# BINUS INTERNATIONAL UNIVERSITAS BINA NUSANTARA

Major Computer Science Sarjana Komputer Thesis Semester [Even] year 2008

## APPLICATION OF WEB CONTENT MANAGEMENT SYSTEM (WCMS) FOR WEBSITE DEVELOPMENT AND MAINTENANCE TOOLS USING PHP

**Daniel Liga** 0800765850

#### **Abstract**

The development of Web Content Management System or WCMS application primarly intends to realize the need of user to create and maintain their website easily and automatically through online web server. The application provides the environment work allowing both technical and non-technical developers as a web designer or web programmer to collaborate working on website with its tools. The tools created provides functionality to cut the development time and cost instead creating them manually.

The method of development of application is using PHP as a web programming to create the systems and MySQL as the database management system to handle content management system database. The development try to design the concept to separately control database and web content and able to integreate easily based on the theory of CMS Feature Onion as a standard theory for core functionalities.

The result of application development as the aim of thesis is producing a complete Web Content Management. Author manages to create 6 systems as tools of web content development and maintenece. The working systems have been proven by developing one website by using WCMS application and utilize all features that the application offers. That website is called "Anisekai" created by the same author.

The conclusion of making WCMS as a thesis application has proven all concepts that developer design and implements provides capability to function as CMS.

### **Keywords**

Web Content Management System, Content, Web Application, Database, Metadata.

## **PREFACE**

First, I thank to God for finishing and successing to develop the thesis project of Web Content Management System. This application is created by spending long of time indended to provide the web content management support for web developer to easily develop the website. Many design concepts made from beginning is only a scratch idea of the basic that the developer needs in developing website. The development of application as the realization of thesis research project is not only involving authors as the creator. It won't succed without involvement from other peoples who contributes idea and technical knowledge to shape the design concepts into implementation. It is not a project that can be created alone because it is complex application, yet has benefits later on. These are the peoples who are contributes and involves and help a lot when developing the thesis:

- Firdaus Alamsjah, Ph.D as an executive director of Bina Nusantara who gives me a chance to take part develops the thesis in this university that I'm proud of.
- Mr. Minaldi Loeis, M.Sc., MM, MBA, as a director of academic programs as
  well as my thesis supervisor who gives me a brilliant idea to complete the
  application and the thesis paper.
- Ir. Tri Asih Budiono, MIT, as a head of computer science and Raymond Kosala,
   Ph.D as a head of research development who allows me to develop and improve the thesis and they are who dedicates in helping student's thesis.
- Not forgetting my best friends; Pratiwi, Marilyn, Albert, Lidya who cheers me
   and support me to develop the thesis and my best schoolmates, Anthony who

share a same struggle to do the thesis, Rio Renaldi my beloved friends who keeps

contact with me supports me.

• My best friends in Bina Nusantara Anggrek as the best of programmers, Andra

Basuki and Pascal Angriawan who contributes their idea and support of thecnical

knowledge to realize the concept into implementation.

I wish all of them have a good fortune and futures of life. Because of them, I manage to

create a complete application, not just a prototype in according to the target time. Once

again, thank you all.

Daniel Liga

August 1, 2008

vi

## **TABLE OF CONTENTS**

Cover Page		
Title Page		ii
Certificate of	Approval of Soft-copy	iii
Abstract		iv
Preface		v
Table of Conto	ent	vii
List of Table		xi
List of Figure.		xiii
CHAPTER 1	Introduction	1
1.1	Scope	3
	1.1.1 Constraint.	3
	1.1.2 Assumption	4
1.2	Aims and Benefits	5
1.3	Thesis Structure	6
CHAPTER 2	Theoretical Foundation	9
2.1	Content Definition	9
2.2	Content Management System (CMS)	9
	2.2.1 Web Content Management System (WCMS)	10
	2.2.1.1 WCMS Components	11
	2.2.2 Other types of Content Management System	13

