

**DEVELOPMENT OF A PORTABLE DIGITAL QURAN**

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# DEVELOPMENT OF A PORTABLE DIGITAL QURAN

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A project report submitted in partial fulfilment of the  
requirements for the award of the degree of  
Master of Engineering (Electrical – Electronics & Telecommunications)

Faculty of Electrical Engineering  
Universiti Teknologi Malaysia

DECEMBER 2010

*Dedicated to:*

*My beloved parents;*

*Hasan b. Jamil, Rodziah Abdul Hamid,*

*My supporting brothers;*

*Haniff b. Hasan, Hisham b. Hasan*

*My lecturers and friends;*

*Thank you...*

## **ACKNOWLEDGEMENT**

Praise to Allah S.W.T for giving me the chance to be part of Universiti Teknologi Malaysia which finally has come to its end as a postgraduate student. I am deeply thankful to Allah S.W.T for giving me the strength and patience in completing this thesis.

A special thanks to my supervisor, Dr Muhammad Nasir Ibrahim for his guidance and encouragement. Also, I would like to deliver my greatest gratitude to my family for their endless support, my lecturers who have taught me to all these years, and my friends who are always been there for me in times of happiness and difficulties.

Thank you.

## **ABSTRACT**

The rapid growth and emergence of technologies and microcontroller as embedded system has opened a new dimension to the Quran, in terms of external structure. The new dimension of Quran is in electronic form, known as the digital Quran. It is developed in a more sophisticated way and offers an interesting interactive approach to attract people to read, listen and recite the Quran. Thus, this project combines both matters (Quran and microcontroller) into one system. This project emphasizes on developing a portable digital Quran in the form of an audio player as a cool gadget/device and a learning tool for everyone. The purposed portable digital Quran is designed based on LPC 2119 ARM7TDMI-S microcontroller. The microcontroller is connected to additional devices like SD Card, MP3 decoder and 16x2 LCD. The software development of the project is compiled and debugged by Keil uVision3 which incorporates a C programming. Finally, a portable digital Quran which uses ARM7 microcontroller and provides audio recitation and surah display is realizable. It can display the surah's name, simultaneously with the surah being played. In addition, the digital Quran is also equipped with a navigation key.

## **ABSTRAK**

Perkembangan teknologi and sistem terbenam yang pesat membangun telah membuka satu dimensi baru kepada Quran, dari segi pembentukan struktur luaran. Dimensi baru yang dimaksudkan adalah Quran dibangunkan dalam bentuk elektronik, yang dikenali sebagai Quran digital. Quran digital ini menawarkan satu pendekatan interaktif yang lebih canggih dan menarik untuk memupuk oraang ramai untuk membaca, mendengar dan membaca Quran. Oleh hal yang demikian, projek ini adalah gabungan antara Quran dan sistem terbenam untuk diletakkan ke dalam satu sistem. Projek ini bertujuan untuk membangunkan Quran digital dalam bentuk ‘audio player’ sebagai satu peranti yang menarik dan boleh dijadikan sebagai bahan pelajaran untuk semua orang. Quran digital ini dibangunkan menggunakan LPC 2119 mikrokontroler ARM7TDMI-S. Mikrokontroler ini disambungkan dengan peranti tambahan seperti SD Card, MP3 dekodder dan 16x2 LCD. Perisian projek ini dibangunankan melalui Keil uVision3 yang menggunakan bahasa C. Akhirnya, Quran digital menggunakan ARM7 mikrokontroler yang menyediakan kemudahan audio bacaan surah dan paparan nama surat dapat direalisasikan. Nama surah dipaparkan serentak dengan surah yang sedang dimainkan. Selain itu, Al-Quran digital ini turut dilengkapi dengan satu kekunci navigasi.

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## LIST OF ABBREVIATIONS

ARM	- Advanced RISC Machines
RISC	- Reduced Instructions Set Computer
UART	- Universal asynchronous receiver/transmitter
SPI	-Serial peripheral interface
GPIO	-General purpose I/O
SD Card	-Secure Digital Card
MP3	- Media player 3
LCD	- Liquid crystal display

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Project Background**

Quran and microcontrollers are virtually everywhere in our daily life. Quran is the soul and light of Islam. Quran is the main religious text of Islam. It is considered as the eternal miracle of Islam. It is a divine guidance and moral direction for mankind. The teachings of the Quran are universal, addressed to all people throughout the world regardless of their creed and color. The text of the Holy Quran has remained unchanged over the past 1400 years. The millions copies of the Quran circulating in the world today are identical to the one revealed to the Prophet Muhammad SAW.

Meanwhile, a microcontroller is an intelligent core for a specialized dedicated system. It is a small computer on a single integrated circuit. A typical microcontroller contains all the components and features necessary to perform its functions, such as a central processor, input/output peripherals, timers, RAM memory for storing program data and executable code, and a clock or oscillator that provides a timing beat. In addition, some microcontrollers include a variety of additional modules and circuits. Some common ones are serial communications, analog to digital converters, digital to analog converters, real time clocks and flash memory. [1]

The rapid growth and emergence of technologies and microcontroller as embedded system has opened a new dimension to the Quran, in terms of external structure. The new dimension of Quran is in electronic form, known as the digital Quran. It is developed in a more sophisticated way and offers an interesting interactive approach to attract people to read, listen and recite the Quran.

Thus, this project combines both matters (Quran and microcontroller) into one system. This project emphasizes on developing a portable digital Quran as a cool gadget and a learning tool for everyone.

## **1.2 Problem Statement**

Sometimes, situation such as travelling and every reading on the move needs accessibility and portability. Thus, electronic digital Quran can help and assist to ease portability and accessibility. Also, the digital version can assist in the reduction of the Quran burning. Errant, torn and worn out of the Quran text cannot be discarded as wasteful piles as Muslims venerate and uphold the Quran. Instead, it should be burnt or buried it in a remote area.

## **1.3 Objectives**

These are the objectives of this project:

- To design a portable digital Quran using ARM7 microcontroller.
- To develop an easy and friendly user portable digital Quran.
- To inculcate the interest of people in listening, reciting and learning Quran in a new interactive technologies way.
-



## **1.4 Scopes of the Project**

Basically, this project is intended on using ARM7 microcontroller as the main core of the system. The system hardware focuses on the audio recitation as output. Additional features like the external storage and the display of the name of surah are also included in the system. The project incorporates with Keil uVision3 in C language.

## **1.5 Thesis Outline**

The thesis is organized into five chapters. The first chapter gives an overview of the background. Chapter two covers the literature review of the Quran and related reference work. Chapter three explains about the hardware overview. The forth chapter presents the hardware and software development of the project. Chapter fifth chapter presents the results obtained which are later discussed. The final chapter concludes the thesis. Suggestions for future work are also stated.

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