Study Room Online Reservation in UUM library

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by

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ABSTRACT

This study introduces the online room reservation system that is developed to facilitate the development of shared virtual environments. The main objective of this project is to assist the students in gaining an easier and faster way of reservation, providing them with more selections, and real time information. The library will be able to offer students the precise estimation of rooms schedule in the service management. This system is to be implemented by integrating online technology with web services.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

Web is a specified set of communication protocols to standardize the way that wireless devices, such as cellular telephones and radio transceivers, can be used in accessing Internet portrayed through E-mail, World Wide Web, Newsgroups, and Instant Messaging. For decades, accessing Internet has been possible in the past. However, different manufacturers have used different technologies. It is highly expected that in the future that devices and service systems using Web will be able to interoperate. Before the introduction to Web, service providers had extremely limited opportunities to offer interactive data services. That is to say, these services that refer to a collection of facts usually are collected as the result of experiences, observations, experiments, processes within a computer system, or a set of premises. As a result, these useful data are considered as a responsiveness offer to the users, to the individuals or to the systems that interact with them.

The contents of the thesis is for internal user only

References

- Alhir,S.(2003). *Use-Case Diagrams*. In Communicating Software Design Graphically, *Learning UML*. (PP.91).O'Reilly & Associates, Inc: United States of America.
- Ambler, S, W. (2004). *The Object Primer: Agile Model-Driven Development with UML*2.0. New York: USA.
- Anderson, P.(2007. February). What is Web 2.0?. *Ideas, technologies and implications for education*. JISC Technology and Standards Watch.
- Bayram, Z. (n.d.). Business Object-Oriented Analysis and Design (BOOAD) Methodology, 2-3.
- Birmingham City University.(n.d.). *HOW TO BOOK A ROOM*. Retrieved February 23,2009,From Kenrick Library Web site: http://newton.bcu.ac.uk/TalisPrism/?newsession=true&rid=381494816
- Booch, G.(1994). OBJECT-ORIENTED ANALYSIS AND DESIGN WITH APPLICATIONS: Categories of Analysis and Design Methods. Canada: Addison Wesley Longman.

Byrd,W,E.(2002, November). Web Programming with Continuations. *Issues to Consider*,3-5.

Carnegie Mellon University .(2008). *Student Room Reservation System*. Retrieved December 28.2009. from Carnegie Mellon University Web site: http://srrs.library.cmu.edu/index.php.

- Chaffey, D. (2008). Define 'Prototypes and prototyping ': Definition: What is? Retrieved March 23, 2009, From: E-marketing Glossary web site:
- Chitnis,M. Tiwari,P. & Ananthamurthy,L.(2002): Sequence Diagram in UML. Retrieved march 23, 2009, from developer.com web site: http://www.developer.com/design/article.php/3080941.
- Czerny,S.(2008, Spring). Study Room Reservation System Pilot Program,9,4. National Library Week: Rohrbach Library http://www.davechaffey.com/E-marketing-Glossary/Prototypes-and-prototyping.htm.
- Garone, S. (2000). Accelerating Embedded development: *Rational Rose Real Time*, Rational Software Corporation, USA.
- Holzinger, A. (2005). Usability Engineering Methods: Usability Engineering Methods (UEMs) for Software Developers, 48, pp. 71-74.
- Kahate, A. (2004). OOAD Methods: Object Oriented Analysis & Design. pp. 26. Tata McGraw-Hill. http://books.google.com/books?id=PkVy_zAaruMC&printsec=frontcover
- KM Consulting. (2005). Usability Testing: Definitions Usability Testing, 1-2.
- Ko,L-T.(2006, December). International Students Guide to Library Services. *Studying in the Library*, 8.
- Kurt, A & Naiboğlu, A.(2005, APRIL). Experiences with Building an Online Exhibition System using Web Services. SYSTEM ARCHITECTURE, 5, PWASET: PROCEEDINGS OF WORLD ACADEMY OF SCIENCE, ENGINEERING AND TECHNOLOGY, 243.

- Lamia, W, M. (1995, May). Integrating QFD with Object Oriented Software Design Methodologies. U.S Department of Defense, 1.
- Lewis, J. R. (1995). IBM Computer Usability Satisfaction Questionnaires: Psychometric Evaluation and Instructions for Use. International Journal of Human-Computer Interaction, 7:1, 57-78.
 Web site: http://hcibib.org/perlman/question.cgi?form=CSUQ.
- Liao, F. Shaikh, S. and Tang, A.(n.d.). *Leavey Room Reservation System*. Retrieved February 25, 2009, From web site: http://franqi.com/projects/leavey_ui.pdf.

Likert, R.A. (1932). Techniques of the Measurement of Attributes: Archives of

Psychology "Likert Scale", vol.CXL, 1055. Web site:

http://www.faqs.org/theories/La-Li/Likert- Scale.html.

- Lund, A.M. (2001) *Measuring Usability with the USE Questionnaire*. STC Usability SIG Newsletter, 8:2. Web site: http://hcibib.org/perlman/question.cgi?form=USE.
- Martin, R, C (2002). The Principles, Practices, & Patterns of Agile Software development: UML for Java Programmers. (PP.1-3).Object Mentor Inc. New Jersey: Prentice Hall.