2.2.3 CMS Feature Onion Theory.....

14

			viii
2.3	Datab	ase	16
	2.3.1	SQL (Structured Query Language)	17
	2.3.2	DBMS (Database Management System)	20
	2.3.3	MySQL	21
	2.3.4	Metadata	22
		2.3.4.1 Definition	22
		2.3.4.2 Metadata in Rational Database	22
		2.3.4.3 Datatype	23
2.4	Websi	te	23
	2.4.1	Definition	23
	2.4.2	HTML	24
		2.4.2.1 HTML Tags	24
		2.4.2.2 HTML Forms	25
		2.4.2.3 Static HTML Page	29
		2.4.2.4 Dynamic HTML Page	29
	2.4.3	PHP (PHP Hypertext Processor)	31
	2.4.4	Javascript	32
2.5	Design	n Theory	33
	2.5.1	Web Template	34
	2.5.2	Consistency Theory	35
2.6	UML	Model Diagram	36
	2.6.1	Use Case Diagram	37
	2.6.2	Activity Diagram	38

		1X
CHAPTER 3	Problem Analysis	39
3.1	Current Internet and Website Development	39
3.2	Development of WCMS	42
3.3	Proposed Solution.	44
	3.3.1 Metadata Manager Tool	45
	3.3.2 Data Manager Tool	47
	3.3.3 Web Content Manager Tool	48
	3.3.4 Web Template Tool	49
	3.3.5 Database Backup and Restore Support	50
3.4	PHP and MySQL as PHP Development Software	52
CHAPTER 4	Solution Design	54
4.1	Introduction of Solution Design.	54
4.2	WCMS Application Structure	55
4.3	Metadata Manager	57
	4.3.1 Metadata Table	59
	4.3.2 Metadata Manager Interface	69
4.4	Data Manager	71
4.5	Template Manager	83
	4.5.1 Code Template	85
	4.5.1 Design Template	90
4.6	Web Manager	91
4.7	Index Manager	97
4.8	Recovery Manager	100

4.9	Use Case Diagram and Scenario	102
CHAPTER 5	System Implementation	125
5.1	Introduction of System Implementation	125
5.2	System Requirements	126
5.3	Application Installation	127
5.4	Implementation Workflow	129
5.5	First Implementation – Table Management	131
5.6	Second Implementation – Data Management	133
5.7	Third Implementation – Web Content Management	134
5.8	Fourth Implementation – Integration Procedure	137
5.9	Fifth Implementation – Content Indexing	141
5.10	Optional Implementation – Data Backup and Restore	145
CHAPTER 6	Evaluation and Discussion	147
6.1	Implementation Result	147
6.2	Evaluation	148
6.3	Discussion	150
CHAPTER 7	Conclusion and Recommendations	152
7.1	Conclusion	152
7.2	Recommendation	154
REFERENCES.		155
CURRICULUM VITAE		
APPENDICES	S	159

# LIST OF TABLES

CHAPTER II			
Table 2.1	HTML Example from W3Schools	24	
Table 2.2	HTML Roots Tags	25	
CHAPTER	IV		
Table 4.1	MySQL and WCMS Metadata Comparisons	58	
Table 4.2	Metadata Table Entity	59	
Table 4.3	WCMS Datatype and HMTL Display Customization	64	
Table 4.4	Data Table Entity	70	
Table 4.5	MySQL Database Table Example: Employee Table Entity	77	
Table 4.6	MySQL Database Table Example: Branch Table Entity	78	
Table 4.7	MySQL Database Table Example: Branch Data	78	
Table 4.8	MySQL Database Table Example: Employee Data	78	
Table 4.9	WCMS Database Metadata Table Result	79	
<b>Table 4.10</b>	WCMS Database Data Table Result: Branch Table	79	
<b>Table 4.11</b>	WCMS Database Data Table Result: Employee Table Table	80	
<b>Table 4.12</b>	Use Case Description of Create New Metadata	105	
<b>Table 4.13</b>	Use Case Description of Edit Existed Metadata	106	
<b>Table 4.14</b>	Use Case Description of Remove Existed Metadata	107	
<b>Table 4.15</b>	Use Case Description of Insert Data into Table	108	
<b>Table 4.16</b>	Use Case Description of Edit Existed Table Data	109	
<b>Table 4.17</b>	Use Case Description of Remove Existed Table Data	110	

