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JUSTIFICATION

Today there are millions of people worldwide who have high-end mobile operating systems like Android, IOS, Windows Phone. The device used for surveillance of the car, using mobile phone networks such as GSM and GPS to alert the user or driver of a possible theft of your unit.

This device maintains communication with the user via text messages. The UART format is in command, so learn these commands is difficult and that emergency situations can get to forget.

The proposed solution to this inconvenience is using an android application simply by pressing buttons can manage the tracking device without learning lines of text.

The statistics of Mexico City show a large number of stolen units daily

The security system used in the car is operated with commands and codes that are difficult to learn, when it happens a robbery or was referred to impound our nerves and fright, makes us forget or remember things. For these reasons an application on android, where commands to get involved in programming to make the user easier to use environment, increase the speed of communication between the phone and the car with the push of a button and not be learned performed commands simply enter the number and password is enough, the phone automatically sends the text message.

INTRODUCTION

Android is a Linux-based operating system designed primarily for touch screen mobile devices such as smartphones or tablets, initially developed by Android. Google backed financially and later bought the company in 2005. Android was introduced in 2007 with the founding of the Open Handset Alliance: A consortium of hardware, software and telecommunications to advance open standards for mobile devices. The first mobile was sold in October 2008.

The structure of the Android operating system consists of applications running on a Java framework for object-oriented applications on the core Java libraries in a Dalvik virtual machine with just-in-time compilation. Libraries written in C ++ language include an administrator GUI (surface manager), an OpenCore framework a relational database SQLite Programming Interface API graphic OpenGL ES 2.0 3D rendering engine WebKit, an engine SGL , SSL and a standard library of C Bionic. The operating system has 12 million lines of code including 3 million lines of XML, 2.8 million lines of C language, 2.1 million lines of Java and 1.75 million lines of C ++.

Applications are usually developed in Java with Android Software Development Kit (Android SDK), but are available other development tools, including a Development Kit Native applications or extensions in C or C ++, Google App Inventor, a visual environment novice programmers and several frames multiteléfono based web applications.

The Android application development requires learning complex programming languages. All that is needed is an acceptable knowledge of Java and possessing the software development kit or "SDK" provided by Google which can be downloaded free.

All applications are compressed in APK format, which can be installed without difficulty from any file browser on most devices.

In Mexico because of the large number of thefts mobile application for the correct use of the tracking device was made. Using the tools provided by google to do it. Eclipse software development and help us creation and tests in a simulator.

CHAPTER 1 Auto Theft Statistics

1.1.1 Car theft in Mexico.

Although the rate of auto theft dropped in the last year, Mexico tops the list of countries in Latin America in this crime, followed by Argentina, Uruguay, Venezuela and Costa Rica, according to the Organization of American States (OAS).

The United Nations (UN) note that Mexico is one of Latin America with the highest theft rates in general, where nearly 20 percent of the population experienced a crime such as assault, theft of property or theft house room.

Using data from the Mexican Association of Insurance Institutions (AMIS), he said that every day in the country for marketing 200 insured cars or their parts, shoplifting or stolen vehicle to commit another crime.

Most vehicles do not have a security system or with insurance to back them to crimes and accidents, since less than a third of the vehicles in the country is assured.

[1]

1.1.2 Theft of insured cars.

Theft of insured vehicles grew by 38.2% in January 2007 to December 2012, going from 53.463 to 73.878 units during this period. However, considering that in December 2011 reached 83.676 vehicle thefts, it shows that in the last 12 months crime decreased 11.7%.

Figure 1.1: Car theft insured 2007-2012.

In this regard, the AMIS reveals that in 2012 the company further increase in robberies is the State of Mexico with a rate of 15%.

1.1.3 Efficiency recoveries.

Meanwhile, in the process of recovery vehicles it has shown greater efficiency, since in 2007 22.7% of cases recovered at the end of 2012 the index has already reached 33%, surpassed only by 2011 when the indicator stood at 34%. This without considering the units recovered by their mechanical and physical condition was unaffordable recovery.

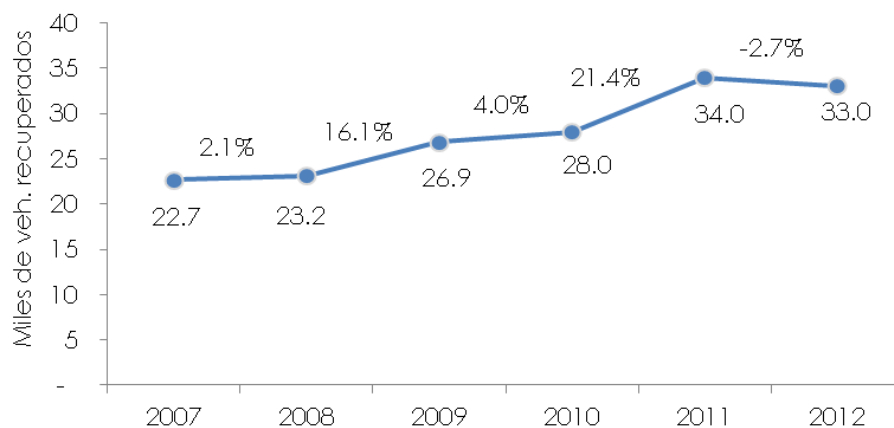


Figure 1.2: List of vehicles recovered in each year.

On the other hand the institution with the highest rate of recovery in 2012 was the state of Coahuila with 56% and the lowest, Baja California with a decrease of 18% on the same indicator.

However, the relationship between insured and stolen vehicles recovered during the period of analysis units has had a favorable variant going from 42% recoveries in 2007 to 45% at the end of 2012, as shown in the following graph:

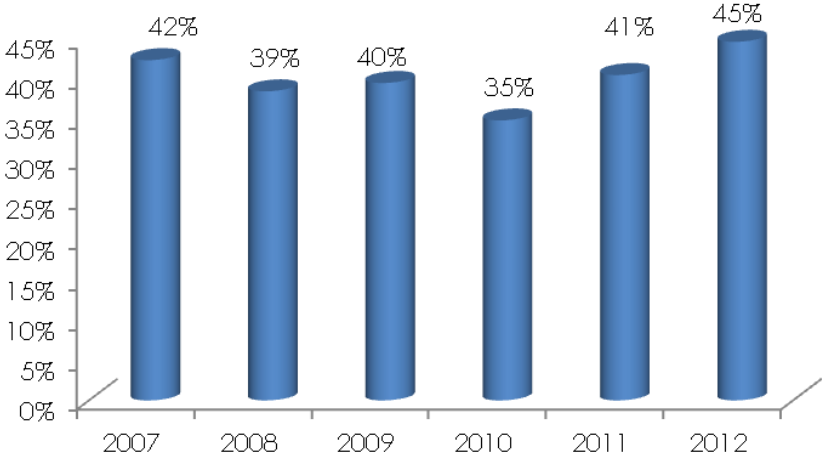


Figure 1.3: Ratio of insured stolen vehicles recovered and units.

1.1.4 Robbery, with a tendency towards stabilization.

The rate of stolen cars against the total number of insured vehicles increased from 38% to 55% during the analysis period, however in recent years tends to stabilize and would be expected that as the security conditions in the country improve the effect reverse driving down these statistics.

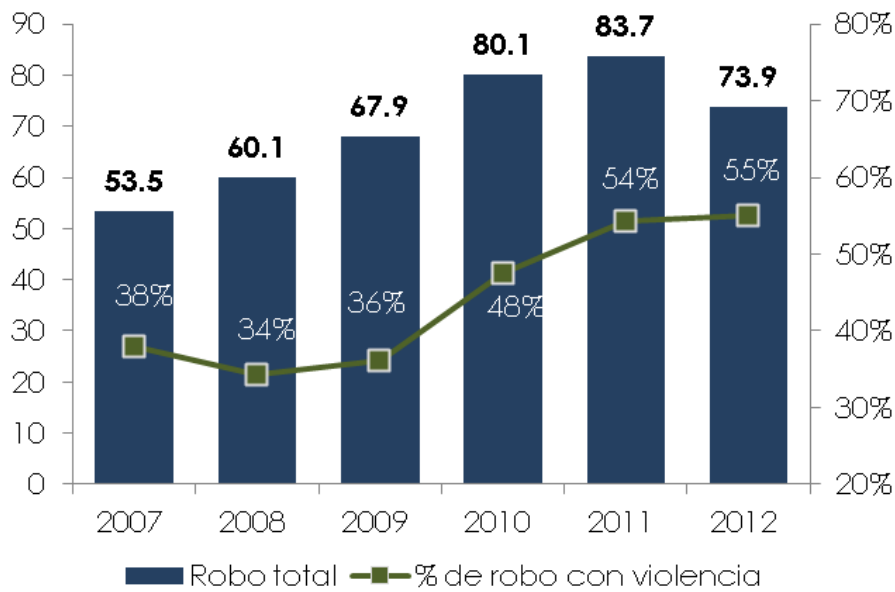


Figure 1.4: Ratio of total self-insured against the index stolen car, the percentage of stolen cars violence.

Of all robberies, 80% occur in 8 states of the country.

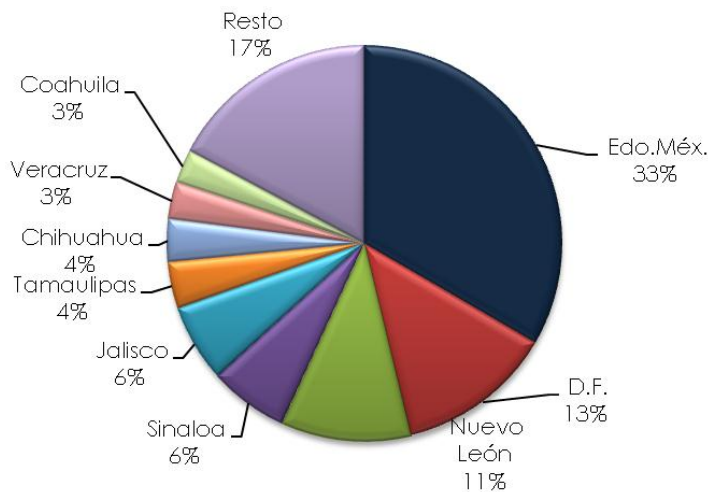


Figure 1.5: Total car theft with violence in the country

In general, the preferences of foreign friends have changed little in recent years. The brands with the highest incidence remain the same: [2]

Table 1.1: Most stolen cars Mexico State and Federal District.

Brand	Model	2010	2011	2010-2012
NISSAN	TSURU	14,197	14,506	2%
NISSAN	PICK UP	3,945	3,662	-7%
VOLKSWAGEN	JETTA GEN 4 ^a	2,042	2,767	36%
NISSAN	SENTRA	2,483	2,484	0%
HONDA MOTO	125	1,664	1,742	5%
VOLKSWAGEN	BORA	1,804	1,424	-21%
GM	PICK UP	1,456	1,075	-26%
FORD	PICK UP	1,023	1,052	3%
GM	CHEVY C	661	977	48%
GM	SILVERADO	718	867	21%
HONDA	CRV	697	867	24%
NISSAN	URVAN	633	768	21%
HONDA	CIVIC	684	760	11%
SEAT	IBIZA STELLA	668	760	11%
FOR	PICK UP LOBI	655	742	13%
RESTO		46,441	48,068	3%

1.2 Different Systems for the Automobile theft.

These are complete systems that most new cars and bring integrated and consists mainly of alarms, canes, short currents and even recorded parts, ie, mark the serial number on each piece of the car to be visible and they can not be sold in parts. If our vehicle does not have

with all these elements can be placed to create our own security system.

