"I declare that I have read this thesis and in my opinion, it is suitable in term of scope and quality for the purpose of awarding a Bachelor Degree in Electronic Engineering (Industrial Electronic)"

Signature : 

Supervisor : A. NASORUDDIN B. MOHAMAD.

Date : 21/03/05

HOME CONTROL SYSTEM

MOHD KAMIL BIN MOHD ZAHARI

This Report Is Submitted In Partial Fulfillment Of Requirements For The Bachelor Degree of Electronic Engineering (Industrial Electronic)

Faculty of Electronics And Computer Engineering
Kolej Universiti Teknikal Kebangsaan Malaysia

MARCH 2005

"Hereby, I declare that this report is a result of my own research idea except for works that have been cited clearly in the references."

Signature : 

Name : MOHD KAMIL B. MOHD ZAHARI

Date : 31 - 3 - 2005

Special dedicated to my dearest parent, sisters and brothers

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ABSTRACT

This project is to design a software and hardware which have the ability to control and operate every electrical appliance in the house automatically by using computer which that the system can be pre-program by user. Through it, knowledge in design and using programming language for interfacing purposes can be learns and improves. The selection of the QuickBASIC program is for better fundamental understanding on computer program application in the computer interfacing. This project will be separate to three parts. The first part is designing the software for interfacing, data key in and timing. The second part is finding and designing the hardware for the project. The third part is joining the entire component that had been design. In this project, the component that will be use includes opto-isolator, electromechanical relays (EMR), Ultra Sonic transducer for motion sensing, timer and parallel port. The advantages of this design are the cost is quite low. Secondly, although the computer is used as the prime controller of this project; if there is any fault occurs to the computer such as system is down or the computer is damage, manual control can still be used whereas the selector switch will be used for the user to select the control mode. Interfacing takes advantage of low-cost, high-speed input/output port, and compatible with high –level languages. The conception of this project can be apply to other purposes such as for security and reduce power consumption. From this project, a model for Home Control System has been developed and successfully simulates the control home electrical appliances.

ABSTRAK

Secara umumnya, projek ini adalah bertujuan untuk merekabetuk aturcara dan perkakasan yang membolehkan pengguna mengawal dan mengoperasikan setiap peralatan elektrik di dalam rumah mereka secara automatik menggunakan komputer; dimana ianya bergantung pada masa serta tempoh yang ditetapkan pengguna pada program. Melalui projek ini, pengetahuan dalam merekabentuk dan penggunaan bahasa pengaturcaraan untuk tujuan pengantaramukaan dapat dipelajari dan dipertingkatkan. Pemilihan penggunaan program QuickBASIC sebagai bahasa pengaturcaraan adalah disebabkan untuk mendalami penggunaan program komputer dalam pengantaramukaan komputer dari peringkat asas. Projek ini terbahagi kepada 3 bahagian. Bahagian pertama akan memberi penekanan kepada gerak kerja penghasilan aturcara untuk pengantaramukaan, masukan data dan pemasaan. Bahagian kedua pula adalah mengenalpasti komponen yang diperlukan dan mereka perkakasan untuk projek ini. Bahagian terakhir adalah menggabungkan semua bahagian yang berkaitan. Dalam projek ini, komponen yang digunakan termasuklah *opto-isolator,* geganti elektromekanikal, transduser UltraSonic untuk tujuan pengesan pergerakan, pemasa 555 dan *port* selari. Kelebihan pendekatan serta kaedah yang digunakan di dalam projek ini adalah kos yang murah. Selain itu, walaupun komputer digunakan sebagai kawalan utama untuk projek ini, jika sekiranya berlaku perkara yang tidak diingini pada komputer atau sistem komputer rosak, kawalan secara manual masih boleh dilakukan dimana suis pemilih digunakan bagi membolehkan pengguna memilih jenis(mode) kawalan samada secara automatik atau manual. Pengantaramukaan mempunyai kelebihan dari segi kos yang murah, saluran keluaran/masukan berkelajuan tinggi dan mempunyai keserasian untuk menggunakan bahasa komputer yang tinggi. Konsep projek ini juga boleh diaplikasikan untuk tujuan lain seperti untuk keselamatan dan pengurangan penggunaan tenaga. Daripada projek ini, satu model `Home Control System` telah dibina dan berjaya menjalankan simulasi bagi kawalan peralatan elektrik dirumah.

