VIGILANCE HOME SECURITY SYSTEM
(VHS SYSTEM)

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ABSTRACT

Home security system is needed for occupants' convenience and safety. The purpose of this project is to presents a prototype of a Vigilance Home Security System (VHS System). The objective of this project is to provide the prototype of low cost home security system which home owner do not need to pay for monthly fee for company that offers Central Monitoring Service (CMS) for home security. Fully-monitored system is by far the most effective home security solution. The problems come when the users need to spent a lot of money for setup, equipment, monthly monitoring fees, and even warranties. These types of home security system not afford to have by low income home owner. Furthermore, the objective is to develop a prototype of silent home security system, it did not create a loud blast sound which is noticeable to the intruder (s) or create disturbance to the neighborhood, instead it notify the user or home owner through the text message of a GSM system. In a remote area, high blast sound of alarm system would not create attention from people all around. VHS system is an ideal solution for smaller home, apartment and condominium. Small business office, small factories or home often neglect the security requirement.

ABSTRAK

Sistem keselamatan rumah diperlukan untuk keselesaan dan keselamatan penghuninya. Tujuan projek ini adalah untuk menyediakan prototaip *Vigilance Home Security System (VHS System)*. Objektif projek ini adalah untuk membangunkan prototaip sistem keselamatan rumah menggunakan kos yang rendah iaitu pemilik rumah tidak perlu membayar yuran bulanan untuk syarikat yang menawarkan Servis Pusat Kawalan untuk memantau keselamatan rumah . Sistem keselamatan rumah berkawalan penuh setakat ini adalah penyelesaian sistem keselamatan rumah yang paling berkesan. Masalah timbul apabila pengguna perlu menghabiskan banyak wang untuk yuran pemasangan, peralatan, yuran bulanan untuk servis kawalan berpusat dan juga jaminan. Sistem keselamatan rumah jenis ini tidak mampu dimiliki oleh pemilik yang berpendapatan rendah. Selain itu, objektif projek adalah untuk membangunkan prototaip sistem keselamatan rumah senyap, tidak mengeluarkan bunyi yang kuat sehingga disedari oleh pencéroboh atau menyebabkan gangguan pada lingkungan kawasan kediaman. Sistem keselamatan rumah ini memberitahu pengguna atau pemilik melalui mesej teks atau SMS daripada sistem GSM. Tambahan lagi, di daerah terpencil bunyi yang kuat daripada sistem penggera tidak dapat didengari oleh sesiapa. VHS System adalah penyelesaian terbaik untuk rumah kecil, apartmen dan kondominium. Pejabat kecil, kilang kecil atau rumah yang sering terdedah dengan kecurian juga sesuai untuk sistem keselamatan rumah ini.

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CHAPTER 1

INTRODUCTION

1.1 Background

Security is a serious issue when there are concerns for the safety of family, properties and others. The majority of home and apartment burglaries occur during the daytime when most people are away at work, vacation or school. Burglaries are committed most often by young males less than 25 years of age looking for items that are small, expensive, and can easily be converted to cash. Favorite items are cash; jewelry, guns, watches, laptop, computers, video players, CDs and other small electronic devices are high on the list. Quick cash is needed for living expenses and drugs.

Statistics tell us that 70% of the burglars use some amount force to enter a dwelling, but their preference is to gain easy access through an open door or windows. Ordinary household tools like screwdrivers, channel-lock pliers, small

pry bars, and small hammers are most often used by burglars. Although home burglaries may seem random in occurrence, they actually involve a selection process. The burglar's selection process is simple. Choose an unoccupied home with the easiest access, the greatest amount of cover, and with the best escape routes. Alarm systems definitely have a place in a home security plan and are effective to avoid those problems from happen.

The earliest home security systems date back to the early 1900's. These systems were generally expensive and very hard to monitor. In the past 100 years as technology has changed, home security systems have also changed. Early home security systems were very expensive and surprisingly ineffective. They were very similar to car alarms. If the security system was tripped it caused a loud siren to sound, but in order to monitor these systems users had to be within hearing distance. As time passed and more and more consumers purchased these local alarm systems false alarms increased at such a rate that many times when an alarm would sound it would be neglected. Intruders quickly learned how to defeat these systems making the home security system essentially useless.