1.2.1 Alarms and interlock.

The alarm is one of the most common and also less reliable devices against false alarms people no longer pay attention to them. As recommended that attachment is not the only security you have the car. Currently alarms come with the circuit breaker is a switch that is responsible for turning off the ignition system of the vehicle.

1.2.2 Alarm two ways.

These systems include communication to the car permanently and always depends on a coverage area or a range. These systems use a remote control that is a transmitter and a receiver at a time, and in this liquid crystal display graphically shows the state of the automobile.



Figure 1.1: alarm Two way control with integrated display, these alarms replace conventional remote control.

So you can see if the locks are closed or open, whether the system is on or is in valet. In addition, when an intrusion alert by a beep or vibration, the system has been tampered with and immediately shows the intrusion into the display and we can see if the door opened, the hood, the trunk or was a blow or cristalazo. These teams include standard comfort systems such as the starter motor remote control, and obviously all the expected options such as running short, the shock sensor, etc. In an affordable range of 600 meters.

1.2.3 Tracking and recovery.

tracking and recovery: two systems of satellite tracking are. These systems work units Satellite Global Positioning (GPS). They give a clear picture of where the car within seconds at any given time.

The tracking only limited to observe and detect the location of the car to inform the authorities. The recovery, locate and immobilize the engine, to leave the useless car and call the authorities. Despite this being the best choice today, it is still operating costs and monitoring these systems are high for the general public and very beneficial to fleets of trucks or rental cars.

The disadvantages have right now is that the coverage areas are limited to certain cities and do not have a project in the short or medium term which will see a network infrastructure that can meet the needs of the entire country, a competitive cost.

1.2.4 mechanical locking.

You can purchase an additional lock that fits the steering column as an iron collar. The key of this lock replaces the contact controlling electrical activity against occasional criminals, but a professional will have tools to remove the closure, and to deflect the teeth of the steering column. It can also be a combination lock for handbrake which is placed on the hand brake lever, leaving it closed in the braking position. This is a lock without keys, which are released by combining three digits.

There are various types of mechanical immobilizers on the market, of which the most used are: the cane on the steering wheel, the wheel will stick to any pedal.



Figure 1.2: Different types of canes for cars.

1.2.5 Systems presence.

It does not allow the advancement of the car, if you try to steal it when it is parked. This with the help of a sensor, which activates upon detection of automotive electrical systems, allowing booting a clear example is the presence system implemented by Nissan Micra called in his car; although there are many in the secondary market, which are magnetic type sensors that are activated by inserting the key in the switch to give up the car.

1.2.6 transponders.

Electronic immobilizers included in the keys of cars are very advanced electronic reading systems that have a high level of combinations and security. This system is implemented by various brands of cars, for example, Seat, Volkswagen, GMC, etc. Although these devices only prevent car theft when parked.

1.2.7 Auto-alarm factory.

These alarms are very similar since they are installed in series. The best known is the key barrel (see figure 3), as it has remained in the market, especially it continued to be implemented in the Volkswagen sedan, until 2004.

This alarm stopped protect cars from the 80's: since its installation in series given the opportunity to thieves to master this device.



Figure 1.3: Alarm type a sedan with key barrel

1.2.8 tablet or encoding card for ignition.

It was implemented in recent years in the Mégane Renault. This system has a remote control for insurance and a pill that is introduced to start the car by pressing a button (see figure). It is a very sophisticated system but has the disadvantage of decomposing or lose the card, you will be requested replenishing the country of origin.

1.2.9 immobilizers.

It is a system that blocks electrical subsystems of the car, preventing this from being started. This type of immobilizers are varied, usually these systems can be used as an accessory for other types of systems as a complement to these same.

1.2.10 anti-l wrenched coded systems.

This system is implemented in Peugeot models 605 and 806 only allow to launch the car once the correct code, so will prevent the traditional bridge can be done is type.

These models in which this system is implemented, are sold only in Europe this type of system.

1.2.11. Opening doors

The best known system for opening doors from which the car brought to market is the handle, with the help of a mechanism allows opening of the door. During the time he has served as the key safety device, but now it is possible for thieves to break the lock.

In the early 90's Ford Motor Company, I take a coding system for the release of electric door locks on these models: Cougar Grand Marquis, Thunderbird, Taurus Explorer (only abroad); having this system a major shortcoming because if someone pressed a number, this remained stored for when he arrived the owner and got his code, not accept it, since he had already stored a number, which caused that the owner will use his key to open also, if it came to decompose, composure was very expensive and their arrangement was not feasible, since it was not very useful.



Figure 1.4: Coding system for opening door.

1.2.12 Automated Vehicle Tracking (AVR).

This vehicle tracking system in real time using their technology is taking GPS location information of the vehicle in real time. This system will be described and discussed in more detail as this is the one most common aspects which will be developed in this project.

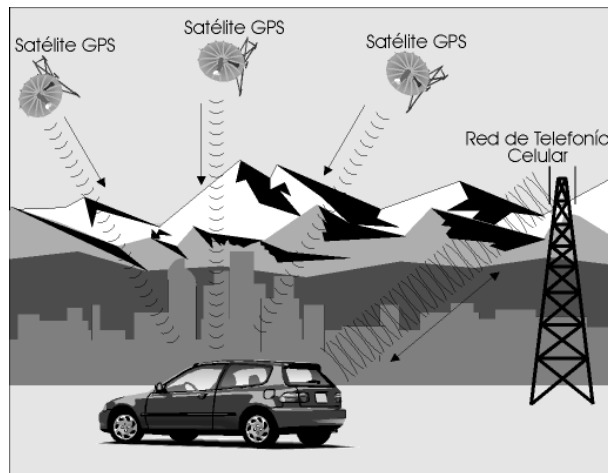


Figure 1.5: Operation (AVR).

It was observed in this chapter, there are many systems for car safety, but all are obsolete and known to anyone deactivate it and can steal the car without any problem.

The mobile application that makes, give a bonus to the tracker device, which uses the same technologies that are in the orb of communications.

In the next chapter we observe in detail because creating the application on android, statistics, comparison with Apple's iOS and Windows Phone. programs necessary for the creation and simulation of the application are described.

CHAPTER 2: Development Environment

Android 2.1 SDK (Software Development Kit)

The Android SDK includes a set of development tools. [3] comprises a code debugger, library, simulator-based phone QEMU [], documentation, sample code and tutorials. Development platforms supported include Linux (any modern distribution), Mac OS X 10.4.9 or later, and Windows XP or later. The integrated development platform (IDE, integrated development environment) supported officially Eclipse with the ADT plugin (Tools plugin Android development), although a text editor can also be used to write Java and XML files and use commands in a terminal to create and debug applications (JDK, Java Development Kit and Apache Ant packages are needed). In addition, they can be controlled Android devices are connected (restart, install applications on remote).

SDK Updates are coordinated with the overall development of Android. The SDK also supports older versions of Android, if programmers need to install applications on obsolete or older devices. The development tools are downloadable components, so that once installed the latest version can be installed previous versions and compatibility testing.

An Android application consists of a set of packaged in .apk format and stored in the / data / app Android operating system files (this directory need superuser, root, for security reasons). A package includes .dex APK files (Dalvik executable, compiled intermediate code), resources, etc. [3]



Figure 2.1: SDK Android

Eclipse 2.1.1.

The Eclipse platform is an Integrated Development Environment (IDE Integrated Development Environment) open and extensible. An IDE is a program consisting of a set of useful tools for a software developer. As basic elements, an IDE has a code editor, a compiler / interpreter and debugger. Eclipse IDE serves as Java and has numerous software development tools. It also supports other programming languages such as C / C ++, Cobol, Fortran, PHP or Python. At the base Eclipse platform will be added extensions (plugins) to extend functionality.

The term Eclipse also identifies the free software community for the development of the Eclipse platform. This work is divided into projects that aim to provide a robust, scalable and quality for software development with the Eclipse IDE platform. This work is coordinated by the Eclipse Foundation, a nonprofit organization, promotion and development of the Eclipse platform supporting both the community and the Eclipse ecosystem.

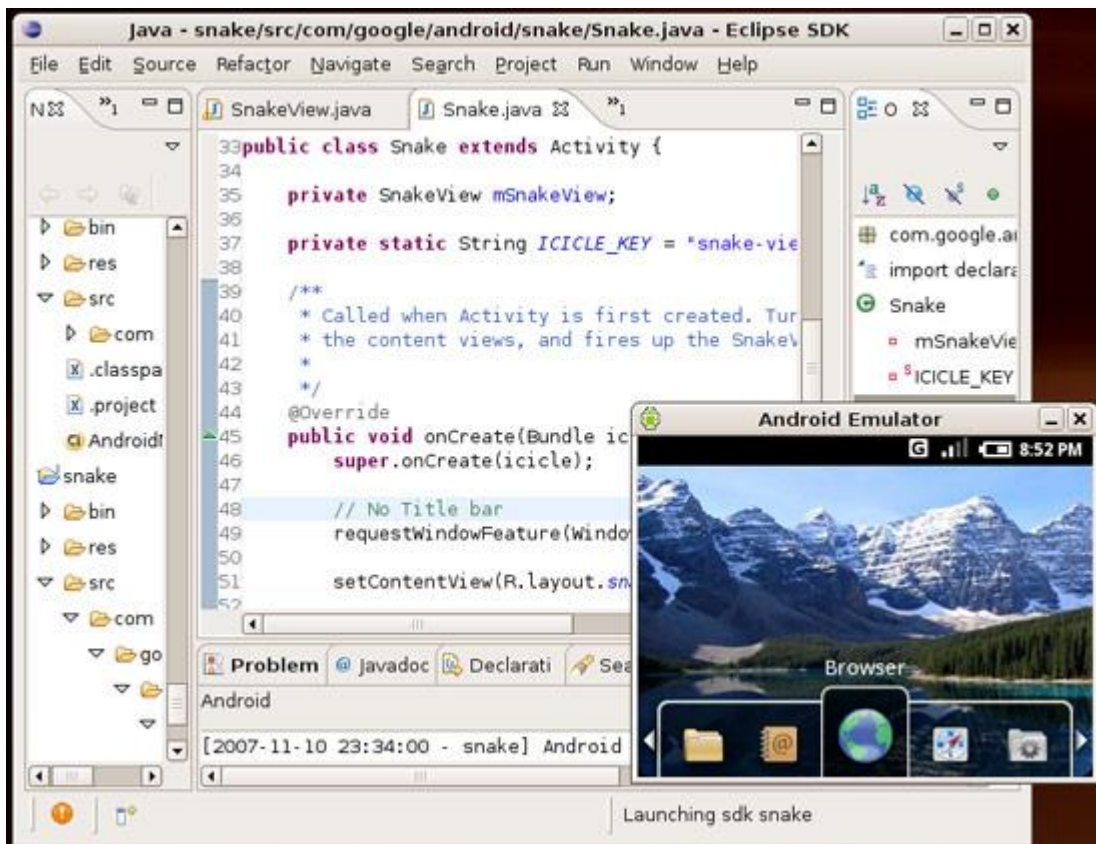


Figure 2.2: Eclipse and the Android Emulator.

2.1.2 ADT (Android Development Tools)

The Android Developer Tools (ADT) Plugin for Eclipse offers a development environment for creating professional Android application. It is a Java IDE complete with advanced features to help create, test, debug and package their applications Android functions.

Free, open source and runs on most major operating system platforms.



Figure 2.3: ADT logo

2.2 GSM-GPS Tracker

Tracker contains these devices for communication with the user.

1. GSM Circuit
2. A cell phone for communication with the chip.
- Antena 3. SMS
4. Chip
5. Battery 3.7V 500mA
6. Reset button
7. Panic Button
8. Relay



Figure 2.4: a cell phone card (SIM).



Figure 2.5: Cellular phone



Figure 2.6: Antenna for GSM mobile phone



Figure 2.7: GPS Antenna for cellular telephony.

