
ANTI THEFT APP

A DESIGN PROJECT REPORT

by

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in partial fulfillment for the award of the degree

of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VISWAJYOTHI COLLEGE OF ENGINEERING AND

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of

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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TECHNOLOGY, VAZHAKULAM

FEBRUARY 2021

VISWAJYOTHI COLLEGE OF ENGINEERING AND TECHNOLOGY, VAZHAKULAM

Department of Computer Science and Engineering

Vision

Moulding socially responsible and professionally competent Computer Engineers to adapt to the dynamic technological landscape

Mission

1. Foster the principles and practices of computer science to empower life-long learning and build careers in software and hardware development.
2. Impart value education to elevate students to be successful, ethical and effective problem-solvers to serve the needs of the industry, government, society and the scientific community.
3. Promote industry interaction to pursue new technologies in Computer Science and provide excellent infrastructure to engage faculty and students in scholarly research activities.

Program Educational Objectives

Our Graduates

1. Shall have creative and critical reasoning skills to solve technical problems ethically and responsibly to serve the society.
2. Shall have competency to collaborate as a team member and team leader to address social, technical and engineering challenges.
3. Shall have ability to contribute to the development of the next generation of information technology either through innovative research or through practice in a corporate setting
4. Shall have potential to build start-up companies with the foundations, knowledge and experience they acquired from undergraduate education

Program Outcomes

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
3. **Design / development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes

1. Ability to integrate theory and practice to construct software systems of varying complexity
2. Able to Apply Computer Science skills, tools and mathematical techniques to analyse, design and model complex systems
3. Ability to design and manage small-scale projects to develop a career in a related industry.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
VISWAJYOTHI COLLEGE OF ENGINEERING AND TECHNOLOGY
VAZHAKULAM, 686670



CERTIFICATE

Certified that project work entitled “ **Anti Theft App** ” is a bonafide work done by **Mr. Cijo Manuel** University Register No. **VJC18CS047**, **Mr. Danny Philip Boban** University Register No. **VJC18CS048**, **Mr. Jexin James** University Register No. **VJC18CS065**, **Mr. Rohit Kumar S** University Register No. **VJC17CS097** in partial fulfillment of the award of the Degree of Bachelor of Technology in Computer Science & Engineering from APJ Abdul Kalam Technological University, Thiruvananthapuram, Kerala during the academic year 2019-2020.

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ABSTRACT

Anti-theft apps are applications that are used to retrieve your stolen phone or to track your accurate location of your phone. The apps which are currently available contains a number of limitations that are needed to be fixed. To solve this, we prepared a new updated model of present anti-theft apps. This app can be installed on any mobile device with an app login password and a phone locking password. The app login password can be used for login app and to unlock the locked stolen device. If the device is stolen or missing, we can send the high security password to the sim number which is on the missing phone to switch on the mobile data and use it to find the accurate location of the missing phone. If our device is missing, we can send the phone locking password to our missing device from any phone number, thereby solving the limitation of the Anti Theft Mobile Tracker app where specified number of contacts can only access the location of the device. The app checks every message that are received in our phone and look for the password that matches with the message. If the password matches, the app will lock the device and switch on the data in our phone. Using this data, we can find the accurate location of the device. The Lost Phone Tracker app uses the GPS for tracking the location of the missing phone, which is less accurate than the live location that is found using mobile data. The Mobile Number Tracker Locator app uses the sim card number to find the location of the device, but it only shows the location of the sim number's Telecom location. Unlike the Google's Find My Device, our app can track the location of the device even if the mobile data in our missing phone is off.

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List of Abbreviations

IDE Integrated Development Environment

SSL Secure Sockets Layer

HTML Hyper Text Markup Language

SDK Software Development Kit

SSPL Server Side Public License

NoSQL Not only SQL

Chapter 1

PREAMBLE

1.1 Introduction

Mobile phone is an integral part of our life and it holds our personal data and valuable information. Mobile phones are comfortable way of communication over a long distance. Life becomes so easy and fast by holding the mobile phones. Mobile phones proved to be a big help in emergencies. Mobile phones are also known as lifesavers as helping people in emergencies. If you get stuck in the middle of the road and find no one for help, you can just use a mobile phone and call for help. Along with the obvious convenience and quick access to help in emergencies big and small, mobile phones can be both economical and essential for travelers trying to stay connected. So it is very important to track and get control of our mobile phone effectively if it is stolen or lost. At present there are a number of applications available on android and IOS to track and retrieve our lost or stolen device. These applications use different techniques to track and find lost devices. Some of the techniques used are sim data, GPS , mobile data. But these applications can't track the accurate location of the device if the data connection in the device is turned off. As a result, the user can't find the any information about their device. So, the aim of our project is to design a antitheft application that can track and find the accurate location of the device even if the data connection in the device is turned off.

1.2 Problem Definition

Generally, in the existing systems, most of the anti theft apps can track the lost devices . Our design project is to list out the design flaws of such apps including 'Lost Phone Tracker' app, 'Google Find My Device' app, 'Anti Theft Mobile Tracker' app and 'Mobile Number Tracker and Locator' app. The major design flaws encountered from the above-mentioned applications are inability to find device when mobile data is off, lack of accuracy in the measuring the distance of our lost device etc. So, the aim of our design project is to introduce an Anti Theft app that overcomes the flaws of the existing ones.

1.3 Objective

The objective of our design project is to create an application that can locate mobile device effectively even if the mobile data is turned off, and also uses the SMS service which is an extra feature to lock the device and to make our app free from the flaws of existing ones.

1.4 Scope

The scope of our project is to make an antitheft application that can be used by everyone who are using either android or IOS device to track their lost device.

Chapter 2

LITERATURE SURVEY

2.1 Introduction

Mobile phone tracking is a process for identifying the location of a mobile phone, whether stationary or moving. Localization may be effected by a number of technologies, such as using multilateration of radio signals between (several) cell towers of the network and the phone, or simply using GPS. To locate a mobile phone using multilateration of mobile radio signals, it must emit at least the idle signal to contact nearby antenna towers, but the process does not require an active call. The Global System for Mobile Communications (GSM) is based on the phone's signal strength to nearby antenna masts.

Mobile positioning may be used for location-based services that disclose the actual coordinates of a mobile phone. Telecommunication companies use this to approximate the location of a mobile phone, and thereby also its user. The location of a mobile phone can be determined in a number of ways.

Now a days we have lot of antitheft apps available in the app store to track lost device. Each of the apps have its own characteristic feature for tracking the lost device. We are considering the apps that have been developed by the different companies/individual for tracking android devices. For comparing design features and drawbacks we have selected 4 apps that have been top rated by the users according to google play store. The apps we taking into consideration are LOST PHONE TRACKER, FIND MY DEVICE, ANTI-THEFT MOBILE TRACKER, MOBILE NUMBER TRACKER AND LOCATOR. Each of these apps are analyzed in their design and performance levels .

2.2 LOST PHONE TRACKER

Lost Phone Tracker makes your cell phone safe from getting lost and make easy for you to reach at your phone location. Main features of this Location Tracker are as follows. It can be used to view your current location with GPS Tracker and to track your own lost phone. This application can share “real time location” with your family and friends. The user can change map to satellite view. The user can also see street view with this mobile app. Lost Phone Tracker also provide notification sending feature, you can send message anytime free of cost to your family or friend with just internet connection with this phone locator. Mobile App provides “user friendly” interface and location tracking with map, also optimised for battery usage. Your privacy will be protected with your password in this Location tracker. Lost Phone Tracker was released on September 15, 2012 and the current version of the app is 1.5.

