

**A Requirement Model for Online Web-based Car Loan  
Management System for UUM Bursary**

This thesis is presented to the Graduate School  
In fulfillment of the requirements for  
Master of Science (Information and Communication Technology)  
Universiti Utara Malaysia

By

**Ayman Nader Abdellatif Alkhaldi**

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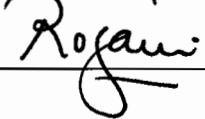
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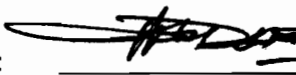
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Nama Penyelia Utama  
(Name of Main Supervisor) **ASSOC. PROF. DR. WAN ROZAINI SHEIK OSMAN**

Tandatangan  
(Signature) :  **WAN ROZAINI SHEIK OSMAN, PhD**  
DIRECTOR AND ASSOCIATE PROFESSOR  
ITU-UUM ASP CoE For Rural ICT Development,  
BANGUNDA TEKNOLOGI MALAYSIA  
UNIVERSITI UTARA MALAYSIA  
06010 UUM SINTOK  
KEDAH DARUL AMAN  
MALAYSIA

Nama Penyelia Kedua  
(Name of 2<sup>nd</sup> Supervisor): **ASSOC. PROF. DR. CHEK DERASHID**

Tandatangan  
(Signature) :  **ASSOC. PROF. DR. CHEK B. DERASHID**  
Deputy Director  
ITU-UUM ASP COE For Rural ICT Development  
Information Technology Building  
Universiti Utara Malaysia

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## ABSTRACT

The current century have witnessed several major technological renaissances and many technological achievements as well, which led to a competition among many countries to adapt this new trends. In fact Malaysia had improved the infrastructure needed in the information and communication technology area, in order to provide the universities with the modern technologies. Therefore the use of the technology becomes available inside the universities which make it more effective.

The staffs have to come personally to the bursary to apply for car loan. And they are facing many difficulties when they intend to fill the application form for car loan. Applicant has to fill data twice; therefore, take a long time and a large quantity of papers is needed.

This research introduces a prototype “Web Based Car Loan Management System” to help in solving the problems or the difficulties of the traditional system (manual system), the study will use the methodology for this study is based on the general methodology in research design, because it is have the logical phases that used to develop a prototype for car loan management web based system and algorithm was developed to help facilitate decision making of the car loan process.

Finally, the system is tested and the result confirms that the proposed system is capable to manage a successful completion of car loan process.

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Finally, I would like to extend my deepest love to all of my family and all of my friends who are happy for me.

## **DEDICATION**

I dedicate this thesis to my family especially my father (Dr. Nader AL Khaldi), my mother, my brother, and my brother in law (Abdelkareem AL Ashqar) for their loving, encourage, support and trust.

## TABLE OF CONTENTS

PERMISSION TO USE .....	I
ABSTRACT .....	III
ACKNOWLEDGMENTS .....	IV
DEDICATION .....	V
TABLE OF CONTENTS .....	VI
LIST OF TABLES .....	X
LIST OF FIGURES.....	X
LIST OF ABBREVIATIONS .....	XI
1. STATEMENT OF OBJECTIVE .....	1
1.1 Introduction.....	1
1.2 Background to the Study.....	1
1.3 Problem Statement .....	4
1.4 Research Questions.....	5
1.5 Objectives of the Study .....	5
1.6 Scope and Limitation of the Study .....	6
1.7 Significance / Contribution of the Study .....	6
1.8 Thesis Organization .....	6
1.9 Summary.....	7

