

**DESIGNING A PROTOYPE FOR UPNM ACADEMIC AND STUDENT
SYSTEM APPLY WITH CONTENT MANAGEMENT CONCEPT**

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UNIVERSITI UTARA MALAYSIA

2009

**DESIGNING A PROTOYPE FOR UPNM ACADEMIC AND STUDENT
SYSTEM APPLY WITH CONTENT MANAGEMENT CONCEPT**

**A thesis submitted to the College of Arts and Sciences in partial fulfillment of the
requirements for the degree of Master of Science (Information Technology)
Universiti Utara Malaysia**

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ABSTRACT

The need of web application in the technology information era becomes very important. Nowadays, web application is a backbone of information system. Universiti Pertahanan Nasional Malaysia as one of public universities in Malaysia realizes that by applying web application technology in their institution to maximize from such application. UPNM Academic and Student System as the main academic system in the UPNM show improvement in managing their community by integrating web technology in their systems. This system use Web Content Management System (WCMS) in order to increase their performance and efficiency of work. It has two main entities, namely lecturer and student. Prototyping is needed as a model for designing this system which no fixed requirements. UPNM Academic and Student System is a system with complex rules, policies and requirements. Because of this complexity, prototype will play the role to assist the system to the stakeholder.

ACKNOWLEDGEMENTS

First of all I am thankful to Allah SWT for giving me the courage, ability, and strength to complete this project.

I would like to thanks and gratitude to:

My supervisor Prof Fadzilah Siraj for her wonderful supports and efforts in assisting me for carrying out this study to become reality. The idea and encouragement help me to get the direction of my work.

Thanks also to my fiancé, Noorhazeira Nor Izahar for giving me courage and strength to complete my study.

To my housemate, Mohd Eshak Teralleh, Fairus Yunos and Umar Sukaimi, for their supports and sharing ideas during this project.

My thanks also go to UPNM staff, my officemate and everybody who involved in this project directly and indirectly for giving me ideas, knowledge and supports throughout my study.

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LIST OF ABBREVIATION

Abbreviation	Description
ASP	Active Server Page
ASIS	Academic and Student Information System
CM	Content Management
CMS	Content Management System
<i>et al.</i>	Et Alii/Alia (Latin: And Others)
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
IP	Internet Protocol
IT	Information Technology
JSP	Java Server Page
Max	Maximum
Min	Minimum
MS	Microsoft Corporation
PHP	Hypertext Preprocessor
PNGK	Purata Nilai Gred Kumulatif
PNGS	Purata Nilai Gred Semester
SQL	Structured Query Language
TCC	Total Calculated Credit
TCT	Total Credit Taken
TGM	Total Grade Mark
TPG	Total Pass Grade
UAT	User Acceptance Test
UNIX	UNiplexed Information and Computing
UPNM	Universiti Pertahanan Nasional Malaysia

UUM	Universiti Utara Malaysia
Vs	Versus
WCM	Web Content Management
WCMS	Web Content Management System
XML	Extensible Markup Language

CHAPTER 1

INTRODUCTION

The need of web application in the technology information era is very important in assisting human performing their task and carrying out their activities. Internet users create an electronic record that needs to be maintained by conducting business transactions over the web (Barry, 2004). Expertise has proposed a lot of web modeling approaches in order to provide efficiency and the best method of developing web applications (Luinenburg *et al.*, 2008). A decision to manage the content of the web application is very critical since there are many web application methods and approaches to describe their models (Luinenburg *et al.*, 2008) out there.

Web content management (WCM) is the answer to this matter. According to Sireteanu *et al.* (2008), WCM systems as a branch of content management (CM) gained importance during the web explosion in the mid-1990s. CM is a formal process of converting, collecting, and organizing data, assets and resources of a corporation, institution, project communities or other group of resources in one location in the form of objects. This is very important in order to ensure that knowledge is captured and disseminated efficiently (Brennan *et al.*, 2001). Miller and Manafy (2003) mentioned that the true power of content management “may actually lie in its flexibility to change shape to fit each new business problem before it.” (As cited in Yu, 2005, p. 3).

