UUM's Library Reminder System

A thesis submitted to the College of Arts and Sciences in Partial Fulfillment of the requirement for the degree Master of Science
(Information Technology)

.Universiti Utara Malaysia

October 2009

By

Mohammed Ben sharrada Mansour

(801205)

KOLEJ SASTERA DAN SAINS
(College of Arts and Sciences)
Universiti Utara Malaysia

PERAKUAN KERJA KERTAS PROJEK
(Certificate of Project Paper)

Saya, yang bertandatangan, memperakukan bahawa
(I, the undersigned, certify that)

MOHAMMED BEN SHARRADA ABDALLAH
(801205)

calon untuk Ijazah
(candidate for the degree of) **MSc. (Information Technology)**

telah mengemukakan kertas projek yang bertajuk
(has presented his/her project paper of the following title)

UUM'S LIBRARY REMINDER SYSTEM

seperti yang tercatat di muka surat tajuk dan kulit kertas projek
(as it appears on the title page and front cover of project paper)

bahawa kertas projek tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan.
(that the project paper acceptable in form and content, and that a satisfactory knowledge of the field is covered by the project paper).

Nama Penyelia Utama
(Name of Main Supervisor): **DR.KANG ENG THYE**

Tandatangan
(Signature) :

Tarikh
(Date) : 17 November 2009 17 Nov 2009

DR. KANG ENG THYE
Pensyarah Kanan
Bidang Sains Gunaan
Kolej Sastera & Sains
Universiti Utara Malaysia

DR. KANG ENG THYE
Pensyarah Kanan
Bidang Sains Gunaan
Kolej Sastera & Sains
Universiti Utara Malaysia

ACKNOWLEDGMENT

"In the Name of Allah the Most Gracious and Most Merciful"

First and foremost, I am forever indebted and thankful to Allah for his blessings without which the whole would not have been possible.

I will always be especially thankful to my supervisor Dr. Kang Eng Thye, for his guidance, patience and faith in me. He was always positive, supportive and encouraging, he fostered my academic growth by challenging and inspiring me to each deeper, to learn more, to expand my viewpoint, and to think critically. Yet, he allowed me to express my views openly and to disagree even when I was wrong. I would to say thank for the persons who helped me in so many different ways, my Evaluator Mr. Amran Mohammed for given me advices to success my project.

The final and the most important acknowledgment are owed to the source of my light and pleasure to the whose enlightens my life to my parents, to my family in Libya for all their love and support, to my brothers' souls Nasser Ali and Mansour Ben sharrada, to my wife for her patient during MSc period, and to my new porn son Mansour.

My special thanks for my best brother Eshticw Alsghir for everything best he has done for me.

PERMISSION TO USE

In presenting this thesis in partial fulfilment of the requirements for a postgraduate degree from Universiti Utara Malaysia, I agree that the University Library may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purpose may be granted by my supervisor(s) or, in their absence by the Dean of the Graduate School. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Requests for permission to copy or to make other use of materials in this thesis, in whole or in part, should be addressed to

Dean of Graduate School

Universiti Utara Malaysia

06010 UUM Sintok

Kedah Darul Aman.

Abstract

According to the 9th and 10th rules in the Sultanah Bahiyah Library, students are responsible for the returning of books borrowed on/before the due date; fines will be imposed on late return of materials borrowed. The delay of return will also affect the well balanced flow of the books. In order to solve the problem, a UUM's Library reminder system is proposed in this research to remind the students to return books on time. The proposed system will follow the General Methodology of Design Research introduced by Vaishnavi and Kuechler. Following this methodology, the awareness of problem and suggestion is made first, after the development of the system, evaluation is conducted and finally conclusion is made. This system is hoped to make the library's daily operation more efficient and help the students to avoid punishment of delay to return books.

