



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**DEVELOPMENT OF ELECTRONIC NOTICE BOARD USING
WIRELESS TECHNOLOGY**

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

by

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I hereby, declared this report entitled “Development of Electronic Notice Board Using Wireless Technology” is the results of my own research except as cited in references.

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor of Electronics Engineering Technology (Telecommunications) with Honours. The member of the supervisory is as follow:

.....
(En.Mohd Saad Bin Hamid)

ABSTRAK

Papan kenyataan elektronik tanpa wayar adalah satu projek yang boleh membantu orang ramai pada hari ini untuk mengemaskini sebarang mesej serta-merta tanpa sebarang kelewatan dengan hanya menulis maklumat yang lebih baik dan lebih dipercayai daripada cara tradisional lama iaitu menampal mesej pada papan kenyataan. Dalam projek ini, Nodemcu Esp8266 akan digunakan sebagai unit kawalan utama sistem keseluruhannya. Selain itu juga, LED Matrix controller Max7219 digunakan di dalam projek ini berfungsi sebagai keluaran. Pengguna hanya perlu mengakses pelayan HTTP yang disediakan di dalam NodeMcu Esp8266 untuk mengakses kandungan. Selain itu, pelayan HTTP di lindungi oleh kata kunci bagi mengawal akses supaya hanya pemilik kata kunci sahaja boleh mengaksesnya. Tambahan pula, projek yang dicadangkan ini boleh dapat digunakan di mana-mana sebagai contoh di tempat-tempat awam, pusat membeli-belah atau di dalam bangunan untuk meningkatkan sistem keselamatan dan juga memberi kesedaran untuk keadaan kecemasan dan mengelakkan daripada sebarang bahaya.

ABSTRACT

A wireless electronic notice board is a project that can help people update any message immediately without any delay by only writing the information which is better and more reliable than the old traditional way of pasting the message on notice board. In this project, Nodemcu Esp8266 will be rolled as the major control unit of the whole system. Besides that, the function of LED Matrix Max7219 Controller in this project is to display the output message. Consumer only need to access HTTP Server that in prepare in NodeMcu Esp8266 to access the content. Apart from that, HTTP Server is protected by password to control access so that only owner only can access. Furthermore, this proposed project can be able used everywhere for example in public places, shopping malls or in the building to improve the security system and also giving awareness for the emergency situation and avoid from any danger.

DEDICATION

Alhamdulillah, praise to the Almighty Allah S.W.T

This thesis is dedicated to:

My beloved family,

My Parents,

My Supervisor,

My lecturers

And all my friends

Thanks for their encouragement and support

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Alhamdulillah, thank you Allah because of His blessing, I finally complete and finish my final year project successfully.

During the process to complete my project objective, I do a lot of research either by using internet, reading past year thesis, reference books and journal. With the guidance and support from peoples around me, I finally complete the project due to the time given. Here, I want to give credit to those who helped me to achieve what I had achieved in my final year project.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

RF	-	Radio Frequency
LCD	-	Liquid Crystal Display
B4A	-	Basic4Android
RSSI	-	Received Signal Strength Indicator
MIT	-	Massachusetts Institute of Technology
RAM	-	Random Access Memory
PWM	-	Pulse Width Modulation
USB	-	Universal Serial Bus
AC	-	Alternating Current
DC	-	Direct Current
GND	-	Ground
IOERF	-	Least Used
RX	-	Receiver
TX	-	Transmitter
ICSP	-	In Circuit Serial Programming
EPROM	-	Electrically Erasable Programmable Read Only Memory
LED	-	Light Emitted Diode
CISC	-	Complex Instruction Set Computer
IC	-	Integrated Circuit
RISC	-	Reduced Instruction Set Computer
PIC	-	Peripheral Interface Controller
PCB	-	Printed Circuit Board
RTC	-	Real Time Clock
MMS	-	Multimedia Messaging Service
GPRS	-	General Packet Radio Service
EDGE	-	Enhanced Data GSM Environment
TE	-	Terminal Equipment

GSM	-	Global System for Mobile
MODEM	-	Modulator-Demodulator
WLAN	-	Wireless LAN
IDE	-	Integrated Development Environment
UHF	-	Ultra High Frequency
ISM	-	Industrial Scientific and Medical Band
EDR	-	Enhanced Data Rate
PC	-	Personal Computer
FYP	-	Final Year Project
IR	-	Infrared

CHAPTER 1

INTRODUCTION

1.0 Introduction

In this chapter, the project background, the problem statement, objective of the project, project limitation and the scope of the project will discuss.