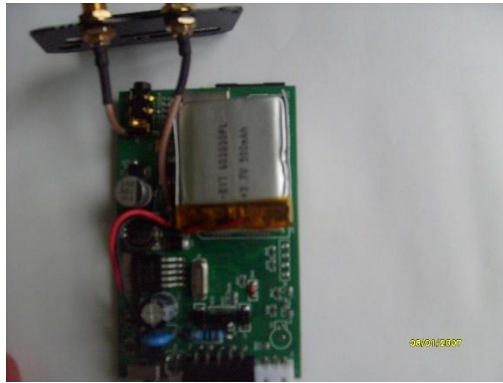


Figure 2.8: Device Tracker

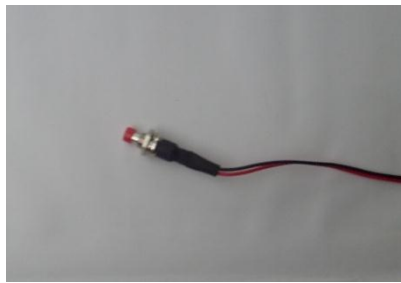


Figure 2.9: Reset button



Figure 2.10: Panic Button



Figure 2.11: Relay to stop the advance of the vehicle

Finder 2.2.1 Global Positioning System (GPS)

Because the GPS has to look for the signal emitted by at least 4 satellites to calculate its position, once any type of receiver is newly installed, it must execute a sequence called cold start. This means that search for the signal of each of the 27 satellites and based on satellite find identify your home and even then can calculate its position. This means that the time it takes to calculate its position for the first time will be between 5 and 10 minutes, depending on the quality of the signal it receives. Once the receiver to obtain these data, the next calculations will be much faster, on the order of 0.3 s and 1 min at restart.

Similarly, if the receiver is located in a confined space, such as a parking lot, you can not detect the signal from satellites and therefore can not calculate its position at that time. However, we have developed high-sensitivity GPS receivers that can detect if weaker satellite signals, although these are attenuated by walls or adverse weather conditions, but not for signals hostile environments, such as underground parking lots, etc.

The device allows 5 numbers authorized. If you place a call to sim tracker, it sends the longitude and latitude where the car (with the tracker inside) and a web address to go directly to google maps locate and faster

2.2.2 GSM network

Network Global System for GSM telephony as the one bearer service consists of all means of transmission and switching required that allow link to will two mobile terminals through a digital channel that is specifically established for communication and disappears once it has been completed it.

The purpose of a mobile communications system, as its name suggests, provide telecommunications services between mobile stations and fixed earth stations, or between mobile stations.

There are two forms of mobile communication and wireless phone.

Wireless Communication: The range of this technology is very limited. In fact mobile equipment and transmit-receive must be located in very close geographical areas, such as within a building.

cellular communication: It has a fully defined network that includes protocols for establishing and clearing calls and track mobile units within

defined geographical areas called cells, which give name to the technology. Since cellular systems operate with a higher power than wireless, the range of the former is much larger, the size of cells on the order of kilometers.

2.2.3 Topology of a cellular system.

The main components of a cellular system are:

The mobile switching center (MSC, Mobile Switching Center), which is the control center of the cellular systems; It is responsible for switching calls to cells, providing support, connect with telephone networks, monitor traffic for billing purposes, testing and diagnostics, and carrying out network management in general.

The cells, which are the different geographical areas in which the total area intended to cover the system is divided.

The mobile unit, which is the mobile transceiver, almost always located in a car, truck, boat, etc., and contains a modem capable of changing frequency that lets you synchronize with a given frequency, designated by the MSC:

The transmit-receive station (BTS, Base Transceiver Station).

There is a per cell and next to this is the interface between the mobile unit and the MSC.

Components GSM 2.2.4.

The main components are GSM:

The mobile switching center (MSC, Mobile Switching Center), is the heart of every GSM system and is responsible for establishing, managing and clear connections and to route calls to the correct cell. The MSC provides the interface to the telephone system and serves to determine the claims and accounting.

The cell, whose size is approximately 35 km.

The mobile unit (MS, Mobile Station).

The base station controller (BSC, Base Station Controller). It is a new element introduced by GSM. It is responsible for operations control transfer calls and also to control power signals between the BTS and the MS, which relieves the switching center multitask.

The transmit-receive station (BTS, Base Transceiver Station).

Sets the interface to the mobile unit. It is under the control of the BSC.

The HLR (Home Location Register) is a database that provides information about the user, based subscription source and supplemental services that are provided.

The VLR (Visitor Location Register) is a database containing information on the situation on / off of the mobile stations and if they are on or off any of the supplementary services.

The validation center (AC or AUC, Authentication Center) which serves to protect each subscriber against unauthorized access or against the use of a number of subscription by unauthorized persons; It works closely with the HLR.

Recording equipment identity (EIR Equipment Identity Register) used to record the type of equipment that exists in the mobile station and can also perform security functions such as call blocking is determined emanating from stolen mobile stations and how to avoid certain stations that have not been approved by the network provider to use it.

In telecommunications, the terms multi-band, dual-band, tri-band, quad-band and penta refer to a device (especially a mobile phone) that supports multiple radio frequency bands used in communications. In the case of mobile, its purpose is to support roaming between different countries / regions whose infrastructure can not support mobile services in the same frequency range. [4]

2.2.5 Advantages of Automated Vehicle Tracking (AVR).

1. The Automated Vehicle Tracking system can reduce data collection time.
2. Analyze the speed of time and place where the vehicle is located.
3. The RVA is to ensure the cargo is transported considering that this has considerable value, because the system allows in case of theft find the vehicle.
4. Reduce the time of delivery to the customer, since it has a database of the shortest routes.
5. To receive GPS satellite signals. -Calculate Its position, speed, direction and altitude.

2.0.2 Disadvantages of Automated Vehicle Tracking (AVR)

1. It is a system offline, the information is not transmitted in real time, it is necessary to use a memory device to transport it and analyze it.
2. Mode of data transmission (radio), do not use other data transmission technologies.
3. Monthly rent for the radio frequency used for data transmission.
- 4.- paid time modem connection for data transmission.
5. Only the system monitors the moving car.

2.2.6 Advantages of the application to the alarm system, auto lock and location via GSM-GPS

- 1.-Monitor to parked or moving car.
2. Block engine when the car is moving through the Android application.
3. Transmission of data in real time and easy access to Gmaps due to the 3G cellular connection where the application is included.
4. Use for data transmission in mobile telephony.
5. The cost of service is much cheaper monthly rent is not paid.
6. Locator Global Positioning Satellite (GPS).
7. all control is to short and long distance thanks to the GSM network.

8. graphical interface and intuitive thanks to the Android application

2.2.7 Description Alarm System, Automotive Locking and Location Based Services GSM-GPS.

The system provides and covers most of the needs of safety for motorists. It operates on the GSM-GPS services. The device is activated when the motorist sends a text message from your phone. Once activated the device records if you open a door and it sends an alert message to the owner or the driver of the car. The user must send a text message which will disable the flow of gas in the car, thus achieving auto shutdown. This will send alert messages and gasoline cut takes an approximate time of 3 minutes, which leads us to believe that the thief may have on the car and advanced in its flight some streets. For this we call the number that is within the chip. Is performed by the user and within 40 seconds receive a text message from the device with the latitude and longitude where the car is, it also provides a Web address linked to google maps application.

When the car is in motion and suffers an attempted robbery motorist can send an emergency message to cell phones that are discharged at that time.

2.2.7 Why Android?

The project is aimed at people of Mexico and easy to acquire a smartphone with Android system.

No other software like it Android. Google designed Android, and Google's own applications run better on it. And with millions of applications, games, songs and videos on Google Play, Android is ideal for fun and for to do the things.

Android devices come in all sizes, all kinds of features and in all price ranges. Each version of Android is the name of a dessert, and the latest version of android kit kat is .With android, you are in control of their mobile experience.

Millions of people use Android, because it is so powerful and yet so easy. The Home screen, applications and widgets are simple to use right out of the box, but completely customizable. With Android, you can create an experience only phone that is right for you. [5]

Adroid 2.2.8 or IOS

Both android and IOS devices enjoy massive popularity among consumers around the globe. While some consumers are very dedicated to an operating system, both products offer mobile computing experiences enjoyable. However, when it comes to choosing a platform for your business, it is important to thoroughly examine the various facets of each product and its infrastructure. This is an important decision, especially for developers who seek to reach consumers on a massive scale.

2.7.1 Examine operating systems by the numbers

It is estimated that 52.3% of smartphone users rely on Android devices. Moreover, the IOS phones only account for 37.8% of the total market. This disparity is related to several different factors.

Perhaps the most important time is that the Android operating system to a single product is not limited, as IOS. Instead, a lot of different manufacturers offer products that work with Android. These products vary greatly in terms of hardware, the characteristics and retail prices. If you are trying to reach a large mobile audience, Android phones represent a unique and intriguing segment of the population.

The following table lists the characteristics and competencies among the most bought today cellular phone operating systems are shown.

Table 2.1 Comparison of mobile operating systems.



			
	Windows Phone 7	iOS (iPhone)	Android
Developer	Microsoft	Apple	Google
Copy/Paste	x	✓	✓
Multitasking	x	✓	✓
Flash Support	x	x	✓
Silverlight Support	x	x	x
HTML5 Support	x	✓	✓
Unified Inbox	x	✓	✓
Exchange Support	✓	✓	✓
Threaded Email	x	✓	✓
Visual Voicemail	x	✓	✓
Video Calling	x	✓	✓ Third Party App
Universal Search	x	✓	✓
Internet Tethering	x	✓	✓
Removable Storage	x	x	✓
Facebook Integration	✓	x (Third Party App)	✓ (Third Party Integration)
Twitter Integration	x	x (Third Party App)	✓ (Third Party Integration)
Folders	Hubs	✓	✓
Apps Organization	Alphabetical	Customizable	Customizable
App Store	1,000+ Apps	300,000+ Apps	90,000+ Apps
Microsoft Office Support	Built-In	Third Party App	Third Party App
Widgets	Tiles on Home Screen	x	✓
Media Sync	Zune Software Mac & PC	iTunes Mac & PC	Direct File Transfer + Third Party Software
X-Box Live Integration	Built-In	Via Third Party App	Via Third Party App

The programs used for creating Android applications are free software like Linux. current operating systems and compared this to the forefront and there are still updates and upgrades is definitely Android.

Before inserting code in the Android SDK we need to make flowcharts. To work well you should always plan and set the goals for which the application is being developed. That's what awaits us in the next chapter: Design and schemes.

Chapter 3. Application Design

3.1 Monitoring car doors.

Most cars have a trigger that activates the lamp in the car. This trigger will serve to monitor the doors are open and when the security system is activated, so that sends a voltage to the device when it is open and if it is closed sends 0V.



Figure 3.1: Switch light for car door.

In the case of the model tests, a push button switch adapted to be pressed to stop send voltage to the device and this sent the alarm message.

3.2 Diagram for cutting the fuel inlet to the car.

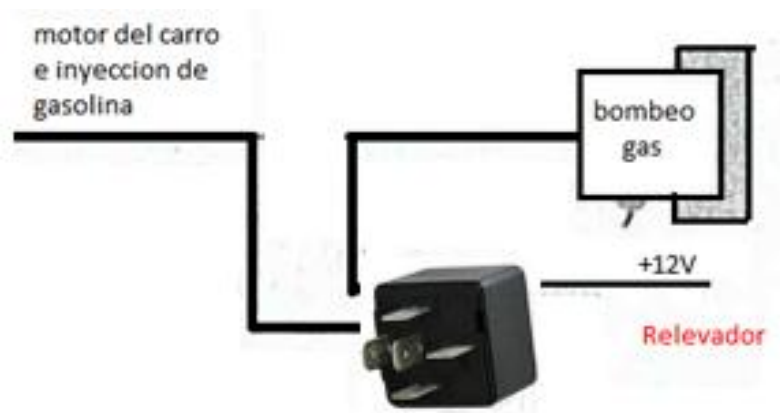


Fig. 3.2: Relay for cutting gasoline.

