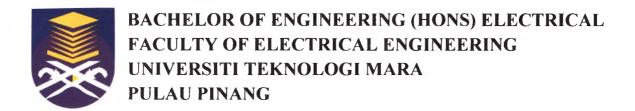
INTELLIGENCE SEJADAH USING VHDL AND FPGA

WAN MOHD NAZMIN BIN WAN MAHMUD

This thesis is presented in partial fulfillment for the award of the Bachelor of Engineering (Hons) Electrical

NOVEMBER 2008



ACKNOWLEDGEMENT

Alhamdulillah which is means "All praise belongs to Allah" with God permission I am able to complete this Final Year Project. I would like to express my gratitude to all the people who has given me their support during the period of completing this project.

Firstly, I would like to express my special gratitude to my Final Year Project supervisor, Ms Irni Hamiza Bte Hamzah that have been come out with the great idea on designing new project and will be a new environment for Muslim nowadays. Thanks for continuous guidance, support, commitment, valuable opinions and give me special enthusiasm to complete this project. Mention also to those lecturers are evaluating for the assessment of this Final Year Project.

Then, genuine gratitude and appreciation to my beloved family and friends who are always stand by me with full support and encouragement in doing this project. I would never forget to those people around me by supporting directly or indirectly. Genuine thanks for all the consideration, cooperation and the concern of each and every single assist I asked, persons who had given treasured point of designing environment with a lot of self motivational support.

ABSTRACT

This project is to develop a hardware that includes of designing, synthesizing and

evaluation skills based on Field-Programmable Gate Array (FPGA) by using Project

Navigator Xilinx ISE's Software as a workspace for VHDL and ModelSim Simulation

Software as a platform to simulate and analysis the design environment with Timing

Diagram. Spartan-3 Kit Board will be used as hardware interface and directly connected

to the Model of Intelligence Sejadah by using I/O ports. The design rule is based on

counter controller described in ASM Chart and then is translated into VHDL

descriptions. This project aims to design an Intelligence Sejadah that can count the

number of rakaat was and will perform by the user during Solat. The Intelligence Sejadah

helps to keep the worshipper alert with rakaat and comfortable during the prostrations of

prayer. Intelligence Sejadah will count the rakaat based on Touch-Switch Circuit and

displaying the number of rakaat on Seven-Segment LED Display as indicator for user

controlled by FPGA user I/O pins.

Keywords: VHDL, FPGA, ASM, Spartan-3.

iii

TABLE OF CONTENTS

INTELLIGENCE SEJADAH USING VHDL AND FPGA

TITLE	<u>PAGE</u>
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vii
LIST OF TABLES	viii
ABBREVIATION	ix
CHAPTER 1	1
INTRODUCTION	1
1.1 BACKGROUND	1
1.2 OBJECTIVES	2
1.3 SCOPE OF WORK	2
1.4 OUTLINE	3
CHAPTER 2	4
LITERATURE REVIEW	4
2.1 INTRODUCTION	4
2.2 APPLICATION OF INTELLIGECE SEJADAH	4
2.3 DESIGN OVERVIEW	5
2.4 SOFTWARE AND HARDWARE	6
2.4.1 XILINX ISE'S	6
2.4.2 FACTORS FOR CHOOSING VHDL	7
2.4.3 SPARTAN-3 BOARD	7

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

There are many Prayer Mat as known as *Sejadah* in existing today which have been taken care of for more than 100 years. Sejadah is a piece of fabric often decorated used by Muslims during their five daily prayers as known as *Solat* that obligatory to perform for person who was Baligh that refers to a person who has reached maturity or puberty and has full responsibility under Islamic law. Each daily prayer is made up of a different number of *rakaat*.

- **Subuh** The Dawn prayer: 2 rakaat
- **Zohor** The Noon prayer: 4 rakaat
- Asar The Afternoon prayer: 4 rakaat
- *Maghrib* The Sunset prayer: 3 rakaat
- Isyak The Night prayer: 4 rakaat

In this project, the *Sejadah* will be modified to be an Intelligence *Sejadah* that can count the number of *rakaat* in each *Solat*. Though the *Sejadah* is not required for prayer, the Sejadah helps to keep worshiper cleans and comfortable during the prostrations as known as *Sujud* of prayer. In addition to keep worshiper alert and focus on *Solat*, the Intelligence *Sejadah* will be helpful for user as indicator or reminder of the number of *rakaat* that was and will perform by the user.