

**HOME CONTROLLING SYSTEM BY USING VOICE RECOGNITION
(VIA ZIGBEE)**

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**HOME CONTROLLING SYSTEM BY USING VOICE RECOGNITION
(VIA ZIGBEE)**

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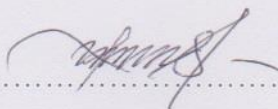
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DEDICATION

This project report, the accompanying presentation and all the effort is solely dedicated to my beloved Parents

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With the name of Allah S.W.T the most merciful, Alhamdulillah, with His bless I could done the responsible that have been given to me to do thisProjekSarjanaMuda and its report as well as I can.

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ABSTRACT

The purpose of this project is to present an approach to design an interaction home controlling system for user, which functioning properly and is easy to use. Home control system involves the home automation and monitoring where users can control lighting, security, and switch electronic appliances using only their voice. Generally, conventional home wiring system use simple latching switch that being connected to the power supply for controlling electrical appliances such as fan or light. The switch usually located at the wall near to the electrical appliance. In this project, the idea is to develop a system that can control the entire electrical appliance in the house by using a voice command. The concept is to use wireless system to control home appliances wirelessly, which it is easy for installation rather than reconstruct all the wiring in the house. A simple and friendly Graphical User Interface (GUI) is designed so that can be used by both normal person and disable people especially vision impaired people. The function of this system is to help the user to do their daily home routine.

ABSTRAK

Tujuan projek ini adalah untuk mengemukakan kaedah untuk merekabentuk satu sistem interaksi kawalan rumah untuk pengguna, yang mudah untuk digunakan. Sistem kawalan rumah ini melibatkan sistem automasi dan pemantauan, di mana pengguna boleh mengawal lampu, keselamatan, dan juga menukar peralatan elektronik dengan hanya menggunakan suara. Secara umumnya, sistem pendawaian rumah pada masa kini menggunakan suis yang disambungkan kepada bekalan kuasa yang digunakan untuk mengawal peralatan elektrik seperti kipas ataupun lampu. Idea utama dalam projek ini adalah membangunkan satu sistem yang boleh mengawal keseluruhan peralatan elektrik di rumah dengan hanya menggunakan arahan suara. 'Graphical User Interface (GUI)' yang mudah dan mesra pengguna direka supaya ia boleh digunakan oleh pengguna normal ataupun pengguna OKU tanpa sebarang masalah. Fungsi sistem ini adalah untuk membantu memudahkan pengguna melakukan rutin harian mereka.

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CHAPTER 1

INTRODUCTION

1.1 Background

Wireless technologies are becoming more popular around the world and the consumers appreciate this wireless lifestyle which gives them relief of the well-known “cable chaos” that tends to grow under their desk [1]. Concepts on smart home application and development include various implementation techniques and are never limited. Smart home systems are created based on analysis on client needs and budget to cater for the system. With technologies available today, efficient integration of this system could be achieved. Now, advancement in wireless technology introduced new ideas such as Bluetooth and Internet linking; Wi-Fi, which has been slowly replacing the conventional wired technology which requires wire bonded interconnection between electrical devices [2].

The purpose of this project is to present an approach to design an interaction home controlling system for user, which functioning properly and is easy to use. Home control system involves the home automation and monitoring where users can control lighting, security, and switch electronic appliances using only their voice. Home automation can design in many types of scope and aspects such as a one-stop centre

control panel, objects for identification sensors or voice recognition. For this project, voice will become the main concept. Home control system interface must have the characteristic of a friendly user and does not provide complex tasking. The areas inside the house will be defined where automation is most desirable. Voice commands will classify to indicate the type of vocabulary word by using engineering software.

1.2 Objective

There are several objectives involved in this project that we need to achieve in order to design the project.

- a) To design a home controlling system using voice command.
- b) To design an embedded system that operates with wireless connection.
- c) To provide a user friendly interface for the system especially for vision impaired user.

1.3 Problem Statement

Generally, conventional home wiring system use simple latching switch that connected to the power supply for controlling electrical appliances such as fan or light. The switch usually located at the wall near to the electrical appliance.

