# **Academic Exam Reminder Information System**

For Information Technology Master Student in UUM

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

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Ву

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

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### Abstract

The master students need to take final examinations almost every subject. The time, venue and date of the exams are decided by the Academic Affair Department in Higher Education Academy (HEA). Students need to get the information of the exams from the lecturers; this action troubled lecturers a lot. Then the students need to remember the information by themselves, wait to the date of exams and go there without any reminder. Once a student miss the exam, he is likely to fail the subject and need to retake it in next semester, all the effort he made in this semester will be useless, everything need to start from zero in the next semester. In order to avoid this case which will waste the lecturers' and students' time and effort, a prototype to remind the students to take their own exams on time is very necessary, this prototype is hoped to solve the miss of the exams.

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### CHAPTER ONE

### INTRODUCTION

### 1.1 Background

There are 25,301 full time students in University Utara Malaysia, among all of them, 3172 are Master students (University Utara Malaysia Figure and Facts, 2008). All the master students are distributed in 13 faculties: Faculty of Accountancy, Faculty of Business Management, Faculty of Cognitive Sciences and Education, Faculty of Communication and Modern Languages, Faculty of Economics, Faculty of Finance and Banking, Faculty of Human and Social Development, Applied Sciences division, Faculty of International Studies, Faculty of Public Management and Law, Faculty of Quantitative Sciences, Faculty of Technology Management, and Faculty of Tourism and Hospitality Management. Among all these faculties, the Applied Sciences division was launched in September 2003 (Postgraduate Academic Handbook, 2007).

In UUM, the exams are managed by the Academic Affairs Department; it provides services throughout four departments: Senate and Corporate Management, Admission and Registration, Academic Liaison, Examination and Degree Conferment. The examination and Degree Conferment department in charges of making the time table of

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### REFERENCE

Academic Guide. (2008). Universiti Utara Malaysia Academic Guide.

- Ardakan.M.A & Mohajeri.K. (2009). Applying design methodology to IT performance: Forming a new solution. Asian network for Scientific information. Journal of applied science: 9 (7): 1227-1237.
- Asvial, M.; Sirat, D. & Susatyo, B.(2008)Design and analysis of anti spamming SMS to prevent criminal deception and billing froud: Case Telkom Flexi. Management of Innovation and Technology, 2008. ICMIT 2008. 4th IEEE International Conference on 21-24 Sept. 2008 Page(s):928 933.IEEE.
- Balzarotti, D.; Cova, M.; Felmetsger, V.; Jovanovic, N.; Kirda, E.; Kruegel, C & Vigna, G. (2008).Saner: Composing Static and Dynamic Analysis to Validate Sanitization in Web Applications. Security and Privacy, 2008. SP 2008. IEEE Symposium on 18-22 May 2008 Page(s):387 401
- Colafigli, C., P. Inverardi, R. & Matricciani. (2001). InfoParco: An Experience in Designing an Information System Accessible through WEB and WAP Interfaces. Proceedings of the 34th Annual Hawaii International Conference on System Sciences (HICSS-34). IEEE
- Dettmer, R.(1997).Short message gets longer [GSM] IEE Review Volume 43, Issue 3, 15 May 1997 Page(s):104.IEEE.
- Fitri. (2009). officer in UUM HEA.
- Hai Zhuge; Weiyu Guo; Xiang Li & Lianhong Ding. (2005). Knowledge Energy in Knowledge Flow Networks Semantics, Knowledge and Grid, 2005. SKG '05. First International Conference on 27-29 Nov. 2005 Page(s):3 3. Digital Object Identifier 10.1109/SKG.2005.86. IEEE.

- Halfond, W.G.J.; Orso, A. & Manolios, P. (2008). WASP: Protecting Web Applications Using Positive Tainting and Syntax-Aware Evaluation. Software Engineering, IEEE Transactions on Volume 34, Issue 1, Jan.-Feb. 2008 Page(s):65 81
- Hao Han & Tokuda, T. (2008). A Method for Integration of Web Applications Based on Information Extraction. Web Engineering, 2008. ICWE '08. Eighth International Conference on 14-18 July 2008 Page(s):189 195
- Hassan, A.E & Holt, R.C. (2001). Towards a better understanding of Web applications.
   Web Site Evolution, 2001. Proceedings. 3rd International Workshop on 10 Nov.
   2001 Page(s):112 116
- Hassan, A.E. & Holt, R.C. (2002). Architecture recovery of Web applications. IEEE.
- Hossain, A.; Jahan, S.; Hussain, M.M.; Amin, M.R. & Shah Newaz, S.H.(2008). A proposal for enhancing the security system of short message service in GSM Anti-counterfeiting, Security and Identification, 2008. ASID 2008. 2nd International Conference on 20-23 Aug. 2008 Page(s):235 240.IEEE.
- Kaewkasi, C. & Rivepiboon, W. (2002).WWM: a practical methodology for Web application modeling. Computer Software and Applications Conference, 2002.
   COMPSAC 2002. Proceedings. 26th Annual International 26-29 Aug. 2002.
   Page(s):603 608
- Ki.Hyuk Nam; Ki-Scok Bang & Wan Choi. (2008). A Method for Distributing Web Applications. IEEE.
- Krishnamurthy, N.(2002). Using SMS to deliver location-based services. Personal Wireless Communications, 2002 IEEE International Conference on 15-17 Dec. 2002 Page(s):177 181 .IEEE.
- Kuechler .W. Vaishnavi. V. K., Petter. S. (2005). The Aggregate General Design Cycle as a Perspective on the Evolution of Computing Communities of Interest. Brill Academic Publishers Computing Letters(CoLe) P.O. Box 9000, 2300 PA Leiden, The Netherlandsvol. 1, no. 3, 2005, pp. 123-128.

