e-STUDENT RESIDENTIAL HALL MANAGEMENT MODEL

(eSRHMM)

YAHIA ALI MUSSE

UNIVERSITI UTARA MALAYSIA

TK

A THESIS SUBMITTED TO THE FACULTY OF ARTS AND SCIENCES IN PARTIAL FULFILLMENT OF THE REQUIEREMENTS FOR THE DEGREE OF MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

UNIVERSITI UTARA MALAYSIA

YAHIA ALI MUSSE

All rights reserved © 2010

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)

YAHIA ALI MUSSE
(804899)

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)

e-STUDENTS RESIDENTIAL HALLS MANAGEMENT MODEL (e-SRHMM)

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. HASLINA MOHD**

Tandatangan
(Signature) :

Tarikh
(Date) : 11.05.2010

PERMISSION TO USE

In presenting this thesis as a partial fulfillment 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 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. Request 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

Malaysia.

ABSTRACT

A key factor which makes Web Based Applications (WBA) highly recommended over stand alone system is centralized mechanism used in those applications. Students' Residential Hall managements in Universiti Utara Malaysia (UUM) use variety of systems which are mostly mixture of WBA and some manual procedures. This study would try to enhance the process of the current management procedures by converting it entirely into a WBA which would solve some of the critical issues which are not supported by the current system. The proposed system would adopt Extreme Programming (XP) and Rational Unified Process (RUP) methodology in order to fulfill its objectives.

ACKNOWLEDGEMENT

Alhamdu Lillah rab al-alamiin wa asalat wa asalam ala'a ashraf khalq Allah Muhamad bin Abdullah peace and blessings be upon him. Finally it is the end of my Master of Science in Information Technology which I have been going through for the last 4 months. I have experienced lots of things while working on the project of e-SRHMM which is completed as scheduled.

I would like to express my deepest sense of gratitude to my parents who pushed me through and helped me in every way possible to continue my postgraduate studies. I am thankful to my beloved wife for giving me her moral support, and spiritual uplifting.

I am really thankful to my supervisor Dr. Haslina Mohd, my evaluator Mr. Mohd Amir for their valuable suggestions, ideas, and help. I would like to thank Assoc. Prof. Dr. Norshuhada Binti Shiratuddin for her advice and guidance while taking her Research Mcthodology class. I am also thankful to all my fricnds who wcrc my support.

I would like to whisper into my forth coming baby boy/girl and say "*My dearest, this work is dedicated to you. Hope you read this document someday, may Allah bless you*".

THANK YOU ALL

TABLE OF CONTENT

PERMISSION TO USE I

ABSTRACT II

ACKNOWLEDGEMENT III

TABLE OF CONTENT IV

LIST OF TABLES VII

LIST OF FIGURES VIII

1. INTRODUCTION 10

1.1. BACKGROUND 10
1.2. PROBLEM STATEMENT 11
1.3. RESEARCH QUESTION 11
1.4. RESEARCH OBJECTIVE 11
1.5. RESEARCH SCOPE 11
1.6. RESEARCH SIGNIFICANT 12
1.7. SUMMARY 12

2. LITERATURE REVIEW 13

2.1. INTRODUCTION 13
2.2. WEB-BASED TECHNOLOGY 13
2.2.1. Preview of the Internet 13
2.2.2. Web-Based Application 14
2.2.3. Advantages of Web-Based Applications 14
2.2.4. Web-Based Application Categories 17
2.3. RELATED WORK 18
2.3.1. Internet Hotel Reservations 18
2.3.2. Overview of Students Residential Hall Management Systems 18
2.3.2.1. Initio for Colleges / Universities, Hostel Management Model 19
2.3.2.2. Orélll Hostel Supervisor (OHS) 20
2.3.3. Other Related Work 22
2.4. SUMMARY 23

3. RESEARCH METHODOLOGY 24

3.1. INTRODUCTION 24
3.2. STAKEHOLDER INTERVIEW 24
3.3. RATIONAL UNIFIED PROCESS 25
3.4. EXTREME PROGRAMMING 28
3.5. SUMMARY 29

4. ANALYSIS, DESIGN AND FINDINGS 30

4.1. INTRODUCTION 30
4.2. REQUIREMENTS ANALYSIS 30
4.3. SYSTEM DESIGN 35
4.3.1. USE CASE SPECIFICATION 35
4.3.1.1. Use Case: Login (REQ_1000) 36