2.2.1 Use Case Diagram

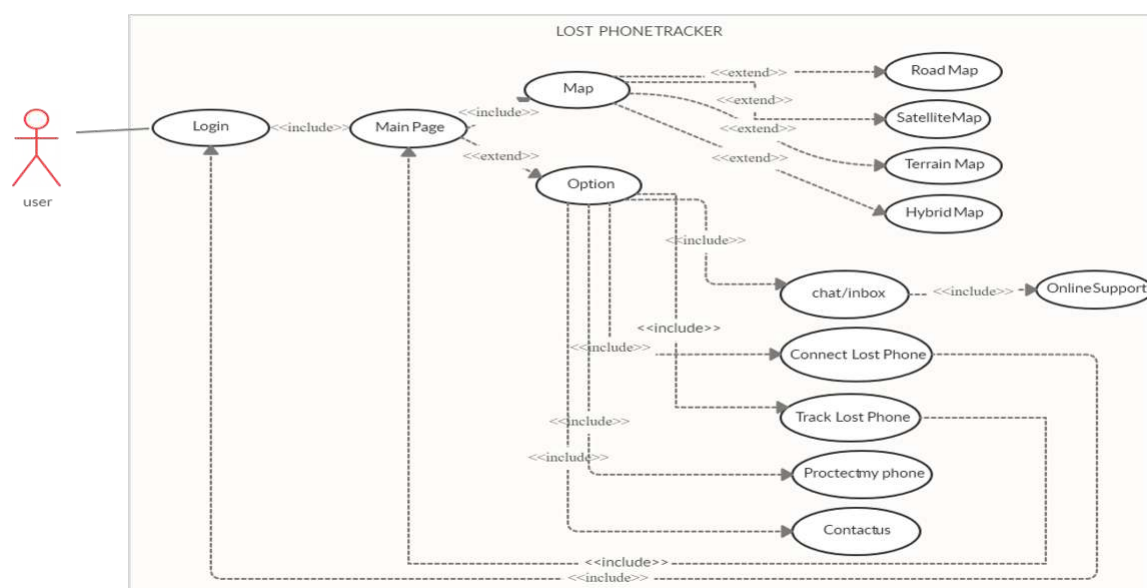
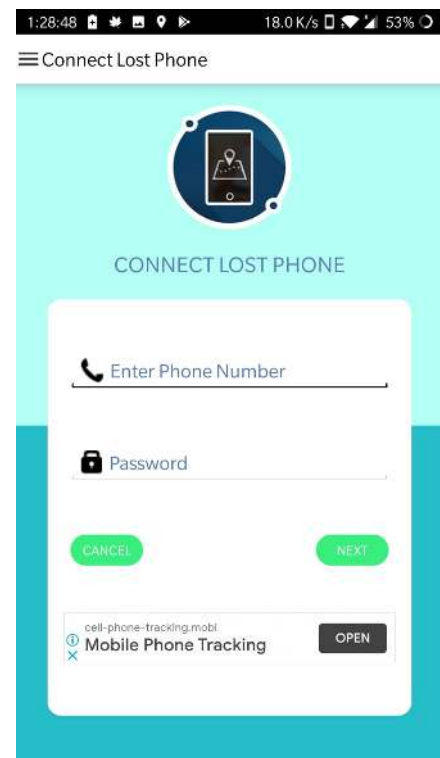
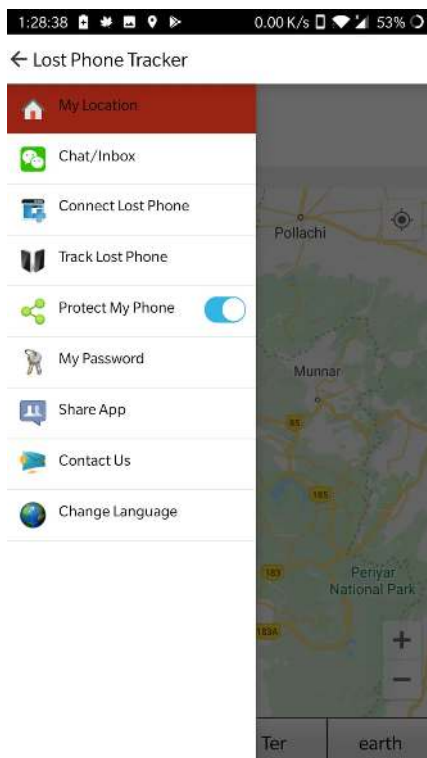
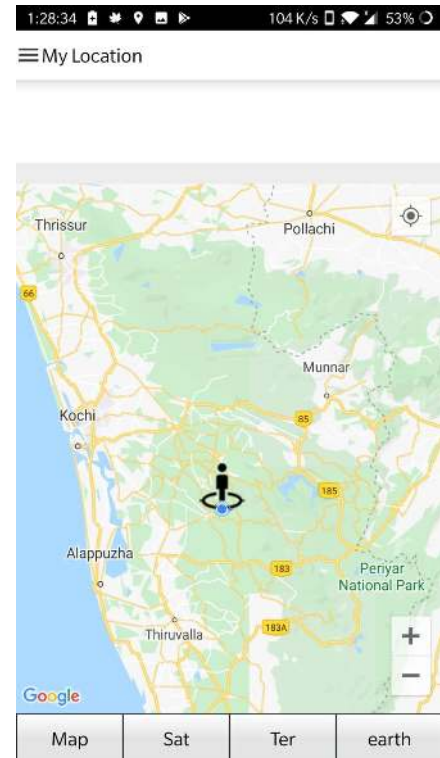


Figure 2.1: LOST PHONE TRACKER Use Case Diagram

2.2.4 Screenshots



2.3 FIND MY DEVICE

Find My Device is an application and service developed by Google to remotely trace, locate and wipe Android devices such as smartphones, tablets and smartwatches, as well as the Pixel Buds. This application uses the gmail id to track the location of device. Find My Device offers different features like device alertor(even if the device is in silent mode), device storage formator, device lock ..etc. It is one of the widely used mobile device tracker in android devices. The only drawback for this application is that, it cannot detect the location of the device if the mobile data in the lost device is turned off. The user interface of this application is very simple and easy to use for a user. The application was released on December 11, 2013 and the current version of the application is 2.4.036 .

