



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**INTELLIGENT AL-QURAN FLIPPER
FOR IMAM AND KHATIB**

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

by

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I hereby, declared this report entitled “Intelligent Al-Quran flipper for Imam and Khatib” 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 Computer Engineering Technology (Computer Systems) with Honours. The member of the supervisory is as follow:

.....

(Project Supervisor)

ABSTRACT

The main purpose of this project is to design and build wearable device of Al-Quran flipper for Imam and Khatib. Imam have a trouble to read long surah without referring to the Al-Quran while Khatib have a limitation to move and turn pages at the computer when standing at mimbar. This project consists of Printed Circuit Board (PCB) and Bluetooth technology to construct wearable flipper device which communicates with computer using Processing software. This project is divided into three stages which include literature review followed by design hardware and software simulation then lastly testing and analyze the results. This project develops an application for reading Al-Quran through computer which can be controlled remotely. This project mainly focuses on the Bluetooth connection from wearable flipper where the device acts as a Bluetooth mouse to the application. Imam uses the wearable flipper during prayer to overcome the problem of difficulties to flip the next pages as during praying, the movement is limited. As for Khatib, he uses the wearable device during Friday prayer when to flip the Khutbah text. The wearable flipper is simple, light small and has Bluetooth connection. This can overcome the problems happened to Imam and Khatib. This project contains of simulation, design and analysis result.

ABSTRAK

Tujuan utama projek ini adalah untuk mereka sebuah peranti mudah pakai Al-Quran untuk Imam dan Khatib. Imam menghadapi masalah untuk membaca lebih dari satu muka surat surah tanpa melihat dari Al-Quran manakala Khatib pula menghadapi masalah untuk bergerak ketika berdiri di Mimbar. Projek ini terdiri daripada litar bercetak (PCB) dan teknologi Bluetooth untuk membina peranti mudah pakai untuk berkomunikasi dengan komputer menggunakan perisian Pemprosesan dan bahasa JAVA. Projek ini terbahagi kepada tiga bahagian iaitu bahan rujukan dari pembacaan diikuti mereka litar dan program seterusnya adalah menguji, menganalisa hasil ujian tersebut. Projek ini akan mereka sebuah aplikasi untuk membaca Al-Quran melalui komputer yang boleh dikawal dari jauh. Projek ini terutamanya memberi tumpuan kepada sambungan melalui Bluetooth daripada peranti mudah pakai yang bertindak sebagai tetikus tanpa wayar. Imam akan menggunakan alat tersebut yang boleh dipakai semasa solat untuk mengatasi masalah kesukaran untuk menukar halaman seterusnya disebabkan ketika solat, pergerakan adalah terhad. Bagi Khatib pula, beliau akan menggunakan peranti ini semasa solat Jumaat ketika memberikan Khutbah. Alat peranti ini boleh dipakai bila-bila masa sahaja kerana bentuknya yang ringkas, kecil, ringan dan ada teknologi Bluetooth. Ini akan dapat menyelesaikan masalah kepada Imam dan Khatib. Projek ini mengandungi simulasi, reka bentuk alat peranti dan analisa keputusan simulasi.

DEDICATIONS

To my beloved parents, I am very thankful for giving me support for complete this project. Thanks for always be with me and support my financial to buy all the components needed. To my supervisor, thanks for always help me during all the process of completing this project. Thanks again for giving me an interesting project and it is a new knowledge for me. It helps me a lot to gain more knowledge. Lastly, to my friends, thanks because always understand me and help in this project. Hope God always bless all of you.

ACKNOWLEDGMENTS

All students undertaking the degree is compulsory to complete a project under the supervisor of UTeM lecturer. The project support students with the chance to gather together the academic understanding and skills gained from the field of modules already studied. Typically, the project can be divided into two parts, namely Final Year Project 1 and 2.

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LIST OF SYMBOLS AND ABBREVIATIONS

SBM	=	Shape-Based Matching
ADC	=	Analog to Digital
API	=	Application Program Interface
AVR	=	Advanced Virtual RISC
BOM	=	Bill of Material
CSR	=	Control and Status Register
EDR	=	Enhanced Data Rate
DLC	=	Double Layer Check
FTP	=	File Transfer Protocol
GPS	=	Global Positioning System
HTTP	=	Hypertext Transfer Protocol
IC	=	Integrated Circuit
IDE	=	Integrated Development Environment
ISP	=	In System Programming
IMAP	=	Internet Message Access Control
LCD	=	Liquid Crystal Displays
MCU	=	Microcontroller
MLF	=	Molded Lead Frame
MP3	=	Music Player
PCB	=	Printed Circuit Board
PDA	=	Personal Digital Assistant
PDIP	=	Program Development Increment Package