Today's security systems are extremely effective in preventing burglary and thefts as well as helping police respond to emergency situations. The mainstay of the home security system is definitely the high decibel siren. Today the siren is used to ward off would be intruders not for monitoring purposes. In most cases home security systems are monitored by large companies with multiple monitoring centers. Home security has changed a great deal over the last century and will continue to do so as long as technology continues to progress.

Extremely effective means extremely expensive. It is hard to find an effective home security system in a low price. For this reason, this project is focused on the development of a Vigilance Home Security System (VHS system). The word vigilance itself means the alertness. VHS system is a combination of electronic hardware, interfacing software and the GSM system.

1.2 Problem Statements

There are many types of home security systems that range from simple alarms systems to fully-monitored systems that provide total security and safety coverage for home. Research and experts agree that a professionally installed, fully-monitored system is by far the most effective home security solution that offers maximum protection and coverage from intrusion. The problems come when the users need to spent a lot of money for setup, equipment, monthly monitoring fees, and even warranties. This VHS System does not need to be monitored by home security company that offers such services because the alert will be send directly to home owner. As early mentioned that, most cases home security systems are monitored by large companies with multiple monitoring centers.

In a normal commercial alarm system creates a loud blast sound which is noticeable to the intruder(s) or create disturbance to the neighborhood. This will create a panic situation. And no one knows that the intruder(s) could be armed with guns or any type of light weapons, this could be dangerous to people around. To avoid this situation, this VHS System will not create any sound. A text message will be sent to the users if the system triggered. The intruder(s) can be cunningly intercepted by the authority.

In a remote storage stores, high blast sound of alarm system would not create attention from people all around. In the worse case, intruder(s) can deactivate the alarm sound and proceed with the intension. The VHS system, when triggered, it cunningly send notification message to the owner or the local authority for further action. It works just like a panic button.

1.3 Objectives

i. To provide a prototype of low cost home security system which homeowner do not need to pay for monthly fee for company that offers Central Monitoring Service for home security.

ii. To develop a prototype of a silent home security system, it did not create a loud blast sound which is noticeable to the intruder(s) or create disturbance to the neighborhood.

iii. To notify the user or home owner through the text message of a GSM system and notify direct to police station.

1.4 Project Scopes

VHS system is an ideal solution for smaller home, apartment and condominium. Small business office, small factories or home often neglect the security requirement. Even in isolated location of the government agencies mostly neglected the security requirement. For example schools nowadays equipped with multimedia equipment. These are often locked in the lab or in the locked stores which is unsecured. The lost of this equipment is far more expensive than the simple security system. TNB stores for example, are often intruded by the irresponsible individual for cables this can be avoided by this system.

1.5 Organization of the Thesis

This thesis consists of six chapters. The first chapter which is Chapter 1 provides an introduction or brief overview of the entire system which includes the project background, problem statement, objectives and system scopes. The second chapter which is Chapter 2 consists of the Literature Review of this system. The third chapter which is Chapter 3 is Methodology that includes the procedures, materials and methods for this system. Chapter 4 Implementation is about the documentation of the processes during the development of the system, including any modification that been plan and made. Last but not least Chapter 5 Result and Discussion will explain about the results that have collected from the analysis and tests of the system along with the constraints and suggestion to enhance the system performance. Finally, Chapter 6 is Conclusion which consists of summary of the project.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Chapter 2 is the important chapter for any project that will be develops. The purpose of this chapter is to present a selected literature review, which is very important for the research. This chapter also describes and explains on the literature review carried out on the system. Besides that, previous research also will be discussed in this section which are existing system and methodologies that being used in other research which is related to this system will be explained and compared to highlight the differences.