<b>2. LITERATURE REVIEW.....</b>	<b>8</b>
<b>2.1 Introduction .....</b>	<b>8</b>
<b>2.2 Requirement Model Overview.....</b>	<b>8</b>
<b>2.3 Object-Oriented Requirements Modeling Based on UML.....</b>	<b>9</b>
<b>2.4 Overview of Web.....</b>	<b>10</b>
<b>2.4.1 Web-Based.....</b>	<b>11</b>
<b>2.4.2 Web Application.....</b>	<b>12</b>
<b>2.5 Loan Management.....</b>	<b>13</b>
<b>2.6 Web-Based Loan Management.....</b>	<b>14</b>
<b>2.7 Web-Based Loan Management System.....</b>	<b>14</b>
<b>2.8 Car loan.....</b>	<b>15</b>
<b>2.9 Online Web-Based PC loan Application for UUM Bursary.....</b>	<b>16</b>
<b>2.10 Online Loans Application in Venture Bank .....</b>	<b>16</b>
<b>2.11 Web-Based CalVet Home Loan Application.....</b>	<b>17</b>
<b>2.12 Web-Based Online Student Loans Scholarship Information System.....</b>	<b>19</b>
<b>2.13 Online PC Loan Application in University of Louisville.....</b>	<b>21</b>
<b>2.14 Program Language.....</b>	<b>21</b>
<b>2.14.1 .NET Framework.....</b>	<b>21</b>
<b>2.14.2 .NET Architecture.....</b>	<b>22</b>
<b>2.14.3 ASP.NET Overview.....</b>	<b>23</b>
<b>2.14.4 Advantage of ASP.NET.....</b>	<b>24</b>
<b>2.14.5 Page and Controls Framework.....</b>	<b>25</b>
<b>2.14.6 ASP.NET Compiler.....</b>	<b>26</b>
<b>2.14.7 Security Infrastructure.....</b>	<b>26</b>
<b>2.14.8 ASP.NET Configuration.....</b>	<b>27</b>
<b>2.14.9 ASP.NET Architecture.....</b>	<b>27</b>
<b>2.15 Database.....</b>	<b>28</b>
<b>2.16 Summary.....</b>	<b>28</b>



<b>3.</b>	<b>RESEARCH METHODOLOGY .....</b>	<b>29</b>
3.1	Introduction.....	29
3.2	Research Methodology.....	29
3.2.1	Phase 1: Conduct analysis study to the currant system .....	31
3.2.2	Phase 2: Design prospective system .....	31
3.2.3	Phase 3: Build prototype .....	33
3.2.3.1	The process of prototyping involves the following steps.....	34
3.2.4	Phase 4 : Examine prototypes by the user test and get feedback .....	34
3.3	Summary .....	35
<b>4.</b>	<b>RESULTS .....</b>	<b>36</b>
4.1	Introduction.....	36
4.2	Analysis.....	36
4.2.1	Requirements Determination.....	37
4.2.2	Use Case Diagram.....	37
4.2.3	System's Requirements.....	41
4.2.3.1	Functional Requirements.....	41
4.2.3.2	Non-Functional Requirements.....	43
4.3	Design.....	45
4.3.1	Logical Design.....	45
4.3.1.1	The Use Case diagram for the whole system .....	47
4.3.1.2	Use Case Specification.....	48
4.3.1.3	Sequence Diagram.....	58
4.3.1.4	Class Diagram.....	65
4.3.1.5	Flowchart for Apply Loan Application Algorithm.....	66
4.4	Physical Design.....	70

4.5 Summary.....	71
<b>5. DISCUSSION OF RESULTS .....</b>	<b>72</b>
5.1 Introduction.....	72
5.2 Implementation.....	72
5.3 Validate the Model using test case (functions).....	73
5.3.1 Login page.....	73
5.3.2 Apply application.....	76
5.3.3 Edit for application.....	78
5.3.4 Print an application.....	79
5.3.5 Sanction loan.....	80
5.3.6 Search for application.....	81
5.3.7 Logout.....	82
5.4 Evaluation.....	83
5.4.1 User testing (questionnaire): .....	83
5.4.2 Respondents.....	83
5.4.3 Structure of the Questionnaire.....	84
5.4.4 Output Result for Usability Evaluation.....	85
5.4.4.1 Sample Gender .....	85
5.4.4.2 Dimensions Testing Results .....	86
5.5 Summary .....	88
<b>6. CONCLUSIONS AND RECOMMENDED FURTHER STUDY.....</b>	<b>90</b>
6.1 Introduction.....	90
6.2 Finding.....	90
6.3 Problems and Limitations.....	91
6.4 Contribution of Study.....	92
6.5 Future Work.....	92
6.6 Summary ... ..	93