3.3 General Connection Diagram

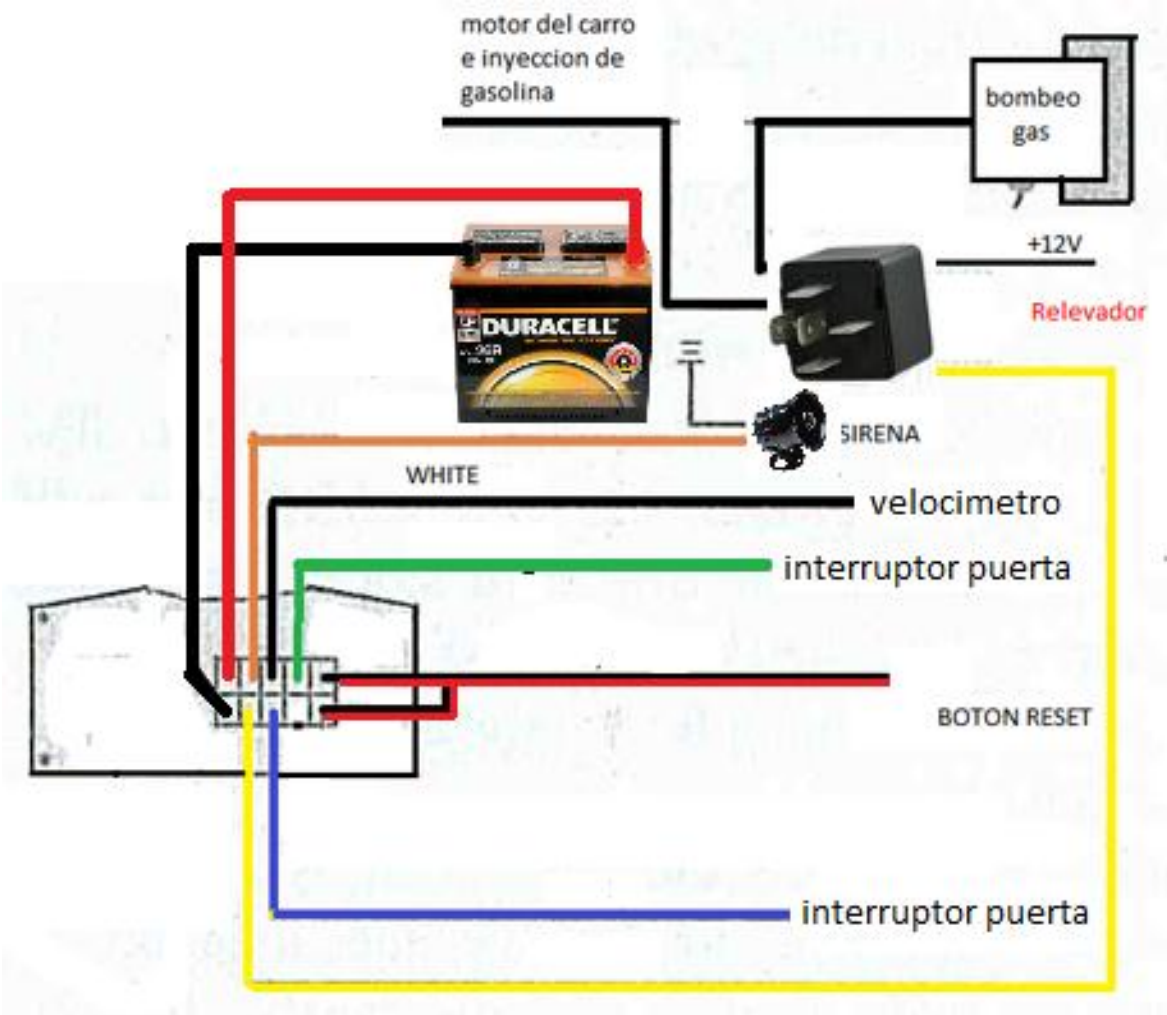


Figure 3.3: General diagram of connections.



Figure 3.4: Programs for mobile application.

The following flow chart shows the design of the application based on the operating requirements of the automotive alarm.

We must have a user name and password registered in both the application and the SIM card tracking device, this to prevent someone else might misuse the application.

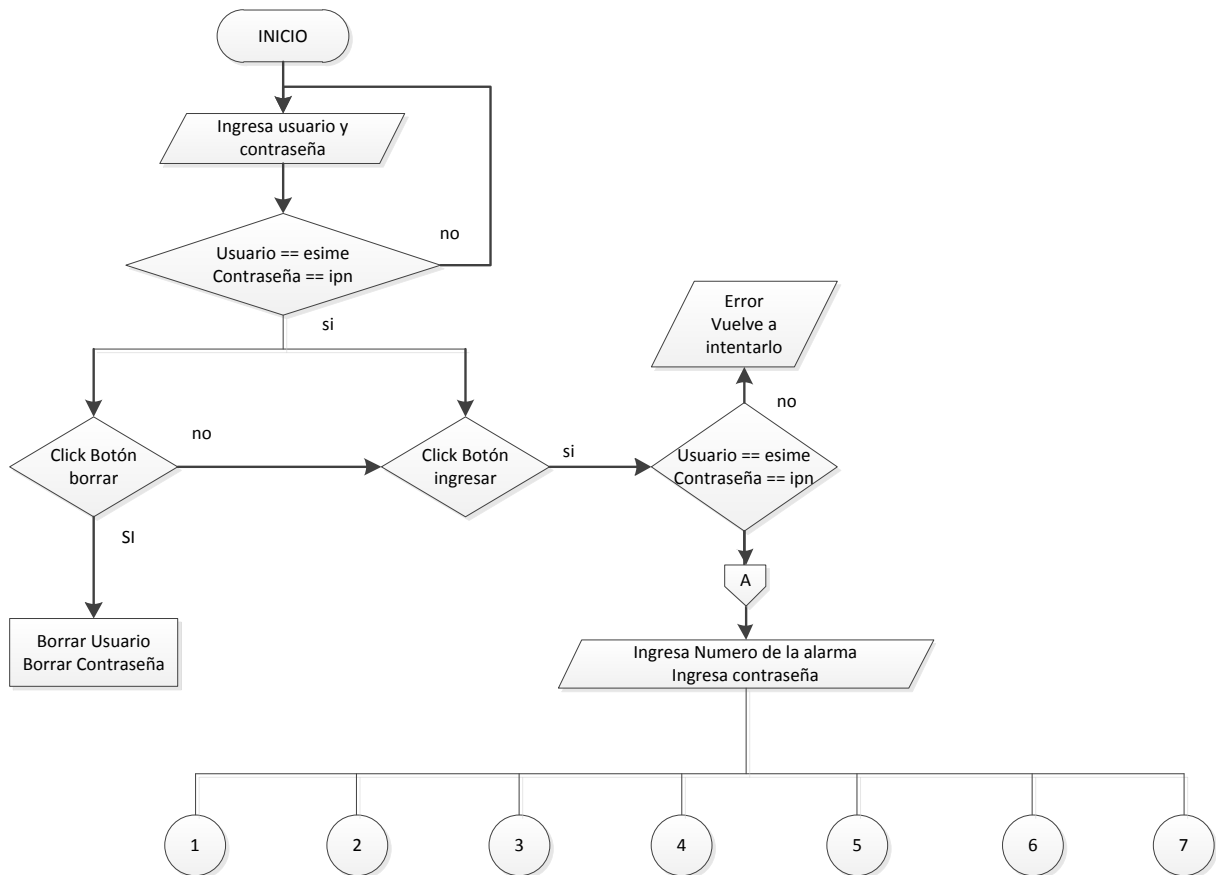


Diagrama 3.1: Inicio del diseño de la aplicación android.

Since we enter the correct username and password have access to all actions to communicate with the tracking device. In the following flowchart action we access the application.

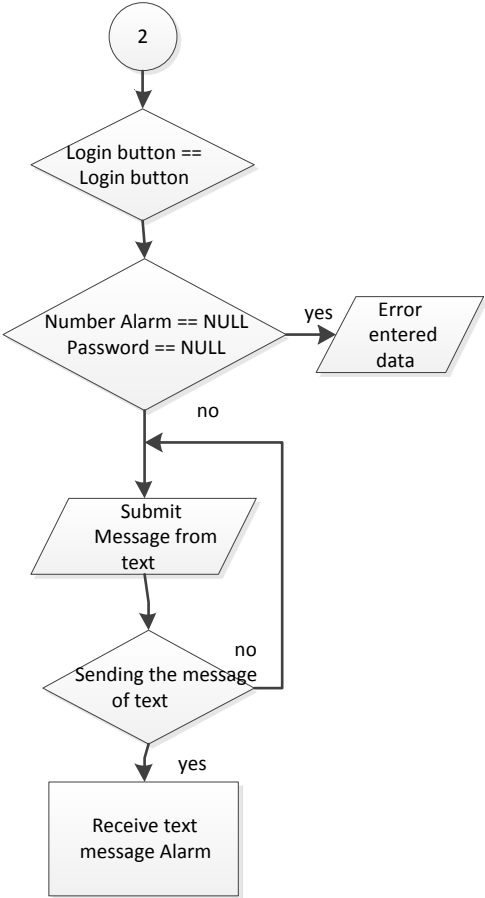


Figure 3.2: Module Login.

Another option that has this screen is to authorize phone numbers, up to a maximum of 5. There are 2 options presented The alarm is armed (activated) and a disarmed (off), ie, if you are using the car, opening and closing doors, obviously does not need to be alarmed by that there is the option Disarming and when left parked and open a door you need is to send us alarm message, for it serves Armed option.

