



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ANDROID BASED HOME SECURITY SYSTEM

This report is submitted in accordance with the requirement of Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Computer Engineering Technology (Computer Systems) with Honours

by

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
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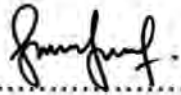
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I hereby, declared this report entitled Android base Home Security System is the results of my own research except as cited in references.

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APPROVAL

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ABSTRACT

Due to the increasing of possibilities of home intrusion has makes home security system has become an important issue that need to be take care. On the other hand, the continuous of mobile devices and advanced mobile applications has become more demanding for people as it becoming more prominent in people daily basis. Therefore Android based Automated Home Security System is created in order to prevent home intrusion and meet up people demands on advance mobile application. This system will have a motion detector that will detects the house break-in when users are not at home. Apart from that, it also provide auto- light system which can save electricity consumption in house. The system will send notification to user if it detect house intrusion. Therefore user can know their current house conditon directly via Smartphone. As for the conclusion , the devolpment of the Android based Automated Home Security System will be written on this project report.

ABSTRAK

Peningkatan kes pecah rumah telah menyebabkan sistem keselamatan rumah menjadi isu penting di masa kini . Di samping itu, kemajuan peranti mudah alih dan aplikasi mudah alih yang semakin pesat membangun telah menyebabkan kehendak pengguna untuk teknologi yang lebih canggih semakin menonjol dari sebelum ini. Oleh Android berasaskan Sistem Keselamatan Rumah Automatik telah dibina untuk mengelakkan pencerobohan rumah dan memenuhi permintaan orang ramai untuk mempunyai aplikasi mudah alih yang lebih canggih dan maju. Sistem ini akan mempunyai pengesan gerakan yang akan mengesan pencerobohan apabila pengguna tidak di rumah. Selain itu , ia juga menyediakan sistem lampu automatik yang mampu mengurangkan penggunaan elektrik di rumah . Sistem ini akan menghantar notifikasi kepada pengguna jika ia mengesan pencerobohan rumah. Oleh itu pengguna dapat mengenal pasti keadaan rumah semasa mereka secara langsung melalui telefon pintar. Sebagai kesimpulan, pembangunan dan fungsi Sistem Keselamatan Rumah berasaskan Android akan ditulis pada laporan project ini .

DEDICATION

This project is dedicated to my parents and family

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First and foremost, I will be thanking God, our Father in heaven for lending me his knowledge and wisdom for all my lifetime. With you by my side, though unseen and unheard yet have constantly guiding me in your wisdom for me to complete the final year project. Thank you for your blessing and giving me the strength to overcome all the challenges and obstacles in my studies and this final year project. I would like to thank my beloved family for their unconditional love and support to me. Their tender love as made what I am today, I am blessed to have them in my life. Thus, a deep appreciation is given to my family. Moreover, I would like thank my dedicated supervisor puan Norfadzlia binti Mohd Yusof for her full interest to be my guidance and countless efforts that she made for me in completing this project. It was an honourable moment doing this project as she was very educative and intelligent as she was willingly to share any of her knowledge yet very patience person when dealing problems in hard times. She has become the role model for me to learn in terms of the passion in learning, being responsible and smart dealing with situation.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

LDR	=	Light Depending Resistor
PIR	=	Passive Infrared
SDK	=	System Development Kit
IDE	=	Intergrated Development Enviroment
GSM	=	Global System for Mobile Application
OSS	=	Operation Support Subsystem
FDD	=	Frequency Devision Duplex
NSS	=	Network and Switching Subsystem
BSS	=	Basic Station Subsystem
SIM	=	Subscriber Identify module
TMDA	=	Time Multiple Divison Access
MSSC	=	Mobile Switching Services Center
LED	=	Light Emitting Diode
SQL	=	Structure Query Language
RMBDS	=	Relational Database Management System
LCD	=	Liquid Crystal Display

CHAPTER 1

INTRODUCTION

1.0 Introduction

In this chapter, the basic ideas and development of the smart android based home security system are provided. This chapter will be comprises into few sections which are the description of the project background, problem statement, objective, project scope, project significant and summary of introduction. Moreover, this chapter will offer a clear and big picture about the project and how it works. Apart from that, chapter one also serves as the very beginning of the preparation for this android based home security system development. This chapter is very significant for user as it will be the guidance and the direction for developer towards the desired goals with clearly specified statement based on the sections included in this chapter.