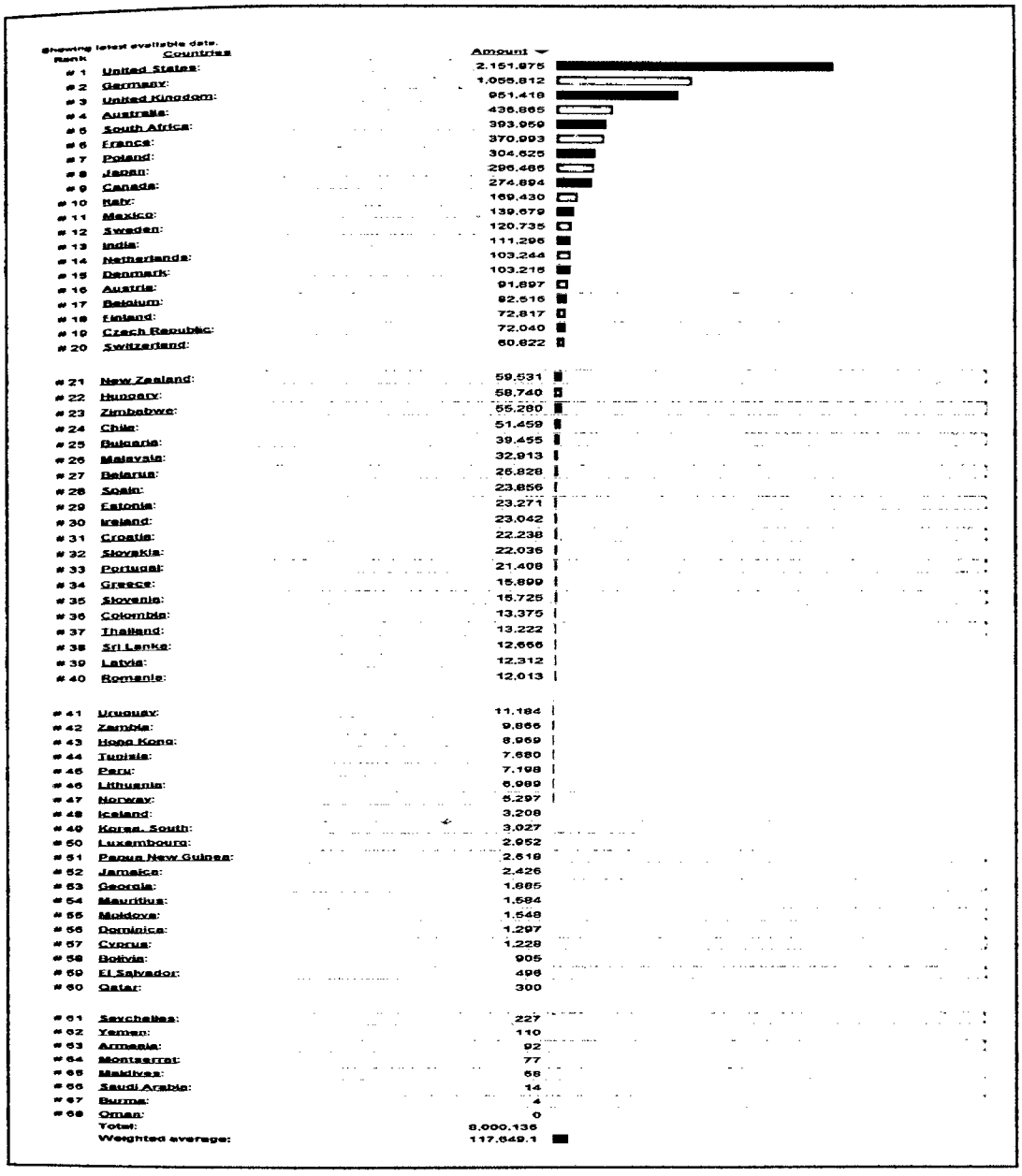
2.2 Security

To complete this system, the focus is to understand the concept of security. According to The Free Dictionary by Farlex, security means freedom from risk or danger, safety. Another meaning is freedom from doubt, anxiety, or fear, confidence. Example of security is something that gives or assures safety such as a group or department of private guards, measures adopted by a government to prevent espionage, sabotage, or attack, measures adopted, as by a business or homeowner, to prevent a crime such as burglary or assault and measures adopted to prevent escape. Besides that, security also is about the state of being secure and precautions taken to ensure against theft, espionage or etc.