<b>REFERENCES .....</b>	<b>94</b>
<b>Appendices .....</b>	<b>103</b>
<b>Appendix A: Screens for the Web-Based Car Loan Management.....</b>	<b>103</b>
<b>Appendix B: Questionnaire for Web-Based Car Loan Management.....</b>	<b>116</b>
<b>Appendix C: List of Output Result for Usability Evaluation.....</b>	<b>121</b>

## **LIST OF TABLES**

<b>4.1 Functional Requirements .....</b>	<b>41</b>
<b>4.2 H/W.S/W Specifications.....</b>	<b>70</b>
<b>4.3 Gender.....</b>	<b>63</b>
<b>5.1 Sample Size .....</b>	<b>84</b>
<b>5.2: Gender Size of the Sample .....</b>	<b>85</b>
<b>5.3 Descriptive of all dimensions for WBCLM .....</b>	<b>87</b>

## **LIST OF FIGURES**

<b>2.1 Web-Based Application .....</b>	<b>12</b>
<b>2.2 Layers of web applications model.....</b>	<b>13</b>
<b>2.3 Web-Based Online Student Loans Information System.....</b>	<b>20</b>
<b>2.4 An Overview of the .NET Framework Architecture.....</b>	<b>23</b>
<b>2.5 ASP.NET Architecture .....</b>	<b>27</b>
<b>3.1 illustrates the Object Oriented Development Methodology Phases.....</b>	<b>30</b>
<b>3.2 The Web-Based Loan Management System Architecture .....</b>	<b>32</b>
<b>3.3 The Prototyping Approach.....</b>	<b>33</b>
<b>4.1 Use Case Diagram for WBCLM .....</b>	<b>47</b>
<b>4.2 Use Case Diagram for logout the system.....</b>	<b>48</b>
<b>4.3 Sequence Diagram for login to the system.....</b>	<b>59</b>

4.4	Sequence Diagram for apply application.....	60
4.5	Sequence Diagram for edit application.....	61
4.6	Sequence Diagram for sanction loan.....	62
4.7	Sequence Diagram for print application.....	63
4.8	Sequence Diagram for search for application.....	64
4.9	Class diagram for Class diagram for WBCLMS .....	65
4.10	Flowchart for Apply Car Loan Application Algorithm.....	68-69
5.1	Login page.....	73
5.2	Apply application.....	76
5.3	Edit for application.....	78
5.4	Print an application.....	79
5.5	Sanction loan.....	80
5.6	Search for application.....	81
5.7	Logout.....	82
5.8	Gender size of the sample .....	86
5.9	Descriptive of all Dimensions for WBCLM .....	87

## **LIST OF ABBREVIATIONS**

World Wide Web (WWW)  
Customer Relationship Management (CRM)  
Web Based Application (WBA)  
Hyper Text Transfer Protocol (HTTP)  
Hyper Text Markup Protocol (HTML)  
Universiti Utara Malaysia (UUM)  
Web-Based Loan Management System (WBLMS)  
Requirement Modeling (RM)  
Unified Modified Language (UML)  
Object-Oriented Modeling (OOM)  
Object-Oriented Methodology (OOM)  
Java Server Pages (JSP)

Active Server Provider (ASP)  
Internet Explorer (IE)  
Loan Management System (LMS)  
Texas Guaranteed (TG)  
Web-Based Loan Management (WBLM)  
Texas Tech Health Sciences Center (TTHSC)  
Texas Tech University (TTU)  
Information Technology (IT)  
Personal Computer (PC)  
Online Web-Based Loan (OWBL)  
California Veteran (CalVet)  
Universal Residential Loan Application (URLA)  
United States American (USA)  
Web-Based Online Student Loans Information System (WBOSLIS)  
University of Louisville (UL)  
Human Resource (HR)  
Common Language Runtime (CLR)  
Common Type System (CTS)  
Object-Oriented Programming (OOP)  
Just In Time (JIT)  
Personal Digital Assistants (PDA)  
Internet Information Services (IIS)  
Vice Chancel (VC)  
Web-Based Car Loan Management (WBCLM)  
Online Web-Based Car Loan (OWBCL)  
Web-Based Car Loan (WBCL)  
Object Oriented Analysis (OOA)  
Information System (IS)  
Object Oriented Development Methodology (OODM)

## **CHAPTER ONE**

### **STATEMENT OF OBJECTIVE**

#### **1.1 Introduction**

This chapter provides a description to the study. It contains the background of the study, problem statement, research questions, research objectives, scope of study, Significance/Contribution of the study and thesis organization.