<b>Table 4.18</b>	Use Case Description of View Metadata	111
<b>Table 4.19</b>	Use Case Description of View Data	112
<b>Table 4.20</b>	Use Case Description of Create New Web Content	113
<b>Table 4.21</b>	Use Case Description of Update Existed Web Content	114
<b>Table 4.22</b>	Use Case Description of Remove Existed Web Content	115
<b>Table 4.23</b>	Use Case Description of View Web Content	116
<b>Table 4.24</b>	Use Case Description of Link Web Content into Index	117
<b>Table 4.25</b>	Use Case Description of Unlink Web Content from Index	118
<b>Table 4.26</b>	Use Case Description of Send Design Template into Template Manager	119
<b>Table 4.27</b>	Use Case Description of Process the Code Template inside PHP	120
<b>Table 4.28</b>	Use Case Description of Perform Data Backup	121
<b>Table 4.29</b>	Use Case Description of Perform Data Restore	122
<b>Table 4.30</b>	Use Case Description of Dispose Backup Data	123
CHAPTER V		
Table 5.1	PHP Example Part I: "Test.PHP" code testing of template	139
Table 5.2	PHP Example Part II: "Test.PHP" code testing of template	140
Table 5.3	PHP Example Part III: "Branch.TPL" template file	140
Table 5.4	PHP Example Part IV: The output	140

# LIST OF FIGURES

CHAPIERII	L	
Figure 2.1	Content Management Life-cycle	11
Figure 2.2	CMS Feature Onion	15
Figure 2.3	Database Management System Architecture	20
Figure 2.4	Web Template Engine	35
Figure 2.5	MVC Model Architecture	35
CHAPTER II		
Figure 3.1	World internet user diagram in March 2008 around world	39
Figure 3.2	Internet user in world on March 2008 in million of users	40
Figure 3.3	Internet user growth percentage from 2000 – 2008	40
Figure 3.4	Total Sites across All Domains August 1995 - April 2008	41
CHAPTER I	V	
Figure 4.1	WCMS Code Structure Diagram	56
Figure 4.2	Data Flow Diagram of Metadata Manager	69
Figure 4.3	File Browsing Design Template of Input Form Prototype	73
Figure 4.4	Data Manager of Data Checking Activity Diagram	75
Figure 4.5	Data Flow Diagram of Data Manager	82
Figure 4.6	Data Flow Diagram of Template Manager	84
Figure 4.7	Current Workflow Diagram of 3 Managers (Metadata, Data and Template)	92
Figure 4.8	Workflow Diagram of 4 Managers (Metadata, Data and Template	03

Figure 4.9	WCMS Five Layers of Web Design Rule	94
Figure 4.10	Data Flow Diagram of Web Manager	97
Figure 4.11	Web Manager and Index Manager Content Assemble Concept	99
Figure 4.12	Data Flow Diagram of Index Manager	99
Figure 4.13	Data Flow Diagram of Recovery Manager (Complete DFD)	102
Figure 4.14	UML Model: Use Case Diagram of WCMS	103
CHAPTER V		
Figure 5.1	WCMS Complete Workflow Diagram	129
Figure 5.2	Anisekai.NET Metadata Manager Interface of creating new table	131
Figure 5.3	Metadata Manager Interface After Create New Table	131
Figure 5.4	Metadata Manager Interface Form of Creating New Metadata	132
Figure 5.5	Metadata Manager Example of New Metadata of nNew Table	133
Figure 5.6	Data Manager Interface Input New Data Form	133
Figure 5.7	Data Manager Interface List of Saved Data	134
Figure 5.8	Web Manager Interface List of Web Content of Anisekai.NET	135
Figure 5.9	Web Manager Interface New Web Content Form	136
Figure 5.10	Template Manager Listing All Design Templates of Anisekai.NET.	137
Figure 5.11	Template Manager Display Template Editor	138
Figure 5.12	Index Manager Showing the Center Contents of Anisekai.NET	141
Figure 5.13	Inside Index Manager showing the content display selection	141
Figure 5.14	Index Manager: Main index page components in Anisekai.NET	142
Figure 5.15	Anisekai.NET content of "header" as top display content	142

Figure 5.16	Anisekai.NET content of "top9anime" and "pool" as left display	
	content	143
Figure 5.17	Anisekai.NET content of "anime search" and "updates" as left	
	display content	143
Figure 5.18	Anisekai.NET content of "param" as center display content	144
Figure 5.19	Anisekai.NET content of "footer" as bottom display content	144
Figure 5.20	Anisekai.NET Main Page Example	145
Figure 5.21	Recovery Manager Interface	145
Figure 5.22	Recovery Manager Backup File Location	146