

**A REQUIREMENT MODEL FOR ONLINE DENTAL  
RESERVATION SYSTEM FOR UNIVERSITY HEALTH CENTER**

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**Universit Utara Malaysia**

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**A REQUIREMENT MODEL FOR ONLINE DENTAL  
RESERVATION SYSTEM FOR UNIVERSITY HEALTH CENTER**

**A Thesis submitted to college Arts & Sciences in partial  
Fulfillment of the requirement for the master's degree  
(Information communication Technology)**

**Universit Utara Malaysia**

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## **ABSTRACT**

The rapid growth with the using of the online services becomes more necessary in the various fields. With A Requirement Model for Online Dental Reservation System for university health center the student will be able to make their reservation for the dentist appointment by online, the proposed system save the time and the effort on the student to make their reservation. A Requirement Model for Online Dental Reservation System for university health center can be obtained easy way to access the enquire information about the dentist appointment. This research introduces an online dentist application which provides the student the new technology to simplify the reservation process and to manage the appointment schedule by the dentist officer.

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# **CHAPTER 1**

## **INTRODUCTION**

### **1. Introduction**

The online reservation services differ from the traditional mode in the capacity to provide services regardless of temporal and spatial constraints. They are also different from traditional interpersonal services that are delivered face-to-face, or from other types of e-services (e-solution), such as online services, where the service delivery is linked to a specific fixed local area network.

The online reservation services allow persons to employ Information Technology without being tied to a single location; it provides greater flexibility than what is possible with desktop. This technology enables users to access the Internet at any time in any location.

A suitable use of the online reservation services and wireless technology has given a new application, manage and reservation for dentist clinic via online services. The ability of

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## 7.0 Reference

- [1] Stevens, K., Jamieson, R., "The Introduction and Assessment of Three Teaching Tools (WebCT, Mind trail, and EVE) into a Post Graduate Course", *Journal of Information Technology Education*, Vol. 1, No. 4, 2002, pp 233-252.
- [2] Booking Patients for General Practice Resident Clinic, University of Alberta, the Department of Dentistry, retrieved 24 Jun 2008, from (<http://www.dent.ualberta.ca/nav02.cfm?nav02=65015&nav01=44192>).
- [3] Nijaz, *Dynamic web-based application development*. New York: Prentice Hall, 2000.
- [4] UUM, University Health Center, retrieved on 20 July 2008, from (<http://www.uum.edu.my>).
- [5] Baran P., "On Distributed Communications Networks", *Trans. Comm. Systems*, March 1964, IEEE.
- [6] Barry M., Vinton G., David D., Robert E., Leonard Kleinrock, Daniel C., Jon Postel, Larry G., Stephen W. *A Brief History of the Internet*, Leiner et al, 1997, from (<http://www.isoc.org/internet/history/brief.shtml>).
- [7] Mitchell L., and Yukako S., *Internet Information Provider Services Industry Analyzed via the Value Framework*, November 5, 2002, (<http://valueframeworkinstitute.org/Nov2002/feature.article.htm>).
- [8] University of Miami Miller, School of Medicine at Florida Atlantic University, Retrieved on 2 July 2008, from ([https://www.uhealthsystem.com/patient\\_services/appointments.asp](https://www.uhealthsystem.com/patient_services/appointments.asp)).
- [9] Franklin Dexter, *Design of Appointment Systems for Preanesthesia Evaluation Clinics to Minimize Patient Waiting Times: A Review of Computer Simulation and Patient Survey Studies*, Department of Anesthesia, University of Iowa, Iowa City, Iowa, 1999 by the International Anesthesia Research Society.
- [10] Clague JE, Reed PG, Barlow J, et al. Improving outpatient clinic efficiency using computer simulation. *Int J Health Care Qual Assur Inc Leadersh Health Serv* 1997.
- [11] UUM Health Center, University Health Centre, accessed on 3 July 2008, from (<http://www.uum.edu.my/bi/v2/facilities/index.html>).
- [12] Collard. R. *Test Design*. Stqemagazine: Software Testing & Quality Engineering, (1999). Retrieved Sep 29, 2007 from ([www.soft-test.ordsif.s/material/rosscollard\\_I.PDF](http://www.soft-test.ordsif.s/material/rosscollard_I.PDF)).