1.1 Background

Wireless communication is the transfer of information between two or more points that are not connected by any electrical conductor. The wireless technology has provided service, such as long range communication which is impossible or not practical to implement with the use of wires. This project is about to develop an electronic notice board that displays notices when a message is sent from the users mobile by using wireless technology. Smart phone is a mobile phone which offers advanced technologies with functionality same as a personal computer. Today, most of users inseparable from their smartphone. The survey has been done which are from United States, United Kingdom, China, India, South Korea, South Africa Indonesia and Brazil. From this survey, found that 5000 people from the country listed state that smartphone is a very important thing and it able to ease human life (TEIK, 2013). From this, the result of this survey proves that most of the people were really used their smartphone, 84% claimed that they cannot live without their smartphone.

1.2 Problem Statement

Nowadays delivery messages by using large notice board commonly used in several places, from school to organization. Also, it is a very challenging and waste of time to change notice board contents by using conventional method. Normally, the electronic board are designed by using wired system. Main reason to develop this board is because not flexible and cannot be in anywhere because tidy wire. In an effort to solve this problem, wireless board has been designed to display latest information in LCD display anything that we routed from the mobile phone.

1.3 Objectives

Due to the reason the following objective have been formulated to solve the problem in this project.

The objectives are:

- i. To develop wireless electronic notice board
- ii. To study the operation of wireless system for data transfer
- iii. To analyze the performance of wireless data transfer

1.4 Scope of this Project

The scope for this project is to determine which method in used and knowledge that used to achieve the objective of the project. Based on the objective, it need to brief clearly to make sure the process to implement is running smoothly.

The work scopes of this project are:

- i. The first of project objective is to develop a wireless electronic notice board. Firstly, understand clearly about the wireless technology in order to upgrade wireless notice board. Also study about the hardware and software such as Arduino, MIT apps inventor, and Basic4Android to complete the project and implement on the notice board.

- ii. Based on the second objective, implement wireless technology to transfer data from mobile to electronic notice board.
- iii. Based on the next objective, perform analysis on wireless technology in term of range and also RSSI.

1.5 Project Methodology

In this project methodology, it shows the steps of the project that should be completed. Furthermore, in order to achieve a successful result in this project, need to ensure that all the objectives must be done. Firstly, is to discuss with supervisor also do research and study about the related project. Then, all the hardware and software that related are included in the following stage and the most suitable method would be selected.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

In this chapter, the previous research that is related with this project are provided and to make it as a references. All the information obtained is from books, articles, journals and internet. In order to ensure this project successful, all the information is very useful as a guide in doing this project. In an effort to ensure this project is successful, all information that are immensely useful as guide in conducting this project. All information in this chapter based on a few key components and topic related to project that will be used in this project that is hardware and software.

2.1 Electronic Notice Board

Electronic or digital notice board can be used for many applications for exchanging information to people in a faster and more cost effective manner than traditional posters or paper notice boards. Also, Electronic Notice Board is a new tool which is the function to display the information on digital devices. This type of notice board, it can leave and erase the information for the people to read and see. Moreover, the use of wireless technology is increasing not only in industrial applications, but also for domestic applications.

2.1.1 Type of Electronic Notice Board

LED and LCD are two technologies that are commonly used in various fields. Next, LED means Light Emitting Diode, which is a single component electronic device. The meaning of LCD is Liquid Crystal Display, which is a multi-component display device. Then, the application used for both devices are similar such as television, instrument display and indicator. Then, in order to complete this final year project, it is very important to have a better understanding in the concept and operation of LCD and LED. Figure 2.1 and Figure 2.2 below are the example of LCD and LED.