2.3 Current Statistical Report on Burglaries by Country

Burglary is part of serious issues in crime in each country. When refer to Wikipedia the Free Encyclopedia, burglaries is a crime, the essence of which is entry into a building for the purposes of committing an offence. Usually that offence will be theft, but most jurisdictions specify others which fall within the ambit of burglary.

Below are the statistical report on most recent burglaries by country from the source of The Eighth United Nations Survey on Crime Trends and the Operations of Criminal Justice Systems (2002) (United Nations Office on Drugs and Crime, Centre for International Crime Prevention) via NationMaster.



Showing latest available data. Rank	Countries	Amount
# 1	United States:	2,151,875
# 2	Germany:	1,055,812
# 3	United Kingdom:	951,418
# 4	Australia:	436,865
# 5	South Africa:	393,959
# 6	France:	370,993
# 7	Poland:	304,625
# 8	Japan:	296,466
# 9	Canada:	274,894
# 10	Italy:	169,430
# 11	Mexico:	139,679
# 12	Sweden:	120,735
# 13	India:	111,295
# 14	Netherlands:	103,244
# 15	Denmark:	103,218
# 16	Austria:	91,897
# 17	Belgium:	82,516
# 18	Finland:	72,817
# 19	Czech Republic:	72,040
# 20	Switzerland:	60,822
# 21	New Zealand:	59,531
# 22	Hungary:	58,740
# 23	Zimbabwe:	55,280
# 24	Chile:	51,459
# 25	Bulgaria:	39,455
# 26	Malaysia:	32,913
# 27	Belarus:	26,828
# 28	Spain:	23,856
# 29	Estonia:	23,271
# 30	Ireland:	23,042
# 31	Croatia:	22,238
# 32	Slovakia:	22,036
# 33	Portugal:	21,408
# 34	Greece:	15,899
# 35	Slovenia:	15,725
# 36	Colombia:	13,375
# 37	Thailand:	13,222
# 38	Sri Lanka:	12,656
# 39	Latvia:	12,312
# 40	Romania:	12,013
# 41	Uruguay:	11,184
# 42	Zambia:	9,866
# 43	Hong Kong:	8,969
# 44	Tunisia:	7,680
# 45	Peru:	7,198
# 46	Lithuania:	6,989
# 47	Norway:	5,297
# 48	Iceland:	3,208
# 49	Korea, South:	3,027
# 50	Luxembourg:	2,952
# 51	Papua New Guinea:	2,618
# 52	Jamaica:	2,426
# 53	Georgia:	1,885
# 54	Mauritius:	1,584
# 55	Moldova:	1,548
# 56	Dominica:	1,297
# 57	Cyprus:	1,228
# 58	Bolivia:	905
# 59	El Salvador:	496
# 60	Qatar:	300
# 61	Seychelles:	227
# 62	Yemen:	110
# 63	Armenia:	92
# 64	Montserrat:	77
# 65	Maldives:	58
# 66	Saudi Arabia:	14
# 67	Burma:	4
# 68	Oman:	0
	Total:	8,000,136
	Weighted average:	117,649.1

Figure 2.1 Statistical reports on most recent burglaries by country

According to the statistical report, Malaysia in the 26th ranking among 68 countries and this proved that burglaries one of the serious issues in Malaysia. State that 32, 913 burglaries case happened in Malaysia. Effective action must be taken to solve this kind of problem. On other side, this show that home-security system in

Malaysia still weak and need improvement and Malaysia people still not take this problem as a serious issues.

This happened because lack of knowledge about home-security and how to get it. This also happened because home-security offered nowadays is too expensive for installation and maintenance. Home security-system nowadays also seems to be complicated to be installing by user itself and as a result need more cost on the service to install the security system.