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CHAPTER I

INTRODUCTION

1.1 OVERVIEW

The aims of developing this project, namely Home Control System, is to provide practical experimentation and learning more productive and efficient by harnessing modern technology. This project is created and developed to make works more easy and smooth.

In this project, Quick BASIC language has been selected as the programming language for Home Control System. Quick BASIC is simple, easy to learn and construct. The most important reason is it can be programs in modular forms and its compiler was small enough to fit on a diskette with ample room for programs as well.

In this chapter will cover title and objective, scopes, project workflow and the work schedule of this project.

1.2 TITLE AND OBJECTIVES

The Title of this project is "Home Control System". The main aim of this project is to develop a software and hardware to interface exterior circuit with computer. The software is developed to become simple, easy and user friendly.

Therefore, this project objective can be defined as below:

- To apply the latest technology in the electric device operation in the house such air conditioner and lamp.
- Facilitate operation in implement routine to control electrical appliances by only using computer as the main controller.
- To expedite and enable routine activity implementing by manually and automatically for controlling home electrical appliances.
- To provide hands on skill in designs and programming.
- To enhance knowledge in computer interfacing.

1.3 SCOPES

The scopes of this project are:

- Design hardware to interface computer with exterior circuit using parallel port.
- Using Quick BASIC as the programming language to develop software to interface data between computer and exterior circuit.
- Using Ultrasonic Motion Detector as sensing device for alarm system.
- Construct a model to simulate the Home Control System

1.4 PROJECT WORKFLOW

Firstly, I need to know the fundamental of this project, besides, a good procedure is needed to implement this project from beginning to the end. Here is provided my project workflow shown as Figure 1.1