TABLE OF CONTENT

PERMISSION TO USE	i
ABSTRACT	ii
TABLE OF CONTENT	iii
LIST OF TABLES	vi
LIST OF FIGURES	vii

CHAPTER ONE

INTRODUCTION

1.1 Introduction	1
1.2 Problem statement	3
1.3 Research questions	4
1.4 Research objectives	4
1.5 Scope of the study	4
1.6 Time Line	5
1.7 Outline Of The Report	5
1.8 Significance of the study	6
1.9 Summary	6

CHAPTER TWO

LITERATURE REVIEW

2.1 Reminder	8
2.2 The Short Messaging Service (SMS)	9
2.3 Email	11
2.4 Web Application	13
2.5 The Sultan Bahiyah Library	15

2.5.1 Introduction 15

2.5.2 Rules and regulations 16

2.5.3 The solutions to the delayed return of materials in other libraries 16

2.6 Summary 18

CHAPTER THREE

METHODOLOGY

3.1 Design Research Methodology 19

3.1.1 Awareness of Problem 20

3.1.2 Suggestion 21

3.1.2.1 Hardware Requirement 21

3.1.2.2 Software Requirement 22

3.1.2.3 User Requirement 22

3.1.3 Development 22

3.1.4 Evaluation 23

3.1.5 Conclusion 24

3.2 Summary 25

CHAPTER FOUR

SYSTEM ANALYSIS AND DESIGN

4.1 Introduction 26

4.2 List of Requirement 26

4.1.1 Functional Requirement 26

4.1.2 Non Functional Requirement 26

4.3 Use Case Diagram 29

4.4 Use case specification 31

4.5 Sequence Diagram 41

4.5.1 Login 42

4.5.2 Manage booking books 43

4.5.3 Manage Users 44

4.5.4 Control Remainder 45

4.6 Collaboration Diagram 45

4.7 Class diagram 49

4.8 Screen Capture for Database 51

CHAPTER FIVE

FINDING

5.I Explanations of screenshots of the functionalities in this prototype 56

5.1.1 Home page and Administrator account management 57

5.1.2 Booking management 59

5.1.3 Books Management 60

5.1.4 User Management 62

5.1.5 Reminder Control 64

5.2 Results of Usability Testing 68

5.3 Summary 72

CHAPTER SIX

CONCLUSIONS

6.1 Findings 73

6.2 Research Limitation 74

6.3 Recommended Works 74

6.4 Summary 74

REFERENCES 75

APPENDIX

APPENDIX A 79

APPENDIX B 83

APPENDIX C 85

LIST OF TABLES

Table 1.1: Library collection 2

Table 2.1: The rules to deal with late return of books in different libraries 17

Table 4.1: Functional requirement 27

Table 4.2: Non-functional requirement 29

Table 4.3: Use Case Login (UC_01) 31

Table 4.4: Use Case Manage booking book. (UC_02) 33

Table 4.5: Use Case manage users (UC_03) 35

Table 4.6: Use Case Manage books (UC_04) 37

Table 4.7: Use Case Control Reinainder (UC_05) 39

Table 4.8: Use Case Modify Admin Account (UC_06) 40

Table 5.1: Result from the questionnaire 69

LIST OF FIGURES

Figure 2.1: Send SMS from web application 10

Figure 2.2: The operation of SMS technology 11

Figure 2.3: The pathway of email 12

Figure 2.4: Architecture of Web Application 14

Figure 3.1: The General Methodology of Design Research 20

Figure 3.2: Usability Evaluation components 24

Figure 4.1: Use Case Diagram 30

Figure 4.2: Sequence Diagram for login 42

Figure 4.3: Sequence Diagram manage booking books 43

Figure 4.4: Sequence Diagram manage users 44

Figure 4.5: Sequence Diagram Control Remainder 45

Figure 4.6: Collaboration diagram for manage reservation 46

Figure 4.7: Collaboration diagram for manage user 47

Figure 4.8: Collaboration diagram for control remainder 48

Figure 4.9: Class diagram manage class 49

Figure 4.10: Class diagram handle exam 50

Figure 4.11: Class diagram control remainder 50

Figure 4.12 admin table 51

Figure 4.13 booking table 52

Figure 4.14 books table 53

Figure 4.15: Remainder table 54

Figure 4.16: Users table 55

Figure 5.1: Home Page 57

Figure 5.2: Login 58

Figure 5.3: Edit administrator account 58

Figure 5.4: Delete Old Reservations 59

Figure 5.5: Edit Old Reservation 59

Figure 5.6: Reserves New Booking 60

Figure 5.7: Add new book 61

Figure 5.8: Delete Old Book 61

Figure 5.9: Edit Old Books 62

Figure 5.10: Add new user 63

Figure 5.11: Delete user account 63

