

**FTMK EXAM QUESTIONS MANAGEMENT SYSTEM VIA SMS**

LAI KAR YEE

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

## BORANG PENGESAHAN STATUS TESIS

JUDUL: FTMK EXAM QUESTIONS MANAGEMENT SYSTEM VIA SMS

SESI PENGAJIAN: 2009/2010

Saya LAI KAR YEE

(HURUF BESAR)

mengaku membenarkan tesis (~~PSM/Sarjana/Doktor Falsafah~~) ini disimpan di Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dengan syarat-syarat kegunaan seperti berikut:


1. Tesis dan projek adalah hakmilik Universiti Teknikal Malaysia Melaka.
2. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan untuk tujuan pengajian sahaja.
3. Perpustakaan Fakulti Teknologi Maklumat dan Komunikasi dibenarkan membuat salinan tesis ini sebagai bahan pertukaran antara institusi pengajian tinggi.

4. \*\* Sila tandakan (/)

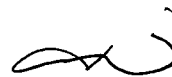
       SULIT (Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia seperti yang termaktub di dalam AKTA RAHSIA RASMI 1972)

       TERHAD (Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)

  /   TIDAK TERHAD



(TANDATANGAN PENULIS)



(TANDATANGAN PENYELIA)

Alamat tetap: 203, BLK A3, SEC 4,  
WANGSA MAJU, SETAPAK  
53300 K.L.

PN. KHADIJAH WAN MOHD. GHAZALI  
Nama Penyelia

Tarikh: 28/6/2010

Tarikh: 28/6/2010

CATATAN: \*Tesis dimaksudkan sebagai Laporan Akhir Projek Sarjana Muda (PSM)

\*\* Jika tesis ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa.

FTMK EXAM QUESTIONS MANAGEMENT SYSTEM VIA SMS

LAI KAR YEE

This report is submitted in partial fulfillment of the requirements for the  
Bachelor of Computer Science (Computer Networking)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY  
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2010

**DECLARATION**

I hereby declare that this project report entitled  
**FTMK EXAM QUESTIONS MANAGEMENT SYSTEM VIA SMS**

is written by me and is my own effort and that no part has been plagiarized  
without citations.

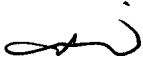
STUDENT

:  \_\_\_\_\_

(LAI KAR YEE)

Date: 28/06/2010

SUPERVISOR

:  \_\_\_\_\_

(PUAN KHADIJAH WAN MOHD.GHAZALI)

Date: 28/6/2010

## DEDICATION

*To my family especially to my beloved mom and dad for their support and encouragement*

## ACKNOWLEDGEMENTS

I thank God, for with Him, nothing is impossible.

I would like to acknowledge the advice and guidance to my supervisor Puan Khadijah Wan Mohd. Ghazali. Her close supervision and guidance in thesis writing and system development has been valuable. I am also very grateful to my former supervisor, Puan Marliza Ramly for her strictness and suggestions throughout the project. Besides, I would like to thank Cik Irda Binti Roslan for giving guidance and ideas which helps a lot in my project. Without them, I would never been able to accomplish my project.

I would also like to thank to my entire friends, without their helping and valuable opinion, I would never been able to accomplish all this myself. Also not forget to any individual that have not mention here but has contributed to this project. To all of them, I'm very thank you and appreciate for their help and support.

Lastly, I would like to express my heartfelt gratitude to my family, for their constant love, support and encouragement throughout these years.

## ABSTRACT

Nowadays, most of our routine tasks are no longer done by human, but computer has taken the place. The process of preparing exam questions in school, however are still done in its manual way. Normally questions are prepared according to Bloom Taxonomy and are saved into Microsoft Word or other word processor to be processed. In such case, some of the lecturers, especially in IT field are trying to prepare the midterm exam papers and quizzes using the system, such as Claroline-based E-learning system. However, different lecturers who involved in the same single subject are hard to collaborate on one single midterm exam paper. In addition, lecturer has to categorize the question manually based on level of Bloom Taxonomy before enter into the system. SMS notification is also not being applied in the system. Thus, the proposed system shall solve all of the limitations above while helping lecturers in producing good quality exam papers. It will categorize the questions automatically according to Bloom Taxonomy, produce standard formatted exam papers, and apply SMS notifications accordingly.