- [13] Nunamaker, J., chan, M., & purdin, T., System development in information system research, (1999). Retrieved 13ogs 2007 from (ieeexplore.ieee.org/xpl/freeabs\_all.jsp?arnumber=205401).
- [14] Kothari, C. R, Research Methodology, Methods and Technique. Delhi: Wiley Eastern Limited. 1985.
- [15] Valacich, J. S., George, J. M. & Hoffer, J. A. (2004). Essential of Systems Analysis and Design. New York: Prentice Hall.
- [16] Hoffer, J. A., George, J. F & Valacich, J. S. Modern Systems Analysis and Design (2nd Edition). United Kingdom: Addison Wesley Longman 1999.
- [17] Kendall, System implementations. UK. Wiley Eastern Limited. 1996.
- [18] Rubin, J. Handbook of Usability Testing: How to Plan, Design and Conduct Effective Tests. London: John Wiley & Sons, 2004.
- [19] Bahrami, A.Object Oriented System Development, McGraw-Hill, United States of America.1999.
- [20] Bennett, S., McRobb, S., & farmer, R.Object-oriented System Analysis and design using UML. Berkshire: McGraw Hill.2007.
- [21] Dennis, A., Wixom, B.H., & Tegarden, D. (2005). System analysis and design with UML version 2.0: an object-oriented approach with UML, 2<sup>nd</sup> edition. Hoboken, NJ: John Wiley and Sons, Inc.
- [22] Eriksson, H., & Penker, M. UML Toolkit. USA, John Wiley & Sons, Inc .1998.
- [23] Hoffer, J. A., George, J. F & Valacich, J. S. (2002). Modern Systems Analysis and Design (3<sup>rd</sup> Edition). Upper Saddle River, New Jersey: Prentice Hall.
- [24] Jacobson, I., Christerson, M., Johnsson, P. & Overgaard, G. (2004). Object-oriented Software Engineering: A Use Case Driven Approach (revised). Harlow, England: Addison-Wesley.
- [25] Kendall, P. A. Introduction to Systems Analysis and Design: A Structured Approach, Irwin, Times Mirror Higher Education Group, 1996. USA.
- [26] Nielsen, J. & Landauer, T.. A Mathematical Model of The Finding Of Usability problems. 2001. In ACM INTERCHI'93. Netherlands: Amsterdam.
- [27] Nunes, N. J. & Cunha J.F.E. Towards a UML profile for Interaction Design: the Wisdom Approach Retrieved from: <http://citeseer.ist.psu.edu/cache/papers/cs/23122/>

<http://zszzszmath.uma.ptzsznjnzspublicationszszzum12000.pdf/nunes00towards.pdf> 24<sup>th</sup> March 2006.