PIC	=	Peripheral Interface Controller
PIN	=	Personal Identification Number
RAM	=	Random Access Memory
RnR	=	Rest and Recreation
RX	=	Receiver
SMTP	=	Simple Mail Transfer Protocol
TQFP	=	Thin Quad Flat Package
TX	=	Tranmitter
USB	=	Universal Serial Bus
UTeM	=	Universiti Teknikal Malaysia Melaka
UV	=	Ultraviolet
2D	=	2 Dimension
3D	=	3 Dimension
Amp	=	Ampere
Gnd	=	Ground
mA	=	milli Ampere
mm	=	milli metre
MHz	=	Mega Hertz
pF	=	pico Farad
V	=	Volt
Vcc	=	Voltage at the Common Collector
Ω	=	Ohm

CHAPTER 1

INTRODUCTION

All students undertaking the degree is compulsory to complete a project under the supervisor of UTeM lecturer. The project support students with the chance to gather together the academic understanding and skills gained from the field of modules already studied. Typically, the project can be divided into two parts, namely Final Year Project 1 and 2.

1.1 PROJECT BACKGROUND

This project provides the reader with the detailed and comprehensive study of theories, designs, results and problems encountered in the designing wearable device of Al-Quran flipper. The approaches used to achieve this project through literature review, designing circuit and simulation. This project is also approaches used to analyse the characteristics and requirements specification before design wearable device. Simulation is the best technique to get the solution because it is fast and economical.

This project is divided into three stages which includes literature review followed by design hardware, software simulation then lastly testing and analyze the results. The wearable device design focus on finding an innovative way for Al-Quran flip pages through software and hardware. The wearable device is designed for Imam and Khatib in Malaysia to use during prayer and give Khutbah.

1.2 PROBLEM STATEMENT

Al-Quran, also known as the narration, is the religious content for Islam that Muslim trust to be a disclosure from God. Its scriptural status within a world religious society and it is main region within world written matter typically. Therefore, it has guide physically to a strong of secondary written matter on the Al-Quran. Al-Quran divisions are named surah while verses are named ayat.

Currently, in every mosque, there is a big Al-Quran place in front of Imam for him to read surah during prayer. The problem here is Imam have a trouble to read long surah without referring to the Al-Quran. Not all Imams are Hafiz, which is someone who has memorized the entire Al-Quran, especially small towns in Malaysia. Sometimes, their reading stuck in partitions or in middle of the surah. This situation makes them curious if their reading is right with its harakat and tajwid. Besides, the big Al-Quran is hard to flip the next pages as during praying, their movements are limited. Sometimes, Imam wants to read more than one page but the limitation makes he forget it.

Besides, Khatib needs to stand at Mimbar when give the Khutbah. Khatib needs to hold a “stick” when standing at the Mimbar. This make Khatib have a limitation to move and turn pages at the computer.

1.3 PROJECT OBJECTIVES

The objectives of this project are:

- I. To construct a circuit of wearable device to remotely control an application
- II. To establish connection between the wearable device and Intelligent Al-Quran application via Bluetooth
- III. To test the functionality of the device and the application.

1.4 PROJECT SCOPE

The scope of this project is to remotely control an Al-Quran application using a flipper via Bluetooth. This project mainly focuses on the Bluetooth connection from wearable device where the device acts as a Bluetooth device to the application. The first part of this project is to study literature. Then, designing hardware by collecting schematic circuit related to wearable device to build an Intelligent Al-Quran flipper.

Besides, this project needs to create a PCB circuit for wearable device. The purpose of using PCB is it provides a mean to hold all components together in one place as a single unit. The PCB circuit was constructed on Proteus software. Proteus drawing links the schematic capture and ARES PCB layout programs to contribute an effective, integrated and simple to use collection of tools for professional PCB layout.

Then, this project is proceeded to modify a program of Al-Quran application. Processing software is use for modifying the Al-Quran program using Processing language. Processing initially creates to assist as a sketchbook application and to

guide computer programming basis in an imaged text. The features of Processing are allows user to create their own classes and every Processing sketch is actually a subclass of JAVA class. Therefore, Processing needed some knowledge about JAVA language.

There are six scopes of works:

1. Study about Bluetooth connection, Processing software and PCB circuit design. In this part, it needs to find some schematic circuit to design wearable device, parameter of circuit. Then, designed the circuit with computer software to make sure the device design is perfect and success.
2. Modify an Al-Quran application for connecting the application with wearable device.
3. By using the Proteus ISIS software, the expected result for the wearable device can be earned. Simulation process is one of the engineering methods to get the expected result without using any material that costly. Simulation can be done using a breadboard.
4. When obtained a successful circuit from the simulation, hardware prototype can be started.
5. Test the hardware prototype after the whole process is done.
6. Compare result with the expected result in simulation.