#### **1.2 Background to the study**

The developments in software and technology of World Wide Web (WWW) show the emergence of the second generation of hypertext browsers (Marshall and Hurley, 1996). The speedy improvement of Internet technology WWW in the past decade has increased the ways of solving complex problems businesses fields for instance organizations, firms, and universities such as Customer Relationship Management (CRM) problems and e-commerce. Also the web as a component of the internet application has changed the technique of the business transactions throughout developing web applications to facilities the Business dealings (Sridharan, 2004).

The contents of  
the thesis is for  
internal user  
only

## REFERENCES

Acunetix. (2008). Web Applications: What are they? What of them? Retrieved May 16, 2008 from

<http://www.acunetix.com/websitesecurity/web-applications.htm>.

Archivesystems. (2008). glossary of terms. Retrieved May 17, 2008 from

<http://www.archivesystems.com/glossary.asp>

Auckland. (2004). web application. Retrieved May 17, 2008 from

<http://www.cs.auckland.ac.nz/tukutuku/help.htm>.

Australian Subject Gateways Forum (ASGF). (October 2007). National Library of Australia. Retrieved May 19, 2008 from

<http://www.nla.gov.au/initiatives/sg/servicetypes.html>

Barker, D. (No date). Requirements modeling technology a vision for better, faster, and cheaper systems. Retrieved September 7, 2008 from

Berners-Lee, T. (1997). Key Web Features. Retrieved May 14, 2008 from

<http://www.livinginternet.com/w/wp.htm>.

Boger, M. Sturm, T. Schildhauer E. and Graham, E. (2004). Poseidon for UML Users Guide. Retrieved September 22, 2008 from

[http://www-gris.det.uvigo.es/~avilas/poseidon\\_users\\_guide.pdf](http://www-gris.det.uvigo.es/~avilas/poseidon_users_guide.pdf).



Brown, D. (2002). An Introduction to Object-Oriented Analysis John Wiley & Sons, ISBN 0471371378. Retrieved September 19, 2008 from <http://www.wiley.com/college/brown/0471371378/ppt/ch06.ppt>.

Bursary. (2008). Introduction. Retrieved May 12, 2008 from <http://www.uum.edu.my/bend/pagebi/bendbi.html>.

BusinessDictionary. (2008). BusinessDictionary.Com. Retrieved September 11, 2008 from <http://www.businessdictionary.com/definition/web-based-application.html>

California Department of Veterans Affairs (CDVA). (2004). Cal-Vet Home Loan Strategic Business Plan. Retrieved May 24, 2008 from <http://www.cdva.ca.gov/CalVetLoans/CalVet%20SBP%202004.pdf>

California Department of Veterans Affairs (CDVA). (2007). calvet home loan application package. Retrieved May 24, 2008 from <http://www.cdva.ca.gov/CalVetloans/cdvainst.pdf>

Carvalho, A. (2004). Sequencing ICT in Post-Conflict/Low-Capacity Countries Undergoing Decentralization. Retrieved May 17, 2008 from <http://www1.worldbank.org/publicsector/decentralization/March2005Seminar/3Carvalho/Carvalho%20Draft%20%20Sequencing%20ICT%20in%20Post-Conflict%20Countries%20Undergoing%20Decentralization.pdf>.

Cal Vet Loans. (2008). Retrieved May 24, 2008 from <http://www.calvetloans.us>

Chitnis, M. Ananthamurthy, L. and Tiwari, P. (2002). The UML Class Diagram. Retrieved September 16, 2008 from <http://www.developer.com/design/article.php/2206791>.