- [28] Bennett, S., McRobb, S., & farmer, R. Object-oriented System Analysis and Design 2<sup>nd</sup> Edition. 2002. UK, McGraw Hill.
- [29] Crowston J. and Rayport J., the Coming Battle for Customer Information. Harvard Business Review, 75, 1 (1997), 53-65.
- [30] Shih H., an Empirical Study on Predicting User Acceptance of E-Shopping on the Web. Information & Management, 41, 351-368. 2005.
- [31] Wixdom & Todd, an Empirical Study on Predicting User Acceptance of E-Shopping on the Web. Information & Management, 41, 351-368. 2006.
- [32] Seafood Delivered from Manchester's finest Frozen Fish Delivery service, Fish Fanatics, retrieved on 4 July 2008, from (<http://www.fishfanatics.co.uk/>).
- [33] Regal Fish Supplies Ltd, on-line Services, 2008, from (<http://www.regalfish.co.uk/page4/80/>).
- [34] Exploratory study of buying fish online: are Malaysians ready to adopt online grocery shopping, Volume 1, Number 1 / 2006, P 67 – 82.
- [35] Whitten J., Bentley L. & Dittman, K., System Analysis and Design Methods (5 Ed.) Mc-Graw Hill: Boston. 2001.
- [36] R.T. Rust and K.N. Lemon. E-service and the consumer. International Journal of Electronic Commerce, 5(3):85–101, 2001.
- [37] R.T. Rust and P.K. Kannan. E-service: a new paradigm for business in the electronic environment. Communications of the ACM, 46(6):36–42, 2003.
- [38] Vaishnavi V. & Kuechler B. Design research in Information Systems. Retrieved: June 19, 2008. From: <http://www.isworld.org/Researchdesign/drisISworld.htm>.
- [39] Morinaga, S., Ya Yamanishi, K., Tateishi, K, and Fukushima, T. 2002. Mining Product Reputations on the Web. KDD'02.
- [40] NLProcessor – Text Analysis Toolkit. 2000. <http://www.infogistics.com/textanalysis.html>
- [41] Paice, C. D. Constructing Literature Abstracts by Computer: Techniques and Prospects. Information Processing and Management 26:171-186. 1990.
- [42] Pang, B., Lee, L., and Vaithyanathan, S.. Thumbs up? Sentiment Classification Using Machine Learning Techniques. In Proc. of EMNLP 2002

- [43] Sack, W. On the Computation of Point of View. AAAI, 1994, Student abstract.
- [44] Salton, G. Singhal, A. Buckley, C. and Mitra, M. 1996. Automatic Text Decomposition using Text Segments and Text Themes. ACM Conference on Hypertext.
- [45] Sparck J. a. Discourse Modeling for Automatic Text Summarizing. Technical Report 290, 1993. University of Cambridge Computer Laboratory.
- [46] Microsoft, "Microsoft ASP.NET 2.0 Providers," 2006, Accessed April 25; 2008, Available: <http://download.microsoft.com/download/d/d/b/db5a94db398-44b5-bbb9-a71808879d79/Microsoft%20ASP.NET%20Providers.pdf>
- [47] P. McMahon, "An Introduction to ASP .NET," 2005, Accessed April 3; 2008, Available: <http://www.dotnet.za.net/book/IntroToASP.NET.pdf>
- [48] Wikipedia, "ASP.NET," Accessed April 22; 2008, Available: <http://en.wikipedia.org/wiki/ASP.NET>.
- [49] T. Uimonen, "Rational Rose," presented at A Seminar on Reverse Engineering, Software Systems Laboratory Tampere University of Technology, 2000.
- [50] T. J. Nam and S. Gill, "An effective prototyping method for delivering interaction design in industrial design education," pp. 1-16.
- [51] wikipedia, "Unified Modeling Language," Accessed April 4; 2008, Available: [http://en.wikipedia.org/wiki/Unified\\_Modeling\\_Language](http://en.wikipedia.org/wiki/Unified_Modeling_Language)
- [52] Reimer, U. and Hahn, U. A Formal Model of Text Summarization based on Condensation Operators of a Terminological Logic. 1997. In Proceedings of ACL'97 Workshop on Intelligent, Scalable Text Summarization.
- [53] IBM, "IBM Rational Rose Technical Developer," Accessed April 23; 2008, Available: [http://download.boulder.ibm.com/ibmdl/pub/software/rational/web/data\\_sheets/version6/rose.pdf](http://download.boulder.ibm.com/ibmdl/pub/software/rational/web/data_sheets/version6/rose.pdf)
- [54] Rubin, J. Handbook of Usability Testing: How to Plan, Design and Conduct Effective Tests. London: John Wiley & Sons. 2004.