Long Range Car Alarm Notification Using SMS

by

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ABSTRACT

In traditional method of car security, simple door locks were used to deter thieves from breaking into the car. This traditional method is considered insufficient for the safety of the vehicle and its contents. Hence, the came the introduction of the car alarm system first invented in the beginning of the 20th century. The usage of car alarm systems is considered sufficient until today but a few underlying problem remain, such as informing the vehicle owner when the car alarm is ringing or wailing. Therefore the project would focus on developing a prototype that can remotely monitor the car alarm system.

The objective of the project is to implement a long range car alarm remote monitoring system using SMS. The system will have a mechanism to alert vehicle owners regarding the alarm siren activation when the alarm system detects an intrusion so that early precautionary steps can be taken. The vehicle owner can then proceed to check the vehicle and deactivate the siren to prevent the scenario of having a depleted car battery that will cause the car to not be able start.

Hypothetical-Deductive method will be used as development methodology for this project. In order to complete development of this project, this method was chosen because it serves as the typical method in other successful researches conducted.

Several test will be conducted in order to prove the viability of the system. Test results indicate the reliability of the system in propagating information directly to the vehicle owners in various conditions. Information received has been recorded in graceful latency under various circumstances.

With the development of Long Range Car Alarm Notification System, it is hoped that it will ease vehicle owners in monitoring their vehicles by applying new technological innovation. The system was developed to cater novice user through user friendly graphical user interface, hence incorporated with Short Messaging Services (SMS) taking into consideration, low cost production and reliable operability.

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CHAPTER 1
INTRODUCTION

1.1.Background Study

The concern with a lot of consumer needs for car alarm systems in this country has stimulated awareness for vehicle owners to increase the safety of their cars by implementing modern car alarm systems to their vehicles. First thing that comes to a car owner's mind is how to improve the safety of their vehicle when it is left unattended. Therefore this problem has captured vehicle owner's interest to implement long range car alarm notification systems to their vehicles. The vehicle remote monitoring method can be implemented in various situations such as in monitoring what triggers the car alarm. However, this project focuses solely in monitoring car alarm system remotely when the car alarm system detects an intrusion.

In the past, the security of the vehicle relied heavily on the vehicle's key door locks to prevent and deter theft of the vehicle and its belongings. But with the invention of the car alarm system, vehicle security has been brought to a new level. Due to the improvement of vehicle security techniques, modern telecommunication technologies can provide a great assistance for the car alarm industry. This project fully utilizes global system for mobile communication (GSM) and short message service (SMS) to directly alert the vehicle owners through their mobile phone. This practice has improved the old method of using paging system to notify vehicle owners. This technology is seen to be suitable in the current era of wireless age where everyone owns a mobile phone.

1.2. Problem Statement

The security of a vehicle is very important to many vehicle owner's nowadays especially when they park their vehicle in areas that are not as safe as parking their vehicles at their home garage. Therefore, a lot of technologies have been created to help prevent and deter the theft of thevehicle and its belongings. Nevertheless, very few are focusing on alerting vehicle owners when the car alarm's siren is ringing or wailing. Vehicle owners are not aware when their car alarm system is activated or ringing when they are far away from their vehicles.

The alarm system that is activated for long periods of time can drain the car's battery which will be a hassle as the owner will not be able to start the engine. The car alarm system that is kept ringing endlessly will also create noise pollution, which annoys the people who live within audible distance of the noise created. In some cases, professional thieves are able to disable the ringing siren and proceed to stealing the belongings of the vehicle and even get away with stealing the vehicle.

1.3. Project Objective

- To conduct a small study on remote alerting system for a car alarm systems.
- To develop a reliable and cost effective alert system for a vehicle's car alarm system.

1.4. Project Scope

- Concentrate on monitoring car alarm system remotely and notify alert through SMS.
- Utilizing Global System for Mobile communication (GSM) Technology.
- VB is used as editing tools.
- OzekiNG SMS Server Trail Version as the SMS Gateway
- D-link HSDPA USB Modem
- Windows 7 Ultimate as the operating system for the server acting as control panel.
- Digi used as telecommunication service provider for test purposes.
- Case study conducted was based on car alarm systems.

CHAPTER 2
LITERATURE REVIEW AND/OR THEORY

2.1 Car Alarm System

If you want to think about a car alarm in its simplest form, it is nothing but one or more sensors connected to some sort of siren. The very simplest alarm would have a switch on the driver's door, and it would be wired so that if someone opened the door the siren would start wailing. You could implement this car alarm with a switch, a couple of pieces of wire and a siren.

Most modern car alarm systems are much more sophisticated than this. They consist of an array of sensors that can include switches, pressure sensors and motion detectors.
A siren is often able to create a variety of sounds so that you can pick a distinct sound for your car. A radio receiver will allow wireless control from a key fob.
An auxiliary battery functions so that the alarm can operate even if the main battery gets disconnected. A computer control unit is used to monitor everything and sounds the alarm; the "brain" of the system. The brain in most advanced systems is actually a small computer. The brain's job is to close the switches that activate alarm devices; your horn, headlights or an installed siren, when certain switches that power sensing devices are opened or closed. Security systems differ mainly in which sensors are used and how the various devices are wired into the brain.

The brain and alarm features may be wired to the car's main battery, but they usually have a backup power source as well. This hidden battery kicks in when somebody cuts off the main power source (by clipping the battery cables, for example). Since cutting the power is a possible indication of an intruder, it triggers the brain to sound the alarm.

Some car alarm systems have a paging system to notify car owners that requires the car owner to have a pager.There are also car alarm systems that have notification via push notification that is transmitted using 3G technology.

2.2 Global System for mobile Communication (GSM)

For the best use of mobile communication technology, this project will utilize global system for mobile communication (GSM) and short message service (SMS) to conduct user notification. There are four advantages to this solution: (1) simple power solutions. Since most vehicles are parked at a far distance from where the owner is situated at, GSM, with its low power transmission requirements, will definitely be a workable choice. (2) GSM system covers a wide range of areas in Taiwan, which is also a plus for large, remote production areas since Taiwan has a good cellular phone penetration rate after many mobile operators have set up and implement base stations here. (3) Using GSM-SMS service, if the host server is out of service, the user data can be kept in the GSM service centre for 24 hours and the data can be received once the server is repaired. (4) Group broadcasts functions can be enabled easily to send real-time alerts to vehicle owners for immediate attention when any monitoring device is not functioning properly.[2]

Hence, by using a standard terminal (such as a remote control, the VCR manufacturer would achieve both significant cost savings and reduce time to market. Also, the end user would benefit from being able to use a familiar device, of his/her own choice, that could potentially be used to control a multitude of different devices. [7]

2.3 SMS in Data Field Acquisition

A number of SMS data will be sent to conduct a performance test. For data transmissions, the number of SMS data that encountered retransmission will be obtained. Data loss rate is defined as the lost SMS data that cannot be received after 24 h in terms of the total sent data count during the considered time period. The accuracy of data transmission via SMS achieved can be up to 915/915 = 100%, retransmission rate is only 25/915 = 2.73% and the toal data loss rate is 6/915 = 0.66%. [2]

Table 2.1: Summary for SMS data transmission performance evaluation

	Total Transmitted Data	**Percentage Value**
Accuracy of data transmission	915/915	100%
Retransmission rate	25/915	2.73%
Total data loss rate	6/915	0.66%

Table 2.1 shows the performance evaluation of SMS transmission. GSM-SMS service can be utilized for data transmission in field data acquisition with this test record of 100% data accuracy rating. [2]

2.4 Comparative Study

Wireless Network Communication

Table 2.2 shows the comparative study between several wireless technologies evaluated prior to be implemented in the project. Three types of wireless technology were evaluated which are GSM, Bluetooth and 3G.