## ABSTRAK

Pada zaman sekarang, semakin banyak kerja harian telah dilakukan menggunakan komputer. Proses menyediakan soalan-soalan peperiksaan di sekolah masih dilakukan secara manual. Soalan-soalan biasanya akan disediakan berdasarkan *Bloom Taxonomy* dan ditaipkan ke dalam Microsoft Word untuk disimpan serta dicetak. Di samping itu, sesetengah pensyarah di Fakulti Teknologi Maklumat dan Komunikasi (FTMK) mengaplikasikan sistem eFTMK untuk menyediakan soalan-soalan kuiz. Akan tetapi, kertas peperiksaan yang dihasilkan oleh sistem tersebut adalah tidak berformat. Selain itu, pensyarah terpaksa mengkategorikan soalan-soalan mengikut peringkat *Bloom Taxonomy* yang ditetapkan secara manual sebelum dimasukkan ke dalam sistem. SMS notis juga tidak diaplikasikan dalam sistem tersebut. Oleh demikian, sistem yang dicadang untuk dibangunkan ini adalah untuk menyelesaikan semua masalah di atas, di samping menyenangkan pensyarah semasa mengendalikan soalan-soalan peperiksaan. Sistem yang akan dibangunkan akan mengkategorikan soalan yang dimasukkan secara automatik berdasarkan *Bloom Taxonomy*, menghasilkan kertas peperiksaan yang berformat seragam, di samping mengaplikasikan notis SMS dengan sewajarnya dalam sistem.



**TABLE OF CONTENTS**

<b>CHAPTER</b>	<b>SUBJECT</b>	<b>PAGE</b>
	<b>DECLARATION</b>	<b>ii</b>
	<b>DEDICATION</b>	<b>iii</b>
	<b>ACKNOWLEDGEMENTS</b>	<b>iv</b>
	<b>ABSTRACT</b>	<b>v</b>
	<b>ABSTRAK</b>	<b>vi</b>
	<b>TABLE OF CONTENTS</b>	<b>vii</b>
	<b>LIST OF TABLES</b>	<b>xiv</b>
	<b>LIST OF FIGURES</b>	<b>xvii</b>
	<b>LIST OF ABBREVIATIONS</b>	<b>xxi</b>
	<b>LIST OF ATTACHMENTS</b>	<b>xxiii</b>
<b>CHAPTER 1</b>	<b>INTRODUCTION</b>	
	1.1 Project Background	1
	1.2 Problem Statement	2
	1.3 Objective	2

1.4 Scope	3
1.5 Project Significance	3
1.6 Expected Output	4
1.7 Conclusion	4
<b>CHAPTER II</b>	<b>LITERATURE REVIEW AND PROJECT METHODOLOGY</b>
2.1 Introduction	5
2.2 Literature Review	6
2.2.1 Domain	6
2.2.2 Keywords	6
2.2.2.1 Exam Management System	6
2.2.2.2 Bloom Taxonomy	7
2.2.2.3 SMS notification	7
2.2.2.4 GSM Modem	7
2.2.3 Previous Researches	7
2.2.3.1 First Case Study: Calgary University	8
2.2.3.2 Second Case Study: Athabasca University	8
2.2.3.3 Third Case Study: Yazd University	9
2.2.3.4 Forth Case Study: Shahed University	10
2.2.3.5 Fifth Case Study: Question Database Management and Program for Generation of Examinations in National	12

Board of Medical Examiner Format	
2.2.3.5 Comparisons of Cases Studies	13
2.2.4 Facts and Findings	15
2.2.4.1 Methodologies	15
2.2.4.2 Comparison of Methodologies	18
2.2.4.3 Databases	19
2.2.4.4 Comparison of Databases	20
2.2.4.5 Scripting Languages	22
2.2.4.6 Comparison of Scripting Languages	23
2.2.4.7 Bloom Taxonomy	25
2.2.4.8 Web Servers	27
2.3 Proposed Solution	29
2.3.1 Project Methodology	29
2.3.1.1 Planning	30
2.3.1.2 Analysis	30
2.3.1.3 Design	31
2.3.1.4 Implementation	31
2.3.1.5 Testing	31
2.3.2 Software and Hardware Requirement	31
2.3.2.1 Software Requirement	32
2.3.2.2 Hardware Requirement	32
2.3.3 Conclusion of Previous Researches	32
2.4 Project Schedule and Milestones	33