1.1 Project Background

The increasing of possibilities of home intrusion has makes home security system as an important issue nowadays. Besides that, the continuous of mobile devices and advanced mobile applications has become more demanding issues than ever before. Therefore, with the combination of these two issues an android application based home security system was developed in order to prevent intrusion of house and also to meet the people demand.

The system used the wireless technology for communication between the devices. The system consisted of an app which is developed using the Android

platform and an Arduino Uno. The Arduino Uno microcontroller is the main controller that hosts and performs the necessary actions that needs to be carried out. The system will provide a user management where username and password identification is required before system can be configure.

The security mechanism of this system will provide motion detector which will automatically switch on the warning light and trigger the buzzer to make noise when it detect motion. Besides that, it also informs the user by giving notification when the system suspect there is intrusion inside the house via Short Message Service (SMS). This system will not only works as a home security system but also has the ability to control electric appliances such as house lamps. The can be switch on or off remotely using the android app that is install to the Smartphone.

Moreover the system will also provide an auto-light system which will automatically turn on the lamp during night time. Android based home security system is a very promising area. It has various benefits such as providing increased comfort, greater safety and security, a more rational use of energy and other resources thus contributing to a significant savings.

Lastly, by using android for the base of this system it gives the user the advantage not only to create secure environment where the users prudential are not expose to others but also the benefits the user to control and configure the system anywhere and anytime they want.

1.2 Problem Statements

In recent years, home intrusion cases have seemed to be worsened. This is due to the lack of awareness from house owner on home security and lack of security and safety features inside the house. Moreover, home intrusion or break-ins usually happens when people are not in home. Based on the statistics gathered by the police, house break-ins will increase by 50 percent during holiday season compare to a normal day (Utusan Online, 2011). In some cases, break in not only involved on property, but also the loss of lives. Besides that, another problem that has been a

problem today is the waste of energy resources in home. As for examples, people tend to forget to switch off the toilet light when it is unused. These not only increase the electricity bills but also led to the depletion of natural energy that is used to generate electricity. Therefore, the home security system is developed to ensure that not only home security is guarantee but also it can save electric consumption in the house.

1.3 Objectives

The following show the main objectives of this project:

1. To develop an android base home security system that provide the security of home against intruders
2. To provide password management system to ensure the user prudential is secure.
3. To test the functionality of the system notification service when house senses an intruder via Short Message Service (SMS).

1.4 Project Scope

Android platform has been chosen for the development of the project. Android platform is chooses due to many Smartphone and handy devices support Android OS system. Android is Google open source mobile OS based on a Linux kernel. It was first introduced in 2007. The development of Android has change the perspective of people in Smartphone OS and creates a rapid pace of evolvment. Apart from that, the system for this system will use motion sensor and buzzer for the security purpose. Motion sensors are used to detect motion in the house. If motion is detected, the buzzer is trigger and the buzzer will produce sound that can be heard around the house. Besides that, the develop system will also have the ability to control electrical appliances. These electrical appliances will be remotely control using Smartphone or any handy devices that has been installed with the Home Security System app in it. In this system user will be given an option on which light need to be switch on or off. Moreover, the system also provides a notification services if the motion sensor has detect intruder in the house. The notification is send via short massage services (SMS)

to the user. This notification will not only notify the user if there is intruder in the house but also help user to take the next action immediately. The system can be controlled and monitored from a remote location using an android application. It will then communicate with the micro web-server via the internet. User can use any internet connection either via Wi-Fi network to communicate with the system. Besides that, password management configuration also being consider in this system. Password identification is needed in order to use the system. If the user Smartphone is stolen or lost the system will not be easily hacked or disrupt by the unauthorized person.