4.3.1.2. Use Case: Manage Forum (REQ_2000) 37
4.3.1.3. Use Case: Manage Bulletin Board (REQ_3000) 38
4.3.1.4. Use Case: Manage Reports (REQ_4000) 40
4.3.1.5. Use Case: Register Student (REQ_5000) 41
4.3.1.6. Use Case: Manage Profile (REQ_6000) 42
4.3.1.7. Use Case: Manage Check in/out (REQ_7000) 44
4.3.1.8. Use Case: Auto Reminder (REQ_8000) 45
4.3.1.9. Use Case: Manage Room (REQ_9000) 46
4.3.2. ACTIVITY DIAGRAMS 49
4.3.2.1. Login Activity 49
4.3.2.2. Manage Forum Activity 50
4.3.2.3. Manage Bulletin Board Activity 51
4.3.2.4. Manage Report Activity 52
4.3.2.5. Register Student Activity 53
4.3.2.6. Manage Profile Activity 54
4.3.2.7. Manage Check in/out Activity 55
4.3.2.8. Auto Reminder Activity 56
4.3.2.9. Manage Room Activity 57
4.3.3. SEQUENCE DIAGRAMS 58
4.3.3.1. Login Sequence 58
4.3.3.2. Manage Forum Sequence 59
4.3.3.3. Manage Bulletin Board Sequence 61
4.3.3.4. Manage Report Sequence 63
4.3.3.5. Register Student Sequence 65
4.3.3.6. Manage Profile Sequence 66
4.3.3.7. Manage Check in/out Sequence 67
4.3.3.8. Auto Reminder Sequence 68
4.3.3.9. Manage Room Sequence 69
4.3.4. COLLABORATION DIAGRAMS 70
4.3.4.1. Login Collaboration 70
4.3.4.2. Manage Forum Collaboration 71
4.3.4.3. Manage Bulletin Board Collaboration 73
4.3.4.4. Manage Report Collaboration 75
4.3.4.5. Register Student Collaboration 77
4.3.4.6. Manage Profile Collaboration 78
4.3.4.7. Manage Check in/out Collaboration 79
4.3.4.8. Auto Reminder Collaboration 80
4.3.4.9. Manage Room Collaboration 81
4.3.5. CLASS DIAGRAM 82
4.3.6. SNAPSHOTS 82
4.4. SUMMARY 82
5. EVALUATION AND TESTING 83
6.1. INTRODUCTION 83
6.2. EVALUATION TECHNIQUES 83
6.3. ACCEPTANCE TESTING 83
6.4. SUMMARY 85
7. CONCLUSION 86
CONCLUSION 86
8.1. INTRODUCTION 86

8.2. CONCLUSION OF THE STUDY 86
8.3. LIMITATIONS AND CONSTRAINTS 87
8.3.1. TIME FACTOR 87
8.3.2. CLIENT RESPONSE 87
8.4. RECOMMENDATION(S) 87
9. REFERENCES 88
10. APPENDICES 89
10.1. APPENDIX A: INSTALLATION GUIDELINES 89
10.2. APPENDIX B: USER MANUAL 100

LIST OF TABLES

TABLE 1: WEB APPLICATION CATEGORIES 17
TABLE 2: COMPARISON BETWEEN E-SRHMM, ORELL, AND CREATIVE-ERAS 21
TABLE 3: LIST OF FUNCTIONAL REQUIREMENTS 33
TABLE 4: LIST OF NON-FUNCTIONAL REQUIREMENTS 34
TABLE 5: FUNCTIONAL TESTING 85