2.3.1 Use Case Diagram

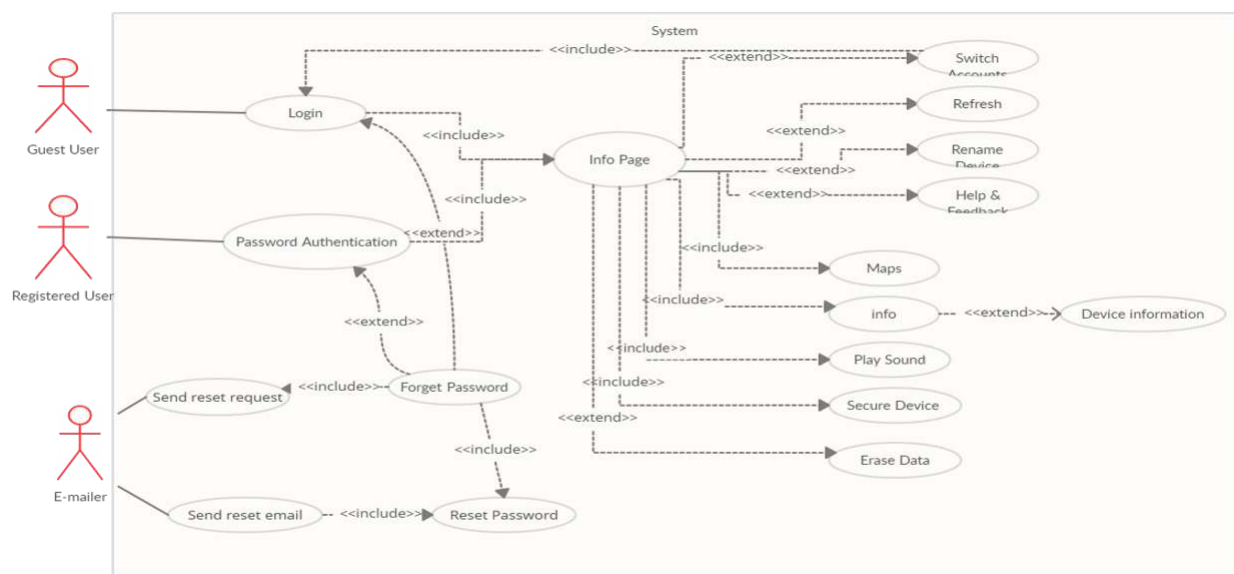


Figure 2.4: FIND MY DEVICE Use Case Diagram

2.3.2 Class Diagram

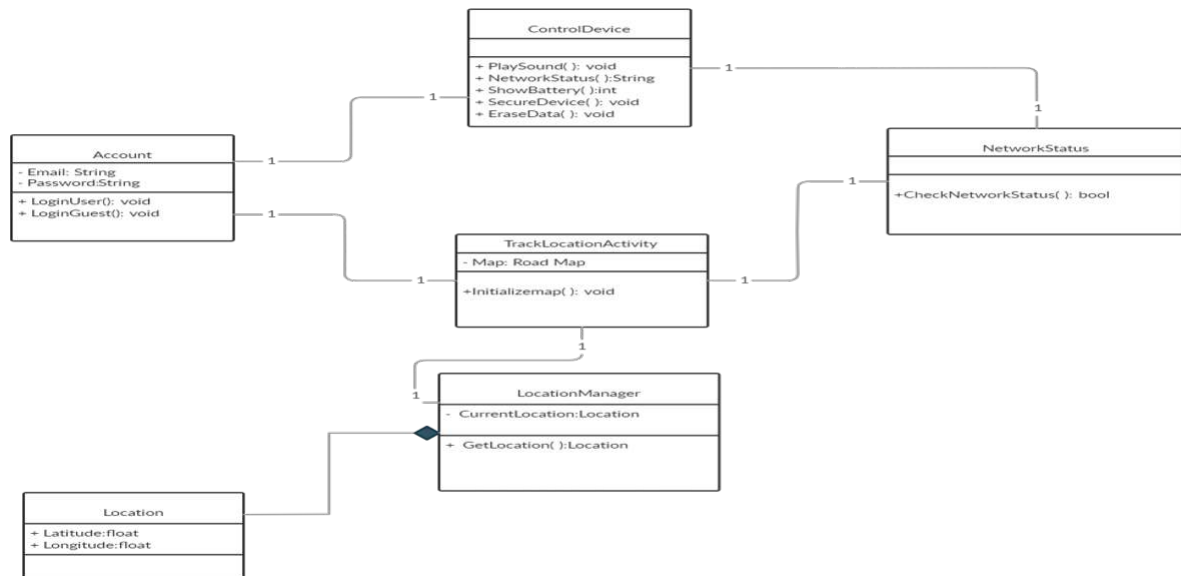


Figure 2.5: FIND MY DEVICE Class Diagram

2.3.3 Entity - Relationship Diagram

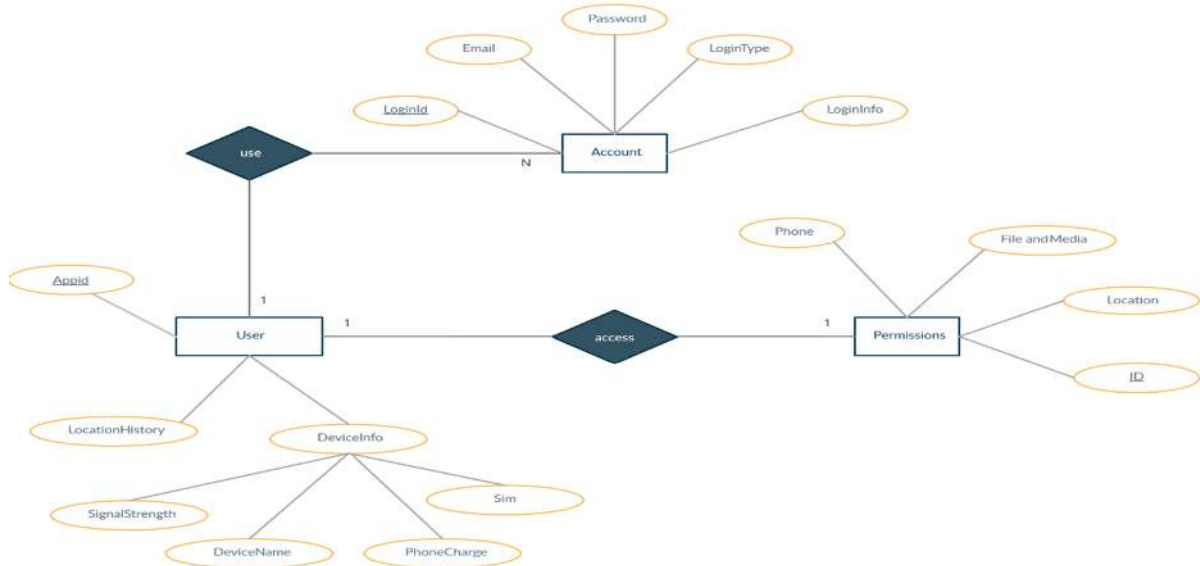
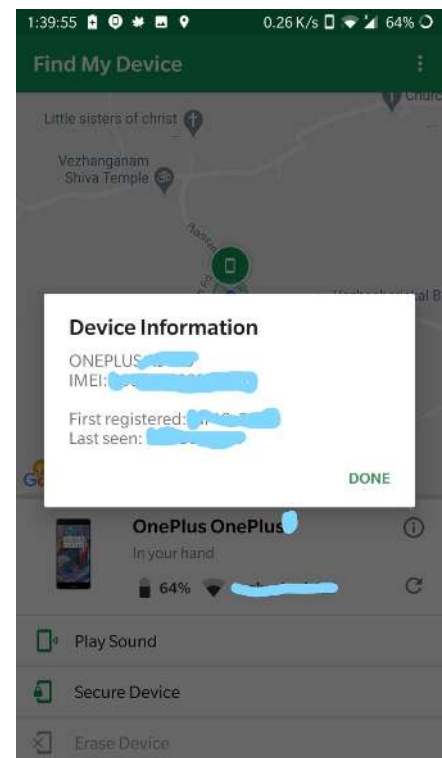
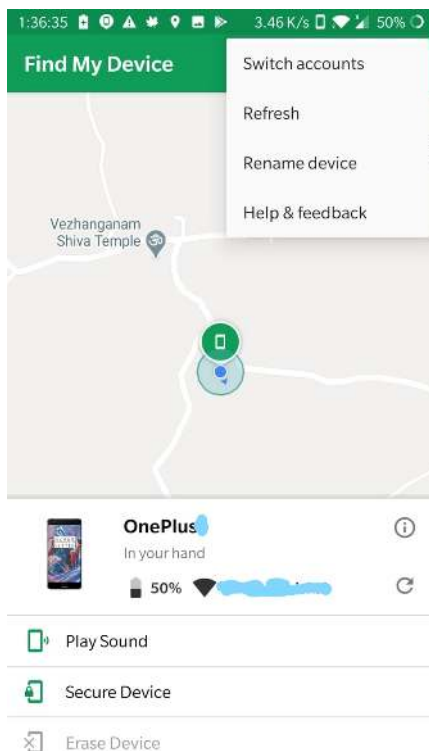
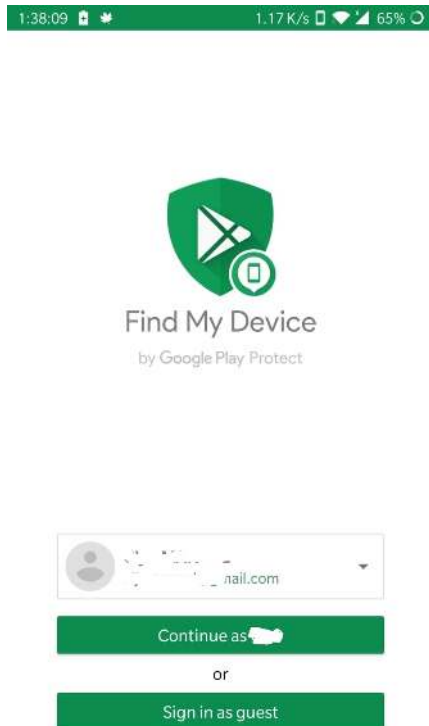


Figure 2.6: FIND MY DEVICE ER Diagram

2.3.4 Screenshots



2.4 ANTI THEFT MOBILE TRACKER

Anti-Theft Mobile Tracker is an app developed by Einzig Technology that helps locate lost Android and lock it until you get it back. It is similar to parenting apps. Anti Theft Device Alarm Tracker provide security feature which sends the lost or atolen mobile location information to recipient mobile phone. Anti Theft Mobile Tracker gives user the power of controlling their mobile phone data and location information in case of theft. No need of internet connection is required for this application. You can remotely lock and delete our personal data. If you have forget to lock or mobile is lost-stolen, by Anti Theft Mobile Tracker, you can lock your phone and protect your data remotely . Anti Theft will also send the location information to recipient number. If you have kept your phone in silent mode , send the alarm code to loud ring it or alarm it in silent mode. The main drawback to this application is that the control features for a device is only allocated to the specific recipient number that is provided by the user. The application was released on 2016 and the current version of the application is 5.3 .