- Kuei-Kuei Lai; Shu-Min Chang; Shann-Bin Chang. (2007). Using Patent Citation to Explore Knowledge Flow between Different Industries. Management of Engineering and Technology, Portland International Center for 5-9 Aug. 2007 Page(s): 1777 1783. Digital Object Identifier 10.1109/PICMET.2007.4349503. IEEE.
- Kwihoon Kim; Jinsul Kim; Hyun-Woo Lee& Won Ryu.(2006).Method for transmitting SMS for VoIP service supporting Multi-protocol. Consumer Electronics, 2006. ISCE '06. 2006 IEEE Tenth International Symposium on 0-0 0 Page(s):1 5.IEEE.
- Kyu Chul Lee& Hong Hyup Lee.(2007). SMS Transmission Mechanisms for Multi-Protocols on VoIP. Advanced Communication Technology, The 9th International Conference on Volume 3, 12-14 Feb. 2007 Page(s):1697 - 1701 .IEEE.
- Jingxian Gu, Lei Xu, Baowen Xu & Hongji Yang. (2008). An Extended MM-Path Approach to Component-based Web Application Testing. IEEE.
- Lim Tai Ching& Garg, H.K.(2002). Designing SMS applications for public transport service system in Singapore. Communication Systems, 2002. ICCS 2002. The 8th International Conference on Volume 2, 25-28 Nov. 2002 Page(s):706 710 vol.2. IEEE.
- Li Jin-hua. (2007).Relation between Network Structure and Knowledge Flow: A Perspective of Complex Networks Theory. Management Science and Engineering, 2007. ICMSE 2007. International Conference on 20-22 Aug. 2007 Page(s):1572 1577. Digital Object Identifier 10.1109/ICMSE.2007.4422067. IEEE.
- Loch.C.H, Terwiesch.C & Thomke.S. (2001). Parallel and Sequential Testing of Design Alternatives. Management Science, Vol. 47, No. 5, pp. 663-678. Published by: INFORMS.
- Nissen, M.E.& Levitt, R.E. (2004). Agent-based modeling of knowledge flows: illustration from the domain of information systems design. System Sciences, 2004. Proceedings of the 37th Annual Hawaii International Conference on 5-8 Jan. 2004 Page(s):8 pp. Digital Object Identifier 10.1109/HICSS.2004.1265599. IEEE.

- Offutt, J.; Wu, Ye.; Du, X & Huang, H. (2004). Bypass testing of Web applications. Software Reliability Engineering, 2004. ISSRE 2004. 15th International Symposium on 2-5 Nov. 2004 Page(s):187 197
- Prieto, A.G.; Čosenza, R. & Stadler, R.(2004). Policy-based congestion management for an SMS gateway. IEEE.

Postgraduate Academic Handbook. (2007).

- Qindong Sun; Hongli Qiao & Nan Wang.(2009). Analysis and Computing of Association Degree of SMS Feature Words Networking and Services, 2009. ICNS '09. Fifth International Conference on 20-25 April 2009 Page(s):338 341. IEEE.
- Questionpro. (2009). Survey Sample Sizes: How many respondents do you really need? Retrieved November 11, 2009 from http://blog.questionpro.com/2009/09/25/survey-sample-sizes-how-many-respondents-do-you-really-need/
- Rajan, S.P.; Tkachuk, O.; Prasad, M.; Ghosh, I.; Goel, N. & Uehara, T. (2009).WEAVE: WEb Applications Validation Environment. IEEE.
- Ramsay, M & Nielsen, J. (2000). WAP Usability: All Over Again. Nielsen Norman Group. Retrieved November 10, 2009 from http://www.useit.com/alertbox/20001210.html.
- Rysavy.O & Bures.F.K. (2004). Formal Abstract Architecture for Use Case Specifications. Proceedings of the 11th IEEE International Conference and Workshop on the Engineering of Computer-Based Systems (ECBS'04).
- Seung Hak Kuk & Hyeon Soo Kim. (2008). Automatic Generation of Testing Environments for Web Applications . IEEE.