The contents of
the thesis is for
internal user
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REFERENCES

Barry, R. (2004). Web sites as recordkeeping & recordmaking systems. *Information management Journal*, 38(6) 26-30, 32. Retrieved April 8th, 2009 from Wilson Web.

Bennett, K.H. (2000). Software Maintenance: A Tutorial. In Software Engineering, edited by Dorfman and Thayer. *IEEE Computer Society Press: Los Alamitos, CA*, 289-303 pp.

Boiko, B. (2001). Understanding content management. *Bulletin of the American Society for Information Science and Technology*, 28(1).

Bouchenak, S., Cox, A., Dropsho, S., Mittal, S., & Zwaenepoel, W. (2006). Caching Dynamic Web Content: Designing and Analysing an Aspect-Oriented Solution. *IFIP International Federation for Information Processing 2006, LNCS 4290*, p. 1-21,

Brennan, M., Funke, S. & Anderson, C. (2001). The Learning Content Management System A New eLearning Market Segment Emerges. *IDC White Paper*, p. 14.

Browning, P., & Lowndes, M. (2001). JISC TechWatch Report: Content Management Systems. *JISC TechWatch (JTW)*, JTW 01-02.

Brunn,J., Neumann,J., & Pritko,S. (2008). IBM Lotus Web Content Management software and existing enterprise content management solutions: patterns for integration. *Web content management and enterprise content management White Paper*. International Business Machines (IBM) Corporation.

Burlaca, O. (2003). NeoSite: A simple Content Management System. *Computer Science Journal of Moldova*, vol.11, no.3 (33).

Burzagli, L., Billi, M., Gannanini, F., Graziani, P., & Palchetti, E. (2004) The use of current content management systems for accessibility. *Proceedings of the 9th International Conference on Computers Helping People with Special Needs (ICCHP 2004), Lecture Notes in Computer Science, 3118*, p.331-338.

Byrne, T. (2004). Web content management products & practices, CMS watch, version 6.0. *The CMS report* (enterprise edition), Retrieved April 8th, 2009 from <http://www.cmswatch.com/CMS/Report/>

Cecchet, E., Chanda, A., Elnikety, S., Marguerite, J., & Zwaenepoel, W. (2003). Performance Comparison of Middleware Architectures for Generating Dynamic Web Content. *4th Middleware Conference 2003*.

Colter, M. (1987). The Business of Software Maintenance. *Proc. 1st Workshop Software Maintenance*, University of Durham, Durham, England.

De Vos, D., & Howarth, M. (2006). Best Practices for using IBM Workplace Web Content Management V6.0. *International Business Machines (IBM) Corporation*.

Deming, W. E., & Ramamoorthy, C. V. (2002). Chapter 1: Software Development Methodology Today in Design for Trustworthy Software: Tools, Techniques, and Methodology of Developing Robust Software. *Pearson Education, Inc.*

Engle, C. B., Ford, G., & Korson, T. (1989). Software Maintenance Exercises for a Software Engineering Project Course. *Educational Materials, CMU/SEI-89-EM-1*

Feldmann, A., Cceres, R., Douglis, F., Glass, G., & Rabinovich, M. (1999). Performance of Web Proxy Caching in Heterogeneous Bandwidth Environments. *IEEE Conference on Computer Communications (INFOCOM)*, New York.

Hackos, J.T. (2002). *Content management for dynamic Web delivery*. New York: Wiley Computer Publishing.

Iyengar, A. & Challenger, J. (1997). Improving Web Server Performance by Caching Dynamic Data. *In proceedings of USITS'97*, Monterey, CA, USA.

Kartchner, C. (2001). Fulfilling the promise of content management. *Bulletin of the American Society for Information Science and Technology*, 28(1).

Kelley, T. (2001). Prototyping is the Shorthand of Design. *Design Management Journal* Vol. 12, No. 3.