2.4.1 Use Case Diagram

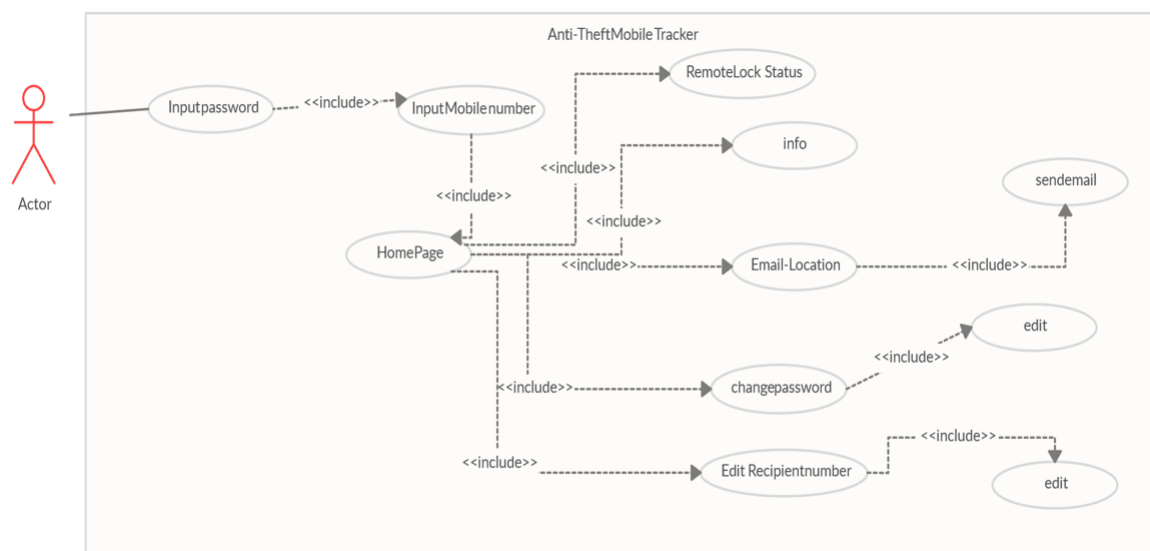


Figure 2.7: ANTI THEFT MOBILE TRACKER Use Case Diagram

2.4.2 Class Diagram

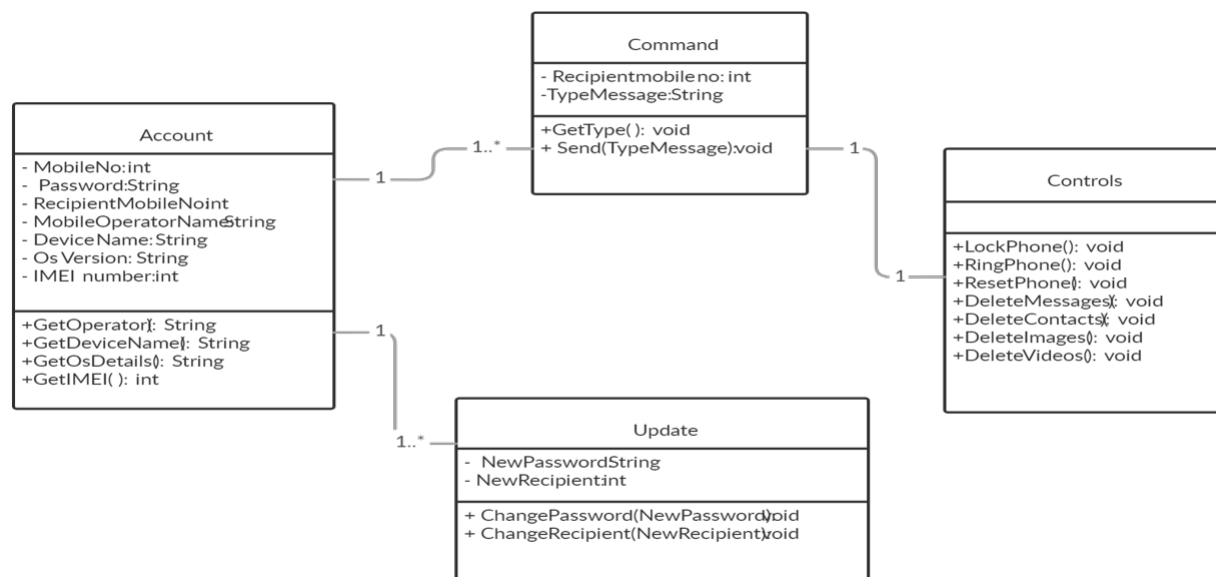


Figure 2.8: ANTI THEFT MOBILE TRACKER Class Diagram

2.4.3 Entity - Relationship Diagram

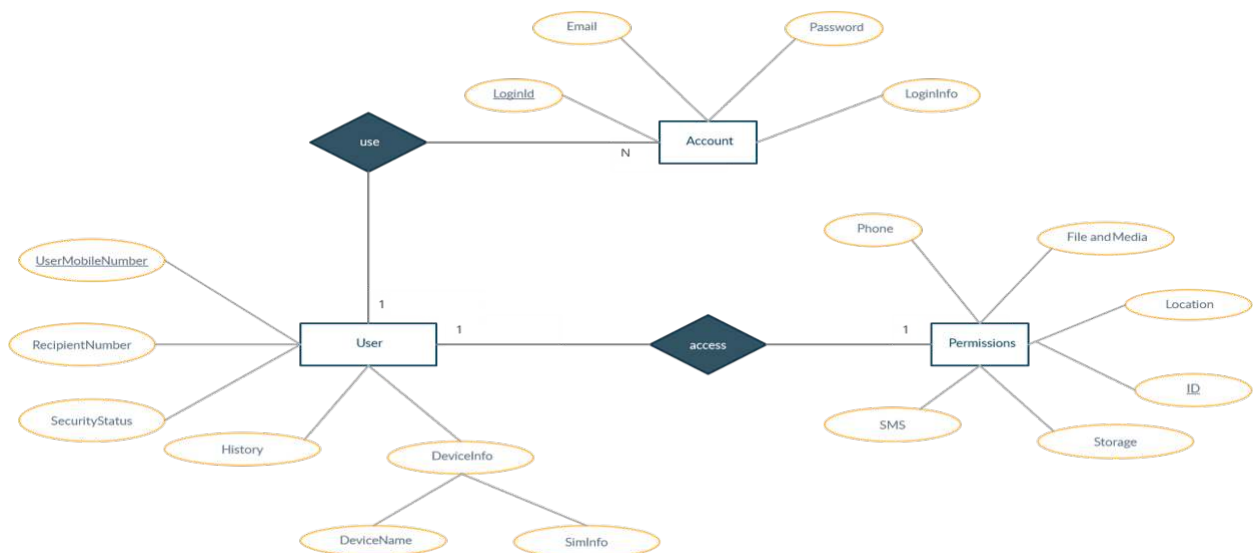


Figure 2.9: ANTI THEFT MOBILE TRACKER ER Diagram

2.4.4 Screenshots



2.5 MOBILE NUMBER TRACKER

Mobile Number Tracker Locator find the location of the device using the sim card inserted on it. The GPS in the device is used for map implementation. This application can be used to search any mobile number details. Mobile Number Tracker provides complete information of any indian mobile number, it's Service provider. This application retrieve information of caller service provider,gsm or cdma,state etc.. The GPS map will locate caller's details like Name,state, carrier SIM and their distance from current location. This application also provides another feature to display the distance between our current position and the mobile number location. Mobile Number Tracker application uses the sim card information to track the location. As a result, the location may or may not be accurate. The application was released on 2015 and the current version of the application is 1.0.9 .