LIST OF FIGURES

FIGURE 1: RUP WITH STAKEHOLDER INTERVIEW AND XP METHODOLOGY 25
FIGURE 2: MAIN USE CASE DIAGRAM 35
FIGURE 3: LOGIN USE CASE 36
FIGURE 4: MANAGE FORUM USE CASE 37
FIGURE 5: MANAGE BULLETIN BOARD USE CASE 38
FIGURE 6: MANAGE REPORTS USE CASE 40
FIGURE 7: REGISTER STUDENT USE CASE 41
FIGURE 8: MANAGE PROFILE USE CASE 42
FIGURE 9: MANAGE CHECK IN/OUT USE CASE 44
FIGURE 10: AUTO REMINDER USE CASE 45
FIGURE 11: MANAGE ROOM USE CASE 46
FIGURE 12: LOGIN ACTIVITY DIAGRAM 49
FIGURE 13: MANAGE FORUM ACTIVITY DIAGRAM 50
FIGURE 14: MANAGE BULLETIN ACTIVITY DIAGRAM 51
FIGURE 15: MANAGE REPORT ACTIVITY DIAGRAM 52
FIGURE 16: REGISTER STUDENT ACTIVITY DIAGRAM 53
FIGURE 17: MANAGE PROFILE ACTIVITY DIAGRAM 54
FIGURE 18: MANAGE CHECK IN/OUT ACTIVITY DIAGRAM 55
FIGURE 19: AUTO REMINDER ACTIVITY DIAGRAM 56
FIGURE 20: MANAGE ROOM ACTIVITY DIAGRAM 57
FIGURE 21: LOGIN SEQUENCE DIAGRAM 58
FIGURE 22: MANAGE FORUM (NEW) SEQUENCE DIAGRAM 59
FIGURE 23: MANAGE FORUM (VIEW) SEQUENCE DIAGRAM 59
FIGURE 24: MANAGE FORUM (DELETE) SEQUENCE DIAGRAM 60
FIGURE 25: MANAGE BULLETIN (NEW) SEQUENCE DIAGRAM 61
FIGURE 26: MANAGE BULLETIN (VIEW) SEQUENCE DIAGRAM 61
FIGURE 27: MANAGE BULLETIN (DELETE) SEQUENCE DIAGRAM 62
FIGURE 28: MANAGE REPORT (BIO DATA) SEQUENCE DIAGRAM 63
FIGURE 29: MANAGE REPORT (MAINTENANCE) SEQUENCE DIAGRAM 63
FIGURE 30: MANAGE REPORT (STATISTICAL) SEQUENCE DIAGRAM 64
FIGURE 31: REGISTER STUDENT (STUDENT) SEQUENCE DIAGRAM 65
FIGURE 32: REGISTER STUDENT (STAFF) SEQUENCE DIAGRAM 65
FIGURE 33: MANAGE PROFILE (ADMIN) SEQUENCE DIAGRAM 66
FIGURE 34: MANAGE PROFILE (STAFF/STUDENT) SEQUENCE DIAGRAM 66
FIGURE 35: MANAGE CHECK IN/OUT (STUDENT) SEQUENCE DIAGRAM 67
FIGURE 36: MANAGE CHECK IN/OUT (STUDENT) SEQUENCE DIAGRAM 67
FIGURE 37: AUTO REMINDER (STUDENT) SEQUENCE DIAGRAM 68
FIGURE 38: AUTO REMINDER (STAFF) SEQUENCE DIAGRAM 68
FIGURE 39: MANAGE ROOM SEQUENCE DIAGRAM 69
FIGURE 40: LOGIN COLLABORATION DIAGRAM 70
FIGURE 41: MANAGE FORUM (NEW) COLLABORATION DIAGRAM 71

FIGURE 42: MANAGE FORUM (VIEW) COLLABORATION DIAGRAM 71
FIGURE 43: MANAGE FORUM (DELETE) COLLABORATION DIAGRAM 72
FIGURE 44: MANAGE BULLETIN (NEW) COLLABORATION DIAGRAM 73
FIGURE 45: MANAGE BULLETIN (VIEW) COLLABORATION DIAGRAM 73
FIGURE 46: MANAGE BULLETIN (DELETE) COLLABORATION DIAGRAM 74
FIGURE 47: MANAGE REPORT (BIO DATA) COLLABORATION DIAGRAM 75
FIGURE 48: MANAGE REPORT (MAINTENANCE) COLLABORATION DIAGRAM 75
FIGURE 49: MANAGE REPORT (STATISTICAL) COLLABORATION DIAGRAM 76
FIGURE 50: REGISTER STUDENT (STUDENT) COLLABORATION DIAGRAM 77
FIGURE 51: REGISTER STUDENT (STAFF) COLLABORATION DIAGRAM 77
FIGURE 52: MANAGE PROFILE (ADMIN) COLLABORATION DIAGRAM 78
FIGURE 53: MANAGE PROFILE (STAFF/STUDENT) COLLABORATION DIAGRAM 78
FIGURE 54: MANAGE CHECK IN/OUT (STUDENT) COLLABORATION DIAGRAM 79
FIGURE 55: MANAGE CHECK IN/OUT (STAFF) COLLABORATION DIAGRAM 79
FIGURE 56: AUTO REMINDER (STUDENT) COLLABORATION DIAGRAM 80
FIGURE 57: AUTO REMINDER (STAFF) COLLABORATION DIAGRAM 80
FIGURE 58: AUTO REMINDER (STAFF) COLLABORATION DIAGRAM 81
FIGURE 59: CLASS DIAGRAM 82

