## Final Year Project Report

A thesis submitted in the partial fulfillment of the degree BSE

Android Application for Learning the Pronunciation of Holy Qur'an



Bahria University Islamabad 30th April 2018 **Supervisor** Aleem Ahmad **Group Members** Attiya Babar (01-133142-168) Syeda Hareem Moazzam (01-133142-208)

Software Engineering Department

## ABSTRACT

Nowadays, due to cultural diversity, the lack of Madrassas and limited Quran tutors, it is tedious to teach Muslims the correct pronunciation, or the Tajweed of the Holy Book. Tajweed is a set of rules and regulations governing the way in which the words of the Holy Quran should be pronounced during the recitation. The Quran was revealed with Tajweed rules applied to it. When applied to the Quran, it means giving every letter of the Quran its rights and dues of characteristics when we recite the Quran and observing the rules that apply to these letters in different situations. Through Tajweed, the reciters can recite the Quran according to the way of the Prophet (P.B.U.H), who received from Gabriel (A.S), from the Almighty ALLAH in the Classical Arabic language.

Quran is the word of ALLAH and its every syllable is from ALLAH. Mostly, people have been very busy and apparently not finding the time to open up the Holy book. To make it easier for Muslims, a Quranic tutor on your phone will not only let you read and listen to the verses of the Holy Quran but also correct the way the Quran is read. It not only helps the readers recite the verses of the Holy Quran correctly but, points out mistakes and corrects them. It can be used anywhere and anytime. Pronouncing the words of the Holy Quran incorrectly, changes the meaning of the whole verse which means that Allahs teaching of the lifestyle of this world changes and it can be considered as a major sin. So it is imperative for all Muslims to learn the rules of recitation in order to strengthen their bond with Allah.

## Contents

1	INT	RODU	UCTION	1				
	1.1	Motiva	ation	2				
	1.2	Proble	em Statement	2				
	1.3	Goals		2				
	1.4		Contributions	3				
	1.5		Organization	3				
2	LITERATURE REVIEW 4							
-	2.1		d Work:	5				
	2.1	2.1.1	Building CMU Sphinx language model for the Holy	0				
		2.1.1	Qur'an using simplified Arabic phonemes	5				
		2.1.2	IBM Watson: Speech-to-Text API	6				
		2.1.2 2.1.3	Automatic Arabic Speech Recognition Enhancement	6				
		2.1.0	Automatic Arabic Speech Recognition Enhancement .	0				
3	SYS	STEM	REQUIREMENTS	8				
	3.1	Interfa	ce Requirements	9				
	3.2	Functi	onal Requirements	9				
		3.2.1	Functional Requirement $\# 01 \dots \dots \dots \dots \dots$	9				
		3.2.2	Functional Requirement $\# 02$	9				
		3.2.3	Functional Requirement $\# 03 \dots \dots \dots \dots \dots$	9				
		3.2.4	Functional Requirement $\# 04 \dots \dots \dots \dots \dots \dots$	9				
		3.2.5		10				
		3.2.6	Functional Requirement $\# 06$	10				
		3.2.7	Functional Requirement $\# 07 \dots \dots \dots \dots \dots$	10				
		3.2.8		10				
		3.2.9		10				
		3.2.10		10				
		3.2.11		10				
				11				
	3.3			11				
		3.3.1		11				

		3.3.2 Use Case # 2: Reading $\ldots$ $\ldots$ $\ldots$ $\ldots$ $\ldots$ 12
		3.3.3 Use Case # 3: Listening $\ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 14$
		3.3.4 Use Case # 4: Testing $\ldots$ $\ldots$ $\ldots$ $\ldots$ 15
	3.4	Non-Functional Requirements
		3.4.1 Performance
		3.4.2 Reliability
		3.4.3 Microphone
		3.4.4 Speaker
		3.4.5 Storage
	3.5	Resource Requirements
	3.6	Project Feasibility
		3.6.1 Technical Feasibility
		3.6.2 Operational Feasibility
		3.6.3 Legal & Ethical Feasibility
4	SVC	TEM DESIGN 19
4	4.1	Design Approach
	4.1	Design Constraints
	4.2	Interface Design
	4.0	4.3.1 High Fidelity Prototype
	4.4	Flow Diagrams (FD)
	4.4	Domain Model
	4.0	Design Approach
	4.0	4.6.1 Sequence Diagram
		4.6.2 Class Diagram
	4.7	Functional Flow
	4.7	runctional riow
5	SYS	TEM IMPLEMENTATION 32
	5.1	Strategy
	5.2	Tools Used
	5.3	$Algorithms \dots \dots$
	5.4	Methodologies
6	SYS	TEM TESTING 35
0	6.1	Test Strategy
	0.1	$6.1.1$ Unit Testing $\ldots \ldots 36$
	6.2	Test Cases $\ldots \ldots 36$
	U + ded	6.2.1 Test Case # 01
		6.2.2 Test Case $\# 02$
		6.2.3 Test Case $\# 03$
		6.2.4 Test Case # 04

	6.2.5 Test Case $\# 05 \dots 38$	8				
	6.2.6 Test Case $\# 06 \dots 38$	8				
6.3	Graphical User Interface Testing	8				
6.4	Usability Testing 43	3				
6.5	Software Performance Testing	4				
6.6	Compatibility Testing	4				
6.7	Security Testing	4				
6.8	Installation Testing	4				
6.9	Integration Testing	4				
6.10	System Testing	õ				
6.11	White Box Testing	5				
6.12	Black Box Testing	õ				
CONCLUSION 46						
7.1	Future Work	7				

7