Figure 5.12: Edit user account 64

Figure 5.13: Reminder control 65

Figure 5.14: Successfully sent reminder information 65

Figure 5.15: Repeat sending 66

Figure 5.16: Edit email 66

Figure 5.17: Edit message 67

Figure 5.18: SMS history 67

Figure 5.19: Graph of the Usability Testing 71

CHAPTER ONE

INTRODUCTION

1.1 Background

The Universiti Utara Malaysia was formally incorporated on 16th February 1984, with the unique mission to provide academic excellence in the areas of business management education, IT and quality management. Faced with this challenging task, the University has, since its inception, ensured that its academic niche areas are focused on such disciplines as management, accountancy, economics, information technology, entrepreneurial development, tourism management, banking and finance, social development, human resources development and international affairs management (The introduction to the library, 2009).

Library plays an important role in the success of university. The university library in UUM which named Sultanah Bahiyah Library is the fist library in Malaysia which was awarded with MS ISO 9002 certification from SIRIM QAS Sdn.Bhd (The introduction to the library, 2009).

University library offers a huge collection and information resources for the benefit of campus community as shown in table 1.1 below. It plays a vital role in providing access to collection, services and facilities to support and enhance research, learning and teaching activities in the university. The library has 301,209 volumes of printed materials, more than 35,000 items of non-printed materials and currently subscribing to more than

The contents of the thesis is for internal user only

References

Abdul Bujang, S.D & Selamat, A.(2008). Verification of Mobile SMS Application with Model Checking Agent. Intelligent Systems Design and Applications, 2008. ISDA '08. Eighth International Conference on Volume 2, 26-28 Nov. 2008 Page(s):217 - 222.IEEE.

Agarwal, R.& Rodhain, F. (2002). Mine or ours: email privacy expectations, employee attitudes, and perceived work environment characteristics.System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference on 7-10 Jan 2002 Page(s):2471 - 2480

Aldrich, F.K. (1997).A case study of NeuroPage: a reminder system for memory-disabled people. Computers in the Service of Mankind: Helping the Disabled (Digest No.: 1997/117), IEE Colloquium on 7 March 1997 Page(s):10/1 - 10/3 .IEEE.

Ayodele, T.; Shikun Zhou &Khusainov, R. (2009).Evolving email clustering method for email grouping: A machine learning approach. Applications of Digital Information and Web Technologies, 2009. ICADIWT '09. Second International Conference on the 4-6 Aug. 2009 Page(s):357 - 362

Baskaran, S. (2009). Content based email classification system by applying conceptual maps Intelligent Agent & Multi-Agent Systems, 2009. IAMA 2009. International Conference on 22-24 July 2009 Page(s):1 - 2

Brown, J.;Shipman, B.&Vetter, R (2007) .SMS: The Short Message Service ComputerVolume 40, Issue 12, Page(s):106 - 110 Digital Object Identifier 10.1109/MC.2007.440.IEEE.

Cavalli, A.; Maag, S. & Morales, G. (2007).Regression and Performance Testing of an e-Learning Web Application: dotLRN. Signal-Image Technologies and Internet-Based System, 2007. SITIS '07. Third International IEEE Conference on 16-18 Dec. 2007 Page(s):369 - 376

Chatzis, N.& Pujol, E. (2008). Email Worm Mitigation by Controlling the Name Server Response Rate. Emerging Security Information, Systems and Technologies, 2008. SECURWARE '08. Second International Conference on 25-31 Aug. 2008 Page(s):139 - 145 Becker.S.A & Berkemeyer.A. (2002). Rapid Application Design and Testing of Web Usability. Feature Article. IEEE.

