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DESIGNING AND DEVELOPING A WEB-BASED POST GRADUATE APPLICATION SYSTEM FOR UUM

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DESIGNING AND DEVELOPING A WEB-BASED POST GRADUATE APPLICATION SYSTEM FOR UUM

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By

Faraj Ali Faraj Saad

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ABSTRACT

The internet technologies are rapidly increasing. The aim of the study is to design and develop a Web-based Postgraduate Application System (WPAS) for Universiti Utara Malaysia. The WPAS is a real-time application system which is free from traditional document processing procedures. It provides a convenient graphics user interface (GUI) for both student and admission department staff. It allows students to make self-apply for their selected apply online, degree program, view application status, and update application information time-to-time. It also allows administrator to manage student account, offer of place and admission information. All of the services are possible anywhere at any time.

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TABLE OF CONTENT

PERMISSION TO USE		i
ABSTRACT		ii
ACKNOWLEDGEMENT		iii
TABLE OF CONTENT		iv
LIST OF FIGURES		x
LIST OF TABLES		xii
LIST OF CHARTS		xii
LIST OF ABBREVIATIONS		xiii
CHAPTER 1: INTRODUCTION		
1.1	Background	1
1.2	Problem Statement	1
1.3	Project Objectives	2
1.4	Research Scopes	2
1.5	Significance of the Research	3
1.6	Thesis Organization	3
CHAPTER 2: LITERATURE REVIEW		
2.1	Concepts and Definition	5
	2.1.1 WEB and Internet	6
2.2	Web-based System	7
2.3	Document Processing	7
2.4	Web Architecture	8

2.5 Previous Related Works 9

2.6 Advantages and Disadvantages of Web and Web Application 10

2.6.1 Advantages 10

2.6.2 Disadvantages 12

2.7 Summary 12

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research Methodology 13

3.1.1 Project Selection & Planning 14

3.1.2 Requirement Analysis 14

3.1.3 Design Requirement Model 15

3.1.4 Usability Testing 15

3.1.5 Documentation 16

3.2 Summary 16

CHAPTER 4: FINDINGS

4.1 Analysis Approach 17

4.1.1 Project Selection & Planning 17

4.1.2 Requirements Analysis 18

4.1.2.1 Current System 18

4.1.2.2 Data Collection 19

4.1.2.3 Hardware & Software Requirements 19

4.1.3 Design Requirements Model 22

4.1.3.1 Use Case Diagram 23

4.1.3.2 Use Case Specification 25

4.1.3.3 Sequence Diagram 26

- Apply Online [WPAS_UCD001] 26
- Pay Application Fees [WPAS_UCD002] 27
- Login [WPAS_UCD003] 28
- View Application Status [WPAS_UCD004] 29
- Update Application Info [WPAS_UCD005] 30
- Update Application Status [WPAS_UCD006] 31
- Authorize Student [WPAS_UCD007] 32
- View Profile [WPAS_UCD008] 33
- Edit Profile [WPAS_UCD009] 34
- Add User Account [WPAS_UCD011] 35
- Edit User Account [WPAS_UCD012] 36
- Search User Account 37
- Delete User Account [WPAS_UCD013] 38
- Forget Password [WPAS_UCD014] 39
- Change Password 40

4.1.3.4 Class Diagram 41

4.1.3.5 Design User Interface 42

- Login Interface 43
- Apply Online Interface 43
- Pay Application Fees Interface 44
- View Application Status Interface 45
- Update Application Info Interface 46
- Update Application Status Interface 47
- Authorize Student Interface 48

- View Profile Interface 49
- Edit Profile Interface 50
- Manage User Account Interface 51
- Add User Account Interface 52
- Edit User Account Interface 53
- View User Account Interface 54
- Delete User Account Interface 55
- Search User Account Interface 56
- Forget Password Interface 57
- Change Password 58