2.5.1 Use Case Diagram

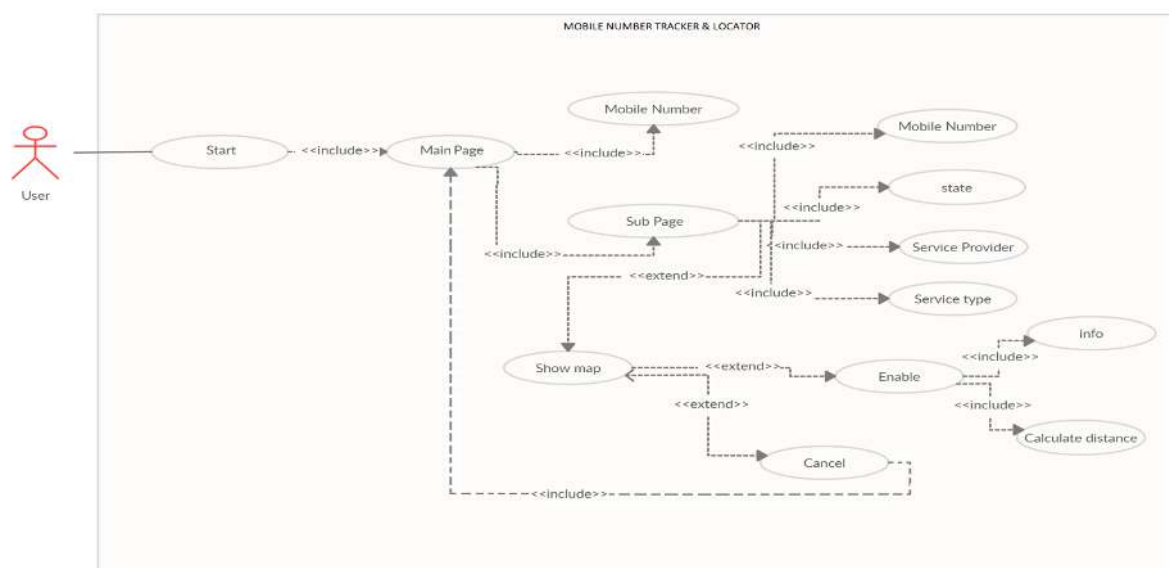


Figure 2.10: MOBILE NUMBER TRACKER Use Case Diagram

2.5.2 Class Diagram

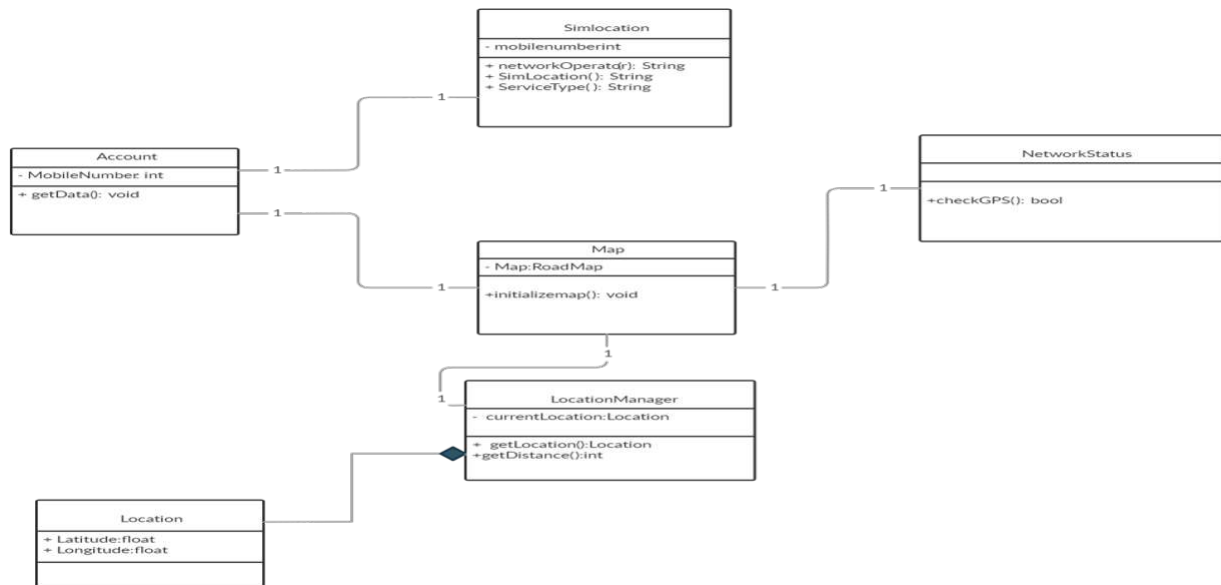


Figure 2.11: MOBILE NUMBER TRACKER Class Diagram

2.5.3 Entity - Relationship Diagram

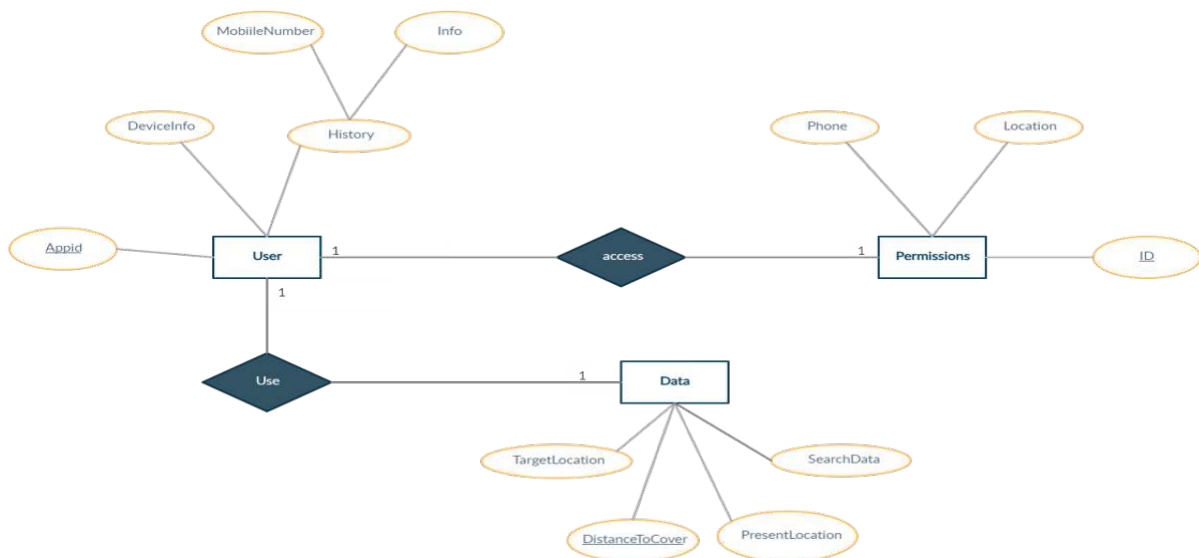
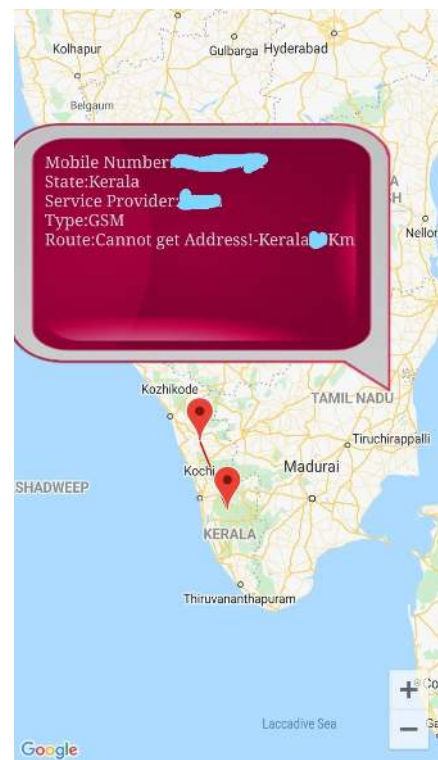
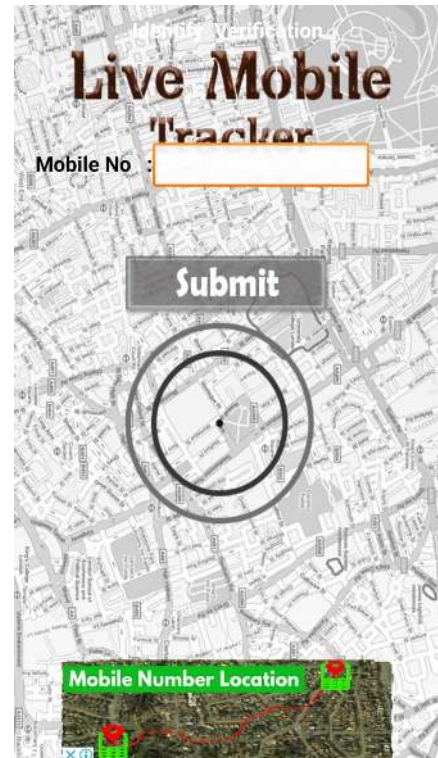
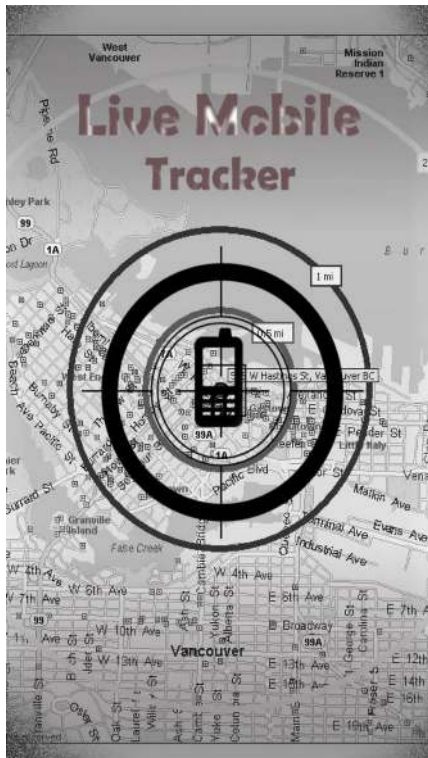


Figure 2.12: MOBILE NUMBER TRACKER ER Diagram

2.5.4 Screenshots



Chapter 3

PROPOSED SYSTEM

3.1 Introduction

The proposed system is a antitheft mobile tracker application that can track the location of lost device even if the data connection in the device is turned off. The worst case arise for this application is that, the android had declined to provide the system permission for external applications to change the data connection settings. Therefore, we used the SMS technique for tracking the accurate location of lost device. This application needs the location permission and sms permission of the device for the expected working of application. The proposed system is named as “Antitheft App”.