	GSM	**Bluetooth**	**3G**
Range	Wide Area	Short range	Limited
Data Range	9.6 Kbps	700kbps	2Mbps
Media	Suitable and low cost	Requires access point to send data to distant areas	Not backward compatible to older GSM technology
Security	Moderate level	Moderate level	Moderate level

As a result, GSM was preferred due to several criteria tailored to the project needs. In terms of range, GSM covers a broader area as compared to the rest. Even though the data rate 9.6kbps which is far lesser than Bluetooth and 3G, the nature and size of the data to be transmitted in this project is just in text in form, which could overly waist of bandwidth if Bluetooth and 3G is used.

CHAPTER 3
METHODOLOGY/PROJECT WORK

3.1 Hypothetical-Deductive method

Hypothetical –Deductive method was used throughout the project. The reason for choosing this method was due to the facts that it served in various projects prior to this. This deductive method involves the process of falsification. It involves stating the output from theory in specific and the finding contrary cases using experiments and observations. If the objectives and research questions are not met, the works need to go back to early phases and the process is started all over again.

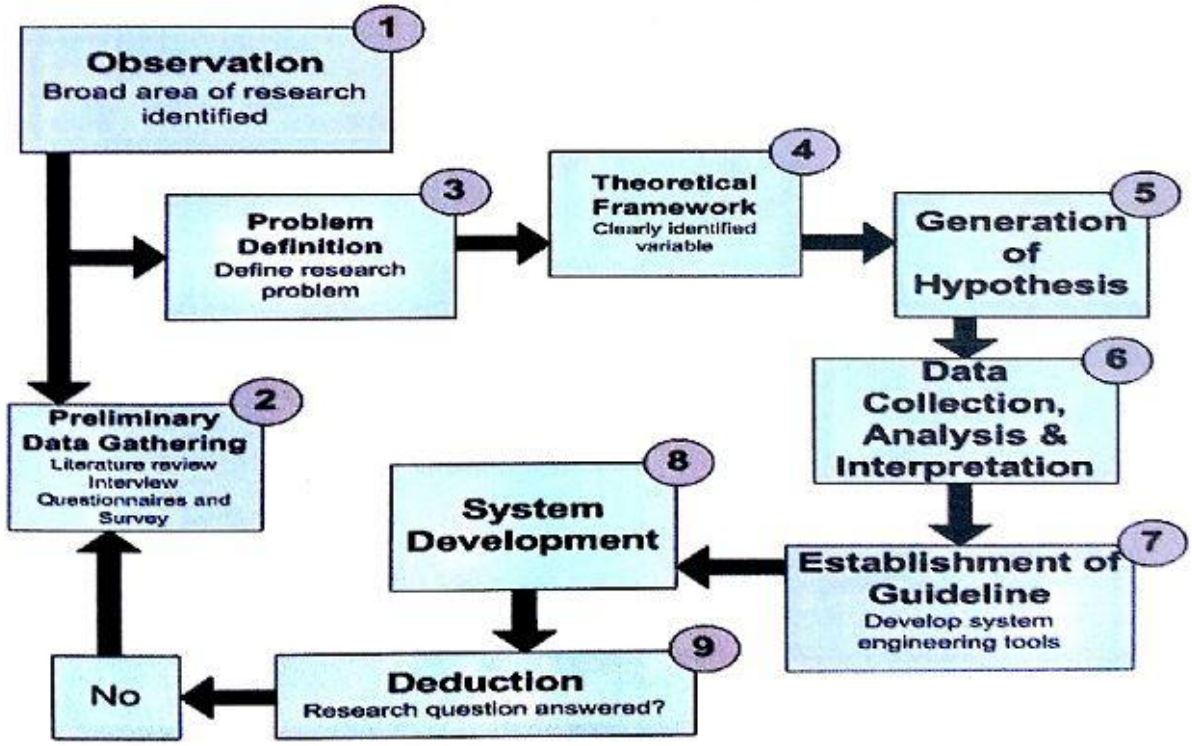


Figure 3.1: Research method and system development lifecycle for Long Range Car Alarm Notification

3.1.1 Observation

It was determined that there was a limited usage of long range communication technologies in car alarm systems. Several developed countries such as the United States and Germany have widely integrated this kind of technology with their agriculture industries. As compared to Malaysia, integrating the communication technology in car alarm systems is still in its infancy stages.

Moreover, it is also observed that there is a huge potential that exist in applying communication technology in car alarm systems industry in Malaysia. The observation carried out focused on how to remotely monitor greenhouse using wireless technology enforced with SMS to propogate information.

3.1.2 Preliminary Data Gathering

At this point, study was conducted which covers research from the internet, reading articles, proceeding papers, journals, and books regarding long range notification technologies and how it is implemented in various areas.

In order to proceed with the project, excellent knowledge about every element involved in the development of this system needs to be acquired. From studies conducted, three important parts need to be focused on this project, which are data acquisition, data communication and data presentation.

Data acquisition concerns the important car alarm system element that needs to be attained. The focus element to be acquired is when the alarm goes off and starts ringing or wailing. The car alarm activation was being observed and attained due to the fact that the car alarm system senses an intrusion to the vehicle.

For data communication, wired-cableand GSM has been used as communication medium for this system. Wired-cable is used to transmit the alarm activation of the vehicle to the data control platform. Later GSM was used to transmit alert notification in the form of SMS to the vehicle owner.

The graphical user interface and functionality of the system was built using VB.NET programming language. This programming language was chosen because [8];

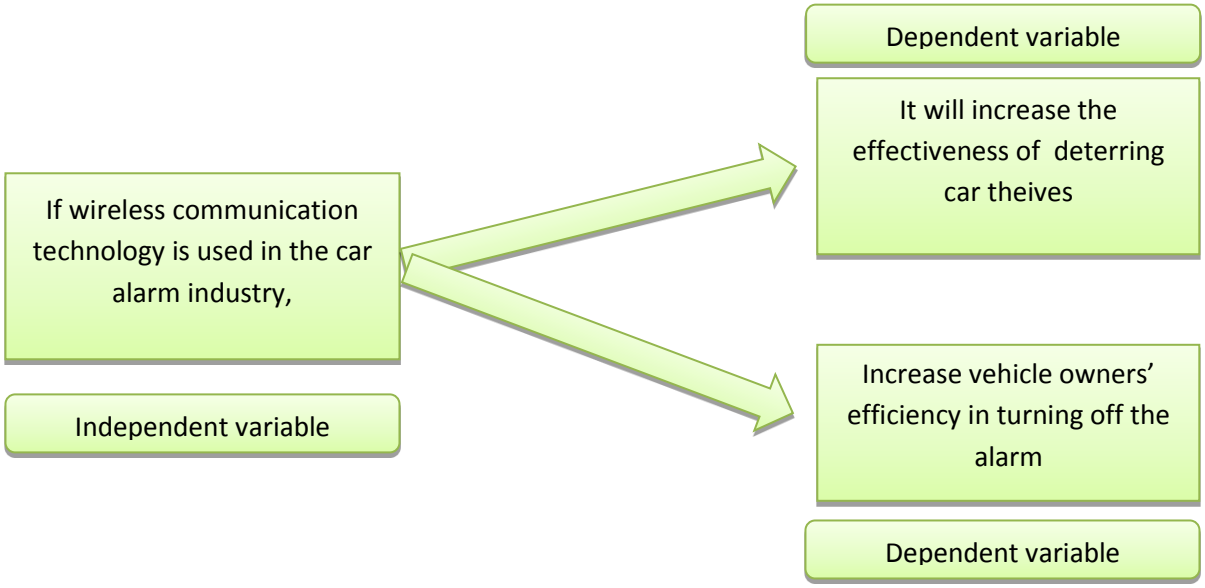
- Stable and mature in Microsoft Windows environment
- Large community leads to ease finding resources
- Can build Windows-based application that leverage the rich user interface features available in the Windows operating system
- Support threading
- Having support for console based application
- Powerful exception handling mechanism
- Object oriented
- Use record set for database connection
- Use dataset for database connection

3.1.3 Problem Definition

This phase is where problem of the study is defined to narrow down the scope of the project. The main focus of this project is to build a long range car alarm notification system in vehicles for owners to ease everyday operations in monitoring their vehicles. Traditionally, vehicle owners who are at a far distance from their vehicles will not be aware when the car alarm system goes off and is ringing or wailing. When the owners finally finds out that the alarm goes off, it has already created noise pollution. This system will help to alert the owners if the car alarm goes off so that they can take precautionary steps to prevent unnecessary loss of the vehicle and its contents.