4.1.4 Usability Testing 58

4.1.4.1 Usability Testing Result 59

4.2 Summary 60

CHAPTER 5: DISCUSSION AND CONCLUSION

5.1 Recommendation 62

5.2 Future Work 63

5.3 Conclusion 64

REFERENCES

APPENDIX A: QUESTIONNAIRE

APPENDIX B: USE CASE SPECIFICATIONS

APPENDIX C: COLLABORATION DIAGRAMS

LIST OF FIGURES

2.1: Basic Web Architecture 8

3.1: Research Methodology 13

4.1: Use Case Diagram 24

4.2: Sequence Diagram for Apply Online 26

4.3: Sequence Diagram for pay Application Fees 27

4.4: Sequence Diagram for Login 28

4.5: Sequence Diagram for View Application Status 29

4.6: Sequence Diagram for Update Application Info 30

4.7: Sequence Diagram for Update Application Status 31

4.8: Sequence Diagram for Authorize Student 32

4.9: Sequence Diagram for View Profile 33

4.10: Sequence Diagram for Edit Profile 34

4.11: Sequence Diagram for Add User Account 35

4.12: Sequence Diagram for Edit User Account 36

4.13**:** Sequence Diagram for Search User Account 37

4.14: Sequence Diagram for Delete User Account 38

4.15: Sequence Diagram for Forget Password 39

4.16: Sequence Diagram for Change Password 40

4.17: Class Diagram for WPAS 41

4.18: Login Interface 42

4.19: Apply Online Interface 43

4.20: Pay Application Fees Interface 44

4.21: View Application Status Interface 45

4.22: Update Application Info Interface 46

4.23: Update Application Status Interface 47

4.24: Authorize Student Interface 48

4.25: View Profile Interface 49

4.26: Edit Profile Interface 50

4.27: Manage User Account Interface 51

4.28: Add User Account Interface 52

4.29: Edit User Account Interface 53

4.30: View User Account Interface 54

4.31: Delete User Account Interface 55

4.32: Search User Account Interface 56

4.33: Forget Password Interface 57

4.34: Change Password Interface 58

4.35: Percentage of the User Acceptance 60

LIST OF TABLES

4.1: Hardware Requirements 20

4.2: Software Requirements 20

4.3: List of Software Tools and Programmer Languages 21

4.4: Use Case Look-up Table 23

LIST OF ABBREVIATIONS

APS	Application Processing System
ASP	Active Server Page
IIS	Internet Information Service
MCQ	Multiple Choice Question
OO	Object-Oriented
WPAS	Web-based Post-graduate Application System

CHAPTER 1

INTRODUCTION

1.1 Background

Currently, applications at University Utara Malaysia (UUM) are processed manually. Every semester thousands of students apply for admission. From this large number of students only a handful of students get the chance to enter the university. Application form increase every semester and academic staffs need to check the documents before deciding either to accept or reject. This process is time consuming and application status can only be given to students after at least two weeks. A web-based application system solution is proposed. The aim of the system is to speed up processing, time and provide an instant decision.

1.2 Problem Statement

Prospective local and international students, who would like to know about this university usually, access the university's website to obtain relevant information. However, those who would like to apply have to send necessary application materials and application processing fee through postal and bank services. They are not able to apply via online.

The contents of the thesis is for internal user only

Asano, H., Suni, A.O., Ramzan, Z., & Zhu, J. (2005). Wireless Electronic Commerce Security Sponsored by Nokia. Retrieved on 27th May 2008, from Website:http://theory.lcs.mit.edu/~zulfikar/papers/NokiaFinalNoConclusion1205.pdf

Al-Bastaki, Y. (2005). *A framework for a WAP-based course registration system*. Vol 44, Issue 3, p327-342, Elsevier Science Ltd. Oxford, UK.

Antovski, L., & Gusev, M. (2003). *M-Payments. Information technology Interfaces*, 2003. ITI 2003. *Proceedings of the 25th International Conference*, 95-100.

Bennett, S., McRobb, S., & Farmer, R. (2006). *Object-oriented systems analysis and design using UML.* London: McGraw-Hill.

Boehm, Gray & Seewaldt (2004). A spiral model of software development and enhancement. IEEE Computer, 5, 61-72.

Booch, G., Jacobson, I., & Rumbaugh, J. (1998). *The Unified Software Development Process*. Massachesetts, Addison-Wesley.

Bulbrook, D. (2001). *WAP: A Beginner's Guide*. New York: Osborne/McGraw-Hill.

Chen, J.J., & Adams, C. (2004). Short-range wireless technologies with mobile payments systems. ICEC' 04, Sixth International Conference on Electronic Commerce, 649-656.