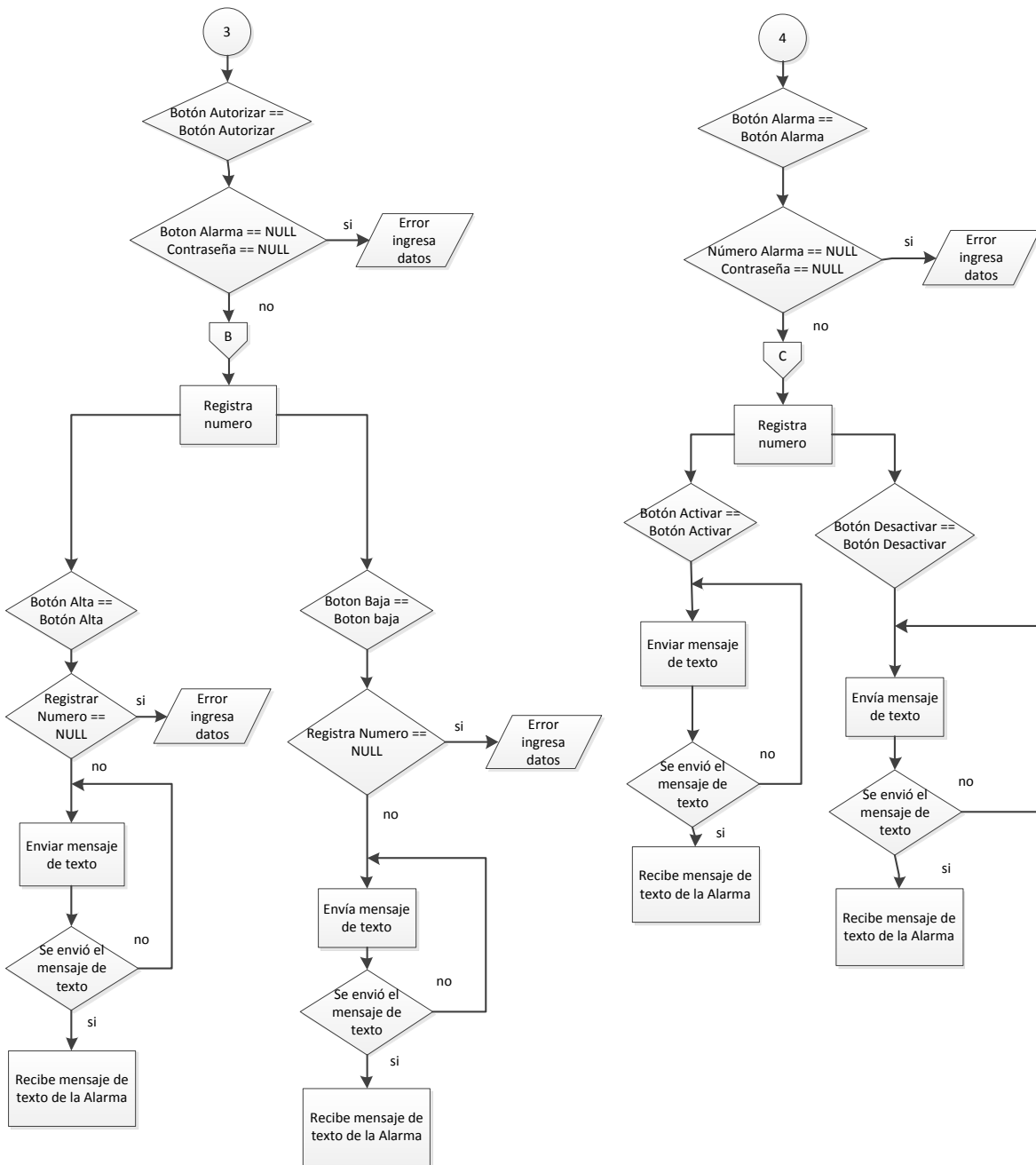


Diagram 3.3: Module authorize and alarm.

Assume that the car doors were opened and the device sends warning message to the user. What actions should take the customer? The first is to cut the vehicle ignition to be detected quickly. Once recovered the car must be reactivate the passage of gas. We see this in the figure below.

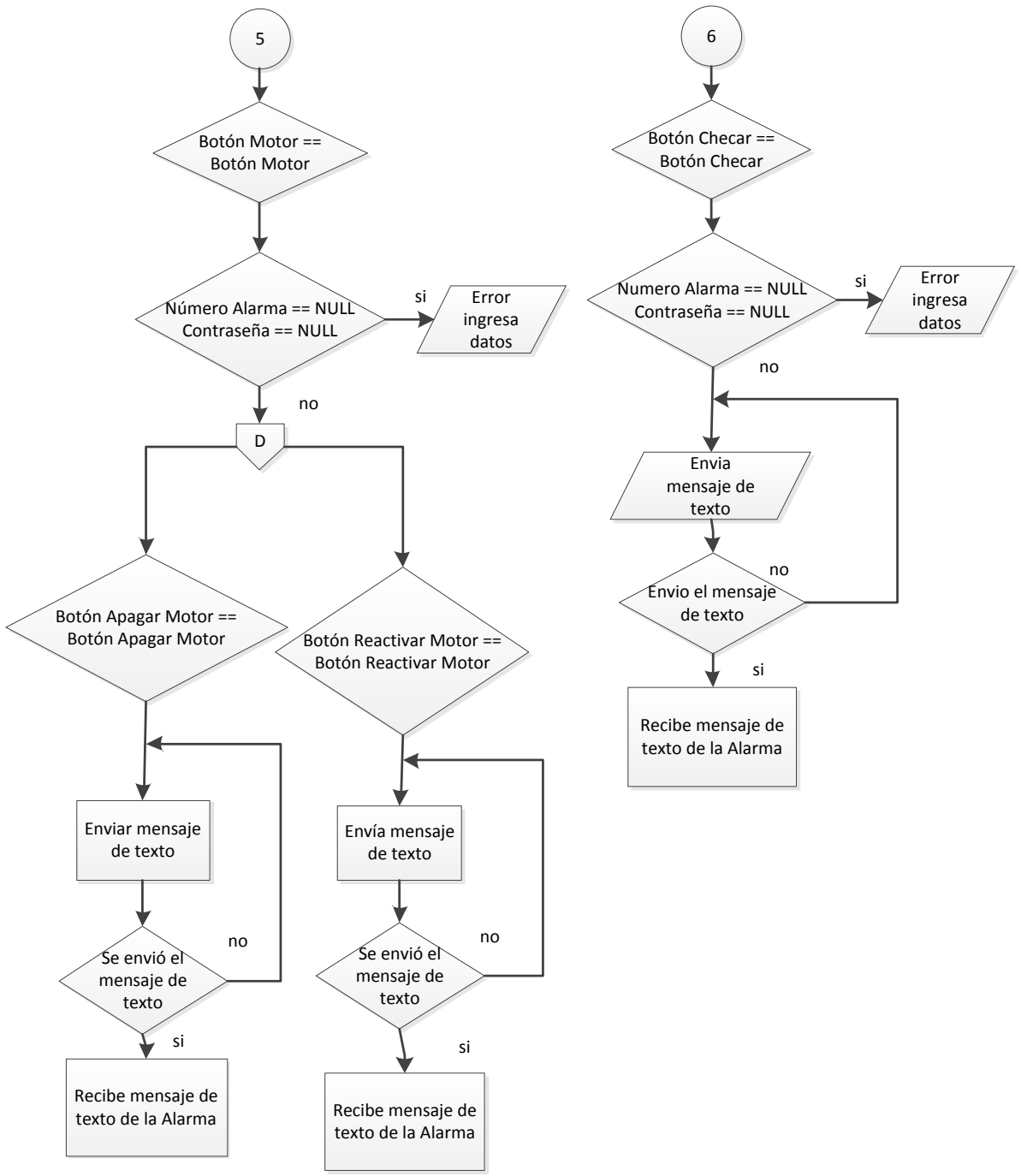


Diagram 3.4: Alarm Module and motor.

What if the car is parked and no one opens the door for robbery, otherwise it takes a crane? The device to be armed (activated) has the option alarm if the car forward over 100 meters, this

so the driver of the car can cut the ignition as mentioned in the above diagram.

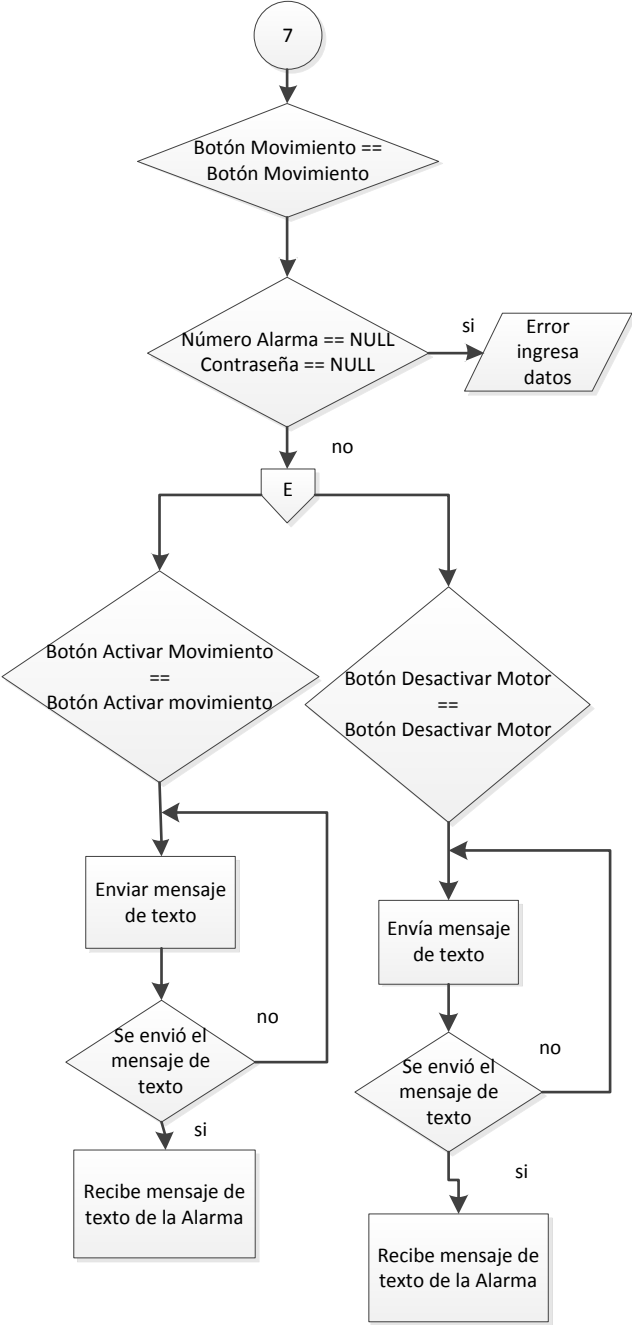


Diagram 3.5: Module movement.

This chapter describes the design of the application was made. The easiest way is with diagrams bring it allows the abstract or what is thought to make a step prior to development.

In Chapter 4, once the application is created to undertake the implementation of the tracking device and extraction APK (application package) file that is used to distribute and install components for the Android platform.

tests are performed with the model and the application so that everything works well and does not operate like this preset, correct the problems.

CHAPTER 4. Implementation of the Android Application.

The implementation and application development for automotive alarm system will be developed on Android. Motorists will have a more dynamic, friendly and easy to use environment.

User Interface 4.1.0.

In this part of the communication between the motorist and the alarm system via the application interface is graphical android hiding commands alarm device will be designed.

The user interface is divided into three main elements:

Activity.

Screen shown to the user. The activities consist of views:

ViewGroup

Composition of view. Complex controls and Layout ViewGroup inherit from the base class.

View

Controls the user interface. Basic interface element that allows interaction with the user. A view is a rectangular area on the screen that manages the size, drawn, changing focus and gestures of the area they represent. The class serves android.view.View Base class for all controls.

Available views used in this screen: TextView, EditText, Button.

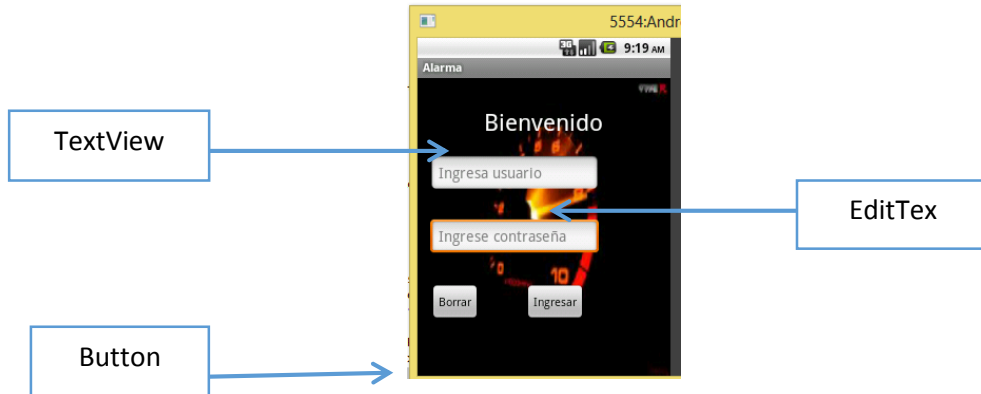


Figure 4.1: View of the first screen of the application.