3.1.4 Theoretical Framework

In this phase, the narrowed problem has been conceptualized. From the observation, gathered information and conceptualized problem, theory for this project is formulated. The theory in figure 3.2 indicates that the relationship of using wireless communication technology in the industry will help vehicle owners to help secure their vehicles and its contents more effectively.



3.1.5 Generation of Hypothesis

After getting a clear view and full understanding about variables involved in this project, an early hypothesis can be generated to predict whether this project has met the objectives or not. In order to justify the truth of the hypothesis, the critical variable defined in the theoretical frame work which is independent variable and dependent variables are put into conditional statement. The statement will be reasoned out during the development and the testing of the project.

The hypothesis for this project is of wireless communication technology is used in car alarm systems, it will help vehicle owners to lower the time taken to get to their vehicle and deactivate the alarm as well as help improve the security of the vehicle.

3.1.6 Data Collection, Analysis and Interpretation

Before the initial development of the system, necessary data needs to be gathered and analyzed for better interpretation of the project. Comparative study on several area of this project had been made to help making decision on choosing tools which are suitable for this project. The decision has been made based on its performance and how it could benefit the project. Two important comparative studies have been made. The first comparison studies on types of wireless communication medium and the second discuss on types of sensors to gathered data.

3.1.7 Establishment of Guidelines

Software Engineering elements was used at this phase to help establish the guidelines for the project. Elements such as frame work, system architecture, flow chart and data flow diagrams, has proven to ease work load and better the organized development of the project. Every detail of the developed guidelines needs to be fully comprehended in order to ensure the successfulness of the system.

3.1.8 System Development

Development of this project requires integration of hardware and software. Every steps and challenges faced during the development process will be reported in chapter 5. System testing will be performed to evaluate the system's reliability, latency and condition in the car alarm system. Details of test results and procedures will be discussed in chapter 5.

3.2 System Modal

The figure below shows the overview of the system model. This model will help to understand the hardware and software involved. Details explanation of the hardware and software is presented in the following subtopics.

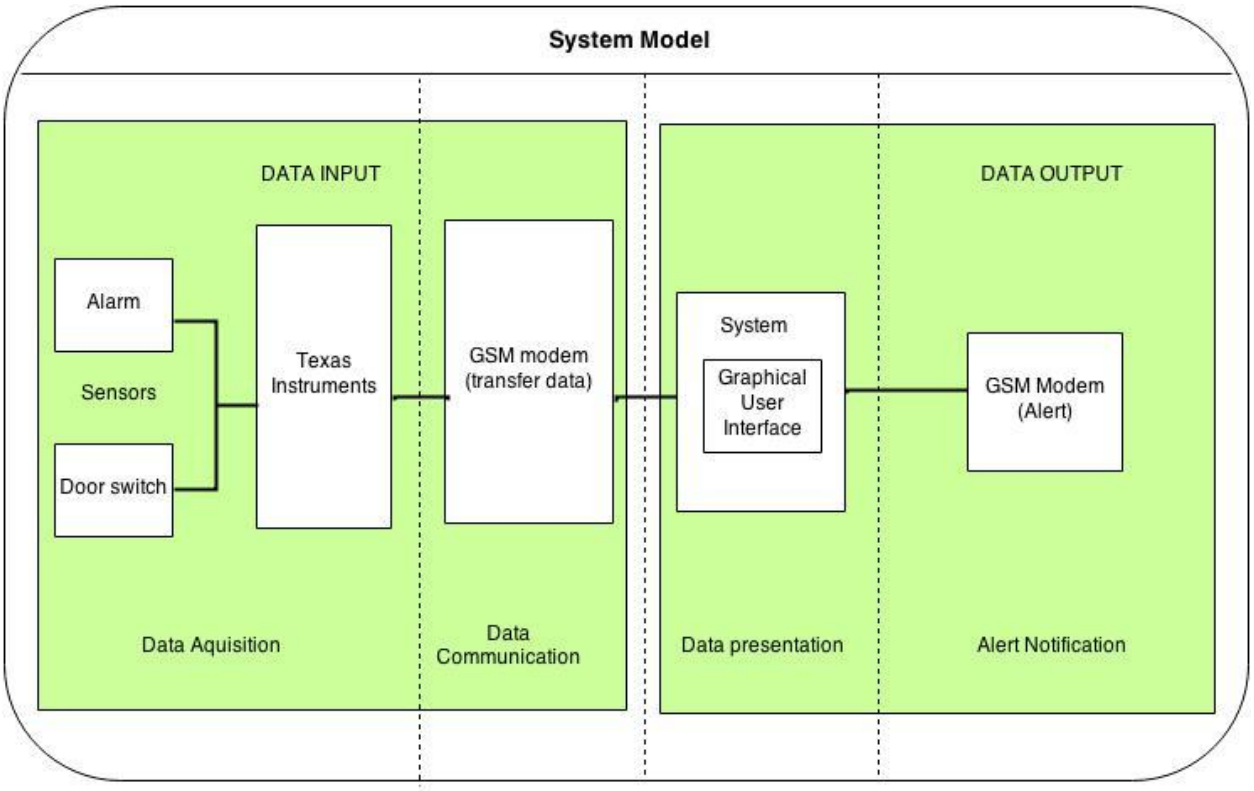


Figure 3.3: System Model for remote monitoring of the vehicle

3.2.1 D-Link 3.5G Express Card

Figure below shows the D-Link 3.5G Express Card. This card act is used as an internet broadband modem to send SMS. A 2.5G telecommunication provider SIM Card (Digi) was inserted in the modem to enable it. The modem need to be integrated with OzekiNG SMS Gateway before SMS can be successfully sent by the system.

Figure 3.4: D-Link 3.5G Express Card

3.2.2 Mobile phone

Figure 3.5 shows the smartphone mobile phone that will be used to receive SMS alert from the system.

Figure 3.5: Android smartphone used to receive alert from the system

3.3 Software

3.3.1 VB.Net

Visual Basic 2010 Express Edition was used as programmig tools for this project. This VB.Net Framework offers a number of advantages in terms of[9];

