MULTIMODE UNIVERSAL CONTROLLER USING BLUETOOTH TECHNOLOGY

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This report is submitted in partial fulfillment of the requirement for the award of
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To my beloved father, mother, and all my siblings and friends.

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ABSTRACT

The Bluetooth specification was developed in 1994 by Jaap Haartsen and Sven Mattisson, who were working for Ericsson Mobile Platforms in Lund, Sweden. The specification is based on frequency-hopping spread spectrum technology. The specifications were formalized by the Bluetooth Special Interest Group (SIG). The SIG was formally announced on May 20, 1998. Today it has a membership of over 7000 companies worldwide. It was established by Ericsson, IBM, Intel, Toshiba, and Nokia, and later joined by many other companies. Wireless communication is currently becoming popular and evolving to support communication needs for wide range of applications. It gives opportunity to wireless data transfer technologies such as Infrared, Home radio frequency (RF), Wi-Fi and Bluetooth to be improved for future benefit. With the advancement of radio frequency (RF) and semiconductor technologies, researchers are now concentrating effort in developing Pico-networks where electronic devices can communicate within 100 meters without requiring any fixed infrastructure. The best & cost efficient future is Bluetooth, a technology named after a 10th century king who brought warring Viking tribes under a common rule. The choice of operating in the license-exempt band that is ISM (Industrial Scientific Medical) band which ranges from 2.4 GHz to 2.4835 GHz enable the goals of global applicability, low power and high aggregate capacity to be meet. To be more specific, this project demonstrates the development of the household and office devices that can be controlled using wireless Bluetooth technology, which is suitable for a wireless home or office environments. This system can be adapted to the needs of the customer, for an example this system used as long as the device is able to read the Visual Basic Program.

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ABSTRAK

Bluetooth adalah suatu sumber yang digunakan untuk menghantar data tanpa menggunakan bantuan dari sambungan wayar. Pada tahun 1994, bluetooth diperkenalkan oleh En. Jaap Haartsen dan En. Sven Mattission. Mereka merupakan pekerja dari 'Ericsson Mobile Platforms' yang ditapakkkan di Luad, Sweden. Pada masa itu juga, Bluetooth Special Interest Group (SIG) diperkenalkan. Mereka mempunyai pelanggan lebih daripada 7000 industri. Kumpulan tersebut telah membuat kajian terhadap bluetooth dan pada masa itulah pengunaan bluetooth telah menjadi lebih meluas. Seorang pengguna bletooth,boleh menggunakan sistem bluetooth sebagai alt penghantar maklumat dan kadang-kadang ia juga boleh digunakan sebagai alat pengawal untuk sesuatu sistem. Dari terbit idea untuk membuat projek menggunak sistem bluetooth. Projek ini lebih menfokuskan kepada sistem penghantaran maklumat dan sistem pengawalan sesuatu bahan. Projek dinamakan sebagai alat pengawal dengan bantuan bluetooth sistem diamana project ini mengadungi lapan keluaran yang terdiri dari lampu dan ia akan dikawal dengan menggunakan 'Visual Basic Program'. Project ini lebih sesuai untuk digunakan terhadap kediaman seseorang ataupun boleh degukan terhadap pejabat seseorang juga.

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LIST OF ABREVATIATION

ADC	ANALOG TO DIGITAL CONVERTER
ALU	ARITHMETIC LOGIC UNIT
BCD	BINARY CODED DECIMAL
CCW	CONTER CLOCKWISE
CH	CLOCK HERTZ
CP	CODE PROTECTION
CW	CLOCKWISE
GND	GROUND
IC	INTEGRATED CIRCUIT
ICSP	IN CIRCUIT SERIAL POGRAMMING
INDF	INDIRECT FILE
LED	LIGHT EMMITING DIODE
PC	PROGRAM COUNTER
PWRT	POWER UP TIMER
RTC	REAL TIME CLOCK
SQW	SQUARE WAVE

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CHAPTER I

INTRODUCTION

The Bluetooth specification was developed in 1994 by Jaap Haartsen and Sven Mattisson, who were working for Ericsson Mobile Platforms in Lund, Sweden. The specification is based on frequency-hopping spread spectrum technology. The specifications were formalized by the Bluetooth Special Interest Group (SIG). The SIG was formally announced on May 20, 1998. Today it has a membership of over 7000 companies worldwide. It was established by Ericsson, IBM, Intel, Toshiba, and Nokia, and later joined by many other companies [1].

1.1 Multimode Universal Controller Using Bluetooth Technology

Wireless communication is currently becoming popular and evolving to support communication needs for wide range of applications. It gives opportunity to wireless data transfer technologies such as Infrared, Home radio frequency (RF), Wi-Fi and Bluetooth to be improved for future benefit. With the advancement of radio frequency (RF) and semiconductor technologies, researchers are now concentrating effort in developing Pico-networks where electronic devices can communicate within 100 meters without requiring any fixed infrastructure. The best & cost efficient future is

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Bluetooth, a technology named after a 10th century king who brought warring Viking tribes under a common rule. The choice of operating in the license-exempt band that is ISM (Industrial Scientific Medical) band which ranges from 2.4 GHz to 2.4835 GHz enable the goals of global applicability, low power and high aggregate capacity to be meet [2]. To be more specific, this project demonstrates the development of the household and office devices that can be controlled using wireless Bluetooth technology, which is suitable for a wireless home or office environments. This system can be adapted to the needs of the customer, for an example this system used as long as the device is able to read the Visual Basic Program.