ViewGroup. A special view that contains other views daughters. *ViewGroup* is the base class wrapper layouts and views in the following figure a daughter view is displayed after entering the correct data in the previous screen when entering throws us another screen button is pressed.

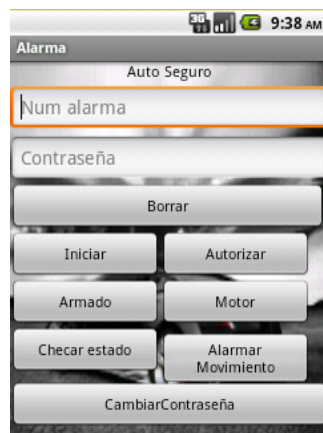


Figure 4.2: Screen derived from the first sight (child view).

This class also defines the class, *ViewGroup.LayoutParams*, *Layouts*: *LinearLayout*, *RelativeLayout*.

ViewGroups: *DatePicker*, *Gallery*, *GridView*, *ListView*, *ScrollView*, *Spinner*, *TabWidget*.

4.1.1 Structure tree view.

The views are organized into structures tree whose root is a ViewGroup, setContentView () allows you to add a view to an activity.

When the graphic design is designed (view) is handled by the Java programming. The following diagram shows the hierarchy of view of the user interface.

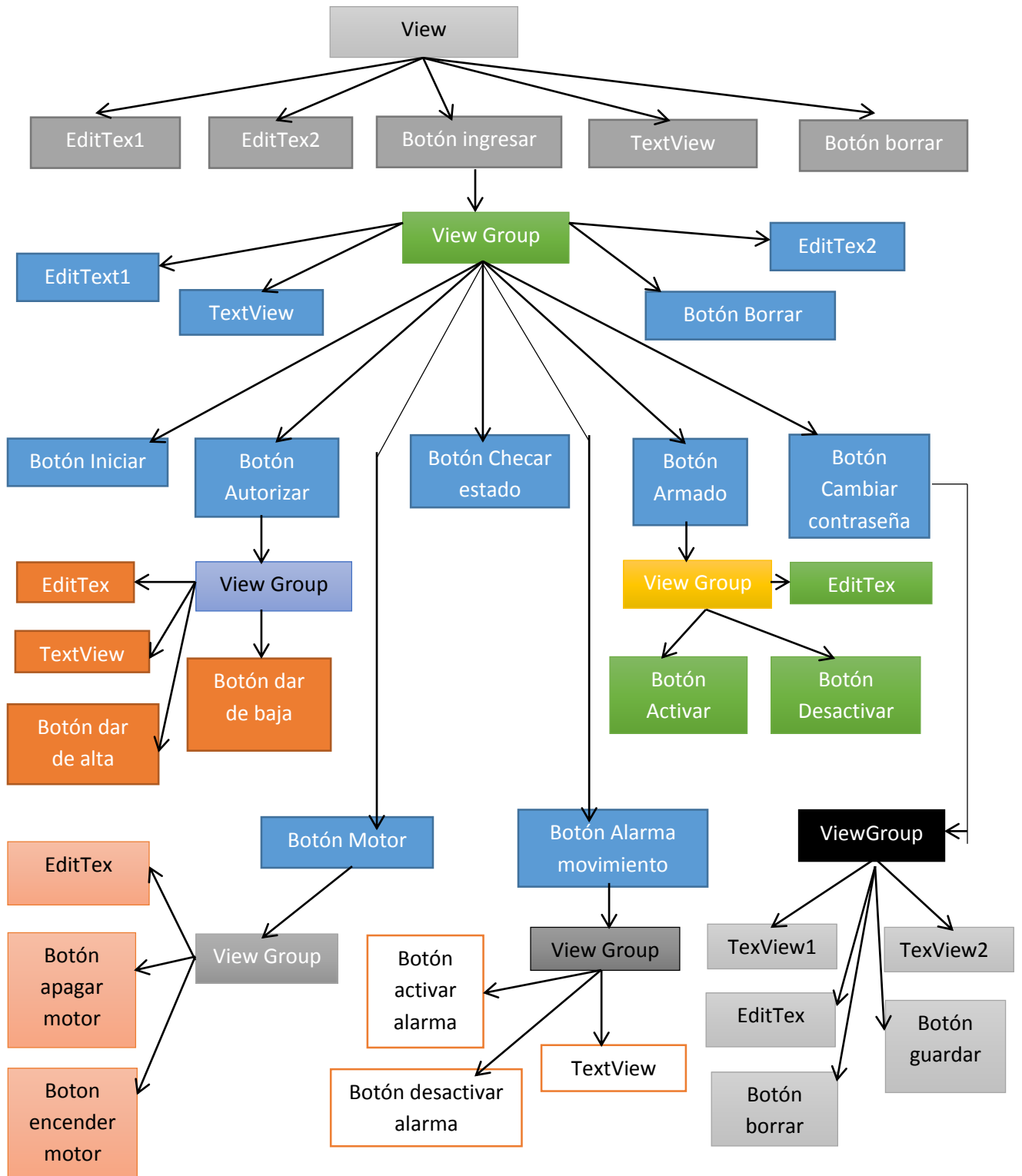


Diagram 4.1: Structure tree view, displays and screens daughters android application.

Designing XML interface declaratively the Android framework allows you to design the interface declaratively in XML. Specifying that you want to see on the screen (similar to HTML).

Xml declarative method can separate the presentation of the application code that contrala behavior. The separate allows them to modify the application interface without modifying the source code. Thus, one could design layouts for different screen orientations, different screen sizes or different languages without touching the source code.

The views inherit attributes its base classes and define their own attributes id attribute identifies the view inside the tree and can recover from the application. The symbol (@) indicates the xml parser that what comes then treat it as a resource identifier. The symbol (+) indicates that the name comes next is a new name and should be added to the resource class R.java

```
<TextView
  android:id="@+id/tv1"
  android:text="Bienvenido"
  android:layout_width="100"
  android:layout_height="60" />
```

When the application is compiled is also compiles each XML presentation file and is accessible from the R "View Resource" class generated by Android.

```
<Button android:id="@+id/acceptButton"
  android:text="@string/acceptButton"
  android:layout_width="wrap_content"
  android:layout_height="wrap_content" />
```

findViewById. You access the view from an activity.

```
Button btn = (Button) findViewById(R.id.acceptButton);
```

Class R.java generated by Android that allows access to resources once compiled as static attributes.

4.1.2 Design of layout and graphics controls.

A Layout's are invisible containers that determine the layout of the view on the screen. All layouts inherit from ViewGroup. Android recommends define the layout in XML using layout files that are in res / layout / main_layout.xml. When the application is compiled is also compiles each XML layout file and is accessible from the R "Resource View" generated class android.

```
protected void onCreate(Bundle savedInstanceState) {  
    super.onCreate(savedInstanceState);  
    setContentView(R.layout.activaralarma);  
}
```

Inflates an activity from a resource layout.

Layout types used are:

- A) LinearLayout: children have horizontal or vertical
- B) RelativeLayout: there are elements relating to other
- C) TableLayout: there are elements in rows and columns
- D) AbsoluteLayout: there are elements in exact coordinates
- E) FrameLayout: allows you to dynamically change the layout controls

The Layout LayoutParams class contains a class that is specialized for each type of layout. (LinearLayoutParams, RelativeLayoutParams, ...)

4.3 Design Android Application Views.

For the design of the first view the graphic environment is designed by xml, later to give an activity as the needs of the application are required.

4.3.1 Vista welcome.

This screen is security for the application, when lost or stolen phone when entering the application asks for a user name and password to enter the menu where the alarm controls. The user and password were defined from the program when the user purchases the application user and password are provided. To create the splash screen XML is used.

- 1) First of all the graphical interface is designed, in view of the elements of the list en res/layout/listItem.xml

Displays text TextView. It does not allow editing.

EditText text editing component accepts multiple lines.

Botton component in which views can be linked daughters.

```
1 <TextView android:id="@+id/tv1" Item.xml
  android:layout_width="wrap_content"
  android:layout_height="wrap_content"
  android:text="Bienvenido" />
```

- 2) Once all the graphics designed to give business environment, it creates a activity designed components inherit xml.

```
2 public class Actividad2 extends Activity implements OnClickListener {
  TextView tv1, tvEnviado;
  EditText et1,et2;
  Button btnBorrar, btnIniciar, btnAutorizacion, btnMotor;
  Button btnAlarma, btnCambiarcontrasena, btnchechar, btnAlarmaMovimiento;
  }
```

3)

3

```
protected void onCreate(Bundle savedInstanceState) {  
    // TODO Auto-generated method stub  
    super.onCreate(savedInstanceState);  
}
```

4) Pass the data to the adapter from the list with the id.

4

```
tv1=(TextView)findViewById(R.id.tv1);
```

5) Add the view to the activity

5

```
setContentView(R.layout.controles);
```

For user interaction with the system it is modeled events. If an application wants to hear and respond to user interaction appropriate logic is added to detect and process the event. An event encapsulates the information necessary for the handler can treat that entry. Event Listener: listen to events generated by a View or ViewGroup.

Each Event Listener has only one callback method, which will be called by the Android framework when the user interacts with the view. Eg onClick, onLongClick, onFocusChanged. The OnClickListener class to detect when the user is interacting with the GUI when pressed a button class listens and processes instructions that are within the class in this case the instructions are the buttons.

```
public class EventActivity extends Activity implements  
    OnClickListener {  
    private View view;  
    public void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.main);  
        view = (View) findViewById(R.id.view);  
        view.setOnClickListener(this);  
    }  
}
```

The next screen is the security screen and welcome.

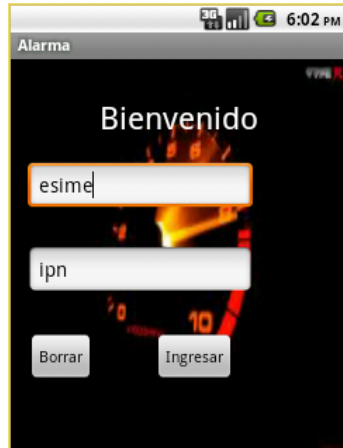


Figure 4.3: Security Screen.

This screen asks username and password to enter the menu alarm system when the enter button sends us a daughter view where the control buttons are pressed.



Figure 4.4: Screen to manage the device.

This view is the control buttons alarm which are hidden all commands and codes to make it easier to interface between the user and the security device to have communication as the data are requested

SIM card number of the alarm system and password this password can be changed as often as the user is required.

The delete button has view only daughter deletes the data entered by the user if he was wrong.

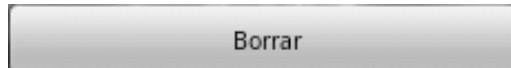


Figure 4.5: Button delete daughter has no view.

The following buttons send SMS text message including the command to the alarm system to send the message a method that was used is as follows:

```
private void sendSMS(String numerotelefono, String message) {  
    // TODO Auto-generated method stub  
  
    SmsManager sms = SmsManager.getDefault();  
    sms.sendTextMessage(numerotelefono,null,message,null,null);  
  
}
```

It is a private method which is passed two parameters are the number of the SIM card and SMS text message. In each base class is the method summons to use it and send the text message.

```
sendSMS(numalarmaR1.getString("numalarmakey1"),"disarm"+contalarmaR1.getString("co  
ntalarmakey1"));
```

As the alarm system sends text message when a class communication correctly to receive text messages from the system is used it is performed class is as follows:

```

package com.example.alarma;
import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.os.Bundle;
import android.telephony.SmsMessage;
import android.widget.Toast;

public class SMSReceveir extends BroadcastReceiver
    public void onReceive(Context context, Intent intent) {
        // TODO Auto-generated method stub
        Bundle bundle = intent.getExtras();//manejador
        SmsMessage [] msgs = null;//creando un msgs donde se guardara el mensaje
que llege del otro dispositivo
        String str = "";//un string que almacena el mensaje pdu a string

        if (bundle != null){//se evalua si yego mensaje
            //si llega un mensaje lo recupera

                Object[] pdus = (Object[]) bundle.get("pdus");//crea el objeto pdu

                    msgs = new SmsMessage [pdus.length];

                        for(int i=0; i<msgs.length; i++){

                            msgs[i] = SmsMessage.createFromPdu((byte[])pdus[i]);

                                str += "SMS de " + msgs[i].getOriginatingAddress();

                                    str += ":";

                                        str += msgs[i].getMessageBody().toString();

                                            str += "\n";

                                                }

                                                    //muestra el nuevo mensaje que ha llegadoToast.makeText(context, str,
Toast.LENGTH_LONG).show();

                                                        }

                                                            }}

```


As text messages arrive in pdu format you have to create an object to store and bring to a character string to be read by a for to store them in an array and then print SMS.