- Consistent Programming Model
- Direct Support for Security

- Simplified Development Efforts
- Easy Application Deployment and Maintenance

3.3.2OzekiNG SMS Gateway

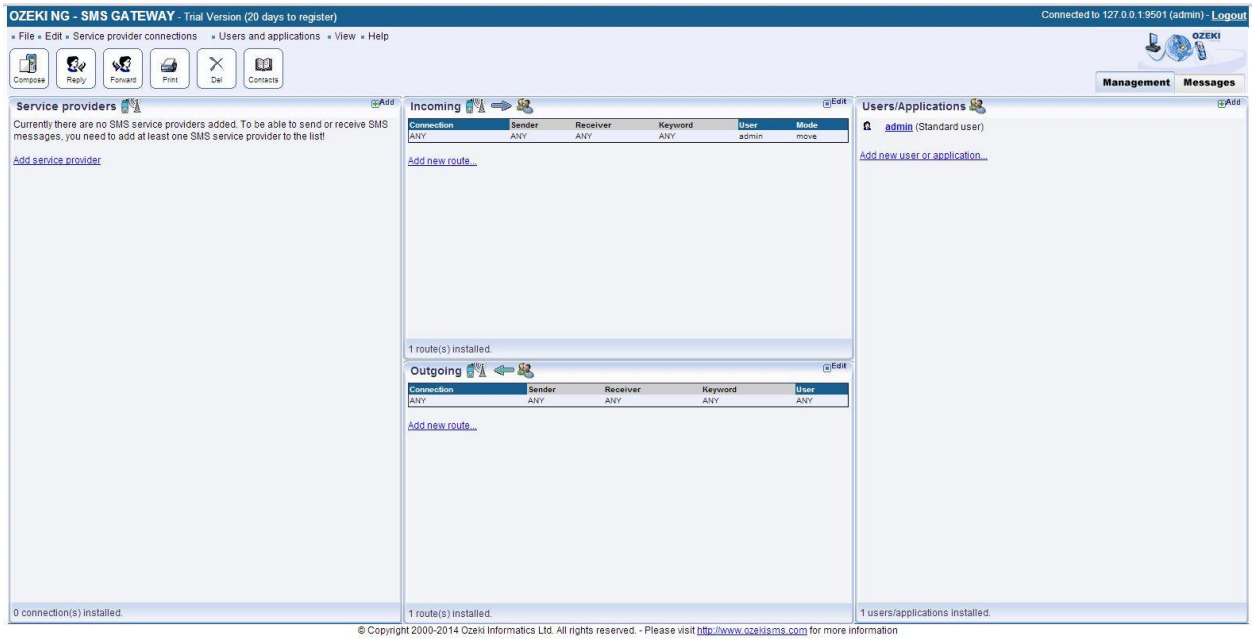


Figure 3.6: OzekiNG SMS Server

Figure 3.6 shows SMS gateway needed to establish connection between the system and GSM modem. It will allow the system to send/receive SMS messages to mobile devices with the computer. OzekiNG SMS gateway was used for this project because it has been previously proven to be reliable in other projects referred.

CHAPTER 4:
RESULTS AND DISCUSSION

4.1 System Architecture

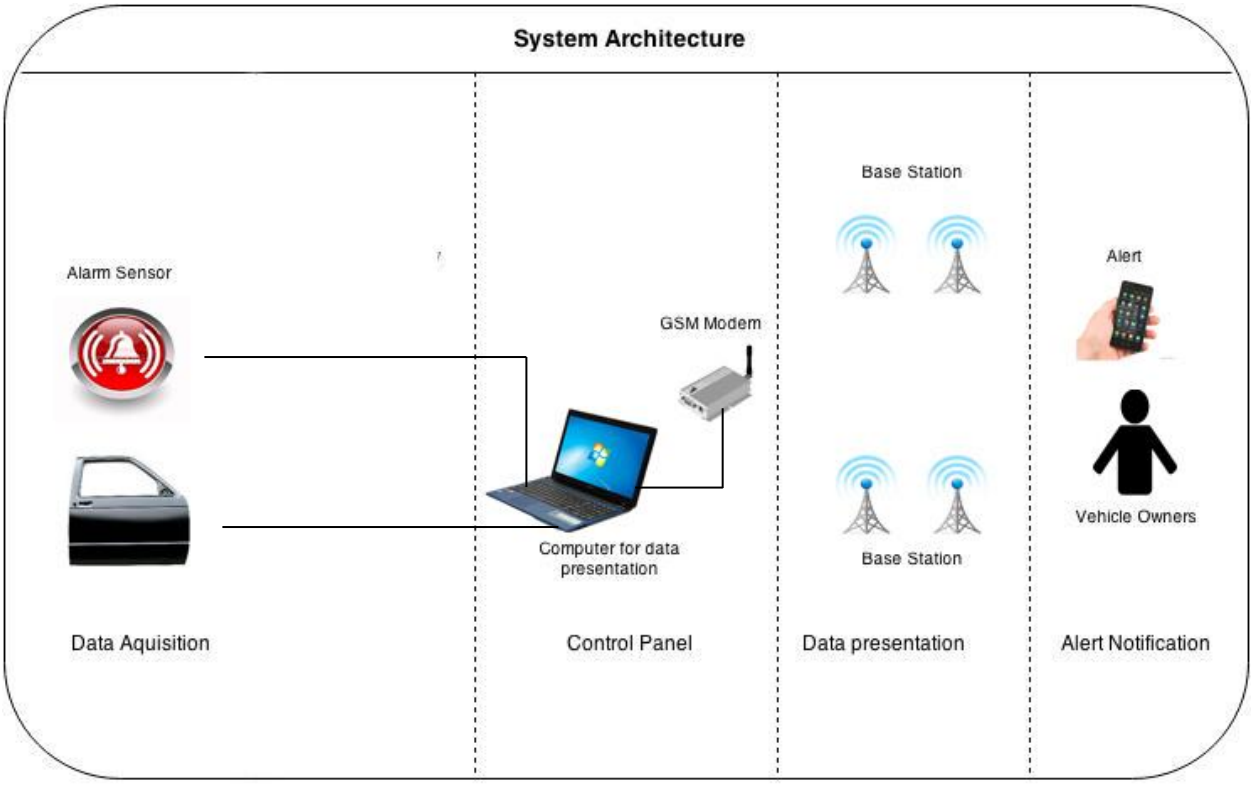


Figure 4.1.illustrate the whole operation of the proposed system. Signal captured from the sensors, later relayed to the control panel. When the signal is received, an alert SMS will be triggered via GSM modem through the cellular network destined to the vehicle owners. This system also allows two ways communication whereby the vehicle owners are allowed to request current status of the vehicle, windows closed, headlights off, car doors locked, doors and car hoods closed, from the control panel.

4.2 Control Panel

4.2.1 Panel Interface

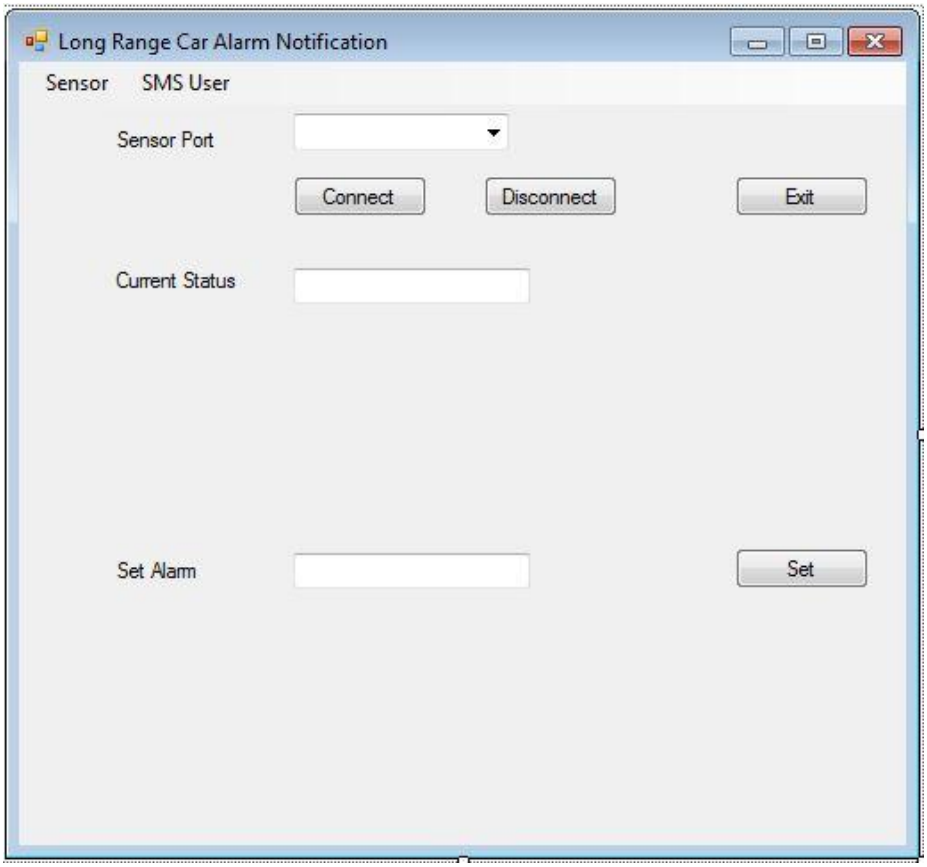


Figure 4.2 shows the control panel interface of the car alarm notification system which had been developed using Microsoft Visual Basic 2010 Express Edition programming language. For the control panel interface, three important parts were developed to execute system smoothly. First part refers to connection between computer and the alarm sensor. Drop down menu was used so that user can choose which communication port to be opened for sensor. Once the sensor is connected to the control panel, data will then be sent to the computer. Second important part is the two textbox with to show data retrieved from the sensor.