CHAPTER ONE
INTRODUCTION

1.1. BACKGROUND

Universiti Utara Malaysia UUM, in English Northern University of Malaysia, is public university which is located in a small town called Sintok, Kedah State. The university was officially established on February 16th, 1984. The university mission was to play leadership role in developing the country by providing high quality management education in the country. On top of that the university has offered other excellent educational areas which are represented as three colleges which are; College of Business (COB), College of Arts and Sciences (CAS), and College of Law, Government and International Studies (COLGIS).

The main buildings in the campus include the academic buildings, the Chancellery, Sultanah Bahiyah Library, Mu'adzam Shah Hall, and Tan Sri Othman Hall. Other buildings include the Sultan Badlishah Mosque, Varsity Mall, Student Union, and Sports Complex. The University also provides 600 units of various types of housing for its staff.

UUM provides accommodation for almost 22,000 of its students in 15 student residential halls including an especially designated student hall for married students. Many of these residential halls are named after multinational companies; namely MAS, TENAGA NATIONAL, TM, PROTON, PETRONAS, TRADEWINDS, EON, SIME DARBY, MISC, PERWAJA, MAYBANK, BANK MUAMALAT, YAYASAN AL-BUKHARY, BANK RAKYAT, and SME BANK. UUM is one of the very few public institutions that offer accommodation to its students throughout their academic years at the University

The contents of the thesis is for internal user only

9. REFERENCES

Ambler, S. (2002). Agile Modeling: *Effective Practices for Extreme Programming and the Unified Process* (1st ed.) New York: Wiley & Sons.

Blanchard, B. S., & Fabrycky, W. J.(2006). *Systems engineering and analysis* (4th ed.) New Jersey: Prentice Hall.

Conallen, J.(2003*). Building Web Applications with UML*, (Second Edition), Addison Wesley.

Connolly, T., & Begg, C.(2005). *Database Systems*, (2nd Edition), Addison Wesley.

Dickerson, T. (1989). *Travel law.* New York: Law Journal Seminars-Press.

Graham, P. (2001). *The Other Road Ahead.* Retrieved from http://www.paulgraham.com/road.html

Kling, A. (1994). *The economic consequences of the World Wide Web.* Paper presented at the second World Wide Web Conference: Mosaic and the Web, Geneva, Switzerland

Konick, K, Hyzny, L, & Allegra, R. (2003). *Electronic reserve: the promise and challenge to increase accessibility.* Library Hi Tech, 21 (1).

Kruchten, P.(2004). *The Rational Unified Process*: *An introduction* (3rd cd.),Addison Wesley.

McConnell, J, & Rutherford P. (1990). *Hotel Reservations: The guest contract.* Cornell Hotel and Restaurant Administration Quarterly 30 (4)

Post, G., & Anderson, D.(2006). *Management information systems*: *Solving business problems with information technology.* (4th ed.). New York: McGraw-Hill Irwin.

Roper,M. (1994) *Software Testing*. New York: McGraw-Hillrwin

Smith, J.(n.d.). *In Street Directory*. Retrieved from http://www.streetdirectory.com

Schwalbe, K. (2005). *Information technology project management.* (4th ed.). New York: Thomson.

WikiAnswers. (n.d.) In *Wiki Answers*. Retrieved from http://wiki.answers.com/Q/What_is_web_application_software

Wilson, R (2000). *The law of cyberspace: Personal jurisdiction and the internet.* Cornell Hotel and Restaurant Administration Quarterly 41 (5)

Wilson, R (2007). *Internet Hotel Reservations: The "Terms and Conditions" Trap.* Cornell Hotel and Restaurant Administration Quarterly 48 (4)