Collard. R. (1999). Test Design. *Stqemagazine: Software Testing & Quality Engineering*. Retrieved June 22, 2007 from <http://www.softtestl.ordsifl.S/material/rosscollard I.pdf>.

Cooley, R. Mobasher, B. and Srivastava, J. (1997). Grouping Web Page References into Transactions for Mining World Wide Web Browsing Patterns. Retrieved May 7, 2008 from <http://ieeexplore.ieee.org/iel3/4982/13690/00629824.pdf?temp=x&htry=3>

Cyberzoo. (2001). loan management system. Retrieved May 21, 2008 from <http://www.adbs.co.za>

Darie, C. Ruvalcaba, Z. (November 2006). Build Your Own ASP.NET 2.0 Web Site Using C# & VB.

Day, M. (2003). Collecting and preserving the World Wide Web. Retrieved May 18, 2008 from [http://www.jisc.ac.uk/uploaded\\_documents/archiving\\_feasibility.pdf](http://www.jisc.ac.uk/uploaded_documents/archiving_feasibility.pdf)

Dennis, A. Wixom, B. and Tegarden, D. (2002). System Analysis & Design, an Object – Oriented Approach with UML. John Wiley & Sons, ISBN 0-471-41387-9.

Dennis G. Jerz. (2000). Usability Testing: What is it? Retrieved October 17, 2008 from <http://jerz.setonhill.edu/design/usability/intro.htm>.

DePaul University. (No Date). SQL Server Database high availability program. Retrieved May 22, 2008 from <http://ipd.cti.depaul.edu/ssdha/SSDHAbrochure.pdf>

D'souza, D and Wills, A. (1999). Objects, Components, and Frameworks with UML the catalysis approach. Addison Wesley. Pages 176-206.

Elmblad, S. (No date). Online Software. Retrieved May 21, 2008 from [http://financialsoft.about.com/od/glossaryindexo/g/OnlineApp\\_def.htm](http://financialsoft.about.com/od/glossaryindexo/g/OnlineApp_def.htm).

Geekazoid & Friends. (1999). Geek Speak Glossary. Retrieved September 10, 2008 from <http://www.geekazoid.com/geekspeak>.

Hanselman, S. (2006). Professional ASP.NET 2.0 Special Edition (Wrox Professional Guides). (1st ed). New work: Geoffrey.

Hevner, A., March, S., Park, J. and Ram, S. (2004). "Design Science in Information Systems Research." MIS Quarterly 28(1): 75-105.

Justus D. Naumann, A. Jenkins, M. (2000). Prototyping: The New Paradigm for Systems Development .MIS Quarterly, Vol. 6, No. 3 (Sep., 1982), pp. 29-44.

Kendall, K. E. & Kendall, J. (2005). Systems Analysis and Design (Sixth Edition), Prentice Hall.

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

Larman, C. (1998). Applying UML and Patterns, An introduction to object oriented analysis and design. Prentice Hall PTR, New jersey. Pages. 49-52-161.

Li, X. (2004). Web-Based Online Student Loans Information System. Retrieved May 24, 2008 from <http://poly.asu.edu/technology/dcst/Projects/May2004/XiaopingLi.pdf>.

Linder, W. (1993). Total Quality Loan Management. (2 nd ed). probus and bankers publication. (Pages 37-42-49).

Lu, M. Zhao, X. Li, M. (1999). Object-Oriented Requirements Modeling Based on UML. Retrieved September 17, 2008.

Malan, R and Bredemeyer, D. (2001). Functional Requirements and Use Cases Retrieved September 21, 2008 from [http://www.bredemeyer.com/pdf\\_files/functreq.pdf](http://www.bredemeyer.com/pdf_files/functreq.pdf).

Marakas, G. M. (2006). System analysis and design: an active approach. New York: McGraw-Hill/Irwin.

Marshall, D and Hurley, S. (1996). Delivering Hypertext-based Courseware on the World-Wide-Web. Retrieved May 9, 2008 from [http://www.jucs.org/jucs\\_2\\_12/delivering\\_hypertext\\_based\\_courseware/MarshallA\\_D.pdf](http://www.jucs.org/jucs_2_12/delivering_hypertext_based_courseware/MarshallA_D.pdf)

McGraw-Hill/Osborne. (2004). Understanding the .NET Framework. Retrieved May 19, 2008 from <http://www.aspfree.com/c/a/.NET/Understanding-the-.NET-Framework/>

Mitchell S. (2005). ASP.NET Data Web Controls Kick Start (2<sup>nd</sup> ed). Boston: Bill and Srinivasa.