	2.5 Conclusion	35
<b>CHAPTER III</b>	<b>ANALYSIS</b>	
	3.1 Introduction	36
	3.2 Problem Analysis	36
	3.2.1 Analysis of Current System	36
	3.2.2 Problems of Current System	45
	3.3 Requirement Analysis	46
	3.3.1 Data Requirement	46
	3.3.2 Functional Requirement	53
	3.3.3 Non-functional Requirement	57
	3.3.3.1 Web Browser	58
	3.3.3.2 Performance	58
	3.3.4 Others Requirement	58
	3.3.4.1 Software Requirement	58
	3.3.4.2 Hardware Requirement	59
	3.3.4.3 Network Requirement	60
	3.4 Conclusion	61
<b>CHAPTER IV</b>	<b>DESIGN</b>	
	4.1 Introduction	62
	4.2 High-Level Design	63
	4.2.1 System Architecture	63
	4.2.2 Sequence Diagram	64

4.2.3 User Interface Design	68
4.2.3.1 Navigation Design	68
4.2.3.2 Input Design	70
4.2.4 Database Design	80
4.2.4.1 Conceptual and Logical Database Design	80
4.3 Detailed Design	81
4.3.1 Software Design	81
4.3.2 Physical Database Design	81
4.4 Conclusion	82
<b>CHAPTER V</b>	<b>IMPLEMENTATION</b>
5.1 Introduction	83
5.2 Software Development Environment Setup	84
5.3 Software Configuration Management	85
5.3.1 Configuration Environment Setup	85
5.3.1.1 AppServ Configuration	85
5.3.1.2 Ozeki SMS Gateway Configuration	86
5.3.1.3 MySQL Connector Configuration	88
5.3.2 Version Control Procedure	89
5.4 Other Configurations Management	90
5.4.1 Hardware Configuration Environment Setup	91

5.4.2 Security Configuration	91
Environment Setup	
5.4.3 Network Configuration	92
Environment Setup	
5.5 Implementation Status	92
5.6 Conclusion	94
<b>CHAPTER VI TESTING</b>	
6.1 Introduction	95
6.2 Test Plan	95
6.2.1 Test Organization	96
6.2.2 Test Environment	96
6.2.3 Test Schedule	97
6.3 Test Strategy	98
6.3.1 Classes of tests	98
6.3.1.1 Unit Testing	98
6.3.1.2 Functionality Testing	99
6.3.1.3 User Acceptance Testing	99
6.3.1.4 Static and dynamic Analysis	99
6.4 Test Design	100
6.4.1 Test Description	100
6.4.2 Test Data	103
6.5 Test Results and Analysis	105
6.5.1 Login Module	105

6.5.2 Broadcast Message Module	105
6.5.3 Lecturer Module	106
6.5.4 System Module	106
6.6 Conclusion	106
<b>CHAPTER VII PROJECT CONCLUSION</b>	
7.1 Observation on Weaknesses and Strengths	108
7.1.1 Strengths	108
7.1.2 Weaknesses	109
7.2 Propositions for Improvement	109
7.3 Contribution	110
7.4 Conclusion	111
References	112
Bibliography	114
Appendix A - Grantt Chart	115
Appendix B - Entity Relationship Diagram(ERD)	116
Appendix C - Data Dictionary	117
Appendix D - Software Design	126
Appendix E - Physical Database Design	134
Appendix F - Questionnaire	137
Appendix G – User Manual	142

## LIST OF TABLES

<b>TABLE</b>	<b>TITLE</b>	<b>PAGE</b>
2.1	Comparison of Cases Studies	13
2.2	Comparison of Methodologies	18
2.3	Comparison of Databases	20
2.4	Categories of Bloom's Taxonomy	25
2.5	Comparison of Web Servers	27
2.6	Duration of Each Activity	33
2.7	Project Schedule For PSM I	33
2.8	Project Schedule For PSM II	34
3.1	Data Dictionary for Inbox Table	47
3.2	Data Dictionary for User Table	47
3.3	Data Dictionary for Subject Table	48
3.4	Data Dictionary for Lecturer_Subject Table	49
3.5	Data Dictionary for Exam Table	49
3.6	Data Dictionary for Question Table	50