1.5 Project Significant

This project is significant for any house owners that want a safer and better protection of their house. The product will provide security by using motion sensor which detects any motion inside the house when the user is not at home. This product can also reduce electric consumption of the house by enable user to activate auto-light system. Moreover, it will also reduce house break and create a safer environment for the user and family to live.

Summary

In the nutshell, this project is about to develop an Android based Home Security System that will not only create a safer surrounding but also fulfilled the demand for a more complex and advanced Android application for Smartphone. The development of this project based on the objectives stated before is expected to be fulfilled. The project is believed to be able to contribute to community and technology innovation.

CHAPTER 2

LITERATURE REVIEW

2.0 Area of Study

The development of this project requires the developer to study on several ideas. Firstly, the developer has to studies on the Android Based Home Security System including the general idea of Android and home security system, formerly and recent application of Android Based Home Security System and its application's development tools. As for the studies of Android, the research about the development of Android is done. The research also includes the hardware tools which needed for the completion of this project. The functionality of the hardware and how it will be integrated with the software application will be studies on this chapter. Last but not least, developer has to studies on the features of the existing Home Security System.

2.1 Home Security System

Home security system can be defined as a system which alert user if an intrusion or disturbance are detected inside or outside the house. People cannot easily monitor their house every time. Thus, the development for a Home Security System is important topic in real life.



Figure 2.1: It is essential to have a home security system to prevent house break in scenario.

(Retrieved on April 2015 from <http://www.netsidebar.com/im-n-ur-house/>)

The development of home security system was first introduced during 1900's. At that time, the system is very expansive, hard to be manage by the user and can be easily bypassed by intruders. Even though the system was not perfectly build yet, the home security system was sold in large numbers. This is because people had no other alternative way to survey and protect their house. A basic home security system will have devices that fitted in the windows and doors of the house. The devices will raise an alarm when an attempt of burglary is detected.



Figure 2.2: The home security systems are large, hard to manage and very expensive when it was first introduced

(Retrieved on April 2015 from <http://wirelesssystemsbudilka.blogspot.my/2014/11/wireless-security-system-this-old-house.html>)

As the time passed by, home security system has become more sophisticated and advanced. More features are added in the system such monitoring screen and smoke and heat sensor. Besides that, there are vast varieties of home security system nowadays which each of them have their own distinctive characteristic. Moreover, many company has develop home security system making the standard of the system become higher and more competitive. With the advance technologies of the home security system and the fast growing android platform, it is not impossible to integrate both technologies and create an android based home security system.



Figure 2.3: The new home security system is now better equipped with advanced technologies than its predecessors

(Retrieve on April 2015 from <http://www.slashgear.com/adt-pulse-mixes-security-and-home-automation-05105965/>)

Other Study Research

According to S. Kumar (2014) on his journal entitle Ubiquitous Smart Home System Using Android Application, he stated that continuous growth of mobile devices in its popularity and functionality the demand for advanced mobile application for the daily use for the people. By utilizing the web services, is the best way of providing remote service access or enabling applications to communicate with

each other. Besides that, it also can become an attractive market for home automation and ideal for busy families and individuals with physical limitations. The proposed design that he created is a low cost smart home system for remotely controlling and monitoring the smart home environment.