Cockburn & Alistair (1998). *Basic Use Case Template*, Available on Website: http://members.aol.com/acockburn/papers/uctempla.htm

Compton, K., & Huggins, J. (2003). Execution *of a Requirement Model in Software Development*. Dept. of Computer Science, Western Michigan University.

Dennis C., Patel, T., King, T., & Hilton, J. (2000). *Qualitative Studies of Shoppers' Motivations, 9th International Conference on Recent Advances in Retailing and Services Science*. Germany: EIRASS, Heidelberg.

Eriksson, H., & Penker, M. (1999). UML Toolkit, United States of America, John-Wiley & Sons, Inc.

Foo, S.M., Hovoer, C., & Lee, W.M. (2001). *Dynamic WAP application development*. Greenwich: Manning Publication Co.

Glahn, R., & Glen, R. (2002). Progenies in Education: The Evolution of Internet teaching. *Community College Journal of Research and Practice*. 26: 777-785.

Herzberg, A. (2003). Payments and Banking with Mobile Personal Devices. Communications of the ACM, May 2003, Vol. 46, No. 5.

Hoffer, J.A., Valacich, J.S., & George, J.M. (2004). *Essential of system analysis and design*, Prentice Hall, Upper Saddle River, NJ.

Holcomb, R. & Tharp, A. (1991). *"Users a software usability model and product evalution", Interacting with Computers,* Butterworth-Heinemann, Oxford, Uk, Vol.3(2) pp.155-166.

Heijden, M., & Taylor, M. (2000). Understanding WAP: Applications, devices and services. London: Artech House.

Jacobson, I., Christerson, M., Johnsson, P., & Overgaard, G. (2004). *Object-oriented Software Engineering: A use case driven approach (revised).* Harlow, England: Addison-Wesely.

Jagoe, A. (2003). *Mobile Location Services*: The Definitive Guid. Upper Saddle River, New Jersey: Pearson Education Inc.

Katz, R. (2003). Balancing Technology and Tradition: The example of course management systems. *Educause*.

Kothari, C.R. (1985). *Research Methodology Methods and Techniques*. Delhi: Wiley Eastern Limited.

Lahner, F., & Nosekabel, H. (2002). The Role of Mobile Devices In ELearning First Experiences With a Wireless E-Learning Environment, Proceedings of the IEEE International Workshop on Wireless and Mobile Technologies in Education, August 29 - 30, 2002. Växjö, Sweden. Retrieved on 14th May 2008, from Website:http://delivery.acm.org.eserv.uum.edu.my/10.1145/1170000/1167282/p118zanev.pdf?key1=1167282&key2=0205770121&coll=Portal&dl=GUIDE&CFID=27880100&CFTOKEN=90226379

Lutz, R.R. (1993). Targeting safety-related errors during software requirements analysis. In *SIGSOFT '93 Symp. on the Foundation of Software Engineering*.

Martin, D. (2000). Getting into i-Mode, [online report]. Retrieved on May 8th 2008, from Website: http://www.xml.com/lpt/a/2000/09/20/wireless/imode.html

Medero, S., & Cornell, K. (2007). *Paper Prototyping*. Published in Information Architecture. Retrieved on 23rd May 2008, from Website: http://www.alistapart.com/articles/paperprototyping

Meinel, C., Sack, H., & Schillings, V. (2002). Course Management in the Twinkle of an Eye — LCMS: A Professional Course Management System, Providence, Rhode Island, USA. Retrieved on 14th May 2008, from Website:http://delivery.acm.org.eserv.uum.edu.my/10.1145/590000/588722/p281meinel.pdf?key1=588722&key2=4604770121&coll=Portal&dl=GUIDE&CFID=27880100&CFTOKEN=90226379

Nielson, J. (2000). *WAP Backlash, Alertbox*. Retrieved on 16th May 2008, from Website: http://www.useit.com/alertbox/20000709.html

Nielsen, J. (2007). *Mobile usability testing problems and solutions*. The report: "*Quality Assurance: Management & Technologies*", BugHuntress QA Lab.