Figure 2.1: LCD Display

(Source: <http://www.differencebetween.net/object/difference-between-lcd-and-led-televisions/> 22/4/2016)



Figure 2.2: LED Display

(Source: <http://www.nairaland.com/3149747/multimedia-led-display> 22/4/2016)

2.2 Hardware

This topic will discuss several hardware platform as part of the literature review for the controller to be used in this project

2.2.1 Microcontroller

Microcontrollers used in world of industry to control various types of equipment, arrived from consumer to specific device. They has replaced microcontrollers old sort, including microprocessor. Moreover, there is need that is increasingly increasing for offline support for computer main processor. Request will grow as equipment that more use more intelligence. Application is from control modern car inboard engine to control laser printer and other computer hardware. Generally, many produce to achieve need for control. The, the most popular is Motorola 68HC11. This is because the 68HC11 microcontroller is relatively easy to work with, yet they have most of the features essential for a complete control system. This is because 68HC11 microcontroller that fairly simple to be working with, however they have most important features for full control system. Therefore, type of controller is easy. Although, futuristic vision to use processor that is newer, that 68HC11 is tool that is great to learn on control fundamentals. This micro guard offer a few functions that are suitable to plan electronic notice board. It is very flexible because it can expand for number that is unlimited port.

The most microcontroller used today's technology is MC68HC11. This microcontroller type may be employed in four operation mode that over bootstrap mode, single chip mode, special test mode and mode expanded. Figure 2.3 is easy block diagram for simple diagram on 68HC11 microcontroller mode expanded.

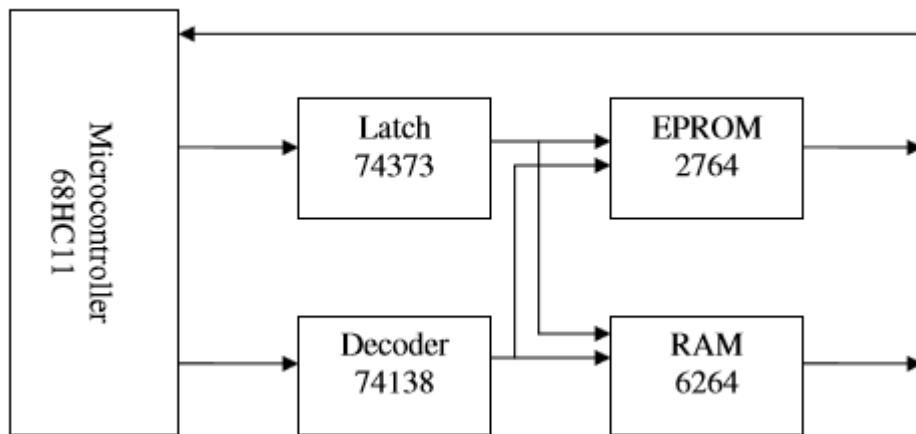


Figure 2.3: MC6811A1 Expanded Mode Block Diagram

(Source: <http://www.seattlerobotics.org/encoder/sep97/basics.html> 24/4/2016)

From circuit above it comprises from microcontroller, latch, decoder, EPROM and RAM. After that, function latch is for demultiplex between data bus and address bus. Then, decoder used to choose input / output and memory. Modes grow normal activated by setting MODA and MODB in high logic condition. This carried out with directly connected to VCC through 4.7K resistance ohm. EPROM is memory that uncertain and commonly used to keep regular program or data. On the other hand, RAM is memory that uncertain and it only used for short storage.

2.2.2 Arduino

Arduino is an open-source platform used to build and electronic programming. It can accept and send information to most devices, and also through internet to order certain electronic device. It utilizing hardware known as circuit board program and Arduino UNO software for board program. Nowadays, Arduino used many in programing microcontroller among others due to position that user friendly or easy to use setting, like any micro guard that Arduino is circuit board with chip that is programmable to do the a few many duties, it sends information from computer program for