

On-line Programming Course Registration System (OPCRS)

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By

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Abstract

Abstract

Recently, we noted that the students in the College of Arts and Sciences (CAS) in University Utara Malaysia (UUM) are going into specializations that do not require programming skills to avoid the necessity of learning programming languages as they do not have backgrounds in programming languages such as ICT students. In this proposal we propose a prototype using Java server Pages to serve as a mediator between students and the training center which is located in FTM (Computing professional Enrichment & Development Division (CoPEN) Center). The main objective of this prototype is to improve interaction between students and the Center by providing them with the latest information about the center such as; allowing the students to know if there are any new courses they could start in the near future by sending E-mails(electronic mail) from the system to inform the student about these courses. On the other hand, this system could allow the students to register and pay for these courses online which will improve and facilitate the process of registration and payment. Moreover lecturers could use this system to inform students if he is not able to attend a certain class or if he wishes to change the timetable and the lecturers will able to upload files such as PDF, document to his students Online. By using this prototype, it will increase efficient interaction between students and staff.

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CHAPTER ONE

INTRODUCTION

1.0 INTRODUCTION

Computer programming still remain an important part of most Information Systems courses (McCarthy, 2008). It is not easy for academic institutions to provide relevant and engaging computing courses that students need to expand their life skills and enhance their employment opportunities. Education institutions that have that benefit provide students with a rich and resonant learning experience, using not only the best available textbooks, but also e-learning and software so that students garner hands-on experience. In various fields, there are so many specialized institutions. They should follow the guidelines and specific plans to learning programming language (Holden & Weeden, 2003).

There are institutes of specialized programming languages such as Java, ASP.NET and Oracle. It is aiming to improve the software experience and the level of student performance of software (Hyland & Lynch, 2002). These institutes came to assist students who face difficulties in learning programming languages.

In recent years, there is a clear development of information technology including the development of the universities and educational institutions that contribute to solve many difficulties that are facing students in their universities like online courses registration system which if done could save a lot of precious time (Tunçkan, 2007) .

The contents of
the thesis is for
internal user
only

REFERENCES

- Ahmad, H., and Yusoff, R. (2001). *Integrated process design for e-learning: a case study*. 488 – 491.
- Ahn, T., Ryu, S. & Han, I. (2004). *The Impact of the Online and Offline Features on the User Acceptance of Internet Shopping Mall*. Electronic Commerce Research and, 3 (2004), 405-420.
- AL-Bastaki , Y.(2005). *A framework for a WAP-based course registration system*.44(3) , Pp 327 - 342 .
- Borošon, E. (2003). "Course Registration System, the on-line registrar, the on-line registrar."Retrieved March 04,2008, from <http://www.cs.brown.edu/courses/cs190/old.dhl2003/> asgns/2-7/tmp/eboroson_specs.pdf.
- Ciebiera, k., Mincer-Daszkiewicz.J , Walen, T. (2004) . *New Course Registration Module for the University Study-Oriented System*, EUNIS'2004, the 10th International Conference of European University Information Systems, Bled, Slovenia, pp. 247–252.
- Carat, G. (2002). *E-Payment Systems database – Trends and Analysis*, Electronic Payment Systems Observatory (ePSO), Institute for Prospective Technological / European Commission.
- Chan, P. (2008). *Dynamic Web Service Composition: A New Approach in Building Reliable Web Service*. Pp 20 – 25.
- Cui, H. (2005). *Digitized OA system construction of University based on web service technology*.113: 698 – 702.
- David, F.D. (2004). *Perceived Usefulness, Perceived Ease of Use and End-User Acceptance of Information technology*. London: Prentice Hall

George, C., and Scerri, J. (2007). *User-Generated Content Online*: Legitimate power or the Wild West? BELETA: 2007 annual conference Hertfordshire.

Gunawardana .J.M.N.C, Ishara . G.P, Ragel .R.G & Radhakrishnan .S.(2008) . *Course Registration System for the Faculty of Engineering in University of Peradeniya* . Proceedings of the Peradeniya University Research Sessions, Sri Lanka, Vol.13, Part II.

Holden.E & Weeden.E (2003) . *The Experience Factor in Early Programming Education* . SIGITE'04, October 28-30, 2004, Salt Lake City, Utah, USA.

Hyland.E & Lynch.G (2002) . *Initial experiences gained and initiatives employed in the teaching of Java programming in the Institute of Technology* . Principles and Practice of Programming in Java.pp.101

James Turner. (2002). *Mysql And Jsp Web Applications*: Data-driven Programming Using Tomcat And Mysql. Retrieved from : <http://www.biblio.com/isbn/9780672323096.html>

Jing,Y .(2009) . *On-line Payment and Security of E-commerce* . Proceedings of the 2009 International Symposium on Web Information Systems and Applications (WISA'09). Nanchang, P. R. China, May 22-24, 2009, pp. 046-050. March 04, 2008, from http://www.cs.brown.edu/courses/cs190/old.dhl2003/asgns/2-7/tmp/eboroson_specs.pdf.