These are the most important to manipulate our alarm system with the Android application classes.

The security system has a number of SIM card and a password to start communication with the security system as data are requested number and password to have communication.



Figure 4.6: View menu, data are requested number and password security system.

The button to initialize this is to initiate communication between the cell phone and the alarm system correctly button. Does not include any child view.

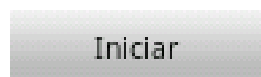


Figure 4.7: Button has no daughter start view.

The button authorize is a button that has a child view which can give high five closest numbers to access the device can be given high or low depending on user needs this interface is designed for when there an emergency, can alert the five numbers that need help.

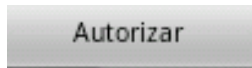


Figure 4.8: Button has a daughter authorize view.

When we click the button shows the following daughter authorize button view.



Figure 4.9: Vista daughter authorize button.

The armed button this button has a child view in which you have two trigger buttons and off. The button to activate the alarm monitors the status of car doors when a door open alarm is activated and sends an SMS message to the cell phone indicating that the door was open text. The system is active siren sounding the car to turn off the security system is to disable the alarm button.

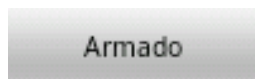


Figure 4.10: Button has a daughter armed view.

Giving the armed click button shows the next child view



Figure 4.11: Vista daughter of armed button.

The next engine button has a child view in which two buttons shown to control the motor current when the user wants to cut power to the engine to not start the car is with the button off the engine, the engine system stay totally inactive by sending an SMS message confirmation that the text engine is off, the current is activated until the user activates the engine switch button, all codes are within the android programming.



Figure 4.12 engine has a daughter view button.

The view the button shows a graphical and easy to manipulate the alarm system environment.



Figure 4.13 View Motor daughter button.

The button check state does not have a view daughter just send an SMS text message indicating the device to send status information (conditions how is the state if armed the battery level, door status, if the GPS network is in good condition as the SMS network.

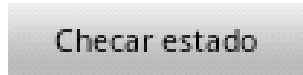


Figure 4.14 Button check state has no child view.

movement alarm button has a daughter view which shows a menu with two buttons activate alarm, disable alarm. This interface serves to activate the GPS when the car is parked for a long time and the user wants to alert you when the car is towed away to impound sending a text message saying that the car is in motion without doors have It has been opened, the message is sent when the car over 200 meters moved.



Figure 4.15: View Button daughter.

Change Password button was designed for the user to change their password security device as often as the user requires. He has a child view in which the buttons are displayed delete and save password. the new password which will be confirmed by the security system by sending a text message that the password has been changed correctly as data are requested.



Figure 4.16 Change Password button.

Vista daughter button change password data are requested as the new password will be discharged in the security system.


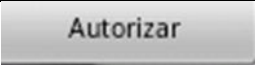
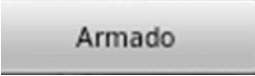
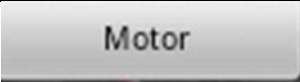
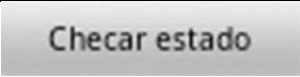



Figure 4.16 Vista daughter Change Password button.

4.3.2 Testing the application.

The tests were performed in a model designed for the security alarm system to work properly the response times of the safety device responding SMS text messages sent by cell phone user is taken. Communication is no problem, as long as the coverage of the cellular network and GPS is good.

Results Table 4.3.2.

Application buttons	Response time to SMS
	5s a 8s Max
	5s a 7s max
	4s a 6s max
	3s a 5s max
	4s a 7s max
	4s a 7s max

The results were optimal response time for the alarm system time is short and fast for any application button.

The application works on phones with android operating system from version 2.2 to the latest 4.2., As developed on a small screen can also be installed in mobile phones with large screens.

The application works correctly with the tracking device.

CONCLUSIONS

Topics are varied career as antennas, sending and receiving data from GSM cell phone, GPS was used as a locating means were discussed.

Programming in Java for the Android application. Electronics also reduce the input voltage of the car battery.

Through the history of automotive safety, we have seen many devices that are effective for each person depending on their need. Today what was achieved with this project is to give another option to secure our total car theft, applying new technologies and high reliability.

In 2013 Who does not know a Smartphone with Android system? Who does not know that is the google Maps? Who does not know how to use an Android app? the answer to these questions is that everyone knows to use the Android system or have a phone to send text messages. Many Mexicans have used the maps of google to find an address or know where they are. From set an alarm, everyone knows configure it and this is how our application seeks to be as friendly and simple as setting the time and date.

It concludes with an exciting final project, hoping it will be productive for the Mexican population and thus reduce crime with and without violence.

BIBLIOGRAPHICAL REFERENCES

- [1] www.informador.com.mx
- [2] www.dseguro.com/robo-de-vehiculos-asegurados/
- [3] www.android.com/
- [4] www.coopvgg.com.ar/alumnado_gomora/files/gsm.pdf.
- [5] <http://es.wikipedia.org/wiki/Android>

ATTACHMENTS

A1 PC Configuration and eclipse for java.

To develop the application of the alarm system the first thing you need is to download and install eclipse set on the PC to download all necessary Java development tools.

Undertake the steps apply to any platform for any changing all operating systems are programs that will be downloaded from the official pages just select the right.

1. Download and install JDK-.

We begin installing the JDK is a development tool for Java. We downloaded from the Oracle page.

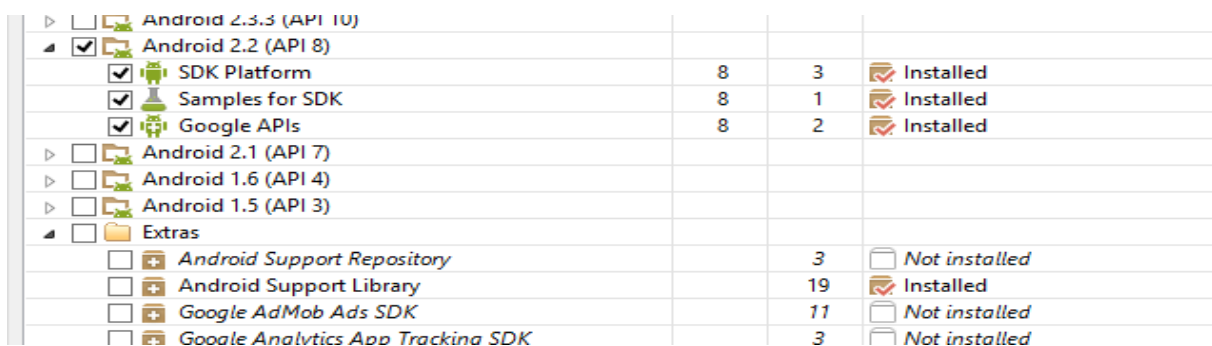
2. Download and install SDK.

We downloaded the SDK tools from the official website of Android and go to the section Developers select All the tools and documentation and select Get the SDK

3. Setting up the SDK.

After we proceed to download and install configuration. Open the Android android SDK manager Manager chose version 2.2 (API 8) since many devices have and so we cover the wider range of devices.

packages version 2.2 as shown in the figure below are installed.



<input type="checkbox"/>	Android 2.3.3 (API 10)			
<input checked="" type="checkbox"/>	Android 2.2 (API 8)			
<input checked="" type="checkbox"/>	SDK Platform	8	3	Installed
<input checked="" type="checkbox"/>	Samples for SDK	8	1	Installed
<input checked="" type="checkbox"/>	Google APIs	8	2	Installed
<input type="checkbox"/>	Android 2.1 (API 7)			
<input type="checkbox"/>	Android 1.6 (API 4)			
<input type="checkbox"/>	Android 1.5 (API 3)			
<input type="checkbox"/>	Extras			
<input type="checkbox"/>	Android Support Repository		3	Not installed
<input type="checkbox"/>	Android Support Library		19	Installed
<input type="checkbox"/>	Google AdMob Ads SDK		11	Not installed
<input type="checkbox"/>	Goole Analytics App Tracking SDK		3	Not installed

Figure A1: Android SDK Manager to download version 2.2 (API8). 4. download

eclipse.

Download eclipse the official site of the platform you can select any operating system either Windows or Linux and select the consistent platform.

Once installed eclipse for the first time we open our working environment.

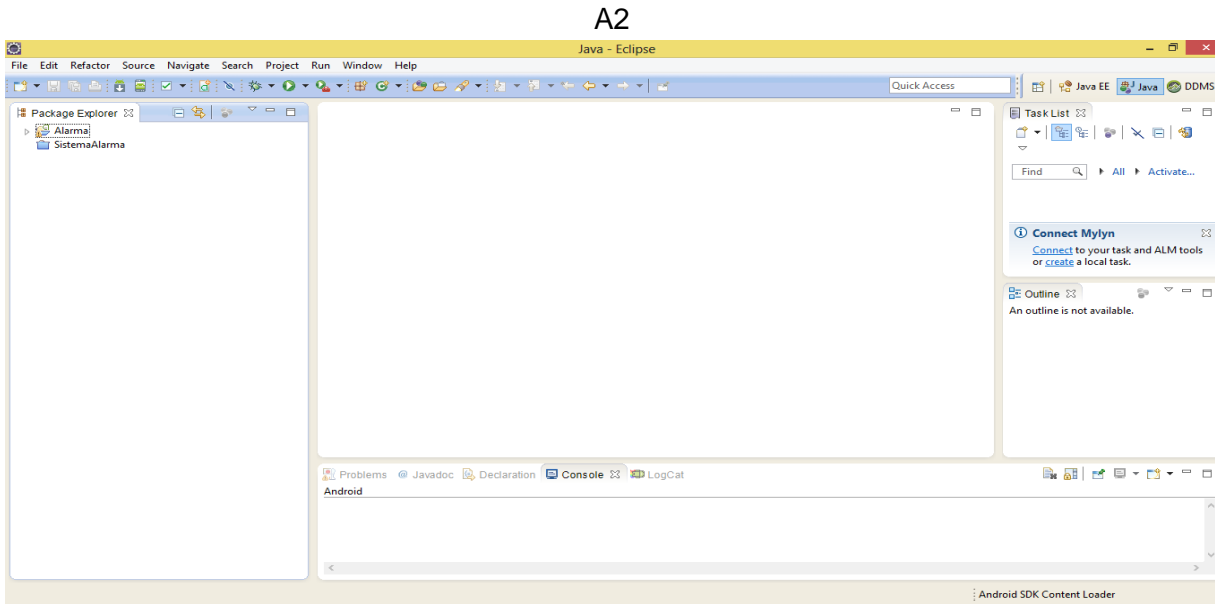


Figure A2: eclipse working environment for application development

5. Install the plug-in.

Proceed to install the plug-in which allows us to integrate our SDK with eclipse.

Help seek and select Install New Software.