1.5 PROJECT SIGNIFICANCE

In this project, the wearable flipper is designed for Imam and Khatib to overcome their problem. It can be used during praying and Friday prayer. The wearable flipper has the functions same as a Bluetooth watch. Imam can use the wearable flipper when praying to flip the next pages of Al-Quran. In goes the same way for Khatib during gives Khutbah in Friday prayer. The wearable flipper designs to be simple to wear because of the size are small and light. The components for construct the wearable flipper are resistor, transistor, ATmega8, buttons and others. These components are easy to find and the price is affordable. In the future, Imam and Khatib in Malaysia will be use this wearable flipper for praying and gives Khutbah.

1.6 THESIS OUTLINE

Chapter 1: Introduction

- This chapter will simply introduce about the project.
- This chapter contains of the introduction of the project background, the problem statement of the project, the project objectives and the project scope as well the project limitation.

Chapter 2: Literature Review

- This chapter shows about the studies and the research that relevant to the project.
- This chapter contains the literature review that will be discussed about what research project was done by other people.

Chapter 3: Methodology

- This part will show the canvass about the research methodology used in this part.
- Contains methodology that will be discussed more on the project design includes the programming, the software and the hardware.

Chapter 4: Result, Discussion and Analysis

- This part will state out the result that be obtained, discussion and analysis the result.
- Contains results and discussion obtained according to the objectives of this project.

Chapter 5: Conclusion and Recommendation

- This chapter will talk about conclusion and recommendation of the project.
- Contains explanation about the conclusion and recommendation can make for future improvement.

CHAPTER 2

LITERATURE REVIEW

This chapter will explain the basic concept and theories needed for development and implementation of the project. Besides, this chapter will provide information about Intelligent Al-Quran application and device.

2.1 INTRODUCTION TO BLUETOOTH TECHNOLOGY

Bluetooth is an open wireless technology standard for short distance device communication (Idwan, 2009). Bluetooth is also a wireless communication etiquette used to interact two or more other Bluetooth capable gadgets and with a master slave structure (Edward et al, 2013). Bluetooth is identical to several communication protocols like HTTP, FTP, SMTP and IMAP that the connection is a master and the one who accepts the connection is a slave (Idwan, 2009). The master may interact with multiple slaves and each device shares the master device's clock (Edward et al, 2013). Bluetooth technology uses 2.4 gigahertz frequencies to attach not only mouse but also keyboards, PDAs and printers. The range is usually approximately to 33 feet which equal to 10 meter (Sridhar, 2008). The mouse operates via infrared signal which is then sent to the Bluetooth and further relayed to the Bluetooth enabled computer.

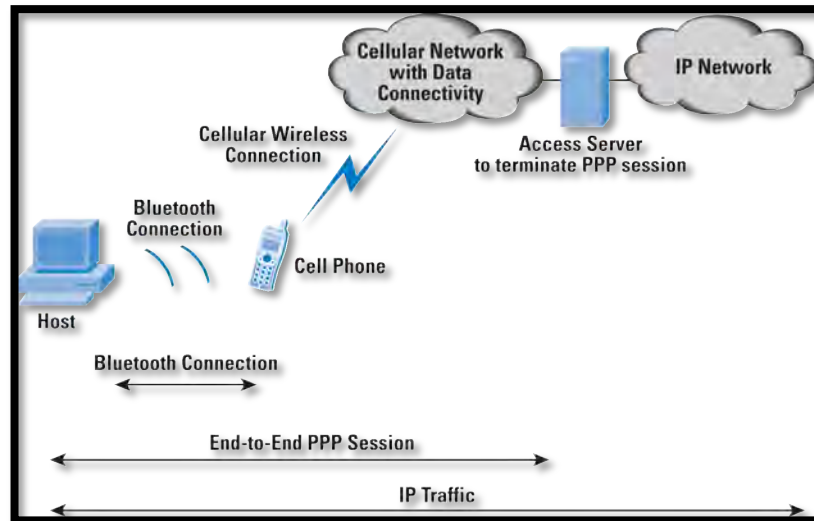


Figure 2.1: General Use of a Bluetooth enabled phone as a data processor for a computer

Bluetooth is a form of technology that dispenses of the need for cables and wires. Two devices in short length of each other and supplied with Bluetooth technology can transfer voice and data information between each other wirelessly. In recent years, Bluetooth technology has been a fast development of Bluetooth capable devices.

The modern's devices need a very long service life without battery replacement (Edward et al, 2013). Others have limited size or weight availability, thereby requiring reduced power supplies. Bluetooth was designed to meet some of these needs. This enables a new class of low cost Bluetooth products with very long battery life such as fitness sensors, proximity keys fobs and wireless watches.