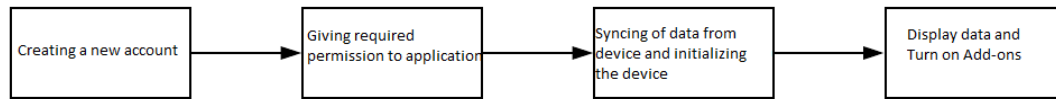
Antitheft App includes almost all of the features of the other apps that we have discussed in the previous chapter. It can locate the lost device even if the device is in offline mode or in silent mode. Design of the app is made very simpler in order to make it user friendly.

3.2 Features

- ATA Support
- Better User Interface with lighter design
- Faster connectivity and data syncing
- Offline and online tracking of lost device
- Accurate location as compared to other apps
- More Add-on Features

3.3 System Architecture and Design

The features of the proposed system have been discussed in the previous section. The overall process is shown in the below block diagram.



The first process is creating an account and logging in. After logging in user mode, the user want to permit the application to access location and handle SMS settings. After this step, the user can change the default settings in the application such as permission to clear device storage on SMS, allow to respond to SMS send from recipient numbers (by default, the application will respond to the SMS which contain authentication key that is send from any number), adding and deleting recipient numbers. If the device is gone lost, the user need to login to the Antitheft application from another device as Guest to send the instruction SMS to the number on the lost device to lock the device and track it. The instruction SMS send to the lost device should contain the authentication key that is given in the initialization step on the lost device's Antitheft application install. The lost device will only respond to the instruction SMS if the authentication key matches. As the next step, the application will send the present location of the lost device to the number in which the SMS send.

3.3.1 Use Case Diagram

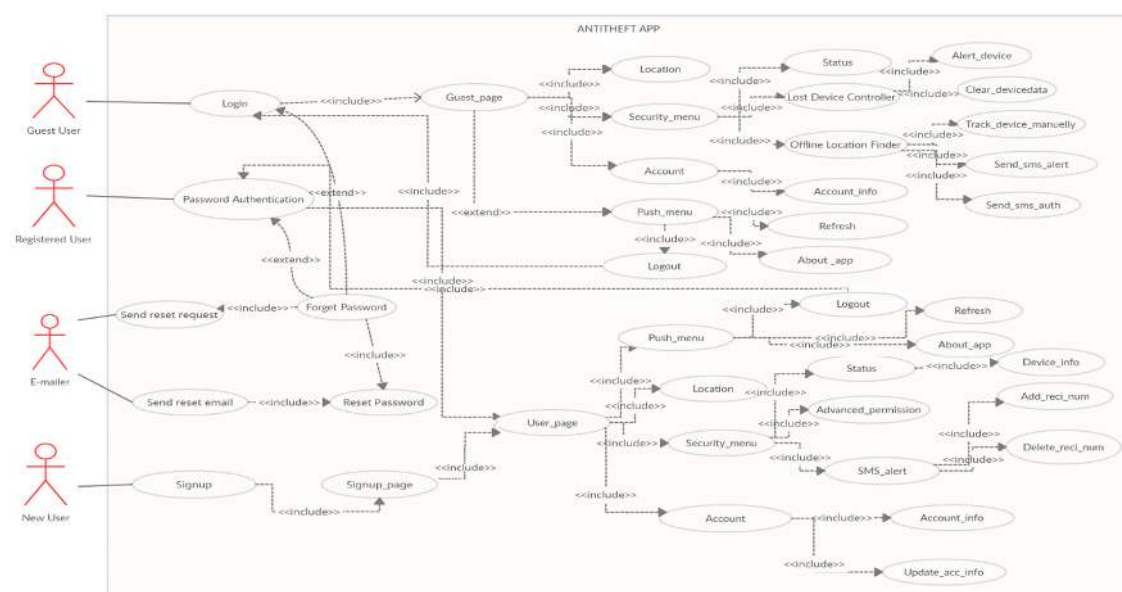
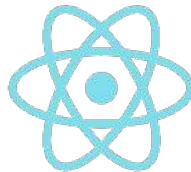


Figure 3.1: ANTITHEFT APP Use Case Diagram

3.4 Software's Used

3.4.1 React Native



React Native is a JavaScript framework for writing real, natively rendering mobile applications for iOS and Android. It's based on React, Facebook's JavaScript library for building user interfaces, but instead of targeting the browser, it targets mobile platforms. In other words: web developers can now write mobile applications that look and feel truly “native,” all from the comfort of a JavaScript library that we already know and love. Plus, because most of the code you write can be shared between platforms, React Native makes it easy to simultaneously develop for both Android and iOS.

Similar to React for the Web, React Native applications are written using a mixture of JavaScript and XML-esque markup, known as JSX. Then, under the hood, the React Native “bridge” invokes the native rendering APIs in Objective-C (for iOS) or Java (for Android). Thus, your application will render using real mobile UI components, not webviews, and will look and feel like any other mobile application. React Native also exposes JavaScript interfaces for platform APIs, so your React Native apps can access platform features like the phone camera, or the user's location.

React Native currently supports both iOS and Android, and has the potential to expand to future platforms as well. In this book, we'll cover both iOS and Android. The vast majority of the code we write will be cross-platform. And yes: you can really use React Native to build production-ready mobile applications! Some anecdota: Facebook, Palantir, and TaskRabbit are already using it in production for user-facing applications.

3.4.2 Node.js



Node.js is an open-source, Javascript runtime environment on Chrome's V8 that lets you effortlessly develop fast and scalable web applications. It utilizes an event-driven, non-blocking I/O model that makes it lightweight, efficient and excellent for data-intensive real-time applications that run across shared devices. Node.js is an epitome of an exceptionally customizable and scalable tech. The server engine utilizes an event-based, non-blocking I/O model. This makes the adaptation of Javascript easier to the machine language providing execution of the code super fast. Thanks to Javascript and Node.js, the code operates faster in server-to-client direction. This enhances the performance ability of the web applications to the next level. To be more precise, web application development in Node.js ensures a steady and secure non-blocking I/O model, simplifying the code beautifully.

3.4.3 MongoDB



MongoDB is an open-source document-oriented database that is designed to store a large scale of data and also allows you to work with that data very efficiently. It is categorized under the NoSQL (Not only SQL) database because the storage and retrieval of data in the MongoDB are not in the form of tables.

The MongoDB database is developed and managed by MongoDB.Inc under SSPL(Server Side Public License) and initially released in February 2009. It also provides official driver support for all the popular languages like C, C++, C, and .Net, Go, Java, Node.js, Perl, PHP, Python, Motor, Ruby, Scala, Swift, Mongoid. So, that you can create an application using any

of these languages. Nowadays there are so many companies that used MongoDB like Facebook, Nokia, eBay, Adobe, Google, etc. to store their large amount of data.

3.4.4 Adobe XD



Adobe XD is a vector-based user experience design tool for web apps and mobile apps, developed and published by Adobe Inc. It is available for macOS and Windows, although there are versions for iOS and Android to help preview the result of work directly on mobile devices. XD supports website wireframing, and creating simple, immersive, interactive click-through prototypes. The first public beta was released for macOS as "Adobe Experience Design CC" to anyone with an Adobe account on March 14, 2016. A beta of Adobe XD was released for Windows 10 on December 13, 2016. On October 18, 2017, Adobe announced that Adobe XD was out of beta. Adobe XD creates user interfaces for mobile and web apps. Many features in XD were previously either hard to use or nonexistent in other Adobe applications like Illustrator or Photoshop.

3.5 Development Process

The software's used for development process has been discussed in the previous section. The app can be considered of two section. Frontend and backend. Front consist of the UI of the app and for backend support we are using Nodejs and NoSQL database along with MongoDB.

First of all, we have designed the layouts of the app using Adobe Xd. The layout design is implemented with React Native. Each layout is designed in the similar way and thus the designing process of the app is completed. Now we have to add functionalities to the app. Codes for the app is completely done in Javascript Language. Necessary packages for supporting the codes are implemented from the repositories provided by facebook and other 3rd party developers. The frontend development of the app is completely done using React Native and Adobe Xd.