Conallen, J. (2000). Building web applications with UML. The Addison-Wesley Object Technology Series.

Elbaum, S.; Chilakamarri, K.-R.; Gopal, B. & Rothermel, G. (2005).Helping end-users "engineer" dependable Web applications. IEEE.

Flinders university library. (2009). Retrieved 16 October, 2009 from http://www.flinders.edu.au/library/

Guangli Nie; Lingling Zhang; Xingsen Li & Yong Shi.(2006).Company for Example.Data Mining Workshops, 2006. ICDM Workshops 2006. Sixth IEEE International Conference onDec. 2006 Page(s):843 - 847

Graham, J. (2000). "Knowledgebase Integration with a 24-hour Help Desk." ACM.

Heng Xu; Hock Hai Teo; Hao Wang. (2003). Foundations of SMS commerce success: lessons from SMS messaging and co-opetition.IEEE.

Henry, P & Hui Luo.(2001). Off-the-record email system INFOCOM 2001. Twentieth Annual Joint Conference of the IEEE Computer and Communications Societies. Proceedings. IEEE

Jang, J.; Nepal, S. & Zic, J.(2008).Trusted Email protocol: Dealing with privacy concerns from malicious email intermediaries. Computer and Information Technology, 2008. CIT 2008. 8th IEEE International Conference on 8-11 July 2008 Page(s):402 - 407 Digital Object Identifier 10.1109/CIT.2008.4594709

Kuipers, B.J.; Liu, A.X.; Gautam, A&Gouda, M.G.(2005).Zmail: zero-sum free market control of spam Distributed Computing Systems Workshops, 2005. 25th IEEE International Conference on 6-10 June 2005 Page(s):20 - 26

Library of European University institution. (2009). Retrieved 16 October, 2009 from http://www.eui.eu/Research/Library/AboutTheLibrary/LibraryRules.aspx#sanctions

Li Zhang. (2008).Requirement engineering for Web applications. IEEE.

Lisonek, D.& Drahansky, M(2008). SMS Encryption for Mobile Communication Security Technology, Page(s):198 - 201. IEEE.

Lui, Shijun Li; Zhiyong Peng; Mengchi, I., Extraction and integration information in HTML tables. Computer and Information Technology, 2004. CIT '04. The Fourth International Conference, 2004: p. 315 - 320.

Melbourne Business School Library. (2009). Retrieved 16 October, 2009 from http://mclennan.mbs.edu/library_rules.htm

Ming Zhang & Kibria, M.(1997).Short message service and paging cluster size impact on the DCCH capacity (TIA/EIA/IS-136).Vehicular Technology Conference, 1999 IEEE 49th Volume 3, 16-20 May 1999 Page(s):2154 - 2158 vol.3. IEEE.

Morita.T, Hidaka.T, Tanaka.A & Kato.Y. (2007). System for reminding a user of information obtained through a web browsing experience May 2007 WWW '07: Proceedings of the 16th international conference on World Wide Web. Publisher: ACM

Nijaz, B. (2000). Web-based information access for agile management. International Journal of Agile Management Systems, 2(2), 121 - 129.

NUS Library. (2009). Retrieved 16 October, 2009 from

http://www.lib.nus.edu.sg/guides/rules/rule_b.html.

Phalgune, A. (2004). Testing and Debugging Web Applications: An End-User Perspective. IEEE.

Ramsay, M. & Nielsen, J.. WAP Usability: 2000 All Over Again. Nielsen Norman Group. Retrived May 15, 2007 from http://www.useit.com/alertbox/20001210.html.

Shaizan, H. & Li, F. (2003) Utilizing IGV Approach In Evaluating the Usability of Web Sites, Journal of Information and Communication Technology,2(2), 25-40

Shan.S. (2006) Detecting Web Application Security Vulnerabilities. Orelly books.