<b>3.7</b>	<b>Data Dictionary for Exam _Question Table</b>	<b>52</b>
<b>3.8</b>	<b>Data Dictionary for Created _Exam Table</b>	<b>52</b>
<b>3.9</b>	<b>The Table of Bloom's Taxonomy</b>	<b>57</b>
<b>3.10</b>	<b>The Table of Software</b>	<b>58</b>
<b>3.11</b>	<b>The Table of Hardware</b>	<b>59</b>
<b>3.12</b>	<b>The Table of Network Components</b>	<b>61</b>
<b>4.1</b>	<b>Input Design for Login</b>	<b>70</b>
<b>4.2</b>	<b>Input Design for My User Account</b>	<b>71</b>
<b>4.3</b>	<b>Input Design for Add and Update Question</b>	<b>72</b>
<b>4.4</b>	<b>Input Design for Add New User Account</b>	<b>73</b>
<b>4.5</b>	<b>Input Design for Add and Update Course</b>	<b>75</b>
<b>5.1</b>	<b>List of Version Control Procedures Of The</b>	<b>90</b>
<b>5.2</b>	<b>System Implementation status of FTMK</b>	
	<b>Exam Question</b>	<b>92</b>
<b>6.1</b>	<b>Management System via SMS Hardware</b>	
	<b>and software requirement for testing</b>	<b>96</b>
	<b>environment</b>	
<b>6.2</b>	<b>Test Schedule of Exam Question Management</b>	<b>97</b>
	<b>System via SMS</b>	
<b>6.3</b>	<b>Test Description for Login Module</b>	<b>100</b>
<b>6.4</b>	<b>Test Description for Broadcast Message Module</b>	<b>101</b>
<b>6.5</b>	<b>Test Description for Lecturer Module</b>	<b>101</b>

<b>6.6 Test Description for System Admin Module</b>	<b>102</b>
<b>6.7 Test Data for Login</b>	<b>103</b>
<b>6.8 Test Data for Broadcast Message</b>	<b>103</b>
<b>6.9 Test Data for Lecturer Module</b>	<b>104</b>
<b>6.10 Test Data for System Admin Module</b>	<b>104</b>
<b>6.11 Test Result for Login Module</b>	<b>105</b>
<b>6.12 Test Result for Broadcast Message Module</b>	<b>105</b>
<b>6.13 Test Result for Lecturer Module</b>	<b>106</b>
<b>6.14 Test Result for System Admin Module</b>	<b>106</b>

## LIST OF FIGURES

DIAGRAM	TITLE	PAGE
2.1	An screenshot of invigilator view in Internet exam program implemented at Shahed University	11
2.2	An screenshot of students view in Internet exam program implemented at Shahed University	11
2.3	Operations System	12
2.4	Classical Waterfall Model	15
2.5	Iterative Waterfall Model	16
2.6	Prototyping Model	16
2.7	Spiral Model	17
2.8	Graph of market share	22
2.9	Graph of overall satisfaction	24
2.10	Graph of performance	24
2.11	Chosen Methodology - Iterative	29

<b>Waterfall Model</b>	
<b>3.1 The Interface of Claroline</b>	<b>37</b>
<b>3.2 The Interface of eFTMK</b>	<b>38</b>
<b>3.3 The Flow Chart of The Current System</b>	<b>39</b>
<b>3.4 The Interface to Choose The Course In My Course List</b>	<b>40</b>
<b>3.5 The Interface to Create New Course</b>	<b>41</b>
<b>3.6 The Interface to Create New Exercise (a)</b>	<b>41</b>
<b>3.7 The Interface to Create New Exercise (b)</b>	<b>42</b>
<b>3.8 The Interface of Advanced</b>	<b>42</b>
<b>3.9 The Interface to Create New Question</b>	<b>43</b>
<b>3.10 The Interface to Edit Answer</b>	<b>44</b>
<b>3.11 The Interface to Set Marks</b>	<b>44</b>
<b>3.12 The Questions Paper In PDF Format</b>	<b>44</b>
<b>3.13 The Flowchart of Login Module</b>	<b>53</b>
<b>3.14 The Flowchart of Lecturer/Coordinator Module</b>	<b>54</b>
<b>3.15 The Flowchart of Administrator Module</b>	<b>55</b>
<b>3.16 The Use Case of The Systems</b>	<b>56</b>
<b>4.1 Diagram of The System Architecture</b>	<b>64</b>