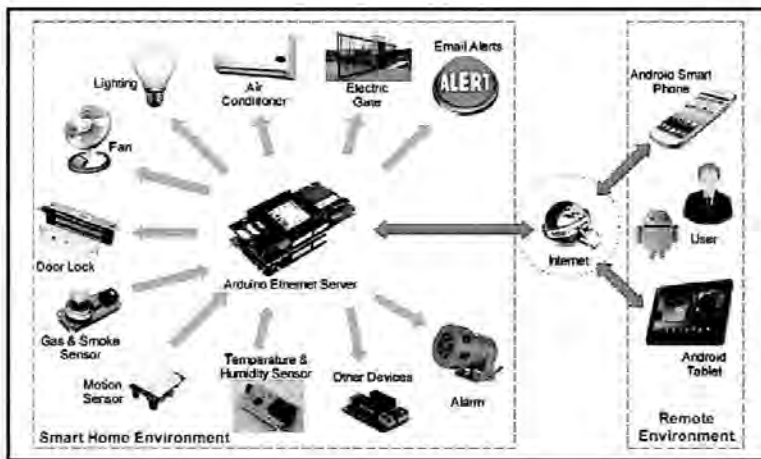


Figure 2.3: Diagram of design architecture suggest by S. Kumar

Based on the diagram above, the system consists of an app developed using the Android platform and an Arduino Ethernet based micro web-server. The Arduino microcontroller is the main controller that hosts the micro web-server and performs the necessary actions that needs to be carried out. The Arduino microcontroller will control other peripherals such as motion detector, gas and smoke detector, door lock, alarm, temperature and humidity sensor, fan, light, air conditioner, electric gate, and other devices. If the smart home system detects intruders, a notification will be send to the user via e-mail.

Another research study also been done by Dhadiwal Kalpesh Paraskumar et. Al (2014) on a journal named Home Security System. They stated that with new arising technologies is this era, smart home security provides a comfortable and safe environment for users. The current home security systems use sensors that are installed to detect the intruders which will give out alarm when it is generated. For the system that suggest, it will use wireless technology for communication between the devices.

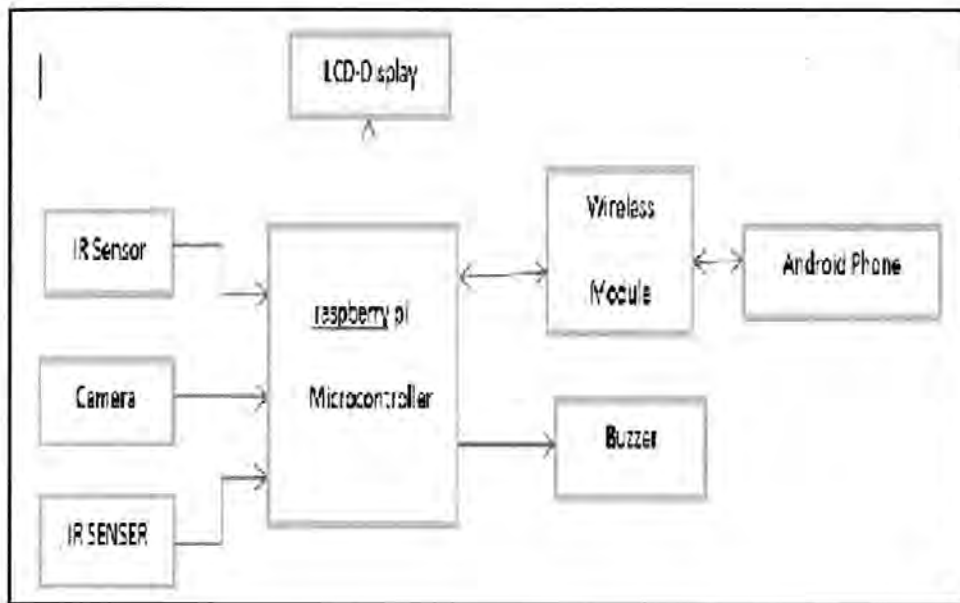


Figure 2.4: Diagram of design architecture on the journal Home Security System. (Dhadiwal Kalpesh, 2013)

Based on the design architecture that been design by the team, the system provides many advantages over other system. For examples, android phone is use as the interface. This is because, most of the people now a day used android mobile for daily basis. The proposed system also will provide monitoring of house if ever owner is not at home and will provide a good security to detect intruder. Raspberi Pi is used as the microcontroller for this system. Other peripherals modules are IR sensor, camera, buzzer and LCD display. A wireless module will become the medium for the connection between the Raspberi Pi and Android phone.

Based from the study research that been done, a comparison is done between the system created by the developer and the systems on the study research. A table 2.4 is created to show the comparison.