Progressive System Solutions, Inc. (2008). Accounting Software Directory. Retrieved May 21, 2008 from <http://www.findaccountingsoftware.com/software/product/4432>

Rodgers, W and Regash, S. (July 2007). The Effects of Web based Technologies on Knowledge Transfer. Retrieved May 9, 2008 from [http://sloan.ucr.edu/blog/uploads/papers/Negash%20%20Rodgers%20CACM\\_FINAL%20VERSION\\_.pdf](http://sloan.ucr.edu/blog/uploads/papers/Negash%20%20Rodgers%20CACM_FINAL%20VERSION_.pdf)

Shahrooj, A. (2008). Online Web-Based PC Loan Application for University Utara Malaysia Bursary. (Pages 3-5).

Shen, W. Guizani, M. and Yang. Z. (No date). Execution of A Requirement Model in Software Development. Retrieved May 9, 2008 from <http://www.cs.wmich.edu/~zjiang/pub/lasse04.pdf>

Sridharan K. (2004). A course on web languages and web-based applications. Education, IEEE Transactions on Volume 47, Issue 2, May 2004 Page(s): 254 – 260  
Digital Object Identifier 10.1109/TE.2004.825228.

Selvan, M and Swarup, K. (2004). Object-oriented power system analysis. Retrieved February 28, 2008 from <http://journal.library.iisc.ernet.in/vol200405/paper2/abst-selvan.pdf>

Technical Committee on Learning Technology (TCLT). (January 2004). Learning Technology. Retrieved May 10, 2008 from [http://lttf.ieee.org/learn\\_tech/issues/january2004/learn\\_tech\\_january2004.pdf](http://lttf.ieee.org/learn_tech/issues/january2004/learn_tech_january2004.pdf)

Texas Guaranteed (TG). (2002). TG Launches Web-based Loan Management System. Retrieved May 21, 2008 from <http://www.tgslc.org/pdf/press021205.pdf>.

University of Louisville. (2007). PC loan program. Retrieved May 22, 2008 from <http://louisville.edu/hr/benefits/pc-loan>.

University Teaching and Learning Centre (UTLC). (2008). LearningCare Portal System. Retrieved May 11, 2008 from [http://www.uum.edu.my/utlc/Brochure\\_learn care.pdf](http://www.uum.edu.my/utlc/Brochure_learn care.pdf)

USA Funds. (2002). Annual Report. Retrieved February 18, 2008 from <http://www.usafunds.org/About/FY2002results.html>.

Venture bank. (2003). Retrieved May 23, 2008 from <http://www.venture-bank.com/consumerloans.htm>

Walther S. (2005). ASP.NET Unleashed (1st ed). Boston: Allyn and Bacon.

Wang, Q. Quan, L. Ying, F. (2004). Online testing of Web-based application. Retrieved May 17, 2008 from <http://ieeexplore.ieee.org/iel5/9304/29573/01342702.pdf?arnumber=1342702&htry=>

Watson, K. (2005). *Beginning ASP .NET 2.0 E-Commerce in C# 2005* (1 st ed)  
Florida: Dari.

Whitten, J. L., Bentley, L. D., Dittman, K. C. (2001). *System analysis and design methods*. New York: McGray-Hill.

Whitten, J. L., Bentley, L. D. (2007). *System analysis and design methods*. New York: McGray-Hill.

wiki2. (January 2008). Introduction to ASP.NET , Retrieved 22 May 2008 ,  
<http://wiki2.wordpress.com/2008/01/18/article-introduction-to-aspnet/>

Wroblewski, L and Ramirez, F. (No date). *Web Application Solutions: A Designer's Guide*. Retrieved May 12, 2008 from  
<http://www.lukew.com/resources/webapplicationsolutions.pdf>