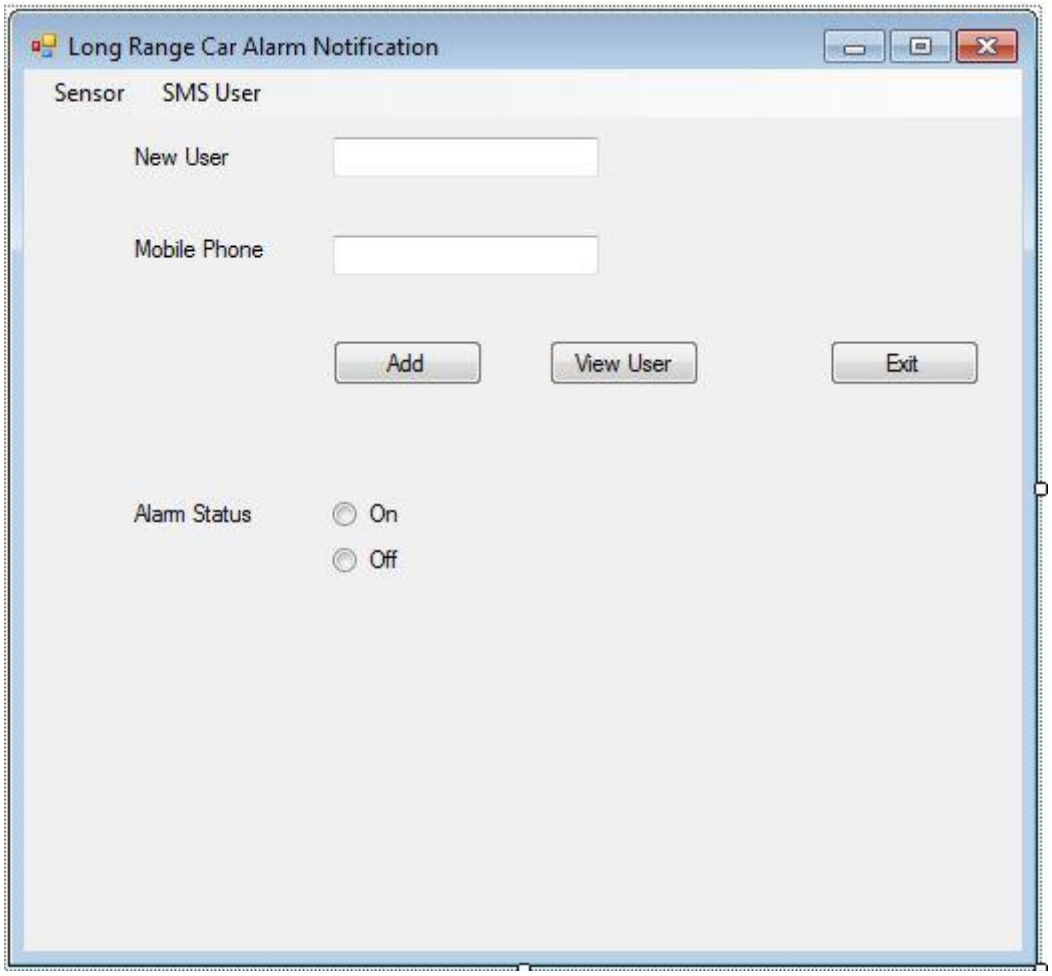


Figure 4.3 shows the control panel interface to set user and its destination mobile number. The car alarm SMS will be triggered on when the system detects someone trying to intrude the car.

4.2.1 Control Panel Coding

- **Sending SMS alert notification to car owner**

The text messages will be sent to the car owner from the Visual Basic form through HTTP with the HTTP GET method. On the form, the following values will be inserted:

IP address: 127.0.0.1)

Port number: 9501

Username: admin

Password: abc123

Recipient: the phone number of the recipient

Message: Alert! Car Intrusion is detected!

```
'This function opens an internet connection
Private Declare Function InternetOpen Lib "wininet" Alias
"InternetOpenA" _
        (ByVal ozAgent As String, ByVal ozAccessType As Long, ByVal
ozProxyName As String, _
        ByVal ozProxyBypass As String, ByVal ozFlags As Long) As Long

'This function handles the closing of the internet connection
        Private Declare Function InternetCloseHandle Lib "wininet"
(ByRef ozInet As Long) As Long

'Reads the response file of the retrieved file requested by HTTP
Private Declare Function InternetReadFile Lib "wininet" _
        (ByVal ozGetFile As Long, ByVal ozBuffer As String, ByVal
ozNumBytesToRead As Long,
        ozNumberOfBytesRead As Long) As Integer

'Opens an URL via the internet connection
Private Declare Function InternetOpenUrl Lib "wininet" Alias
"InternetOpenUrlA" _
        (ByVal ozInternetSession As Long, ByVal ozUrl As String, ByVal
ozHeaders As String, _
           ByVal ozHeadersLength As Long, ByVal ozFlags As Long, ByVal
   ozContext As Long) As Long
```

InternetOpen function creates Internet connection

InternetCloseHandle closes the connection

InternetOpenUrl opens an URL

InternetReadFile saves the HTTP response

```
'Sends the actual HTTP request

Private Function SendRequest(ByVal strUrl As String) As String
        Dim ozConnOpen As Long, ozGetFile As Long
        Dim ozReturnValue As Long, ozBuffer As String * 128
        Dim ozData As String

                ozConnOpen = InternetOpen("Ozeki HTTP client", 1, vbNullString,
vbNullString, 0)

                If ozConnOpen = 0 Then
                        MsgBox "No Internet connection avaible"
                        Exit Function
                End If

        ozGetFile = InternetOpenUrl(ozConnOpen, strUrl, vbNullString, 0,
&H4000000, 0)
                InternetReadFile ozGetFile, ozBuffer, 128, ozReturnValue
                ozData = ozBuffer
                        Do While ozReturnValue <> 0
                                InternetReadFile ozGetFile, ozBuffer, 128,
ozReturnValue
                                ozData = ozData + Mid(ozBuffer, 1,
ozReturnValue)
                        Loop

        InternetCloseHandle ozGetFile
        InternetCloseHandle ozConnOpen

        SendRequest = ozData
        ozData = ""
End Function
```

SendRequest function requests the URL

```
Private Sub Command1_Click()

    Dim ozIpaddr As String
    Dim ozPortNum As String
    Dim ozUser As String
    Dim ozPass As String
    Dim ozRecipient As String
    Dim ozMessage As String


        ozIpaddr = Text1.Text
        ozPortNum = Text2.Text
        ozUser = Text3.Text
        ozPass = Text4.Text
        ozRecipient = Text5.Text
```

```
        ozMessage = Text6.Text

Dim SendString As String

'SendString variable will contain the HTTP GET string, which will be used to
send the message.

SendString = "http://" + ozIpaddr + ":" + ozPortNum _
    & "/api?action=sendmessage&username=" + ozUser _
    & "&password=" + ozPass _
    & "&recipient=" + ozURLEncode(ozRecipient) _
    & "&messagetype=SMS:TEXT&messagedata=" + ozURLEncode(ozMessage)

'Sending the SMS with the HTTP request, and writing the response xml to the
frame

        Label7.Caption = SendRequest(SendString)

End Sub
```