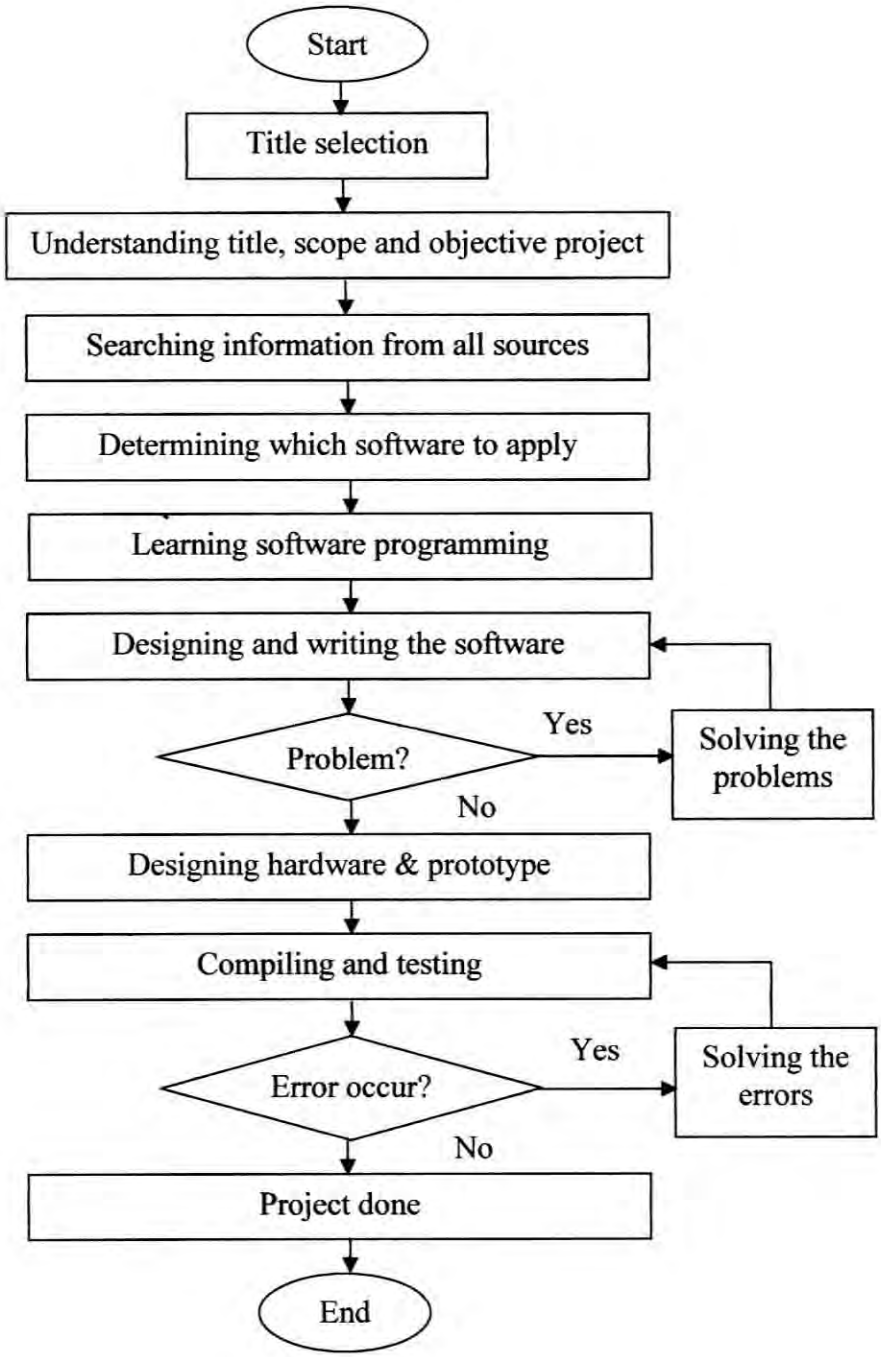

Figure 1.1 : Project Workflow

1.5 WORK SCHEDULES

Table 1.1: Work Schedule for PSM 1

Week / Actions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Title Selection															
Analysis Objectives															
Gather Information															
Further Reading															
Mastering QuickBASIC															
Writing Report															

Table 1.2 : Work Schedule for PSM 2

Week / Actions	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Writing Software	■	■	■	■	■	■									
Designing Hardware & Prototype					■	■	■	■	■	■					
Testing							■	■	■	■					
Writing Thesis									■	■	■	■	■	■	■
Final Presentation & Submission														■	■

CHAPTER II

PROJECT BACKGROUND AND LITERATURE REVIEW

2.1 OVERVIEW

Progress in Application of computer system to the purposes of digital control, communication functions and data acquisition has been widespread following the first time real-time minicomputer implementation for process measurement and control. Since the integration of these systems may be defined with respect to the design of the computer interfaces, it make remarkable that such design continue to be based essentially on empirical methods and circuit considerations. However, economic and performance accountability requirements have recently prompted the search for improved interface understanding in pursuit of a more quantitative methodology.

Personal computer is being used in control application and data acquisition along with control and data acquisition board installed in the computer. These boards are inserted into the chassis of computer and allow the computer to be connected to exterior circuit, sensors and other monitoring devices much like a voltmeter is connected by the probes to the voltage source being measured.

The computer provides many attractive features to the control system and data acquisition such as high clock speed, programming flexibility, mass data storage, low cost, high computational power and a level of sophistication those not available to discrete circuits.

The body of knowledge required of today's technician and engineers includes what previously had been the purview of computer along with the body of knowledge traditionally associated with the field electronics. The electronics technicians today is concern with computer programming, developing software algorithms, interfacing, signal conditioning , as well as operation amplifiers, transistor , electric motors and endless variety of digital integrated circuits.

Interface is connecting input between hardware and software. Interfacing takes advantages of low cost, demonstrates in a down-to-earth style the range of problems in data acquisition for analysis, can rapidly analyze the results and display the results in the computer, high-speed input/output ports and compatible with high–level languages[6].

In this chapter, will cover on project background, literature review and some benefits of this project.