Shan, T.C. & Hua, W.W. (2006).Taxonomy of Java Web Application Frameworks. IEEE.

Shanmugam, J.; Ponnavaikko, M.(2007).A solution to block Cross Site Scripting Vulnerabilities based on Service Oriented Architecture. IEEE.

Shahreza, M.S. (2006) .erifyin Spam SMS y Arabic CA C A. Information and Communication Technologies, 2006. ICTTA '06. 2nd.IEEE.

Shirali Shahreza, M.H. & Shirali Shahreza, M.(2008).An Anti-SMS-Spam Using CAPTCHA. Computing, Communication, Control, and Management, 2008. CCCM '08. ISECS International Colloquium on Volume 2, 3-4 Aug. 2008 Page(s):318 - 321.IEEE.

Sonneck, G. & Mueck, T.(2003).Optimization of Web applications by graph transformations. IEEE.

Sukho Lee & Sunyeong Cho.(2000).Digital libraries in Korea. Digital Libraries: Research and Practice, 2000 Kyoto, International Conference on. 13-16 Nov. 2000 Page(s):130 – 135. Digital Object Identifier 10.1109/DLRP.2000.942164.IEEE.

Tallinn University of Technology Library. (2009). Retrieved 16 October, 2009 from http://www.lib.ttu.ee/eng/overview.html

The introduction to the library, Retrieved July 13,2009 , from the official universiti Utara Malaysia website: www.uum.edu.my.

University Utara Malaysia. Academic guide, 2009.

Vaishnavi.V.K & Kuechler.W. (2004). Design Science Research Methods and Patterns. Auerbach Publications. Retreved 31 October from http://books.google.com.my/books?id=sI2Y9Jh8tq8C&pg=PR3&source=gbs_selected_pages&cad=4#v=onepage&q=&f=false

Vilnius Pedagogical University Library. (2009). Retrieved 16 October, 2009 from http://www.vpu.lt/bibl/library/rules_2003_March.html

Voinikonis.A, Irmscher.K & Schulze.H. (2005). Distributed processing of reminding tasks within the mobile memory aid system, MEMOS .Personal and Ubiquitous Computing , Volume 9 Issue 5.Publisher: Springer-Verlag

Web of Clickatell.(2009). Retrieved 21 October from http://www.clickatell.com/index2.php

Wen Guihua; Haoying; Ding Yuehua & Zhang Yu. (2000). An integrated creative reminding algorithm.Systems, Man, and Cybernetics, 2000 IEEE International Conference on Volume 1, 8-11 Oct. 2000 Page(s):641 - 644 vol.1. Digital Object Identifier 10.1109/ICSMC.2000.885067.IEEE.

Whitehead.C.C. (2006). Evaluating Web Page and Web Site Usability. Copyright 2006 1-59593-315-8/06/0004. ACM .

Wijetunge, S.; Wijesinghe, P. & Gunawardana, U.(2008).Social Impact of SMS in Sri Lanka. Information and Automation for Sustainability, 2008. ICIAFS 2008. 4th International Conference on 12-14 Dec. 2008 Page(s):346 - 350.IEEE.

Xiao-Lin Wang & Cloete, I. (2005). Learning to classify email: a survey Machine Learning and Cybernetics, 2005. Proceedings of 2005 International Conference on Volume 9, 18-21 Aug. 2005 Page(s):5716 - 5719 Vol. 9

Yiru Li & Somayaji, A.(2005). Securing email archives through user modeling.Computer Security Applications Conference, 21st Annual 5-9 Dec. 2005 Page(s):10 pp. - 556

Zou, C.C.; Towsley, D.& Weibo Gong. (2004). Email worm modeling and defense. Computer Communications and Networks, 2004. ICCCN 2004. Proceedings. 13th International Conference on 11-13 Oct. 2004 Page(s):409 - 414 Digital Object Identifier 10.1109/ICCCN.2004.1401687