John ,J. Micheal, A. Irina, A. and Ramazan, B. (2004), *Online Interactive Home Work Grading System* . Retrieved from : [http://www.iiisci.org/journal/CV\\$sci/pdfs/P792477.pdf](http://www.iiisci.org/journal/CV$sci/pdfs/P792477.pdf)

Junping, W. (2007). *Risk Control and Estimation of Online Services Market Segmentation*. 1 – 5.

Kerner, S. (2006). *Is PHP the Cure for the 'Broken' Web*, internetnews.com.

Knight A., and Dai, N. (2002). *Objects and the Web*. IEEE Software. pp.51-59. IEEE.

Lankton, N. (2007). *Antecedents and Dimensions of Online Service Expectations.*" 54(4): 776 – 788.

Laudon, K. C, & Laudon, J. P . (2000) . *Management Information Systems*: Prentice Hall PTR Upper Saddle River, NJ, USA.

Lee, K. and Jae, Y. (2008). *A Survey on Internet Payment Systems*. Software Ecosystem.

McCarthy , B . *An Evaluation of an Online Programming Course*. Communications of the IBIMA . Volume 5, 2008.

Naini, V., and Tanik, M. (2008). *A Web-based interactive Student Advising system using Java frameworks*. 172 – 177.

Nijaz, (2000), *Dynamic web-based application development*. New York: Prentice Hall.

Nielsen, J. (1993), *Usability engineering*, Boston: AP professional. (chapter 6.5: test tasks, 185-186)

Nielsen, Jakob (2000). "Why You Only Need to Test With 5 Users". 19 March. Retrieved from :
<http://www.useit.com/alertbox/20000319.html>

Nielsen, J. (1998). International Standard, Ergonomic Requirements for Office Work with Visual Display Terminals (VDTs). Switzerland: Int. Organization for Standardization Geneva.

Raghu Ramakrishnan and Johannes E. Gehrke 3003) . *Database Management Systems*, Third Edition. McGraw Hill.

Rayport and Jaworski,. (2004) *Best Face Forward, Why Companies Must Improve Their Service Interfaces with Customers*. Harvard Business School Press, January 2005

Roy, T., and Richard, N. (2002). *Principled Design of the Modern Web Architecture*. ACM Transactions on Internet Technology, Vol. 2, No. 2, May 2002, Pages 115–150.

Satzinger, J., R. Jackson & S. Burd (2002). Systems Analysis and Design in a Changing World (2nd Ed.), Boston, MA: Course Technology.

Schmitt (2006). Engaging a Rich Web Experience. Greenwich: Manning Publications Co.

Sekaran, U. (2003). Research Methods for Business: A skill building approach. New York : John Wiley & Sons.

Silva, P. & Paton, N. (2003) .*Unified Modeling Language for Interactive application* Retrieved from:<http://scholar.google.com/scholar?q=UMLi:%20Unified%20Modeling%20language%20for%20Interactive%20Application&hl=en&lr=&oi=scholar>.

Singh sumanjeet .(2009), *emergence of payment systems in the age of electronic commerce: the state of art*. Global Journal of International Business Research Vol. 2. No. 2.

Steven, J., & Templeton, E. (2008). *Detecting Spoofed Packets*, retrieved on 3 Oct 2009, U.C. Davis.

Sun (2007),*JavaServer Pages[tm] Technology* - White Paper. Retrieved from :
http://java.sun.com/products/jsp/White_Paper/index.html

Sun technology. (2008). *Java Server Pages technology work*, Retrieved from:
http://java.sun.com/products/jsp/White_Paper/index.html

Treiber, M. (2007). *Active Web Service Registries*. 11(5): 66 – 71.

Tunckan, E. (2007), *Structural Dimensions And Functions Of Student Centers In The Open Education Faculty Practices*, TOJDE October 2007 Volume: 8 Number: 4 Article 13
Retrieved December 15,2008 From <http://tojde.anadolu.edu.tr/>

Uebersax J. S. (2006). *Likert scales: Dispelling the confusion. Statistical Methods for Rater Agreement Web site*. Available at ourworld.compuserve.com/homepages/jsuebersax/likert2.htm. Accessed December 18, 2007.

Vaishnavi, V. & Kuechler, B. (2004). *Design Research in information system*. Retrieved 28, March, 2008, from <http://www.isworld.org/Researchdesign/drisISworld.htm>

Woodley.M & Kamin .S. K (2007) . *Programming Studio: A Course for Improving Programming Skills in Undergraduates*. SIGCSE'07, March 7–10, 2007, Covington, Kentucky, USA.

Yasuhiko, H., Tsutomu, A., and Syun, T. (2006). *Construction and operation of a registration system in a university*. 37(10): 69 – 80.

Zainal, A., and Hasibuan, H. (2005). *The Use of E-Learning towards New Learning Paradigm: Case Study Student Centered E-Learning Environment at Faculty of Computer Science-University of Indonesia*. 1026 – 1030.

Zane , V. (2004) . *Wireless Student Testing* , Proceeding of the International Conference on Pervasive Computer and Communication , Las Vegas , Nevada . Retrived on 14 may 2008.