Click event of Command1 button will execute the program and write the response XML

```
'This function will URL encode the characters in the HTTP request.

Function ozURLEncode(ByVal Text As String) As String
    Dim i As Integer
    Dim ozCode As Integer
    Dim char As String

    ozURLEncode = Text

    For i = Len(ozURLEncode) To 1 Step -1
        ozCode = Asc(Mid$(ozURLEncode, i, 1))
        Select Case ozCode
            Case 48 To 57, 65 To 90, 97 To 122
                ' Do not replace the alphanumeric characters
            Case 32
                ' Replace the space character with "+"
                Mid$(ozURLEncode, i, 1) = "+"
            Case Else
                ' Replace the national characters with a percent sign and the
characters
                hexadecimal value
                ozURLEncode = Left$(ozURLEncode, i - 1) & "%" & Hex$(ozCode) &
Mid$ _
                    (ozURLEncode, i + 1)
        End Select
    Next

End Function
```

ozURLEncode URL encodes its parameter

4.3 Testing

4.3.1 SMS Reliability Test

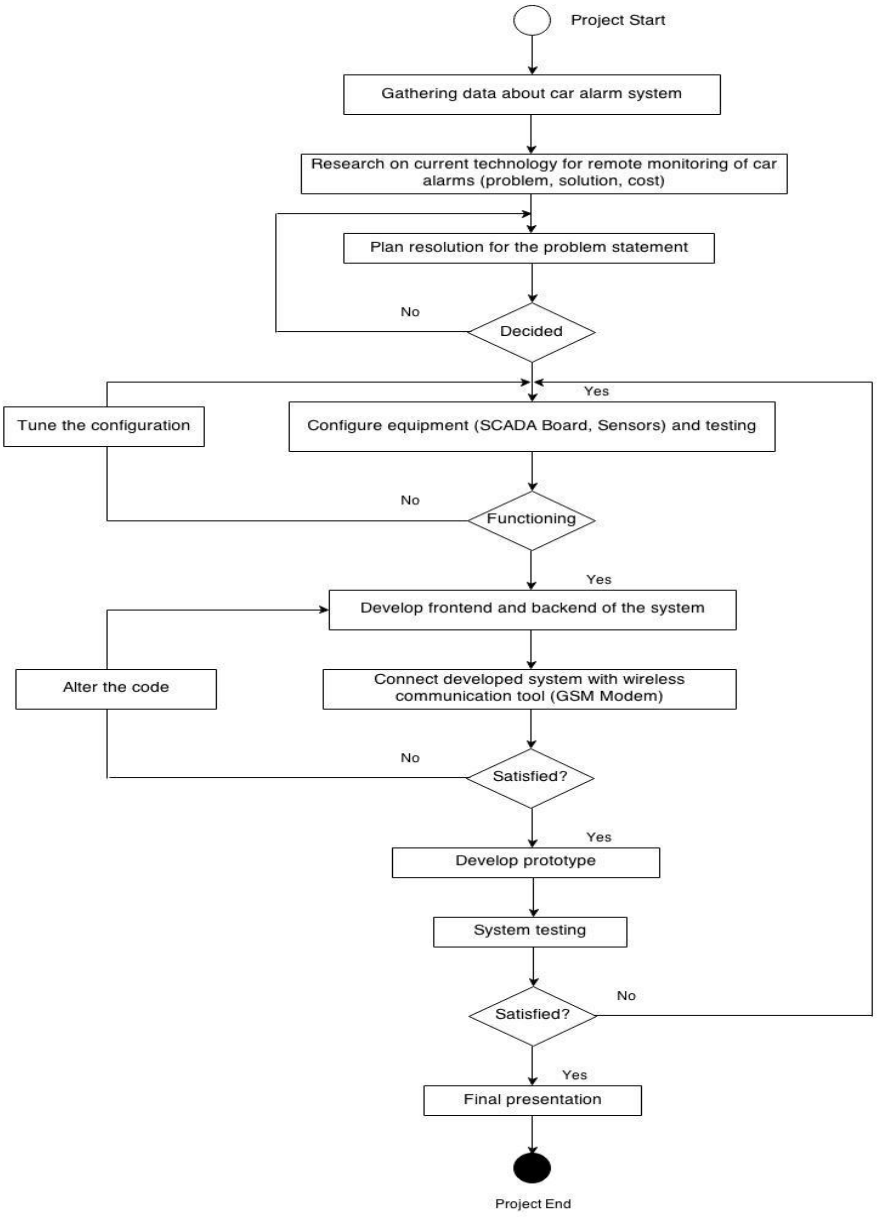
This test was conducted to examine the reliability of using SMS as a medium for communications. The analysis form this study examines the reliability of sending SMS notifications to the users of the system. There is found that there are similar test that have been done to verify that SMS is reliable in data acquisition.This has been explained in chapter 2. The environment of the telecommunications might be similar to conditions in Malaysia, therefore for this project, it is best to imitate a similar type of testing.

Table 4.1: SMS Reliability Test

	Total Transmitted Data	Percentage
Accuracy of transmission	300/300	100%
Retransmission rate	5/300	1.6%
Total data loss rate	0/300	0%

Table 4.1 shows the results obtained from the SMS reliability testing. The accuracy of the transmission was 100%. At different time intervals, the users have received a total of 300 SMS that were sent from the system. The retransmission rate is 1.6% or 5 from the total of 300. Not a single SMS was lost, and all the SMS were sent from the system and received by the users.

4.4 Flow Chart Diagram



Flow chart diagram above explains the process development of this project. Development of the research of this project will undergo a stage by stage process to obtain a successful system. Every stage will need to be satisfied and only then to proceed to the next stage. Tasks that are not satisfied will be revised before proceeding to the next stage.

CHAPTER 5:
RESULTS AND DISCUSSION

5.1 Conclusion

The two main objective of the project has been successfully met.

The internet search yield information pertaining to the programming code and advises to develop the system. Through this, the first objective has been met which is to conduct the small study on remote alerting system for car alarms.

The orderly development has been explained for clearly in the past chapter. The programming has been imparted altogether. The system interface and in addition its operation has been clarified. Toward the end, a complete system was produced considering reliability and lowering down costs. This two criteria has been demonstrated with the test conducted. Consequently the second goal which is to create a more reliable and cost effective notifications system to alert vehicle owners of an intrusion is met.

Initially, the idea was to have two conditions to trigger the system to deliver SMS notification to the car owner. However, only the condition of having the alarm siren ringing was studied. The second condition which is a trigger from a motion sensor was not used in this system due to its expensive cost and insufficient funds to purchase the sensor.

Through the finishing of the development of this system, a proper versatile system could conceivably be obtained. The proposed system is more secured through this.

5.2 Recommendation

This project can possibly be developed fusing numerous functionalities. Therefore a few recommendations need to be highlighted for the individuals who are interested to

proceed with this project. The task is additionally left with a few areas that still can be extensively explored and fields that have potential continuation.

5.2.1 Add more sensors to monitor other conditions which are essential in detecting car intrusions.

It is found that there are several conditions that can be monitored to detect intrusion of a vehicle instead of just the ringing siren of the car alarm system. Pressure sensors detecting broken car window screens can be used to detect intrusion. Motion sensors of moving items in the car can be used to detect a removal of items or and intruder entering the car. A proper mechanism will be needed to be integrated with the proposed system to monitor these conditions.