1.2 Problem Statements

Even thought this demonstrate with latest technology by using Bluetooth, there got some problems that can't avoid from persist.

a) The data only can be sending in serial communication. That means, it's only allowed for one way communication.

b) Let say the laptop didn't build in with Bluetooth modem, its compulsory to buy a Bluetooth dongle and install it to the appropriate laptop.

c) But for PDA system which was not built in with Bluetooth, it's impossible to demonstrate this project into their PDA system.

1.3 Project Objective

This project demonstrates the development of the household and office device that can be controlled using wireless Bluetooth technology. This device is suitable for a

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wireless home or office environment situation and best solution to eliminate the need for wires, cables and the corresponding connectors between mobile phones, modems, computers, printers, PDAs and etc. Besides that, the purpose of this project is to design and develop PIC system using Bluetooth technology. Apart from that, this project also interfaces the system between hardware and software (Visual Basic and C-Language). It is a system that can be used to control several home and office appliance like fan, light and etc by using bluetooth device (SKC21).

1.4 Scope of work

The scope of the project is hardware on the hardware and Software. The system also includes of applying the wireless Bluetooth, hardware and Visual Basic by using PIC microcontroller. Bluetooth module is included in the hardware for wireless transmission. However, the software parts that analysis the data is done by Visual Basic program. At the end, the wireless data glove system will be combining with the software part to become the completed home and office environments using Bluetooth technology. The Scope of work has been listed below:

- **Hardware:**
  - ❖ Studied specifications of SKC 21 Bluetooth module and other electronics devices.
  - ❖ Designed a circuit board for a relay card system.
  - ❖ Completed circuits and wiring for PIC, Bluetooth.

- **Programming:**
  - ❖ Develop PIC Microcontroller's program.
  - ❖ Write a program for Visual Basic.

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1.5 Expected outcome of the project

The purpose of this project is to design and develop PIC system using Bluetooth technology. Apart from that, this project also interfaces the system between hardware and software (Visual Basic and C-Language). It is a system that can be used to control several home and office appliance like fan, light and etc by using bluetooth device (SKC21). At the end of this project we able see that, all output will be control by Visual Basic 6.

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1.6 Project Methodology

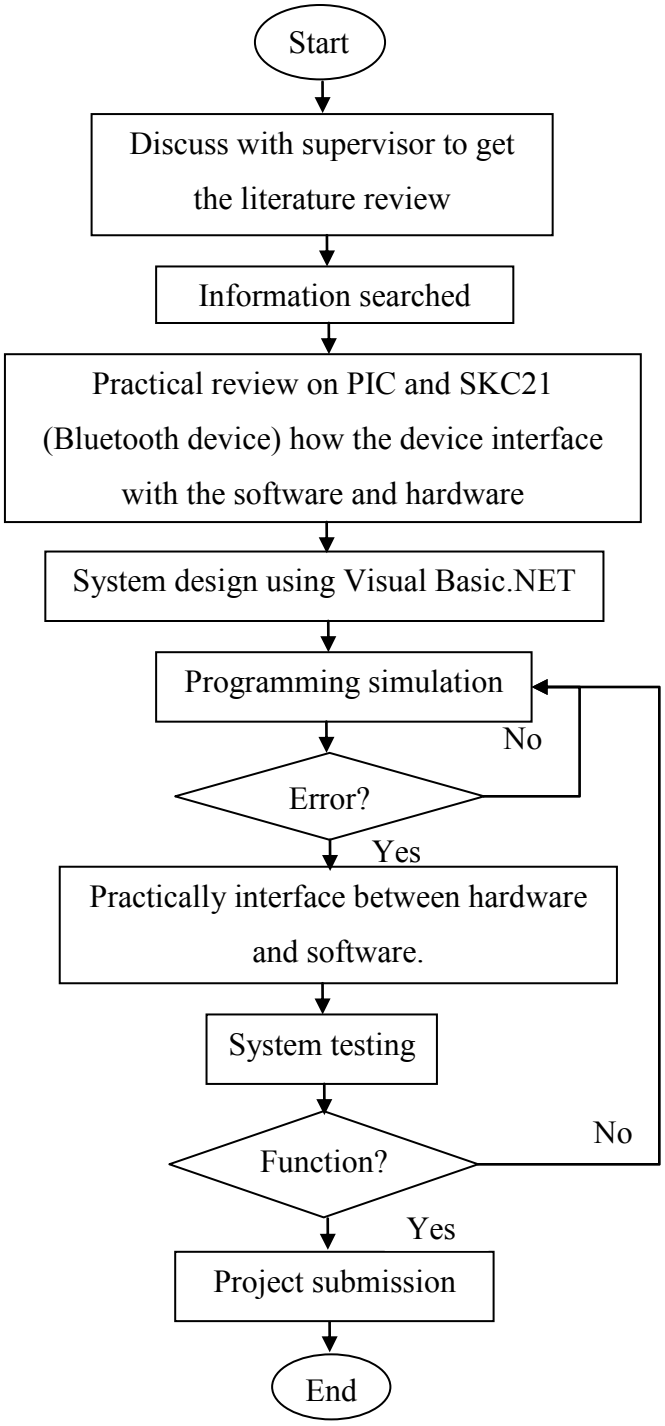

Figure1.0: Flow chart for project methodology

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