2.3.1 Why Are Home Security Systems Important?

According to Larry Amon from *eHow Contributor*, home security systems are reasonable in cost and can be added to almost any house or apartment. Using one can make users safer and more secure. There are several important reasons to consider getting a home security system.

i. Personal Safety

When thieves break into a house, they are not likely to be concerned with the personal safety of anyone in the house. Beyond theft, there are people who are interested in breaking into houses just to hurt those inside. Home security systems deter and help prevent these types of attacks.

ii. Property

In tough economic times, thieves are more likely to be brazen about breaking into homes for valuables. At any time, a house may be broken into even if owners don't think it have any valuables. Thieves can find value in things owners might not

iii. Resale Value

Having a security system in house can provide an additional selling point when owner go to sell the house. A security system also adds actual financial value.

iv. Insurance

Having a home security system may lower home insurance. If a house has already been broken into, insurance companies may suggest or require owners to have a security system to insure or to insure owners at a better rate.

v. Peace of Mind

Having a home security system can help owners sleep better and give owners peace of mind, knowing that if someone were to break in, owners would be alerted. Any strange noises in the middle of the night can likely be relegated to the house settling or something less serious.

2.4 Types of Existing Home Security System

Home security systems are used by homeowners to make sure their homes are well-protected from theft, burglars, fires and other disasters. Many people decide which type of home security system to purchase depending upon the neighborhood in which they live, how much security they want and how much they are willing to pay for the security. According to article by William Hynes from EzineArticles.com, the types of security systems available for installation fall under unmonitored and monitored.

The unmonitored home security system is the most popular and cost-effective system on the market today. When the alarm is triggered by a burglar, it produces a loud siren noise on the inside and outside of the home. A majority of the time the siren will scare off the intruder before he even enters the home. If owner do not at home when the alarm is tripped, it will be up to owner neighbors to call the police, as this type of system does not contact the monitoring company for the owner.

Monitored home security systems are ones that alert the central call center when the system is tripped by a burglar or intruder. When the alarm is tripped, the call center waits 30 to 45 seconds to confirm that owner did not accidentally set it off. If the alarm continues, the call center will attempt to contact owner for a password, and if unsuccessful, will alert the authorities. Monitored systems also signal the authorities in the event of a fire, gas leak and flood. The biggest advantage to this type of system is owner does not have to depend on neighbors to be home to contact the authorities for the owner, but the 30 to 45 second delay allows burglars ample time to escape with owner valuables.

Both the monitored and unmonitored systems can be set up with cameras, motion detectors, sensors, smoke, fire and carbon monoxide detectors, keypads and video displays. These setups can be hard wired or wireless. Wireless home security systems are, by far, the easiest to set up, as owner do not have to install new wires in the walls of owner homes. Another advantage to the wireless home security system is that it can be installed by the average do-it-yourself homeowner, as the system is only connected by battery-powered radio transmitters and receivers. The downside to these types of home security systems is that owner are limited in the distance allowed between the sensors, cameras and control panel due to the radio transmitters.

2.5 Existing projects on home-security system

2.5.1 Existing project motivations

The current home-security service system in market included preventing thieves from intruding, monitoring and control system, fire control etc. Even though all of them were comprehensive, yet there still were some defects among them such as the consumers must construct cooperative relationship with security supplier, and this condition resulted in high expenditure for service quality as well as much difficulty in maintain and discriminating of responsibility. In this paper will review about the existing projects regarding to home security system by researchers who tried to develop set of home-security with certain criteria's.

As for this project, the main objective is to develop a prototype of a low cost home security system. There is existing research by Yanbo Z. & Zhaohui Y. (2007) which also focuses on a low cost. This project are said to be a low cost because they used microprocessors. All the microprocessors used in the sensor nodes and the gateway are cheap 8-bit microprocessors, and all other devices are inexpensive.

On other hand, these projects also consider low power consumption. All security sensor nodes are powered by batteries. They also produce an easy installing system because the nodes communicate with the gateway by wireless, they can be installed anywhere inside the home. Rapid response which is the GSM/GPRS gateway will send SMS (Short Message Service) messages to inform remote PMP (Property Management Person) and users when alarm incidents occur. They also developed a friendly user interface. The system has a friendly user interface including sixteen capacitive sensor keys and a LCD. Users can view the states of security sensor nodes, modify password of the gateway and change the