5.2.2 Implement Artificial Intelligent Concept or Expert System

This system is not outfitted with artificial intelligent concept or expert system such as fuzzy logic. By having this idea the system will have capacity of self learning, foreseeing circumstances, and characterize questionable circumstance. Accordingly it has the capacity make a move before an unwanted incident happens.

5.2.3 Reduce Cost of Hardware

The project cost for the system to be completed is RM1140 (refer to budget table in Appendix). The item that incurs a high cost are the GSM modem and VB.net installer. It would be better to obtain a means to develop this project using a lower budget.

References

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APPENDIX

Appendix A: Screenshots of Long Range Car Alarm Notification

Appendix B: Screenshots of SMS Received by Car Owners

Appendix C: Screenshots of Ozeki NG SMS Server

Appendix D: Budgets

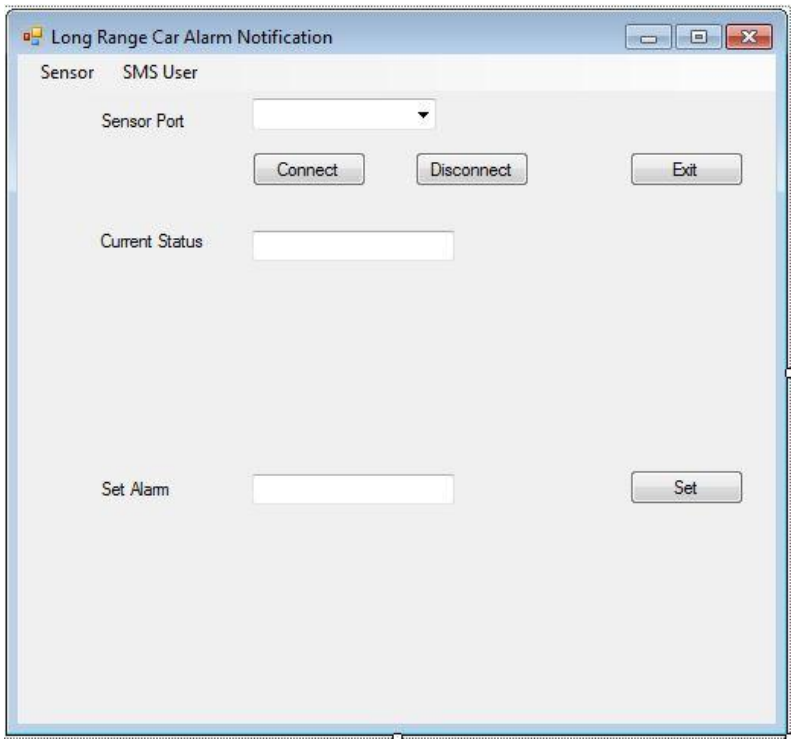
Appendix E: Technical Paper

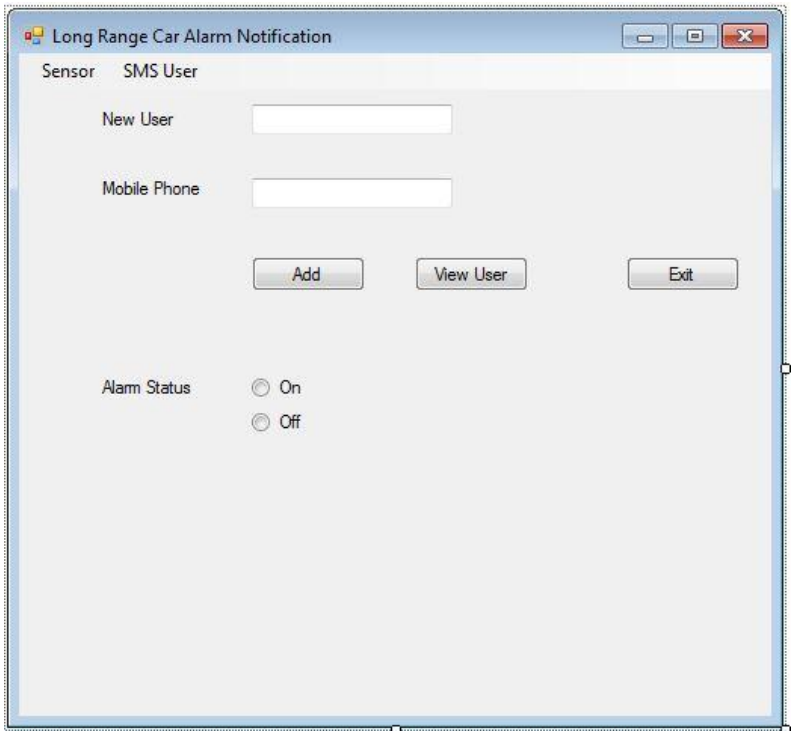
Appendix F: Poster for Pre-SEDEX

Appendix A

Screenshots of Long Range Car Alarm Notification

A1- Screenshots of Long Range Car Alarm Notification

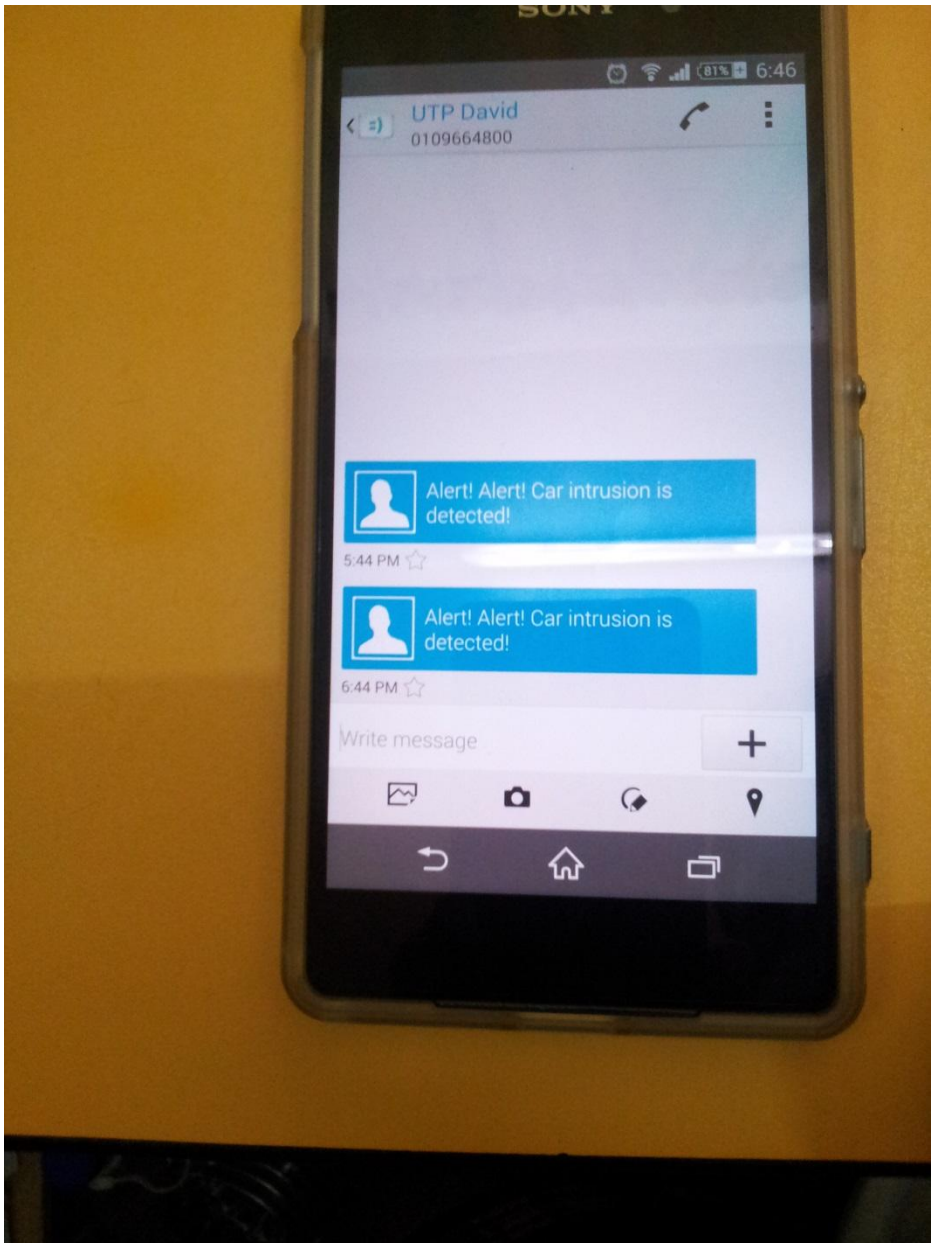




Appendix B

Screenshots of SMS Received by Car Owners

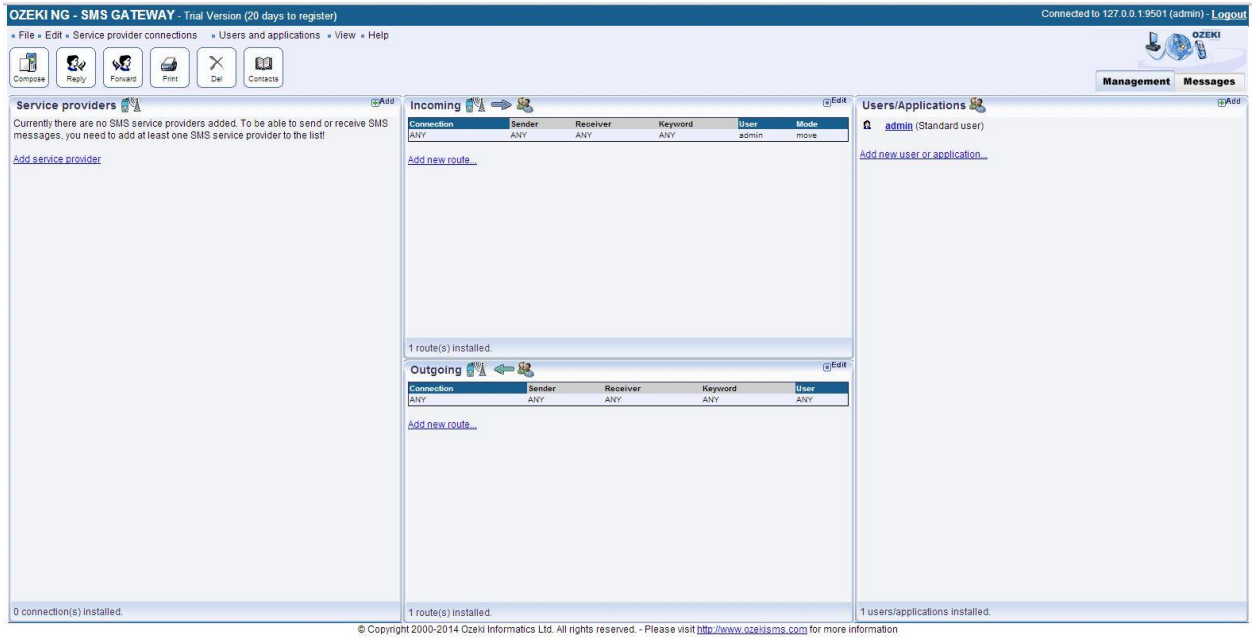
B1- Screenshots of SMS Received by Car Owners



Appendix C

Screenshots of Ozeki NG SMS Server

C1- Screenshots of Ozeki NG SMS Server



Appendix D

Budgets

D1- Budget for Long Range Car Alarm Notifications System

Item	Quantity	Price	Amount
Hardware D-Link 3.5G Express Card	1	RM500	RM500
Software 1.VB.net installer	1	RM500	RM500
Others 1. DiGi Prepaid 2. Hardbound Report 3. Poster	 3 1 1	 RM10 RM70 RM40	 RM30 RM70 RM40
		Total	RM1140

Appendix E

Technical Paper

Appendix F

Poster for Pre-SEDEX

CAR ALARM NOTIFICATION SYSTEM USING SMS

BY : DAVID BARU PADAN (13048), INFORMATION & COMMUNICATIONS TECHNOLOGY
SUPERVISOR : A.P. DR. JAFREEZAL JAAFAR, CO-SUPERVISOR: DR. IZZATDIN ABDUL AZIZ

BACKGROUND