Nunes, N.J., & Cunha J.F.E. (2006). Rewards a UML Profile for Interaction Design: the Wisdom Approach. Retrieved on 25th May 2008, form Website: http://citeseer.ist.psu.edu/cache/papers/cs/23122

portal.uum.edu.my. "Introduction". Retrieved on 25th April 2008, from Website: http://portal.uum.edu.my

Rochford, T. (2001). *The Impact of Mobile Application Technology on Today's Workforce. 4,5,13,14.*

Shneiderman, B. (1998). *Designing the User Interface,* 3rd ed., Addison-Wesley. Retrieved from Website: http://www.w3.org/People/Berners-Lee/WorldWideWeb.html

Sendall, S., & Strohmeier, A. (2000). From Use Cases to System operation Specification. In *UML 2000—The Unified Modeling Language Advancing the Standard. Third International Conference, York, UK*, October 2000, vol. 1939 of LNCS, pp. 1-15, Springer.

Silva, A.P., & Mateus, G.R. (2003). A Mobile Location-Based Vehicle Fleet Management Service. Proceedings of the Intelligent Vehicles Symposium, 9-11 June 2003, pp. 25-30.

Sommerville, I. (2007). "*Software Engineering*". 8th Edition, New York, Harlow: Addison Wesley.

Tarban E.M. (2006) Marketing Notes and communications: why do people shop?. *Journal of Marketing*, Vol. 36, October, pp46-59.

Thanh, D.V. (2003). Mobile e-commerce on mobile phone. In Lim, E.P. & Siau, K. (Ed.), *Advances in Mobile Commerce Technologies* (pp. 19-43), Hershey, PA: Idea Group Publishing.

Taylor, D. (2006). WAP Review: *Carnival of the Mobilists*, No. 39. Retrieved on 22 May 2008, from
Website: http://wapreview.com/blog/?cat=5

uum.edu.my. *The University (2007)*. Retrieved on 10th May 2008, from
Website: http://www.uum.edu.my/bi/v2/myuum/index.html

UUM Academic Guide Book (2007). The University Utara Malaysia.

Ullman, L. (2003). *PHP and MySQL for Dynamic Web Sites* (1st Edition). London: Peachpit Press.

Vaishnavi, V., & Kuechler, W. (2005). *Design research in Information Systems*. London: McGraw-Hill Press.

Valacich, J.S., George, J.M., & Hoffer, J.A. (2004). *Essential of system analysis and design*, Prentice Hall, Upper Saddle River, NJ.

Whitten, J.L., Bentley, L.D., & Dittman, K.C. (1998). *Systems Analysis and Design Methods.* USA: McGraw-Hill.

Whitten, J.L., Bentley, L.D., & Dittman, K.C. (2001). *Systems Analysis and Design Methods* (5th ed.), Boston: McGraw- Hill.

WAP Forum (2002). WAP 2.0 Technical White Paper. Retrieved May 16th 2008, from
Website: http://www.wapforum.org/what/WAPWhite_Paper1.pdf

Wutrich, C.G., Kablefleish, Griffin, T.N., & Passos (2003). On-Line Instructional Testing in a Mobile Environment, Journal of Computing in Small Colleges.

Yang (2003). WAP Application Develop. Mobile commerce and WML. NY.

Zhang, Q. (2000). University Course Registration and Management System-*A distributed Application using Microsoft Distributed Component Object Model*. The department of Computer Science, Canada.

Zanev, V. (2004). Wireless Student Testing, Proceedings of the International Conference on Pervasive Computing and Communications, Las Vegas, Nevada. Retrieved on 14th May 2008, from
Website:http://delivery.acm.org.eserv.uum.edu.my/10.1145/1170000/1167282/p118zanev.pdf?key1=1167282&key2=0205770121&coll=Portal&dl=GUIDE&CFID=27880100&CFTOKEN=90226379

INTERNET REFERENCES

idi.com. Exploring Mobile Applications Technology Landscape. Retrieved on 16th May 2008, from
Website: http://www.idii.com/wp/pmtExploringMobile.pdf

infoloom.com. Mobile commerce and WML. Retrieved on 12th May 2008, from
Website:http://www.infoloom.com/gcaconfs/WEB/paris2000/S1301.html

library.thinkquest.org. WAP architecture. Retrieved on 11th May 2008, from
Website:http://library.thinkquest.org/C012948/index.php?sect=waparch&page=home

visualtron.com. Mobile-Originated Example of WAP Architecture. 16th May 2008, from
Website: http://www.visualtron.com/wap_topic04.htm