anti theft software has the basic functions and objective which is to check the position of a mobile phone, but majority of the software lack the main concept of the Anti theft system and the feasibility of detecting theft using the software. Therefore, the proposed anti theft software will cover all the major flaws that those software was unable to capture. Example, the proposed application can be used has a mobile tracker.

**4.3 Proposed System**

MATS would be widely used as people are concerned about their mobile phones. Moreover the software would be designed to use very less memory and the package can be downloaded over internet via google play store. This system can be used by concerned parents to track their children at any moment of time without their notice. Employers can track employees as well.

After owner of a mobile phone install the Mobile Anti theft System on his mobile phone, and the application is put to start by filling all the necessary information like his alternate number, his username and password which will be used to check the state of the phone and update his or her information and commit the information into the application database. When he loses his mobile phone, he waits for SMS from the Mobile Anti Theft Software. When he / she receives that SMS, then he starts corresponding with the Mobile Anti Theft System via requesting or postal address etc, relative of the owner can request for the location of the mobile phone either the mobile phone is lost or not, he acts as the master to the Mobile Anti Theft System; Supposing a scenario wherein the thief hasn't change the SIM, that allow the relative to request for the mobile location.

If in a normal scenario where by Thief changes the SIM of the Mobile phone and reboots the mobile phone. on rebooting the mobile the Mobile Anti theft system will automatically triggered and intimation is sent to the alternate phone number.

I belief the Mobile Anti Theft System would be widely used as people are now concerned about their mobile phones. Moreover I will make the software to be downloaded over the internet with less phone memory usage.

**4.4 Feasibility**

MATS would be widely used as people are concerned about their mobile phones. As I have stated on my investigation on the mobile theft issues faced all over the world. And that all people care for the data and not the phone itself. Since the technology is an open source which is free of cost, therefore, I would not need invest money to develop the application, in addition, with my severy years of experience with developing application under java platform the backbone this development is mainly on java. Therefore, the software would be designed to use very less memory and the package can be downloaded over internet via google play store, and most importantly be intuitive enough to interact with.

**4.4.1 Technology**

**ECLIPSE IDE**

Eclipse is an Integrated Development Environment (IDE) and an extensible plug-in system which is primarily written in Java and Java applications can be created. The Eclipse IDE serves our development environment for designing and testing the application.

**JAVA**

The Primary activities like sensing the phone turn off and on, SIM changed, Available credit on the newly inserted SIM and send message to alternate phone is done with Java Technology under android SDK

**XML**

XML will be used for representing subjective data structures for communicating between the lost phone and the alternate phone by requesting and responding to services request.

**GOOGLE MAPS API**

offers services like street maps, navigation planner for travelling from source to destination by foot, car or any public transport and even helps in locating shops, restaurants , cinema and many other across the world this service will be used to locate the lost or stolen phone postal address.

**SQLLITE DATABASE**

**SQLite**

It will be used to capture information needed to recover the lost or stolen phone, please its act has the data store for request and respond to information require. And it directly embedded into the android phones.

* + - 1. **Hardware**

The hardware requirements for the MATS is an important part of the MATS standard. The requirement is stated below [blue crest college textbook]

1. Any android mobile phones with ARM processor, GPS and GPRS support.
   * + 1. Software

Though the java cross-platform nature of java helps alleviate concerns over the wide range of mobile device operating systems. Even, so the Android specification lays some ground rules about what is expected of the operating system in android devices. Therefore, for are the major software specifications for the proposed system(MATS) [blue crest college textbook]

1. Minimum Version Google Android OS 1.5
2. A mechanism to read from and write to non-volatile(persistent)memory
3. A timing mechanism for establishing timers and adding time stamps to persistent data
4. Sqllite database

These requirements, although are somewhat minimal, still provide a reasonably rich set of features that are available for use by MATS application.

Chapter 5 (Design Techniques)

5.1 Introduction

**5.2 Use Case Diagrams**

Use case diagram here shows the roles of all the people involved in this project. Here in our project we consider 3 cases they are owner, relative and thief.

RELATIVE

OWNER

THIEF

From the above use case diagram we know that the owner can register the details in the database when software is installed and at any point can retrieve the details and if necessary can change it accordingly and relative receives SMS, GPS co-ordinates and postal address whenever the change of SIM is done and thief doesn’t play a role in this but he is related with changing SIM and rebooting as soon it’s done, relative of the owner will get the details accordingly.

**5.3 Data Flow Diagram**

**Foreground**

The foreground includes the user interface of the application. Whenever the user open the application it ask for login and if it’s a new user then ask for user account creation. After the user has created the his or her account, user may never open the application again, if require user can update his or her record this module is only accessible by the user. The application will all run at bootup without the knowledge of the user.

Above is the Dataflow Flow Diagram for the Foreground activity in the application:

Owner Database

Create Account

Owner Database

Owner Database

Owner Database

**Background**

The actual process running on the background is not known to the user. He only enters the required information when registering and saved to the application. Whenever the phone bootup the application will all check the mobile IMSI and if it’s same as the stored data then it doesn’t start any events. In a case if the IMSI stored is not same as current IMSI on the phone, the application will act and perform some events which will occur without the knowledge or without any hint, then sends SMS to the alternative phone number stored by the owner.

Booting

Owner IMSI = current IMSI

Owner Database

Theft Database

Theft Database

Theft Database

Owner Database

Owner Database

5.3 Class Diagrams

5.4 Enhanced Entity Relationship Diagrams

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