The concern with a lot of consumer needs for car alarm systems in this country has stimulated awareness for vehicle owners to increase the safety of their cars by implementing modern car alarm systems to their vehicles. First thing that comes to a car owner's mind is how to improve the safety of their vehicle when it is left unattended. This project fully utilizes global system for mobile communication (GSM) and short message service (SMS) to directly alert the vehicle owners through their mobile phone. This practice has improved the old method of using paging system to notify vehicle owners. This technology is seen to be suitable in the current era of wireless age where everyone owns a mobile phone.

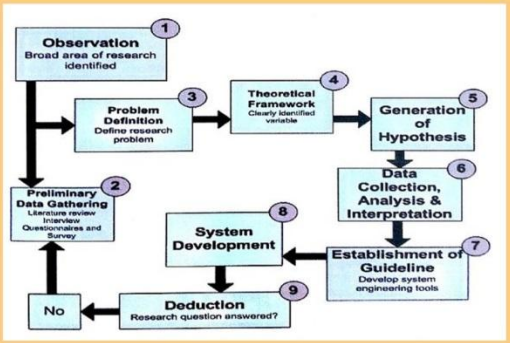
PROBLEM STATEMENT

- Not many alarm system are focusing on alerting vehicle owners when the owner is far away.
- Alarm system that is kept ringing/wailing endlessly drains the car battery.
- Professional thieves are able to disable the ringing siren and get away with theft.

OBJECTIVES

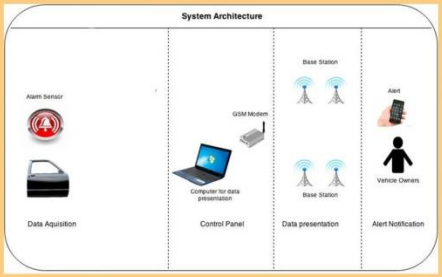
- To conduct a small study on remote alerting system for a car alarm systems.
- To develop a reliable and cost effective alert system for a vehicle's car alarm system.

METHODOLOGY

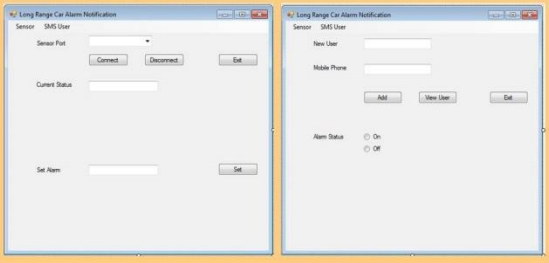


RESULT & DISCUSSION

SYSTEM ARCHITECTURE



SYSTEM INTERFACE



COMPARATIVE STUDY

	GSM	Bluetooth	3G
Range	Wide Area	Short range	Limited
Data Range	9.6 Kbps	700kbps	2Mbps
Media	Suitable and low cost	Requires access point to send data to distant areas	Uses high transmitted data bandwidth
Security	Moderate level	Moderate level	Moderate level

CONCLUSION & FUTURE WORK

- The use of SMS in monitoring the car alarm system will benefit vehicle owners by providing a cheap and effective means to them.
- The use of SMS is hope to achieve an easy user interface system with a low cost production.
- Implement Artificial Intelligent concept or Expert System.
- Add more sensors to monitor other intrusions which are important to deter theft of vehicles.