Nowadays new technologies create new solution for home controlling system. This improvisation of the technology are called home automation system, which all the conventional method of using latching switch is replace by using remote control or touch screen panel [3]. By using this system, the entire electrical appliance in the house can be control effectively compare to the conventional home.

Still monitoring and controlling the appliance need some movement and physical contact. This will be a burden especially for blind user. They cannot sense anything on the touch screen [4]. Even though they can sense the remote control button but they still did not know what are they touch.

Usually, upgrades the conventional house to automated home system need major reconstruction on the wiring system of the house [5]. Therefore, we intend to develop a system that can running through wireless

1.4 Scope of Project

In order to achieve the objective of this project, several scopes need to identify. The scope of the project is to define suitable methods that will be used for signal voice processing. In this project, we are used our voice to control and monitor all the house appliances. The software that has been used to recognize the voice is Microsoft Speech Recognition. Meanwhile, Visual Basic software was used to design appropriate and friendly GUI to the user. It is used as a GUI to monitor and to link the Microsoft Speech Recognition engine to hardware for execution. The system will control via wireless use computers based on wireless protocols (Zigbee).

1.5 Thesis Organization

This thesis is the combination of five chapters that contain the introduction, literature review, methodology, result and discussion and the last chapter is conclusion and recommendation of the project. Chapter 1 is an introduction of the project. In this chapter, we will explain the background and objectives of the project. The concept behind the project and overall overview of the project also will discuss throughout this chapter.

Chapter 2 focuses on the literature review and the project flow for the development of the Home Controlling System by Using Voice Recognition (Via ZIGBEE and RF Remote Circuit).

Chapter 3 describes about the project methodology of the project. This chapter will explain about the project activity such as workflow, procedure, block diagram and method that we are following in order to develop this project.

Chapter 4 discusses all the results obtained from the project. During do the project, many problems have accorded. Besides that, by doing some inspection and troubleshooting, the solution been found and all devices may function properly.

Chapter 5 concludes the whole project. Finally, the project has been finished with the expected result. This project can be testing for the long period, but some recommendation must be included to make sure the system running properly without any violation.

CHAPTER 2

LITERATURE REVIEW

2.2 Background

In recent years, the home environment has seen a rapid introduction of network enabled digital technology. This technology offers new and exciting opportunities to increase the connectivity of devices within the home for the purpose of home automation. Moreover, with the rapid expansion of the Internet, there is the added potential for the remote control and monitoring of such network enabled devices [3]. Home automation is one of the fast growing industries that keep promising and meet the needs for world population in such many ways. It been created due to many aspect that are required for those who are seeking luxury modern lifestyle while others being offers to those with special needs such as elderly and disable person.

Home automation is a very promising area. Its main benefits range from increased comfort and greater safety and security, to a more rational use of energy and other resources, allowing for significant savings. It also offers powerful means for helping and supporting the special needs of people with disabilities and, in particular, the elderly. This application domain is very important and will steadily increase in the future [6].

According to Khusvinder Gill et. al., (2009), in recent years the introduction of network-enabled devices into the home improvement has proceeded at an unprecedented rate [3]. In other word, home automation also known as domotics. Domotics is defined as a set of element that, when installed, interconnected and controlled automatically in a building, save the users worrying about routine everyday actions, providing improvement in their comfort, in energy consumption, in security and in communication as well [5]. Home automation also called as assistive domotics, especially for disabled person and the elderly.

2.3 Related Journal in Home Automation

There are several techniques or methods that been develop for design and implement the system that related with home automation.

2.3.1 Low cost Arduino/Android-based Energy-Efficient Home Automation System with Smart Task Scheduling

In this paper, Home Automation techniques were use to design and implement a remotely controlled, energy-efficient, highly scalable and user-friendly Smart Home with basic features that safeguard the residents' comfort and security (turning appliances ON/OFF, dimming the lights, controlling the temperature, and more). The system consists of a house network, which includes both sensors and