<b>4.2</b>	<b>Sequence Diagram for Login</b>	<b>64</b>
<b>4.3</b>	<b>Sequence Diagram for Question Management</b>	<b>65</b>
<b>4.4</b>	<b>Sequence Diagram for Quiz Management</b>	<b>66</b>
<b>4.5</b>	<b>Sequence Diagram for Preparation of Midterm Exam Paper</b>	<b>67</b>
<b>4.6</b>	<b>Sequence Diagram for Admin</b>	<b>67</b>
<b>4.7</b>	<b>Navigation Design of The System</b>	<b>69</b>
<b>4.8</b>	<b>Login Page</b>	<b>70</b>
<b>4.9</b>	<b>My User Account Page</b>	<b>71</b>
<b>4.10</b>	<b>Add and Update Question Page</b>	<b>72</b>
<b>4.11</b>	<b>Add New User Account Page (Admin)</b>	<b>73</b>
<b>4.12</b>	<b>Add and Update Course Page (Admin)</b>	<b>74</b>
<b>4.13</b>	<b>My Course List in The Menu Page</b>	<b>76</b>
<b>4.14</b>	<b>Question Page</b>	<b>76</b>
<b>4.15</b>	<b>Quiz Page</b>	<b>77</b>
<b>4.16</b>	<b>Add and Update Quiz Page</b>	<b>77</b>
<b>4.17</b>	<b>Add Question to Quiz Page</b>	<b>78</b>
<b>4.18</b>	<b>Midterm Exam Paper Page (Coordinator)</b>	<b>78</b>
<b>4.19</b>	<b>All User Account Page (Admin)</b>	<b>79</b>
<b>4.20</b>	<b>Course List Page (Admin)</b>	<b>79</b>

<b>4.21 Delete Exam Paper and Password Page (Admin)</b>	<b>80</b>
<b>5.1 Software Development Environment</b>	<b>84</b>
<b>5.2 Successfully Installed AppServ</b>	<b>86</b>
<b>5.3 Configuration of GSM Modem Connection</b>	<b>87</b>
<b>5.4 Configuration of Database User Interface</b>	<b>87</b>
<b>5.5 ODBC Data Source Administrator</b>	<b>88</b>
<b>5.6 Create New Data Source</b>	<b>88</b>
<b>5.7 Add Data Source Name</b>	<b>89</b>
<b>5.8 Hardware Configuration Environment Setup</b>	<b>91</b>
<b>5.9 Network Configuration Environment Setup</b>	<b>92</b>

## LIST OF ABBREVIATIONS

FTMK	-	Faculty of Information and Communication Technology
PHP	-	Hypertext Preprocessor
SMS	-	Short Messaging Services
SKK	-	System and Communications Computer
ICT	-	Information and Communication Technologies
GSM	-	Global System for Mobile Communication
SIM	-	Subscriber Identity Module
USB	-	Universal Serial Bus
VB	-	Visual Basic
SQL	-	Structured Query Language
HTML	-	Hyper Text Markup Language
IT	-	Information Technologies
RAD	-	Rapid Application Development
RDBMS	-	Relational Database Management System
GNU	-	General Public License

ORDBMS	-	Object-Relational Database Management System
ASP	-	Active Server Pages
IIS	-	Internet Information Server
GUI	-	Graphical User Interface
DFD	-	Data Flow Diagram
ERD	-	Entity Relation Diagram
PK	-	Primary Key
FK	-	Foreign Key
OS	-	Operating System
CCS	-	Cascading Style Sheets
CPU	-	Central Processing Unit
RAM	-	Random Access Memory
ISP	-	Internet Service Provider
UML	-	Unified Modeling Language
SDLC	-	Software Development Life Cycle