Key Considerations For Selecting a WCMS For Your Enterprise Website. (2008). *White paper of Falcon-Software Company, Inc.*

Luinenburg L., Jansen S., Souer J., Weerd, I.V.D., & Brinkkemper, S. (2008). Designing Web Content Management Systems Using the Method Association Approach. *Proceedings of the 4th International Workshop on Model-Driven Web Engineering (MDWE 2008)*, Toulouse, France, 106-120.

Lehman, M. M. (1984). Program Evolution. *Journal of Information Processing Management*, 19(1):19-36.

Leung, H. K. N., & White, L. J. (1990). Insights into Regression Testing. *Proceedings of the Conference on Software Maintenance, Miami, Florida, IEEE Computer Society Press*, pp. 60-69.

Lurie, I. (2002). A Web Content Management Blueprint - Planning for a content-rich, successful website. *Portent Interactive.*

McGovern, G. (2002). The benefits of a content management system. Retrieved April 7, 2009, from www.gerrymcgovern.com.

Merker, L. (2007). How to Evaluate Web Content Management Solutions for Higher Education ...and Avoid Overspending. *White Paper of OmniUpdate, Inc.*

Miller, B. & David, D. (2002). Directions in Web Content Management - An Overview and Primer for Business and Information Technology Managers. *Burntsand Inc.*

Morisson, B. (2003). Fulfilling the Promise of Web Content Management. *ATG White Paper*. Art Technology Group.

Obermier, T. R. (2006). Accreditation Self-Study Management Using a Website Content Management System. *Journal of Industrial Technology*, Vol. 22, No. 4.

Powel, W., & Gill, C. (2003). Web Content Management Systems in Higher Education. *Educause Quarterly*, Number 2 2003.

Platon, E. & Sei, Y. (2008). Security software engineering in wireless sensor and networks. *Progress in Informatics*, No. 5, pp. 49-64.

Rothwell, R. (2007). Choosing and Using A Content Management System (CMS) Guidance for Managers in the Third Sector. *National Computing Centre*, ICT Hub.

Ruping, A. (2006). Web Content Management - Patterns for Interaction and Personalisation. *EuroPLoP*.

Schach, S. R. (2002). Object-Oriented and Classical Software Engineering. *Boston: McGraw-Hill*, p. 71.

Selecting a Development Approach. (2008). *White Paper of Department of Health and Human Service USA*.

Sireteanu, A., Airinei, D., Andone, I., & Homocianu, D. (2008). Implementing a Web Content Management System for an Educational Institution. *Economic Informatics*, p. 1-4.

Sokic, M., Matic, V. & Bazant, A. (2003). Web Content Management System Based on XML Native Database. *25th Int. Conf. Information Technology Interfaces IT/ 2003*. Cavtat, Croatia

Souer, J., Weerd, I. V. D., Versendaal, J., & Brinkkemper, S. (2005) Developing Situational Content Management System-based Web Applications. To be published in *Proceedings of the Sixth International Conference on Web Information Systems Engineering (WISE 2005)*, New York City, New York.

Souer, J., Weerd, I. V. D., Versendaal, J., & Brinkkemper, S. (2007). Situational requirements engineering for the development of content management system-based web applications. *Int. J. Web Eng. Technol.*, 3(4), 420.

Souer, J., Honders, P., Versendaal, J., & Brinkkemper, S. (2008). A Framework for Web Content Management System Operations and Maintenance. *Journal of Digital Information Management*, Vol. 6, No. 4.

Special Administrative Region. (2008). *Web Content Management System*. The Government of Hong Kong

Warren, R. (2001). Information architects and their central role in content management. *Bulletin of the American Society for Information Science and Technology*, 28(1).

Weerd I.V.D., Souer J., Versendaal J., & Brinkkemper S. (2005). Situational requirements Engineering of Web Content Management Implementations. To be published in *Proceedings of SREP '05*, Paris, France.

Yu, H. (2005). Library Web Content Management: Needs and Challenges. *Information Science Publishers, Hershey, PA.*