For backend we used Nodejs and NoSQL database. For easier handling of database, we have used MongoDB. For connecting database with app we have to use a server. Since this is in development stage we have used Nodejs which provides localhost HTTP server along with databases and many other supports. Query transactions from app with database can be done only with help of nodejs. In order to create and modify the frontend and backend files, we have used Microsoft Visual Studio. The created backend files which uses nodejs and mongodb have placed in a specific project and hosted it with the help of 3rd party hosting sites.

In the case other than the database, we are using another storage which is called as local storage. Local storage is the storage of data inside the device running the app. We can add and remove contents from local storage easily. The contents will be stored till we clear the data of app or till uninstallation of app.

All the developments are compiled together to form an apk file which can be used to install the app on the device. For testing purpose we have used android emulators which is a virtual smartphone with necessary specifications that can be run in our computer. In order to develop an android app using React Native or Android Studio, we need some development kit which is known as SDK. There are different SDK available in android development. Each of these targets on different versions of android.

Some of the problems we have faced during the development stage is listed below.

- Denial of permission on android devices to turn on/off mobile data using 3rd party application from android 6 onwards.
- Since the localhost server is only available within the machine a unique ip is required for connecting the app with server. That is the device running the app and the computer which acts as a server must be in a same network. In order to avoid such situations, we have used android emulators which runs inside the system itself. So network problem does not affect.
- Lack of availability of libraries for some purposes like device lock, battery saver settings...etc.
- Size of the developed app.
- Changes in gradle configurations and android x incompatibility.

But we overcome most of the problems that arises during the development process at the end.