- Shanmugam, J.; Ponnavaikko, M.(2007). A solution to block Cross Site Scripting Vulnerabilities based on Service Oriented Architecture. IEEE.
- 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
- Storey.V.C & Goldstein.R.C. (1993). Knowledge-Based Approaches to Database Design. MIS Quarterly, Vol. 17, No. 1 (Mar., 1993), pp. 25-46. Published by: Management Information Systems Research Center, University of Minnesota.
- Svendsen, G.B.; Evjemo, B. & Johnsen, J.A.K.(2006). Use of SMS in Office Environments System Sciences, 2006. HICSS '06. Proceedings of the 39th Annual Hawaii International Conference on Volume 3, 04-07 Jan. 2006 Page(s):57b 57b.IEEE.
- Soaresa.A & Fonseca.F. (2007). Ontology-driven information systems: at development time. International Journal of Computers, Systems and Signals, Vol.8, No2, 2007. Category: Research articles, Publisher: IAAMSAD.
- Toorani, M. & Beheshti Shirazi, A.A.(2008). SSMS A secure SMS messaging protocol for the m-payment systems. Computers and Communications, 2008. ISCC 2008. IEEE Symposium on 6-9 July 2008 Page(s):700 705.IEEE.
- Universiti Utara Malaysia Figures and facts. (2008). Retrieved August 23, 2009 from http://www.uum.edu.my
- UUM official website. (2009). Retrieved August 23, 2009 from http://www.uum.edu.my
- Vaishnavi & Kuechler. (2004). Design research in information system. Retrieved November 15, 2009, From Http://www.lsworld.Org/Researchdesign/Drisisworld.Htm

- Whitehead.C.C. (2006). Evaluating Web Page and Web Site Usability. Copyright 2006 1-59593-315-8/06/0004. ACM.
- Wang Xianbin; Liu Rui & Wang Weijun. (2009). Knowledge Management Sytem based on Knowledge Flow in Web2.0 Environment. IT in Medicine & Education, 2009.
   ITIME '09. IEEE International Symposium on Volume 1, 14-16 Aug. 2009.
   Page(s):372 377. Digital Object Identifier 10.1109/ITIME.2009.5236395. IEEE.
- Weidong Zhao &Weihui Dai. (2008).Integrated Modeling of Business Processes and Knowledge Flow Based on RAD. Knowledge Acquisition and Modeling, 2008. KAM '08. International Symposium on 21-22 Dec. 2008 Page(s):49 53. Digital Object Identifier 10.1109/KAM.2008.42. IEEE.
- 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.
- Xiangfeng Luo; Zhian Yu. (2007). Building Knowledge Flow of Textual Topics for the e-Science Knowledge Grid. Grid and Cooperative Computing, 2007. GCC 2007. Sixth International Conference on 16-18 Aug. 2007 Page(s):693 700. Digital Object Identifier 10.1109/GCC.2007.53. IEEE.
- Young-Gul Kim; Sung-Byung Yang; Yong-Sauk Hau; Jeong-Su Seo; Ghi-Hoon Ghim. (2009). Identifying Organizational Knowledge Paths through Social Network Lens: Synthesis of Multi-Industry Case Studies. System Sciences, 2009. HICSS '09, 42nd Hawaii International Conference on 5-8 Jan. 2009 Page(s):1 10 Digital Object Identifier 10.1109/HICSS.2009.242. IEEE.
- Zhang Hui; Zhang Zhen& Zhu Junwu.(2008). SI4WAC: A Semantic-Based Infrastructure for Web Application Cooperation. IEEE.
- Zhaoli Zhang; Zongkai Yang; Qingtang Liu. (2008). Modeling Knowledge Flow Using Petri Net. Knowledge Acquisition and Modeling, 2008. KAM '08. International Symposium on 21-22 Dec. 2008 Page(s):142 146. Digital Object Identifier 10.1109/KAM.2008.168. IEEE.

Zhang Wu-yi; Li Xiao-liang; Deng Yun-long; Hua Lian-lian. (2009). The Evaluation and Research of Knowledge Flow in Supply Chain Based on Fuzzy Comprehensive Analysis. Intelligent Information Technology and Security Informatics, 2009. IITSI '09. Second International Symposium on 23-25 Jan. 2009 Page(s):81 - 86.Digital Object Identifier 10.1109/IITSI.2009.25. IEEE.