Martin, R, C. (1997). UML Tutorial. Class Diagrams, 1-3.

- Mathieson, D.P., & Doane, K. (2003). Using Fine-Grained Likert Scales in Web Surveys, PP. 1-7.
- Maxwell, D.(Feb 2006). Room reserve. Meeting Room Reservation Management. Retrieved December 28.2009.from evancedsolutions Web site: http://www.evancedsolutions.com/.

- McCulloch, A. (2008). *Book Study Rooms Online*. Retrieved December 28.2009. from University of Waterloo Library Web site: http://www.lib.uwaterloo.ca/newsitems/booking.html.
- Midmarket CIO.(2005). Definitions Rational Rose, Retrieved march 23, 2009, From SearchCIO-Midmarket.com Definitions Web site: http://searchciomidmarket.techtarget.com/sDefinition/0,,sid183_gci516025,00.html
- Ojo, A & Estevez, E. (2005). Object-Oriented Analysis and Design with UML. E-Macao Report 19.
- Patzer, A. (2002). JSP Examples and Best Practices: Understanding Web Containers. Impressions Book and Journal Services, Inc. New York: Book and Journal Services.
- Perfetti, C., & Landesman, L. (2001). User Interface Engineering: *Eight is not enough*. Retrieved UIE.com April 1, 2009, from web site: http://www.uie.com/articles/eight_is_not_enough/.
- Santa Fe College.(n.d.). *Library Group Study Rooms: Conference Room Policy*. Retrieved February 23,2009, from Lawrence W. Tyree Library Web site: http://dept.sfcollege.edu/library/study_rooms/smform.htm.
- Techtarget. (2009). Definition of Usability Testing. Retrieved April 1, 2009, from TechTarget.com web site: http://searchsoa.techtarget.com/sDefinition/0,,sid26_gci214526,00.html.
- Uimonen, T.(2000). Case: Rational Rose: *Software Systems Laboratory*. A seminar on Reverse Engineering, Tampere University of Technology.

University of California Berkeley, Haas School of business.(2004). How Do I

Reserve Services Equipment. Retrieved February 23,2009, From Resi

Web site: http://reserve.haas.berkeley.edu

- University of Gloucestershire.(2009, September). Learning and Information Services. *Study facilities*, Retrieved February 23,2009,From LIS Web site: http://resources.glos.ac.uk/departments/lis
- University of Texas Libraries ,College of Fine Arts.(2008). *Fine Arts Library Room Reservations*. Retrieved February 23,2009,From Arts Library Web site: http://www.lib.utexas.edu/fal/falreservations.html
- University of Victoria Libraries. (2008). *Book a Study Room*. Retrieved January 5.2009. from University of Victoria Libraries Web site: https://triton.library.uvic.ca/studyrooms/day.php?year=2008&month= 12&day=20&area=1.
- University of Washington Libraries. (2009). *Reserve Study Rooms and Equipment*. Retrieved December 30.2009. from University of Washington Libraries Web site: http://www.lib.washington.edu/services/facilities/studyRooms/.
- University of Wisconsin. (2006). *Study rooms Reservations System: Group Study Room Policies*. Retrieved February 23, 2009, From University of Wisconsin System Web site: http://studyrooms.library.wisc.edu/index.php?mode=policies.
- Utah State University. (n.d.). *Rooms ordered by Room Number with Scheduled Time*. Retrieved February 23,2009, From USU Library Web site: http://library.usu.edu/main/group_study_rooms/

- University Utara Malaysia, Sultanah Bahiyah Library. (2009, January 29). Retrieved February 25, 2009, From UUM library Web site: www.lib.uum.edu.my.
- Vanderbilt Owen School of management.(2009). Study Room Reservation System: How to Reserve a Room. Retrieved February 23,2009,From Walker Management Library Web site: http://www2.owen.vanderbilt.edu/walker/services/students/studyrooms.php
- Walden, K., & Nerson, J.M. (1994, September). Seamless Object-Oriented Software Architecture: Analysis and Design of Reliable Systems. Stockholm and Paris: Prentice Hall
- White, D. (2009). What is Web Application Development? .Retrieved February 22, 2009, From wise geek Web site: http://www.wisegeek.com/what-is-web-application-development.htm
- Williams, J, R. (n.d). Usability Testing. Retrieved April 1, 2009, from Synergetic Applications web site: http://www.synergeticapplications.com/usability.htm.
- Wooldridge. M., Jennings. N. R, and Kinny. D. (1999). A Methodology for Agent-Oriented Analysis and Design.
- Yu, C. H. (2000). An introduction to computing and interpreting Cronbach Coefficient Alpha in SAS [Electronic Version]. Retrieved 5/4/2009 from http://www2.sas.com/proceedings/sugi26/p246-26.pdf.
- Ziemer,S.(2002,November 28). Architecture for Web Applications. Essay in DIF 8914 Distributed Information Systems.9-11.