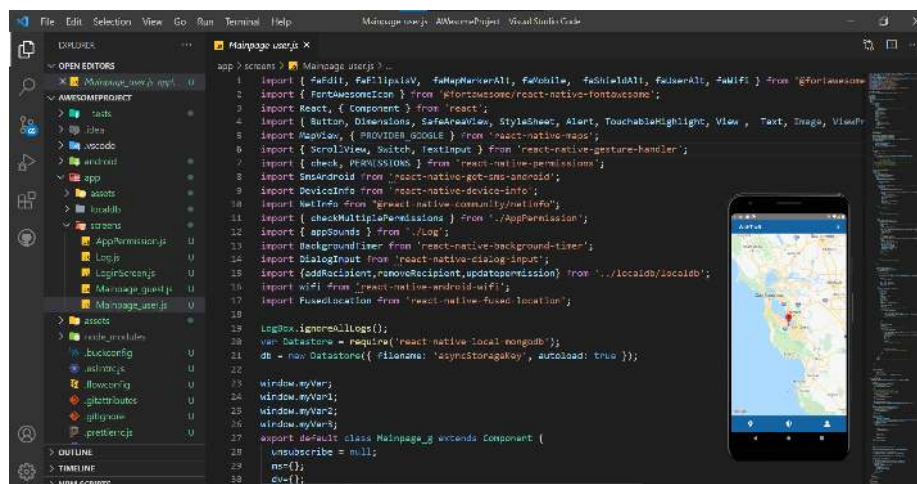


Figure 3.4: React Native working window

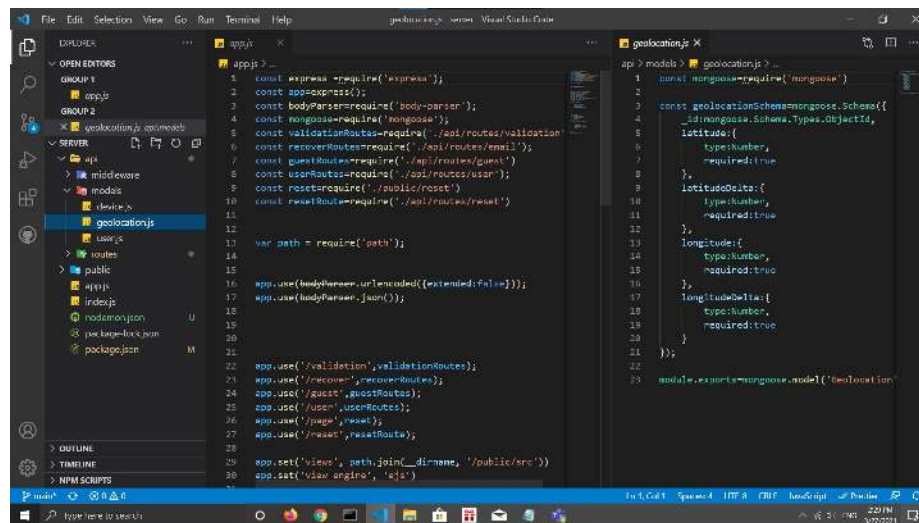


Figure 3.5: Nodejs and mongodb working window

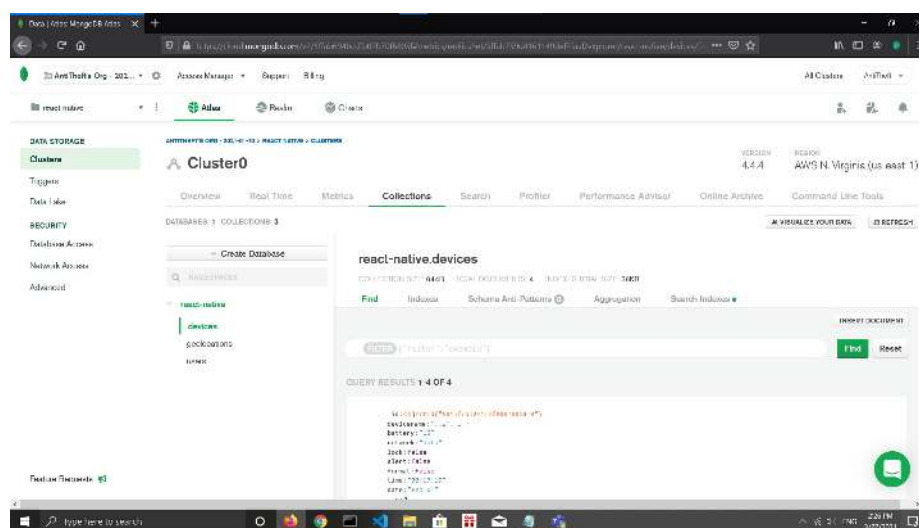


Figure 3.6: Mongodb database window

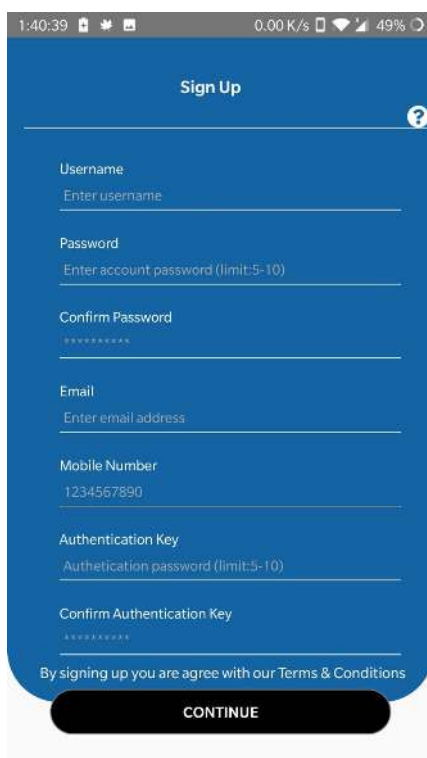
3.6 Screenshots



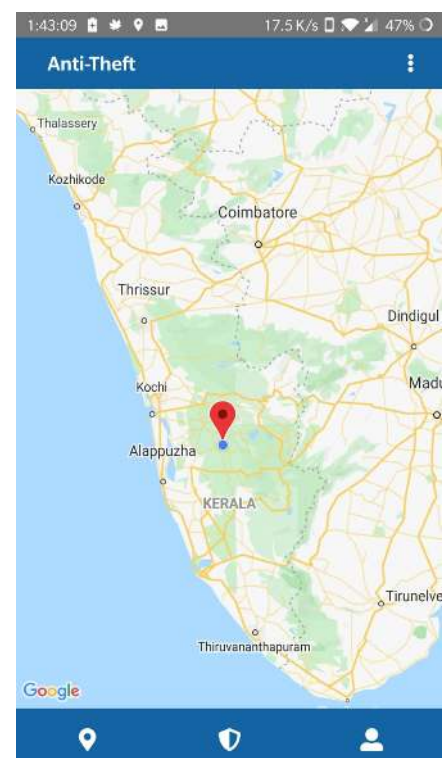
Login page



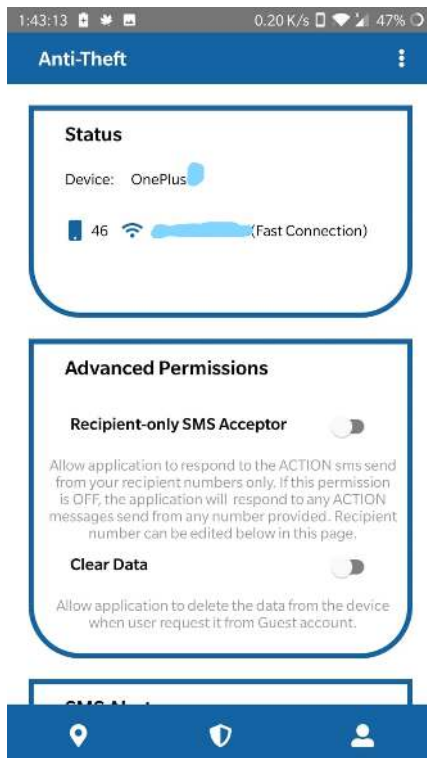
Forget password page



Account creation page



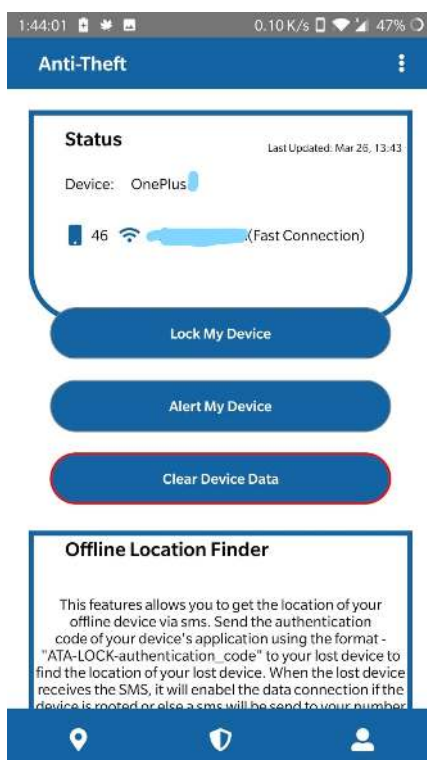
Location viewer page



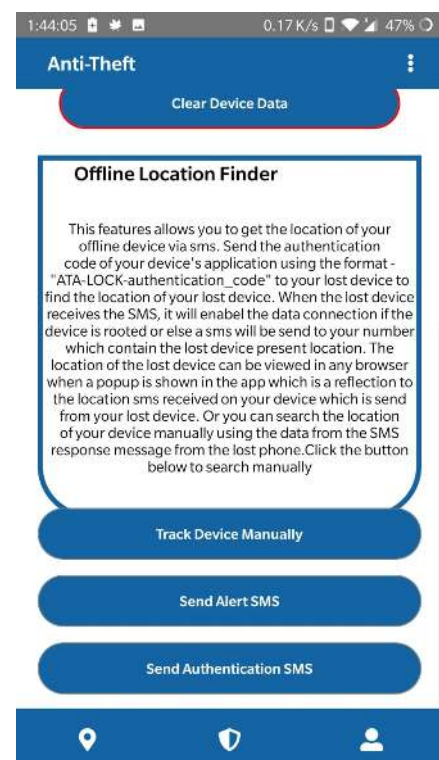
Feature menu - in User mode of ATA application



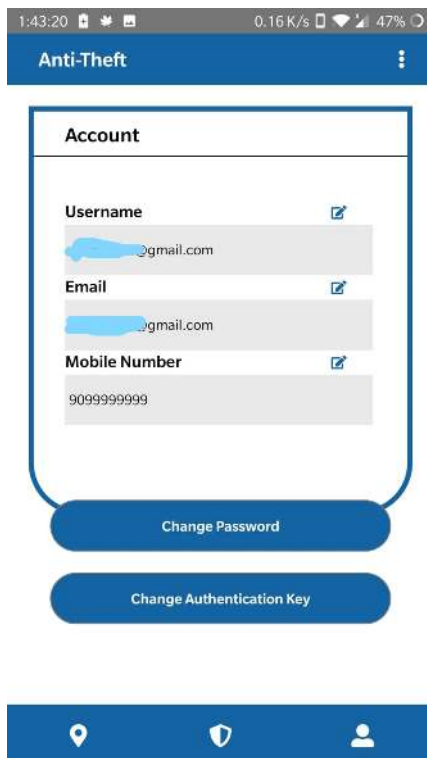
SMS alertor - in User mode of ATA application



Feature menu - in Guest mode of ATA application



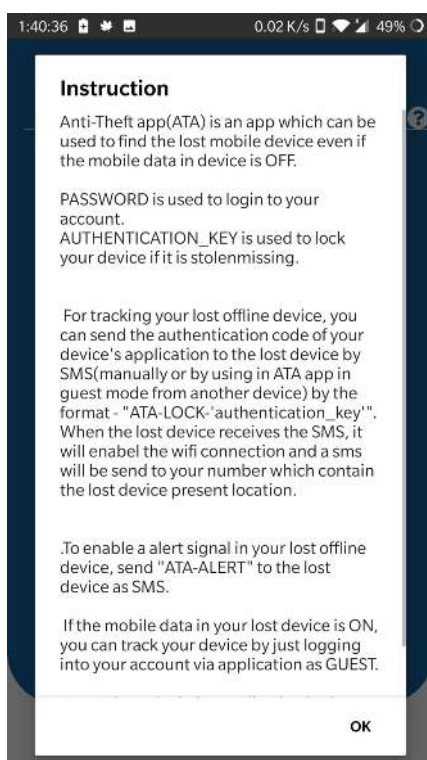
Offline location finder feature - in Guest mode of ATA application



Account page of ATA application



Menu bar of the ATA application



Instructions for the user

3.6.1 Advantages

- Accurate location using android's Fused API.
- Intuitive design
- Online and Offline tracker
- control device using SMS service
- Add-on features
- Update support

3.6.2 Disadvantages

- App size is slightly more than others
- Battery consumption of device may increase
- Should permit the app for SMS handling permission

Chapter 4

Conclusion

In today's digital age, the need to track our mobile device is at an all-time high. Mobile device, tablets and more have become an integral part of everyone's life. These devices store information such as our contact list, passwords, emails, texts and so on. This is where the importance of mobile phone tracking comes in. Many underestimate the value a phone truly holds when it comes to the information it stores. Your phone has your entire life on it. Your phone is a portable storage device that holds as much data as its able to hold. Your device is also a mobile bank and a social network hub. There are so many functions to a mobile device that makes us realize how important it truly is to protect the information stored within it. So we must use specific application to track and find the location of our device when it lost or stolen.

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- [9] [online] <https://play.google.com/store/apps/details?id=com.mobiletracker.location>

Appendix A

Sample of mongodb script used

```
const mongoose=require('mongoose')

const geolocationSchema=mongoose.Schema({
  _id:mongoose.Schema.Types.ObjectId,
  latitude:{
    type:Number,
    required:true
  },
  latitudeDelta:{
    type:Number,
    required:true
  },
  longitude:{
    type:Number,
    required:true
  },
  longitudeDelta:{
    type:Number,
    required:true
  }
});

module.exports=mongoose.model('Geolocation',geolocationSchema);
```

Appendix B

Sample of nodejs

```
const express=require('express');
const router=express.Router();
const mongoose =require('mongoose');
const bcrypt=require('bcrypt');
const jwt=require("jsonwebtoken");
const User=require('../models/user');
const Device=require('../models/device');
const Geolocation=require('../models/geolocation');

router.get('/device/:_id',(req,res,next)=>{
    const id = req.params._id;
    Device.findById(id)
        .exec()
        .then(doc=>{
            res.status(200).json(doc);
        })
        .catch(err=>{
            console.log(err);
            res.status(500).json({error:err});
        });
});

module.exports = router;
```

Appendix C

Sample of React Native Component

```
import React, { Component } from 'react';
import { Text } from 'react-native';

export default class Speed extends Component{
  constructor(props) {
    super(props);
    this.state={
      sp:"data loading..."
    }
    NetInfo.fetch("wifi").then(state => {
      // console.log("ssid",state.details.ssid);
      // console.log("Strength", state.details.strength);
      // console.log("Is connected?", state.isConnected);
      let st=''
      if(state.details.strength>66){
        st="Fast Connection"
      }else if(state.details.strength>33){
        st="Moderate Connection"
      }else{
        st="Slow Connection"
      }
      this.setState({sp:state.details.ssid?state.details.ssid+"("+st+") ":"data"}
    )); }
  render() {
    return(<Text> {this.state.sp} </Text>)
  }
}
```