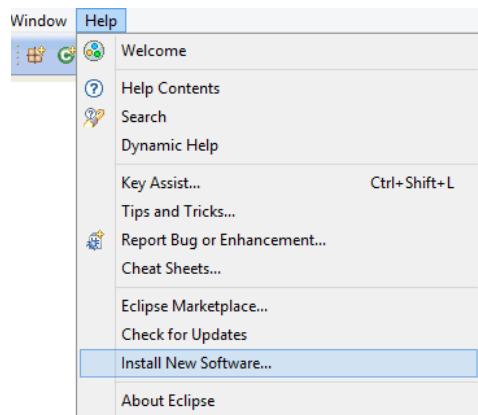


Figure A3: Installing the plug-in

Then a dialog box where you give a name and path where our SDK opens. This location is on the page Android.

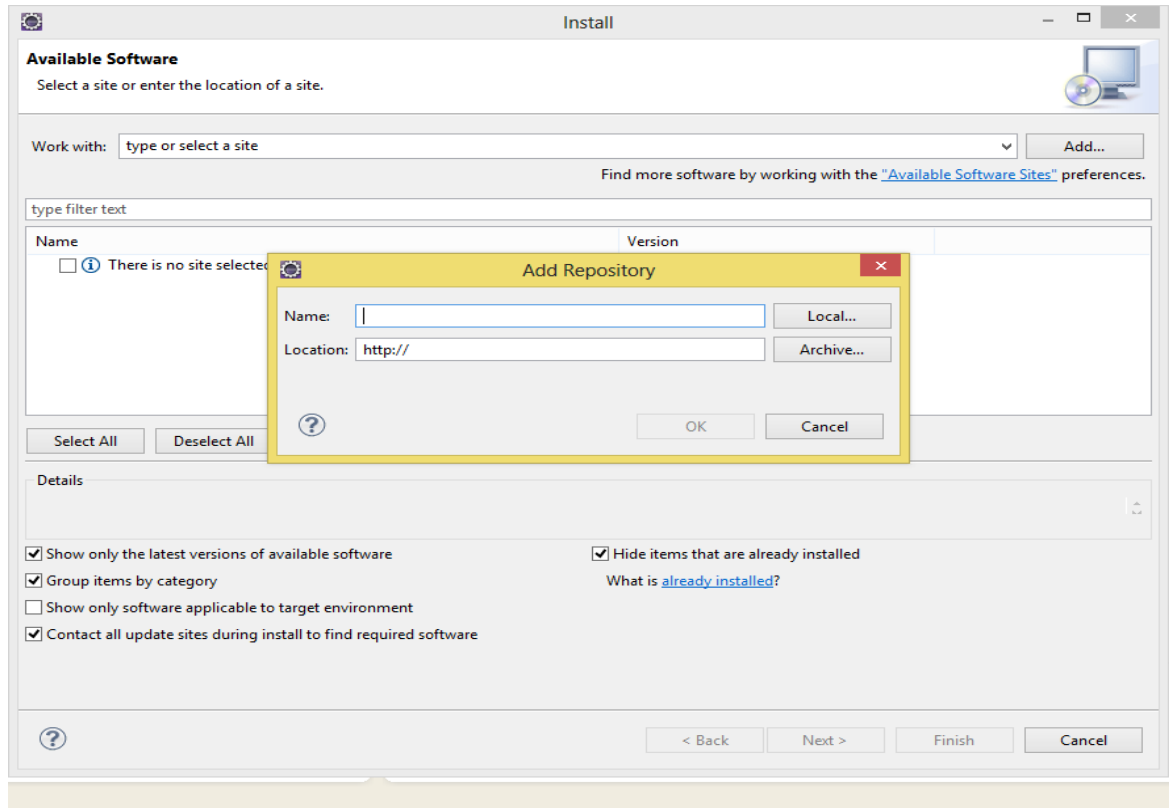


Figure A4: dialog and path of the JDK.

6. Set the virtual machine.

The virtual machine is used to view programming without passing them to a cell phone. The buttons and programming can be viewed and properly check the operation of the program. We icon Android Virtual Device Manager found in the toolbar. We click on the New button and the following screen appears.

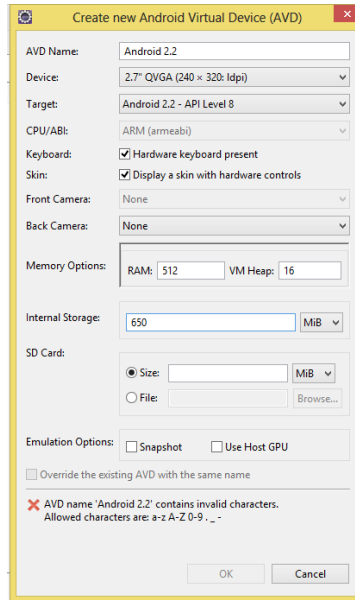


Figure A5: configuration of the virtual machine.

We name the AVD, the resolution of the screen is 2.7" QVGA (240 x 320: IPDI) the type of card is Android 2.2 API Level 8-other data are already by default.

Once ready all the virtual machine configuration appears everything is correct and we give Start

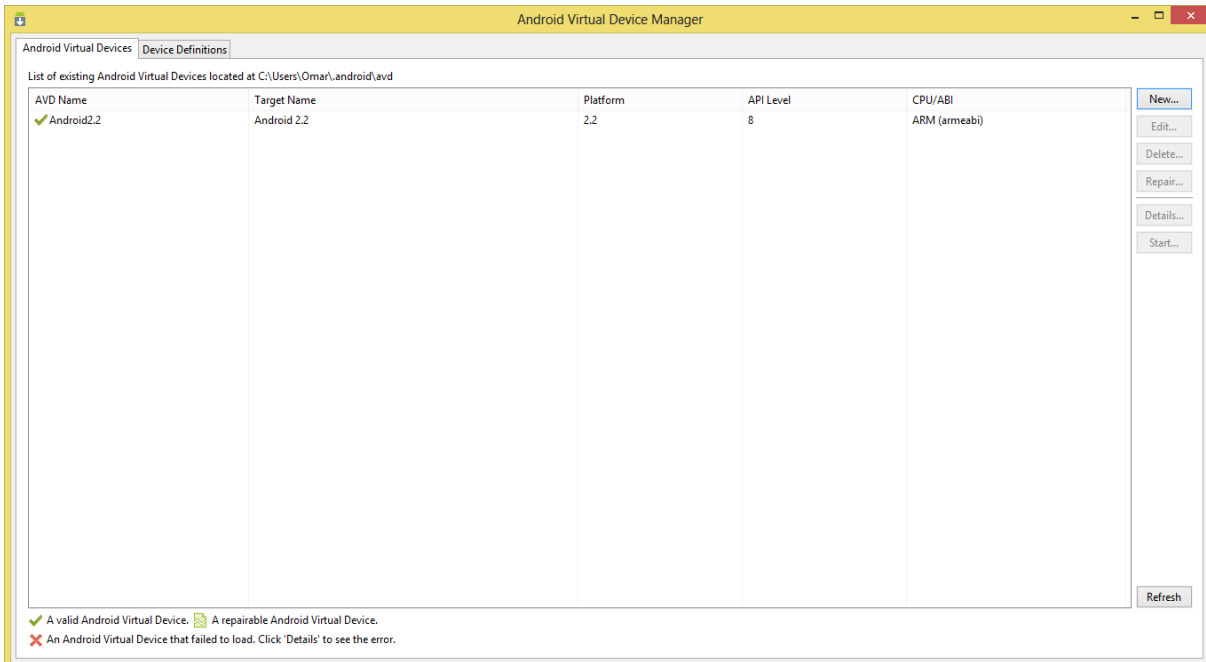


Figure A6: created virtual machine.

The virtual machine represents a real phone.



Figure A7: virtual graphical representation of a real phone.

Having all the tools needed for application development alarm system user interfaces were designed with the car.

B Operation and commissioning of the device

Performance Indicators

To initialize communication security system is turned on. Normal tracker, and turn on the switch on the battery. GSM / GPS LED Indicator

The red LED: No sign of the GSM network.

Red LED indicator flash fast (once every second): GSM Network signal is normally, and tracker works in the GSM mode.

Red LED indicator flashes slowly (once a second The three objectives): Tracker works in GPRS mode.

The green LED indicator on: GPS signal is normal. Green

LED indicator off: No GPS signals.

initialization

Send SMS begin + password to the unit, it will respond OK start and initialize all settings (password: 123456).

Example: send SMS begin123456, which respond to start well. (No quotation marks when sending all the SMS).

Change Password.

Send SMS password + old password + space + new password to the unit to change the password.

Example: send SMS password123456 888,888 to the unit. If successful, will accept password will respond to your cell phone tracker device. Remember the other password.

Attention: Make sure the new password is in 6 digits, or can not recognize the password.

Authorization.

Maximum authorization numbers is 5.

Authorized numbers may continue to the device.

Send SMS admin + password + space + cell phone number to set an authorized number, the other authorized numbers should be set by the first authorized number, if the number is successfully authorized, the unit management response either by SMS.

Example SMS admin + password + space + cell number.

SMS Admin + 123456 + space + 5518598749.

Remove authorization. Send SMS admin + no password + space + authorized number to delete the authorized number.

Example no admin + 123456 + space + 5518598749.

To locate the drive.

Any authorized number to make a call tracking device, it will respond with an SMS including the position of latitude and longitude. If the authorized number is not properly configured you will not receive any SMS

Once the call is made, the call is hang up and answer a latitude and longitude in real time.

Situation automatically succession.

Send SMS fix030s005n + password to the tracking device commands, report the Geo-info at 30s intervals 5 times. (S: second, m: minute, h: hour). This set of commands must be in 3 digits and the maximum value is 255.

Cancel: Send SMS nofix + password to the tracking device to cancel the automatic tracking.

ALARMS SYSTEM PROTECTION SEGURADAD

Low battery alarm

When the voltage tracking device is near 3.6V, it will send SMS of low battery + lat. / Log much information to authorized number in 3 minutes interval.

Turn off the alarm.

To turn off the alarm

send SMS xtpower + password + space + off. To turn the alarm SMS EXTPOWER + password + space + on. When power is cut or the voltage is 0V, the tracker device will send SMS alarm + lat. / Long. The authorized number in 3 minutes interval.

Help button.

Hold down the SOS button for 3 seconds, the tracking device will send SMS help me! + Lat. / Long. All authorized numbers in the range of 3 minutes.

Power Control car engine

Send SMS command + password to stop tracking device that will respond Stop engine Succeed in your cell phone from the tracking device, and stop your car engine as well, at the same time. the stationary state will remain until receiving the next SMS command of resuming the oil and power that receives the SMS command once to cut the oil system and power.

Activate the alarm when the car is parked arm + password Send SMS command to the tracker device in the vehicle. Give an answer is active in both armed and disarmed state, and the SMS command will make the tracking device into armed state if the unit is currently disarmed.

It is activated when the engine is turned off and the door is closed.

Deactivate the alarm.

Send SMS command "disarm + password" to the tracker device in the vehicle, the answer is disabled in both armed state and disarmed, and the SMS command will make the tracking device into disarmed state if the unit is armed now.

Door alarm.

Send SMS unit door alarm + lat / long authorized in the range of 3 minutes number when the car door opens into the activated state to disable send disarm + password to stop it.

Check the status of the vehicle.

Send SMS command check + password to the tracker device in the vehicle, he will answer the power status, battery, GPS, door, GSM signal to the authorized number. Example: Send SMS check123456 to the tracker device in the vehicle, it will reply following SMS.

Battery: HIGH

GPS: OK

Door: Off

GSM signal: 1-32 (performance).

Note: The highest figure shown, the stronger of GSM signals it receives.

Reset button.

Press the reset button for 1 second, hardware tracking device will restart.